LISTEN TO THE WORLD

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

Six Wavebands—LW (710-410 kHz), BC (525-1250 kHz), 4 x SW (160-10m). The four shortwave bands continuously cover the frequency range from 1.25—30 MHz with separate calibration for the commercial (72—11m) and radio amateur bands (80—10m) of the large drum-type main tuning and bandspread dials.

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

NEW. CL22 Antenna Coupler
for the SWL.
Only £14 inc. VAT and postage

FULL CATALOGUE 50p from
LOWE ELECTRONICS
Cavendish Road,
Matlock,
Derbyshire
TS820

The ultimate transceiver...TRIO's TS-820. No matter what you own now, a move to the TS-820 is it...it offers a degree of quality and dependability second to none, and as the owner of this superb unit, you will have at your fingertips the combination of controls and features that, even under the toughest operating conditions, make the TS-820 the leader that it is.

Unprecedented demand plus the painstaking care...TRIO lavishes on each TS820 created an initial backlog of orders but happily we can now supply the TS820 from stock. Once you have operated the TS820, you will not be satisfied with anything else.

Features

SPEECH PROCESSOR - An HF circuit provides quick time constant compression using a true RF compressor as opposed to an IF clipper. Amount of compression is adjustable to the desired level by a convenient front panel control.

PLL - The TS-820 employs the latest phase lock loop circuitry. The single conversion receiver section offers superb protection against unwanted cross-modulation. And now, PLL allows the frequency to remain the same when switching sidebands (USB, LSB, CW) and eliminates having to recalibrate the same when switching sidebands (USB, LSB, CW, FSK) and eliminates having to recalibrate the same when switching sidebands (USB, LSB, FSK).

CARRIER SUPPRESSION - The TS-820 is your best move.

Specifications

FREQUENCY RANGE: 1.8-30 MHz (160-10 metres)
MODES: USB, LSB, CW, FSK
INPUT POWER: 200W PEP on SSB
Receive: 26W. (heaters off).
160W DC on CW
100W DC on FSK
TRANSMIT OUTPUT: 280W.
DC - DC converter).
ANTENNA IMPEDANCE: 50-75 ohms, unbalanced.
IF FILTERING AT 10.7 MHz AND 455 KHz WITH NO SIGNALS.
SIDEBAND SUPPRESSION: Better than 50dB.
IF REJECTION: Better than 50dB.
Receive: 26W. (heaters off).
POWER REQUIREMENTS: 120/220 v. AC,
50/60Hz. 13-8v. DC (with optional DS-1A DC-DC converter).
POWER CONSUMPTION:
Transmit : 280W.
Receive: 26W. (heaters off).
DIELECTRIC:
Dimensions: 13½”w. x 6½”h. x 13½”d.
WEIGHT: 35-3lb. (16kg.)

The Portables

TR2200GX. Represents the very best of TRIO design. It is the latest in line of continuous progress from the first TR2200 and maintains the TRIO tradition of top quality at a reasonable price. The TR2200GX has all the features that you could want-high power output; sensitive receiver; flexible use from internal batteries or external supplies using the power lead supplied; built in removable telescopic antenna with flexible whip available; built in metering of signal strength; transmit output and battery condition; fitted with twelve channels at low, low prices; in short, all that you could want.

All operator controls are placed for maximum convenience on the top face of the rig and a protective carrying case is included in the price.

VB2200GX. This is the matching 10 Watt mobile amplifier for the TR2200GX (and all previous models). It is self contained and of very small size but produces well in excess of 10 Watts for 2 Watts of drive. It contains a regulated power supply for the TR2200GX and has 5kW protection for the PA transistor. The amplifier may be switched out of circuit if required, but still supplies power for the TR2200GX.

TR3200. Not content with having the lead in 2 metre handy portables, TRIO have gone a step further and produced the best 70 cm portable rig to match.

The TR3200 is really terrific; over 2W output with switched reduction to 400mW for local contacts; tailored speech response with a new limiter circuit; receiver performance and nulls give you crisp speech quality.

Excellent receiver performance with double IF filtering at 10.7 MHz and 455 KHz with no less than five limiters to guarantee noise free performance on even the weakest signals.

12 channel capability with three channels factory fitted with crystals for SU8, 18 and 20.

Don't forget, the following accessories are provided with the TR2200GX and TR3200 -

Removable carrying case Free
Shoulder strap Free
Battery charger Free
External power lead Free

Prices including 12½% VAT

TR2200GX £139 (3 channels)
VB2200GX £645
TR3200 £182 (3 channels)
MB1a £69-70
NiCad pack £9-72
The TR7500 is the very latest 2 metre FM mobile to be introduced by TRIO and will delight the owner with its combination of performance, reliability and unique design. It represents another step forward in the TRIO product line and is designed to give you the very best FM transceiver available in its class.

Whatever you now own, or may have been thinking of buying, it would be foolish to settle for anything less than the TR7500.

PLL Synthesiser

You have no crystals to buy—ever—with the TR7500 since the operating frequencies are generated by a TRIO designed LSI phase loop synthesiser. This provides 80 FM channels at 25 kHz spacing from 144–146 MHz, all 10 repeater channels and all 10 reverse repeater channels with low noise oscillator injection which is a feature of TRIO PLL designs. The channels are selected by a single knob and no programming is required from the user—just unlock the rig, connect 12 volts dc and you are on the air.

Unique display

TRIO attention to detail at its very best is shown in the method used to display the channel number. TRIO believe that ease of use is the priority consideration, and have arranged the large LED display to show the correct channel number at all times. If you want to operate on S24, turn the channel knob until the display shows 24—simple isn’t it? Need R7? Turn the knob until the display shows 7. There’s no need to worry “did I programme S24 into channel 15 or channel 9?”

Repeater operation

Available at the touch of a front panel switch. Turn this to “N” (normal) and you operate normal repeater with 600 kHz transmit down shift. If you wish to listen on the input, turn the switch to “S” (Simplex), and you are there—and can operate simplex on the input frequency. Need reverse repeater? Turn the switch to “R” (reverse) and you operate with receiver down shift of 600 kHz. This facility is most useful when you hear several stations calling into a repeater with only one (of course) appearing at the output. Using reverse repeater operation, you can call into the pack to invite anyone to a simplex channel for direct QSO.

Automatic tone burst is provided, with a front panel LED to remind you that you have the tone burst on. Needless to say, the 1750Hz is generated by TRIO’s unique tuning fork oscillator which guarantees spot (on) frequency at all times and in all temperatures.

Performance plus

In the same way that the 7200G set new standards in receiver dynamic range and sheer good performance, the TR7500 continues and improves on this by setting new, even higher standards. A combination of multi section helical filtering at signal frequency, monolithic crystal filters at 10-7 MHz, and sharp multi pole filters at 455 kHz allows the TR7500 to keep right on working under strong adjacent signal conditions when other, lower quality rigs, fold up and die.

The receiver performance for sensitivity is excellent. On the samples checked so far, we obtain 12dB SINAD for a startling 0.18 microvolts from 144-146 MHz on the TS700G, we found just one signal—the wanted one. It was impossible to find a single unwanted signal coming out of the TR7500 under these extremely severe conditions.

Attention to detail

As is well known, TRIO introduced the since copied variable power SWR protection system, and it is of course fitted to the TR7500 with an improved high gain dc amplifier for tighter and faster control.

As a final test for freedom from unwanted band signals, we ran the TR7500 at full output with a TS700G coupled to it on the bench. Tuning from 144-146 MHz on the TS700G, we found just one signal—the wanted one. It was impossible to find a single unwanted signal coming out of the TR7500 under these extremely severe conditions. Wideband checks using the analyser revealed no spurious outputs detectable above noise level. At this point we retired happy!

Accessories

The TR7500 is supplied complete and ready to use with the TRIO quick release mobile mount, microphone, power leads, comprehensive manual etc., etc. Nothing more to buy to own the best mobile/fixed station FM rig on the market.
TAKE A YAESU FRG7 ADD A SMC COUNTER AND YOU HAVE THE BEST VALUE AROUND TODAY

The FRG7 is a general coverage solid state receiver with specifications unparalleled in its price range. It uses a Barlow Wadley Triple-mix, drift cancelling loop for continuous, spin-tuned inclusive coverage of 0.5 to 30 MHz.

The receiver is sensitive (0.5µV for 10dB, S+N/N(SSB)) and stable with A.M., SSB and CW modes catered for. A 3 position audio filter, RF attenuator, dial lamp conservation switch, recorder and phone sockets are fitted. It is mains powered, but should he supply fail, or portable operation be required, 8 dry cells are automatically switched in.

FRG7 ANALOGUE £145 (+VAT) FRG7 DIGITAL RECEIVER £199 (+VAT12½%)

STOP Think carefully before buying your new 2m. multi-mode rig.

LOOK At the published specifications. Remember some manufacturers claim performance figures their equipment can only just reach, Yaesu write their specifications very conservatively. Look at the features: internal VOX, CW sidetone, crystal control facility, 600 kHz and 1.6 MHz shifts, auto tone burst, digital readout options, etc. Look at the spurious outputs (or try to find them if the transceiver has a P.L.O. to clear sub harmonics of oscillator chain). Look at the ergonomics, are there more controls than necessary, preselectors or varicaps tuned receiver. Look inside, take off the lid (or merely lift the lid); does it look like the bottom of granny's sewing box or is it modular constructed with plug in boards, etc.

LISTEN To weak signals, listen to strong signals, listen to your own signal. Is your PA rates to dissipate 7 times the claimed output power.

THE FT227R NEW FROM YAESU

The new FT227R uses a "single knob" tuned digital synthesizer employing a photoelectric sensor for an optical coupled system which eliminates both noisy, unreliable rotary switches, and crystal banks. Full coverage of 2 metres in 5 kHz divisions with a ±600 kHz shift plus a memory feature which permits recall of any entered frequency or particular offset. Bright, large, digital readout gives unequivocal readout of the frequency in use. The receiver offers 0.3µV (for 29dB S+N/N) sensitivity into ±6 kHz (at 6dB) bandwidth whilst maintaining a remarkable immunity to overload and image problems. The 20W, DC input transmitter features Hi/low power outputs, AFP, tone burst on repeaters and an out of band inhibition trip, etc.

FC301 MATCH POWER METER

10-160m. Switched, 50/75 input, 500W. PEP max. handling. Power meter with 25, 250 & 500W PSS ranges. 4 position antenna selection 1 wire and 3 SO239 sockets.

FL110 ALL BAND LINEAR AMP.

10-160m. Switched L.P.F. 15W to 200W. PIP A1[A], 4W. to 75W. Fl. Push pull SRF1427's. Negative feedback with ALC to exciter. RF sensing (Adjustable hang time) with over-ride.

YO301 MONITOR TX & RX SCope

1.8-54 MHz Tx monitor 10-500W. Envelope, Trap and Cross. Vert. 2Hz-5MHz (±9 and 10.7 provision). Horz. 10Hz-250 kHz, sweep 10Hz-10 kHz. 2 tone generator.

NEW STOCK AND PRICE LIST SEND SAE OR 30p IN STAMPS

SOUTH MIDLANDS COMMUNICATIONS LTD.

OSBORNE ROAD, TOTTON SOUTHAMPTON SO 4 4DN

Head Office, Showrooms Cables: Aerial Southampton Telex: 477351 SMCOMM G Tel: Totton (04216) 7333 (3 lines)

hours of business: 9-3.30; 9-12.30 Saturday
The MONITORSCOPE is a convenient Test Instrument allowing "on the air" monitoring and testing of Radio Transmitters operating in the frequency range 500 kHz to 30 MHz with a power rating of up to 2KwPEP (1Kw average).

The Monitor has been designed to be connected between the Transmitter or Linear Amplifier antenna socket and the Antenna or Antenna Tuning Unit. A visual display of the Transmitter envelope is provided. This will allow the Transmitter to be "talked up" to full power output whilst watching for "flat topping" which would cause distortion and loss of readability also the "splatter" produced would create interference to stations on adjacent frequencies. By using the 2-tone Test Generator which is incorporated in the SSB Transmitter may be adjusted to ensure that it is operating in a linear condition, necessary for good quality SSB transmission. Likewise, amplitude modulation and Morse Keying characteristics can be observed. A flexible screened lead is provided for connection to the Transmitter audio or microphone input.

**LOOK AT YOUR SIGNAL!!!**

**SMC MONITORSOPE only £69 (+8%)**

- Input/Output impedances: 50-75 ohms using two SO239 UHF type connectors.
- RF Power Capability: 10-2000 watts PEP.
- Sweep Speed: 20-200 Hz.
- Tone Oscillators: Nominally 1-3 kHz and 2-3 kHz.
- Tone Level Output: 0-50mV rms per Tone at 50K ohm.
- Panel Controls:
  - Intensity/Power-on/off Switch.
  - Audio Tone (Single or 2-Tone) Vertical Gain.
  - Horizontal Shift.
  - Vertical Gain.
  - "Y" Shift (preset).

**LEADER WATTMETERS NEW!**

- LPM805: Through line (illustrated). 1-8-54 MHz. 20-200-1000V FSD. (P & P 75p) £61.50 +8%
- LPM800: Absorption. 1-8-500 MHz. 20-120W. FSD. (P & P 95p) £64.00 +8%

**HIGH MOUNT KEYS**

- BK100: (illustrated right) £12.15 +8%
- Mechanica Bug Key £6.25 +8%
- Hung key marble plinth £6.15 +8%
- Hand key 0-5 kg. Dec. delivery £7.95 +8%

**LEADER ANTENNA COUPLER**

- LAC895: 3.5-30 MHz. 50/75 coax (SWR <5) and single wire (10-250 ohms) feed transformed to 50 ohm. Wattmeter 20 and 250W, FSD, SSB 500W. PIP £00.00 +124%

**TRANSISTOR DIP OSCILLATOR**

- LDM015: 1-250 MHz on fundamentals battery c/w earphone plugs and plug-in coils 2 kHz modulation. 1-15 MHz Crystal facility. £30.50 +8%

**LEADER WATTMETERS NEW!**

- LPM800: Absorption. 1-8-500 MHz. 20-120W. FSD. (P & P 95p) £64.00 +8%

**TRANSMITTING PROCESSOR**

- Processor 60 Audio to audio, via 10-7 MHz mains powered, illuminated meter. FT711 FT2 plugs suitable all phone modes superb on FM £41.35 (P & P FREE) NEW!!

**RF SPEECH PROCESSOR**

- Up to 1 kW, 1-5 GHz. 0-3 dB less, 1-15 VSWR, 50dB isolation, 50 ohm "N" or "PL" fittings. £35.00 £0.00 +124%

**MICROPHONE ACCESSORIES**

- Coax Relays 12v. DC 50 ohm. Silver plated. (Post free but VAT + 12%) £14.75
- Microphone only £9.75
- Footswitch only £5.95

**Solid State Mobile Linears (UHF and VHF) from KLM and Ampere**

- 50/120W. 1-5 GHz, mains powered, illuminated meter. 5-20W. FSD. (P & P 95p) £64.00 +8%

**LEADER WATTMETERS NEW!**

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- Hung key marble plinth £6.15 +8%
- Hand key 0-5 kg. Dec. delivery £7.95 +8%
Midland and North West distributors for the XCR30 unique crystal controlled receiver. This receiver is designed to provide precision frequency tuning over the full short wave spectrum up to 30 MHz with exceptional frequency stability for both AM and SSB. Separate tuned whip antenna.

Price £145-00 inc. VAT
XCR-30 FM Receiver with FM band 87-5 to 101 MHz.

Price £100-00 inc. VAT

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

Price £175-00 including VAT and Postage

Mk. II VARIATION, £135-00. Covering 550 kHz to 30 MHz. Send S.A.E. for full information and Test Report.

YAESSU FRG-7 RECEIVER. Mains and battery operated receiver 0-5 to 30 MHz. Solid state. Advance circuitry offers excellent performance for the DX listener at a moderate price.

Price £135-00 inc. VAT

TR2200GX PRICE £130 (3 ch.), £160 (12 ch.) inc. VAT Ex stock
This is the definitive 2 metre FM portable rig which has won praise from all over the world. Over 2W, transmitter output with switched reduction to 400 mW for local contacts. High gain receiver with double IF filtering at 107 MHz and 3.35 kHz for razor sharp selectivity. The TR2200GX is supplied with all accessories including the battery charger for the optional Nicad battery pack, the removable telescopic antenna, the carrying case, the shoulder strap, external power lead, microphone and handbook. Fitted with 12 channels, the price is only £160 inc. VAT. If you wish to start out at a lower price, we can supply the rig fitted 3 channels for only £130. With all its performance, the TR2200GX is a must for the portable operator. At the price, it has to be the best around. Just look around at the next rally and see how many operators are carrying them. Also available are a mobile mounting brackets at £9-45, a matching 10 Watt amplifier for £69-45 and a flexible antenna. Send for full details now.

Price £120 inc. VAT

TR3200 PRICE £171 inc. VAT. Ex stock
The newest FM handy transceiver from the ever expanding TRIO range. Superb performance for the 70 cm. operator with all the advantages of portability and TRIO reliability. 12 channel capacity in the range 432-436 MHz with three channels fitted (SU1, 18, 20). Transmitter output switched 2W/400 mW and incorporating the exclusive TRIO 1750 Hz tuning fork access tone generator (does that mean you can ring for credit)? High gain SSB wave antenna for enhanced performance on transmit and receive. Supplied complete with all accessories as for the TR2200GX and including the all important battery charger.

We have just received the first shipment of the VB3200 10W amplifier for the TR3200. Rather more complex than the VB3200, the VB3200 also includes a switchable receiver preamplifier. Price £95 inc. VAT. Send for details now.

Price £195 inc. VAT

TR7500 PRICE £225.00

Mk. II VARIATION, £135-00. Covering 550 kHz to 30 MHz. Send S.A.E. for full information and Test Report.

Price £135-00 inc. VAT

Other TRIO Models available

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>T5520 HF Transceiver</td>
<td>£189.00</td>
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<tr>
<td>T57000 VHF Transceiver</td>
<td>£242.00</td>
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<td>T57005 VHF Transceiver</td>
<td>£282.00</td>
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<tr>
<td>T57010 SSB VHF Transceiver</td>
<td>£189.00</td>
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<tr>
<td>TR8100 70cm. FM Transceiver</td>
<td>£327.00</td>
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<tr>
<td>P55 PSU with clock</td>
<td>£58.00</td>
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<tr>
<td>P55 PSU</td>
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<tr>
<td>RS930C All mode HF Receiver</td>
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<tr>
<td>VE2200X Mobile Amplifier</td>
<td>£45-00</td>
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<tr>
<td>HC2 World Time Clock</td>
<td>£15-00</td>
</tr>
</tbody>
</table>

We carry a large range of stock which we cannot advertise in the space available. Send 25p in stamps or postal order and we will forward you our latest price list and equipment information available.

Shop Hours: 9.30 till 5.30 Monday to Friday, 9.30 till 5 p.m. Saturday,
ACCESS and BARCLAYCARD facilities available Instant on spot HP facilities
We are always looking for good clean equipment and spot cash will be paid for receivers, transmitters, transceivers, etc. If you have equipment surplus to your requirement we would be pleased to sell this for you on commission. Our secondhand stock changes daily. If you require a specific piece of equipment send us a SAE and we will let you know as soon as we have the model available. All our secondhand equipment is covered by 3 months guarantee.

PLEASE NOTE ALL OUR PRICES INCLUDE VAT at the current rate.

Carriage, postage is extra

We can quote for delivery in any port of the world. We are located on the A584 (East Lancs. Road), 5 miles from the M6. Easy access from North, South, East and West. NO PARKING PROBLEMS.

Accessories

<table>
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<tr>
<th>Item</th>
<th>Price</th>
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<tr>
<td>Single Meter SWR</td>
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<td>Twin Meter SWR</td>
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<td>S0 ohm Dummy Load</td>
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<tr>
<td>KW E-Z Match</td>
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<td>KW109 Matching Unit</td>
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<td>KW107 Matching Unit</td>
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<td>KW03 SWR/Power Meter</td>
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<td>3 Way Antenna Switch</td>
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<td>KW Antenna Traps</td>
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<td>Antenna Insulators</td>
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<td>PL239 Plugs</td>
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<td>8 pin SO239 Sockets</td>
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<td>Cable reducers 17p Line conn</td>
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<td>Aluminium Co-Ax plugs</td>
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<td>Hy-Mount Morse Keys</td>
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<td>Nye King Morse Keys</td>
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<td>Junkers Heavy Duty Morse Key</td>
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<td>Bauer Keing Faddge</td>
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<tr>
<td>Kasumi Electronic Keyset</td>
<td>£19.00</td>
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<tr>
<td>Microphone plugs 4 pin</td>
<td>£7.00</td>
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<tr>
<td>Microphone sockets 4 pin</td>
<td>£7.00</td>
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<tr>
<td>Yaesi YP150 Dummy Load Wastmeter</td>
<td>£45.70</td>
</tr>
</tbody>
</table>

Price £45.70 inc. VAT

Postage extra. Min. postage charge 25p. All items despatched same day as order received.

COMTEK 2m. Linear Amplifier
Models: SSB - CW - FM - AM
Input: Up to 15 watts SSB, up to 5 watts FM
Power output: 100 watts PEP SSB, 60 watts FM
Receiver Pre-Amp 12-18dB, QV06-40A, RF switching for easy control.
Price £140-00 inc. VAT

We carry a stock of products by over thirty of the world's leading manufacturers.

We are located on the A584 (East Lancs. Road), 5 miles from the M6. Easy access from North, South, East and West. NO PARKING PROBLEMS.
SEE THE ENTIRE S.T.E. RANGE AT THE AMATEUR RADIO RETAILERS’ ASSOCIATION EXHIBITION, GRANBY HALLS, LEICESTER, OCTOBER 27-28-29th, (1977) 10 a.m. to 6 p.m. daily.

Price List (including postage)

<table>
<thead>
<tr>
<th>Product</th>
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<tbody>
<tr>
<td>AK20 FM Transceiver</td>
<td>£170.00</td>
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<td>ARAC 102 Receiver</td>
<td>£100.00</td>
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<tr>
<td>Atal 228 Transmitter</td>
<td>£126.00</td>
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<tr>
<td>ASAP 154 AC PSU with speaker</td>
<td>£135.00</td>
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<tr>
<td>AAI Audio Amplifier</td>
<td>£75.00</td>
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<tr>
<td>AD4 FM Discriminator</td>
<td>£65.00</td>
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<tr>
<td>AL9 Linear Amplifier</td>
<td>£170.00</td>
</tr>
<tr>
<td>AT222 Transmitter</td>
<td>£50.00</td>
</tr>
<tr>
<td>AR20 C.C. Receiver</td>
<td>£45.00</td>
</tr>
<tr>
<td>AT23 C.C. Transmitter</td>
<td>£50.00</td>
</tr>
<tr>
<td>AS15 Stabilised PSU D.C</td>
<td>£10.00</td>
</tr>
<tr>
<td>AG10 Tone Generator</td>
<td>£45.00</td>
</tr>
<tr>
<td>AC2A Converter 28-30 MHz</td>
<td>£20.00</td>
</tr>
<tr>
<td>AK20 Transceiver Kit</td>
<td>£110.00</td>
</tr>
</tbody>
</table>

S.T.E. MILAN VHF EQUIPMENT

ASP 154 | ATAL 228 | ARAC 102

SPEAKER
AC POWER SUPPLY UNIT
144 - 146 MHz AM-FM TRANSMITTER with Microphone
28-30 MHz 144-146 MHz AM-FM-SSB RECEIVER

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

AT 222. A complete transmitter exciter unit for 144-146 MHz on AM or FM. VFO controlled or fixed channel operation. Complete with microphone pre-amp., speech processor including active audio filter. 1 watt output, FM. 23 watt AM. Output impedance 50-75 ohm adjustable. Frequency deviation 3-10 kHz adjustable.

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

AT 233. 12 Channel PM Transmitter. 3 watts, 144-146 MHz. Frequency deviation 3-10 kHz adjustable. 12v, DC operated AF input sensitivity 2mV adjustable to 50 mV.

NEW MODEL ELECTRONIC KEYER
Jamble operation - Weighted transmission - Three memory lengths up to 1024 bits. Internal monitor. Transmitter keyed through internal relay. Silver plated contacts. 220v. AC operation. Price £106.00

STEPHENS-JAMES LTD.
47 WARRINGTON ROAD, LEIGH, LANCS. WN7 3EA

Please note new telephone number 0942 - 676790
At last . . . .

the Mast

TO SOLVE ALL YOUR ANTENNA SUPPORTING PROBLEMS

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SUPERB VALUE . . . STRONG . . LIGHTWEIGHT . . Another "WESTERN" Quality Product.
LISA CAN LIFT IT . . . and she's only 8!

Consider these star features . . .
* One 10’ section weighs only 11 kg.
* Easily assembled by one person
* Self-supporting . . . no guys
* Can be extended to 200 feet!
* Climbing rungs incorporated
* Corrosion resistant high strength alloy

PRICES (Carr. paid) VAT 8% Extra

375/PSS/3. 30’ Self-supporting

Alumast . . . . . Only £111.00
TP-I. Top Plate, takes 1 29/32” mast £6.50
RMP-I. Rotor Mounting Plate . . . £4.00
FB-I. Fixed Base . . . . . £12.00
HB-I. Hinged Base . . . . . £21.00
375/PSS/I. Additional 10’ Sections £37.00

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there’s no better buy!
Here’s why . . .

Some other firms just drive round in their Rolls-Royces!
At “Western” we plough back our profits to give you better value.
The more you buy from “Western” . . .
. . . . the better savings YOU will get.

Your SINGLE-STOP SOURCE!
New! Extended Range ‘Penetrator’ Series Antennas

Get on top of the pile-up with the New DX-34

* Heavy duty 2 kW p.e.p. rating
* Broadband operation
* SWR less than 1:3:1 at resonance
* Forward gain up to 9dB
* Front/back ratio up to 20dB
* Stainless steel hardware

Another **Western** quality product

<table>
<thead>
<tr>
<th>PRICES (Carr. paid)</th>
<th>12½% VAT extra</th>
</tr>
</thead>
<tbody>
<tr>
<td>DX-31 Dipole 10/15/20 2kW p.e.p.</td>
<td>£35.00</td>
</tr>
<tr>
<td>DX-32 2 ele. 10/15/20 2 kW p.e.p.</td>
<td>£55.00</td>
</tr>
<tr>
<td>DX-33 3 ele. 10/15/20 2kW p.e.p.</td>
<td>£75.00</td>
</tr>
<tr>
<td>DX-34 4 ele. 10/15/20 2kW p.e.p.</td>
<td>£99.00</td>
</tr>
<tr>
<td>TDI 10/80 Dipole, 10, 40 and 80m.</td>
<td>£19.50</td>
</tr>
<tr>
<td>TDI 15/80 Dipole, 15, 20, 40 and 80m.</td>
<td>£19.50</td>
</tr>
<tr>
<td>Type P Dipole, portable 10/80</td>
<td>£24.00</td>
</tr>
</tbody>
</table>

We have designed and built the 70TV up to a high standard. Not down to a price! Don’t buy a 70TV if you’re looking for a cheap unit.

BUT if you want to hear signals that some others can’t... the 70TV is the answer!

* Fully stabilised AC and DC PSU
* Full 10W. R.M.S. output
* Double conversion to minimise spurii
* Noise figure 2.5dB typical
* Built-in 28 MHz attenuator 30:1
* Built-in relays
* Matches Yaesu styling
* Withstands infinity mismatch
* All units aligned on Hewlett-Packard Spectrum Analyser
* Can be driven by most 28 MHz Transceivers

Agents: LES LYSKE, G3ICO, NEWTOWNARDS (0247) 812449
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THE NEWEST LEADER — FT227R FROM
THINK HARDER NOW BEFORE BUYING

ONLY
£189
INC. VAT

COMPARISONS! Have you ever tried it?
Confusing, isn’t it—turning from one ad. to another, some giving one piece of information, others not; some showing data in one form, some in a different form. How can you decide on which 2 metre FM rig to buy?

LET US HELP YOU... Take as a basic requirement—10 watts FM, with a good receiver, freedom from “funnies,” and no need to spend extra later to extend flexibility.

NOW READ ON...

CHANNELS AVAILABLE BY FRONT PANEL CONTROL...

FULL 4 MHz COVERAGE (144-148) WITHOUT MODIFICATION

FREQUENCY STEPS

TRUE FREQUENCY DISPLAY

FREQUENCY MEMORY FACILITY

REPEATER SHIFTS

TONE BURST

FACTORY-FITTED HIGH/LOW POWER SWITCH

PRICE (including VAT)

PRICE COMPARISON

* All details taken from current advertising.

NOW... YOUR CHOICE IS CLEAR!
BE THE FIRST WITH THE BEST!

"WHY DON’T THEY DO AN ANTENNA TUNER?"
Yes—it’s a question that’s often been asked—and one that’s remained un-
answered—until now...

We are therefore especially pleased to be able to announce the

YAESU MUSEN FC-30I ANTENNA TUNER

Featuring:
* All-band coverage, 160-10 metres
* Power and SWR measurement
* Four-way antenna switching
* "Gold-Line" styling
* Realistic price.

SPECIFICATION:

<table>
<thead>
<tr>
<th>Free. ranges (MHz)</th>
<th>Input impedance</th>
<th>Maximum SWR</th>
<th>Maximum power</th>
<th>Insertion loss</th>
<th>Power ranges (meter)</th>
<th>SWR ranges (meter)</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8-2.14; 3.5-4.0; 7.0-7.3;</td>
<td>50-75 ohms unbalanced.</td>
<td>5 : 1 with respect to input impedance.</td>
<td>500 watts PEP.</td>
<td>0-5dB max.</td>
<td>25W, 250W, 500W full-scale.</td>
<td>Calibrated to 4 : 1 SWR.</td>
<td>212(w) x 125(h) x 295(d) mm.</td>
<td>4-6 kg.</td>
</tr>
</tbody>
</table>

★ PRICE £88.88 (you have to love it at that price!) inc. VAT ★

BOTH THESE NEW MARKET LEADERS FROM...

YAESU MUSEN

AVAILABLE FROM;

Western Electronics (UK) Ltd
FAIRFIELD ESTATE, LOUTH.
LINCS. LN11 0JH
CQ110E Transceiver (ex stock), £645 plus VAT £80.63, total £725.63
(Price includes Securicor Delivery)

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

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

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

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

Digital Readout—Separate Crystal Filters for each of LSB, USB and CW.

AC and DC power units are built in. Switched metering for “S” meter, Relative Output, Plate Current and ALC for setting MIC Gain.

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

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

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

We also stock Antennas and Accessories—Microwave Modules—Modular Communication Systems—Polar Electronic Developments—Antex Products—Components etc.

SECONDHAND EQUIPMENT

NEC EQUIPMENT IS AVAILABLE FROM

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(Tony Blackmore)

64 High Street, Wombwell, Yorks. Tel. (0226) 756229.
2 Joseph Parry Close, Llandough, Penarth, S. Glamorgan, CF6 1PL. Tel. (0222) 702982.

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QUARTZ—16
£169 inc. VAT!
Fitted 10 Channels

The Fast Selling 2m. FM Transceiver
NOW . . . 145-50 Reads “S 20”!
Yes, the latest version now has a calibrated dial
giving direct readout in European “S & R”
channels.

Some Questions Answered
It covers 144-146 MHz, any frequency, not just the 25 kHz spots! It
is easy to QSY without having to wind the channel knob all the way
round. For example if you fit S20 in the priority position “A” you can
immediately flip from say S57 to S20 in a second. Low power is available
but only in the low power position! (In the high power position you
will typically obtain 12 watts output). Extra channels can be added
simply by plugging in additional crystals thus ensuring complete freedom
of movement throughout the band and, more important, a clean spurious
free transmission. Tone-burst is automatic but with the facility of
switching it out so that a distant repeater can be worked without
switching on the local one. A remote vfo is available for complete
coverage of 144-146 MHz with the addition of a synthesizer available
soon. It also costs a lot less!

Technical Points
On the more technical side we can add that such things as helical
filters, 107 MHz crystal filters, 455 ceramic filters are all included in
the design. The transmitter is completely protected against open
circuit or high SWR and the modulation is crisp and clear. The standard
frequencies fitted are S0, S20, S21, S22, S23, R3, R4, R5, R6 and R7.
Included with the Quartz 16 is microphone, power cord, fuses, plugs,
table stand and English manual.

Free Credit! (limited period only)
QUARTZ 16 Deposit £43
MULTI-II Deposit £53
MULTI-UII Deposit £59
Send for full details

UK Licensed amateurs only
Balance paid over 6 months

DE LUXE 2M. FM RIG 23 CHANNELS
Plus Autoscan . . .
. . . and a lot more!

A Really Hot Receiver
Better than -90db quieting is typical front-end sensitivity of
the Multi-II. Little wonder, with its built-in RF pre-amp it is the hottest
thing around! But sensitivity is no good without selectivity as well.
That’s why the Multi-II has a high performance helical filter resonator
network in the front end. This is followed by a 107 MHz crystal filter
and finally a 455 kHz ceramic filter. The result—razor sharp selectivity
and QRM free reception.

Many Unique Innovations
The unique dial has a back-lighted indicator that is only illuminated
when channels are fitted. The S-Meter can be switched to read centre-
zero. A switch allows the transmission and reception of both wide-
band and narrow band FM. A further switch allows the tx driver stages
to be switched on to monitor the modulation and check both tx and
rx netting. A vfo socket allows the subsequent use of vfo’s and
synthesizers. A switch on the front panel allows the automatic tone-
burst to be defeated so that d x repeaters may be worked without
accessing the local ones. A further front panel control allows the receiver
to be tuned approximately plus or minus 4 kHz for perfect reception.

4 Channel Autoscan
This feature is a most useful and practical innovation. It permits one
to monitor the popular calling and repeater channels whilst keeping
ones hands firmly on the wheel. Up to 4 channels may be scanned
continuously. As soon as a signal appears the receiver locks-on. However,
if the signal drops off the auto-scan reverts to manual control allowing
manual selection of any one of the 4 autoscan channels.

£209 inc. VAT and delivery (7 channels S0, S20, R3, R4, R5, R6, R7)
£219 (10 channels inc. S21, S22, S23)

A Transceiver you should consider
This really is the deluxe 2 metre fm transceiver that outclasses all
others. FDK engineering and reliability from the company that specialises
solely in VHF communications. But supplemented by the backing of
WSE in the UK, full time service staff, £1,000’s of spares and a fast
turn around—no wonder our company has grown—our customers keep
coming back to us!

High Power Output
While some transceivers struggle towards 10 watts output, the FDK
Quartz 16 costs along at 12 watts or more. The PA is completely pro-
tected against open circuit, short circuit, and high SWR.

A really hot receiver

Free Credit! (limited period only)
QUARTZ 16 Deposit £43
MULTI-II Deposit £53
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Send for full details

UK Licensed amateurs only
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Plus Autoscan . . .
. . . and a lot more!

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accessing the local ones. A further front panel control allows the receiver
to be tuned approximately plus or minus 4 kHz for perfect reception.

4 Channel Autoscan
This feature is a most useful and practical innovation. It permits one
to monitor the popular calling and repeater channels whilst keeping
ones hands firmly on the wheel. Up to 4 channels may be scanned
continuously. As soon as a signal appears the receiver locks-on. However,
if the signal drops off the auto-scan reverts to manual control allowing
manual selection of any one of the 4 autoscan channels.

£209 inc. VAT and delivery (7 channels S0, S20, R3, R4, R5, R6, R7)
£219 (10 channels inc. S21, S22, S23)
MULTI-2700—THE COMPLETE STATION

The FDK Multi-2700 is a front-line all-mode transceiver that incorporates every conceivable feature to ensure maximum enjoyment. In fact, apart from a mains plug and an aerial, there is little else we can sell the owner of a Multi-2700. All in all it is an unbeatable transceiver at an unbeatable price.

ALL MODES—ALL OCCASIONS

All modes are provided AM, FM, SSB and CW. For SSB operation VOX is included and for CW, fast break-in is provided with completely adjustable side tone. The 2700 can be used at home with its internal 240v. AC PSU or taken out to the local high spot and run from 12v. DC. This really has to be the QSO machine that you will never tire of.

BEAUTIFUL TO OPERATE—BEAUTIFUL TO HEAR

The transmitted audio quality of the 2700 is second to none. Its crisp, clear quality reflects the manufacturers knowledge that a clean signal sells more products! The Optimised 16.9 MHz 8 pole crystal filter gives clean SSB signals and good selectivity. On FM, direct modulation of the VCO gives smooth but penetrating audio. The conventional analogue VFO with its watts but the flip of a switch and you have clean SSB signals and good selectivity. On FM, direct modulation of the VCO gives smooth but penetrating audio. The conventional analogue VFO with its watts but the flip of a switch and you have clean SSB signals and good selectivity. On FM, direct modulation of the VCO gives smooth but penetrating audio.

IT'S VERSATILITY IS ENDLESS

Inter-continental contacts are possible via OSCAR. Press the OSCAR button on the front panel and you bring in the 28 MHz downlink receiver converter to enable true transceive operation through the satellite. An audio SPEECH PROCESSOR can be switched in to permit extra punch. The amount of compression being adjustable to suit the operator. RIT operates on all modes and both VOXs. A NOISE BLANKER is included for really excellent suppression of ignition pulses. The receiver section covers 143 to 149 MHz (Tx covers 144-146 MHz + 1.6 MHz shift). Apart from the two existing repeater offsets one further shift may be programmed. AGC control is continuously variable, as is the VOX DELAY and ANT-VOX etc. All pre-set controls are easily reached through the top hatch of the transceiver. Separate centre zero and ra 3-meters are provided. We could go on but if you have read this far perhaps it is time you sent off for the 4-page brochure giving full details of this beautiful transceiver at a really competitive price.

£489 inc. VAT and SECURICOR DELIVERY.

WE ALSO STOCK—YAESU, BELCOM, MICROWAVE MODULES, S.E.M., JAYBEAM, HYGAIN, STOLLE, CDE, MINI-PRODUCTS, SAGANT, BANTEX, ASP, POLAR, MOSLEY, G-WHIPS, SEIWA, KEN, etc. STOP PRESS—NEW JAYBEAM KR400 ROTATORS, SUPPORTS F TON, COSTS £95 S.A.E.
ICOM

JUST A HEAP OF WINNERS!

THE ICOM RANGE OF 2 METRE GEAR IS SOME OF THE BEST YOU CAN BUY — FOR QUALITY, RELIABILITY AND EXCELLENCE OF PERFORMANCE!

ADD TO THIS THE OFT' Praised SERVICE OF THANET WITH OUR WELL QUALIFIED TECHNICAL STAFF AND RANGE OF TEST EQUIPMENT AND YOU NEED HAVE NO WORRIES IN BUYING ICOM FROM THANET

FOR MOBILES;
IC-240 The well tried and highly popular FM synthesised rig. If you know a friend with one you will know we have every right to boast about the excellent quality of the signal it puts out. (Perhaps that is why we have sold so many!) Now available with Super-Scan as an extra. By the way this is the same size as the SSB unit on the IC-245E.
£198
IC-245E The leader in multi-mode mobiles. Fully synthesised to give full band coverage in 100Hz or 5 kHz steps. LED readout of frequency to the nearest kHz. FM, USB, CW, Normal or Reverse Repeat or split frequency working with any spacing, automatic tone burst etc. An excellent bit of engineering which can also serve as a base station.
£396

FOR PORTABLES with a decent power output and large battery capacity;
IC-202 The 3W SSB portable which is tunable over all the sideband patch and can be used, when fitted with extra crystals, to cover 144-145 and 145-8 to 146 MHz. Used by many as a prime mover for something bigger because of its excellent clean signal. By far the most popular VHF SSB only set on the market. There are a lot about!
£172
IC-215E The big boy in FM portables, with Rx sensitivity and transmission quality every bit as good as a base station (and better than many!). A healthy 3W of FM and sensible batteries with four times the capacity of those used in most other portables — so that they don’t run flat on you in the middle of a QSO quite as often. Despite this and its rugged construction it is still easy to carry around. Lots of these about also!
£162

FOR BASE STATIONS;
IC-211E The leader of them all. Fully synthesised VFO with 7 digit LED readout to the nearest 100 Hz. FM, CW, LSB, USB. There’s nothing quite like it. Most would make this their choice if it wasn’t for the problem that you have to pay more for the best! (With these days of inflation it isn’t silly to think about HP.) See October’s ad. for more details.
£529

ALL PRICES INCLUDE VAT, AND DELIVERY IS FREE ON MAIL ORDERS FOR TRANSCEIVERS WHY NOT POP A NOTE ON THE ANSAFONE FOR A PRETTY COLOURED BROCHURE AND DETAILS?

THANET ELECTRONICS
HERNE BAY, KENT
02273 - 63859

THANET NORTHERN
WOMBWELL, S. YORKSHIRE
0226 - 756229

OTHER AGENTS
PHONE FIRST — All evenings only except Norfolk and Burnley:
LONDON—Terry G8BAM (01 556 9366) NORFOLK—Ted G3FHW (05080 632)
MIDLANDS—Tony G8AVH (021 329 2305)
SCOTLAND—Ian GMBDO (07868 3223) WALES—Tony GW3FKO (0222 702982)
BURNLEY—(0282 38491)

FOR ALL MAIL ORDERS AND SALES DURING BUSINESS HOURS

THANET ELECTRONICS
HERNE BAY
(02273 63859)
The IC-240 from Thanet has had a bit of a face change. Gone is the tone button, which doesn’t do anything anyway, and in its place is a crafty little switch which gives simplex in the centre position, normal duplex at DUP A and reverse repeat (on Rx AND Tx) at duplex B. With the IC-240 it is the RECEIVER which is shifted when working Duplex and not the TRANSMITTER as with some other rigs we could mention. This means that you can listen on the input channel, or work reverse repeat, merely at the flick of a switch—you don’t have to re-tune the channel knob as you would otherwise.

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

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

Check off these points against that competitive rig:

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

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

SEE ONE AT LEICESTER — STAND 9

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

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

All warranty and other repairs for sets bought from Thanet Agents and Shops must be referred to our Service Dept. in Herne Bay where we have a good range of test equipment and the technical skill to use it. Sets from other dealers MUST be referred to that dealer.
THE FABULOUS TR-4CW TRANSCEIVER — NOW WITH RIT
FROM RADIO SHACK LTD.—UK IMPORTERS OF R. L. DRAKE
ASTATIC MICROPHONES
ATLAS TRANSCEIVERS
BEARCAT SCANNING RECEIVERS
HAL RTTY AND MICROPROCESSORS
NYE MORSE KEYS, MFJ FILTERS
HY-GAIN ANTENNAS, CDE ROTATORS
HUSTLER MOBILE ANTENNAS, OMEGA-T
PRESTEL FIELD STRENGTH METERS

TRIO at RADIO SHACK LTD
also JAYBEAM, MICROWAVE MODULES, BANTEX and all the run of the mill amateur items
We decline to make exaggerated claims to greatness

Radio Shack Ltd
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Just around the corner from West Hampstead Underground Station
Telephone: 01-624 7174
Open Monday–Friday 9–5, Saturday 9–12.30. Closed for lunch 1–2
Up Your Frequency!

Get away from the madding crowd below.
The MMT432/28 432 MHz Linear Transverter will get you there.
This solid state linear mode transverter allows you to operate your 28 MHz units at 432 MHz... up where there still aren't a lot of people.
This precision built British made unit is available direct from ourselves, or from our many retail outlets throughout this country. Price £109.13 inc. VAT.
Not such a high price to pay to enjoy a QSO in the peace and quiet of one of the most civilised up and coming amateur bands.

**SPECIFICATIONS**

- **Frequency coverage**: 432 - 436 MHz
- **Input frequency range**: 28 - 30 MHz
- **Input modes**: SSB, FM, AM or CW
- **Drive requirements at 28 MHz**: 5mW to 500mW.
- **Power output**: Variable input attenuator
- **Spurious outputs**: Better than -65 dB
- **Receive converter gain**: 30 dB typical
- **Receive converter noise figure**: 3 dB maximum
- **D.C. power requirements**: 12 Volts nominal
- **Current consumption**: 2.1 Amps peak
- **RF connectors**: 50 Ohm BNC
- **Power connector**: 5 pin locking DIN
- **Size**: 187 x 120 x 53 mm.
- **Weight**: 900 grams

**MICROWAVE MODULES LIMITED**

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## ADVERTISERS’ INDEX

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aero &amp; General Supplies</td>
<td>567</td>
</tr>
<tr>
<td>Amateur Electronics UK</td>
<td>530, 565</td>
</tr>
<tr>
<td>Amateur Radio Exchange</td>
<td>560</td>
</tr>
<tr>
<td>Amcomm Services</td>
<td>561</td>
</tr>
<tr>
<td>Amtest</td>
<td>573</td>
</tr>
<tr>
<td>Ian Austin</td>
<td>574</td>
</tr>
<tr>
<td>Baginton Electronics</td>
<td>569</td>
</tr>
<tr>
<td>B. Bamber Electronics</td>
<td>back cover</td>
</tr>
<tr>
<td>J. Birkett</td>
<td>563</td>
</tr>
<tr>
<td>British National Radio &amp;</td>
<td>564</td>
</tr>
<tr>
<td>Electronics School</td>
<td></td>
</tr>
<tr>
<td>C. &amp; C. Electronics</td>
<td>568</td>
</tr>
<tr>
<td>Cambridge Kits</td>
<td>574</td>
</tr>
<tr>
<td>Catronics Ltd.</td>
<td>571</td>
</tr>
<tr>
<td>C.B. Electronics</td>
<td>564</td>
</tr>
<tr>
<td>Ian N. Cline</td>
<td>575</td>
</tr>
<tr>
<td>Colomor Electronics Ltd.</td>
<td>575</td>
</tr>
<tr>
<td>Commercial Communications</td>
<td>568</td>
</tr>
<tr>
<td>Crayford Electronics</td>
<td>565</td>
</tr>
<tr>
<td>Datong Electronics Ltd.</td>
<td>562</td>
</tr>
<tr>
<td>Ashley Dukes</td>
<td>573</td>
</tr>
<tr>
<td>G3HSC (Rhythm Morse Courses)</td>
<td>572</td>
</tr>
<tr>
<td>G2DYM Aerials</td>
<td>572</td>
</tr>
<tr>
<td>G.W.M. Radio Ltd.</td>
<td>575</td>
</tr>
<tr>
<td>Hamgear Electronics</td>
<td>574</td>
</tr>
<tr>
<td>D. P. Hobbs Ltd.</td>
<td>568</td>
</tr>
<tr>
<td>Johns Radio</td>
<td>575</td>
</tr>
<tr>
<td>K.W. Communications Ltd.</td>
<td>562</td>
</tr>
<tr>
<td>Lee Electronics Ltd.</td>
<td>559</td>
</tr>
<tr>
<td>Lowe Electronics</td>
<td>513</td>
</tr>
<tr>
<td>M.H. Electronics</td>
<td>573</td>
</tr>
<tr>
<td>Microwave Modules Ltd.</td>
<td>527</td>
</tr>
<tr>
<td>Mosley Electronics Ltd.</td>
<td>566</td>
</tr>
<tr>
<td>William Munro Ltd.</td>
<td>521</td>
</tr>
<tr>
<td>Partridge Electronics Ltd.</td>
<td>570</td>
</tr>
<tr>
<td>P.M. Electronic Services</td>
<td>569</td>
</tr>
<tr>
<td>Pulse Technical Communications</td>
<td>573</td>
</tr>
<tr>
<td>Radio Shack Ltd.</td>
<td>526</td>
</tr>
<tr>
<td>R.T. &amp; I. Electronics Ltd.</td>
<td>566</td>
</tr>
<tr>
<td>SEM</td>
<td>558</td>
</tr>
<tr>
<td>Small Advertisements</td>
<td>570-574</td>
</tr>
<tr>
<td>South Midland Communications Ltd.</td>
<td>514, 515</td>
</tr>
<tr>
<td>Spacemark Ltd.</td>
<td>566</td>
</tr>
<tr>
<td>Stephens James</td>
<td>516, 517</td>
</tr>
<tr>
<td>S.W.M. Publications</td>
<td>Inside back cover, 572, 573, 575, 576</td>
</tr>
<tr>
<td>Technical Associates</td>
<td>567</td>
</tr>
<tr>
<td>Teleradio Electronics</td>
<td>567</td>
</tr>
<tr>
<td>Thanet Electronics</td>
<td>524, 525</td>
</tr>
<tr>
<td>Reg Ward &amp; Co. Ltd.</td>
<td>568</td>
</tr>
<tr>
<td>Waters &amp; Stanton Electronics</td>
<td>522, 523</td>
</tr>
<tr>
<td>Geoff Watts</td>
<td>574</td>
</tr>
<tr>
<td>Western Electronics (UK) Ltd.</td>
<td>518, 519, 520</td>
</tr>
<tr>
<td>W. H. Westlake</td>
<td>574</td>
</tr>
<tr>
<td>Yaesu-Musen Co. Ltd.</td>
<td>528</td>
</tr>
</tbody>
</table>

---

**SHORT WAVE MAGAZINE**

(GB3SWM)

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**CONTENTS**

<table>
<thead>
<tr>
<th>Article</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editorial—Interference</td>
<td>531</td>
</tr>
<tr>
<td>VHF Bands, by N. A. S. Fitch, G3FPK</td>
<td>532</td>
</tr>
<tr>
<td>The Datong UC/1 Up-converter—A Test Report</td>
<td>536</td>
</tr>
<tr>
<td>The GM3RFR Broomstick Antenna, by S. Polson, GM3RFR</td>
<td>538</td>
</tr>
<tr>
<td>“SWL”—Listener Feature</td>
<td>539</td>
</tr>
<tr>
<td>Time-Out Warning Circuits, by A. B. Plant, B.Sc., C.Eng., M.I.E.E., G3NXC</td>
<td>543</td>
</tr>
<tr>
<td>Communication and DX News, by E. P. Essery, G3KFE</td>
<td>547</td>
</tr>
<tr>
<td>The QRP Scene, 1977</td>
<td>551</td>
</tr>
<tr>
<td>Testing a Museum Piece, by F. H. Walker, ex-G4TX/G5AX</td>
<td>552</td>
</tr>
<tr>
<td>The Month with The Clubs—From Reports</td>
<td>554</td>
</tr>
</tbody>
</table>

---

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Interference

The sort that goes on, on GB3LO, divides three ways: 1. The chap who used to foul up Top Band transmissions; 2. Those who jam the repeater for idle entertainment; 3. Licensed amateurs jamming deliberately because they don't like the concept of repeaters. The practical result is an equal mixture of hot temper and hot air, with a bit of tyre-slash ing thrown in for good measure. The problem, (if indeed there is a problem outside the mind) is one which can reasonably be resolved by letters to the Home Office, the RSGB, or one's MP depending on personal preferences and affiliations. These have been shown to produce results within the last few days over the Phase Two repeater hold-up, where a representation to an MP cleared a seven-month long-jam in almost hours. That is something jamming or tyre-slash ing could never have done.

However, the Post Office and the Home Office also have a problem. The former have to catch their man in flagrante delicto-which is all but impossible with a transistorised bit of gear which doesn't get hot. The Home Office is required, in the case of licensed offenders, to act the part of The Law, their sentence being cancellation of the licence for a greater or lesser time. This, since it doesn't give room for a defence to be formally made, is contrary to Justice and a quite unfair responsibility on the Home Office. For the Post Office, their task should be made easier by imposing a simpler requirement of proof: for example bearings taken and plotted on at least two occasions onto the building in which the offender operates, together with recordings of the received signal, and the display of the offending piece of gear. Proof needs to be as simple as that for a speeding offence, the only other requirement being that it be shown the interference was beyond reasonable doubt deliberate.

This is not to be taken that the writer necessarily has any opinions one way or the other on the desirability of repeaters; but it can and must be taken as a request to “cool it” for the benefit of the vast majority of amateurs, and to take the arguments through the proper channels.

MCC—November 5 and 6, and the Rules were given in the last issue, p. 489. It only remains for us to add that it should be another good clean contest, and lots of fun for those clubs which compete. Good Luck, and may the best club win!
**VHF BANDS**

**NORMAN FITCH, G3FPK**

**VHFCC Award**

Just one reader has been awarded a VHF Century Club certificate this month. No. 288 for 2m. operation goes to Ian Gordon, G8IFT, from Rubery, Birmingham. Ian passed the R.A.E. in May, 1973 and he commenced operation on October 30 that year using a home built AM.Tx. After much TVI he went over to FM. In 1975-6, he built an SSB rig using the Plessey SL-600 series of IC's. He has been QRV on 70 cm. since January, 1976. His QTH is 700ft. a.s.l. and he has been QRV on 70 cm. since 1975 and on 23 cm. since January, 1976. His QTH is 700ft. a.s.l. and he has used many local hills for contest work.

**Beacons**

A fairly constant request is for details of beacons. Brian Bower, G3COJ, has kindly provided the list of U.K. beacons from 4m. through 3 cm. shown in the table and says, "I believe this list to give the correct beacon situation." As will be seen, GB3DD on 1296-89 MHz is on again. The recently commissioned Lerwick beacon GB3LER on 144-965 MHz has been heard aurorally in at least five countries.

A new beacon in Austria is OE5XBL in G177a on 144-920 MHz running 80-100 watts e.r.p. from an 8-ele. Yagi but confirmation is awaited concerning which direction it beams.

**Contests**

**Results:**—101 groups entered VHF NFD on the July 2/3 weekend. The combined Martlesham and Ipswich clubs turned the tables on last year’s winners, the March and District RAS, by beating them into second place. The Wullfurn Contest Group came third. The leading GI group was the All-Antrim-Amalgamated Contest Group; in GM, the Lothians Radio Society led the field, while the Isle of Man RS took the honours for GD. In the Channel Islands, the Guernsey Radio Society were top. Band leaders were, on 70 MHz, GI3FFF/P, the All-Antrim folk; on 144 MHz, G4BPO/P, the Martlesham and Ipswich clubs; on 432 MHz, G8AGU/P, the Plymouth RC and on 1.3 GHz, G3DY/P, the March and District RAS.

In the 144 MHz QRP Contest on July 31, there were 16 entries in the Fixed section which was won by G3BDQ (Hastings) with 1998 points, followed by G8KUC (Canterbury) with 1086. The Portable section attracted 48 entries, the winner being GW3ERP/P with 1548 points, followed by GD4AFN/P with 1260.

The two part 70 MHz Open Contest on August 13 and 14 was won by GU3HFN in the Fixed section with 710 points from 58 contacts. G4AEQ (Manchester) was second with 626 points from 82 QSO’s and G3NHE (Sheffield) came third, his 90 contacts being worth 610 points. In the Portable section, G3JYP/P was the winner with 1038 points from 91 contacts; GM4DMZ/P scored 856 points from 66 QSO’s and G3UVT/P was third with 810 points from 82 QSO’s. All the above news from GB2RS.

**Coming Events:**—The 144 MHz CW event is on November 5/6 from 2000-0100 GMT. On November 20, The Grafton Radio Society is holding a 144 MHz all-mode contest from 2000-2300 GMT, scoring as in normal RSGB events. All entries to G8JGE (QTHR) by December 9. The club call is G2CJN.

### Table: U.K. Beacons

<table>
<thead>
<tr>
<th>Call</th>
<th>QRP MHz</th>
<th>QTH wt’s</th>
<th>Keying</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB35X</td>
<td>70-685</td>
<td>AL71d 16</td>
<td>F1</td>
</tr>
<tr>
<td>GB3SU</td>
<td>70-695</td>
<td>ZN61a 20</td>
<td>A1, F1</td>
</tr>
<tr>
<td>GB3N</td>
<td>144-130</td>
<td>ZD12a 30</td>
<td>F1</td>
</tr>
<tr>
<td>GB3GI</td>
<td>144-137</td>
<td>X041j 40</td>
<td>F1</td>
</tr>
<tr>
<td>GB3VHP</td>
<td>144-150</td>
<td>AL52j 40</td>
<td>F1</td>
</tr>
<tr>
<td>GB3CTC</td>
<td>144-915</td>
<td>XK64a 75</td>
<td>A1, F1</td>
</tr>
<tr>
<td>GB3LER</td>
<td>144-965</td>
<td>ZU65f 65</td>
<td>F1</td>
</tr>
<tr>
<td>GB3ANG</td>
<td>144-975</td>
<td>YQ3sc 20</td>
<td>F1</td>
</tr>
<tr>
<td>GB35UT</td>
<td>432-89</td>
<td>ZM31b 60</td>
<td>F1</td>
</tr>
<tr>
<td>GB3EM</td>
<td>432-91</td>
<td>ZN32b 50</td>
<td>F1</td>
</tr>
<tr>
<td>GB3AND</td>
<td>1296-87</td>
<td>ZL63b 50</td>
<td>F1</td>
</tr>
<tr>
<td>GB3DD</td>
<td>1296-89</td>
<td>ZL08e 2</td>
<td>F1</td>
</tr>
<tr>
<td>GB3WRN</td>
<td>1296-91</td>
<td>YM28g 2</td>
<td>F1</td>
</tr>
<tr>
<td>GB3UOS</td>
<td>3456-0</td>
<td>ZN42c 4</td>
<td>F2</td>
</tr>
<tr>
<td>GB3IOW</td>
<td>10100-</td>
<td>ZK34a 0.8</td>
<td>F2</td>
</tr>
<tr>
<td>GB3LNB</td>
<td>10100-</td>
<td>AL31c 1.5</td>
<td>F2</td>
</tr>
<tr>
<td>GB2ALD</td>
<td>10120-</td>
<td>YJ30h 1</td>
<td>F2</td>
</tr>
</tbody>
</table>

**Short Wave Magazine**

November, 1977

**Meteor Scatter**

On August 11, Dave Price, GW4CQT in YL25d had an MS schedule with UW6MA in TH69c, the QRB being 3090 kms. Dave only got a few pings and bursts from the Russian but, in a subsequent letter, UW6MA reckons he got a four minute burst from Dave, so much so that he wonders if it really was all MS. According to G3POI, the Russian runs good gear, nevertheless, this is too long a distance for pure MS since a simple geometrical exercise shows the ionisation would have to be at about 190 kms. In this instance, it seems likely that Dave’s signal enjoyed a bit of tropospheric bending before it “headed for the trail.” Of course, if GW4CQT has all the necessary callsign and report information taped, this would undoubtedly be a new, European record. Even so, it is a remarkable distance to propagate a 2m. signal.

Ian White, G3SEK, and Clive Penna, G3POI, have worked out their MS procedure proposals to somewhat supersede the 1975 Warsaw Conference document WA-79. The next major shower will be the Geminids in December, of which more next month. Meantime, Chris Bartram, G4DGU, has suggested the following “do’s and don’ts” for newcomers to MS. First the “do’s”: Use standard procedure; get on frequency (plus/minus 200 Hz); get your timing right (plus/minus 1 second referred to GMT, all receive and transmit periods starting at zero second of any minute); try to speak clearly and listen first.

Second the “don’ts”: use 144-200 MHz for tropo. contacts; waste words; be an alligator (all mouth, no ears!); try to use speeded-up speech; use phonetics; call “CQ”
example on Orbit No. 13082 on hot and Nicad batteries do not like maximum sunlight and getting rather reason. lower orbit for some unaccountable late and has slipped into a slightly following recent Delta rocket failures. confirmation of launch date is awaited complete and ready to fly but con- and building put November. of October or the first launch might be at the end same channel, the following day. was due on RBO on October 13 and received their paperwork by now. the licence for all the Phase 2 UHF them Zone 33, counting as Africa. giving those lucky enough to work the QTH locator IH9’s LCK, JT, XIX and ZWV. did take place, the calls used being expedition to the Pantelleria Islands trying MS. experienced MS operator it February, 1975. If new to the game, article in Radio Communication for Ludlow’s (GW3ZTH) time being are those approaching the legal unless you have an adequate rig and know how to use it. (Something approaching the legal limit to a reasonable aerial—say 10-elements or more—and some previous experience of schedules SSB MS.)

These notes were compiled after the salutary experience of the Perseids when it was very obvious that some enthusiasts had a rather hazy idea of the way to attempt random MS contacts on SSB. The standard procedures for the time being are those set out in WA 79 which was based upon Joe Ludlow’s (GW3ZTH) definitive article in Radio Communication for February, 1975. If new to the game, it is recommended you talk to an experienced MS operator before trying MS.

G3POI reports that the Italian expedition to the Pantelleria Islands did take place, the calls used being IH9’s LCK, JT, XIX and ZWV. The QTH locator was FW20a giving those lucky enough to work them Zone 33, counting as Africa.

Repeaters

The Home Office has now issued the licence for all the Phase 2 UHF repeaters and all groups should have received their paperwork by now. GB3SV at Bishops Stortford, Herts., was due on RB9 on October 13 and GB3MS, the Mid-Severn one on the same channel, the following day. ’MS is co-sited with GB3MH.

The Satellite Scene

No firm news about the Russian OSKARS. USBWN intimated that the first launch might be at the end of October or the beginning of November. AMSAT-USA is to put up a small, fully manned building at the Goddard Space Center, which sounds very ambitious and expensive. A-O-D is now complete and ready to fly but confirmation of launch date is awaited following recent Delta rocket failures. Oscar 7 has been rather erratic of late and has slipped into a slightly lower orbit for some unaccountable reason. It is now in a period of maximum sunlight and getting rather hot and Nicad batteries do not like that. It’s on-board, 24 hour clock seems to go haywire at times. For example on Orbit No. 13082 on Sept. 24 when it should have been on Mode “A” it was on Mode “B” instead. At 2227 GMT, the telemetry indicated it thought the time was 0232 GMT the next day, and four minutes later, the TLM decoded it as 0302 GMT!

New stations on 0-7 on CW, Mode “A” include SVIDO, UB6OMSK and 4X4IX, all around 29-465-29-470 MHz downlink. 5T5CJ is a strong signal on 29-440 MHz but 5T5CW is rather weak on 29-490 MHz CW running about 5 watts. VP91B is reported QRV on both modes and 5WAT is going to PJ2 some time soon.

Ken Willis, G8VR/W1, operates from Southbury, Connecticut, and says that Oscar operation “ . . . is a bit of a scramble . . . ” over there. He uses a 5-ele. Yagi in the living room and the 10m. dipole is strung around the picture rail. European signals tend to be rather weak but he hopes to be on Mode “B” soon from Southbury, Connecticut, and says that Oscar operation " . . . is a bit of a scramble . . . " over there. He uses a 5-ele. Yagi in the living room and the 10m. dipole is strung around the picture rail. European signals tend to be rather weak but he hopes to be on Mode “B” soon. Ken says that tropo conditions over there are very different from what he was used to over here. They have received European 52 MHz TV signals over there this year.

<table>
<thead>
<tr>
<th>QTH LOCATOR SQUARES TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>G8FUF</td>
</tr>
<tr>
<td>G3POI</td>
</tr>
<tr>
<td>G3JNN</td>
</tr>
<tr>
<td>GM4CXP</td>
</tr>
<tr>
<td>G3CHN</td>
</tr>
<tr>
<td>G8GML</td>
</tr>
<tr>
<td>G3EPK</td>
</tr>
<tr>
<td>G4COJ</td>
</tr>
<tr>
<td>G4BWG</td>
</tr>
<tr>
<td>G3OHC</td>
</tr>
<tr>
<td>G3XCS</td>
</tr>
<tr>
<td>9H1CD</td>
</tr>
<tr>
<td>G8HVY</td>
</tr>
<tr>
<td>G4BAH</td>
</tr>
<tr>
<td>G8LEF</td>
</tr>
<tr>
<td>G2AXI</td>
</tr>
<tr>
<td>G8BKR</td>
</tr>
<tr>
<td>G4FCD</td>
</tr>
<tr>
<td>G8FFH</td>
</tr>
<tr>
<td>G4DKX</td>
</tr>
<tr>
<td>GD2HDZ</td>
</tr>
<tr>
<td>9H1BT</td>
</tr>
<tr>
<td>G8IWA</td>
</tr>
</tbody>
</table>

Starting Date January 1, 1975. No satellite or repeater QSO’s.

DX Notes

Paul O’Brien, EI4CM (Co. Galway) operated from UO and UN squares the weekend of Sept. 17/18. He was not heard in SE England but comes back periodically so more rare square operation is on the dards. Con Hunter, EI9V, reckons to be activating UL and
new 1977 counties. George Zitterstein, G8ITS (City of London), found 70 cm. conditions "abyssmal" and made just 11 QSO's.

Seventy Centimetres

G4ERX found many S9 DL's on the 11th until the band went quiet at about 3.00 a.m. on the 12th. John Woodham, G8BK/3 (Bristol), missed out till about 700 GMT on the 11th when a couple of F's in AK square were worked followed by a clutch of PA's for the first ever Dutchmen on the band. Some good ducting into Scandinavia on the 19th produced a QSO with SM6ESG (GR72h) for G8HBO. This station also worked by G4JJ and G8FUW. This September opening very much favoured the northwest of England plus EI and GI.

G30HDZ took advantage of the Sept. 19/20 lift to work three new squares in SM, viz; FR, FS and GR, for probably the first GD/SM QSO on 70 cm.? Strangely, Arthur did not hear any OR stations in this period. Lawrence Woolf, G8HAA, worked G8GON/P in Devon on Sept. 11 using two-way, 625 line TV. Lawrence uses a Vidicon camera with TTL/Diode ROM call sign generator. This was a "first" G/GJ two-way TV QSO. For Derrick Dance, GM4CXP (Borders), the period Sept. 17-21 was productive of many SM, LA, OZ, GI, GM and GW stations using 6 watts output to a 46-ele. MultiBeam. EA1CR (XD32d) is reported to have copied G8HVY's signals during the Sept. 10/11 opening but unfortunately, José was unable to transmit on 70 cm. GM8NCM (Fife) is now QRV on 70 cm.

Two Metres

The main events this month have been the fine opening to the south through east on the weekend Sept. 10/11 and several auroras. G3XCS worked EA1CR at RS 59 each way on the 10th and also EA20Z who was mobile in Bilbao in YD square. On the 11th, Colin managed to get through the pile up to LX1DB (DJ32b) on SSB but could not crack LX1G's pile up. F0DH in Sept. 09, was overheard telling that his home call is 3A2EE.

G4ASR/A really "had a ball" in the tropo. opening, notching up 16 countries including EA, LX, HB9 and DJ1BP/P/HB9 in Liechtenstein, QRB being 1,110 kms, on Sept. 10. Dave worked 3 EA's, 2 LX's, 18 HB9's and 171 F's over the weekend and his total stations worked in 31 hours was 342! Two Italians called him but were too weak to work. Readers seeking the Scillies in WJ square on 2m. might find G4ASR/P on 144-26 MHz SSB on Nov. 11-13 as Dave hopes to be QRV from there. If so, he will participate in the CW contest with 150 watts of CW to 2 x 6-ele. Quads. G3AUS was another west country operator to work all over France from HB to EA during the Sept. 10/11 lift.

G8BK/KR missed out on the EA's and though the QRB around LX1DB more reminiscent of 20m. John did work F6FBB/P in AC07c, however. Steve Lowe, G8FE0 (Reading), wasted a couple of hours calling F1CYO/P in AE21g on the 10th and gave up when he found that Joël was running 800 watts to a 32-ele. array. On the 11th, Steve was QRV from 1500-030 GMT working many F's and PA's, most of whom were S9-plus. Ken Osborne, G8KSS (Bristol), is still on AM but with SSB in the offering. He failed to raise HB9AMH/P in DH66c on Sept. 10 but on the 11th, he too managed F6FBB/P near the Andorra border, along with other F's in AF, AG, AM squares. The evening brought forth a few ON's and a PA. On the 14th, Ken heard a couple of F's in CH square. He remarks on the lack of SSB stations above 144-40 MHz but mentions a few operating in the CW section of the band.

C. J. Reed, G8MFP (Warks.), worked some F's, PA's and ON's with his Trio TR-7010 and 8-ele. Yagi at 40ft. and mentions 8 sunspots on the limb of the Sun on Sept. 13. Martin Green, G8MKW (Warks.), took his Liner-2 to GD for a week in September and enjoyed being on the receiving end of a pile up. He worked "...a host of GI's ..." EI4CM in Galway, GM8MJV/P near Peterhead and GW's and G's.

GM4CXP noted seven auroral events on Sept. 13th, 19th, 21st, 22nd, 23rd, 24th and 26th. On the 13th, GB3LER, proving to be a very reliable portender of auroral activity,
was 53A from 1544-1835 GMT, QTF 020° but only 2 GM's worked. On the 19th, it peaked 5AA (040°) between 1638 and 1750 GMT and Derrick worked SM5FVH (IT2sc) and LA3WU (CU47d). On the 21st, G8SFBQ — — 70 14 10 10 148
G8GMG — — 65 14 51 12 142
G3XSX 44 6 53 19 10 4 136
G4BYE 25 5 53 12 28 9 132
G4FCD 36 2 69 19 3 1 130
G8LEF — — 66 17 36 11 130
G4ECQ 44 4 65 15 — — 128
G3FII 37 5 50 11 20 4 127
G8BKR — — 70 16 28 6 120
G8HII — — 57 15 36 11 119
GM4CXP 18 2 55 21 14 8 118
G4DWX 26 3 52 13 17 4 115
G8HIQ — — 58 17 28 10 113
G8IFT — — 61 13 31 5 110
G4AEZ 29 6 37 12 17 4 105
G3BWW — — 49 12 30 7 98
G3FPK — — 74 22 — — 96
G4CMV — — 69 15 7 2 93
G4ERX — — 50 13 23 6 92
G4FOR — — 62 16 7 2 87
G4DEZ — — 67 20 — — 87
G4FBB — — 58 14 12 1 85
G4DXX 7 1 37 11 19 6 81
G8ITS — — 46 10 21 3 80
G8HXX — — 61 18 — — 79
G8KSS — — 57 17 — — 74
G8LHT — — 58 14 1 1 74
G8GI — — 31 5 28 6 70
G8JPR — — 55 12 — — 67
G8MKW — — 51 12 — — 63
G8JHGK — — 46 12 — — 58
G4GCQ — — 45 9 — — 54
G4GET — — 40 7 — — 47
G8IZY — — 38 7 — — 45
G4FK1 — — 21 5 4 1 31

was 53A from 1544-1835 GMT, QTF 020° but only 2 GM's worked. On the 19th, it peaked 5AA (040°) between 1638 and 1750 GMT and Derrick worked SM5FVH (IT2sc) and LA3WU (CU47d). On the 21st, G8LER was auroral from about 2230 GMT and still so at 0030 when he went to bed, QTF again 040° this event producing QSO's with EI, G, GI, LA, SM4 and SM6 and OZ, the QTF's being 045-070° but with DLOPR (EO54c) peaking 57A at 2255 at azimuth 350°. On the 22nd, some auroral SSb was heard at 1547 on an IC-202 plus whip aerial. Between 1611 and 1950 GMT, G, GM, EI, LA, PA and ON were worked at QTF's 050-080°. On the 23rd, Lerwick was 57A from 1551-1712 GMT with LA6HL (CS80b) and GM4BVD (Perth) worked. On the 24th, GB3LER was weakly Au for a few minutes around 1700 GMT. On the 26th, Lerwick was 55A from 1605-1730 and again from 2120-2310 GMT. LA4VHF (CU47c) on 144.89 MHz was heard a few times around 2150 at 41A, QTF being 045°. Only GM8NCM was worked in this event which was predicted by Ed Tilton, W1HDQ, during a talk at Alexandra Palace last May.

Alistair Simpson, GM8NCM (Fife), found September to have been an eventful month. He now has a lively, 200 watt linear for his FT-221/R which needs taming! On Sept. 19, he worked OZ's and SM's via tropo in E7, E2, ER, FR, FS, GR and GS squares and on the 22nd, G8GXP, GM4EOU and GM8DMZ via the Aurora, all QTF 040°. At G3FPK, GB3LER was first copied on tropo at RST 419 on Sept. 16 at 2243 GMT. An opening to the west produced EI4CM (VN51) on the 14th. On the 17th, the Edinburgh and District Radio Club operated from ZR42h and RS 58 reports were exchanged at 1802 with GM8MJV/P. Sept. 17 produced 3 G1's on SSb. Only the Auroras of Sept. 21 and 22 produced any contacts but the going was tough due to a persistent "burbler" around 144-04-144-06 MHz. Chris Bartram, G4DGU (Oxon.), managed LA5JS (DS70d) via the Sept. 21 Au, QTF 020° and SM0DJW (IS10d) at 1822 GMT on the 22nd, QTF 0°.

**Deadlines**

That's it for another month. All copy for December by Nov. 3 and for January by Dec. 8 to:-

“VHF Bands” SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. 73 de G3FPK.
THE DATONG UC/1
UP-CONVERTER
A TEST REPORT

BROADLY speaking, amateur radio equipment falls into two categories. Firstly there are the obvious items like transmitters, receivers, wavemeters and aerial tuning units and secondly the "Why didn't somebody think of this before?" type of accessory. The Datong UC/1 Up-converter belongs in this latter category.

Prior to the introduction of Class-B licences, VHF/UHF operators invariably used a normal down-converter feeding into an HF band receiver. Nowadays this situation has been largely reversed in that many Class-B licensees own high performance, self-contained two-metre receivers or transceivers and later wish to listen on the LF/HF bands. An expensive solution is to buy a complete receiver covering these bands but a more cost effective and certainly space-saving alternative is to acquire an up-converter using the two-metre receiver as a tunable IF. The Datong UC/1 is a unique accessory to achieve this.

The Circuit

When connected as shown in Fig. 2 the UC/1 will enable thirty, one megahertz bands up to 30 MHz to be tuned using a 144-145 MHz receiver as an IF strip.

The heart of the device is a frequency synthesiser with a basic crystal controlled reference frequency of 1 MHz. (In some models a 5 MHz crystal is used in which case the frequency is first divided by five.) A train of very narrow 1 MHz pulses is fed to a balanced sampling gate phase locking a voltage controlled oscillator to any multiple of 1 MHz between 115 and 144 MHz. Harmonic phase locking is used to achieve this.

The LF/HF signals are routed through a low pass filter and 0, 15, 30 dB switched attenuator to the preselector. The preselector is a five band, capacitor tuned stage covering nominally 90 kHz to 30 MHz using encapsulated inductors and very low noise J-FET's. The preselector output is actively impedance matched to the first mixer which is a balanced type using a dual J-FET type E431. The local oscillator frequency is any one of the thirty between 115 and 144 MHz selected by the "MHz" switches and it passes through a wideband buffer amplifier to the gates of the E431 mixer to give the 144-145 MHz IF output.

A conventional two-metre down-converter is incorporated in the UC/1 using two dual gate MOSFET's as the 145 MHz amplifier and mixer with the second local oscillator signal being derived from a 116 MHz overtone crystal, voltage stabilised. This gives an alternative IF output of 28-30 MHz.

Installation

The UC/1 requires a DC voltage between 9 and 15 at no more than 150 mA. The power socket is a standard three-pin DIN type and a matching plug is provided. The three input/output sockets are SO-239 VHF types. For use with a two-metre receiver, the UC/1 is connected as shown in Fig. 2. If a receiver tuning 28-29 MHz is employed, the built-in two-metre down-converter is used and the inter-connexions are as in Fig. 3. In this case, an attenuator is automatically switched in in front of the 144/28 MHz converter to prevent overloading the second mixer.

For straight use as a two-metre down-converter with a tunable 28-30 MHz IF the same inter-connexions as Fig. 3 are used except that the two-metre aerial is plugged into the 144-146 MHz input/output socket as shown in Fig. 4.

Operation

Two-metre reception at the reviewer's station is achieved with a Solid State Module's 2/10m. down-converter feeding into a Hallicrafter's SX-146 receiver. The UC/1 was used in both Fig. 2 and Fig. 3 modes, thus utilising either the SSM or UC/1 down-converter respectively.

Setting up any frequency up to 30 MHz is quite simple. To take as an example setting up on a frequency of 17-319 MHz, the "MHz" selector switches would be set to "1" and "7" and the preselector switch to the 9-7-30 MHz band. The main receiver dial would be set to 144/319 or 28/319 MHz, depending on which IF was used. Lastly the signal would be peaked up by the "RF Tune" control on the UC/1. Note that the "MHz" switches would actually select the phase locked 127th harmonic of the 1 MHz crystal as the local oscillator frequency which, mixed with the incoming signal on 17-319 MHz would give the IF of 144-319 MHz.

Using a few feet of wire around the picture rail as an aerial, everything from MSF on 60 kHz to 27 MHz Citizens' Band from Italy and the Oscar 7 downlink on 29.4-29.5 MHz was heard. Naturally, the facilities of the SX-146 were all available such as various modes, variable bandwidth, calibrator, noise limiter, gain controls, etc.

About ten years ago, one dealer advertised a particularly mediocre receiver as having, "twice the number of stations above 15 MHz!" That was another way of warning that the thing had a diabolical image response. The first IF of the UC/1 is 144-145 MHz so, for coverage...
from near "DC" to 30 MHz, the image signals would be between 289 and 259 MHz. Obviously there are no images.

The switched attenuator ahead of the preselector is an essential refinement. With no attenuation some cross modulation and overloading was noticed on certain frequency bands where the received signal strengths were very high. However, switching in 15 dB of attenuation always eliminated these problems.

The harmonics of the 1 MHz crystal were all detectable without an aerial connected but were overlooked when any aerial was used. For those who need the highest accuracy, those at 5, 10 and 15 MHz could be used to beat against MSF or WWV to ensure that the synthesiser crystal is really "spot on." A trimmer associated with the crystal and accessible through a hole in the larger diecast box in the photograph would allow this to be achieved using the attenuator to match the amplitude of the received signal to that of the harmonic.

The gain of the 145 MHz down-converter was about 15 dB less than that of the SSM device, but then gain is not necessarily too important. The circuit produced no objectionable cross modulation effects nor did it suffer any overloading from very strong signals during a recent contest. Due to the use of a 116 MHz overtone crystal, no annoying spurii from non-amateur VHF transmissions were found.

Conclusions

The reviewer was very impressed with the UC/1. Without doubt it is another thoroughbred from the Datong stable; an ingenious design using "state-of-the-art" techniques. The workmanship and presentation is of the fine standard we have come to expect from this manufacturer. The writer is not aware of any comparable device on the market to enable a two-metre receiver to be used as a tunable IF for an LF/HF bands, continuous coverage receiving system.
THE GM3RFR BROOMSTICK ANTENNA

S. POLSON, GM3RFR

THE following is a detail of investigations carried out over the past two years at GM3RFR QTH. The aim of the experiments was to discover if antennas, and particularly antennas for the 40m. and 80m. LF bands, could be grossly compressed in size and yet remain effective. First experiments were made with a 20 metre compressed antenna, the amount of work involved being much less than for 40 or 80 metre antennas: failure could occur and there was obviously no point in taking more time to reach the failure point.

Anyway, to the method of operation: A length of sturdy insulated wire approximately twice the length required for a quarter-wave antenna, e.g. 33 feet, was close-wound on to an ordinary broom-stick. The total winding length, dependent on the thickness of the wire, should be less than twelve inches. In other words the normal 16ft. 6in. ground plane is compressed to approximately 1/17 of its normal length.

The tuning procedure was as follows. A length of twin 50-ohm feeder was attached, one wire of the feeder to the antenna and the other to a radial of 16ft. 6in. in length; using a Tx and a SWR meter sufficient output from the Tx was injected into the antenna to give a reading on the meter. A check was made at each end of the 14 MHz band for the lowest SWR reading. A low but not low enough reading at 14-00 MHz would suggest the antenna is too long and gradually a turn or two should be clipped off until a low reading is seen around 14-2 MHz. A lowish reading at 14-35 MHz would suggest that the antenna is too short and by adding a few turns the SWR can be brought to a satisfactorily low reading at about the middle of the band.

A further adaptation was to attach the antenna by a short length of wire, in place of the radial, to the station earth, thus permitting indoor usage. A slight adjustment to the number of turns again resulted in a satisfactory SWR. The final product was properly refurbished, coated by insulating tape and then tried out. The results have been surprising: all Europe responded easily to the 20 metre band. A low SWR was obtained on all three bands with the earth wire attached. Crocodile clips were used to link up sections as required.

A friend subsequently suggested the use of a hollow alkathene 1¾in. water pipe as a base for one of these antennas and an 80 metre version using about 157 feet of insulated earth wire was made up as per recipe. Fifty-five feet were scaled down to 4 feet and the contraption mounted with 3 radials at 22 feet above ground in the vile hollow which contains the RFR antenna farm. Resonant point was 3-72 MHz, a bit too low for the SSB DX section of the band. On 5 watts p.e.p., OZ, OH, G, EI and GM have been worked: on QRO, contacts have been made with VE, 5Z4 and VS6.

It should be said of the broom-stick that it obviously cannot compare as a DX-er with its giant full-size relations, but as a pigmy it carries a useful punch and might be a handy avenue of experiment for those poor souls who, locked in modern concrete jungles and tramelled by the limitations of planning permission, have to keep their antennas in a cupboard.
ONE often wonders just how anyone can ever afford to have a hobby at all in this day and age, unless they have a working wife and an approach to economy that is almost fanatical so as to be able to afford even simple gear. Yet people are for ever changing their receivers, for instance, for ever-more-expensive boxes each time selling the previous one at a loss.

Apart from the economics of it, one wonders whether the approach is at all valid in terms of SWL. Certainly it is that the writer had held his call for well over twenty years before he first aspired to a new bit of gear, then he bought a KW-2000B; and that one was replaced by a TS-520 only as a result of a legacy. Neither is any better on receive than the KW-77 receiver which "stands by"—though probably being used more in fact!—and the old 888, both of which belong to the Magazine rather than your old J.C. thanks to the original Editor, G6FO, who wished to make sure there was no excuse to be late with the copy by claiming the lateness was due to mending the old home-brew!

But, whatever you have in the shack, there is ever a need to keep it "up to scratch" and free from faults (particularly of the insidious "getting a bit older" type). One should have a Table of Voltages in the handbook somewhere which can be checked when the set is first bought, and marked-up with the figures found with your meter and your receiver; just about any fault will be reflected by changes in the readings, including the "old age" one. If you are unlucky enough to be landed by an intermittent fault then you have a problem indeed. The formal method is firstly to try and carry out any limiting of the field by comparing the symptoms against effects which would be expected from a fault in a particular stage. If nothing very obvious is noted, you have to recall that somewhere in the circuit you have a fault which will cause almost certainly a change either in the voltages noted or the currents drawn by each stage. Therefore, you can break the circuit into two halves and insert a current meter: you will then be metering half the circuit. Note the reading of the current meter while things are working properly, and when the fault appears. If there is a change, you are metering that part of the circuit in which the fault lies; and so you progress, slowly but surely to the offending stage and component.

However, from the insides of receivers, to what comes out of them.

The Mail

Initially, let us look at the new reporters. L. McKay (Dingwall) last reported in 'way back, and he wonders whether anyone still has copies of "SWL" from back in the 1965-1967 days available for disposal—he has "slung" his and wishes he had them back. Offers to loan at 5 Castle Gardens, Dingwall, Ross-shire.

L. Stockwell (Grays) uses an HA-600 receiver to a sixty-foot wire at twenty feet, which he feeds to the receiver through an ATU. Looking at the list we find Len has a claim to fame by way of the two "BY" stations he mentions—whatever they were, they were not from BY, and if they were from BY they wouldn't be using BY anyway! Confusing, isn't it? But no amateurs from Red China about sums it up, and we guess they could be mishearings for PY's.

SWL has been the hobby of A. Cuthbert (Jarrow) for the past ten years, from the fourth floor of an 11-storey tower-block on which no aerials are permitted; aerials are the main interest, clearly, for one in such a situation and various attempts at a beam have been made but not all that successfully. It seems from the writers' experience that indoor beams are not all that clever at HF, and probably the best chance is to use an all-driven array rather than a parasitic or Yagi type. The initial Eddystone 2245A is still there, but has been put into second place; the prime receiver was a Drake 2C which eventually developed a fault which couldn't be dealt with, and now there is an Inoue IC-700R. To date some 170 countries have been put in the log.

"Caught it from the teacher" is W. Pretty's explanation for his addiction to SWL; teacher had an HRO and long-wire at school it seems. However there are now two SWL's in the Diss area, as Wesley seems to be on from home now with a CR-70A. This is a very simple receiver admittedly, but there is no reason why, properly used, it shouldn't work several wonders; after all, John Fitzgerald used a brace of transistor portables for years before he got round to a "proper" receiver, and indeed his HPX total at that time was around the 8-900 mark we seem to recall. We reckon that if you can knock your CR-70A into the All-Time list before you go to something more expensive, you will have learned about the skilful usage of simple gear, which is of inestimable benefit in getting the best from any receiver.

Another return to the fold is indicated by D. Hill (Crawley) who last reported in from Edinburgh some eight years ago before marriage, two shifts of home, and three junior ops. provided some variation in the activity! Now things have stabilised a bit, an FR-101 is run into dipoles on 14, 21, and 28 MHz; since August 1—six weeks to the time of his letter—some 339 entries have been logged. Many years ago, Dave passed the R.A.E., and now that his interest has been sparked off by Oscar, and he has got the knack of predicting the passes, he is seriously thinking of having a go at a G8 for just this last activity. A minor mystery was a station heard on the downlink giving no callsign but repeating a QRA locator of UI48e which would put him off the S. Coast of Ireland!

Dipoles for 28 and 21 MHz, plus an eighty footer for the rest, and all or any fed into an FRG-7 receiver is the formula for K. Kniveton (Kingswinford). As to where to send DX reports for the Short Wave Magazine—why not here? They always are of help in evaluating conditions, and if enough people are interested in a DX Corner we wouldn't mind putting one in.

The accuracy of the dial readings on a Trio 9R59DS is noted by K. A. Burch (Plymouth); this is normal on a
general-coverage receiver—dial accuracy of 2 per cent is as good as the normal signal generator, and to go up to a closer accuracy you have to calibrate against a crystal. For a general-coverage receiver one needs 1 MHz steps as well as the usual 100 kHz ones, and to be able to go down to 10 kHz steps is nice; they can all be obtained by an IC or two and a 1 MHz crystal, which in its turn can be checked against WWV. The use of a counter on a receiver is pretty-looking, but when one has taken into consideration that the counter has to monitor every oscillator in the receiver and mix them in the correct manner in order to look at the final receiver frequency, that there will be an error of ± one count on each, and that the counter itself can only be as accurate as its internal crystal oscillator the achieved accuracy is not much, if any, better than using a calibrator and a good set of ears. Half the world at least seems to have bound itself to the idea that if you display something digitally you have made it not just more, but absolutely, accurate which is, frankly, the acme of foolishness. Both digital and analogue displays have their good and bad features, which determine which is right for a particular application.

In answer to the inquiry last time round by L. Stockwell, K. Rogers (Lutterworth) comments on his NR-56 in use in the car; he uses it /M as much as at home, the car aerial being a 5/8 wave whip; and, praise be, his Ford Escort doesn’t generate any noise! Having answered one, Ken asks one in return—how the blazes does one rid oneself of TV line-timebase QRM? A Good Question, to which the only answer is probably for every amateur and SWL in the country (including all the BC listeners!) to write to his MP and ask precisely what his party is going to do about it, and other forms of similar QRM. If a dozen letters of this sort landed on the mat of every MP in the country one morning, each demanding a reply, and each with a copy for the personal attention of the Minister of the Environment, one would think that “things” would happen! And, we could add, we suspect that the average TV service-man would be shown up as the bogder he is, saving the few—and honourable—exceptions. For the meantime, there is a little one can do. For a start, check whether it is mains-borne or coming in via the aerial; if the former, a filter on the mains will help, in the latter case fitting a balun to any coax-fed aerial such as a dipole should help the screen to do its job; and any of the varieties of skywire which need an earth connection are out. If that fails, turn off the power station and run off your own generator!

G3KFE is taken to task for giving bad gen in the September issue; ISWL’s Bureau doesn’t need an s.a.e. for the incoming cards to be put in—which is one of the major benefits of ISWL membership. Actually, old ‘KFE is getting a mite absent-minded in his dotage, as he should have known the right answer! John Fitzgerald (Gt. Missenden) is now fully kitted-out for reception of every MP in the country one morning, each demanding a reply, and others for the personal attention of the Minister of the Environment, one would think that “things” would happen! And, we could add, we suspect that the average TV service-man would be shown up as the bogder he is, saving the few—and honourable—exceptions. For the meantime, there is a little one can do. For a start, check whether it is mains-borne or coming in via the aerial; if the former, a filter on the mains will help, in the latter case fitting a balun to any coax-fed aerial such as a dipole should help the screen to do its job; and any of the varieties of skywire which need an earth connection are out. If that fails, turn off the power station and run off your own generator!

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Oddy enough, M. C. P. Bennett (Datchet) effectively is taking your conductor to task for the same evil of forgetfulness—of course those odd calls mentioned last time by K. Linge were surely MARS stations and so not acceptable. On a different tack, 4079WARC and YTO1ARU are both genuine calls, emanating from Yugoslavia.

J. Ollis (Solihull) also mentions these two, and also comments on the noticeable and steady improvement of the bands; true enough, but the sad part about it is that the general shape of the sunspot curve is a sawtooth with a fast rise-time and slow decay; and the last one was quite an exceptionally long time a-dying, as even now the odd spot is being noted from the old cycle.

John has not neglected the constructional side of things, having fitted a Toko mechanical filter to the receiver and made the result work nicely, not to mention building an HF band converter which seems to be OK on Twenty although misbehaving a mite on Fifteen and Ten; a few ferrite beads here and these will doubtless calm it down.

“What is a MARS station?” asks K. Linge (Willington). It is a unique animal, operated by an amateur but not part of the Amateur Service as defined in the international sense. These stations tend to appear wherever “GI’s” are, operating phone-patch traffic back to the States, or handling third-party messages in the same way. Unlike an ordinary American “handling traffic” the MARS station is set up especially for handling traffic, and if the operator comes up to work the world, he will be using a different callsign.

The very next letter is from G. Brazil (Dublin) who has a great beef about the MARS stations—and other Americans—handling phone-patch traffic. MARS stations are outside our bands (just) and so of no interest, but the normal “traffic” activity is amateur-to-amateur and so in our bands and a darned nuisance. We couldn’t agree more, but the W’s got that privilege years ago, almost before they knew their signals could girdle the earth, because the telephone service there is not a monopoly—and there is no doubt that the public-relations of an amateur with his neighbour are improved by the ability to pass on an urgent message. Also the countries to which traffic may be passed are clearly defined in their licence. All of this, of course refers to non-emergency traffic: when the chips are down in earnest, whatever the country and whatever the rules, amateurs will do all they can to help. Old-timers will never forget the epic of the Flying Enterprise and her radio-amateur

ANNUAL HPX LADDER
Starting date, January 1, 1977

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<tr>
<th>SWL</th>
<th>PREFIXES</th>
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<tbody>
<tr>
<td>D. W. Waddell (Herne Bay)</td>
<td>499</td>
<td>K. M. Rogers (Lutterworth)</td>
<td>371</td>
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<td>S. Hammond (Solihiull)</td>
<td>499</td>
<td>A. R. Darby (London SE16)</td>
<td>341</td>
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<td>Dr. H. Square</td>
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<td>P. Ramsey (Steventon)</td>
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<td>P. Sharpe (London W2)</td>
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<td>Mrs. S. Waterfall</td>
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<td>M. Shaw (Huddersfield)</td>
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<td>K. A. Burch (Plymouth)</td>
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<td>B. Shepherd (Staines)</td>
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<td>D. Hill (Crawley)</td>
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<td>G. Brazil (Dublin)</td>
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<td>G. A. Passmore (Pembroke)</td>
<td>393</td>
<td>L. Stockwell (Grays)</td>
<td>236</td>
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<tr>
<td>K. Piper (Bognor Regis)</td>
<td>366</td>
<td>P. Q. Armitage (Amersham)</td>
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Starting score, 200 Prefixes heard, in accordance with HPX Rules. All Prefixes to have been heard in 1977.
master, Kurt Carlsen, or the East Coast floods—bad enough for us, but a major disaster for the Dutch with so much of their country below sea level. It was in fact the aftermath of the latter which resulted in the formation of RAEN, and the facility in the G licence to handle traffic for the authorities in such a disaster. However, back to Gerard and his queries: \(1I\) and \(1K\) are off-shore islands belonging to Italy and as such not of any great rarity-value save to a prefix-hunter, while the \(2J\) call prefix has been allocated to the Republic of Djibouti when that area gained independence.

On a different theme, M. J. Thomson (Dundee) comments on the usefulness of a BC221 as a front-end injected BFO for use with any old transistor portable. True enough, and it has the further advantage that it can, by adjusting the spacing between the BC221 and the receiver, be made to provide injection of just the right quantity as well as quality.

Returning to that question in July about \(W6\) in the far off pre-1939 days, W6OJW points out that in those days \(W6\) covered California, Utah, Nevada, and Arizona. Alaska, now \(KL7\) was then \(K7\), while the now \(KH6\) was then known as \(K6\). Thanks, Bill!

Once again, Bert Glass (Plymouth) is threatening to give up, as he is finding it a bit hard to winkle out new ones on CW, and also Bert is of the opinion that his “pet” 21 MHz band has been under the weather of late; one might, just might, argue that proposition!

S. W. Allsopp (Banbury) has been a bit pushed for time lately, but has used some to go through his copy of Geoff Watts’ Prefix List and marvel at the value thereof for a keen SWL or for that matter transmitter. We would agree and, what is more, it is quite amazing just how easy it is to keep up to date given that you keep your back-numbers of DXNS. The writer was spurred into correcting his own copy from April-last to date, in a matter of five minutes, by working backwards until he picked up corrections already noted.

K. Piper (Bognor Regis) often has a session before he goes to work in the morning, hunting the \(VK\)’s—unless he forgets to get up! The latter is your scribe’s besetting sin also, come to think of it!

Another newcomer—we missed him in the sorting as his handwriting is a perfect double of the familiar fist of A. Nielson! R. Towson (Nottingham) has entered a claim for the “1977” in parallel with an All-Time one, as he was unsure as to whether he needed to appear in the “1977”; so we are showing him straight in the All-Time Post War HPX ladder.

Minimum starting score 200 heard for CW, 500 for Phone. Listings in accordance with HPX Rules, and only include recent claims. A “Nil” return is permissible to hold a place.

### HPX Ladder

#### (All-Time Post War)

<table>
<thead>
<tr>
<th>SWL</th>
<th>PREFIXES</th>
<th>SWL</th>
<th>PREFIXES</th>
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<td>J. Aspinall (Leeds)</td>
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<td>S. W. Nicklin (Lincoln)</td>
<td>1952</td>
<td>D. Taylor (Harborne)</td>
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<td>R. Shilvock (Kingswinford)</td>
<td>1600</td>
<td>P. Rooney (Liverpool)</td>
<td>737</td>
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<td>R. Carter (Blackburn)</td>
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<td>R. Towson (Nottingham)</td>
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<td>B. Hughes (Worcester)</td>
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<td>J. Fitzgerald</td>
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<td>L. Gibson</td>
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### Other Points

It has always been a marvel to this old scribe just how “het up” and argumentative people will be over the Phone/CW thing; just today a friend was saying he would take the course for a Yachtmaster certificate but not the exam because it contained Morse at four w.p.m. Other others who confined themselves to “just a list” with no comments on the usefulness of a BC221 as a front-end injected BFO for use with any old transistor portable. The fact that so many prefixes of the 9R59DS and their improvement—we’ll print ‘em if anyone will come up with something suitable.

A CW log from J. H. Rosling (Bakewell) seems to be about round off the letters this time, save for those others who confined themselves to “just a list” with no comment. On this point, Mr. and Mrs. Jane of East Looe have two entries each, having just missed the boat to the authorities in such a disaster.

But seriously, one forever wonders at the postures being right. Other Points are bandied about as subjects for argument and debate. Perhaps, here in “SWL”, we can recite some of them. In fact, YL’s as radio officers are about, and it’s not that long ago that we published a photograph of a YL R/O.
arguable points which are largely matters of preference anyway. Fact Number One is that for a given path a CW Morse signal will convey information at the lowest power level; the reason lies in, firstly, the fact that the "modulation" is always 100 per cent, the carrier switching on and off, and secondly because with a modern receiver tailored to CW, there is a minimum noise bandwidth to take into account — noise of course in this sense being equally distributed across the pass-band of the receiver; thirdly, Morse CW signals are more tolerant of poor receiver-operation, as compared with, say, SSB although one has to admit that the human ear might protest a bit at the result. Fact Number Two is that, while SSB is far more able to cover long distance or QRM-filled paths than AM, with the best will in the world it needs a bigger signal to be laid down at the receiver simply because the intelligence is contained in varying amplitudes of signal and the fact that there is no "redundancy" while CW, having benefit of redundancy, can be copied by any reasonably capable pair of ears at a level such that the key-down signal is equal to the noise level, and even lower for a skilled operator. Fact Number Three is the "elitism" aspect: any person with a R.A.E. pass and a licence is part of an elite to the chap who just builds two-transistor amplifiers from one of the comics — this is why the latter is for ever bleating about "why can't I have a call without passing the R.A.E.??" Similarly, within the amateur field itself, we have elitism: at the bottom of the pile comes the G8 with his "B" licence, in the middle the "A" licencee, and at the top of the pile the /T chaps. Long may it continue so — the fewer people in populous countries like ours who have an "A" licence the better, so that the CW operator finds himself in a better situation with respect to QRM, with respect to "lid operators" and with respect to pirating of any sort. Once that is away, then all that is left is personal preference!

Second Wave

Since we were daft enough to set a Sunday deadline for you all, the mail was divided into those who assumed J.C. meant Saturday and those who opted for Monday — we've dealt with the first group, now we have the second wave!

First we have H. M. Graham (Harefield), who collected a prize funny-man when he heard (on Eighty, where else?) "MUW" asking amateurs to clear off his frequency and calling QRZ with no replies audible. Probably some type of military or Cadet Force station. An oddity on 14 MHz was 8P30H, no location given and no-one heard anything but "AE4WDF signal is on 14.40 MHz."

Afinal-final is from D. L. Mallet (Maidenhead), who indicates that he could thereby obtain a suntan while sitting on the top of sunny Welsh mountains listening for DX!

P. Q. Armitage (Amersham) was led to the path of QRM by the pi- rating of any sort. Once that is away, then all that is left is personal preference!

P. Rooney reports this time from Littleton, Chester; studies at Oxford were successfully completed and then there was an almost instant QSY to the College of Law in Chester, so that yet again there just has to be a nil return. Meantime, Philip wants to know how you measure a minus quantity like spare time!

S. Foster (Metheringham) finds less time to operate at night now, as the junior op. sleeps right through! Stew encloses a note from G3XCS concerning various old suffixes which may be heard tacked on to the end of W calls. It seems that if a station upgrades, say, from Novice to General class, or General to Extra, he is given the rights of the new class immediately. To avoid him being noted by FCC monitoring stations, he tacks a two-letter code on the end of his callsign, for example W4DQD, operating in the General class part of the bands after upgrading from Novice, would sign, on CW, "W4DQD/SV" or on Phone "W4DQD interim SV." Since the SV is a two-letter abbreviation of the location of the office where the deed was done, and since FCC have some 24 such offices, the possibilities of errors in prefix claims are obvious. Two at least of the offices have codes like amateur prefixes: SV for Savannah could be mistaken for SV Greece, and PA for Philadelphia could be taken as a PA Netherlands.

P. Q. Armitage (Amersham) was led to the path of ruin by his teacher, John Fitzgerald, who got him reading such things as radio magazines; the reading was followed up by a receiver, and then an aerial. Quentin wants to know whether there is a fully described 80-10 metre trap dipole in the literature which has a top 100–130 feet long. Well, the thing which in the U.K. is often called the "KW trap dipole," as it is commercially made by KW, is known in the States as the W3DZZ design, and all the details have been published. However with 130 feet to play with, there are all sorts of devices possible, such as for instance a quarter-wave against earth, or a "GSRV" aerial.

M. Shaw (Huddersfield) managed to "lose" three prefixes in the course of making-up an index system, and so asked would we send him initial entries back to him for checking. This we have done — but we must make it clear from now on we will not be able to continue the practice, owing to the high cost of postage, and the time spent of necessity in scratching about in the archives — we like to do a bit of SWL-ing ourselves!

On now to P. L. Shakespeare (Foulness), who has been tackling both the phone and the CW ends of the bands, with intermissions of — wait for it! — decorating and house repairing.

One of the best reasons for running a two-metre ladder we have ever heard comes from R. E. Thomas (Gwyddelwern), who indicates that he could thereby obtain a suntan while sitting on the top of sunny Welsh mountains listening for DX!

A final-final is from D. L. Mallet (Maidenhead), who points out that the USA MARS stations discussed earlier in fact operate out of our bands — for example the AE4WDF signal is on 1440 MHz.

Finale

Which is where we come to the deadline date for next time — make it Friday, November 11, to give us a reasonable allowance for the inevitable delays in Christmas mails between ourselves and the printers, and also the long Christmas break. Meantime, enjoy yourselves — at the time of writing this N4XX predicts a solid week of High Normal conditions, and it looks as though things could be quite fun on the bands over the Christmas period. The mailing address, as always, is to "SWL," SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.
TIME-OUT WARNING CIRCUITS
A. B. PLANT, B.Sc., C.Eng., M.I.E.E., G3NXC

To many operators using the VHF repeaters, the time-out blips are becoming a depressingly familiar feature of their contacts. In an attempt to avoid the problem, numerous amateurs have built themselves simple timers which give some form of indication when the 60-second allowable period has elapsed. The usual comments heard over the air about such devices relate to the lack of consistency of the timing period or to the fact that the circuits do not give any warning of impending time-out. In the following article, the author shows why the simple circuits can be very inaccurate and describes a more accurate system. A more complex circuit, which gives an indication of impending time-out, is also described.

Simple System

The 555 integrated circuit is often used for timers of this type, as shown in Fig. 1. Initiation of the timing period occurs when the +12 volt supply is switched on, the trigger pulse duration being determined by the time constant R1, C1. At switch on, the output of the 555 is the trigger pulse duration being determined by the time period occurs when the +12 volt supply is switched on, this type, as shown in Fig. 1.

Stable Simple Circuit

Feeding the 30°C figures into the appropriate equation shows that the time period would extend to about 86 seconds at the higher temperature. If the leakage current increases by 30 per cent (and the temperature does not have to increase much beyond 30°C for this to happen), the circuit would never time-out.

![Fig. 1 SIMPLE TIMER CIRCUIT](image)

The 555 integrated circuit is often used for timers of this type, as shown in Fig. 1. Initiation of the timing period occurs when the +12 volt supply is switched on, the trigger pulse duration being determined by the time constant R1, C1. At switch on, the output of the 555 is driven high thus holding off VT1. When the time period is completed, the output goes low which turns VT1 on and activates the warning device. From the 555 data book, it can be found that the time period, t, is given by the expression: t = 1.1 x R2C2. The data book also recommends that, for a 15-volt supply, the value of R2 should not exceed 20 megohms.

Using the above equation, values of 5M6 and 10 µF give an answer near enough for all practical purposes. For the capacitor to be of reasonable size and price an electrolytic type is usually chosen and this is where the problems start. Electrolytic capacitors tend to suffer the twin disadvantages of high leakage and high temperature coefficient of capacitance.

Consider the circuit of Fig. 1 using a 10µF 25 volt electrolytic capacitor whose leakage current is defined as I = V/15 + 0.6 μA, where V is the voltage across the capacitor (this is realistic for an aluminium capacitor run up to 33 per cent of its rated voltage). The first sign of the problems to come would be that with R2 set to 5M6 the circuit would never time out. To get the circuit to give a 60-second period would require the value of R2 to be reduced to about 3M.

Homing to adjust the value of R2 to yield the correct time is not too serious—as long as the constructor is aware of the need to reduce the value by such a large amount. More serious are the effects of the temperature coefficients of leakage current and capacitance. Some typical data show that raising the ambient temperature from 20°C to 30°C causes the leakage current to increase by 20 per cent and the capacitance to increase by 5 per cent.

December issue will appear on Friday, November 25th.
can be run in its normal mode and VR1 adjusted until a 60 second period has been achieved. The second method is usually the easiest to carry out, but requires a plentiful supply of black coffee!

Timer with Pre-warning

Whilst the ZN1034E circuit can give the accuracy required for the repeater time out application, the action is still of the "sudden death" variety. The circuit of

![Table of Values](image)

**Table of Values**

**Fig. 2. Stable Timer Circuit**

- \( C_1 = 0.1 \mu F \)
- \( R_1 = 180 K \)
- \( R_2 = 820 R \)
- \( R_3 = 2K2 \)
- \( R_4 = 10K \)
- \( VR_1 = 100K \)
- \( TR_1 = BC108 \)

**Fig. 2 STABLE TIMER CIRCUIT**

![Warning device](image)

**Warning device**

+12V

+9V

0V

+9V

0V

+12V

![Diagrammatic representation of timer operation](image)

**Fig. 4 DIAGRAMMATIC REPRESENTATION OF TIMER OPERATION.**

Fig. 3 is more complex than those described previously but offers the advantage of a 10 second warning period prior to the 60 second time out signal. The heart of the circuit is a CMOS 14 stage binary counter and the basic operation is similar to that of the ZN1034E.

Inverter gates IC1A and IC1B form an astable multivibrator oscillating at about 170 Hz, the frequency being determined by \( R_5 \), \( VR_1 \) and \( C_1 \); inverter IC1C is included to buffer the oscillator from the rest of the

![Table of Values](image)

**Table of Values**

**Fig. 3. Pre Warning Timer**

- \( C_1 = 22n \)
- \( C_2 = 1 \mu 30v. \)
- \( C_3 = 0.1 \mu \) disc
- \( C_4 = 68n \)
- \( R_1 = 220R \)
- \( R_2 = 27K \)
- \( R_3 = 27K \)
- \( R_4 = 330K \)
- \( R_5 = 100K \)
- \( R_6 = 82K \)
- \( R_7 = 330K \)
- \( R_8 = 33K \)
- \( R_9 = 6K8 \)
- \( R_{10} = 3K9 \)
- \( VR_1 = 47K \)
- \( MR_1 = 9\frac{1}{2} \) volt zener
- \( MR_2, \)
- \( MR_3 = 1N914 \)
- \( VT_1 = BC179 \)
- \( VT_2 = BC108 \)
- \( IC_1 = CD4049 \)
- \( IC_2 = CD4011 \)
- \( IC_3 = CD4020 \)
- \( MBT = Mini Bleep tone (see text) \)

![Diagram diagram](image)

**Fig. 3 PRE-WARNING TIMER CIRCUIT**
Table of Values
Fig. 5. Simple Tone Generator
R9 = 2K2
R10, R11 = 82K
C5 = 4n7

circuit. With the trigger input held at low the counter, IC3, is held in the reset condition; in this condition, Q8, Q12 and Q14 are low which results in the outputs of IC2B and IC2C being high, hence holding off the warning device (MBT). When the trigger is taken high, the reset signal is removed from IC3 which then starts to count. After the appropriate time period, Q14 goes high which enables IC2B and IC2C; as Q14 goes high, Q12 goes low thus continuing to hold IC2C output high. IC2B, being enabled, lets through an inverted version of Q8 which causes the output device to be "bleeped" as the repetition rate of the Q8 output.

Eventually, the Q12 output goes high which causes the output of IC2C to go low and hold the warning device on. With the output of IC2C low, gate IC2A is disabled thus preventing the clock pulses reaching IC3 and hence latching the circuit into this condition.

To the user, the effect of the circuit is that for 50 seconds after triggering it, the warning device is silent; it then gives seven bleeps over a 10 second period after which the device comes on and stays on until the circuit is reset. Fig. 4 shows the operation in diagrammatic form.

It can be shown that the time from initiation to the start of the first bleep is \(8320/f\) and to the start of the continuous tone is \(10112/f\) seconds, where \(f\) is the frequency of the astable multivibrator; with the frequency set for an overall period of 60 seconds, the start of the first bleep occurs at about 49\(1/2\) seconds. The trigger input terminal may be connected to the +12 volt supply, in which case the circuit operation is initiated by switching the supply on. If the circuit is to be used in this way, it is important to keep the values of C2 and C4 to those
shown; with C2 made too large or C4 too small, the reset signal for IC3 will go low before the power supply has had time to stabilise and the circuit may not function as expected. However, if the circuit is to be operated from a constant supply and the trigger switched, C2 may be any convenient value above 1 µF and C4 could be reduced to 470pF or less. Diodes MR2 and MR3 prevent transients on the trigger line causing damage to the input of IC1D. The VDD supply for the CMOS circuits is generated by a 9.1 volt zener diode as shown in Fig. 3.

The circuit has been designed to operate a low power high-intensity warning device. In the author’s unit, this device is a Mini-Bleeptone manufactured by A. P. Besson of Hove. They require very little power, about 5 or 6 mA from a 12 volt supply, but deliver a very penetrating note. An alternative arrangement could be to use the spare two input gates of IC2 and one of the spare inverters of IC1 to form a gated oscillator as shown in Fig. 5. The output signal, which is at about 1870 Hz, can be fed to an audio amplifier to produce the warning.

Construction

A printed wiring board was used by the author to interconnect all of the components except an on/off switch and the Mini Bleeptone; this printed wiring board, the layout of which is shown in Fig. 6 is 3.2 by 2 inches. Fig. 7 shows the disposition of the components on the circuit board and the interconnections between the board and the external devices. If the CMOS devices are to be soldered directly to the circuit board, the usual precautions need to be taken, i.e. the soldering iron bit should be earthed and the IC’s mounted after all of the other components.

The Mini-Bleeptone has three flying leads: two of these, coloured red and black, are for the supply with the red lead being the positive connection. The third wire, coloured white, may be connected to either the red or the black lead. If the former connection is used, the device gives out a single high pitched tone. The other option results in a lower frequency modulated tone. Which tone to opt for is a very individual matter and the author would advise intending builders of the circuit to try both options before committing himself.

A standard plastic equipment box, of approximately 4.5in. x 2.5in. x 1.5in. can be used to contain the components. Figs. 8 and 9 show the assembled unit with and without the lid fitted. The 12 volt supply and trigger signal, if the latter is required, can be fed in to the rear of the box via a 3 pin DIN socket; most FM transceivers have some form of output available on their rear panels when the rig is transmitting. This output may be in the form of either a +12 volt supply or a pair of relay contacts. For the case of the +12 volt supply, the trigger input should be linked to the supply, as shown in Fig. 7, and the supply taken from the switched +12 volt signal. If relay contacts are provided, pin A of the printed circuit board should be connected to a fixed +12 volt supply and the relay contacts connected as shown in Fig. 10.
COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

Since last writing a CDXN, your conductor has had a pleasant holiday in which he enjoyed a session with G3UZZ but for one reason or another didn’t quite make it to see G3RPC; walking the lanes and paths without a thought for either the Magazine or for radio of any sort was the main part of the prescription, even though we may have missed some pleasing conditions on the bands. And, praise be, we are definitely beginning to see the upswing owing to the new sunspot cycle; the general indications now that we can see the whole form for 1976 are that the two bottom months were March and June 1976, both with smoothed numbers of 12·2; thus March 1976 is being taken as the start of Cycle 21, which makes Cycle 20 to have lasted 11·5 years. At that time, solar flux figures day by day were doing well to get up to seventy, while the reports for mid September 1977 show periods of a week or more where the flux had not dropped below 100—so, keep trying!

Ten Metres

Our regular observer, G2ADZ (Cheshington) sent a couple of reports; his first, through the system, we haven’t yet got to hand, but the second one was sent direct to let us know that the week-end of October 2 was a real humdinger, with all continents heard, and a wandering gremlin in the transceiver which meant his best was about five watts; VK5GK was ragchewing with a G for quite a while; YU2KVI was calling CQ in the Phone section while a G station called CQ DX right on top of him, UAJ9’s, UAO’s, UL7AAB, and an HL with a lot of QSB on his signal; from Africa 5R8AL, several ZS, of which Bill managed to attract ZS6DL and 9G1JN; some weak W’s from Four-land, and weak Europeans. The band was open as far as G2ADZ was concerned from 0830 right through to 1950 clock-time. An interesting thing about it was the number of G stations who came out of hibernation, when normally they just don’t appear to surface. Odd . . . Returning to the matter of that gremlin, one seems to recall that the things bred in the bottom of Fremlin bottles and danced up and down the wings of Merlin-engined aeroplanes bringing all sorts of “interesting” problems in their wake; the G2ADZ one probably popped out of a bit of war-surplus in the junk-box after the warm weather had brought it out of hibernation.

Those 21 MHz attic aerials of ex-G2JC (Horndean) work quite well on 14 and 28 MHz too; South Americans and ZE, VP9BA and a station on the same frequency sending VE0UNEEEA; the grand opening seems to have begun on September 30, on which a couple of ZS signals were logged; then on October 1 and 2 a couple of short sessions at the receiver produced more ZS’s, ZE1CB, ZE3JO (nice to hear of Mal again), ZC4IO, 5R8AL, all CW, while on SSB JY3ZH, UA’s including UA9CAS, ZS’s, 4X4, 7P8AC, 9G1JX, and 9J2GJ were all booked in.

We have already mentioned the second letter from G2ADZ; now we have the first one to hand through the system, which covers the month of September. G2ADZ reckons the band just couldn’t make up its mind, as there were six blank days; six short-skip days, DX worked/heard on thirteen days, sometimes overlapping the short-skip, and five days when DX beacons were to be heard but nothing else. The openings when they did come along were in the evenings, and built up suddenly to give contacts with PY2WUZ, 4X4BS, PY1ZAE many times, 9G1MK, 4X4WF, ZE2JW, HK0BXX, and LU5DON; also ZS6DL and 9G1JN. On the Gotaway front one notes a couple of VP8’s. On September 19, there was an opening to North America, but the skip seemed to be favouring the Germans and G2ADZ didn’t manage to raise one although hearing W1, W4, W8 call areas, plus S9 from PY and S9-plus from 5T5ZR.

During a QSO with PY1ZAE, Bill received the information that the PY beacon, PY1CK had been QRT for over a year.

Top Band

We have already made a few comments on the band, in the pre-amble, but we have reports from various parts to add to the tale. GM3YOR has been somewhat restricted as to his operating time since he returned from the far North, but he still managed to improve his score in the Table—actually the improvement is not, sad to say, as much as it looks since Drew has to admit he forgot how to score his entry properly. On a different tack, Drew and Dave, GM3OLK are looking into the possibilities of doing OY and TF for their DX-pedition next year, covering all the bands from Top Band right through to 432 MHz. They ask if anyone has ideas on who are the right people to contact for licences and other matters they can hear from them.

Like so many of us, G2HKU (Sheppey) has been a wee bit “under the weather” during the last period. In addition the home-end mast is down for overhaul, which has brought one end of the “G5RV” aerial down to seven feet high; this doesn’t seem to make a lot of difference to the signals in either direction, but with the feeder in the apple tree much of the RF is busily cooking the apples, and when the weather is a little wet, the VSWR indicated dances a hornpipe. Nonetheless, PA0PWN was worked on SSB, plus CW QSO’s with GI3LFH, G13JPDN, OL4ATY.

Steve at G4EDG (Newton Abbot) continues to be surprised at the things happening to him on this band. One annoyance was to do several late night stints and hear strong W’s, who couldn’t be raised as they clearly weren’t tuning the low end. What, Steve plaintively enquires, can one do about it? One supposes a call on their fre-
quires how many noticed the way (Peterborough); an odd comment on Eighty is G2NJ; grab the first VK on Twenty also; much of a thrill to work K2NN and TS-520; John says it was almost as indoor dipole driven by the trusty (Paisley), he having for; at the top by about eighty feet of the aerial at Newton Abbot is in 9H1CG, and between them these more, this time with a nice solid a call of CQ ZL raised ZL3GQ once Overslept on October 2 because of him a call in response to the CQ. ZL3GQ, this time at 0549, giving morning, and was amazed to hear tried a CQ or two the following fired around 0618 ZL3GQ was heard at through the September period with- he knows of at least one operator who realised. are getting out better than they know of at least one operator who knows of at least one operator who has missed several DX QSO’s through not listening in the DX segment; but one should take care about this sort of thing lest the idea of the DX Window become swamped by local QSO’s on either side of the Pond. G4EDG had better luck in the opposite direction, though as a result of hearing a lot of chat about ZL contacts among the eighty-metre rag-chews. So, he spent a while searching all through the September period without any luck, but on the last day around 0618 ZL3GQ was heard at a strength of around RST22. This fired the imagination, so Steve tried a CQ or two the following morning, and was amazed to hear ZL3GQ, this time at 0549, giving him a call in response to the CQ. Overslept on October 2 because of lying awake half the night wondering about it no doubt, but on October 3, a call of CQ ZL raised ZL3GQ once more, this time with a nice solid 569 both ways, after which ZL3GQ was heard to call N6DC—no sign of the N6DC signal was heard though. Other QSO’s during the month were with PY1RO and 9H1CG, and between them these have raised morale considerably at G4EDG! As a matter of interest, the aerial at Newton Abbot is in fact the 7 MHz ground-plane, loaded at the top by about eighty feet of wire.

**Eighty Metres**

One very pleased GM reports for the first time, namely G4M4EQY (Paisley), he having for the first time managed to get across the Atlantic on Eighty SSB, using an indoor dipole driven by the trusty TS-520; John says it was almost as much of a thrill to work K2NN and W1ZY like this as it was earlier to grab the first VK on Twenty also with an indoor dipole.

One reader who never misses the odd comment on Eighty is G2NJ (Peterborough); this time he enquires how many noticed the way the band went completely dead from around 1100z to 1330z during which period neither he nor G2CAS could find any phone or CW contacts, although 7 MHz was still yielding at least an SM6/MM calling another SM. Incidentally it is rather amusing to see the way that G2NJ/M operates—he sits on the back seat working CW on 14 MHz with a Uniden rig while G5NX/M up front takes care of the two-metre Phone stuff. On an entirely different theme, G4DQA, who is on leave in Sunderland, has been making enquiries about a /MM licence; he is after a British call, but is operating from a foreign tanker.

One or two excellent days, avers G4DMN (Wirral), with KH6XX at 0615 as prize of the month. However the band has suffered from some degree of disturbance but other QSO’s, all SSB, included C6AEY, DK3AD/W3, EA9FE, EL9ON/MM/2, KP4DDO, HU2HL, KP4EH, PJ2FR, YV1AVO, YV4YC, DL2RL/YV, VE3PET, X01FG (VO1 in disguise), ZD8EW, ZD8RR, ZL4AP, 4Z4DT, 4Z4MQ, 9K2DR, 9G1JX, 9G0ARS and 9Y4NP.

Now we turn to G2HKU, who seems to have bought some new batteries, insofar as his QRQ input is now up to 3 watts, with which he made G3LFH, G13PDN and OL4ATY, CW of course.

**Forty**

Perhaps the first surprise here is in the heading to the letter from G4EAN (Nottingham) who hopes his letter will reach us in time for the December issue—clearly no faith at all! Last time round Ian was complaining that the SWR on his aerial had suddenly rocketed up; the problem was resolved fairly easily by re-soldering the duff connection in the co-ax PL259 plug, and the rather wistful thought “Wish I could solder! “However, hope is not given up yet, and Ian hopes to get the 18AVT trained before the winter is out.

Trying QRQ on Forty seems a good way of driving one’s self round the bend, but a surprisingly large bunch do this with some degree of success, notable G2HKU who offers SM5AHK.

Stick to the key if you want to work some real DX, advises GM3YOR, who used this mode to work EP2SV, N2US, K3EST, UL7CAD and PY7AOW.

- Next we have G4GIE, who is down to half power as compared with Eighty on this band, with 240 milliwatts output to a Joystick which combination offered him contacts with DJ7WJ, DM2CZJ, DF1HF, ON5VC, G3OSZ, DF3LG, DA2SL, DL8YT, YU2BOP and F6COB. Meantime the old rig stands to suffer some competition, as we are given to understand that an HW-8 is on the stocks for some more band coverage. On now to GW4BLE, who only made one attack on the band with the specific intention of working the Galapagos Is. DX-pedition, an ambition which was not achieved (Snap!); on the other hand, as a sort of consolation prize, SSB QSO’s were made with KZ5DG and LUSO.

Another one who didn’t listen much was G4DMN, although he does admit to a couple of morning sessions which brought him SSB QSO’s with HC1AL, HBSRH, OA4VR, PJ2FR, VK2WC, VK3BKM, VK7CK, ZL3GQ, ZL4JJ, WA1SQB/V9 and 9G0ARS.

It is now forty years since G6TC (Wolverhampton) first got his ticket, and Ted is as active as ever; at the moment it is 7 MHz where the DX is being hunted, and the month brought in 50 VK/ZL QSO’s, the star turns being VK3MR and VK3VJ, both of whom have been worked in the morning and the evening times. In addition, Ted notes W5, W6, W7, VE5, PY, LU and KH6, all worked on CW with an inverted-vee dipole fed with balanced feeder.

**Strays**

An interesting come-back to that piece about Poldhu (October issue, p. 475) came in the letter from G3CED, writing basically to note that work is far too thick on the ground for him to spend time on the air; George says he recalls the broadband effect of spark being used during W.W.II, as a means of, hopefully, putting off the early radio-controlled flying bombs being thrown at H.M.S. Beaufort; because the control frequency was not known, they rigged a primitive and quite untuned fixed spark which, if nothing else, clobbered all channels
**TOP BAND/TEN METRES COUNTY/COUNTRY LADDER**

Starting date January 1, 1977

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<table>
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Scoring is on the following basis: one point per county worked on SSB, two per county on CW, three per county worked on AM; two points for county AM/SSB QSO’s, each to end score two points in the appropriate column for the mode used. No other cross-mode working permissible. Countries score one point each regardless of mode.

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Verulam Club Contest is down for a four-hour shortie, 0900 to 1300Z, the two-metre one dated November 27, and the Top Band one December 11—details from G4DUS at the appropriate address which is given in the Club Secretary's box associated with the "Clubs" piece.

The CQ WW DX Contest has its Phone leg on October 29/30, and the CW one November 26-27, from 0001 Saturday to 2359 Sunday all times GMT of course. Exchange RS(T) report plus your CQ Zone. QSO points three for each one outside your own continent, same continent one point, same country no QSO points but one for the Multiplier. Multiplier to be one for each Zone worked, and one for each country worked. Final score is the sum of the total QSO points, times the sum of the Zone and the Country Multiplier. Logs postmarked before December 1 for the Phone or January 15 for the CW contests to CQ WW DX Contest Committee, 14 Vanderventer Avenue, L.I., N.Y. 11050, USA.

Looking at the Surprises, one of the first is hardly in the category of a surprise, that those 3V8P contacts included a rubber QSL, bouncing straight back; on the other hand, we hear that after all this time, some WG1JKF QSL cards have surfaced. Changing the subject dramatically we have it that VS6DA, during a recent VK trip, broke the world record for a hot-air balloon by rising to 30,500 feet, some 500 feet above the previous best; contact being maintained up to 1200 feet as VK6XB/BM with VK6RU, while VK6AO was in the ground crew.

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**Fifteen**

Not unexpectedly it's been a bit up-and-down, with most of the activity in a North-South polarity, but it has been doing its stuff in a far more enthusiastic-making way than of yore; so let's look in the box.

GW4BLE found it in very good shape, even opening on occasion to the West Coast USA. SSB was used to hook up with 3D6BP, VP8PL (S. Orkneys), KPBI, KP4BPJ, S88TH, Z5OBDN, Z5SM, FR7BI, 5H3KS, 5Z4KW, 7P8BC, A2CZV, EL3T, SU1CR, 9G1JX, 9G0ARS, VU2DK, 9K2DR, 4Z4MQ, K6NA, ST0RK, ZE1CH and 9J2WS.

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"CDXT" deadlines for the next three months—

December issue—November 3rd
January issue—December 1st
February issue—January 5th

Please be sure to note these dates!

Openings to the West Coast are also mentioned by G4DMN, who connected with A4XHA, GD3FXN, GW4BLE, HZIAB, HK3AWY, JRI, N6KA, S88TH from Transkei, K5UT, WA6NGJ, W2FXY, K8SA (Colorado), YN1PJ, ZP5RA, 4Z4MQ and 9J2CB.

"Varying from very good to very bad" about sums up the views of ex-G2XC; he heard A2CVL, HD8CD, JA's, K0WIQ/DU2, KG6JHII, KX6BU, P29BB, P29JF, S88TH, VS6HF, lots of W6 and W7, several YB's, Z5SM, 5H3KS, 5V7VT and 9N1MM.

G3N0F, cautiously, says he has found conditions good at times. Morning openings both long and
short paths to JA, Africans in the later afternoons, preceded by openings to VU, AP, 9V1 and so on, with the usual North Americans from noon to midnight, but with deep QSB and fading out. South America has been noted later in the evenings, all adding up to QSO's with C5AAP, CE1NF, CE3PY, CP1BP, CX6AM, KK3DFT, K5EJO, KH6JUD/VQ9 (Diego Garcia), KP4DLC, KP4ERR who got this call for the Virgin Islands out of the FCC computer instead of the more usual K7Y prefix, LU6DWA, N7ZL/PT2TF, PY2AKJ, PY8J0, S88TH, VP2AZB, VP2SAG, VU2KMK, W4AFZG/KV, WA7NJI, WB5SFS, WD5BHA, WB5DKS, ZD7SD, ZP5CBE, ZS1FEZ, ZS1JJ, ZS6HE, 9J2WS, 9L1NP and 9L1SE.

A first report from an old call: G2DHV (Sidcup) back on with 50 watts to a dipole. George offers SM7EDI/MM, VK8GG, VR4BT, W5QKZ, ZP5AP, ZS1EZ, ZS1JJ, WD5BHA, WB5DKS, ZD7SD, ZP5CBE, ZS1FEZ, ZS1JJ, ZS6HE, 9J2WS, 9L1NP and 9L1SE. Twenty contacts were on SSB, of TVI complaints which were thought to have been cleared up years ago. Nevertheless there were a few W7's in the log, with a W7 notable, LU, PY, plus an early-morning long-path opening to VK5QG. On a different tack altogether, Shaun mentions that he took his rig to EI with him for the summer holiday. To Get an EI licence one has to apply for each band separately, and Top Band is the subject of a special permit under the Wireless Examiners Act and needs a good reason and several weeks delay before one sees the permit turn up. It also takes several weeks to get any sort of “ticket” through and G3ZSU thinks it is not unreasonable to allow three months after the forms have been filled in. An address is required and it should be transmitted upon the commencement of each QSO and at every thirty minutes.

GW4BLE found things excellent in the mornings over the long path, which in any case is his best take-off area. All contacts were on SSB, with FM7WV, FP8DF, P29JS, VS6MM, 9L1JM, HD8GZ, C9MDB, KZ5JM, TI2CAP, H8MDBG, YN1KL, VP2LDD, VP2LDJ, S88TH, PJ3BW, HI1JC, 9Y4LR/M, 9Y4NP, 4079WARC, VU2DK, PJ2FR, 9G1JR, 9G0ARS, 5V7WT, F88ZL, YS1RRD, YS1GMY, CP1AT, 8P6FU, HP1SI, OA4BI, OA7MZ, JY9VK, VK1 to VK8, ZL1-4.

Like pretty well everyone else, G4DMN mentions the longpath JA openings around 0730z. Richard worked C6AEB, HD8CD, JA, HC1BL, JE1ISSE, VK2-VK6, ZL, 4S7DA, 7P8BC, K4YT/8R1, 9M2DW, and 9M2EE.

In a rather throw-away line, Ted, ex-G2XC remarks that his pair of "W8JK" aerials in the loft for 21 MHz also function, for listening at least, on Twenty, although the directivity is not quite so good—and different. Nevertheless VK's and ZL's have been heard.

The later band-openings mentioned previously caused G3NOF to ask his locals, and their observations tallied nicely. In the mornings the JA's are in by 0730z, preceded by VK/2L, and some West African openings have been noted at this time too, although not much from the Pacific (which G3NOF reckons might be in part owing to the effect of his new working-hours). SSB QSO's have been made with DK1YG/HB0, DU1MEL, HZ1TA, HZ1TB, J4LCK/IH9, K7LUH/CY6, KL3CH, KL7HQW, N7ML, P29JS, TT8SM, TU2GA, U6OS, UK0LAD (Zone 19), UW0NE also in Zone 19, VE6TD, VE6UX, VK3ABH, VK3AGG, VK3MO, VK4J1, VK5QI, W6RHC, W6QKZ, W5TYQ (New Mexico), W7APA, W7LQQ, W7OF, W7VF, WA7GVM, WA7LCP, WB70FO, W7MR, both in Utah, WD9AOY in Colarado, ZL2NY, 4079WARC, 9G1JX, and 9G0ARS.

For G4EAN there is the promise of more next month; but for the moment Ian has had to be content with VO1FN, VE3FMI, VE6DX and VP9IR.

Up in the Kingdom of Fife GM3YOR came out fighting, the CW going out to overcome EP2IA, DL2RL/YV6, LU6ACA, LU9FAZ, PY4CZ, UK6KAA, UI8LBA, UA9ABV, UK9CBD, VE1BKB, W6PN, WA6TLA and 8P6IM.

**Twentys**

Last this time, but by no means least—in fact the picture overall is livelier than one has seen for quite a while.

Our first reporter this time is G4DJY (St. Annes-on-Sea) who mentions heavily restricted operating time at the moment, although the attempt is made to get on for a half-hour daily. Stations worked included contacts in all continents although, as he says, none of them is "much to write home about" save for CR9AJ and P29JS. The countries score is now up to 130 worked, and 91 confirmed and—he has operated phone this month!

G4GIE is down to 240 milliwatts by the time he reaches 14 MHz, but he still managed to get through to ISOYDD, UA1QAU, UBSZP, F8PM, F6BRF, DK9AY, DK8EI, HA7KTM, UK3MBQ and UW3ZK.

Next on the list is G3ZSU (Maidstone) who says he has thrown away the Top Band aerial and put up a Delta loop on Twenty. He had a go with it one evening and got a spate of TVI complaints which were thought to have been cleared up years ago. Nevertheless there were a few W7’s in the log, with a W7 notable, LU, PY, plus an early-morning long-path opening to VK5QG. On a different tack altogether, Shaun mentions that he took his rig to EI with him for the summer holiday. To Get an EI licence one has to apply for each band separately, and Top Band is the subject of a special permit under the Wireless Examiners Act and needs a good reason and several weeks delay before one sees the permit turn up. It also takes several weeks to get any sort of “ticket” through and G3ZSU thinks it is not unreasonable to allow three months after the forms have been filled in. An address is required and it should be transmitted upon the commencement of each QSO and at every thirty minutes.

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**Finale**

You have it all there for this month; for the next offering look into the box in the body of the column, which gives the dates. Address, as ever, is to CDXN, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Till then, good DX.
THE QRP SCENE, 1977

Worldwide Activity

Following a period of ever increasing effort and enthusiasm the United Kingdom has emerged as the world centre of QRP activity, closely followed by the Western European mainland. In the UK most activity revolves around the G-QRP Club which during the past three years has built up a membership totalling 19 countries. Main centre of West European mainland activity is the Benelux QRP Club, embracing the Belgium/Netherlands/Luxembourg complex, and the QRP section of the German CW activity group, which also includes HB stations. Although not yet formally organised there is also considerable activity in France, and during QRP contests the Italians, Czechoslovakians and East Germans appear in considerable numbers. Adding to this widespread activity in the U.S.A., Japan and other areas, produces a picture of steadily increasing world-wide QRP operation.

DX Working is Commonplace

To many QRO operators the words “QRP contact” conjure up a picture of two stations desperately trying to hold an RST 339 QSO over a distance of 100 miles. Nowadays nothing could be further from the truth. Some examples may illustrate this point: in the 3 watt class, DJ1ZB, G3KPT and G8PG already have over 50 contacts confirmed, and many other stations are near this total. During the January 1977 DL QRP Contest GM3OXX, running 2 watts to a dipole, worked 28 countries and four continents on 14 MHz in 15 hours; in the same contest G4BUE turned in a score which is likely to be an all-time record. In the mobile field, OE1SB has worked some outstanding DX with a 5 watt rig in a VW Beetle. Portable-the-hard-way is represented by DL7DO/P who likes to operate from above the winter snow line: his sji-carried 28 MHz milliwatts have produced some outstanding contacts, often when the temperature was so low that the batteries had to be carried next to the skin to prevent them freezing! Also in the milliwatt range the work done by G4AYS will be familiar to all readers of CDXN. In an equally difficult environment, G4EZF enjoys his QRP with the aid of some lengths of wire in the roof space of his council flat, energised by the 5w. c.c. rig recently described in the Magazine.

VHF/UHF not Forgotten

While a great deal of QRP work takes place on the HF bands, VHF and UHF are not neglected, with many G8+3s and others consistently using low power. One outstanding contact was the UK-Canada QSO achieved by G3NEO when using 5w. on the 70 cm. Oscar up-link; various other 5w. space contacts were also made. This work, plus consistent performance on other VHF and HF bands won G3NEO the G2NJ Trophy awarded annually by the G-QRP Club. These low power contacts via Oscar have another significance, however: the next generation of amateur satellites will allow access by tens of thousands of amateurs for long periods, and because of this occupancy rigid power discipline will be essential if the operation of the satellite is not to be seriously affected. The maximum recommended power is 100w. e.r.p., equivalent to 10w. into a beam with 10 dB gain. As the G3NEO contacts show, however, lower power will often be effective, and every user of the satellite must be ready to reduce power whenever conditions permit this.

Research and Experiments Encouraged

Research and experiments, both operational and technical, are carried out by QRP operators in the UK. Current subjects include loop aerials for fade-free short range communication on 3.5 MHz; propagation, including exploiting summer E layer appearances on 21 MHz; and the development of transistor transmitters. It is anticipated that during the next few months a large scale investigation into the development of aerials for use in restricted spaces will begin, and this is scheduled to run for 12 months. What may prove to be an even more significant advance than the introduction of SSB is coherent CW (CCW). In this method control of the transmitter and receiver at both stations is by means of a highly stable oscillator (ideally, stable to within 1 Hz). This oscillator also drives a clock circuit which controls an el-bug and a special gated active filter; with the clocks in synchronism, the el-bug at the sending station can only start a dot or dash symbol at the instant that the filter at the receiving station is being gated on. The filter will recognise the beginning of the symbol and remain on for its duration, after which it is gated off. The originators of the system claim that at 12 wpm (9 Hz bandwidth) it provides the equivalent of a 100 times power increase because it gives a 20 dB improvement in signal-to-noise ratio. They also state that in tests between Japan and the U.S.A. a 10w. CCW signal provided the same communication effectiveness as a 1 kW conventional CW signal! In the UK, QRP enthusiast G3FMW is tooling up for the method, so we may hear of the first UK/U.S.A. CCW contact before long.

Home Construction is Booming

A complaint never heard in QRP circles is the one about everybody using the same Oriental black boxes. A proportion of commercially built rigs are in use, but the majority of QRP operators build their own gear, either from kits such as the Heath HW-7 and HW-8, or from scratch. Designs published in the Magazine are popular, and these are supplemented by some useful circuits published in SPRAT, the quarterly journal of the G-QRP Club. The latter include valve and transistor rigs for CW, DSBC and AM developed by enthusiasts such as G3YUQ, G3IGU, DJ1ZB, W9SCH and G8EPE. An increasing number of newly licensed stations are turning to QRP, and it is felt that this is partly due to the attraction of making contacts with reasonably simple home-built equipment.

Schedules and Contests

Regular contacts between QRP stations in Europe are now being organised. Such stations should be looked for around 3540 kHz, 7040 kHz and 14065 kHz. Activity is particularly likely on the two higher frequencies between 1130 and 1200 on Sundays, and on the lower
frequency between 1400 and 1600 on Sundays; spot frequencies for QRP SSB are currently being investigated. Much inter-European QRP working also takes place during QRP contests. The DL AGCW QRP Contest, a world-wide affair, takes place twice yearly in January and July and all bands between 1-8 and 28 MHz are used. UK stations often occupy leading positions (details from G8PG). The RSGB QRP contest, held each April, uses the 3·5 and 7 MHz bands; this contest is now open to non-members resident outside the UK. Special QRP activity weekends are also held regularly. Of course many QRP stations work DX during the more conventional contests; for instance during the 1976 ARRL DX Contest two 3-watt G stations were at one stage averaging a trans-Atlantic contact every five minutes!

**Corrections**

The diagram in the article “The Poldhu Story—Fact or Fiction?” on p. 475 of the October issue is incorrect and should have been as shown below. We apologise to the author G. R. M. Garratt, G5CS—and to readers—for our mistake.

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**Testing A Museum Piece**

F. H. Walker, ex-G4TX/G5AX

When visiting the Science Museum at South Kensington in 1926 I noticed that there was very little SW gear on exhibit, so I wrote to the Curator asking if he would be interested in a receiver as used by many amateurs of that period. He was interested, and I built the Rx in the spring of 1927, and presented it to the Museum.

I saw the Rx on exhibit on a few visits to the Museum over the years, but gave the matter little thought until I retired from the film recording business in 1973. Looking over old logs of the '20s etc., I thought of the Rx and a photograph of it which was lost and wrote to the Director of Telecommunications at the Museum asking for a copy. The Director kindly sent the photo and this led to a visit to the Museum in July 1976 when it was suggested that I had the Receiver at my home to evaluate its ability after fifty years!

The circuit was the popular Reinartz “Det & One Step” of those days, with Gecophone slow-motion all-brass variable condensers, S.L.F., air spaced “low loss” coils 3in. dia., a Ferranti AF3 intervalve transformer, a Bowyer Lowe HF choke, and a Mullard PM5A detector followed by a PM6 LF valve. To try out the receiver a dry battery was used for the filaments, and 54 volts of HT from PP3s; the only phones I have are low impedance so a small transformer was added in the plate circuit.

My aerial is only 20-ft. high and 50-ft. long: when first connected the Rx was very noisy owing to the oxide on the variable condenser contacts, and the large coils picked up mains hum from the shack wiring (not in conduit). These troubles were soon cured, and reception on 7 MHz and 14 MHz quickly obtained. On CW
selectivity was very good and many of the SW Broadcast stations received clear of QRM. With the coils provided, the coverage was from 7 MHz to about 18 MHz and the amateur bands and a few “marker” stations enabled a graph to be made of the frequency range of the three coils. This showed the excellence of the S.L.F. condensers.

It was on a similar Rx to this that I received Australia on November 12th, 1924, the reception being reported in the Press the following day (this being the first amateur reception of that country in England, the transmitter being A3BQ, Box Hill, Victoria).

When the receiver was constructed there was no mains supply within ¼-mile, and that was DC, so the matter of hum pick up on the large coils was never dreamed of! On the amateur bands the best reception was on 14 MHz where W’s, K’s, and very many European stations were received on CW; SSB was not so well received. I feel that the quality of Morse from amateur stations is much better these days, and noted the use of electronic keys.

Until a few years ago I was using a CRO Rx, and feel that as far as CW goes the Museum Rx would hold its own with the CRO, but would require a little more skill in handling.

My interest in radio started in 1920 when a weekly paper “The Scout” published an article on making a crystal set for the reception of ships, FL (Eiffel Tower), MPD (Poldhu), etc., and having built this Rx listened to MPD’s Wx reports sent at 12 w.p.m. until the code was mastered; the following year a one-valve set was made and the SW listening started. In 1922 the Transatlantic Tests were held in the December, and a number of Americans on 200 metres were heard. The harmonics from the arc transmitter GBL at Leafield, Oxon., caused a lot of QRM. Much midnight oil was burnt in the mid '20s, QSL cards being greatly in demand!

A transmitting licence with the call G5AX was obtained in 1925 and QRP work on 100 metres with a DE5 valve, a Hertz antenna, and 120v. HT allowed a QSO with Canada and the States. It was also in this year that I met my lifelong friend Tom Dearlove, G3FMN, and together we conducted many experiments with a W.E.205 valve on 5 metres. In 1929 I was working with Western Electric Co. installing cinema sound equipment and from then on, except for a period during the War, no further radio work was done, but in the '50s I re-licensed and obtained the call G4TX, worked QRP on 7 MHz, and later on 28 MHz with a rotary beam obtaining phone QSO’s with many K’s and W’s.

In conclusion I feel that I was very lucky to have experienced the joys of early amateur radio when the SW bands were so free from QRM, and a new signal gave one’s heart a faster beat!
THE MONTH WITH THE CLUBS

By "Club Secretary"

BEFORE we get down to the gory details and doings for this time, we have a plea for help: a letter from a young SWL who lives in Fressingfield, which is near Diss, in Norfolk, and wants to join a club. The nearest clubs of which we know are Ipswich, Norwich and Stowmarker; does anyone know of a nearer one, or if not will any member of one of these clubs who goes anywhere near Fressingfield on his way to meetings please get in touch with: W. Pretty, 7 Priory Crescent, Fressingfield, Diss, IP21 5PL.

The South-East

As usual numerically the largest pile; either the rest of the country is less "clubbable" or they have a dislike of being known!

November's programme for Harrow is all taken at Roxeth Community Centre, Scott Crescent, West Harrow. Friday, November 4 sees three short lectures being given by members, the subjects being respectively Op-Amps, Flip-Flops, and FETs. A week later, on 11th there is an informal and on 18th G4AUF will talk about Micro-Processor Applications; and on 25th the month is rounded off nicely with a Bring and Buy Sale.

Milton Keynes Hon. Sec. isn't standing for re-election this year; a pity from our point of view since he was one of the few who organised things to help us get it right. Sadly the October date is now past—it was a visit to the Whitbread brewery in Luton; but on November 14, they have Brian Wilks from Wolverton College of Further Education, who will be taking as his theme "Aerial Polar Diagrams."

All we can say for Echelford is that their Hq. is at St. Martins Court, Kingston Crescent, Ashford, Middlesex, on the second Monday and the last Thursday of every month; but the details as to what is going to happen on these dates are not given; if you must know before you make a firm decision to attend, contact the Hon. Sec. at the address in the Panel.

It is the first and third Thursdays as a routine for the Cray Valley chaps, their Hq. for these being at the United Reformed Church Hall, 1 Court Road, London SE9. We don't have details on these two, but we can tell you that the annual Buffet-Dance will be on November 19, at Tudor Barn.

A wee bit further southwards now: South-East Kent YMCA who foregather every Wednesday evening at the YMCA, Godwyn Road, Dover. An interesting feature is that the gang have talk-ins arranged on GB3KR for radio contacts in the Seychelles and Australia.

Now we come to Verulam who have their Hq. hidden away in the Market Hall, St. Peter's Street, St. Albans, with plenty of room for a large attendance—which they get regularly thanks to a live-wire committee. They are even organised to the extent that a PA system is brought along to each meeting for the benefit of the speaker in a room where the acoustics are not too good. The "main" meeting is at the Hq. above on the fourth Thursday in the month, while on the second Thursday there is an informal, held in the R.A.F. Association Hq. in Victoria Street, St. Albans.

Quite a large September issue of the Reigate "Feed-back" with a couple of cartoons, and extracts from the issue of fifteen years ago. However, when we turn to the dates, we find them all neatly listed out on the front page: November 8 for the Natter session at the Marquis of Granby, and November 22 for G3NPF to talk about Printed Circuits.

A nice idea at Southdown, who are hoping to put on a Home-brew Gear Demonstration possibly in liaison with the Eastbourne Model Flying Club, on November 7, the venue, as usual being the Chaseley Home, South Cliff, Eastbourne. Looking forward to December, on 5th there is the Annual General Meeting.

Acton, Brentford & Chiswick are based on Chiswick Trades and Social Club, 66 High Road, Chiswick, London W4. November 15 will be devoted to a report

DON'T FORGET THE 1977 MCC ! !

NOVEMBER 5th and 6th

See p. 489 of the October issue for rules, etc.
on the club entry in MCC.

There isn't any data on the meetings of Mid-Sussex in the Newsletter—it is rather more taken up with the fact that everyone who takes on the Editorship seems to suffer some misfortune in the way of health! So—all we can do is suggest you contact the Hon. Sec, for the needed information, and take the chance to commiserate with them! The venue, by the way, is Marl Place Further Education Centre, Burgess Hill.

Time was when we used to hear from Maidstone YMCA as regularly as clockwork; and the club scribe with them! The venue, by the way, is Marle Place Further Education Centre, Burgess Hill.

**Midlands**

Firstly, a couple of new ones. The first is called Foster Cambridge Amateur Radio and Electronics Club, based on Foster Cambridge Ltd., Sports and Social Club, Howard Road, Eaton Socon, St. Neots. Outsiders who are interested are welcome to join as Associate members—this is the normal situation where a club has its Hq. in a company's social club. At the moment, the crying need is for some licensed amateurs—believe it or not they have eleven members chasing May's R.A.E., but not a single licensed member yet on the books. Details, from the Hon. Sec.—see Panel.

Our second newcomer is at Bury St. Edmunds where the group get together on the second Monday in each month at 29 Angel Hill, which appears to be the G3GGB spot, at least until they can get up the numbers enough to justify looking round for Hq. and setting things up formally. Details from G3IRM at the address in the Panel. For both these clubs, our best wishes and hopes for long-term success.

**Stockport** have November 9 and 23 booked at Blossoms Hotel, Buxton Road, Stockport; the former for a talk on Astronomy and the latter for the Construction Contest. Looking on to December we see the AGM on December 14, the December 28 date being scrubbed. Incidentally, the group now have 110 licensed members which must come close to a record number.

It's not so many moons ago that the Hon. Sec. at Hereford was beefing at low attendances—this time he can record a headcount of thirty at the last meeting, so they must be doing the right things. They have their bookings on the first and third Fridays in the month, and this gives November 4 and 18th, at County Control, Civil Defence Hq., Gaol Street, Hereford.

An inaugural meeting is to be held at the Old Bakery Chester Walk, Cheltenham on November 3—this will be the first session of the combined Cheltenham club and RSGB group, plus some non-members of either; this has come about by way of a lot of planning, a lot of give-and take, and above all, a lot of good will on all sides. Let us hope the combination goes from strength to strength. For the moment, and until we have any firm news of a change, we will put the RSGB group Hon Secs, name and address in the Panel, that being the most recent information we have.

Mid-Warwickshire don't often report to this piece, but they are announcing their Autumn/Winter programme by way of a newsletter which reached us. From this we see they have moved from their old place to 61 Emscote Road, Warwick, where they now have the first and third Mondays in each month. November 7 is given over to a talk and demonstration of TV Cameras and Monitors, and on 21st SWL Smith will be talking about Contests and Awards open to SWL's—he himself has brought home the Continent and the World award in ISWL contests so he knows what it's all about.

The Wolverhampton Newsletter usually has something of interest, and occasionally the shafts of wit from the Vice-President, apparently acting as typist, can strike hard, right on target . . . but at other times? Seriously, the group foregather at Neachells Cottage, Danescourt Road, Stockwell End every Monday. November 7 sees G8EDG and G3UBX talking and demonstrating the FRG-7 receiver while on 14th there is a Natter Nite in the Club room. The Junk Sale on 21st will be a bit more complex than usual—on the one hand the Junk Sale, and on the other the flea-market. The only reservation the committee make (and we are surprised that no club to the writers' knowledge has ever done this) is that any item brought to the clubroom for sale must be removed, or it will become club property and subject to resale. The final date in November is 28th, on which the committee meeting takes place.

The group associated with Nunsfield House, Alvaston, Derby have their AGM on November 4, while on 11th they have a talk on the GB3DY repeater by members of the repeater group concerned; and on 18th there is a Surplus Sale. On November 25, someone un-named is going to try and take a peek at the future in terms of electronic component developments—a brave man indeed!

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**Deadlines for “Clubs” for the next three months—**

(For December issue—October 28th)
For January issue—November 25th
For February issue—December 30th
For March issue—January 27th

Please be sure to note these dates!

Another of the once-a-week clubs is at South Manchester, where the Hq. is at Sale Moor Community Association, Norris Road, Sale on Friday evenings. G3HZM will be bringing in a bit of nostalgia for the OT's when he talks about the club history on November 4, and on 11th the “inner-man” is comforted by the Annual Dinner. November 18 is set aside for Mr. B. Moreman to talk about “Ionoospheres in Antarctica.” Finally on November 25, G3LEQ discusses and demonstrates some VHF/UHF gear. In addition to all this, there are still informal VHF sessions at the Club Shack, Greeba, Shady Lane, Baguley.

Its AGM time for Peterborough, at the Scout Hut,
Occupation Road, on Friday November 18, the start being timed for 7.30.

November 8 is down for a Giant Surplus Equipment Sale, while December 13 is the AGM, says Bury’s Hon. Sec., who adds that they have also every Tuesday booked at Moseley Community Centre, Cecil Street, Bury.

**Up North**

Our first from this neck of the woods is Northern Heights, still getting together at the Peat Pits Inn, Ogden, Halifax on alternate Wednesdays. November 2 is shown as a Junk Sale, November 16 as the “Wakefield Project”—whatever that may be, it’s probably meaningful to the members!—and November 30 is a Quiz with the White Rose side.

York next, at the United Services Club, 61 Micklegate, York, where the routine is a bit puzzling even for the members; they turn up on Fridays except the third one in each month. November 11 is a special date for them, as they will be receiving a talk from the Vero Electronics representative.

Now to East Lancs, which is the name of the group serving the Blackburn area; the only snag about their newsletter is that it doesn’t mention anything about Hq., dates, subjects or whatever; although to be fair, the Hon. Sec.—we assume—noted October 6 on the front cover, which we suppose implies the first Thursday in each month, which we suppose implies the first Thursday in the month. More details from the Hon. Sec.—see Panel.

A change of venue for Wakefield is indicated; the aerials and facilities at the old place were not enough out what they have to offer in the way of facilities—which seem to be quite a lot. The Hq. is now at Building 101, Houndstone Camp, where they can be found on any Thursday. Thus, on November 3, G3BEC and G3NOF induce some nostalgia with a combined effort on pre-war amateur radio, and on 10th the members will be bringing along their slides of radio interest; it’s the members again on 17th, this time giving five-minute talks, and the month is rounded out by G3BMO talking about SSB. This idea of a circular to all the locals is a good idea of doing for the S.W.E.B. Clubroom, Pool, Camborne; we don’t at the time of writing know what they have to offer in the way of facilities—which seem to be quite a lot. The Hq. is now at Building 101, Houndstone Camp, where they can be found on any Thursday. Thus, on November 3, G3BEC and G3NOF induce some nostalgia with a combined effort on pre-war amateur radio, and on 10th the members will be bringing along their slides of radio interest; it’s the members again on 17th, this time giving five-minute talks, and the month is rounded out by G3BMO talking about SSB. This idea of a circular to all the locals is a good...
idea, although if all are sent through the mail it could cost a tidy sum; but certainly the chaps in the Call Book could be sent theirs by hand—who knows, it may turn up some new members or bring back some lapsed ones!

Others

The first of these is the G-QRP Club, which is now up to 292 members; but will all members please note the change of address for G3RJV to that shown in the Hon. Sec. address panel. Doing this will, it is hoped, reduce the chance of mail going astray and get the information to the members most quickly. Turning to the club and its activities, the latest issue of their SPRAT is as usual full of interesting things—your scribe is already in haste to get this piece finished and get the old soldering-iron to work again! Of course the commercial-gear users are catered for also, by way of the QRP Awards and so on. In fact this is much more like what we used to call a club—something for everyone, and everyone helping as needed.

The letter from HB9AMS about the Jamboree-on-the-Air event for 1977 was a bit too late for our longer deadlines, and so for 1977 we've missed the 'bus. All is not lost though, as we can tell you that the 1978 date is the weekend October 21-22, 1978—which should give you time to get ready.

The news from the Royal Signals this time is that each issue of "Mercury" is going to cost 14p, and forces a rise in subscription from January 1, 1978. On the other hand, your scribe is of the humble opinion that the issue is front of him right now is one of the best he has seen for a long time. Details from the Hon. Sec.—see Panel.

Finale

That's the pile, once again. For next month the deadline is publication day of this issue—but your forward dates for three months are as usual, and will continue to be each month, set out in a "box" in bold face in the body of the piece. So—let's have your next lot of news, along with the Hon. Sec. name and address, the Hq. address details and all the rest of it. Address it to "Club Secretary," SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Meantime, keep up the good work.

Hold Up!

Just as we were taking this lot to the post, who should we bump into but Postie—bearing two packets of several-days-old mail! When we ripped it open, we found several "Clubs" items so we are adding the gen on the end of the piece here, and will take in the Hon. Sec.'s various addresses to the Panel by a quick re-typing job.

B.A.R.T.G., with the familiar fist of GW3IGG to tell us that they have their AGM on November 12, at London House, Mecklenburg Square, London WC1; please, members, make the attempt to turn up and give the committee the advantage of hearing your views. On a different tack, the "lectures for clubs" programme goes on, and several thousand miles have been clocked up by members going to give talks. And, of course, the Newsletter—always well worth a read—has now been turned into "tabloid" shape with the approval of the readership.

An interesting and off-beat subject for Torbay on November 26, is Marine Biology, by Mr. L. Jackman. The Hq. is at Bath Lane, rear of 94 Belgrave Road, Torquay.

Both our next two come from Bristol; let us give the new North Bristol: its place first; they foregather at Romney Avenue, Lockleaze, every Friday evening. And if you want to take R.A.E. or revise your knowledge, they are doing a course at the Hon. Sec.'s address—see Panel.

Next we have City of Bristol RSGB group; their first request is to clarify the route to Hq. for newcomers: to get to the Small Theatre, Queens Building, University Walk, aim yourself for the Wills Memorial Building, that being a well-known Bristol landmark; University Walk is just behind that block and has a "continental-type" barrier entrance. As for the date, that will be November 28, to include a talk by Gordon Mather, G3GKA.

It's November 1, if you want to join Thames Valley at their meetings at Giggs Hill Green Library, Giggs Hill Road, Thames Ditton, when their speaker will be G3XZV, who will be talking about that eternal favourite—Aerials. Looking forward a little, nothing is finalised for December 6, but on January 3 comes the Grand Inquisition, in the form of an AGM, something which all members should do their best to attend.
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**ASP 2009. £3 3dB 2m. Mobile. NEW MODEL with swivel base.**

- £85.00

**ASP 629. 2m. Mobile.**

- £85.00

**ASP 677. 2m. 5dB Mobile.**

- £85.00

**ASP 909. 2m. 3dB Mobile.**

- £17.00

**ASP. Gutter clip less cable.**

- £17.00

**ASP. Magnetic mount with cable.**

- £17.00

**ASP. No hole mount.**

- £7.95

**ASP. Gutter clip less cable.**

- £7.95

**ASP. Magnetic mount with cable.**

- £7.95

**ASP. No hole mount.**

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**ASP. Gutter clip less cable.**

- £7.95

**JAY-BEAM ANTENNAS**

- ALL MODELS IN STOCK

- J.V.L. 6dB 2m. CO-LINEAR

- Fully adjustable for maximum gain and minimum S.W.R.

- £39.00 Carriage £1-50

**KYOCUTO DIGITAL II**

- 10W. 2m. 400 channel Mobile Transceiver

- £325.00

**FRG7 — DIGITAL**

Yes. The world famous FRG-7 is now available with digital read-out fitted in place of kHz dial...

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For customers who already own FRG-7's we can supply the digital read-out complete with installation instructions £70.00 + VAT

FRG7 Digital £180

FRG7 with analogue dial £145.00

FR7 Perspex cover as illustrated £35.00

All plus 12½% VAT

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Tel. 01-579 5311

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UNIT 3, 771 ORMSKIRK ROAD, PEMBERTON, WIGAN, WNS 8AT

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HOW TO FIND US — From M6 junction 26 follow signs for Wigan A577 at first traffic lights (T junction) turn right towards Wigan. At next traffic lights you are there, BUT turn left and 10 yards further turn right by telephone kiosk. Premises are slightly to your right. Plenty of parking space. Mileage from motorway ½ mile.

From Wigan follow the A577 Skelmersdale to traffic lights at Fleet Street, Pemberton (Ye Olde White Swan on your left). Turn right then 10 yards right again. By telephone kiosk. Mileage from Wigan 2½ miles.

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2M10 80L 80W. 144 MHz amplifier. Solid state
HF3 100L 100W. 3-30 MHz amplifier. Solid state.
DX555P VHF counter with HF Generator.
PA144N Low noise 144 MHz pre-amplifier.

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WANTED: RECEIVERS & TRANSCEIVERS HF or VHF

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S.A.E. ALL ENQUIRIES

H.P. AND CREDIT TERM
### YAESU MUSEN ADD 12.5% VAT

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
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<tbody>
<tr>
<td>FT301 T/Rx 18-30, 100W</td>
<td>£485.00</td>
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<tr>
<td>70MHz Digital B/W</td>
<td>£550.00</td>
</tr>
<tr>
<td>FT301Q VHF PEP 300</td>
<td>£340.00</td>
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<tr>
<td>FY301 External VFO</td>
<td>£365.00</td>
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<tr>
<td>FP301 PSU/Spker</td>
<td>£79.00</td>
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<tr>
<td>FP3010/S P101 + Clock, Ident.</td>
<td>£125.00</td>
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<tr>
<td>FT200B T/Rx 3-5-30</td>
<td>£249.00</td>
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<tr>
<td>FAS100B AC/PS PSU/Spker</td>
<td>£310.00</td>
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<tr>
<td>FRG7 Rx -530 Cont.</td>
<td>£400.00</td>
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<tr>
<td>FT221R T/Rx 2m, &quot;All Mode.&quot;</td>
<td>£339.00</td>
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<tr>
<td>FT242 T/Rx 2m, FM 23, DM 12, 12c</td>
<td>£139.50</td>
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<tr>
<td>FT242 Digital readout &quot;D&quot;</td>
<td>£480.00</td>
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<tr>
<td>SP101B External speaker</td>
<td>£155.00</td>
</tr>
<tr>
<td>FL101 Tx 1.8-30 MHz</td>
<td>£235.00</td>
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<tr>
<td>FT2206B Linear 12 K2 Pip</td>
<td>£284.00</td>
</tr>
<tr>
<td>FT101E T/Rx 1-8-30 AC/DC</td>
<td>£400.00</td>
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<tr>
<td>YC601 Digital Display 101</td>
<td>£110.00</td>
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<tr>
<td>JY301 Monitor scope</td>
<td>£123.50</td>
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### HY-GAIN ANTENNAS INC. CARR. & VAT

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
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<tbody>
<tr>
<td>12AVQ 10-20m. vertical 2Kw.</td>
<td>£39.90</td>
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<tr>
<td>14AVQ 10-40m. vertical 2Kw.</td>
<td>£55.40</td>
</tr>
<tr>
<td>18AVT/WB 10-80m. vertical 2Kw.</td>
<td>£75.90</td>
</tr>
<tr>
<td>TH3 JNR 10-20m, yagi 600W.</td>
<td>£109.00</td>
</tr>
<tr>
<td>TH5 Mk3 10-20m, yagi 2Kw.</td>
<td>£165.00</td>
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<tr>
<td>BN86 balance 2Kw.</td>
<td>£135.00</td>
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### BANTEX

<table>
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<th>Item</th>
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<tr>
<td>VHF WHIPS (Carriage 90p)</td>
<td>VAT 12.1%</td>
</tr>
<tr>
<td>BGA FG 2m. Fibreglass</td>
<td>£8.75</td>
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<tr>
<td>70MHz 70 MHz Fibreglass</td>
<td>£6.00</td>
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<tr>
<td>I441, 145 FG or 55</td>
<td>£3.50</td>
</tr>
<tr>
<td>85 145 MHz FG</td>
<td>£6.35</td>
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<tr>
<td>BGA 55 2m. Stainless steel</td>
<td>£8.50</td>
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<tr>
<td>BSU 432 MHz</td>
<td>£5.00</td>
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<tr>
<td>UCL Mid loaded</td>
<td>£6.00</td>
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<tr>
<td>TLM Trunk lip mount</td>
<td>£5.75</td>
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<tr>
<td>MB Magnetic base</td>
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### SMC Monitorscope £69.00 + 8% VAT

Available ex-stock—NOW.

### Crystal Filters and Crystals £3.75 a pair !

### YAESU

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<thead>
<tr>
<th>Item</th>
<th>Price</th>
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<tbody>
<tr>
<td>FT22/F, FT22B, FT2 AUTO, FT224.</td>
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<tr>
<td>TR2200(GX), CR146A, CR106MB.</td>
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<tr>
<td>FT233, (6, 12, 18 MHz Tx. M2, M8, 12 (12 MHz Tx and 44 MHz Rx).</td>
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<tr>
<td>SIMPLEX 5 (O, 12, 16, 19).</td>
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<tr>
<td>DEX RXDID (at least, a large selection of inverse receive</td>
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<td>primitives).</td>
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<tr>
<td>SF200B, FT301(S), FT321(R), CONVERTER CRYSTALS £2-20</td>
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<tr>
<td>FT101(KE), FT73(S), PR101(S) all £2-20 each.</td>
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<td>(70cmh).</td>
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### MISCELLANEOUS

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<tr>
<td>JD 110 Power, VS/WR, Field Strength Meter £9.00 + 8%, VAT</td>
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<tr>
<td>SWR 50 SVR/PWR Twin Meters</td>
<td>£115.50 + 8%, VAT</td>
</tr>
<tr>
<td>ODR 123, Mod 12, 12V.</td>
<td>£115.75 + 8%, VAT</td>
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<tr>
<td>Power Supply 3 amps (5 amps Peak) £12.50 + 8%, VAT</td>
<td></td>
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<tr>
<td>COAX Slider Switches</td>
<td>£19.40 - 12%, VAT</td>
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<tr>
<td>TWS 1201 in 2 out</td>
<td>£22.30 + 12%, VAT</td>
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### OTHERS

<table>
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<tr>
<th>Item</th>
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<tbody>
<tr>
<td>YF30FJ350 350Hz F101, CW6pl</td>
<td>£13.00</td>
</tr>
<tr>
<td>YF30FJ500 350Hz F101, CW6pl</td>
<td>£20.75</td>
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<tr>
<td>YF30FJ200 600Hz F101, CW6pl</td>
<td>£60.00</td>
</tr>
<tr>
<td>YF30H12 12kHz F101, CW6pl</td>
<td>£60.00</td>
</tr>
<tr>
<td>YF30HA4 2.4 kHz F101, CW6pl</td>
<td>£60.00</td>
</tr>
<tr>
<td>YF30HD4 2.4 kHz F101, CW6pl</td>
<td>£60.00</td>
</tr>
<tr>
<td>YF30H12 12kHz F101, CW6pl</td>
<td>£60.00</td>
</tr>
<tr>
<td>YF307H24 4.4 kHz F101, CW6pl</td>
<td>£60.00</td>
</tr>
<tr>
<td>YF307H24 2.4 kHz F101, CW6pl</td>
<td>£60.00</td>
</tr>
<tr>
<td>YF307H24 2.4 kHz 10 MHz F101, CW6pl</td>
<td>£60.00</td>
</tr>
<tr>
<td>Carrier crystals (9 or 10 MHz) HCB8/10U ea. £2</td>
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### SERVICES

194A Northolt Road South Harrow, Middx
England. Tel: 01-864-1166

### AMCOMM

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01 - 864 - 1166
Decca KW-103 Combined SWR/RF Power Meter is an instrument for measuring a 50 ohm coaxial line feeding an Aerial System or Dummy Load. (1) Standing Wave Ratio, (2) RF Power with two ranges 0-100 & 0-1000W when used with a 50 ohm Dummy Load.

Decca-KW Dummy Load is air convection cooled and has been designed as a purely resistive 50 ohm load up to 30 MHz. Decca-KW Balun Mk. II. The Decca-KW Balun is broadband—3 to 30 MHz, rated up to 1.2kW p.e.p. 1:1 Ratio 50 ohms "unbalanced" input to "balanced" output. Waterproof moulded case. Suitable for dipoles and Beam aerials.

Note: The well-known KW LOW PASS FILTER passing 3-30 MHz is available from stock.

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FREQUENCY-AGILE AUDIO FILTER

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A versatile bandpass or band-reject filter with fully variable bandwidth and centre frequency plus unique search/lock/track capability for automatic removal of heterodyne whistles. Improves reception of CW, RTTY, and SSB. Connects between receiver and loudspeaker.

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10X CARTES
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CRISTALS 28 kHz, 28.5 kHz
Both 50p each

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50 BC 107-8-9 TRANSISTORS. Unmarked Assorted for 57p.

SPECIAL 10X CRYSTAL
100 kHz plus 1 MHz
with COSMOS Circuit
For Calibrator
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70x HIGH VOLTAGE DISCS. 500PF 70v, 1000PF 70v.
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15x 25uf, 50uf, 100uf, 22uf, 47uf, 100uf, 220uf at 50p.
15x AV 25V, 50V, 100V, 250V at 50p.
15x 1uf 250v, 10uf 250v, 25uf 63v, 33uf 63v, 68uf 63v, 330uf 63v, 680uf 63v, all at 50p.

ASSIGNMENT complete with instructions for £1.

FM TUNER HEAD
88 to 108 MHz
With Conversion
Details to Aircraft
Band or 2 Metres
£3

MULLARD 10-7 MHZ
I.F. MODULE WITH 465 kHz at £4

MULLARD VARI-CAP
MODULE LP 1186
at £4.40

2-5 GHz DUAL NPN TRANSISTORS. With data, 4 pair for 57p.
7010, 7040, 7050, 7070, 7080, 7090, 7100, 7200.

ALL ASSORTED 1000pf 300v, 1uf 250v, 10uf 250v, 25uf 63v.
ALL at 50p each.

10 ASSORTED 1000PF 6V, 1uf 250v, 10uf 250v, 25uf 63v.
ALL at 50p each.

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I.F. MODULE WITH 465 kHz at £4

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MODULE LP 1186
at £4.40

2-5 GHz DUAL NPN TRANSISTORS. With data, 4 pair for 57p.
7010, 7040, 7050, 7070, 7080, 7090, 7100, 7200.
Illustrated are DX555p VHF counter and HF generator
2M10 -80L 144 MHz amplifier
SASE for details of above products

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HERE'S THE NEW GENERATION OF FINE TRANSCEIVERS FROM AMERICA'S FOREMOST MANUFACTURER OF COMMUNICATION EQUIPMENT

SWAN'S NEW 350A & 350 D (DIGITAL VERSION) GIVE YOU 300 WATTS INPUT ON SSB OR PROVIDES 200 WATTS FOR THE CW MAN WITH DUAL CW FILTER ON RECEIVE.

FOR THE OPERATOR WHO DEMANDS THE ULTIMATE THE NEW 750 CW HAS AN INPUT OF 700 WATTS ON SIDE BAND GIVING FULL LEGAL POWER AND HAS SIMILAR EXCELLENT FEATURES FOR THE CW MAN

WRITE, PHONE OR CALL IN FOR FULL DETAILS OF THESE EXCITING NEW RIGS FROM THE SOLE IMPORTER—AMATEUR ELECTRONICS UK

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021-327 1497 OR 021-327 6313. TELEX 337045

CRAYFORD ELECTRONICS

G8AYN

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We can supply a wide range for frequencies from 68-500 MHz. They are constructed using a tapers copper-plated steel helix, and covered in a neoprene material, giving strength and flexibility. All are currently ex-stock.

For 145 MHz:
- FX2200G X  For Trio 2200G X  ...  £3.25
- FXUMF  With PL259 plug  ...  £3.00
- FXBNC  For modified 2200, 2200G, KP202, etc.  ...  £3.20
- FXMINXNC  For Pye PF70, etc.  ...  £3.40
- FX500  For Storno 500 series  ...  £4.20
- For 433 MHz:
- FXUBNC  With BNC plug  ...  £2.40
- FXUMINXNC  For Pye PF70 UHF series  ...  £2.00
- FX14  With 4BA thread—modified PFI  ...  £2.00

Others available, 84 unit coming soon for 3200GX.

SAE Enquiries and lists Post 20p VAT EXTRA 12.5%

6 LOVELACE CLOSE, WEST KINGSDOWN, SEVENOAKS, KENT, TN13 6DJ 24 Hr. Answer Service 047485 2577

HAMGEAR

Start the Winter season right with a good signal to noise ratio on your receiver, give those weak stations the best chance of being heard. The P.M./IDX 76 Super preselector covering 1.5 to 32 MHz in five overlapping ranges. Has a built in A.T.U. to make the most of those small antennas. Has regeneration over the range 18 to 32 MHz to give just that extra "edge" where most receivers start to fall off. Has a low noise and high gain of 30 dBs, and when used correctly will improve most receivers. A "Listen Thru" switch is also incorporated, enabling instant check to be made with or without the unit in circuit. Send two 9p stamps for further details of this and our Oscaramp for down link oscar.

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R. T. & I. ELECTRONICS LTD.

where equipment is fully overhauled

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R.CA. ABR516L Receiver ..................... £240.00 ($4.50)
KW 201. B.S. Receiver ....................... £100.00 ($2.00)
HAMMERLUND H4180A ......................... £180.00 ($4.00)
HAMMERLUND SP6600X ....................... £170.00 ($4.00)
EDDYSTONE 940 ............................... £170.00 ($4.00)
EDDYSTONE 680X Receiver ........................ £140.00 ($4.00)
NATIONAL MIC 190 Receiver .............. £80.00 ($2.00)
HALLICRAFTERS SX100 Receiver ........... £110.00 ($4.00)
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EDDYSTONE 940 Receiver .................... £170.00 ($4.00)
Grundig Satellit 2000 with SSB unit ...... £130.00 ($3.00)

We are MAIN DISTRIBUTORS for AVO, MEGGER, TAYLOR and EARL’S INC. CAR, and packing.

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S. G. BROWN’S HEADPHONES. Type “F” 120 ohm, 2000 ohm, 4000 ohm, £14-50 ($1-00); Rubber Earpads for same, £1-32 per pr. (40p); Standard Jack plugs, 24p (4p).

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YAESU MUSEN FRG-7 Receiver in stock ................................ £145.00 ($3.00)
YAESU MUSEN FT-221-R Transverser ........ £319.00 ($4.00)

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NOTE: 12½% VAT must be added to all prices, new and secondhand, except Test Equipment which is 8%, inc. carr. and packing.

Carriage for England, Scotland and Wales shown in brackets.


HOURS—9.30 a.m.—5.30 p.m. MON.—FRI. CLOSED SATURDAYS

NEW SAMSON ETM-3C C-MOS KEYER

1 µA battery drain—Why switch off?

- Self-completing dots/dashes/spaces.
- Can be used either as normal electronic keyer or as an amatic mode squeeze keyer.
- 8-50 wpm.
- Constant 3:1 dash-dot ratio. 6 C-MOS ICs and 4 transistors.
- Plug-in PCB. Long battery life—typically 1 µA drain when idling—Built-in battery holder for 4 x 1.5V batteries (but will work over 3-10v. range). PCB has both a reed relay (250v., 0.5 amp., 25w. max.) and a switching transistor (300v., 30 mA max.)—either keying method can be used. Has the well-known fully-adjustable Samson precision twin keying lever assembly, Operate/Tune button. Side-tone oscillator. Grey case 4 x 3 x 2”. PCB has both a reed relay (250v., 0.5 amp., 25w. max.) and a switching transistor (300v., 30 mA max.)—either keying method can be used. Has the well-known fully-adjustable Samson precision twin keying lever assembly, Operate/Tune button. Side-tone oscillator. Grey case 4 x 3 x 2”.

- Adjustable gap/tension. Key-click filter. Hinged grey cover. 28-64.

BAUER KEYING PADDLE

Single-paddle unit on 1” x 2” base for home-built 1E bugs. Adjustable gap/tension. £10-85.

88 mH TOROIDS

For CW, RTTY, SSB and other filters. 90p each.

All prices post paid UK and include 12½% VAT.

Please send stamp with enquiries.

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- Self-completing dots/dashes/spaces.
- Can be used either as normal electronic keyer or as an amatic mode squeeze keyer.
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READERS

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Sale: Sony multi-mode multi-band, with three VFO's, excellent condition, £175. Yaesu model 224 two-metre mobile, spot channel and eleven channels fitted, used once, £160. Heathkit transceiver, 100 mW., CW, with power supply, as new, £20.—Ring Parsons, Blackmoor Vale Road, Alnwick (2487), Northumberland.

Selling: Icom HF transceiver, £220. Eddystone 840, £60. EC-10, £60. Eddystone 659/670, £40. Codar 70A, £25. All in mint condition, s.a.e. for complete list.—Cain, G3DVF, 18 Oaky Balks, Alnwick (2487), Northumberland.

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