The R-3000 uses an advanced PLL system in an up-conversion scheme to a high (48MHz) first IF to remove any possibility of image responses. The receiver covers the entire frequency range from below 200kHz right up to 30MHz in 30 bands, each 1MHz wide. The bands are selected, not by ambiguous knob twiddling as in receivers using the Wadley loop but by a 30 position band switch which controls the PLL system.

The band switch also electronically selects the appropriate band pass filter network in the RF stages of the receiver so there are no "preselector" or "antenna trim" controls to twiddle — simply set the band switch to the range required — that's it!

A highly stable VFO tunes each 1MHz range and its linear, back lit scale makes readout easy. However, in addition to this dial, Trio have also provided 5 digit true frequency digital readout so as to guarantee spot on accuracy on any frequency. As a further feature, the digital display can also be switched to read time, this being derived from a quartz standard. Marvellous for accurate log keeping. The display uses high intensity readout units which can be dimmed for use in low light conditions.

As for what else is inside this superb instrument — selectivity is catered for by three custom made IF filters: a 12kHz wide AM filter; 6kHz narrow AM filter; and a new 2.7kHz SSB filter with a shape factor of better than 1:2 6:60dB. Selectable sidebands are available at the touch of a switch.

For the first time in mid-price receiver, a true noise blanker is provided to remove pulse type ignition noise.

To minimise front end overload, a step RF attenuator is included which gives 0-60dB attenuation in four steps.

All the rear panel connectors are recessed on a sloping panel so that you can stand the receiver either on its back, or pushed hard against a wall when used in conventional shelf mounting. The antenna inputs allow the use of either a high impedance wire aerial or a 50ohm balanced input so that the proverbial long lump of wire will work really well with the R-1000.

This receiver is so advanced it makes everything in its price range completely obsolete.

LOWE ELECTRONICS LTD. CHESTERFIELD ROAD, MATLOCK, DERBYSHIRE.
LOWE ELECTRONICS LTD

PRICE LIST MARCH 1980

TRIO EQUIPMENT

<table>
<thead>
<tr>
<th>Price</th>
<th>Carriage</th>
</tr>
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<tbody>
<tr>
<td>TRS20 - 160-10m transceiver 200W PE</td>
<td>£669.30 £4.50</td>
</tr>
<tr>
<td>DG1 - Digital readout to 100Hz</td>
<td>£150.00 £4.50</td>
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<tr>
<td>SPE20 - External SPE</td>
<td>£141.95 £4.50</td>
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<tr>
<td>VFO20B - External VFO</td>
<td>£95.00 £4.50</td>
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<tr>
<td>YGB8C - CW filter 800</td>
<td>£185.00 £4.50</td>
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<tr>
<td>R902 - The ultimate matching receiver TS20</td>
<td>£95.00 £4.50</td>
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<tr>
<td>TRG500-2m</td>
<td>£95.00 £4.50</td>
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<tr>
<td>TR3200 - 2300</td>
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<tr>
<td>TR3200-70cm</td>
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<td>TR8300-70cm</td>
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<td>TR2400-2</td>
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<td>TR2300-2m</td>
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<tr>
<td>TSX350-2 - 160-10m transceiver</td>
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<tr>
<td>VFO520S - External VFO</td>
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<tr>
<td>RS200- Speaker</td>
<td>£58.50 £4.50</td>
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<tr>
<td>YG3395C - 8 po CW filter</td>
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<td>DG6 - Digital display/counter</td>
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<tr>
<td>DSX20 - Conversion for TS120</td>
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<tr>
<td>TS120S - 80-10m mobile transceiver 200W PE</td>
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<tr>
<td>TS120V - 80-10m mobile transceiver 200W PE</td>
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<tr>
<td>PS20 - Power supply for TS120</td>
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<tr>
<td>MB100 - Mobile mounting bracket</td>
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<tr>
<td>TRY8C8 - 500W CW filter</td>
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<tr>
<td>SP120 - External speaker</td>
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<tr>
<td>VFO120 - External VFO</td>
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<tr>
<td>AT120 - Antenna tuner (100W)</td>
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<tr>
<td>PS00 - AC PSU for TS120S</td>
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<tr>
<td>AT200 - 180 30MHz antenna tuner</td>
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<tr>
<td>SM200 - Monitor scope</td>
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<tr>
<td>BS5 - TS200a/2 board for SM200</td>
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<tr>
<td>BS400 - TS200a/2 board for SM200</td>
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<tr>
<td>TL120 - 10-10m 200W linear</td>
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<tr>
<td>TL122 - HF linear amplifier 160-10m/2Kw PE</td>
<td>£58.50 £4.50</td>
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<tr>
<td>LC500 - Desk microphone/microphone</td>
<td>£58.50 £4.50</td>
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<tr>
<td>MC355 - 50KHz microphone</td>
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<tr>
<td>MC365 - 50kHz microphone</td>
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<tr>
<td>LF300A - HF low pass filter 1KHz 90dB</td>
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<tr>
<td>BPF2A - 2m band pass filter 144-146MHz</td>
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<tr>
<td>RD300 - High power dummy load</td>
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<tr>
<td>TS710 - 2m/70cm all mode band</td>
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<tr>
<td>SP70 - Matching speaker</td>
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<tr>
<td>TR7600 - 2m Synthesised mobile/fixd transceiver</td>
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<tr>
<td>RM76 - Microprocessor control unit</td>
<td>£58.50 £4.50</td>
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<tr>
<td>TR2300 - 2m FM portable transceiver PLL with 80 FM Channels</td>
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<tr>
<td>VB2300 - 10W booster</td>
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<tr>
<td>MB2 - Mobile mount</td>
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<tr>
<td>RA1 - Helical rubber antenna</td>
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<tr>
<td>PS5 - 2-way power unit and charger TR2300</td>
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<tr>
<td>TR2400 - 2 meter synthesised handheld transceiver</td>
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<tr>
<td>ST1 - Base Stand and quick charger</td>
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<tr>
<td>EC5 - 12v quick charger</td>
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<tr>
<td>SC3 - Carrying case</td>
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<td>TS180S - 160 10m solid state transceiver</td>
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<td>VFO100 - External VFO</td>
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<td>SP180 - Speaker</td>
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<td>DF180 - Digital frequency control</td>
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<tr>
<td>PS30 - AC power unit for TS180S</td>
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<tr>
<td>TRS300 - 70cm FM mobile transceiver fitted 4 channels</td>
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<tr>
<td>TRS300 - 70cm FM handy transceiver fitted with 3 channels</td>
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<tr>
<td>MB1A - Matching mobile mount</td>
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<tr>
<td>PS60 - Digital filter control</td>
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<td>TR2300/200 - Spare power lead</td>
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<tr>
<td>R1000 - 0.2-30MHz receiver</td>
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<tr>
<td>SP100-3 - 2-way power unit</td>
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<tr>
<td>R300 - General coverage receiver</td>
<td>£58.50 £4.50</td>
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<tr>
<td>HS5 - Communications headphones, tailored response</td>
<td>£58.50 £4.50</td>
</tr>
<tr>
<td>HS4 - Communications headphones, tailored response</td>
<td>£58.50 £4.50</td>
</tr>
</tbody>
</table>
**The Way to Have Tomorrow's Equipment Today**

Everyone is talking about the new Lowe credit card scheme, following its introduction at Leicester. This is the new, easy way to have the rig you want without the pressure of an instant purchase and without any future price rises. How does it work? You simply agree to pay a fixed amount each month and you then get instant purchasing power of 24 times the payment. For example, a payment of £10 gives you £240 of credit, more than enough to buy that TR2000 aerial and accessories. No hassles and no waiting periods. A further advantage is that as the payments continue, your credit is automatically extended to allow further purchases. Why not ask for full details right away and join the growing numbers who hold the Lowe blue card - the way to have tomorrow's equipment today. A major advance to your purchasing power.

**Low Electronics Ltd**

<table>
<thead>
<tr>
<th>Item</th>
<th>Price inc. VAT</th>
<th>Carriage</th>
</tr>
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<tbody>
<tr>
<td>Morse Keys - HK708</td>
<td>£9.66</td>
<td>£1.00</td>
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<tr>
<td>Morse Key - Sykes Robertson standard key</td>
<td>£11.50</td>
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<tr>
<td>Squeeze pad</td>
<td>£20.00</td>
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<tr>
<td>EK1 - Keypad key</td>
<td>£16.49</td>
<td>£0.75</td>
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<tr>
<td>MK1024 - Electronic key with 1024 bit memory</td>
<td>£134.00</td>
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<tr>
<td>HK704 - Squeeze pad</td>
<td>£10.50</td>
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<td>Rotators</td>
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<tr>
<td>AR45 - (15 core cable required)</td>
<td>£54.63</td>
<td>£4.50</td>
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<tr>
<td>FX200 - for lightweight 2m beam</td>
<td>£40.39</td>
<td>£4.50</td>
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<tr>
<td>DR7500 - Will take 7/8 element tribander</td>
<td>£108.10</td>
<td>£4.50</td>
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<tr>
<td>DR7600 - Will take 2 element 40mre beam</td>
<td>£154.10</td>
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<tr>
<td>DR7600P - As above but with preset or manual controller</td>
<td>£204.70</td>
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<td>Mobile Whips etc.</td>
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<td>HE-10 - Heavy duty gutter mount</td>
<td>£3.00</td>
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<tr>
<td>MB5 - Mug mount with 5m coax terminated in PL259</td>
<td>£7.95</td>
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<tr>
<td>CBA311 - 2m gutter clamp aerial</td>
<td>£6.00</td>
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<tr>
<td>MA41 - 2m 3/4 wave gutter mount aerial complete with whip, clamp, cable etc.</td>
<td>£11.33</td>
<td>£1.00</td>
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<tr>
<td>Base station aerials</td>
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<tr>
<td>HF5 - Our original success; 80 10m HF vertical, no radiators required on ground mount</td>
<td>£41.40</td>
<td>£4.50</td>
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<tr>
<td>HF5R - Radial kit for mast mounting</td>
<td>£23.00</td>
<td>£4.50</td>
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<tr>
<td>MA5 - New TRIGR and mobile aerial</td>
<td>£85.00</td>
<td>£4.50</td>
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<tr>
<td>GP5 - High performance 2m base station collinear</td>
<td>£22.00</td>
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<tr>
<td>GD2X - 3dB gain over the range 50-480MHz</td>
<td>£36.80</td>
<td>£4.50</td>
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<tr>
<td>T5 - Classic wideband aerial</td>
<td>£11.50</td>
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<tr>
<td>LAB - Air band ground plane</td>
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<tr>
<td>Power Supplies, All 220-240V ac input</td>
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<tr>
<td>PS3A - 300mA at 6, 7.5, 9V, Dual polarity clip</td>
<td>£2.85</td>
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<tr>
<td>PS2 - 1A at 6, 9, 12V</td>
<td>£15.85</td>
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<tr>
<td>PS1 - 400mA at 3, 4.5, 6V</td>
<td>£5.65</td>
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<tr>
<td>PS125 - 3.5A at 13.8V regulated</td>
<td>£18.40</td>
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<tr>
<td>PS1207 - 700mA at 13.8V regulated</td>
<td>£10.93</td>
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<td><strong>NEW</strong></td>
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<tr>
<td>FX1 - Station wavemeter 700kHz-250MHz</td>
<td>£28.00</td>
<td>£1.00</td>
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<tr>
<td>BR5S - L.C.R. bridge, marvellous instrument</td>
<td>£39.00</td>
<td>£1.25</td>
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<tr>
<td>DX450 - Desk mic, built in digital clock and transmission timer. The best</td>
<td>£63.00</td>
<td>£1.25</td>
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<tr>
<td>SI10 - 6V dc morse practice oscillator</td>
<td>£0.95</td>
<td>£0.25</td>
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<tr>
<td>ME221 - Station multimeter 20kV</td>
<td>£16.49</td>
<td>£0.75</td>
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<tr>
<td>RA144 - 2 metre receiver preamp</td>
<td>£9.05</td>
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<tr>
<td>FC3 - 500MHz counter with i.f. offset</td>
<td>£41.40</td>
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<tr>
<td>FC22A - 250MHz counter with i.f. offset</td>
<td>£66.70</td>
<td>£0.75</td>
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<tr>
<td>DX-008 - Fully programmable counter, gives decoding on any rig</td>
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<tr>
<td>LCM 1 - 500MHz counter 240V/12V</td>
<td>£115.00</td>
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</tbody>
</table>

Low Electronics Head Office and Service Centre
CHESTERFIELD ROAD, MATLOCK, DERBYS. TEL: 0629-2817 or 2430. TELEX 377482. OPEN 9.5.30 TUES-SAT. PHONE IN 9am-9pm.

Agents: John, G3JYG. 16 Harvard Road, Ringmer, Lewes, Sussex, Ringmer B12701. Sim, GM3SAN, 19 Ellismuir Road, Balloch, Nr Glasgow, 041-771 0364

COME AND SEE US SOON - IT'S WORTH THE VISIT, 73 DE G3PCY
AMATEUR ELECTRONICS UK

AEUK — Your number one

AS FACTORY APPOINTED DISTRIBUTORS WE OFFER YOU —
WIDEST CHOICE, LARGEST STOCKS, PROMPTTEST DEAL AND
FAST, SURE SERVICE RIGHT THROUGH

TOP OF THE SHOP

YES INDEED — WHEN IT COMES TO AMATEUR RADIO
IT MATTERS NOT IF THE SHOP IN QUESTION IS IN BIRMINGHAM OR BOMBAY — THE FINEST RANGE OF
EQUIPMENT ON THE SHELF WILL CARRY THE YAESU MARQUE OF THE WORLD'S LARGEST MANUFACTURER. YAESU'S REPUTATION
FOR HIGH TECHNOLOGY ENGINEERING IS LEGENDARY
AND WITHIN THE PRODUCT RANGE MAY BE FOUND MODELS TO SUIT EVERY CONCEIVABLE APPLICATION
AND BUDGET. THIS MONTH WE FEATURE THREE TOP
UNITS FROM THE HF RANGE.

FT-901DM

FT-901DM YAESU's Competition Grade Transceiver
— without doubt the ultimate in all-mode HF rigs ir-
respective of manufacturer. An absolute delight to
operate as any user will confirm and the owner can
build up a very impressive station by adding from the
comprehensive range of interfacing ancillary units.

ALL SOLID STATE FT-107M

ALL SOLID STATE FT-107M

FT-107M. This is the brand-new solid-state HF Transceiver which has just been included in the ever-growing range.
The receiver performance is comparable to the FT-901 (which says everything) and a memory option is provided of 12
programmable channels plus fine tuning. Add to this the ease of tuning, 240 PEP input, superb low-profile styling and
here is the rig for the Eighties.

HOW TO REACH US (EASY PRIVATE PARKING ON OUR 90ft FORECOURT)

FROM SOUTH AND EAST. We are located approximately two miles from Junction 5 of the M6 from which follow signposts to Birmingham. Within 1/4 mile
turn right at Clock Garage and proceed towards city. After one mile look for traffic lights at Fox & Goose and immediately over the lights take minor left fork in
Alum Rock Road. We are located one mile from this point.

FROM NORTH. Leave M6 at Junction 6 (Spaghetti) and follow left fork down to traffic island beneath motorway complex. Take third turning off to Lichfield.
One mile further on follow A4040 to the right and within 100 yds veer again to the right, approximately one mile further on brings you to the Fox & Goose. Turn
right and see preceding directions.

FROM THE WEST AND SOUTHWEST. Follow M5 then M6 to Spaghetti Junction (see above). Alternatively, leave M5 at junction 4 or 3 and proceed to inner
ring road. Turn South on ring road and leave on A47 (East). We are located three miles from this point.

Hours: 9.30—5.30 Continuous including Saturdays—Early closing Wednesday, 1 p.m.

Access or attractive H.P. terms readily available for on-the-spot
transactions. Full demonstration facilities. Free Securicor delivery.
source for YAESSU MUSEN

FT-101ZD. When YAESU first introduced the original FT-101 this was the trend setter of the day and so it has been with each succeeding version of this world famous transceiver. Countless thousands have been purchased around the Globe and the reputation which these rugged rigs earned for performance and reliability operating under every form of adverse condition went a long way towards establishing the YAESU MUSEN name. When the latest model, the FT-101ZD, was launched last year we knew as soon as we saw the first delivery that once again YAESU had a winner and the sales that have followed have proved this beyond any shadow of doubt. There is simply nothing on the market that can match the FT-101Z and FT-101ZD for value for money and as we keep saying - the performance outstrips many a rig with a fancier price tag.

AND WHAT ELSE IS AT AMATEUR ELECTRONICS?

The short answer is 'PLENTY', but the full reply is a very lengthy one indeed these days. Quite apart from the host of accessories and ancillary units stocked we import the superb SWAN range as per our recent advertisements and carry ATLAS equipment and latterly the full ICOM range. Add to these the superb new STANDARD RADIO models and you'll soon see that a visit could be well worth while. If you can't make it, of course, then we shall be pleased to send you all the information you require by return of post. Lest you forget! - we carry the full Jaybeam range plus a good choice of mobile aerials.

ATTENTION BARGAIN HUNTERS! A large SAE will bring you our latest used equipment list and our special offers on discontinued new gear and new demonstration models.

AGENCY APPOINTMENTS

We are pleased to announce that we have extended our service to out-of-town customers with the appointment of two new agents in areas which are, in our view, lacking in amateur sales facilities at the moment. AMATEUR ELECTRONICS UK is now fully represented by the following additional AGENTS and the personnel involved, named or otherwise, are fully licensed operators who have been selected for their interest in and knowledge of, the hobby not to mention their impeccable bona fides.

EAST ANGLIA - Dr. T. THIRST (Tim) G4CTT, NORWICH. 06925 403.
NORTH EAST - NORTH EAST AMATEUR RADIO, DARLINGTON. 0325 55969.

We hope customers in the above areas will avail themselves of the service now offered and we are sure they will derive great benefit from expert local help.

Our existing representatives remain, of course, as below.

BRANCH: AMATEUR ELECTRONICS, UK - COASTAL, CLIFTONVILLE,
KENT, KEN McINNESS, G3FTE, THANET (084) 291297. 9 a.m-10.30 p.m.

BRANCH: AMATEUR ELECTRONICS UK - SCOTLAND, 287 MAIN STREET,
WISHAW, LANARKSHIRE, GORDON McALLUM, GM3UCI.
TELEPHONE WISHAW 71382. (EVENINGS CARLUKE 70914)

AGENT: WALES & WEST - ROSS CLARE, GW3NWS, CAERLEON, NEWPORT. (CAERLEON 422232) - ONLY 20 MINUTES OVER THE SEVERN BRIDGE.
THE MOBILE OF CHOICE FROM THE WORLD FAMOUS ICOM STABLE — THE IC-255E

25 WATTS — 5 MEMORIES — SCANNING — 600 KHz AND USER SELECTABLE REPEATER SHIFT — FULL COVERAGE IN 5 KHz or 25 KHz STEPS

We have had a poke around one of these little beauties and are certain that Icom, yet again, have come up with a winner. As you can see, it has the expected smart Icom appearance. Features include:

- Crystal controlled Tone Burst
- Full band coverage — extendable to 148 MHz if required
- Four digit LED display
- 25 Watts output or 1W low power. A superb receiver using grounded gate FET front end
- Scanning over a user programmable range
- Memory scan
- Stop on empty or busy channels
- Tuning in 25KHz or 5KHz steps
- 5 Memories — retained while the power is connected to the rig
- Built-in 600 KHz Repeater shift
- Alternative programmable shift
- Reverse Repeater facilities
- RIT (±3 KHz) for those off channel stations
- Good loud audio
- Optically coupled tuning between control knob and CPU
- Multiway 24 pin socket on back for touchpad, computer, or external control (note the current RM3 cannot be used but a new version is to be introduced)
- Rugged modular PA (guaranteed of course!)
- Mobile mount which can be padlocked

At £255 including VAT these are such value for money that demand may exceed supply for a while — but they are worth waiting for! (Delivery is free of course by Registered First Class Letter Post.)

FROM THANET OF COURSE
ICOM®

“NEW” IC251E £479 inc.

DON’T WORRY — WE GUARANTEE ALL SOLID STATE RIGS INCLUDING PAs

AFTER YEARS OF SUCCESS THE IC211E HAS NOW BEEN REPLACED BY THE IC251E. NOT JUST A FACELIFT, BUT A NUMBER OF IMPORTANT DEVELOPMENTS HAVE BEEN INCORPORATED.

MICROPROCESSOR CONTROL — CPU control with Icom’s original programs provides various operating capabilities. No backlash dial controlled by Icom’s unique photo-chopper circuit. Band edge detector and Endless System provides out-of-band protection. No variable capacitors or dial gear, giving problem-free use. The IC251E provides FM, USB, LSB, CW coverage in the 144-146 MHz frequency range. Thus the IC251E can be used for mobile, DX, local calls, and satellite work.

MULTI-PURPOSE SCANNING — Memory Scan allows you to monitor three different memory channels. Program Scan provides scanning between two programmed frequencies. Adjustable scanning speed. Auto-stop stops scanning when a signal is received in all modes.

DUAL VFO’s — Two separate VFO’s can be used either independently or together for simplex operation, and any desired frequency split in duplex operation.

CONTINUOUS TUNING SYSTEM — Icom’s new continuous tuning system features a luminescent display that follows the tuning knob movement and provides an extremely accurate readout. Frequencies are displayed in 7 digits representing 100 MHz to 100 Hz digits.

Automatic re-cycling restarts the tuning at the bottom of the band when the top is reached — and vice versa. Quick tuning in 1 KHz steps is available, and fine tuning in 100 Hz steps in the SSB and CW modes, and 5 KHz steps and 1 KHz steps in the FM mode, is provided for trouble free QSO.

EASIER OPERATION AND LIGHTER WEIGHT — The most compact, lightest weight all-mode 144 MHz transceiver. First to use a pulse power supply in communication equipment, for lighter weight. 50 mm-diameter large tuning control knob for smooth and easy tuning. Trouble-free controlling knobs for both receiving and transmitting. LED indicator for transmit and receiving modes.

MOST SUITABLE FOR BOTH FIXED AND PORTABLE STATIONS — Built in 240V AC and DC power supplies. Convenient Dial Lock switch for mobile operation. Easy carry handle. Effective Noise Blanker. IC SM5 high quality stand microphone is suitable for fixed station operation. Powerful audio output 1.5 Watts at 8 ohm, for easy listening even in noisy surroundings.

OUTSTANDING PERFORMANCE — The RF amplifier and first mixer circuits using MOS FETs and other circuits provide excellent Cross Modulation and Two-Signal selectivity characteristics. The IC251E has excellent sensitivity demanded especially for mobile operation, high stability, and with Crystal Filters having high shape factors, exceptional selectivity. The Transmitter uses a balanced mixer in a single conversion system, a band pass filter and a high performance low-pass filter. The system provides distortion-free signals with a minimum spurious radiation level.

MODES — USB, LSB, CW and FM output.

SENSITIVITY — CW and SSB — Less than 0.25 microvolts for 10 dB S+N/N. FM — More than 30 dB S+N+N/D at 1 microvolt or less than 0.3 microvolts for 20 dB Noise quieting.

FROM

THANET

OF COURSE
IC-215
£162 inc.

IC-402
£242 inc.

IC-202S
£169 inc.

IC-240
£169 inc.

IC-280E
£250 inc.

* WITH SCANNER £260

AGENTs (PHONE FIRST - All evenings and weekends only, except Barnsley and Burnley)
Scotland - Jack GMBGEC (031-665 2420)
Wales - Tony GW3FKO (0222 702982) Burnley - (0282 38481) Midlands - Tony GBAVH (021-329 2305)
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FOR ALL MAIL ORDERS AND SALES DURING BUSINESS HOURS
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THANET ELECTRONICS LTD.
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ANNOUNCING A NEW COMMUNICATIONS COMPUTER!

Theta 7000E

Built-in demodulator for high performance for 170, 425 and 820 Hz shift.
Crystal controlled modulator for AFSR — Hi or Lo tone.
Convenient ASCII key arrangement.
Large capacity display memory — 2 pages 32 chr x 16 lines split screen for Rx & Tx if required.
Automatic transmit/receive switch.
Anti noise circuit.
Battery backed-up memory 7 channels of 64 hrs.
Send function.
Buffer memory — 53 character type ahead, rub out function.
Simultaneous access of the memory.
Pre-loading function.
CR (carriage return) LF (line feed) cancel function.
Cursor control function.
Word mode operation.
Automatic CR/LF (72, 60 or 80 chr per line).
Echo function.
Word Wrap around function.
Transmit/receive in ASSC11 mode in RTTY.
CW identification function.
Mark and break (space and break) system.
Monitor circuit.
CW practice function.
Variable CW weights.
Cross pattern checking output terminal.
Log computer output provided.
Test message function (Ry and OB).

£640.00 inc.

The new THETA 7000E means that every Amateur can enjoy the visual display of CW, RTTY, and ASCII in both transmit and receive modes. Just connect the TONO to any VTR set via the antenna terminals or to a page printer from the parallel port provided. Bring up your CW speed in receiving or sending by either watching receiver sent or from recorded cassettes. Connection to the transceiver is via the key, phone and mic sockets.

Some of the Outstanding Features

COMMUNICATIONS COMPUTER THETA 0-7000E
VHF and Composite Video Output Provided

Printer interface.
Wide range of transmitting and receiving speeds — 10CW speeds + BRTTY.

Computer compatible—the Best!
IC-701 HF £899 inc.

ICOM's superior LSI technology takes the lead in Amateur HF. The extremely compact IC-701 delivers 100 watts output from a completely solid state, no tune (broad band design) final, on all modes and all bands, from 160-10 M. With single knob frequency selection and built-in dual VFO's, the LSI controlled IC-701 is the choice in computer compatible, multi-mode Amateur HF transceivers.

The IC-701's single frequency control knob puts fully synthesized instant tuning at a single finger tip. WIDE bands, with 100Hz per division and 5kHz per turn, is instantly co-ordinated between the smooth tuning knob and the synthesizer's digital read-out with positively no time lag or backlash (no waiting for counter to update; less operator fatigue). And at the push of the electronic high speed tuning button, the synthesizer flies through megacycles at 10kHz per step (500kHz per turn).

The computer compatible IC-701 LSI chip provides input of incremental step or digit-by-digit programming data from an external source, such as the microprocessor controlled accessory which will also provide remote band selection and other functions.

Full band coverage of all six HF bands, and continuously variable bandwidth on filter widths for SSB, RTTY, and even SSTV, help to make the IC-701 the very best HF transceiver ever made. IC-701 includes two CW widths, all of this standard at no extra cost. Sold complete with the high quality electret condenser base mic (SM-2), the IC-701 is loaded with many ICOM quality standard features. Standard in every IC-701 are two independently selectable, digitally synthesized VFO's at no extra cost. Also standard are a double-balanced schottky diode 1st mixer for excellent receiver IMD, and RF speech processor, separate drop times for transmit and CW VOX, optionally continuous RIT, fast/slow AGC, efficient IF noise blanker, fast break-in CW, and full metering capability.

FROM THANET OF COURSE
South Midlands

SMC & YAESU FOR HF – SMC & YAESU FOR HF

FT707 NEW SOLID STATE TRANSCEIVER

The FT707, The Wayfarer, is an ultra-compact solid-state transceiver covering 80-10m, including 30, 17 and 12m – all factory installed, with 100W output (10W 'S' model) 50% out developed in 3:1 VSWR, digital bright LED's in mode sensitive counter and analogue readout, status at a glance from LED and single displays! 16 poles of crystal filtering continuously adjustable IF bandwidth 2,4kHz to 30kHz.

Noise blanker of most advanced design using local AGC loop, Schottky diode ring module, power transistor buffers, ultra-clean low noise oscillator are combined to produce, size and price notwithstanding. Probably the best receiver you have ever used.

FT107M NEW SOLID STATE TRANSCEIVER

All solid state transceiver, 160-10m (WWV Rx and 2 Aux), 12v DC, SSB, CW, FSK and AM, 240W PIP. The fan cooled (thermally controlled) no tune "broad band" power amplifier delivers 75% power at 100kHz, -75% 3dB dynamic range and digital readout to 1kHz. Sensitivity and with excellent dynamic range (hard driven Schottky diode ring mixer). Continuous variable bandwidth 300kHz to 2.4kHz plus optional "basic" of 350/600kHz and 6kHz. Full equipment includes: audio peak/nitch filter, full metering including SWR, RF power, selected memory, sidetone, VOX, clarifier on Tx, Rx, or both, UV 70 attenuator etc. The optional memory system provides 12 stored channels (with fine tuning), and offers scanning from the microphone. The store employs DMS – digital memory shift – to allow tuning, via a photo interrupter of any of the memorised frequencies. 13-240kHz.

FT901DM THE SUPERB PERFORMER

160-10M (+ WWV Rx) 12 and 234V PSI/AC, SSB, AM, CW, FSK and FM (Transceiver and Aux), 180W PIP, 80W Fl. Analogue 1kHz and digital to 10kHz. Sensitive 400W 'S' with AGC controlled Mosfet RF, to pull pull FET RF, to balance active mixer, push pull IF, to cryo-cool mixer when blanked. Continuously variable selectivity 300kHz to 2kHz plus optional "basic" of 350/600kHz and 6kHz. Full equipment includes: audio peak/nitch filter, full metering including SWR, RF power, selected memory, sidetone, VOX, clarifier on Tx, Rx, or both, UV 70 attenuator etc. The optional memory system provides 12 stored channels (with fine tuning), and offers scanning from the microphone. The store employs DMS – digital memory shift – to allow tuning, via a photo interrupter of any of the memorised frequencies. 13-240kHz.

FT101ZD PERFORMANCE AND ECONOMY

A hybrid HF transceiver, 160-10M (+ WWV Rx and Aux), 234V AC and 12V DC (built-in inverter option), SSB, AM, CW, 180W PIP from a pair of 6146B with negative feedback. Analogue and "mode sensitive" digital readout to 100kHz, -75% 3dB dynamic range and digital readout to 1kHz. Sensitivity and with excellent dynamic range (hard driven Schottky diode ring mixer). Continuous variable bandwidth 300kHz to 2kHz plus optional "basic" of 350/600kHz and 6kHz. Full equipment includes: audio peak/nitch filter, full metering including SWR, RF power, selected memory, sidetone, VOX, clarifier on Tx, Rx, or both, UV 70 attenuator etc. The optional memory system provides 12 stored channels (with fine tuning), and offers scanning from the microphone. The store employs DMS – digital memory shift – to allow tuning, via a photo interrupter of any of the memorised frequencies. 13-240kHz.

FT7B MOBILE AND BASE TRANSCEIVER

A compact all solid state HF transceiver, 80-10M (full 2MHz coverage of 10 with optional crystals). USB-LSB CW-AM. 100W PIP (A3 and A1), 25W (A3). VFO control with clear analogue scale to 1kHz, plus an optional digital readout unit that can be conveniently sited above the transceiver, on the dash or steering column, and can remarkably unobtrusive for a transceiver featuring a crystal calibrator, VOX, clarifier, sidetone, an excellent audio peak filter for CW. A Mosfet RF stage for sensitivity, and a Schottky diode ring mixer for dynamic range provides a level of receivers performance that outclasses "cost sensitive" (F) transceiver's. The FT7B provides the economic answer to world wide communications from home or from the car.

PRICES EXCLUDE VAT (15%) BUT INCLUDE DELIVERY – SECURICOR/POST IN THE UK

SOUTH MIDLANDS COMMUNICATIONS LIMITED

OSBORNE ROAD, TOTTEN, SOUTHAMPTON SO4 4DN
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AGENTS STOCK AND SALES

THE SHORT WAVE MAGAZINE
April, 1980
Communications Ltd

SMC & YAESU FOR VHF — SMC & YAESU FOR VHF

FT720R NEW 'REMOVABLE'

The FT720R is a new concept in mobile FM. Take a neat 'removable' control head (2m or 4m of extension cable and your choice of 2m (10 or 25W) and 70cm 10W main units. Add if you wish a switching box and then both 2 and 70cm are available from the one money and space saving controller.

The package offers sophisticated microprocessor PLL control system, optical coupled tuning, 5 memory channels, priority channel, up/down scanning from the mic (stop on busy or empty), auto or man. Tone burst up/down repeater shift and a string of yellow and red leds for power out and S meter etc.

FT720R Transceiver 10W 2m £148.00

FT720R Transceiver 25W, 2m £152.00

FT720R Transceiver 10W, 70cm £179.00

FT207R — FT202R: 2m HANDHELDs

The FT207R is a microprocessor controlled synthesized handheld that offers 12.5kHz channel steps!!
4 memory channels are provided and these may, as can the whole band, be scanned. Any one of the memories can be used as a priority channel. Simply operate as normal on any frequency, designate one of the memories as priority, and every few seconds, for a few milliseconds, the set will check occupancy of the channel. All frequency entry is by the keyboard (which includes touch tone).

The readout displays frequencies (to 10kHz), memory channel number and 'P'. Switches are provided for keyboard lock (prevents accidental operation) and display 'time-out'. A 800kHz shift, and any programmable split, is available, and is an economical 6 channel handheld physically similar to the FT207R.

The FT202R is an economical 6 channel handheld physically similar to the FT207R.

CPU2500 MICROPROCESSOR CONTROLLED

The CPU2500 family are 2 metre FM transceivers available in 25W or 10W output form with keyboard or standard push tune microphones. CPU stands for Central Processing Unit and it is this microprocessor that governs all the synthesizer functions. Fitting the two tuning knobs (optically coupled), by using the up/down push buttons on the front panel, by using the up/down push buttons on the microphone or by tapping in the data on the keyboard microphone. Plus and minus 600kHz repeater shift and any split up to 4MHz can be programmed in. Four memory channels with back-up are provided and these may be scanned, as can the whole band, the scanner stopping at the first vacant or occupied channel.

The SMC stepper (St) provides 25kHz steps between 145-146MHz (and entry of 5kHz direct from the keyboard) rather than the 10kHz (5 up) synthesizer steps only, when it is switched into circuit.

CPU2500DR 25W standard £292

CPU2500DRS 25W CW stepper £319

CPU2500RX 10W key mic £292

CPU2500RXS 10W key stepper £319

CPU2500RS 25W key mic £328

CPU2500RSS 25W CW stepper £335

CPU2500RMS 10W standard £272

CPU2500RSS 10W CW stepper £279

FT227 SYNTHESIZED MOBILE TRANSCIEVER

The FT227s are 10W output 2 metre transceivers whose receiver performance — sensitivity and immunity to overload has become the standard against which others are compared. They use a signal knob (photo interrupter) to control the synthesiser, which basically runs in 10kHz steps with a 5kHz 'fill in' oscillator. FT227RXS is an FT227R fitted with SMC's scanner. This maintains all the normal features of the 227 but the neat internal installation provides automatic tuning from 145 to 146 in 25kHz steps. When finding an occupied channel the scanner pauses for about seven seconds and if not held will move on. A flick of the P.P.T. will lock out one or all unwanted channels next scan around. FT227RXSt is an FT227RB with SMC's stepper. A four channel memory is provided in this model and tuning may also be accomplished by push buttons on the microphone. A single push moves the transceiver 25kHz, hold the button down for 3 seconds and it scans the band until a station is found.

FT227RXS Transceiver £252.17

FT227RXSt Transceiver £257.03

FP4 12V 4A PSU £35.00

YD148 Desk mic £18.50

FT225R MULTIMODE 2 METRE TRANSCIEVER

144-146-148MHz, USB, LSB, AM, CW (semi-break-in with side tone). Smooth dual speed VFO control 11 (x 4) crystal channels. Simplex and (auto tone burst) repeater. 600kHz and auxiliary shifts both up and down. Single signal input, with phase locked conversion oscillator, for spurious free output. Mains 230-10V 50-60Hz and 12V DC, worldwide portability. Excellent sensitivity, SSB 2kHz with 1:75. 1 SF, 12kHz at —6dB. High sensitivity with modern MOSFET RF stage. Good strong signal handling by careful gain distribution, mixer and crystal filter design. High power output 10W AM, 1-25W CW and FM, SSB 25W + with great reliability and low MO's. Mode sensitive digital readout to 10kHz and easy to service superior plug in board construction. Front panel controls for: SSB mic gain, FM power, squelch, Vox/Mox sensitivity, noise blanker, AGC, readout brightness, meter functions (1centre plus relative power) etc., Digital and Analogue versions and memory options.

FT225R Transceiver £485.00

FT225R Transceiver £465.00

M EM memory option £65.00

COUNT Counter RIO £50.00

PRICES EXCLUDE VAT (15%) BUT INCLUDE DELIVERY — SECURICOR/POST IN THE UK

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Jack Tweedy. G3ZY

150 Horncastle Road.

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Tel.: Woodhall Spa (0526) 52793

9.5 Tuesday Saturday (+ appoint.)
### TRANSVERTORS

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<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tr>
<td>MMT 1296/144</td>
<td>23m/2m IF 1.3w 3.5dB NF</td>
<td>£139.00</td>
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<td>MMT 432/144R</td>
<td>70m/2m IF 10w 1.6MHz shift</td>
<td>£151.00</td>
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<td>MMT 432/28S</td>
<td>70m/10m IF 10w 432-436MHz</td>
<td>£119.00</td>
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<td>MMT 144/28</td>
<td>2m/10m IF 10w 2.5dB NF</td>
<td>£75.00</td>
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<td>MMT 70/144</td>
<td>4m/2m IF 10w 2.5dB NF</td>
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<td>MMT 28/144</td>
<td>10m/2m IF 10w</td>
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### LINEARS

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<tr>
<td>MML 432/100</td>
<td>70cm 100w out, 10w Drive</td>
<td>£199.00</td>
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<td>MML 432/50</td>
<td>70cm 50w out, 10w Drive, RX Pre Amp</td>
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<td>MML 144/100</td>
<td>2M 100w out, 10w Drive</td>
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<td>MML 144/40</td>
<td>2M 25w out, 2w Drive</td>
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<td>MML 144/25</td>
<td>2M 25w out, 2w Drive, RX Pre Amp</td>
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<td>MML 70/100</td>
<td>4M 100w out, 10w Drive</td>
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### CONVERTORS

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<tr>
<td>MMC 432/28S</td>
<td>23cm/2m IF Low noise</td>
<td>£52.00</td>
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<tr>
<td>MMC 1296/144</td>
<td>23cm/2m IF Ring mixer</td>
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<td>MMC 1296/28</td>
<td>23cm/10m IF Ring mixer</td>
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<td>MMC 432/28S</td>
<td>70cm/10m IF 432/4, 434/6 MHz</td>
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<td>MMC 136/28</td>
<td>Maritime/10m IF</td>
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<tr>
<td>MMC 144/28ED</td>
<td>2m/10m IF Lo output</td>
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<td>MMC 136/28</td>
<td>Satellite/10m IF</td>
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<td>MMC 113/24WB</td>
<td>VDR/20-30MHz</td>
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<td>MMC 70/28LO</td>
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### PRE AMPS

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<tr>
<td>MMA 1296</td>
<td>23cm 2.9dB NF, 18dB gain</td>
<td>£25.00</td>
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<tr>
<td>MMA 432</td>
<td>23cm 2.9dB NF, 18dB gain</td>
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<td>MMA 144/2</td>
<td>2m Dual output</td>
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<td>MMA 144/47</td>
<td>2m RF switching, 1.5dB NF, 100w Thou</td>
<td>£13.00</td>
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<td>MMA 70</td>
<td>4m Dual output</td>
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<td>MMA 28</td>
<td>10m Dual output</td>
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### SOURCES

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<tr>
<td>MMS 384</td>
<td>Source 5-500m W cv FM modulator</td>
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<td>MMS 384</td>
<td>Varactor tripler to 23cm</td>
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<tr>
<td>MMS 1152</td>
<td>Varactor tripler to 23cm</td>
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### COUNTERS

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<tr>
<td>MMD50/500</td>
<td>Digital counter 500MHz</td>
<td>£80.00</td>
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<td>MMD50/P500</td>
<td>Prescaler + 10</td>
<td>£20.00</td>
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<tr>
<td>MMD9P2</td>
<td>Probe, 28MHz pre-amp</td>
<td>£10.00</td>
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</tbody>
</table>

### PRICES EXCLUDE VAT BUT INCLUDE POSTAGE WORLDWIDE
Communications Ltd

CDE and STOLLE — ROTATORS — SMC for CHOICE

AR40 AR30 BT1 T2X HAM IV CD45

Accurate, silent, self-calibrating control box. Dial up desired beam heading, push knob motor rotates to that position and then switches off. AR30 UHF QRP VHF AR40 VHF QRP HP Four position preset plus normal manual controls. Handles aerials up to 5 sq ft of wind area. Supplied (as AR40) with lower mast fitting etc.

£52 + VAT £79.50 + VAT £99 + VAT £199 + VAT Post and packing Free. £145 + VAT £85.83 + VAT Post & packing Free.

£99 + VAT £145 + VAT £199 + VAT Carriage by Securicor Free (UK Mainland)

Large illuminated meter gives readout of antenna heading at all times. Superior brake mechanism. Low voltage motor CD45 to 8% sq ft. HAM IV 15 sq ft. T2X to 30 sq ft.

£52 + VAT £0.27 £0.39 £0.45 + VAT

£145 + VAT £26.22 £26.25 £279

£99 + VAT £145 + VAT £199 + VAT

ROTATOR ACCESSORIES

Carriage in brackets. Prices exclude VAT.
AK121 Adaptor Kit CDE "Bell" rotor to tower plate ......................................................... (45p) £5.75
CD52 Alignment bearing for CDE AR10, 20, 30 .......................................................... (£5p) £6.75
RC3W 3 core cable (20/50) ......................................................................................... (p&p extra per metre £)
RC4W 4 core cable AR (10, 20, 40) .......................................................... (p&p extra per metre £0.22
RC5W5 core cable AR (30, 40, 33, BT 1 + Stolle) .......................................................... (p&p extra per metre £0.27
RC8W 8 core cable CD (44, 45) Ham's, T2X .......................................................... (p&p extra per metre £0.39

£35 + VAT £45.83 + VAT £145 + VAT £45.22

£60.00 £63.00 £60.00 £65.00

£26.25 £26.25 £279 £28.75

£26.22 £26.25 £279


£99+ VAT £145 + VAT £199 + VAT

ROTATOR BARGAINS

Offers subject to availability, please phone for stock position
AR10 Similar AR30 solenoid control special price ......................................................... £26.22
AR33 Similar AR40 plus 4 pre sets ................................................................................ £45.22
CD44 Similar CD45 ........................................................................................................ £60.00

£26.22 £45.22 £60.00

CDE AR40 plus VAT and delivery £60.00

£145 + VAT £199 + VAT

VAT and delivery.

GEM QUAD

A light strong, boomless, quad antenna covering 10 15-20 metres. The centre spider is aluminium and the spreader arms (13.6° and 2.2°) are of a glass fibre tri-deltic construction. (Thin rods forming a triangle with tape crossing for light, rigid, low wind resistance structure.)

GO2E 18 x 18' x 9.5' BdB Gain
GO3E As 2 ele plus 6.5' Boom
GO4E As 2 ele plus 13' Boom
All prices exclude VAT and delivery.

£26.22 £45.22 £60.00

£124.00 £187.00 £249.00

£63.00 £125.00 £181.25

£9.85 £9.85 £9.85

£9.85 £9.85 £9.85

£8.25 £8.25 £9.85

£26.25 £26.25 £26.25

10ft Sections, '30ft'

Capable of supporting a HF beam or several VHF antennas. The head unit takes a 2" tube and provides for a rotator. Operation is simple with single winch system. Low height eases planning permission problems.

10M10 P30 £265
10M18 P30 £265
10M18 BP30 £175
10M18 BP30 £75

£9.85 £124.00 £187.00 £249.00

£63.00 £125.00 £181.25

£26.25 £26.25 £26.25

£9.85 £9.85 £9.85

£26.25 £26.25 £26.25

10ft Sections, '30ft'

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<td>Transceiver, gen. conv. receiver &amp; Digital</td>
<td>£87.00</td>
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<td>Power Supply 120/240v for TR-7 &amp; DC-4</td>
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<td>MS-7</td>
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<td>Receiver 0-30 MHz</td>
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<tr>
<td>SL-300</td>
<td>CW Filter for TR-7 &amp; R-7 (300 Hz)</td>
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<tr>
<td>SL-500</td>
<td>CW Filter for TR-7 &amp; R-7 (500 Hz)</td>
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<tr>
<td>SL-4000</td>
<td>AM Filter (4000 Hz) for R-7 Receiver</td>
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<td>NS-7</td>
<td>Noise Blanker for TR-7</td>
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<td>Accessory crystals for R-4C &amp; SPR-4</td>
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(GB3SWM)

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Citizen's Band — Again!

In recent weeks some 10,000 illegal CB radios have been smuggled into the country, and as a result the amount of police activity to find this gear — and prosecute the operators — has considerably increased. This is particularly the case in London and Essex where there have been countless instances of bona fide amateurs being delayed or held while gear and status were checked. In an attempt to minimise this disruption in their neck of the woods, Harlow and Bishops Stortford amateurs arranged a meeting with the local police, the result of which was an agreement that local amateurs will carry a copy of the front sheet of their licence, their driving licence and/or RSGB card; club secretaries will give the police a list of local names, addresses and call-signs; and there will be a copy of the Callbook in the police station.

This is what has happened in Harlow: we hope it will serve as an example of what can be done if things become difficult elsewhere.

We have no particular axe to grind for or against CB, but at the same time it must be pointed out that if it had not been for the arrant twaddle published by the so-called "Citizen's Band Association", smuggling of CB sets on this scale would never have happened. The result is that many an innocent lorry-driver, say, is now about £200 lighter and awaiting the dealings of Justice — because someone told him it was "all right"; and any ham who has bought one can ponder the fact that he has broken the law and been ripped-off.

Article Competition

Having considered the matter very carefully, we feel that the prize of £50 should go to A.P. Ashton, G3XAP, for his series "Antennas — The Weak Link". Because of a lot of reader feedback, we know this series (now virtually at an end) has clarified and revealed the importance of a much-misunderstood, yet vital, facet of amateur radio: and this surely is the best reason for awarding the prize.
COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

As your scribe begins this piece again he is still minus the main aerials, erection of which has been held up for one reason and another — work was ever the curse of the hamming classes. On the other hand there has been some entertainment, too. Only today I was slung an old reel-to-reel tape recorder and informed that the owner’s XYL thought seven tape recorders in the workshop was a bit much, so would I take this one away and play with it — he had it for ten years and never switched it on. I lifted the lid and behold — a four-speed deck, no less: mechanically it seemed a bit reluctant, but the ever-useful little bottle of Arkline resolved that problem — and lo! — it spoke, and indeed sang too. Not loud, you understand, but enough to produce the “clicked again” reaction. Then I realised it was dark and the aerial-business still not done!

Oh well, dry the tears away and get on with the aerials available, at least until this CDXN is out of the way. So — let us circum-ambulate the bands.

Coming, going, gone

Which is where we chronicle the adrenalin-generating activities mentioned in the Bulletins. The DX Bulletin continues to improve as the grip on things is tightened; but while they were quite right to mention the various China propositions, they should have reserved judgement. At this moment, your scribe is of the opinion that a BY operation is out of court — and anyone who publicises their proposal before they have got the licence, the visa, and the aeroplane ticket reserved, is very likely to “lay an egg” as it does seem the Chinese authorities are cautious in opening up amateur radio activity in their country. So far the writer has not heard anything of ZL1AD1 from China; JA6HOZ hopes to be on from there sometime soon, and VE7BC also has plans.

Burma is mentioned in the DX Bulletin Issue 26, with a statement that VE3FXT will be in Rangoon with a medical team from April 15 to June 15, and he has hopes of a licence, for one frequency on 21 MHz and under the supervision of the authorities.

From the DX Bulletin we turn to Geoff Watts’ DX News Sheet. And it seems Geoff has a problem ... a letter ordering a Prefix List, postmarked Bromley, Kent, signed with a flourish that might be read as G. Lawrence but overlooked the matter of his own address, and Geoff would like to hear from him by letter or telephone so he can clear this problem from the file.

Another Geoff Watts publication is now available and it is a list of QSL Managers, over 2000 DX-stations having their managers listed during the last 18 months. The QSL Managers Directory comes from Geoff from his usual address of 62 Belmore Road, Norwich NR7 0PU, and the price is 50p or two dollars, or 6 IRCs to overseas by airmail.

Turning to our copies of DXN5, we note that with A22GW, Diana of G4EZI has now worked YLs in some 184 countries.

If you hear EA0JC on the air, he is King Juan-Carlos. And G5ATM is of course JY1 using his reciprocal call: King Hussein of Jordan has done much for amateur radio, and world peace too.

Looking well ahead, we have a notice of the International Police Association Contest and their “Sherlock Holmes” Award. Details on both these matters are available from R. A. Ridley, G3UTX, 23 Green Acre, Worlebury, Weston-super-Mare, Avon.

Those readers interested in /MM operators and their doings will be saddened to hear that G3RSP and G3ZGC both lost the ships they had served on for years, when the contract between the radio company and the owners was cancelled, so now they look to be on a different ship each voyage. G3ZGC/MM got his permission through to operate aboard a ship named Cast Osprey, of 106,000 tons deadweight carrying oil to the States from the North Sea and returning with grain from Mississippi. With such work about half the time is spent in harbour and so much less time is available for operations.

Forty

An odd place to start into the correspondence but a good one — if you can connect with DX here you can call yourself an operator! As far as the writer is concerned the absence of suitable aerials for the moment has stopped activity and even listening, but another few days will, if all goes well (optimist!) see him back on all bands.

The first letter to mention the band comes from Tim Charles, G4EZA, who like quite a few others is a refugee from the VHF bands. Activity occurs from his Colchester address, rather than Kingston where he is studying in the week. Gear in use (and well used) includes a Lowe SXR-30 used for a bit of SWL-ing at Kingston, and an FT-200 at home; the latter being, on occasion, the driver stage for either 200 milliwatts with the driver and PA plug pulled out or, for five watts, a home brew machine with a BD123 in the output stage. Aerials are not by any means easy in a terrace house with nothing outside allowed, but on the other hand a bit of mild bending of the rules plus a ten-metre beam firing at VK in the loft have all added to the totals. Full power CW on Forty gave QSOs with VE3JUP, VP2ML, and ZL4AV, and the 200 milliwatts level served for working G3LYX, G3TQD, and G4GZG.

Jack at G3PKS (Wells) has, after six years, finally pulled down his Pyramid, and built himself an ATU which can cope with all bands. Outside there are now a pair of vertical loops, roughly Delta shaped, and each fed through some six feet of open-wire feeder. Jack is now amusing himself with various combinations, such as N/S axis or E/W axis, or two in parallel, or the same again with one pair of feeders reversed (that made the ATU cough a bit!). They can also be connected in series, again connections reversed, and finally all feeders strapped together for Top Band operation. So far, the thing seems to tune nicely and flat from 7 MHz upwards,
and produces signals on all six bands, although it must be admitted that there was only "local-net" QSOs entered in the log. Changing tack we like the tale about G30TK operating 1 watt in the contest in the first week of March on ten metres: several times he was told by continental and Ws that "No we don't want your serial number of 1" followed by a stunned silence when he told them that the '1' referred to the power in use!

Let's see what next Chris Page, G4BUE (Upper Beeding) has been up to, he having taken to this QRP lark like the proverbial duck to water. The W2BA, W2SR, W1DA, N3EA, K4IEX, W4WJ, and W4ELM.

GM4ELV (Arrochar) is now back in operation, after being QRT since July 24, 1979, mainly on Forty but with the odd foray elsewhere. David worked AA7C for Oregon, and remarks on the aerial farm this station runs: 6-element monobanders for 14/21/28, 4-elements on 7 MHz and a small array like eight Hygain towers, 50 feet high, arranged in two rows of four, and phased for 7-28 MHz! David's only SSB contact on this band was with UK7LAR, but CW went out to VP2KAH, W3RJ, CO8CO, AA7C, hunter's delight! On 7 MHz we notice ONs, DJs, DFs, assorted Gs, and so on, including a ragchew with D16ZF that lasted 50 minutes; if you've heard George rattling along on his key, then a lot passed in each direction.

Eighty

Nice to hear again after quite a while from W3HQO/G3XNV, who is the Gen. Sec/Treasurer of the Ex-G Club—"For Radio Amateurs born in the U.K. and Domiciled Abroad." The Ex-G Club Bulletin is somewhere on its way to us, but meantime, eligible amateurs should note the address as 519 Lincoln Avenue, Hulmeville, PA 19047, U.S.A.; and others could do to recall that when travelling abroad there is usually a member in the country they are going to, and of course this applies with double force in U.S.A.

On now to G4EAN, who has at last got his tower to take RF, albeit with a poor SWR, but the FT-101B doesn't seem to mind; to prove the point he worked G5VO on Eighty. This last month has seen two pieces of new gear in the shack, namely a Datong frequency-agile filter and a KW-1000 on test for the Nottingham club; both seem to be doing their job quite nicely. As far as the lines go, the big snag is the price of the PA bottles — 572Bs are about £25 + tax. (That is why your scribe's "big pair of boots" is on one side here, and the smaller KW-600 is the only one in regular use, until we save our pocket-money is saved for the two 572Bs already ordered.)

G8RY (Newmarket) has to be an RTTY buff with a call like that, and indeed he is. Since November last, Frank has been knocking off the countries on the 'printer and now has thirty booked in. The main aerial is a trap dipole for 80-10, but there are some phased verticals and an inverter-vee for Ten fed from the feedpoint of the trap job. Frank has a beef about the people who persist in coming down into the CW-end of the 3.5 MHz band. The only good way to deal with the nuisance is to sit on them and have a QSO, or even call CQ on top of them until they can't finish their QSOs. It's hitting below the belt, but hard luck; alternatively, creep in one dark night and drop their aerials, leaving a little note as to why.

G4EAN

ARRL CW weekend was the main target, and some 1045 contacts run up in the weekend of which 574 were W/VE types, and some 52 DXCC countries. On Forty the two slopers worked nicely, with 63 Ws, TF3IRA, VE1ANU, UL7CAL, and UK0SAW. The Argonaut certainly works for its living!

Last month, G2HKU (Sheppey) reeks, saw conditions on Ten dropping off, and he also asks for some kind soul to blow up the Poltava Gas engine. No hope: it probably runs on the hot air fed it by politicians worldwide! CW found TF3KCW, W4ELM, WA4DOH, W4YL, N4CL, K8GG, W9YT and W2LPE. The GM4ELV machinery comprises a trap dipole for 7 and 3.5 MHz, and delta loops for the HF bands albeit these are down at the moment; in the shack there is an Argonaut 509 and an NEC CQ-110E.

One always likes to see a log from G3CED/G3VFA, with his two watts and Joystick aerials, because it is so full of humour — the covering letter indicates the log was posted on his 72nd birthday, and the comment that he'd stopped playing the numbers game! We liked also his definition of 7 MHz — beautiful QRM, a QRM-
seems to have been a very fine show this year, with lots of club members and lots more in the 6-15 watt level, says G8PG. He comments that while there was quite a lot of activity on the HF's there were still lots of people on 7 and 3.5 MHz. Angus heard G4BUE running 45 milliwatts output on 21 MHz, and believes it was a case of round-the-world propagation.

G2NJ (Peterborough) continues to report on the odd QSO on this band; G5NX working CW while driving his car was worked three times in eight days. Other QSOs were with G3HLI in Skipton, running a TCS-13 transmitter made in Hamilton in 1944 and owning a matching receiver. G4VF in Chelmsford was using a Marconi "Seaspan" of the 1950 era.

A look at the 3.5 MHz CW contacts of G3CED (Broadstairs) shows, rather as one would expect for a predominantly day-time operator, about an even balance of Gs and Europeans; the remarks columns are always interesting and against the call G3JJH is the note "QRT 17 years!"

A nice even mix of QRP and QRO for G2HKU, who keyed his HW-8 with YU1QP, IXKX, DL1GA, LX2FT, SP1JM, SP1ECY and PA0KRT, while the FT-101X saw to VE1AJL and ZL4JO.

G3PKS is rather enamoured of the band over the past couple of months, commenting on the Ws heard at dawn and the improvement in daylight conditions. However he didn't work any DX owing to net commitments and work; but these Ws — he could have had a ball with 'em!

In discussing his total in the ARRL DX CW Test, G4BUE mentions one QSO in passing when he remarks that his QRP entry included contacts with K2NG on all five bands; so Chris would rather like to know how they train their ears! An interesting comparison on scores is between G4BUE and Al Slater, G3FXB, about ten miles away on QRO. G4BUE made 1045 QSOs with a multiplier of 121 and 52 DXCC countries for a claimed score of a hair over 400K; while G3FXB ran up some 2500 QSOs with a multiplier of 210 in the same contest.

**Top Band**

Well, what about it? It's becoming popular again, that's what! If you can work UA9 or UAO on Top Band it makes a Top Band WAC almost a pushover.

G2HKU is now using an FT-101Z; he has heard UD6 and UAO on Top Band, and has found that one watt of Top Band RF, or even the teletype from GNF, is practically enough to upset the Trom and JVC video-recorders which price out at £700 a throw! Returning to the QSOs, CW found its way to PA0INA, PA0LOU, DL6AN, G4DBG, YU2RTW, DJ4SO and E193.

G3PKS is the other one who reckons the band is showing more signs of popularity; he made some 30 QSOs on it during the month, but failed to get any response whatsoever to CW calls. Contacts mentioned included a nice evening one with G3PU in Weymouth (about 45 miles), and on the Sunday morning with GU2FRO on Sark which must be getting on for the 100 mile distant mark.

**Ten Metres**

Not as good in mid-winter as in spring and autumn, of course, but value for money none-the less.

G4ITL (Harlow) continues his peaceful way; the ten-metre dipole now also has a 21 MHz bit on the same feeder, and it is soon to be joined by a 14 MHz brother, again all on the same feeder. As for countries, Bernard is taking them as they come, having heard people with DXCC saying how they overlooked the QRMs for new countries! The only snag to emerge is a complete absence of African stations at times when he could operate — mornings and lunchtimes; that is a pity, because it would complete his clutch of countries for a WAC award. It is sad that Africa is, in amateur radio terms, a Dark Continent. Even the chaps with the beams are finding it hard to run them to earth, and yet they should be about on one band or another more or less continuously. On the other hand, G4ITL found a VP5 and worked him one lunchtime, and didn't realise that he had just broken into and through his first pile-up!

G4EZA is a multimode type; CW gave him HZ1AB, PY6JAG, while the SSB came up with AX4YQ, JX9WT, TF3YH, VS6EZ, VUB2X, and 9K2DR.

G4HZW (Knutford) passed the RAE back in 1969, but various traumas of life meant interest was lost until a friend re-introduced him to the pleasures of the bands late in 1978. A G8 ticket was obtained, and 3 QSOs on VHF was enough to say "not my scene" and get down to the Morse which was passed in four months. The rig was a cheapie against everyone's advice in the form of an FT-75 plus AC and DC power supplies, and VFO. It was connected to a dipole and G4HZW talked to 'Alex' and 'Vlad', plus the odd W, but all short QSOs as people weren't copying any too well at the far end. As 28 MHz was the favourite band, a home-brew two-element Quad was put up, using scrap scaffold poles to make a 24-foot mast and bits of an old vacuum cleaner for the boom. The total cost of the Quad was 58p, and it has totally transformed the situation: the QSOs can last for hours, and they queue up to come back to a Q. Lots of Ws in all call areas, including WB1CDL/M with two watts to a bumber-mounted aerial, plus VP5WJR, VE3BVD/ST2, OK3TAB/D2A, HC1LH, VK4NR, LUSHDJ, PY2XB, 9V1UH, V12DPK, ZS6PS, CE5BSHM3U, L9EK, DK6NN/C6A, VK4NMM, CAA5AS, EP2TY, CX4BA, CP8CB, CO7AM, H44WV, VK6NMM, VK6NFI, J3AAG, OA4YQ, VY5AL, HV3SL, HC1HV, KH3Y, PY1ZAE, LUIHE, 8P6KY, VY5USB, V02CW, VE8MTF, VP1A, and all states. At the time of his first letter, Tony had them all in bar KH6, and his second letter indicated he had connected with a couple of them plus another KL7. So that's what a beam does for you!

**'CDXN' deadlines for the next three months**

- May issue — April 4th
- June issue — May 1st
- July issue — June 5th

Please be sure to note these dates.

G4IDU (Kingswinford) is a refugee from Justin Cooper, and of course that means he has been an active SWL for quite a while and knows the game. There is an FT-101E and a home-brew keyer for CW, an all-band end-fed wire, and a dipole for 21 MHz. CW on Ten accounted for YV5GAB, PY1ZAE, W6RR/7, and WB1CBO who was working using just the driver stage of the FT-101, and WB2PVO on a two-transistor QRP rig.
G3NOF (Yeovil) found the band open on occasion from 0730 right through to 2200. In the mornings the long path to VK/ZL/JA has been good, changing to short path as early as 0930. USA signals have been heard from 1100 till band closure which has been as late as 2230. Africa was not very obvious in the signals. Don made it with SSB to A4XIU, A4XHK, AP2FI, C6ACY, CI2DF, C7XBF, EA8OR, H31LR, JA5TJE, JA6BG, JA8CA, JF1IVR, K7LR for Idaho, K0RF in Colorado, VE5ADA, VE6LU, VE6MP, VE6WQ, VE7BJN, VE7B5M, VE7CVM, VE7DZ8, VE7D7V, VE7HN, VE2VEX, VK2VHC, VK4NMW, VK6PS, VP1A, VP2KAH, VP2ML, VP3EE, VS6GGY, W1BIH/PJ2, W6RO aboard the old Queen Mary, W6LKT/7, W6POC/7, W7JDF, W0ZV, WA0OBN, 9K2DR, 9V1UH, 9Y4FU, 6Y5YM, and N6YK/VP2A.

G4EAN mentions just two QSOs on the band, he having been playing with microprocessors too much; K4VMG and G4XGL were the favoured ones.

Just the two watts to a Joystick were in use at G3C6D/G3VFA, and on Ten this is quite a good combination. One Sunday session yielded QSOs with four Ws, a brace of UVs, a U9A, and UA1ASM from Leningrad who had 20 watts to a two-element beam and putting out a potent signal with it.

Ten for G4BUE included UI8JQC, VP2KAH, UH8HAI, EA8TY, ZE4JS, and YV1NX, all with his five watts of CW in the ARRL Contest weekend.

At G2HKU we note a longish list for the band, unusually so for Ted, including UA9QAS, W9VNE, W7NCO, EA8QO, 9J2BO, ZS6ME, W50MV, K7NHV, VP2MF, W6VD, K7RQ, VE7NH, W6CF, W6TD, and K6DDO.

The ten-metre log at G3PKS includes SSB with W2FRW, and W0HMF, who was away above 29 MHz as late as 1930 on the clock. PY2DLK, PY2BTR, PY6HL, YV1AD, WA6PVC, WD6GTT, W1PK, ZS1AF, R22ABH, WB0KLJ, VK6NDJ, VE3BFK, HH2VP, W9GX, N7ARA; all these were worked with CW.

Fifteen

Almost an anti-climax after the way Ten has been showing at sensible times; but of course it is nice to have 21 MHz to fall back on when Ten dies for any reason. It is an eminently civilised band these days, nice and quiet but plenty of DX — and we can hardly blame the band for the Poltava Pestilence.

G2HKU of course normally stops at this band for a quick look, and his quick look found — with the fleapower rig — SM5AHK, while the big rig keyed to W6TZD, W8DLX, and K8EJ.

The QRP entry in the contest by G4BUE shows he had CW contacts on this band with VP2MOC, UK8MAA, UH8HAI, KG6DX, W3NX/KP4, and PY1ARS/4.

It seems that with all the stuff on Ten, G3C6D didn’t have time for 21 MHz, and there was just one QSO noted, that with YU7VR, in which 589 reports were exchanged.

We had to chuckle at G4EAN’s log on 21 MHz: just four Ve’s — just like London buses, all in a line!

At G3NOF, the JA/VK/ZL path has been open long-path from about 0730 then the short way round from 1000; the Ws have been in evidence from about 1100 till 2300, and again the dearth of African signals has been noted. For Don it meant SSB QSOs with A22GV, A7XA, CP6EL, EL2AY, K6LL/L7, K7HCD, K0STI, N4HX/T8, N7RO, N0YC/7 (Utah), SU1AL, VE4ADV, VE6CU, VET7L, VP1A, VP1CS, W4JFE/7, W7BNH, WB0YYV, YBAOACL, 3B8CF, 9Q5GB, and 9Y4AP.

G4IUD uses it, seems, about equal amounts of SSB and CW, and the CW made it to PY7DA, N6GJ, VE7AGC, VP2MFC, VK5NJU, JAS, UA0SAO in Zone 32, and PY0MA; while the SSB was used to work A9XBE, A5XIO, EP2TY, W7XA, WA6EKL, 7Z2AP, and EA9IE in Spanish Morocco.

G4EZA next, and he managed to work one five-watt QSO on the band, with OE3WZ.

G8RY complements the comments elsewhere in this piece on the Ex-G Club by mentioning that he has phased verticals on 21416 KHz for the club net in which he takes part almost daily.

Twenty

GM4ELV used his QRP rig to work PJ2M1 on SSB, and also found W6D0T/LX for another SSB QSO.

G3ZGC/MM used 14 MHz for his 1815z skeds for some of the time; from the Gulf of Mexico it was so bad that it was a lucky shot that got the words “try Ten” through; Ten continued best until past the Azores when 14 MHz was satisfactory, while coming up the English Channel a switch to Forty was felt to be in order.

A quick look-see by G3PKS raised W3CBM and a pleasant chat with GM3BXY, while the list of those heard included some good DX from all continents.

At G2HKU there was the usual sked in the mornings for SSB to reach ZL1VN, ZL3SE, ZL3RS, and ZL4HB, and the trusty key made the path work to KL7MF, WA7JRL/SU, W5XJ, EL0AN/MM, IT9AGA, H13PC, JE1DVM, ZP5CA, and VK4ACU.

Still with his QRP list in the contest, G4BUE mentions EA6CL, UG6GAF, VP2KAH, YV1NX, and VP2ML.

The short list from G4EAN includes W2JHQ and W7ZLA.

Now we press on to G3NOF, who like all the others has not much to report on 14 MHz; Don says that from Yeovil the mornings have shown without the usual VK/ZL stations, and only a very few contracts were made, among which we noted CS5AP, CS5BK, JY3ZH, ZS1DL, and ZS1DZ.

A slightly longer list is entered by G4IUD, who found his CW could get through to VE7BEY, WA7VHO, W7IZO, UI8IAJ, W7ZB, W7F8DSQ, PY6HU, PY6RU, VP2ML, VP2KAM, KV4AA, and W6VPH.

Another one who has made comments on his log is G4EZA; for him it was CW all the way save for his SSB contact with ZL2RS of which he notes “all my own work!” The CW mentioned includes KP4DSY, KV4AA, DKO1A, F6FLB, HB9NE, and UB5NBF, the last four all being at the five-watt level.

So — there it is for another time. Thanks for all those letters and we hope to hear from you (and more!) again; and it would be nice to hear again from some of the OTs to this piece. Note the deadlines in the ‘box’ in the piece, and send your mail — and what about some table entries?? — to “CDXN”, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

Stop Press

The China operation by ZL1AD1 is off — apparently he is an American citizen!
THE "S.C.D.", PART III

CONCLUDING THE LOW COST, LOW TECHNOLOGY, QRP TRANSCEIVER PROJECT

REV. G. C. DOBBS, G3RJV

The S.C.D. is a complete transceiver for QRP CW operation on the amateur bands designed for simple home construction at low cost. In Part I and Part II the basic transceiver was described. This third, and final section, goes on to describe various additions which will enhance the operation of this simple rig; as in the previous parts, the circuits are described fully, but are open to adaptation and experimentation depending on the ability or pocket of the constructor.

Receiver Incremental Tuning

Part II of these articles described how the S.C.D. could be amended for VFO operation by the use of a tuned circuit in the oscillator stage. This was accompanied by a warning about the main problem of transceiver operation with a common VFO for transmitter and direct conversion receiver operation — the problem being that of transmitting and receiving on the same frequency. The VFO will have a frequency offset when keyed on transmit, and the operator must ensure he can listen on the frequency offset when keyed on transmitter output. Although this technique can be simple and gained by experience, a distinct advantage can be gained by having independent receiver tuning.

Receiver independent tuning adjustment is common in commercial transceivers and is often called “offset tuning”. The author prefers the term Receiver Incremental Tuning, or RIT, and abhors the American “clarifier” so beloved in CB equipment.

The object is to provide a small degree of additional tuning on receive only so that a comfortable listening pitch can be obtained. (Old hands may say it’s for chasing drifting UA signals up and down the band, but we’ll ignore that!). In a simple transceiver like the S.C.D., the incremental tuning control will enable the operator to listen on the exact frequency of his transmission and obtain a comfortable pitch without tuning the VFO which would also alter his transmitting frequency.

Fig 1 shows the RIT circuit used in the S.C.D. Again it is a very simple circuit. C1 and D1 form a varicap circuit such that the capacitance across C1/D1 can be changed slightly by a voltage change at D1. This voltage change is provided by VR1 which forms a potential divider across the 12 volt line. As VR1 is turned clockwise, D1 sees an increasing voltage through R1. The increasing voltage raises the capacitance across C1/D1 and, if they are connected across a tuned circuit, the frequency will lower. C1 goes to the top of the VFO tuned circuit.

Construction

C1 and D1 must be placed across the VFO tuned circuit (L2, TC1, VC2). In practice it is easiest to mount C1, D1 and R1 very close to the socket arrangement into which the VFO tuned circuit is plugged, as described in Part II. D1 is named as the IN914, but several junk box unmarked diodes were tried in the prototype and gave good results. Since the RIT works at RF it is also useful to have VR1 close to the rest of the circuit. If the lead between R1 and the slider of VR1 is to be more than a couple of inches, it may be a good idea to slip on a couple of ferrite beads to help decouple RF.

Operation

When the RIT circuitry has been connected, try the S.C.D. as a VFO receiver, without 12 volts at the top of VR1: the receiver should operate in the normal way. Connect 12 volts to VR1 and swing the control. It should become apparent that VR1 now provides a useful amount of fine tuning which will aid the reception of CW signals. If the VFO tuned circuit allows the receiver to tune onto the SSB portion of the band, it should now be very easy to resolve SSB signals with clarity. If VR1 is turned fully anti-clockwise, that is down to ground, and the 12 volts is removed from VR1, there should be an imperceptible change in frequency. At this stage the RIT offset can be checked by listening to the VFO on another receiver and noting the frequency change between VR1 at minimum and maximum; there should be a several KHz change. If the change is thought to be too small, C1 can be raised or other junk box diodes tried to give a larger swing.

In theory it is now possible to use the RIT with the transceiver. The only problem is that it is connected on both transmit and receive and will, therefore, provide offset in both modes. One could use it by returning the VR1 control to ground on transmit, advancing it to a suitable point when receiving. This is clumsy and inconvenient and the RIT is best switched out on transmit as described below.

Transmit-Receive Switching

The original S.C.D. circuit has a diode arrangement in the receiver front-end to provide protection on transmit and no transmit-receive switch was used. This did give a slight problem with keying thumps in the receiver during transmit and an additional problem is now present with the RIT being in circuit on transmit; these problems can both be solved by adding a simple switching circuit. It would be possible to add electronic switching to the S.C.D. but in line with the simple construction and circuitry techniques a single switch will be used for this facility.

The transmit-receive switching circuit is shown in Fig 2. A single pole change-over switch provides all that is

![Fig. 1 R.I.T. CIRCUIT](image-url)
required. Follow through the 12 volt power supply as it is used in this circuit. The 12 volt supply is connected to the centre of the change-over switch; also connected to the supply all the time are the transmitter and the receiver audio board. As the transmitter is on all the time care has to be taken not to press the key when on 'receive'. This will not damage the receiver as the diodes on the input provide protection, but RF will be transmitted and those awful thumps will appear in the receiver.

On 'receive', the receiver mixer board is switched on with the RIT circuit. This allows for full receiver operation, including RIT. It is pointless to switch the transmitter off at the same time as the oscillator is used on receive and is part of the transmit board.

On 'transmit', the receiver mixer board is switched off which relieves the keying thump, and the RIT is off allowing the VFO to be at its normal frequency. The audio board to the receiver is still on, so the sidetone oscillator will be heard in the headphones. The transmit side of the switch does not switch any circuit boards and, so as not to waste the switch position, a transmit indicator has been added. On transmit the LED is switched on. This LED may be any cheap type and the value of R1 can be lowered to increase its brightness. The author has used values as low as 100 ohms, but bears in mind that an LED is not intended for shackle illumination and they may not like dissipating too much current! The constructor may like to use another LED to indicate receive, which could be added to the receiver switch position. Perhaps a green LED could be used which would indicate that the transmitter was on all the time — and enhance the front panel.

Operation

In these days when break-in operation is common, it may seem a regression to use a switch to control transmit-receive functions, but in practice the single operation of a switch proves no real handicap when operating the transceiver. The prototype used a miniature switch with a long toggle which was convenient to flick over. Slide switches, although cheap, are not recommended as they are often prone to poor contacts. The operator must learn to use the RIT to find the exact frequency of the transmitter: this can be checked by listening to the VFO on 'transmit' and 'receive' and noting where the RIT control has to be placed for good netting of the signals. Bear in mind that this will vary according to the band in use and also with the antenna in use. The actual use of the RIT is best confirmed by practice on the bands. Since the RIT tunes to a lower frequency by adding capacitance, operate the receiver by tuning high-to-low on the band.

Audio Filter

Because of the inherent lack of tuned circuits in a direct conversion receiver, the selectivity is somewhat less than a conventional superhet. It is usual to add selectivity at the audio stages, by using a sharp bandpass filter to enhance an audio signal of the required VFO pitch. Passive filters may be used, but these involve the use of critical R-C or L-C circuits. The simple active audio filter of Fig 3 may be added to the S.C.D.

The 741 integrated circuit op-amp functions as an audio amplifier with selective feedback, controlled by C1-C2-R5 tuning it to accept the frequency governed by their values. The resistor network R2-R4 enables a single rail to be used with the op-amp. This circuit provides a bandwidth of some 110 Hz at a frequency of about 800 Hz. C1 and C2 should be close tolerance components.

Construction

The prototype audio filter was built on a printed circuit board, but it would be easy to construct it on 0.1 inch perforated matrix board (Veroboard without the strips) with interconnecting wires on the underside; a layout is shown in Fig 4. By using small physical components, quite a neat layout may be obtained. The circuit and layout is identical to the filter used in the Direx Receiver, a project by the author in the April 1978 issue of Short Wave Magazine.

Operation

The audio filter is inserted into the receiver circuit between the mixer board and the audio amplifier board. Screened leads may be used if the filter is not close to either boards, but ideally it should be placed between the two. The output from the mixer board (C7 on that board) goes to R1 of the filter; the output goes via C4 to the volume control VR1 of the audio amplifier board. The filter may give a very slight reduction in audio output within the receiver, but the overall audio gain of the receiver is more than enough to cope with such a minor reduction. Upon inserting the filter, an immediate improvement in selectivity should be heard. Some receivers arrange for the filter to be switched in and out, and this could be done by putting a single-pole switch between the input to R1 of the filter and the output of C4. Since this transceiver is only used for CW operation it is best to leave the filter in circuit.
The transceiver is now complete for reasonable use on the bands, but naturally with such low power full use must be made of the RF output from the transmitter. QRP transmitters are difficult to tune-up for reliable use by the usual method of monitoring the DC input to the transmitter PA. This transceiver is simpler than most, having no tuneable circuits in the output from the PA; but good matching should be ensured into the antenna. The operator may be using his favourite ATU — if a tuned antenna is not in use — so good matching is vital. Few seasoned QRP operators would be happy about matching their low output to the antenna without some indication of any standing waves that might be present. A basic Standing Wave Ratio Indicator is a valuable aid for the QRP operator.

**SWR Bridge**

This is no place to go into the theory of transmission lines, even if the author considered himself competent so to do! It is sufficient to say that with such low powers the operator wishes to avoid much reflected RF power returning down the line to reduce his signal level. The basic SWR bridge circuit shown in Fig 5 is a version of the famous design by Brune. It could be calibrated for actual SWR values, but in this application a relative reading is all that the operator requires.

The signal passes through L2, a small but substantial coil, straight out without much loss; L1 takes a sample of the signal and small RF signals 90 degrees out of phase appear across the load resistors R1 and R2, representing the forward and reverse RF power in the line. S1 can check either end of the L2 circuit. The signal is rectified by D1 and read on the meter M1; C2 decouples RF at the meter and VR1 provides a meter sensitivity control.

**Construction**

The layout of the bridge is shown in Fig. 6. This may be a printed circuit board, a small panel of paxolin or a matrix board. The windings for L1 and L2 are shown, and the layout is best symmetrically arranged. The SWR bridge
Antenna Tuning Unit

The ATU coils may be adversely affected by metal screens, so construction in a plastic case or wooden box is advised. The prototype, which the author has used for 15 years, is built on a wood base plate, with a tinplate front panel, and otherwise open for the world to see. L1 is shown clearly in Fig. 8 and may be wound on any former with a diameter around 1½ inches; S1 is a 10-way wafer switch, but this was a late addition to the unit which originally had a crocodile clip which fastened onto the required tap. A 12-way switch would also serve, using more tappings. The tappings are spaced out over the whole winding in about the ratio stated on the diagram.

C1 is a 500 pF variable capacitor (half of a dual 500 pF tuning capacitor from an old broadcast valve receiver would do). A large component with airspacing is best for C1, although the author has a portable version of this ATU which uses a miniature solid dielectric variable for a Japanese transistor radio, and this appears to work well.

Stout wiring and short leads are helpful in ATU construction. Two large, easy-to-handle knobs should be used for S1 and C1 and a simple calibration should be provided for both to help locate settings. When building ATU's, junk-box hunting is the order of the day and anyone spending good money on an ATU should hang his head in shame!

Operation

Follow the outline for operation of the SWR bridge in the section above. Approximate settings for S1 can be found with the receiver, but the final adjustment should be made with the SWR bridge.

This ATU has been used with various QRP transmitters including the SCD with end-fed bits of wire of lengths from 40 feet to 200 feet. If the shack has a good earth, then it is ideal to load the antenna against earth. But if the earth is in the slightest suspect or the earth lead-in is long, the author would advise the use of a counterpoise.

An article on a transceiver is no place for a treatise on the author's preference for counterpoises over an earth, but if in doubt, or getting poor results, try one. The S.C.D. has

![Fig. 7 ATU Circuit](image)

![Fig. 8 ATU Coil](image)
been used with end fed-wires and the L-match ATU against quarter wave counterpoises for the band in operation. Suitable lengths for counterpoises are:

- 80 metres — 63°
- 40 metres — 32°
- 20 metres — 16°
- 15 metres — 11°

Such counterpoises should not be underground, but raised slightly above ground. Experts quibble, but the author has put counterpoise wires all over the place and with reasonable results: under stair carpets, down the outside of house walls, along garden fences and walls. The only common denominator is that they have rarely managed to fit into a straight line! The simplest way is to get some cheap PVC covered copper wire and try it.

Conclusion

The purpose of describing the S.C.D. in these three articles is to bring back a little of the fun into our hobby:

Corrections

The article “Digital Frequency Readout and Other Improvements for the Yaesu Musen FRG-7 Receiver, Part II” which appeared in the February 1980 issue, contained some errors and omissions. Fig. 8, p.675, was without its caption, which should have read: “1. Gate opens after down counter is present to 4550. 2. Times after which 4 digit counter counts down to zero for first time. 3. Times after which 4 digit counter counts down to zero for second time. 4. Times after which 4 digit counter counts down to zero for third time. 5. Gate closes; the reading remaining in the 4 digit display is displayed. 6. Times after which 4 digit counter would count down to zero for fourth time if gate were still open; this actually happens in one case only, when the input frequency is 3.455 MHz. Readings displayed are proportional to the lengths of the horizontal dashed lines”. P.677 para 1 line 11 read reset, not ‘rest’; p.679 para 2 line 26 read switch, not ‘which’; p.680 para 3 line 10 read PLL, not ‘PPL’; Fig. 13, p.679, is upside down.

The author, Robert Dawson, informs us (as many readers will have already found out) that the filters used in the design are no longer available. However, Ambit International Ltd. can supply the MFH51-T 5 kHz filter or the CFG-4551 4 kHz filter. The former is directly inter-changeable with the MFH41-T used in the original, but neither give quite as good results as the MFH41-T; the PLL BFO works well with them if they are used for SSB. Ambit will also shortly be able to supply an alternative SSB filter, and an s.a.c. to them will bring details when available (200 North Service Road, Brentwood, Essex). Mr Dawson also mentions that the version of the counter chip used is the Intersil 7217 J11.

Amateur Radio is too serious and expensive these days. It is up to the reader to use as much or as little of these circuits for their own entertainment, have fun, avoid spending money and be surprised at what simple circuits can do. You may even be able to look the XYL straight in the eye as you tell her how much this transceiver cost. But he warned QRP — is addictive!

Components:

Amidon Coils by T.M.P. Electronics. Other components — J. Birkett can supply most for those with shallow junk boxes. (Both advertise in S.W.M.).

Bibliography:


More Mobile Rallies

The following updates the list published in the February issue. May 18, Northern Mobile Rally, Victoria Park Hall, Keighley, 11.30 to 5.30, talk-in on 2m. FM S22 and 70cm. FM SU8; contact G8DFZ (QTHR) for details. May 25, Plymouth Mobile Rally, Tamar Secondary School; contact R v Hooper, G3SCW (QTHR) for details. July 13, Upton Mobile Rally, Upton-on-Severn; full details from G8NSL, QTHR. Sept. 7, Vange Mobile Rally, St. Nicholas School, St. Nicholas Lane, Basildon, from 10 a.m.; contact A. Smith, G4FMK, QTHR, for details. Sept. 28, Harlow A.R.S. Mobile Rally, at Netteswell Comprehensive School; details from A. Keeble, G4HPU, QTHR. Special Event Stations: May 24, 25, 26, St. Helens and District A.R.C. will be operating GB2RST (‘Rainhill Steam Trials’) from Rainhill Cricket and Tennis Club to mark the 150th Anniversary of the Liverpool-Manchester Railway; operation will be on HF and VHF/UHF, and there will be a special QSL card for all contacts. Full details from club sec. Paul Gaskell, G8PQD (Tel: St. Helens 25472). May 29, 30, 31, Exeter A.R.S. will be operating GB2EXE and GB8EXE at the Royal Albert Memorial Museum, Exeter, to mark the City of Exeter 1900-Year Festival; talk-in on 2m., and all bands working.

May issue will appear on Friday, April 25th
TRAVIS FM DISCRIMINATOR FOR
THE EDDYSTONE 730/4, ETC.

F. G. RAYER, T. ENG(CEI), G30GR

For a long time FM reception has been with a 2m.
converter and an Eddystone 730/4, 888A, or 840. With
these and similar communications receivers adequate voice
quality is obtained by slope detection. Nevertheless, this
results in two slightly separated tuning positions and a loss
of that excellent quality obtainable with a receiver intended
for FM. It was thus decided to make an add-on FM
detector.

After some trials, the Travis, with semiconductor diodes,
was chosen — it does not need a tapped or 3-winding trans-
former, nor any power supply. A unit with valves or tran-
sistors would give increased sensitivity, but in view of the
gain of the receiver with which the unit is employed, the
diodes were adequate.

Travis Circuit

IFT1 and IFT2 are in series, Fig. 1, completely separate
and screened from each other. IFT1 is tuned slightly above
the unmodulated carrier frequency, and IFT2 slightly below
the carrier frequency. The secondaries are reversed in
phase. In the presence of FM, this balance is upset, pro-
ducing audio at C3.

The 730/4 has a back IF output socket, and IF signals are
taken from this by a short screened lead. This receiver IF is
about 450 kHz, and Denco transistor type IFTs are suitable.

It need not be said that IFT1 and IFT2 must be tunable to
the receiver IF, so check this is about 450-470 kHz.

With other receivers it would be necessary to take the IF
signal from the final IFT, via a small coupling capacitor.
AF has to go back into the receiver audio amplifier, or into
a separate amplifier. Some Eddystone models have suitable
PU audio input terminals which might be adapted; other-
wise a 2-way switch to take C3 or the usual receiver detector
to the receiver audio circuit is called for.

The components are easily assembled on a perforated
board, about 1½in. square.

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1, R2</td>
<td>=4K7</td>
</tr>
<tr>
<td>C1, C2</td>
<td>=220 pF</td>
</tr>
<tr>
<td>C3</td>
<td>=0.1 µF</td>
</tr>
<tr>
<td>D1, D2</td>
<td>=OA47 (or equivalent)</td>
</tr>
</tbody>
</table>

Adjustment

This is best with two suitable core adjusting tools. Short 4
and 5 of IFT1 and peak IFT2 on an AM signal. Similarly
peak IFT1 with 4 and 5 of IFT2 shorted. Then screw IFT1
core out a turn or so, and IFT2 core in a turn or so, and
make adjustments with an FM signal, for best volume,
maximum speech quality, and poorest response to AM. A
notable improvement in speech quality should be found.

The PS1200 Power Supply and Nicad Charger manufactured by
LAR Modules Ltd. This new unit, designed primarily for use
with transceivers such as the TR-2200GX, TR-2300, IC-402,
etc., enables the operator to use his transceiver with mains power
and charge the batteries simultaneously; switching is automatic,
and inbuilt protection circuits are provided. Price of the PS1200
is £30.75 including VAT and post/packing, and is obtainable
direct from the manufacturers at 27 Cookridge Street, Leeds
LS2 3AG, or from dealers.

"yeah man, using pot core inductances here"
A DESCRIPTION of a method of switching and controlling transverters for 70, 144 and 432 MHz by simple switching, permitting crossband working, which could be expanded to cover other bands. A stabilised power supply with current limiting and overvoltage protection is included.

This unit was conceived after the author reorganised his station around an Icom IC-701 HF bands transceiver. HF is used mainly for keeping in touch with friends and colleagues, but the main interests at G4FRX have always been VHF/UHF DX and contest operation: with this in mind, it was thought that the qualities of the IC-701 (i.e. dual VFOs, good CW facilities and excellent dynamic RF performance) would translate well to the higher frequencies. Since optimum intermodulation performance of RF front-ends and the achievement of the best possible noise figures are pet obsessions of the author, it was decided that the system should, on 144 and 432 MHz at least, incorporate GaAsFET RF amplifiers and Schottky diode ring mixers.

4m. was to be included, as was a facility for transmission on one band and reception on another by simple switching; this is with Oscar work in mind, as well as being useful for other purposes. It was necessary to arrange for the control system to handle all switching between the IC-701 and the transverters and to provide certain control voltages for the HF rig to set up various conditions of RF routing inside it. The IC-701 has a separate output for transverters, supplying a few milliwatts at 28 MHz, and one of its features is that the 28 MHz transverted output bypasses the 28 MHz RF amplifier in the IC-701 and is fed directly to the Schottky diode mixer, with obvious benefits in terms of RF intermodulation performance. The author strongly feels that putting a transverter with some 30 dB gain in front of a standard HF rig is a sure way of setting up severe limitations of dynamic range, since the HF RF stage is simply not designed to be able to cope with such conditions.

FIG. 1 STABILISED POWER SUPPLY SECTION

All switches shown 'off': S1 to S5 are, respectively: thermistor bypass after warm-up, mains on/off, HT on, internal/external use of supply selection, relay supply on/off. LED's D3 to D7 mean, respectively, crowbar activated, HT on, supply switched internally.
A stabilised power supply and indicators, to show which bands were selected for transmission and reception, were also to be provided in the same cabinet. At the time of writing, most of these requirements have been fulfilled, although more work needs to be done on the transverters to optimise their performance: hopefully, therefore, they will form the subject of a separate article later, when the author has more experience with GaAsFETS. However, since the transverters were built in the same size die-cast boxes as the popular Microwave Modules units (and in fact were made to be directly interchangeable with them). It occurred to the author that it would be worthwhile to describe the system as first built, using the Microwave Modules units for 2m. and 70cm. and a rather deaf 4m. version home-brewed as a stop-gap. Only one modification is required to the MM units to use with the IC-701 in this system: because the IC-701 requires 8v. at the transverter input/output socket on “receive” as part of the aforementioned control voltage, a small three-terminal regulator providing 8.2v. is installed in each MM transverter and its output fed to the “28 MHz output” socket via an RF choke. DC is isolated from the internal link winding by a 0.01 µF ceramic capacitor.

It is not suggested, therefore, that this article embodies anything new or revolutionary; what it represents is one man’s way of solving simple problems set by a particular operational requirement for his station, given a small toolbox, little skill and no patience, the floor of a bed-sitter and a rather sparsely filled junk-box!

### Power Supply

The “G4FRX transverter system” falls into two main sections, the power supply and the switching and control circuitry, and we consider first the power supply, Fig. 1. Both the Microwave Modules and the home-brew transverters require 2A or so at 12v., which must be stabilised, and it was decided to make the power supply capable of about 5A and able to be used independently of the transverters for general purposes in the shack. As power supplies go it is quite conventional, but a description will be given to illustrate some points that arise during its design and construction.

Mains enters via the IEC socket, SF1, which incorporates a mains filter (this happens to be a stock Radiospares item salvaged from a colleague’s defunct project!). The thermistor TH1 in series with the transformer primary is there because the author has a congenital aversion to the “thud” that a large transformer produces when trying to feed 47000 µF electrolysics on switch-on — they represent practically a short-circuit, and the Society for the Prevention of Cruelty to Transformers is not best pleased. The transformer itself is a large ex-service component of a type which are quite common on the surplus market at the

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supply switched externally, relay supply in use. NE1, D4, D5, D7 located above S2, S3, S4, S5 on front panel. TR1 is on PCB; TR2, TR3 and R3, R4 are on heatsink on rear panel. For value of R5 see text.
moment. It has two 10A secondaries tapped in 2v. steps from 10-22v. and several lower-current windings and, like most transformers of its ilk, one imagines that these ratings are rather conservative. This one is very under-run in this application, but this is good for reliability, and the author would rather use this kind of component (which would probably cost a small fortune to buy new) than a modern transformer perhaps more suitable for the job in terms of size but costing more, and nothing like as mechanically or electrically well made.

The thermistor is bypassed about 10 seconds after switch-on by switch S1, and it is a simple matter to remember to restore it at the end of an operating session. Another benefit of this approach is that it becomes possible to use a 500 mA quick-blow fuse, F1, in the transformer primary instead of the 5A anti-surge variety that is otherwise needed to cope with the switch-on surge, and the value of the improved protection for an irreplaceable transformer is considerable! If anything, it is preferable always to fuse the primary of any mains transformer and not just its secondary circuits. The reason is that, for instance, a fault were to develop in one of the rectifiers or smoothing capacitors in the circuit diagram (assuming of course that F2 and F3 were not present) causing the secondary to look into a short-circuit, one of the net effects is that the inductance of the primary winding is effectively cancelled, and the mains "sees" only the few ohms DC resistance of

### Table of Values

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<tr>
<th>Component</th>
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<tbody>
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<td>2K</td>
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<td>R6</td>
<td>3K</td>
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<td>R7</td>
<td>3.9K</td>
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<tr>
<td>R8</td>
<td>560 ohm</td>
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<tr>
<td>R9 to R12</td>
<td>1K</td>
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<tr>
<td>R13</td>
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<td>µA 3423</td>
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<tr>
<td>VDR</td>
<td>see text</td>
</tr>
<tr>
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<td>400v., 30A bridge</td>
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<tr>
<td>T1</td>
<td>see text</td>
</tr>
<tr>
<td>R3</td>
<td>see text</td>
</tr>
<tr>
<td>SF1</td>
<td>Radiospares 6 amp. IEC socket/filter (no. 238-429)</td>
</tr>
<tr>
<td>S1 to S4</td>
<td>toggle switches as required</td>
</tr>
</tbody>
</table>

Note: Heatsink needed for TR2, TR3 (size calculated as shown in text). Standard DIL sockets may be used for IC1 and IC2. All fuses "quick-blow".  

General view of the G4FRX transverter system.
General interior view, with 4m. transverter removed for clarity. The two rectifiers are adjacent to the transformer, with the RF switching relays to the right of the rectifiers and RLD driver board below RF relays; PSU board is on stand-offs on the cabinet rear. S1 and thermistor is seen at top left.

The rectifiers used for both the stabilised supply and relay/control voltage lines (one derived from each secondary) are 400v. 30A devices, which again represent some degree of overkill but were used in the interests of reliability and also because they were available. In passing, the author likes to test home-built equipment for 250 hours continuously at full load, in the belief that if it will stand that then a 24 hour contest will present no problem! The smoothing capacitors are 47000 μF 25v. units ex-computer power supply. Their working voltage needs to be chosen bearing in mind that the kind of regulator circuit used requires about 3v. more at its input than the regulated output required, i.e. for 12v. stabilised output a minimum of 15v. is needed. A 15v. winding on a transformer feeding a bridge rectifier and smoothing capacitor will produce around 15 × 1.414 (approx. 21.2v.) off load at the capacitor. So 25v. working is a good value for the capacitors. Too high a working voltage, however, does not produce any increase in reliability, since the capacitor tends to "form" at the voltage presented to it and with low-voltage high-capacity units a voltage much less than their specified working voltage tends to induce an apparent drastic loss of capacitance. In the present system, a secondary tapping of 16v. is used in fact, but the transformer primary is used at the 250v. tapping; the mains

The winding; the result, clearly, is destructively high current if no fuses are present, which will destroy the primary instantly.

Also out of love for the transformer and rectifiers, a VDR is placed across the primary winding and its value chosen to conduct above 380v. peak. The reason for this can easily be seen if the bands are quiet one evening and you have nothing to do for ten minutes or so — simply connect any suitable low-voltage transformer to the mains supply and look at the output of its secondary with an oscilloscope; the result may well frighten you. Certainly 1.5 kV spikes lasting a few microseconds are not at all uncommon at G4FRX, and local thermostats, solid-state drill controllers and the like produce quite bizarre displays on the 'scope. PIV ratings of rectifiers become matters of rather more than academic importance in such circumstances! Also, of course, dV/dT suggests a bandwidth of many megahertz for such phenomena, so that decoupling capacitors, and capacitors across rectifiers, should be of quite low value to minimize their reactance and maximize their effectiveness. The VDR mops up the worst of the unwanted noise and spikes and, significantly, gets quite warm. Hence, also, the reason for the mains filter, which helps to reject some of the spurious mains-borne transients.
Points labelled C, B, E, on board connect to 2N3771's on rear heatsink.

at G4FRX are not quite that, so the secondary output is in practice about 15.5v on load. This still comes out nicely within the 25v working voltage of the capacitors.

Stabiliser

We now come to the stabiliser unit, which is built on a printed circuit board, Figs. 2 and 3. Again, it is fairly conventional, but as always there is something to learn. The well-tried 723-plus-pass-transistor approach is used, with the basic circuit cribbed from the manufacturer's data sheet: an extra transistor is connected to form a Darlington pair with the pass devices. This is necessary because (and I apologise for perhaps labouring this point, but I have heard several people wondering why a supposedly stabilised supply is anything but — and overlooking it) the maximum output current of the 723 is 150 mA and the output current required is about 5A. This implies a current gain in the pass device of about 35, i.e. 5/0.15 (in fact, two devices are used in parallel here, simply because a heatsink with the pair already mounted was purchased at a rally for 50p — but this does not affect the reasoning). Now the specified current gain for a typical series pass transistor that one might use in this application, such as the popular 2N3055 or the 2N3771 used here is listed as “20-70”. The essential point here is that at 4 or 5A the current gain is certainly going to be nearer 20 than 70, and indeed the highest figure out of a sample of twelve 2N3055 transistors measured at 12v. and 4A was 22. Hence simply connecting a 723 to a 2N3055 and expecting it to regulate to 10A will lead to some dismay! It might manage 1A with good regulation, but no more. So another transistor, in this case a BFX85 with an hFE of 70 is used in a Darlington pair configuration with the two parallel pass transistors, giving a total current gain of approximately 70 × 20, i.e. about 1400. This gives ample margin and excellent regulation, even at 5A. The figure for current limiting is arrived at by adjusting the value of R₄ in the circuit diagram in accordance with the formula 'I' Limit = 0.65v. + ‘R’ Limit; for 5A this suggests a value of 0.13 ohms. The author used two 0.25 ohm 3W wirewound resistors in parallel, which gives a value of 0.125 ohms (no doubt the extra resistance of the printed circuit board track and the author’s soldering provides the other 0.005 ohms!). Whatever the truth of that assertion, the shuck Avo on its 10A range, when placed across the output of the supply, indicates a needle-width under 5A, so the current limiting works well. In fact, the voltage does not drop at all until the load exceeds just over 4.8A, so, provided that heavy-gauge wire is used to convey the volts from the supply to the transverters, their 2A peak load is well within the capacity of the supply.

One logical question, especially since the reader will have noted the size and capacity of the transformer and rectifiers and the fact that the pass transistors used here are 2X2N3771 30A devices is “why limit the supply to 5A? Wouldn’t it be a lot more useful if it could supply a higher current?” The reason is simply one of size and thermal conductivity of the heatsink and the maximum junction temperature of the pass transistors; these are the parameters that fix the current capability of a stabilised power supply much more definitely than the current rating of the devices. For most TO3 transistors which could be used in this circuit, the absolute maximum junction temperature is 200°C with, allowing for some safety factor, about 150°C as a sort of everyday do-not-exceed figure. Now even a fairly substantial heatsink of the Redpoint variety as used by the author has a thermal coefficient of 1.1 degrees C/W — in other words, if the ambient temperature is 20 degrees
the allowable temperature rise of the heatsink is 130 degrees, which corresponds to a dissipation figure of $130/1.1 = 118\text{W}$. This is the absolute maximum that the output device can handle before its junction temperature will exceed 150 degrees, and note that this figure is not related to how much current the output device is listed as being capable of handling.

In practice, owing to the fact that the thermal connexion between the transistors and the heatsink is not perfect, its thermal coefficient may be degraded by its method of mounting, and also the fact that the ambient temperature in the back of a van on a summer afternoon half-way through VHF Field Day may well be nearer 30 degrees, this figure of 118W could well be derated. For the sake of the argument, let us assume that we have a figure of 100W to work with: in other words, that our 1.1 degree/W heatsink will permit that degree of dissipation before the pass transistors exceed their junction temperature ratings, or at least a safe figure. Now the worst case for the series-pass device is the short-circuit current-limiting condition (i.e. the ‘Avo’-on-10A-range test previously mentioned). Here the transistor has to drop practically the total input voltage to the regulator across itself at the limiting value of short-circuit current chosen by the designer. In this design, the input rail falls to about 16v. on full load, and it follows that the maximum available current would be $100\text{W}/16\text{w.} = 6.25\text{A}$. Note again that this figure has nothing whatsoever to do with the current rating of the transistor and everything to do with its maximum junction temperature rating. Therefore if, as here, a figure of 5A is chosen, the transistor has to handle 5A multiplied by about 17v. (i.e. the input rail voltage at 5A load) which is about 85W. This is well within the rating of the 2N3055 (115W) or the 2N3771 (150W) (let alone the two 2N3771’s used here) so a single 2N3055 could quite well have gone on the same size heatsink as that used. VR1 is used to set the output volts — and in the interests of precision can be a helipot.

*to be concluded*
CLUBS ROUNDUP
By "Club Secretary"

A WEEK or two ago, the Old Man got a letter, in which
the writer (an SWL, by the way) made it clear that he
thought Short Wave Magazine would go down the pan
unless we dropped "VHF Bands", "Clubs" and "CDXN"
from our pages, in favour of lots of constructional articles
with all the details on how to lay out the Veroboard and
why Ohms Law applied to this and so on and so forth. Now
this chap has been at SWL for a long time we reckon, and
so it has probably escaped his notice that AM has disappeared
in favour of SSB — which very effectively removes the old way in to the hobby, which was to have a
listen to the short waves and then find a local operating
amateur. Thus, it is more than ever vital that we should have a
piece for the SWL's and a piece for the clubs: indeed the latter
is read from beginning to end by a very large number of readers (which the writer will admit to finding, in a way,
a bit surprising). So . . . "Clubs Roundup" and "SWL" is
primarily, but not exclusively, for the newcomer; "VHF
 Bands" and "CDXN" is intended mainly for the licensed
operator, be he a 'raw recruit' or an old hand at the game.

Though we accept that a proportion of radio amateurs
are, and always will be, loners, we also believe that the strength of the amateur radio movement, in this or any
other country, is directly measurable by the number of clubs per million head of the population or some like ratio;
and it is our duty to support these clubs as best we can,
albeit of course within our limitations.

So — on to the letters!

Up North

Northern Heights have a place at Bradshaw Tavern,
Illingworth, Halifax, every Wednesday evening.

At Edinburgh, the venue is the City Observatory, Calton
Hill, where they are to be found on Tuesday evenings.

Scarborough have their place at the Cricket Club, North
Marine Road, on Mondays; the first Monday is always a
Surplus Sale, two are given over to talks or some such
activity, and one to operating the club station.

In York, if their letters are anything to go by, they are a
happy group of kindred spirits; they are booked in for each
Friday evening except the third at the United Services Club,
61 Micklelegate, York.

Back over the Border again, this time to West of Scotland
who are based at 22 Robertson Street, Glasgow G2. They
foregather on Friday evenings, alternating talks with chat-
nights; and we understand their club shack has gear for
both HF and VHF available.

Helensburgh are on a basis of first and third Wednesdays
of each month, starting at 7.30 at East Clyde Street School.

The group known as White Rose is now based at Moor-
town R.U.F.C., Moss Valley, King Lane, Leeds 17. The
new HQ has paid off handsomely with the membership up
to 125 now; they have a shack with rotary arrays for both
VHF and HF, gear to match, and workshop facilities. Also,
of course the White Rose Rally at Lawnswood School starts
the rally year off on March 30.

International

Here our first port of call just has to be with the Ex-G
Radio Club, members of which are those born in UK but
now domiciled abroad. If you come into that category, or
know of anyone who does, you will be doing a good turn by
joining — the Secretary's address is in the Panel.

Now AMSAT-UK; AMSAT is the group who get those
Oscars up in the sky, and of course AMSAT-UK is the
British arm of the group. Details from the Hon. Sec. at the
address in the Panel.

RAIIBC is the one that looks after all the blind and
invalid folk who are in the hobby, either licensed or other
SWL; these are the "full" members, but the other bit that
matters is the Supporter and the Representative grade of
member — the commitment can vary from nothing save the
sub., right through to such tasks as taping 'Radial' or
teaching RAE, servicing some gear, giving some of your
surplus gear, or setting a full member with a shiny new
licence into an operational condition by putting up arials
and so forth. Ask the Hon. Sec. — she knows!

Deadlines for "Clubs" for the next three months—

(May issue—March 28th)
June issue—April 25th
July issue—May 30th
August issue—June 27th

Please be sure to note these dates!

Next we have the Royal Navy, and the name is pretty well
self-explanatory, except to add that the Merchant Navy or
members of other navies are acceptable as associates. The
Newsletter is one of the best and most consistent to cross
this desk over the years, despite several changes in the
editorship as RN affairs have dictated. Details from the
Hon. Sec. — see Panel.

BARTG covers the devotees of RTTY on the amateur
bands, whether as SWL or licensed; there is an annual
convention, and of course the newsletter, which is a very
good one. Again, the Hon. Sec.'s name and address is in
the Panel.

"QC-TV" is the title of the publication put out by
BATC, in the interests of all those who are involved in
amateur television, whether fast-scan or slow-scan, closed-
circuit or over the air, black-and-white or colour, or even
the "Narrow Band TV" of Baird and the BBC between
about 1930 and 1935. If you are into this sort of world, you
should really be a member.

West End

Plymouth first, and we hear they meet at Whitleigh
Methodist School on alternate Mondays; and of course the
Plymouth Rally on May 25 at Tamar Secondary School is
occupying many of their thoughts at the moment.

Now to Yeovil at Building 101, Houndstone camp; they
have a pretty comprehensive set of gear for the club call
G3CMH, a library of amateur radio books, and a lecture room for the talks which they aim to set up for each Thursday of the month (save for the final meeting in the month which is always set aside for a matter).

It's the second and fourth Wednesdays for North Devon: the former meeting is at the Pilton Community Centre, Barnstaple, while the latter one is chez G2FKO, 38 Clovelly Road, Bideford. Other interests of the group are Raynet and a local repeater group.

Lothian have Hq at Lothian Boating Club on the second Monday in each month; for details, please contact the Hon. Sec. at the address in the Panel.

At Jersey the venue is Quennevais Commicincare, and on April 9 there is a slide show to be watched.

Over to North Bristol, who have changed their venue; they now have a place at S.H.E.7, Braemar Crescent, Northville, Bristol 7 where, in addition to meetings, they have RAE and Morse classes. Incidentally, we note that the S.H.E. stands for Self Help Enterprise.

One group that always seems to have a good attendance is Cornish, at the SWEB Club Room, Pool, Camborne, on the first Thursday in each month: for April there is a talk by G3XFL on System Protection, set down to follow the AGM.

Over the water now; first we go to EI and the IRTS Newsletter, which tells all about the goings-on in the Emerald Isle — the Hon. Sec. will be pleased, we are sure, to help with information on the clubs and activities in EI. His address can be found in the Panel. Incidentally, if you want to know where all the EIs are, IRTS have just put out a full callbook of their own at 50p.

Into GI now, and a new formation called Lagan Valley Radio Society and operating from their Hq in the Scout Hall, Dromore. The routine is to have a formal meeting there on the second Monday, starting with a short talk or film, then a natter, ending with a session with the club HF gear.

Midlands

This is a large area to cover, and any geographical slips must be forgiven — though we try not to put clubs into the wrong area, we do sometimes come unstuck!

Let us pick up the thread on Merseyside, and first with Liverpool, who are to be found at the Conservative Rooms, Church Road, Wavertree every Tuesday evening. April 1 sees a talk by one “BF39” — doubtless it will have some theme suitable to the date! April 8 sees a Quiz and on 15th, the G6CJ tape-and-slide lecture on aerials will provide food for thought. April 22 sees a talk called “How I won the Constructional Contest,” by the winner, and on 29th DJ0PC/G41HS will be telling the history of German amateur radio.

Now we come to the problem — two different clubs who both call themselves “Wirral.” To avoid bias we will look at the older-established Wirral group, who are based on the Sports Centre, Grange Road West, Birkenhead, on the first and third Wednesdays of the month. April 2 is down for pre-NFD planning, and on 16th the date is to be decided.

The other group is based on the West Kirby Sports Complex on the second and fourth Wednesdays of each month, and programme details can be obtained from the Hon. Sec. at the address in the Panel. For clarity this club is down in our files as “Wirral (West Kirby)” but we do wish the two groups would get together to sort out the confusion over titles, if only because one can imagine a newcomer wondering which is which!

It's not long since the Malvern Hills set-up came into existence, and we are informed they have a nice snug Hq at “The Star” in Cowleigh Road, North Malvern. Details from the Hon. Sec. (see Panel) as to what happens there on the second Tuesday of each month.

Every Thursday evening the Nottingham chaps crowd into their place at Sherwood Community Centre, Mansfield Road (which is opposite Woodthorpe Drive), the start time being 7.30. Two regular favourites are the Forum and the Activity Night, cropping up as they do each month in between the lectures, film-shows and whatever.

At Ormskirk they have a place in the Over-60's Hut, on Tuesdays, this venue being in Liverpool Road and opposite Christ Church.

Solihull were a bit unlucky with the post last time out and so we don't have the latest information. Not to worry though, we can tell you they have a place at the Manor House, High Street, Solihull, on the third Tuesday of each month — we guess their lecture on Microprocessors by G8KGV was quite an interesting one.

Over to Worcester, and the Old Pheasant Inn, New Street on the first Monday of each month — we understand the room has been getting better filled of late, so the gang must like the programme set out for them. It is an interesting thing that with many clubs we can sense which way things are heading when we read the first letter from a new Hon. Sec.

G2FKS writes to mention Cambridge, who have Fridays at the ATC Hq, 730 Newmarket Road. In general, lectures are alternated with informals, and an attempt is being made to cater specially for beginners and new members.

Although we have the dates for Ipswich, namely April 2, 9, 16, 23 and 30, we can't be sure where they are being held, as the School premises they use will be closed; ... the Hon. Sec., and his name and address are in the Panel.

Just as it is everywhere else, it is Spring in Melton Mowbray, by which time the members will be putting the finishing touches to their entries for the Construction Contest on April 18, at the St Johns Ambulance Hall, Asfordby Hill, Melton Mowbray.

We have often disagreed with the words of G3LEQ of the UK FM Group Western, but the current issue of their newsletter is both interesting and a breakthrough. It appears there has been some bother with piracy on GB3MP; and it seems that someone has had the savvy to talk to the pirates and why they pirate. This line has been taken to the length that in the current issue they are publishing a letter from a pirate saying just why he pirated — and although he was ready to put his name on the letter, UKFMGW stuck to its normal practice of just initials. In addition to that, an RAE class has been organised for these chaps, to the extent that any pirate who wishes to attend will not be barred by virtue of his piracy. We at “Short Wave Magazine” would like to see a copy of this newsletter’s relevant parts circulated to all clubs and RSGB groups. To turn to the matter of UKFMGW themselves, they share Hq with the Warrington club, at Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington, on the first Thursday of each month.

Kidderminster have just turned out their first issue of a newsletter, which is looking to be of the sort that lasts — the over-ambitious ones usually come unstuck. They meet
on alternate Tuesdays at Aggborough Sports and Social Centre, Hoo Road, and the start is at 8 p.m. sharp. Informals every Monday evening from 9.30 to closing time at Bellmans Cross Inn, Shatterford, and the strong ones go on to the local chinese restaurant afterwards.

119 Green Lane is the Hq address of the Derby group, where they are to be found on Wednesdays. April 2 is the monthly Junk Sale night, and on 9th they will have film and slide of the decade in retrospect. On 16th, an RSGB rep. will be talking about the RSGB and the members: we hope he doesn't forget G2CVV in the back row! April 23 is a "Night on the Air", and on 30th G4FFH will be talking about the use and abuse of rechargeable batteries.

Over to Stourbridge who are based on Longlands School, Brook Street, Stourbridge. They are a bit unlucky in having to scrub round the April 7 date which falls on Easter Monday, but they will be back in action for the main meeting on April 21.

Years ago, the Norwich club used to call themselves Norfolk, and we recall them as having a superbly produced newsletter, and of gatherings at "The Brickmakers Arms". Nowadays the venue is Crome Centre, Telegraph Lane East (which is not far from the railway station, on the A47 out to Great Yarmouth). G8TTB wrote in on their behalf, but says he is not the Hon. Sec. — so can we have the current Hon. Sec.'s name, address and phone number for the file, please? Meantime, drop in on them from about 7.30 onwards.

Now we head a bit to the North to Bury — we always wonder whether they should be north or Midlands — and their Hq at Mosses Youth and Community Centre, Cecil Street, Bury, every Tuesday, with a "special event" on the second Tuesday of each month. April 8 is down for a TV1 seminar.

The Cheltenham crowd get together at the Old Bakery in Chester Walk, Clarence Street, where they may be found on the first Thursday and the third Friday in each month. This gives April 3 for G4CLF to talk about CB and the progress to date, and April 18 for a natter session.

At Hereford, the Hq is at the Civil Defence Headquarters in Gaol Street, Hereford on the first and third Friday in each month.

S.E. England

Acton, Brentford & Chiswick are pleased to find that nothing of their's was lost during the fire which demolished their Hq recently. They now are based on Chiswick Town Hall, where on April 15 they will have a talk on Workshop Constructional Aids by G3IGM.

Now Salisbury where the venue is the Activity Centre, every Tuesday. Incidentally, their records go back to 1924, when Sir Oliver Lodge was their Foundation Patron.

For Maidhead we need an up-date; but the last date on the list in front of us shows an AGM so, maybe, a new committee will be setting to work on a new programme. Hq is still at the Red Cross Hall, The Crescent, Maidenhead. Not too easy for the stranger to find — from the A4 find a roundabout with 'Aegis House' on the Northernly side; turn off the roundabout to leave said House on your left, and the Crescent is on your left.

For Reigate we have it that they have their AGM on April 15, at the Conservative and Constitutional Centre, Warwick Road, Redhill.

At Harlow the place is Mark Hall Barn, First Avenue, every Tuesday evening. April 1 is given a boost with an All Fools Day Junk Sale; entry of £1 entitles one to take away any of the junk on display and similarly to sell one's own junk — privately only of course, not for the traders.

Barking next; Hq is at Westbury Recreation Centre, Westbury School, Ripple Road, Barking, on Thursdays. We haven't had an update so we can't tell you any more — but the Hon. Sec. appears in the Panel!

Would you believe it, but Cheshunt haven't sent in an update, and yet they have persuaded the Old Man to visit and give a talk — shame on you! Again, the Hon. Sec.'s name and address appear in the Panel.

Over to Mid-Sussex, and April 17 when they will be listening to a talk by G8SC, at Marle Place Further Education Centre, Leylands Road, Burgess Hill.

At West Kent they have a place in the Adult Education Centre, Monson Road, Tunbridge Wells; April 25 is the AGM. Informals are also held at the Drill Hall in Victoria Road on alternate Tuesday evenings.

Vange is the name of a group in Basildon who seem to enjoy their amateur radio without reporting their doings very much. However, in the course of a letter on their mobile rally date (September 7, St. Nicholas School) they mention that the Hq address is at Baste Community Centre, Long Riding, Basildon, every Thursday evening.

Now to Stevenage, and their Hq at the British Aerospace Site B Senior Staff Canteen on the first and third Thursday of each month — more details from the Hon. Sec. at the address in the Panel.

100-plus paid-up members is the proud boast of the Harrow club; every Friday they foregather at the Harrow Arts Centre, High Road, Harrow Weald; it must be quite a large room or a tight squeeze! On a different note, a temporary editor produced the Newsletter, and we must say we haven't seen a better typing effort anywhere, and the reproduction does it justice, too.

On now to Edgware where they are to be found on the second and fourth Thursday in each month, at Watling Community Centre, 145 Orange Hill Road, Burnt Oak.

April 20 is the date for East London RSGB to foregather at Wanstead House, The Green, Wanstead at 3 p.m. on the third Sunday in each month, to listen to G3AMF talking about the early days of radio.

Next we go to SE Kent YMCA Radio Club, which seems to be synonymous with Dover. April 2 is the AGM, with a natter evening on 9th. April 16 sees Part 2 of a lecture on Test Gear by G8EGT, April 23 is an Activity Night, with the idea of working some of the Ws, and on April 30 they have a Fox Hunt.

It is some time since last we heard from Clifton, but we understand they still meet at 225 New Cross Road, which is opposite New Cross Bus Garage, every Friday.

Gradually digging into the pile, we come next to Surrey and their Hq at T.S. Terra Nova, 34 The Waldrons, South Croydon, where the AGM takes place on April 4. The informal will be at the same venue on 18th.

The April 30 programme for Chiltern was still to be settled at the time their Newsletter was being printed and we have no more recent 'gen'. However, we can tell you the Hq address which is the canteen of the John Hawkins Ltd. factory in Victoria Street, which is not far from the A40 known as the West Wycombe Road.
Names and Addresses of Club Secretaries reporting in this issue:

LIVERPOOL: A. Neilson, G4CVZ, 79 Ackers Hall Avenue, Liverpool L14 2EA. (051 220 5470)

LOUGHOR: T. Griffin-Thomas, GW8TYS, ‘Riverside Manor’, 77 Castle Street, Loughor, Nr. Swansea, W. Glamorgan. (Swansea 89332)

MAIDENHEAD: J. Patrick, G3TWO, Bedford Lodge, Camden Place, Bourne End, Bucks. (Bourne End 25275)

MALVERN HILLS: Hugh C. Nash, G8JAO, 3 Wilton Road, Great Malvern.

MELTON MOWBRAY: R. Winters, G3NVK, 32 Redwood Avenue, Melton Mowbray, Leics. LE13 1TZ. (Melton Mowbray 3369)

MID-SUSSEX: J. Broker, G3JMB, 20 Farnham Avenue, Hassocks, Sussex.

NORTH BRISTOL: W. G. R. Wilby, G2BSU, 10 Wolsely Road, Bristol BS7 8EN.

NORTH DEVON: H. G. Hughes, G4CQG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon EX31 2DP.

NORTHERN HEIGHTS: M. Topham, G8NUL, 120 Great Horton Road, Bradford. (Bradford 73271)

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ORMSKIRK: L. J. Higgins, G4GIX, 8 Delph Top, Greetby Hill, Ormskirk L39 2DX. (Ormskirk 75546).

PLYMOUTH: R. Hooper, G5SCW, Station House, Tavistock North, Tavistock, Devon PL19 9EJ.

RA. I. B.C.: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Gidea Road, Upminster, KT6 4TE.

REigate: J. S. Roberts, G8EDJ, 15 Bakehouse, Road, Horley Row, Horley, Surrey.

ROYAL NAVY: M. Pattuck, G3L RK, 21 Sandfield Crescent, Cowplain, Portsmouth, Hants. PO8 8 SQ. (Waterlooville 35580).

SALISBURY: A. C. A. Newman, G2FXI, 74 Victoria Road, Wilton, Nr. Salisbury. Wilts. SP2 6DY.

SCARBOROUGH: Mrs. M. A. Crofts, G4JAO, 43 Broadlands Drive, East Ayton, Scarborough, N. Yorks YO13 9ET.

SOLIHULL: R. A. Hancock, G4BBT, 80 Ulleries Road, Solihull, West Midlands, B92 8EE.

SOUTH GATE: J. Finch, G8REW, 15 Kent Drive, Cockfosters EN4 9AP. (01-440 7535)

STEVENAGE: E. Godfrey, 94 Common View, Letchworth. (Letchworth 72184).

STOURBRIDGE: C. Williamson G4EB, 14 Lawn Street, Stourbridge. (Stourbridge 2009).

SURREY: R. Howells, G4FFY, 157 Nutfield Drive, Betchworth Close, Sutton, Surrey SM1 4NR. (01-642 9871).

SUTTON & CHEAM: G. Brind, 26 Grange Meadow, Banstead. UK FM GROUP (Western): G. L. Adams, G3LEQ, 2 Ash Grove, Knutsford, Cheshire WA16 8BE.

VANGEL: Mrs. D. Thompson, 10 Feering Row, Basildon, Essex.

VERULAM: A. Clarke, G8MAE, 24 Kiln Ground, Hemel Hempstead, Herts. HP3 9RE. (Hemel Hempstead 64751).

WEST KENT: B. P. Castle, G4DYE, 5 Pinewood Avenue, Sevenoaks, Kent. (Sevenoaks 56708).

WEST OF SCOTLAND: I. E. Mcgarvie, 3 Kelso Avenue, Paisley PA2 9JE.

WHITE ROSE: R. R. Hughes, G4DZI, 3 Primley Park Crescent, Leeds LS17 7HY.

WIRRAL: H. Crofts, G3DLF, 3 Barmouth Road, Wallasey. (051-638 2513).


WORCESTER: J. TittENSOR, G4EKG, 12 Durrington Road, Evesham, Worcs. WR11 6EQ. (Evesham 41105).

YEOVIL: D. L. McLean, G3MNO, 9 Cedar Grove, Yeovil, Somerset.

YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.
Sutton & Cheam have their AGM on Friday April 25, at Sutton College of Liberal Arts.

It seems a long time since last we heard from the gang at Farnborough; they still are based on the Railway Enthusiasts Club on the second and fourth Wednesdays, the start being, it would seem around 7.30, when the bar opens! The HQ is in Access Road, which in turn is off Hawley Lane, near the M3 Bridge. More details from the Hon. Sec. — see Panel.

That familiar duplicator tells us instantly that we are looking at the Crystal Palace newsletter; from it we glean the information that on Saturday 19 April they will be listening to Mike Bues, G8AA1, explaining how all this amateur television is done, and doubtless finding a way to demonstrate it.

It is odd that this month we find ourselves in the surprising position of having to refer you to Verulam's Hon. Sec. — see Panel — for dates and details of the April doings. The formals for this group are now at the Jubilee Hall, Catherine Street, St. Albans.

On to Crawley where we have a new Hon. Sec. to whom we can refer you to for the details on their activities at Trinity United Reformed Church Hall after the informal on April 9 — which is where the list stops!

We seem to have got ourselves into the doghouse with the Bournemouth Hon. Sec., and not unreasonably, as we got his call wrong! Sorry, Bob, we can't read our own writing.

Anyway, we see from the newsletter that on April 4 there is a natter night or a VHF D/F by G8AMQ, while on April 18 there are all the amateur films to be shown — they must have amateur radio interest, it is noted!

At Guildford, we see a Junk Sale down for April 11, and the AGM on April 25, the venue being the Model Engineers Club in Stoke Park. Incidentally the gang are very much into the activity between the twin towns, Guildford and Farnborough, and members are looking out for Farnborough QSOs and when they can.

For Cray Valley the latest Newsletter we have covers the AGM, on April 3, at Christchurch Centre, Eltham High Street, while the one on April 17 will be held in a pub called "The Greyhound". Work — then relax!

Many moan ago we heard on one of Burnham Beeches club, and then — nothing. However, they still proceed quietly on their way on the first Thursday of each month at the St. Johns Ambulance Service Hall in Slough.

Southgate are to be found at the Scout Hut in Wilson Street, Winchmore Hill Green, on the second Thursday of each month, and this time it should be good fun, as Junk Sales always are! For this group it is one of the highlights of the year.

Our final letter is to mention the formation of the Aylesbury Vale Repeater Group and, as one of their projects, the formation of an amateur radio club. If anyone is interested, please contact the Hon. Sec. — see Panel.

Finis

For another month; and we would like to remind all Club scribes of the need for regular updating of information, and for the notification of any changes in Hon. Sec. for the Panel. All details to arrive by the date shown in the 'box' in the piece, addressed as always to "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts AL6 9EQ.

BOOK REVIEW

“TWO METRE ANTENNA HANDBOOK”

These days it is increasingly rare to meet a radio amateur who is using home designed and built equipment. In this affluent society the great majority buy items from the extensive range of excellent commercial gear and accessories. However, aerials remain one area where the challenge to develop a new concept and squeeze an extra dB of gain here and there is still rife. Any book on the subject is worth reviewing.

VHF enthusiasts will be interested in Fred Judd’s, G2BCX, Two Metre Antenna Handbook which comprises five chapters and a useful index. The first section deals with "Wave Propagation and Fundamentals," and is pretty basic stuff. Chapter 2, "Omnidirectional Antennas," includes the well-known "halo" and ground plane designs, the J-match half wave and colinear aerials and the author’s popular Slim Jim, the "Jim" derived from J-Integrated Match. This section would be of main interest to repeater and FM addicts who use vertical radiators.

The third chapter, "Directional Antennas," includes G2BCX’s ZL-Special concept, originally developed for the HF bands in the 1950’s. The basic two element version is described, along with the later five, seven and twelve element versions, the latter having a claimed gain of 13.5 dBd from a boom length of only 3.2 metres. These aerials are well suited to home construction and are excellently illustrated, Quad, Yagi and end-fire arrays and slot-fed aerials are covered, too, but a disappointing omission is any reference to the Quagi approach.

Chapter 4 entitled, "Matching and Feed Cables," covers the fundamentals of transmission lines and illustrates the common matching and balun ideas. A comprehensive table of coaxial cable data is included with cross references between BICC, Uniradio and Military numbers. Many people make a mess of fixing plugs to cables so the blow-by-blow account of preparing thin and thick coaxial cable for soldering to the "PL" type of VHF plug is a worthwhile inclusion. However, the plug shown is a PL-259, not PL-295.

The last chapter is called, "Antenna Performance" in which the author describes and illustrates his test equipment for evaluating aerial designs, which he does at 650 MHz. It includes a revealing graph showing the real VSWR readings versus indicated values, taking into account feed line loss. For example, if a 2:1 VSWR is indicated and the line loss about 3 dB, the real VSWR is 5:1.

The book is very readable, concise and authoritatively written and is to be recommended on its technical merit. The format is pocket-sized, 7½ x 4½, with 157 pages and is one of the Newnes Technical Book series. The problem is the price, £4.35 including post/packing (from Publications Dept., S.W.M.), which seems far too high for such a production. After all, for £7.20, one can buy the complete RSGB VHF/UHF Manual in hardback, covering all VHF/UHF topics including a comprehensive chapter on aerials. The only really original material in Mr. Judd’s book are his Slim Jim and ZL-Special designs.
on the air the following day. The Home Office has granted permission for the RSGB to establish a 50 MHz beacon in Anglesey but it will only be allowed to operate outside TV hours.

**Satellite News**

Satellite buffs are getting all ready for the launch of the first of the AMSAT Phase 3 birds, destined to become *Oscar 9*. The launch date is now given as May 20, between 1500 and 1800 UTC. It is planned to broadcast full coverage of the event from the station of WA2LQQ who will come on 28.880 MHz at 1400. If 10m. propagation is poor, the net will QSY to 21.280 or 14.280 MHz. He will have a direct line to Kourou in French Guiana.

A-0-9 now weighs 85kg, so the perigee of the final orbit will be between 1,500 and 3,000 kms. It arrived in Toulouse from Washington on Feb. 25 for integration with the ARIANE rocket. The journey to South America is due to start on April 9. After launch, A-0-9 will be placed in a transfer orbit and it could be only 2½ weeks before the *Thiokol* single kick motor is fired to put it into its final orbit. Once a stable orbit is confirmed, AMSAT-UK will produce transparent overlays at modest cost as are available for O-7 and O-8. By the time you are reading this, calendars of O-7, O-8 and the weather satellites for April through June should be obtainable from AMSAT. The cost is £1.27 by post free from AMSAT-UK at 94 Herongate Road, London, E12 5EQ.

**Repeaters**

At the time of writing, the Glasgow relay, GB3GL, on RB4 is off the air due to damage to its feeder. UHF repeaters GB3HO (Horsham) on RB14; GB3LC (Louth) on RB13; GB3MW (Leamington Spa) on RB10 and GB3WN (Wolverhampton) on RB8 were all due to commence operation in Feb. or early March. GB3MR (Park Moor) on RB14 was taken out of service on Feb. 29 for a complete rebuild. GB3NK on RB4 is now operational from its new, Wrotham location.

GB3NX (East Grinstead) on RB2 is now back again after a rebuild. The Weymouth repeater, GB3SD, on RB14 has been re-located on higher ground, north of the town and is providing much better coverage. Finally, VHF relay GB3WT (Omagh area) in Ulster on R7 is now back with its proper aerials.

**Contests**

Results: — The CW 70 MHz Contest on Jan. 20 was won by G3UKV with 209 points from 32 contacts. Runner up was G3XY by whose 34 QSO's were worth 160 pts., while G3BA came third with 131 pts. from 31 exchanges. There were 19 entries.

Coming events: — April 12 from 1600 to 2400 GMT sees the 1,296 MHz Contest. It is for either single operator or multi-operator entrants with scoring at one point per kilometre. The 432 MHz event takes place the following day from 0900-1700 GMT under the same rules except that radial ring scoring is to be used. This is an s.w.l. contest as well.

Teletype fans will be at it the following weekend, April 19/20, from 1800-1200 GMT in the first Spring BARTG VHF/UHF Contest. Exchanges to consist of: — Time of start of QSO in GMT, RST reports, message number starting at 001 and continuing in sequence, QTH locator and QTH; e.g. 3 kms NW of Stafford. Radial ring scoring system. Bands are 144 and 432 MHz but no cross-band, repeater or satellite QSO's.

The weekend May 3/4 sees the 144, 432 and 1,296 MHz Contest from 1600 to 1800 GMT. Only one call sign may be used and simultaneous operation on two or three bands is not allowed. This is a single-op. and multi-op. event with single operators having to take a consecutive six hour break. Radial ring scoring on 144 and 432, but one point per km. on 1,296 MHz.

**Amateur Television**

Kevin McMahon, G8JJR (S. Yorks.) told your scribe of keen and growing interest in fast scan TV in the area. In S. Yorks., Notts. and Lincoln, he reports four transmitting stations active on 70 cm. and that 144.4 MHz is used for multi-mode talk-back.

**Four Metres**

Jim Whittle, G3EKP (Lancs.) enters the annual table after an absence of several years and is one of several readers who report on the encouraging level of Sunday morning activity on 70 cm. He uses SSB. Ray Elliott, G4ERX (Essex) also mentions: "... evenings at about 8.00 p.m." He has added three more counties since
last month, G2OAK (Glos.), G3PWK (Cambs.) and G4APA (Berks.).

Dave Thorpe, G4FKI (Essex) has now worked 100 stations on the band since last year and is looking for the QSL’s for the VHGC Award. During Feb., Arthur Breese, GD2HDZ, added another 5 counties and 2 countries for 1980 in the shape of G2AOK, G3EKP, G3IKR (Hereford); GM3WOJ (Dumfries) and GW4DRR (Gwynedd). John Baker, GW3MHW (Dyfed) says, “Friday night is 4m. activity night.” He mentions that G3LIT (Glos.) has ordered a new transverter so should be back on the band after a few years break. John asks us to mention again his nightly sked. at 2000 on 70.205 MHz with G2AOK and says they welcome all “breakers.”

He suggests the increasing activity could be due to growing disillusionment with 2m. Whatever the cause, it is important that the band is well used in a responsible way so that there is a sound case for its retention by the amateur service. On a practical note, having had his PA bias supply transformer go open circuit on the tip with 2m. passing along the tip which should be avoided in the future.

Mike Allmark (Leeds) reckons there was not a lot to report in Feb. but mentions the 17th when EA1CV and EA1CV (XD) were copied very weakly, along with F1FH1/2(2H) and F1EWP (AG). The weak AR on the 6th. produced SSB from G18RC, GM8’s DMZ and PEV and a few G’s. On the 23rd., Mike heard EI2ACB and EI3DMB and the following day heard stations in 36 counties in G, GI, GM, GU and GW.

Bill Hodgson, G3BW (Cumbria) contributes his first entry to the 1980 table and got off to a good start with several rewarding MS QSO’s in the Jan. Quadrantids. So far, he has caught three AR’s working SM’s and LA’s in CU, FT, HS, HT and 1S squares, plus GM3JLI (WS) and GW4EAI (Gwent) a region not normally heard in Whitehaven, it seems. Bill reports “bedlam” on 2m. during the March 1/2 contest with fantastic signals from GJ and northern French stations.

Two Metres

Mike Allmark (Leeds) reckons there was not a lot to report in Feb. but mentions the 17th when EA1CV and EA1CV (XD) were copied very weakly, along with F1FH1/2(2H) and F1EWP (AG). The weak AR on the 6th. produced SSB from G18RC, GM8’s DMZ and PEV and a few G’s. On the 23rd., Mike heard EI2ACB and EI3DMB and the following day heard stations in 36 counties in G, GI, GM, GU and GW.

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Dave Sellars, G3PBV (Devon) mentions the good lift across the Channel on Feb. 17 with EA1CV (XD) a good signal all day, as was EA1CR running a TS-700. The following evening Dave worked FIEAN (AG). During the contest, conditions picked up early with AG, BH, CI, DK, EH and EI squares worked plus HB9MIN/P in DH. By contrast, propagation to the north was poor with QSB towards the end of the affair. G4RX put up the 6-ele. Quad for the contest and hooked up a 4CX150A amplifier with which he worked 30 counties and 10 countries. Stations worked included F1KPO/P (BG); F6GAK/P (CH); HB9AMD/P (EH); HB9MIN/P (DH) and some Germans in EH and EI squares.

G4FKI has not done much on 2m. so far this year but expects to be back on SSB soon to improve matters. Some months ago, a station on CW signing G4GPK was causing deliberate interference. Your scribe and others soon established that the location was not Crowborough, Sussex, where Lyster Williams, the real G4GPK lives. He writes that he has no 2m. gear at all at present but has very occasionally operated on FM using borrowed gear, from Tonbridge, Kent.

Welcome to the column Gary Allitt, G4HNS, who enters the annual table with 86 points and with 4m. to come soon, as well. He found conditions in the March contest good and worked down to EH square. Ken Osborne, G4ISO (Bristol) caught the lift on Feb. 17 and worked EA1CV (XD) and F1UPX (AG). During the contest, best DX included F1EIBZ/D (DH); DB2VZ/P (DJ); D80MT/P (EH); HB9MIN/P (DH); DK0VL/9 (EH); DLQ0E/P and DB1TP, both in EI, and HB9AH/P (EH).

The G4JJE team (Essex) which comprised Paul Turner, Bryn Llewellyn, G4DEZ, and a Dutch visitor, made 527 contacts in the contest during which Bryn heard OK1KIN/P. The SOCOM group used Steve Marsh’s call G4BGW/P from AL-45 and made 730 QSO’s, quite a few into the “F” line of squares. On CW in this event, Ron Glaser, G6XL (Croydon) worked way down to F5CI/P in BD72d, Dept. 11.

Tony Collett, G8GXE, was out portable with G8RZ/2/8P at Stokenchurch (Bucks.) and reports that G8RZ/P made about 550 contacts worth about 4,100 points. 4 HB’s were worked. Dave Cox, G8OPR

Starting Date January 1, 1975. No satellite or repeater QSO’s. “Band of the Month” 7cm.
(Hants.) still leads the 1980 table, his score of 118 being the highest April one since the new counties have been used. During the contest, his best DX was DK0VL and HB9AHD/P, both in EH square. Andy Markham, G8RZA (Essex) had a go in the contest and his list includes HB9MIN/P.

From Co. Antrim, Steven Ruff, G18EWM, writes that he has not been very active recently but did get on for the contest adding three new QTH squares; FIEKU/P (BH); FIEJX/P (CH) and DK0FR/P (DH). Geoff Brown, GI4CD, worked DF7RX in F119c in the contest for square number 150 on the band. Conditions to the north were obviously good as he lists QSO’s with GM8BDX (Borders); GI4BMW (Antrim); G8UJA (Lancs.) and G3YYV (Cleveland).

A fairly average period at G3FPK. The weak AR of Feb. 6 was missed but another was discovered in the late evening of the 15th when SM4COK (HT56c) was worked on CW. Others heard included GM3J1J (WS69c) and GM3BOC/A (YS71c), QTF’s being about 10°. Another weak AR occurred between 2200 and 2245 on the 25th, best DX heard being SM4HVE (HT). As observed from the London area, conditions during the contest were better than expected. Even so, while strong signals were received from stations up to 800 kms., there seemed nothing beyond the “E” and “F” row of squares. This was mentioned by Dave Price, GW4CQT (Gwent) who reckoned it seemed somebody had erected a screen at that distance!

There was considerable ducting from Switzerland and the Black Forest area which passed over our heads. A lengthy QSO was monitored between DL0EE/P (EI32h) and EI2AWB (Limerick) which must be about 1,300 kms. While the German was S9, not a whisper was heard from the EI. This was at 2030 on the Saturday night. By contrast, at 0930 on the Sunday morning, EI9Q (WM65d) was a loud signal amongst all the “crud” around the SSB calling frequency.

Seventy Centimetres

G3BW has found conditions this year to have been exceptionally quiet. During the contest, Bill seems to have been too far north to catch the ducting into HB. His best DX was to FIEDET (BH) but, nearer home, he had a chat to Albert Latham, EI6AS, in Dublin. At the moment, G3EKP only has FM capability but hopes to have a transverter for SSB later this year.

G3PBV picked up another 8 squares in the contest and reckons the power increase to 50 watts has helped. On Feb. 17 Dave worked some Channel Islands folk, FICPX (AH) and FIFYH/P in ZI, who was using an IC-402 hand-held 3-watts rig and quarter wave whip! In the contest, best DX was Claus Neie, DL7QY (FJ) and DK0VL/P (EH) as well as stations in BG, BH, BJ, CK, CI, CM, and DJ.

Mike Lee, G3VF (Essex) complains that the contest rules allowed 2m. only as a single band entry which resulted in very little 70 cm. activity. Even so, he worked some nice Continental DX on the Saturday evening including DK0VL, DJ9HI/P (FH); FIFYA/P (C1) and DK2FR/P (DH). On Sunday, F2OL/P in the rare BG square was worked. Mike showed your scribe a QSL from IW1AIH (DF15c) at the VHF Convention. The Italian heard him working F1DJY/P (CH) but could not raise him with 5 watts. His QTH is 1,282m. a.s.l. and he uses four 20-ele. Yagis with 18 dB gain and a BFR91 RF stage. Mike also reports that HB9BMC/P (EH73) is claiming the first HB to GI 70 cm. QSO made on March 2.

G4ERX worked EA1CR on Feb. 17 for a new square and country on the band. Ray lists DK0VL and F1EDJ/P (BH) for new squares during the contest. G4HNS (Notts.) was disappointed at the lack of 70 cm. contest activity but did connect with DK0VL. Only 7 stations were heard on the Sunday. G8GXE was out portable in the contest and found conditions to the southeast on Saturday good. Tony worked 136 stations worth 740 pts. in 9 countries and 23 squares. These included an HB9 and BG, BH, CH, EH and ZH squares. G8OPR’s best contest DX was DK0VL and he heard GW4CQT working into HB9.

The contest provided GD2HDZ with 8 more 1980 counties in the fixed event on Feb. 3, followed by GI4GVS (Antrim) on the 15th. G18EWM added 3 new squares in the March affair; F1EDJ/P (BH); FIEBN/P (BJ) and the ubiquitous DK0VL (EH). GJ4ICD says he copies the beacon in ZD square almost every day and can call into the

70 cm. nets in AD, BC and BD squares.

**Twenty-three Centimetres**

On the Continent, the March 1/2 contest included 23 cm. Some U.K. operators took advantage of the good conditions on the Saturday and were rewarded with some very good DX. For example, David Butler, G4ASR (Hereford) worked DK0VL/P in EH on this band, to complete the hat trick, having already worked him on 2m. and 70 cm. Russell Stewart, G8BHH, was also hearing the HB9's in Wolverhampton.

**The VHF Convention**

This year’s VHF Convention was probably the largest yet. More use was made of the Whitton School to accommodate the trade show which featured about 30 exhibitors. In addition, numerous groups, such as AMSAT-UK, Raynet, BATC and, of course, the RSGB were there. The exhibits ranged from high quality products to utter junk but the main attractions were those traders offering components. With companies frequently requiring handling charges, coupled with the now very expensive postal costs, it makes sense to shop for components, large and small, at this kind of event.

Crayford Electronics had the new Microwave Modules 1,296 MHz transverters on display. The transmit section is versatile in that it can accommodate inputs from the driving source between 5 and 500 mW or 10 watts through a supplied 15 dB. attenuator. Power output is 1.3 watts continuous and a 10 watts amplifier will be available later. The receive section has a noise figure of 2.9 dB. maximum. At under £160, it would seem this product could promote much more 23 cm. activity among those who are getting increasingly disillusioned with 2m.

The new line of muTek Ltd. featured the FT-221/225 replacement "front end" board and a microstrip-line UHF bandpass TVI filter. New to the U.K. is the range of aerial combiners from Kungsimport (SM6CKU) in Sweden. Two and four port versions for 2m., 70 cm. and 23 cm. are available at between £25.50 and £29.75, excluding VAT and carriage. All are 50 ohm devices with kilowatt power handling capacity.

Your scribe had a long talk with Charlie Newton, G2FKZ, recently returned from a trip to Greece where he met Costas Fimerellis, SV1DH, one of the keen researchers into Trans-Equatorial Propagation at VHF/UHF. Charlie was manning the RSGB Propagation Studies stand and played a fascinating recording of the pulsed 28 and 144 MHz signals from southern Africa as received in Athens. SV1DH now has Greek government backing for this investigation into what part of the ionosphere carries VHF signals over such long distances and is making this TEP study the basis of his Doctorate degree.

Obviously, extreme accuracy is vital if any firm conclusions are to be made. To this end, the 2m. and 10m. beacons ZE2JV (Salisbury) and the atomic time standard in Pretoria. The time delays of the arrival of the signals in Athens are 30-plus milliseconds, this interval being measured by reference to the atomic time standard of the Mediterranean LORAN chain.

The multi-path, Doppler-spread signals sound "semi-auroral" and a definite time pattern has been observed. It is possible to follow the paths of the heavily ionised blobs as they track across the Indian Ocean, the African continent and finally over the Atlantic Ocean. Indeed, so predictable was this progression when Charlie was with Costas, that SV1DH showed Nigerian TV on 62 MHz received on a domestic set with whip aerial at just the right time.

The numerous lectures were well attended although your conductor did not attend any of the time. The main complaint is about the venues. Few people are satisfied with having to wander between two separate locations. It may be only 400 yards, according to the Convention map, but it is a bit hard on one’s aching feet.

**Operating News**

This is a plea to all operators to state where they are and where they are beaming to when calling "CQ." It never ceases to puzzle your scribe that this procedure is not adopted as a matter of course. Perhaps due to inexperience, many newer licensees seem to think there is some magic way their whereabouts can be determined. However, many old hands fail to state their locations.

There are quite a lot of pirates on 2m. particularly, especially on the repeaters. One can recognise some of the voices heard on the illegal CB 27 MHz band. A frequent ploy is to "borrow" someone's call and add; "stroke alternative" in an attempt to avert suspicion. Many do operate from alternative addresses, defined as "temporary premises" in Clause 9 (1) (b) of the licence. Clause 9 (4) clearly states one must broadcast the address of the temporary premises when contacting each station. Those operating /A and not complying with this requirement should not complain if they are accused of being pirates.

**Deadlines**

That's it for April. Due to Easter, the deadline for the May copy is April 1 at Welwyn. For the June piece it is May 7 but bear in mind that the 5th. is the May Day holiday. Everything to; "VHF Bands," SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. 73 de G3FPK
THE NEW ALL-MODE MOBILE

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- DM800 Grid Dip Meter/Wavemeter: £59.80
- TS2000 Transceiver: £432.40
- TL120 Linear Amplifier: £128.80
- HS5 Headphones: £21.85
- HS10V Headphones: £40.35
- MC50 Desk Microphones: £24.15
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£178 inc. VAT and delivery

Dear Sirs,

Thank you for your most excellent service and unbiased advice when I called in to purchase a short wave receiver. I might say that I did intend to buy in London but when I was told by one dealer that their repairs were done elsewhere, I became suspicious. How confident I was when I saw your large service department—my message to any other customer would be: Go to Waters and Stanton—they have the experience and facilities at their new premises that far exceeds any other retailer in the South I have visited!


Interested in RADIO or HI-FI?

HERE'S
JUST A FEW OF
OUR BARGAINS

TRIO HI-FI
KA3700 Amp 2.5w .... £77.00
KA305 Amp 40w .... £97.00
KA405 Amp 55w .... £140.00
K1500 Tuner .... £87.00
KR2010 20w Receiver .... £106.00
KR2010 35w Receiver .... £177.00
KD10335 Tuntable .... £53.00
KD1500 Tuntable .... £55.00
KX530 Dolby Casette .... £116.00

PIONEER HI-FI
SX590 20w Receiver .... £98.00
SX690 30w Receiver .... £129.00
SX790 40w Receiver .... £203.45
SA408 20w Amp .... £59.00
TX408 FM Tuner .... £58.90
PL512 Tuntable .... £51.00
PL200x Tuntable .... £102.00
PL300x Tuntable .... £112.00
CTF500 Dolby Casette .... £89.80
CTF600 Dolby Casette .... £103.90

FANTASTIC OFFER

FDK 2m 1 Watt Portable
Complete with: Flexible antenna, ni-cads, AC charger, S20 and S22, cigar lighter, DC lead and 6 channel capability.

PALM II

£89.50 inc. VAT*

Postage and packing 75p.

* Crystal tone-burst £10 extra

70cms version
Palm IV

£149 inc. VAT

MONDAY - SATURDAY 9-5.30
18-20 MAIN ROAD, HOCKLEY, ESSEX

WATERS & STANTON ELECTRONICS

Telephone (03704) 6835
Telex 995895

EARLY CLOSING WED 1.00pm
RETAIL CALLERS

AGENTS:— G3PWJ (03844) 77778 G3WRA (0432) 67864 G8NMU (0272) 669454 G3TX (0708) 68956 GM3GRX (0324) 24428
The R-1000 uses an advanced PLL system in an up-conversion scheme to a high (48MHz) first IF to remove any possibility of image responses. The receiver covers the entire frequency range from below 200kHz right up to 30MHz in 30 bands, each 1MHz wide. The bands are selected, not by ambiguous knob twiddling as in receivers using the Wadley loop but by a 30 position band switch which controls the PLL system.

The band switch also electronically selects the appropriate band pass filter network in the RF stages of the receiver so there are no "preselector" or "antenna trim" controls to twiddle — simply set the band switch to the range required — that’s it!

A highly stable VFO tunes each 1MHz range and its linear, back lit scale makes readout easy. However, in addition to this dial, Trio have also provided 5 digit true frequency digital readout so as to guarantee spot on accuracy on any frequency. As a further feature, the digital display can also be switched to read time, this being derived from a quartz standard. Marvelous for accurate log keeping. The display uses high intensity readout units which can be dimmed for use in low light conditions.

As for what else is inside this superb instrument — selectivity is catered for by three custom made IF filters; a 12kHz wide AM filter; 6kHz narrow AM filter; and a new 2.7kHz SSB filter with a shape factor of better than 1.2 6.60dB. Selectable sidebands are available at the touch of a switch.

For the first time in mid price receiver, a true noise blanker is provided to remove pulse type ignition noise.

To minimise front end overload, a step RF attenuator is included which gives 0-60dB attenuation in four steps.

All the rear panel connectors are recessed on a sloping panel so that you can stand the receiver either on its back, or pushed hard against a wall when used in conventional shelf mounting. The antenna inputs allow the use of either a high impedance wire aerial or a 50ohm balanced input so that the proverbial long lump of wire will work really well with the R-1000.

Up until now we have been taking orders on a waiting list system because of short supply of this item. Hopefully by the time you read this we will be able to supply from stock. And remember all our R1000 are given our full pre-delivery check and then despatched promptly to reach you within 24 hours of us receiving your order. That’s real service! Just one of the many things that make more and more people come to us for all their amateur radio needs.

£298 inc. VAT
STOP PRESS

TR9000 2m all mode £340 inc. VAT

ALL PRICES INCLUDE 15% VAT

@TRIO

TS120V £408
TS120S £495

SOLID STATE RIG RELIABLE AT LAST

Up until now there has been a natural reluctance to accept solid state HF rigs as anything but a second rig or mobile unit with dubious reliability of the PA devices. Now at last the new TS120 series gives you 80-10 metre coverage at either 10 watts output or 100 watts output. Digital readout and variable selectivity are just two features that put them in a class above any other solid state rig we know of (apart from the TS1800) — even those costing nearly £1,000. The TS120 will to shame many of the older valve PA designs and can confidently be regarded as a good reliable base or mobile station — and no tune-up means instant GSY from band to band at the flick of a switch.

SPECIAL OFFER

TR7600 £220 + FREE MICROPROCESSOR
144-148 MHz

Here's a really super deal. A brand new TR 7600 transceiver together with the RM76 microprocessor for £220. Full coverage 144-148MHz in 5kHz channels with 10 watts output gives you a highly versatile transceiver. The basic transceiver has plus and minus repeater shift tone-burst and memory. Plug in the microprocessor and you open up a new world of operating convenience. Electronic tuning and memory. The memories can be programmed at the touch of a button and then scanned. At £220 the transceiver is a first-class buy and if we offer you the RM 76 for nothing you'll have to admit that it's a bargain you won't see again.

NEW

@TRIO

R-1000 £298 inc VAT

At last the Trio R1000 has been announced — a real purpose built receiver for the serious short wave listener. 200kHz to 30MHz in 30 bands. This receiver has many features that are not available on other models and, of course, has the technical backing of the world's largest manufacturers of amateur communications equipment. Features include: 1kHz digital readout and separate analogue dial, large high quality speaker, digital 12 hour clock — AM and PM, three separate filters for selectivity, noise blanker (try finding this on any other receiver!), automatic preselector tuning via the 1MHz band switch, three-stage attenuator, dimmer control, tone control, timer circuit, and all this in a diminutive package measuring 12l x 4l x 84 in. Trio have now solved the problem of choosing a receiver — there is no choice — it's got to be Trio!

NEW

@TRIO

TR2400 £210 inc VAT

The new TR2400 really does eclipse all other hand-helds in its sheer technology. There's no other model that can approach its performance. The large LCD readout has low current drain and the 1.5 watts output is a good compromise between effective communication and reasonable battery drain. 10 memories, automatic scanning, instant reverse repeater operation, 16 key touch-tone encoder, 144-146MHz etc. etc. etc. all adds up to the new leader in hand-helds — the Trio TR2400. Get your Barclayscard or Access cards ready for this one — half its fascination is operating it — the other half is owning it.

The TR2300 is a remarkable package which combines all the advantages of a portable station with those of a mobile transceiver. In many ways it is the ideal "starter rig" in amateur radio. Full band coverage from 144-146MHz in 80 x 25kHz channels plus 600kHz repeater shift and 1750Hz automatic tone-burst complete its versatility. The dial is directly calibrated in frequency and has illumination for night use. The transmitter is exceptionally clean with an output power in excess of 1 watt. Receiver sensitivity is every bit as good as the best mobile rigs and either internal batteries of an external DC source may be used. Fits easily into a suitcase or on the corner of a desk and makes a really compact mobile rig. Price includes carrying case, shoulder strap, battery charger, external DC cord and, of course, the Waters & Stanton 12 month warranty. An absolute bargain — we even sell them to our staff!
MULTI 700EX 25 WATTS 2M FM 25 & 12½kHz CHANNELS
PRIORITY SCANNING

Price T.B.A. Delivery expected April

The Multi 700EX is the replacement for the Multi 700E, having an updated specification — without making it too complex for safety under mobile conditions! Its powerful 25 watts output has been retained together with the front panel continuously variable power control. The frequency range has been expanded to cover the entire band 144-146MHz in 25kHz steps. Of course, essential to all current equipment is its ability to operate on 12½kHz channel spacing and this you can do at the press of a button. Four priority channels that are user programmable have been added and these can be electronically scanned. The channels are not lost when the equipment is switched off! The stable crystal controlled tone-burst is automatic and both normal and inverse repeater operation is possible at the press of a button. By simple alteration of the diode matrix the plus 600kHz facility can be changed to 1.6MHz for operation through the proposed FDK 70cMs transverter (in matching cabinet). Altogether a simple but highly effective mobile transceiver that provides everything you could wish for in a 2 metre FM mobile.

MULTI 750 15 WATTS FM/SSB/CW — EVERYTHING YOU NEED AT A VERY SENSIBLE PRICE!

This rig will really set the pace for 1980 — wait until you hear the price!

Delivery expected April

The Multi 750 is FDK's new, all mode 2 metre unit for both base or mobile use. Using the same cabinet dimensions as the M700EX, this really does provide the basis for an action-packed, go-anywhere station. To list all its features would be impossible in the space available on this page. However, we will list its main points so you can get some idea of just what this amazing package is capable of.

144-146MHz at 10 WATTS OUTPUT (Minimum); ALL MODES — FM/USB/LSB/CW; REPEATER OPERATION — normal or reverse with automatic crystal controlled tone-burst; DUAL VFO's — these are selectable at the press of a button so that one vfo can be left at the SSB end of the band and the other at the FM end; NOISE BLANKER — a really efficient circuit to take out those ignition pulses on ssb; DUAL SPEED TUNING — enables 1kHz or 100Hz step tuning on SSB/CW and 1kHz or 5kHz steps on FM; RIT — essential for accurate tuning of the received SSB signal; LOW EFFECTIVE PRICE — at present we cannot tell you what the final price will be — suffice to say it will be extremely competitive — so much so that we would strongly recommend you to hold back on purchasing a similar unit until we unveil our SUPER LOW PRICE PACKAGE!
### C8800 2m FM Mobile

The C8800 is a matching unit to the C7800 with the same features covering the 2m band in 5 or 25kHz steps (this is switchable from the rear panel). $20 and $22 are pre-programmed and available at a touch of a button, the unit has a 3 position RF gain to attenuate strong signals such as repeaters. Provision is made for two repeater offsets (600 kHz is fitted as standard) at £219.50 + VAT carriage free.

### C7800 70cm FM Mobile

The C7800 is one of the most advanced mobile 70cm transceivers available covering 430.00-440.00 a full 10 MHz, in 25 kHz steps. Tuning is accomplished either by the main tuning control or with the Up/Down control on the mic. A MHz button is provided to step the frequency up by 1 MHz at a time to save hours of knob twiddling. Su20 is available at the touch of a button, two repeater offsets are supplied 1.6 MHz and 4.8 MHz for European use.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Three memory banks</strong></td>
<td>8 digit display, 8 digit bank name, 8 digit bank number, 8 digit bank number</td>
</tr>
<tr>
<td><strong>Bandwidths</strong></td>
<td>1.6 MHz and 4.8 MHz for European use</td>
</tr>
<tr>
<td><strong>Up/Down control</strong></td>
<td>On the mic</td>
</tr>
<tr>
<td><strong>Manual tuning</strong></td>
<td>Available</td>
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<tr>
<td><strong>RF gain attenuation</strong></td>
<td>3 position</td>
</tr>
<tr>
<td><strong>RF gain attenuation settings</strong></td>
<td>600 kHz (standard)</td>
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**Post and Package:** £1.00 + VAT 15%
H.F. RECEIVERS

<table>
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<tr>
<th>Model</th>
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<tr>
<td>Lowe SRX 30</td>
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<tr>
<td>Yaesu FRG 7</td>
<td>£214.00</td>
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<tr>
<td>Trio R 1000</td>
<td>£298.00</td>
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<tr>
<td>Yaesu FRG 7000</td>
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2 METRE F.M. RECEIVERS

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<tr>
<td>Search 9</td>
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<tr>
<td>FDK TM56B (+ scan)</td>
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<tr>
<td>Belcom AMR217B (+ scan)</td>
<td>£120.00</td>
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<tr>
<td>Bearcat 220</td>
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MARINE VHF RECEIVERS

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<tr>
<td>S R 11 (+ scan)</td>
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<tr>
<td>FDK TM56B (+ scan)</td>
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<tr>
<td>Bearcat 220</td>
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AIR BAND RECEIVERS

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<tr>
<td>Waltham W144</td>
<td>£29.95</td>
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<tr>
<td>R 517 (VFO + 3CH)</td>
<td>£49.50</td>
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<tr>
<td>AP 12 (12 CH)</td>
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<td>Bearcat 220</td>
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ROTATORS (carr. £2.50)

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<th>Model</th>
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<tr>
<td>TRI (TV &amp; FM)</td>
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<tr>
<td>Stolle 2060 (Light VHF)</td>
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<td>AR 30 (Light VHF)</td>
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<td>9502 Colorator (Med VHF)</td>
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<td>AR 40 (Large VHF)</td>
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<td>KR 400 (Med HF)</td>
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<td>CD 44 (Med HF)</td>
<td>£109.00</td>
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<td>Ham IV (Large HF)</td>
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KEYERS (carr. 75p)

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<th>Model</th>
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<tr>
<td>Morse Keyer HK707</td>
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<td>Electronic Keyer EK150</td>
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H.F. TRANSCEIVERS

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<tr>
<td>TR 10 120V</td>
<td>£347.00</td>
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<tr>
<td>Dentron HF 200A</td>
<td>£399.00</td>
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<td>Yaesu FT 7B</td>
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<td>Trio 120S</td>
<td>£432.00</td>
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<td>Trio TS 520SE</td>
<td>£437.00</td>
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<td>Yaesu FT 101Z</td>
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<td>Yaesu FT 101ZD</td>
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<td>Trio TS 820S</td>
<td>£669.00</td>
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<td>Trio 180S (with DFC)</td>
<td>£759.00</td>
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2 METRE F.M. MOBILES

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<tr>
<th>Model</th>
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<tr>
<td>FDK Multi 700EX</td>
<td>£225.00</td>
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<tr>
<td>Trio TR 7625</td>
<td>£246.00</td>
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<tr>
<td>Standard C8800</td>
<td>£250.00</td>
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<tr>
<td>Icom IC 255E</td>
<td>£255.00</td>
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2 METRE F.M. HANDHELDs

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<th>Model</th>
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<tr>
<td>FDK Palm II</td>
<td>£99.00</td>
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<tr>
<td>Yaesu FT 202R</td>
<td>£119.00</td>
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<td>FDK Palmisizer</td>
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<td>Trio TR 2300</td>
<td>£166.00</td>
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<tr>
<td>Yaesu FT 207R</td>
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<td>Trio TR 2400</td>
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2 METRE MULTIMODES

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<th>Model</th>
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<tr>
<td>Icom IC 260 E</td>
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<td>Icom IC 251 E</td>
<td>£479.00</td>
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<tr>
<td>Yaesu FT 225RD</td>
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<td>FDK Multi 750</td>
<td>£P.O.A.</td>
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<td>Trio TR 9000</td>
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ACCESSORIES

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<th>Item</th>
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<tr>
<td>Yaesu QTR 24 World Clock</td>
<td>£18.40</td>
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<td>Yaesu QTR 24D World Clock</td>
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<td>Clock Quartz</td>
<td>£10.00</td>
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<tr>
<td>Yaesu YH55 Headphones</td>
<td>£10.35</td>
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<tr>
<td>Trio HS5 Headphones</td>
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<td>Trio HS5 Headphones</td>
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<tr>
<td>SWR Meter (twin) SWR 25</td>
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<tr>
<td>SWR Meter T435 (432 MHz)</td>
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<td>SWR Meter SW110 (150 MHz)</td>
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<td>SWR Meter CN620</td>
<td>£52.81</td>
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<tr>
<td>Dummy Load DL20 (15W)</td>
<td>£5.95</td>
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<td>Dummy Load T80 (80W)</td>
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<td>Dummy Load T150 (150W)</td>
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<td>Dummy Load Trio RD300</td>
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<td>Coax Switch 2 way Toggle</td>
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<td>Coax Switch 2 way Rocker</td>
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<td>Coax Switch 5 way Rotary</td>
<td>£10.20</td>
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<tr>
<td>Power Supply 12V 3A cont</td>
<td>£22.95</td>
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<td>Power Supply 3-12V ½ A cont</td>
<td>£16.60</td>
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<td>Power Supply 12V 6A</td>
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<td>Power Supply Yaesu FP12 12A</td>
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<td>Power Supply Trio PS30 (20A)</td>
<td>£85.10</td>
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<td>7MHz Traps 500 Watts</td>
<td>£6.95</td>
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<tr>
<td>FF 50 DX Low Pass Filter</td>
<td>£21.30</td>
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<tr>
<td>LF 30A Low Pass Filter</td>
<td>£18.40</td>
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<tr>
<td>HP3A TV1 Filter</td>
<td>£3.00</td>
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<tr>
<td>1:1 3-30 MHz Balun</td>
<td>£11.45</td>
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<tr>
<td>Ferrite Rings</td>
<td>£0.50</td>
</tr>
</tbody>
</table>

TO ORDER ANY OF THE ABOVE ITEMS SIMPLY WRITE OR PHONE YOUR CREDIT CARD NUMBER TO THE ABOVE ADDRESS TO ENSURE SAME DAY DESPATCH

REMEMBER 0444 400786

ACCESS • BARCLAYCARD • INSTANT HP • PART EXCHANGE

PLEASE PHONE YOUR ENQUIRY

Callers Welcome
Datong RF Speech Clippers add "punch" to your speech signal and help you get through where otherwise you wouldn't. Their low-distortion R.F. clipping technique helps in two ways:

Firstly it allows your transmitter to radiate more useful average power and secondly it improves the intelligibility of your speech in difficult conditions.

The renowned fully automatic R.F. clipper MODEL ASP is now joined by a new manually operated R.F. clipper MODEL D75. This supersedes our original manually controlled unit, MODEL RFC, and offers the following additional features:

- Input monitor LED - lights when clipping is between 0 and 20 dBs.
- Power-on LED
- Full/High input impedance selector
- Stylish appearance to blend with any rig

Remember: all Datong R.F. clippers connect in series with your microphone. No internal connections are required. For R.F. clipping at minimal cost our MODEL RFC/M is still available. 

MODEL RFC/M is a fully assembled and tested R.F. clipper in PCB module form. You provide controls, case and power source.

Data sheets on all three R.F. clipppers, including the new MODEL D75, are available on request.

Price: Model D.75 £49.00 plus VAT (£56.35 total). Model A.S.P. £69.00 plus VAT (£79.35 total).

MORSE TUTOR

Morse Tutor has a calibrated speed control plus a separately adjustable delay between letters. Start at, for example, 12 words per minute but with a two second delay and just reduce the delay as you improve. It delivers five character groups of letters, numbers, or both together. The sequence is random so the supply is unlimited!

All this plus portability, built-in loudspeaker, personal earpiece and key jack. Only £43.00 plus VAT (15%), inclusive price £49.45. Full data sheet free on request.

MODEL FL1

Frequency

Agile

Audio

Filter

AS REVIEWED IN AUGUST ISSUES OF "QST" and "73"

A versatile add-on unit for communications receivers which helps to extract wanted signals from background interference, it connects in series with the loudspeaker or headphones. The effect is similar to "I.F. pass-band tuning" for SSB or RTTY reception, and bandwidth down to 20Hz with limited a.f.c. gives an amazing capability for pulling weak CW stations out of the QRM. Model FL1 is unique in being able to tune itself when notching out unwanted whistles.

Price: £59.00 plus VAT (£67.85 total).

NEW SHORT FORM CATALOGUE AVAILABLE FREE ON REQUEST (QUOTE REF. RC12)

If you wonder how our products blend into a station, October's Rad. Com. gives some nice examples; out of the photographs of members' shacks, 4 show Datong equipment in use - (three FL1's, two RFC's and a UC1)

MODEL UC/1 UP CONVERTER

If you already own a good quality ten-metre or two-metre receiver or transceiver, you are only £118 away from a really high performance general coverage receiver. Just add the magic ingredient, MODEL UC/1 from DATONG!

You get full coverage in thirty synthesised 1 MHz segments from 80kHz (Rugby MSF) to 30MHz, at high sensitivity and with all the facilities and high performance of your existing rig!

For good measure UC/1 also adds two-metre coverage to ten-metre receivers. Price: £119.00 plus VAT (£136.85 total).

MODEL AD170

ACTIVE ANTENNA

For sensitive reception right through from MSF at 60 kHz to Band 1 TV DX around 50 MHz, without the need for an antennae farm, MODEL AD170 has no adjustments and needs no external tuning units. Although only three metres long, MODEL AD170 has the same directional properties as a full size dipole, even at 60 kHz.

Price: £33.00 plus VAT (£37.95 total). Special price complete with mains power unit: £37.00 plus VAT (£42.55 total).

ALL PRICES QUOTED INCLUDE POST & PACKING

DATONG ELECTRONICS LIMITED

Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Telephone: (0532) 552461
MORE NEW ITEMS . . . . .

★ MML144/40 ★
40 WATT, 144 MHz LINEAR POWER AMPLIFIER & LOW NOISE RECEIVE PREAMP
10 WATTS IN, GIVES 40 WATTS OUT
RX PREAMP – GAIN: 10dB, NF: 2.5dB
RF VOX AND MANUAL OVERRIDE
LED STATUS LIGHTS FOR POWER AND TRANSMIT

Price: £69 inc. VAT
EX-STOCK

★ MMA 144 V ★
144 MHz ULTRA LOW NOISE RF SWITCHED, PREAMPLIFIER
GAIN: 15dB NF: BETTER THAN 1.3dB
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<th>Type</th>
<th>Description</th>
<th>Price</th>
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<tr>
<td>D8/78cm Double 8</td>
<td>£20.45</td>
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<tr>
<td>PM/8178cm 18 ele P/beam</td>
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<td>MM/8878cm 40 ele M/beam</td>
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<td>MB/8878cm 80 ele M/beam</td>
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<td>12XY/78cm Cross 12 ele yagi</td>
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<td>BXY/78cm Cross 8 ele yagi</td>
<td>£31.05</td>
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<tr>
<td>C/7cm Grid colinear</td>
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**FOR 23CMS BAND**

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**PAYING HARNESS**

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<td>PM/92/2 stacking</td>
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<td>PM/97/10s stacking</td>
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<tr>
<td>MASTS and ROTATORS, etc.</td>
<td>£12.70</td>
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<td>SPM/15 portable mast</td>
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<tr>
<td>M/4' extension</td>
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<td>SV/R vertical mount</td>
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<tr>
<td>9502/2 rotor</td>
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<td>9523 mast alignment bearing</td>
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<tr>
<td>KR/400 Hub driver</td>
<td>£105.80</td>
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