AT THE
GRANBY HALLS
LEICESTER
THURSDAY 1200-2000
FRIDAY 1200-2100
SATURDAY 1000-1800
28, 29, 30 OCTOBER

ADMISSION TO THE FINEST EXHIBITION OF AMATEUR RADIO EQUIPMENT AND ACCESSORIES

30p
CONCESSIONS FOR CLUBS AND STUDENTS. SAE FOR RATES TO G3FGY. QTHR.

THE AMATEUR RADIO RETAILERS ASSOCIATION
WHEN ONLY THE BEST WILL SUFFICE

TR7200G

2 Metre FM mobile transceiver TR7200G

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

Performance plus

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

Repeater access tone

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

Superb squelch performance

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

Switched TX output power

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

Features, features

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

New Price Structure

The basic price fitted 5 channels is £162 including VAT. If ordered at the same time as purchase of the rig, we will fit 3 more channels for £10 or 6 for £20 inc. VAT. This means that you can have the finest 2 metre mobile rig fitted 11 channels for £182 incl. VAT.

Features

The following features are fitted as standard.

- 22 channel dial with R and S channel numbers.
- RF powered LED under channel number.
- RF powered "on air" lamp.
- Instantaneous slide in/slide out installation.
- No screws to fiddle with.
- Installation for padlock.
- Dust tight and waterproof.
- Public address facility.
- Switchable receiver sensitivity.
- Helical front end filter.

Price Structure

The basic price fitted 5 channels is £162 including VAT. If ordered at the same time as purchase of the rig, we will fit 3 more channels for £10 or 6 for £20 inc. VAT. This means that you can have the finest 2 metre mobile rig fitted 11 channels for £182 incl. VAT.

Features

- 22 channel dial with R and S channel numbers.
- RF powered LED under channel number.
- RF powered "on air" lamp.
- Instantaneous slide in/slide out installation.
- No screws to fiddle with.
- Installation for padlock.
- Dust tight and waterproof.
- Public address facility.
- Switchable receiver sensitivity.
- Helical front end filter.

Price Structure

The basic price fitted 5 channels is £162 including VAT. If ordered at the same time as purchase of the rig, we will fit 3 more channels for £10 or 6 for £20 inc. VAT. This means that you can have the finest 2 metre mobile rig fitted 11 channels for £182 incl. VAT.

Features

- 22 channel dial with R and S channel numbers.
- RF powered LED under channel number.
- RF powered "on air" lamp.
- Instantaneous slide in/slide out installation.
- No screws to fiddle with.
- Installation for padlock.
- Dust tight and waterproof.
- Public address facility.
- Switchable receiver sensitivity.
- Helical front end filter.

Price Structure

The basic price fitted 5 channels is £162 including VAT. If ordered at the same time as purchase of the rig, we will fit 3 more channels for £10 or 6 for £20 inc. VAT. This means that you can have the finest 2 metre mobile rig fitted 11 channels for £182 incl. VAT.
In case you hadn't noticed, the TRIO TS-700 has a new look. Now updated and incorporating all the features which made it the most sought after transceiver on 2 metres, it now includes additional refinements which you, the keen radio amateurs, have requested.

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

The main refinements can be summarised as follows:

* New improved received front end system contributes to a new standard of sensitivity; 0.25µV for 10dB S + N/N ratio on SSB, 20dB quieting for 0.4µV on FM. This is the best receiver on the market today.
* New FM IF strip with narrower filter for European market.
* New centre zero tuning meter for FM.
* New 100 kHz calibrator with automatic disconnection of antenna to remove confusing outside signals. Automatic transmitter disable in CAL. mode.
* New logarithmic S meter.
* New repeater and reverse repeater operation at the turn of a panel switch. Operates on either VFO or crystal controlled channels.
* New improved audio system for FM and AM transmit.

The use of fully balanced mixing at all stages of frequency conversion guarantees a clean signal free from unwanted products. The power output of the transmitter is normally between 15 and 18 watts and this, in conjunction with the TRIO amplified ALC system, gives you an outstanding signal. Just listen to 2 metres and judge for yourself which rig always sounds the best.

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

**TS-700G**

£382.50 inc. VAT

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

**TS520**  
£378 inc. VAT  
The TS520 is the best value for money HF transceiver available in Europe today. It incorporates all the features of more expensive equipment at no extra cost—AC/12v operation, speech compression, 1 kHz readout, all band coverage 80-10, VOX, calibrator, blower cooled PA, transverter outlets, 4 function metering, etc., etc. Why not send for details today and find out what Trio design expertise is all about; or just call on us and try the superb TS520 for yourself. You are in for a pleasant surprise.

**TS700G**  
£382.50 inc. VAT  
The standard by which all others are judged. Full 2 metre coverage, VFO or crystal controlled. All models AM, FM, USB, LSB, and CW. Mains or battery operation. Normal and reverse repeater facilities. Trio exclusive tuning fork access tone generator. Plus, of course, Trio quality and reliability backed by Lowe Electronics service. If you haven't seen it yet, go to one of our branches and be prepared to be impressed. 15 Watts output, 0.25 microvolt sensitivity. European standard FM selectivity. This rig has all others beaten.

**TR3200**  
£148.58 inc. VAT  
The newest FM handy transceiver from the TRIO range. Superb performance for the 70 cm. operator. 12 channel capability in the range 432-436 MHz with three channels fitted (SUB, SU18, SU20). Transmitter output switched 2W/400mW and incorporating the TRIO exclusive 1750 hz tuning fork access tone generator. 8-wave detachable antenna for high gain performance on both transmit and receive. Supplied complete with all accessories as the TR2200G and with the new miniature handy microphone.

**TR7010**  
£198 inc. VAT  
Following the worldwide success of the TS700, Trio have taken the TS700 basic design and packaged it for 2 metres SSB mobile use. The TR7010 sets new standards in receiver sensitivity and low spurious emission on transmit. Operating CW and SSB from 144.1-144.3 MHz, the TR7010 covers all CW, SSB and beacon activity. 40.5 KHz channels plus VXO and RIT provide continuous coverage. 8 extra channels can be used, without retuning, in the range 144-145 MHz by fitting auxiliary crystals. Single conversion using an IF of 10.7 MHz with a superb crystal filter provides outstanding selectivity. Wide range amplified AGC and newly developed FET devices in RF amplifier and mixer stages allow maximum sensitivity to be used with freedom from overload due to adjacent signals. Single conversion transmitter with newly fully balanced mixer system generates a beautifully clean signal with crisp audio quality.

**REMEMBER**  
WHERE LOWE AND TRIO “LEEDS”, THE OTHERS FOLLOW!  

SEE YOU ALL AT GRANBY HALL. 28, 29, 30, OCTOBER.
LOWE ELECTRONICS

LA106 £200.25 inc. VAT

A reasonably priced, compact, high performance linear for 2 metres. SSB/FM/CW operation. 10W of drive for around 180W input gives your signal the extra kick to get it out of the noise. Built-in receive preamplifier with adjustable RF gain and helical filters for increased selectivity and reduced intermod from out of band signals. Built-in regulated 13v, 2.5A supply for Liner 2 or any similar driver.

The LA106 will match any rig such as the TS700, FT221, IC201 in any mode provided that the drive level is around the 10W level. Using a rugged valve in the PA allows you to get away with occasional misuse (just try a high power solid state amplifier into a mismatched load) and gives very low intermod products.

LINER 2 Mk II £184.50 inc. VAT

Belcom have just introduced the latest model of the Liner 2 with many detail improvements, notably in the new receiver front end and which results in much higher sensitivity, and transmitter modifications which improve the signal quality and lower the level of unwanted signals.

The Liner 2 is still the ideal way to get into real DX operation on 2 metres and continues the Belcom tradition of being one step ahead of the field in amateur radio developments.

Frequency coverage 144.1-144.34. 10W output. Complete with the usual Belcom comprehensive range of accessories including mobile mount etc. Contact us soon for a demonstration.

LINER 430 £290.25 inc. VAT

Two steps ahead comes the Liner 430. Already being used by us to make mobile contacts with the U.S.A., the Liner 430 opens up a whole new dimension of long distance contacts via the OSCAR satellites.

Covering two 480 kHz bands in 20 kHz steps and using the exclusive Belcom Auto watch system which detects the presence of a signal anywhere within VXO range without tuning. No more missing signals and worn out fingers from control twiddling.

10W output. Selectable USB/LSB/CW operation. Dual conversion using 50 MHz and 74 MHz IFs results in excellent image rejection and high sensitivity. Truly a new dimension in amateur radio from the Liner 430.

FS1007P £198 inc. VAT

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

All this and supplied fitted receive crystals for 145, 145-25, S20, S21, S22, 145-6, 145-8, R3, R4, R5, R6, R7 together with transmit crystals for 145, S21, R6 make the FS1007P the most incredible bargain on the FM market. Backed by the combined reputations of Belcom and Lowe Electronics.

HEAD OFFICE
119 Cavendish Road, Matlock, Derbyshire. Tel. 2817 or 2430 9 a.m. to 9 p.m.
20 Wallington Square, Wallington, Surrey. Tel. 01-669 6700
Soho House, 36-4 Soho Road, Handsworth, Birmingham. Tel. 021-554 0708
27 Cookridge Street, Leeds. Tel. 0532-452657

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

SEND 30p IN STAMPS FOR COMPLETE CATALOGUES AND PRICES
We are pleased to announce a new product, MMD050/500, as illustrated above. This is a combined version of our 50 MHz Digital Frequency Meter and 500 MHz ÷ 10 prescaler, MMD050 and MMD500P, providing complete 500 MHz coverage in two ranges. Selection of the appropriate range is achieved by diode switching, and the position of the decimal point is automatically selected at the same time. Other 500 MHz counters on the market cost several hundred pounds. This unit, by providing just the basic counting facility with no gimmicks or frills, is available at a breakthrough low price as detailed below.

**SPECIFICATION**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit height</td>
<td>10mm.</td>
</tr>
<tr>
<td>Case size</td>
<td>111 x 60 x 27 mm.</td>
</tr>
<tr>
<td>Frequency ranges</td>
<td>0-45-50 MHz, 50-500 MHz</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>Better than 50mV over 50 MHz range</td>
</tr>
<tr>
<td></td>
<td>Better than 200mV over 500 MHz range</td>
</tr>
<tr>
<td>Input impedance</td>
<td>50-200 ohm</td>
</tr>
<tr>
<td>Power requirements</td>
<td>12-15 volts DC at 300mA approximately</td>
</tr>
<tr>
<td>Power connector</td>
<td>5 pin 270° locking DIN. (Plug supplied).</td>
</tr>
<tr>
<td>Accuracy at 50 MHz</td>
<td>± 100Hz</td>
</tr>
<tr>
<td>Accuracy at 500 MHz</td>
<td>± 1 kHz</td>
</tr>
</tbody>
</table>

The unit is reverse polarity protected and the RF input is diode protected.

**PRICES**

<table>
<thead>
<tr>
<th>Description</th>
<th>Price £</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMD050/500 Combined 500 MHz counter</td>
<td>93.00</td>
</tr>
<tr>
<td>MMD050 50 MHz counter</td>
<td>66.00</td>
</tr>
<tr>
<td>MMD500P 500 MHz ÷ 10 prescaler</td>
<td>27.00</td>
</tr>
<tr>
<td>BNC plugs (Each)</td>
<td>0.70</td>
</tr>
</tbody>
</table>

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

**MICROWAVE MODULES LIMITED**

Brookfield Drive, Aintree, Liverpool L9 7AN.

Telephone: 051-523 4011  Cables: Microwave Liverpool.
AMATEUR ELECTRONICS UK

YOUR FIRST CHOICE FOR YAESU MUSEN!

AND THE SUPERB

FT-221

SSB/FM/CW/AM

2 Metre Transceiver

(Ex-stock)

STEP INTO THE FUTURE WITH AN ATLAS!

Ask any owner—
Compare with any other transceiver and the answer is the same—
Atlas lead the field!
Full Service/Spares back-up.

The Sensational ATLAS-210/215X

A COUPLE OF STAMPS (NO ENVELOPE REQUIRED) BRINGS THE FT-221 OR ATLAS LEAFLET. IF YOU WOULD LIKE THE LATEST YAESU MUSEN MAIN CATALOGUE—DUE TO LIMITED SUPPLIES OUR CHARGE FOR THIS REMAINS AT 25 PENCE POST PAID, BUT FOR THE BENEFIT OF THE SERIOUS ENQUIRER THIS NOW COMES TO YOU TOGETHER WITH OUR CREDIT VOUCHER VALUE £1 FOR USE AGAINST YOUR FUTURE YAESU PURCHASE.

CREDIT TERMS: New Low Deposit, Trade-ins Welcomed

BRANCH AMATEUR ELECTRONICS UK—COASTAL, 316-318 NORTHDOWN ROAD, CLIFTONVILLE, KENT. THANET (0843) 22060
Telephone KEN McINNES, G3FTE for courteous attention
AGENT WALES & WEST—ROSS CLARE, GW3NWS, CAERLEON 422232

We are sad to report the untimely death of Ron Turner, GM8HXQ, our good friend and Scottish Agent. Ron was widely known and respected both north and south of the border.

508-514 ALUM ROCK ROAD 021-327 1497
BIRMINGHAM 8 Telex 337045 6313
THE NAME IS YAESU

FT221 MULTI MODE TRANSCEIVER

100 kHz calibrator
(1 MHz ± 10)
“S” meter/FM centre zero/PO
Clarifier IRT and IRT/ITT
600 kHz up and down shifts
44 FIX channels (4 x 11)
Fully adjustable squelch.
AM, FM, USB, LSB, CW.
Dual speed VFO drive
Readout Better than 1 kHz.
2-4 and 12 kHz bandwidths
PLL VFO
Clean Output
Mic. supplied
Noise Blanker
AC or 12v. DC
CW sidetone
Semi Break-in
Semi-sens
ALC socket
RLY Socket
Plug in boards
11½", 8", 11½"
Rigid 22lbs.
Tone burst
Adjustable VOX
Mic Gain Control,

The FT221 design offers an unparalleled level of technical sophistication, combining latest “state of the art” techniques with extreme reliability and ease of operation.

One look at the construction: plug in boards throughout (with presets positioned for easy access) and one glance at the circuitry and you will be convinced that the FT221 may have rivals but no peers.

The final frequency is derived via single signal frequency mix from 10-7 MHz. The tunable component is produced by a 133 MHz voltage controlled oscillator (VCO), phased locked to the sum of; the temperature compensated 8 MHz VFO (or one of the 11 fix crystals) and the nonupled 14 MHz band (or repeater shift) crystals. The DC control voltage from the VCO is applied to 8 varicap diodes in both the transmitter and receiver effectively electrically ganging the RF tuned circuits to the VFO and Band crystals, thus both the transmitted and receiver are always fully on resonance even when using the repeater facility. This narrow band technique further improves the transmitter output spectrum and the receiver’s immunity to overload, rendering continual tweaking of pre-selectors obsolete.

If for any reason, the VCO should not lock, an indicator light flashes, the transmitter, and the receiver audio, being disabled.

The transmitter employs; a balanced FET mixer, RF derived ALC (which is fed to the two first mosfet TX I.F. amplifiers) preventing over driving and allowing operation at full rated output on low DC supply voltage and ends by using a BAM 20 (series modulated for true A.M.) to drive (a 40W P.E.P.) BAM 40 PA, rated by its manufacturer to withstand any VSWR irrespective of phase angle.

The sensitive receiver offers a remarkable immunity to overload, the mosfet RF stage is AGC controlled, the FET mixer feeds a transfilter then an I.F. amplifier. This band limited signal, of the correct level, is presented to the noise blanker gate (before any serious pulse stretching occurs) and hence to either the quality crystal filter on SSB, or the 455 kHz mixer for FM.

Designed for the serious amateur, it also offers a unique double push tone burst, selcal socket, and linear amplifier provisions (relay make and break and ALC sockets) with the spectral purity that allows you to use one with a clear conscience.

“The rig here is a FT221 need one say more?”
MUSEN—THE REPUTATION IS UNPARALLELED!

FT-101E/EE

Solid State 160 thru 10 Metre Transceiver

The world's number one transceiver now offers even more value and performance in one, compact, thirty pound package. An effective, RF Speech Processor is a built-in integral part of this exciting transceiver. Now you can realize that extra talk power to cut through the pile ups—without the addition of a linear amplifier. Except for the final and driver stages, the FT-101E/EE features the latest in solid state technology, incorporating time proven, plug-in "computer type" modules for unparalleled reliability and serviceability. New lever type switches offer easier operation. Here is a complete radio station designed to go anywhere—ideal for today's active amateur. Just add an antenna and 12v. DC or 100-234v. AC for instant operation on 160 thru 10 metres. The FT-101E/EE is another step forward in amateur communications from the world's leader in communications equipment. YAESU—The Radio Company.

Features

* Built-in AC and DC power supplies
* Built-in RF-speech Processor for increased talk power (E model only)
* 260 Watts PEP, SSB, 180 Watts CW, and 80 Watts AM.
* Factory sealed, solid state VFO for optimum stability and accurate 1 kHz readout
* Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
* Built-in, fully adjustable VOX
* Automatic break-in CW operation with sidetone
* Selectable 25 kHz and 100 kHz calibrator
* +5 kHz receiver clarifier w/separate ON/OFF switch
* Built-in WWV/WWJY reception
* Heater switch to shut off final tubes for conservation of current drain

* Reliable easy to operate level switch
* Adjustable carrier level for tune-up and novice operation
* Built-in speaker
* High-Q, permeability tuned, RF stages to provide the performance required even in base station operation
* Includes dynamic, hand-held type microphone.
* Indicator lights for internal VFO and clarifier operation
* Eight pole SSB filter for unparalleled selectivity on today's crowded bands
* All mode operation—SSB, CW and AM
* Built-in internal crystal control provision and Dual VFO adaptor
* Complete line of compatible accessories for flexible station design

YAESU MUSEN KNOW THE PROBLEMS—AND HAVE SOME PRECISE ANSWERS!
AND NOW FROM THE LARGEST INTERNATIONAL MANUFACTURER—

NEW GENERAL COVERAGE RECEIVER FRG-7

HERE'S THE SET THAT YOU HAVE BEEN WAITING FOR!

YAESU MUSEN HAVE NOW MET THE NEEDS OF COUNTLESS SHORT WAVE LISTENERS AND OTHERS WITH THIS EXCITING NEW RECEIVER—STUDY THE SPECIFICATION BELOW AND WE ARE SURE YOU'LL AGREE!

Synthesized All Solid State General Coverage Receiver !!

Features and Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode</td>
<td>SSB (LSB, USB selectable), AM and CW.</td>
</tr>
<tr>
<td>Coverage</td>
<td>500 kHz to 30 MHz continuous coverage.</td>
</tr>
<tr>
<td>Frequency Readout</td>
<td>Better than 5 kHz.</td>
</tr>
<tr>
<td>Frequency Stability</td>
<td>500 Hz within any 30 minutes after warm up.</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0.5 ( \mu )V for 10 dB S+N/N for SSB and CW, 2 ( \mu )V for 10 dB S+N/N for AM.</td>
</tr>
<tr>
<td>Selectivity</td>
<td>More than ±3 kHz at −6 dB. Less than ±7 kHz at −50 dB.</td>
</tr>
<tr>
<td>Audio Output</td>
<td>More than 2 watts.</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>100/117/200/234 volts AC 50/60 Hz or 12 volts DC (8 dry cells*).</td>
</tr>
<tr>
<td></td>
<td>If the AC supply fails the DC supply is automatically connected.</td>
</tr>
<tr>
<td>Size</td>
<td>13( \frac{1}{2} )” wide, 6”, 7” overall high, 11( \frac{1}{4} )” deep.</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 15( \frac{1}{2} ) lbs.</td>
</tr>
</tbody>
</table>

ADD STATUS TO YOUR STATION WITH YAESU
YAESU MUSEN FOR TEST GEAR — NO OTHER INTERNATIONAL MANUFACTURER OFFERS SUCH A RANGE OF ESSENTIAL TEST EQUIPMENT AND TUNING AIDS.

**POWER METER/DUMMY LOAD**
The YP150 is a fan cooled 50 ohm dummy load using a large carbon resistor which maintains impedance (V.S.W.R. less than 1:2 : 1 at 145 MHz) by the use of a "Tapering Trough" and a power meter, for use between 1:8 to 200 MHz. Calibrated 6, 30 and 150W. FSD on a large 3 1/2" x 2" meter with a maximum error of 10% FSD. Size 6" (7") x 4 1/4" x 11" (12"). Weight 6 lbs.

**MONITOR SCOPE**
The YO100. The Multi purpose monitor offers: through line display, 1:8 to 60 MHz of transmitted signals, of 10 to 300W, monitoring of the IF of a receiver (3:18 MHz standard 445 kHz and 9 MHz options), trapezoidal exhibition, audio and R.T.T.Y. portrayal. Built in 1:6 and 1:8 kHz oscillators permit the measurement of power, in accord with statutory two tone P.E.P. measurement requisites.

**DIGITAL FREQUENCY METER**
The YC355D counts from 5Hz to 35 MHz. The D model's prescaler extends this range to over 200 MHz. The ingenious design offers: a dual range system (providing eight digit readout but using only five cold cathode tubes) and operation from mains or 12v at the flick of a switch. The accuracy offered is time base (1 MHz crystal ±0.0005% at 25°C, ±0.0025%, 0 to 40°C) ± 1 count. Input impedance is switchable 1 Mohm or 50 ohm (B.N.C. socket), construction is on double sided epoxy board. Size 8 1/2" x 3 1/2" x 11" (12"), weight 7 lbs.

**DIGITAL DISPLAY**
The YC601 digital display unit (for 101 and 401 series 3:18 MHz IF) indicates transmit and received frequencies to 100Hz on six bright green, 9 segment gas discharge tubes. Built in mains P.S.U. (consumes only 10W), gate time of 100mS., size 3" x 8 1/2" x 9" (10") and weight 5 1/2 lbs. Supplied complete with connecting cables, etc.

YAESU MUSEN AUTHORISED UK AGENTS
(IN ALPHABETICAL ORDER)

AMATEUR ELECTRONICS UK

G3FIK

SOUTH MIDLANDS COMMUNICATIONS LTD.

Western Electronics (UK) Ltd
THE DIGITAL II (FM 14.4-105XRII) COMPACT STATE OF THE ART 2 METRE FM TRANSCEIVER

The de luxe 2 metre F.M. transceiver with a 5 kHz stopped synthesizer and bright digital readout, from 7 segment LED's. Selectable 10 or 1 Watt output, (or simplex or duplex (up and down shifts), across 144-146 (rx to 149 MHz) from a tiny 6x1/2x2/1" tank. Easily fed up with the supplied mounting bracket, or placed into place in the broadcast wireless.

For strong signal handling and low noise the R.F. mixer, first IF (16.9 MHz), second mixer (and LO) are all FET’s. The front panel is tuned by twists fed by the DC output of the P.L.L. with superb selectivity provided by 15 poles (± 8 kHz at 6 dB, ± 15 kHz at ±90 28) Ceramic filter.

LED lamps indicate if the P.L.L. is unlocked or the squelch open.

The V.C.O. is directly modulated (for exceedingly linear deviation).

UNITARY 6 circuit block construction (for serviceability and screening).

Selective calling socket (mic/LS/PTT etc.) on rear panel.

INTRODUCTORY PRICE ONLY £225 + VAT

THE HANDHELD

KP022

The multi U11 A NEW DIMENSION IN SEVENTY CMS. F.M.

A unique combination of frequency control by either external VFO, 23 switchable or 4 instantly selectable auto-scanning channels.

Both the Tx deviation and the Rx bandwidth are switchable accommodating 50 or 25 kHz spacing.

The main dial is channel numbered (e.g. 16 = 433-4, 20 = 433.5 etc.) and is illuminated only when a channel is crystalised up. "Two R.F. stages in the receiver provide great sensitivity (0-5WV for 30dB NO). The use of a band pass first IF (CF 45 MHz) gives high image immunity and low channel drift. Further conversions to 107 and 45 MHz prevents IF image whilst providing good pass and signal selectivity." The transmitter of switchable 100W output draws only 2.5 or 1.3A (0.6 or 0.3A Rx) and has a netting of new crystal facility.

Other features include, diode RF switching, R.T.I. "on the air" lamp, PO meter, 5 meter, ARP, reverse polarity protection etc.

With 8 Channels SU (8, 16, 20) and RU (2, 4, 6, 10)

COAX SLIDE SWITCHES

Up to : 1K, 1.5 GHz, 0.0 dB loss, 1-2-1 VSBR, 50dB isolation, 50 ohm "N" or "PL" fittings available. Ex-Skotk P. & P. 30p, VAT 8% only

TWS 120-2 In 2 out Nickle 50/39 64.50
TWS 150G I In 5 out Gold 50/29 60.50

ROTATORS

Ex-Skotk in Totton for fast delivery VAT-Rotators (1/3), Cable and deliv. 8% Carriage (BRS or post) FREE. Secucitor delivery 1/3 excess (mailing)

All rotors supplied complete with appropriate control box and instr

AR30 (illus. right near and centre) £29.50
AR40 (illus. right centre and far) £29.50
AR50 (illus) £28.50
CD44 (C.B. illus. left) £115.00
2010/2020 Stolle though Rotator (bias) £60.00
5 core-AR30/40/50 2030 per yd. 20p
8 core-CD44, Ham II per yd. 32p

AEC METERS

SWR, Power (Pr), Field Strength (F.S.) Unless Stated: -SWR (±10%), 1-5 to 160 MHz. 50/75Ω

SWR10 (7/AD) single meter horizontal type 8-15
SWR20 (BLH) 50Ω, F.S., Pr. 10 and 100W, FSD (±10%) 69.90
SWR40 (Centre) single meter Vert. type with F.S. 7.80
SWR50A (7/8) SWR (±5%) 3-5 MHz range pr. to 1KW (±20%) 69.60
SWR50 (BRH) as SWR50A (300μA), but 100μA meters 61.20

NOTE THESE PRICES DO NOT INCLUDE VAT (8% or 12½%) Terms-Cash with order or credit card holders just 'phone in for, if possible, same day despatch. Immediate H.P. available for card owners for amounts up to £225. Holders of current U.K. catalogues (where references have been provided) can be speedily cleared or normal H.P. at competitive rates is available.
THE FT301S EX-STOCK This Month

The FT301S is a new solid state 12v. transceiver of plug in construction, which with all options installed offers:

Top band to 10 metres (inc. 5 MHz MSF) in 500 kHz segments, 10W output, built in RF speech processor, selectable 2-4 or 600 kHz crystal filters, front panel controlled VOX (with NOX and PFT), semi-break-in keying (with side panels), clarifier with separate off switch, 25 kHz crystal calibrator, 1 kHz readout from the dual speed VFO (100 and 16 kHz per turn), single knob resonance, Internal VFO or 11 kHz crystal per segment (or external VFO with same crystal facility), 3W audio to the internal or external AC p.a.s.i.'s loudspeaker.

The transceiver employs a pre mixed VFO and single conversion signal frequency IF (9 MHz) uses MOSFETS in the RF and mixer stages followed directly by a roofing filter for sensitivity coupled to dynamic range.

MODES: AI, A8 (USB + LSB selectable)
SELECTION 2.4 kHz 8dB (SF 1:1)
SIZE 11" x 5" x 11½"
SENSITIVITY 0.5uV for 10 dB S/N
SELECTIVITY 600 Hz ± 6 dB (SF 2:1)
WEIGHT 16lbs.

The FT101E, complete HF station FT101E (EE-EX) EX-STOCK

The FT101E complete mains or 12v. DC station contained in a compact 305b. package. 1.25W P.L.P. of SSB (with in-built R.F. speech processor), 180W, CW and 80W. of AM, 10 to 160m. (inc. 10 MHz RX). The sensitive and selectable (permissibility tuned RF stages and 8 pole crystal filter) receiver offers: threshold adjustable noise blanker, switchable 29 and 100µHz calibrator, ±5kHz clarifier (with separate on/off switch), etc., etc.

The VFO is stable and linear (readout to 1kHz), external VFO or crystal control can be selected, with LED indicators illuminated accordingly. Carrier level is adjustable for: tune up, AM, for CW operation, whose performance is unparalleled, Linear and linearizer provisions are made with sockets for: relay contacts, ALC output, all internal HT supplies, low level RF heater links and switches, etc., etc.

The FT221, complete 2m station EX-STOCK

The FT221. The multimode USB, LSB, AM, FM, CW (with semi-break-in and side tone), 2m. transceiver offering the choice of: phase locked VFO or 44 crystal channels, simplex or repeater (600kHz up and down shifts), with unique "double push" auto tone burst, mains or 12v. (SA operation: excellent selectivity, SSB 2 kHz (1:7:5F), or FM 12 kHz. Front panel adjustable VOX and mic gain, a clarifier (10 kHz upwards), RF and side tone readout and linearity, sensitive squelch, clarifier with IRT and IRT with IF (makes F.S.K. easy), switchable "S" and centre zero tuning meter, noise blanker, serviceable plug in boards all contained in 11½" (14") x 5½" x 11½", 22lb. rigid package.

The FRG7, general coverage receiver EX-STOCK

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

The receiver is sensitive (0.5µV for 10dB, 5 ± N/N (SSB)) and stable (within 500Hz for any 30 minutes after warm up) with 10kHz SSB and CW modes catered for. A 3 position audio filter, RF attenuator, dial lamp conservation switch, recorder and phone sockets are fitted. It is mains powered, but should the supply fail, or portable operation be required, 8 dry cells are automatically switched in.

FREE YAESU CATALOGUE, 22 PAGE STOCK/LIST, SECOND HAND LIST, ETC.

COMMUNICATIONS LTD.

SOUTH MIDLANDS COMMUNICATIONS LTD.

Head Office, Main Showrooms and all Mail Order agencies
COSBORNE ROAD, TOTTENHAM, 504 4DN
Osborne Road is off Rumbridge Street.

Hours of Business: 9-5.30, Saturday 9-12.30
Telex 07331 SMCOMHG, Tel (04216) 4930 & 2785.

Northern Branch:
29 BOWERS, No. 3 THE PARADE
NORTH LANE, HEADINGLEY
Tel (0322) 78 2136

Hours of Business: 9-5 Tuesdays-Saturdays
9-8 p.m. Thursdays.

Brian Kennedy, G3ZUL
Droitwich (09057) 4916

A Ian McKechnie, G3BDOX
Bridge of Allan (078683) 3223

E Peter Avill, G3FUX
Darton (022 678) 2517

T Howarth Jones, GW3TMP
Pontypridd (023 387) 846

S Mervyn Anderson, G3WUY
Tandragee 849646
Since we are unable to support the RSGB "RADCOMEX 76" exhibition by our presence, we are making a special offer to support the RSGB during the period of their exhibition by giving you A FREE SUBSCRIPTION TO THE R.S.G.B. (subject to the societies rules of acceptance). On a YAESU purchase of £200 + VAT you will receive 2 years FREE subscription; on £400 + VAT, 3 years free subscription and on £600 + VAT, four years free subscription. We hope you will take this opportunity to support your National Society which works to protect your interests. This offer applies only to orders received by us July 30th—August 1st, inclusive.

**YAESU MUSEN PRICES** (including VAT and FREE Securicor delivery)

<table>
<thead>
<tr>
<th>HF TRANSCIEVERS</th>
<th>VTG</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-75B 10-80m., 120w.</td>
<td>£195.87</td>
<td></td>
</tr>
<tr>
<td>FF-75B AC pau/Spk.</td>
<td>£48.37</td>
<td></td>
</tr>
<tr>
<td>DC-75B DC pau/Spk.</td>
<td>£48.37</td>
<td></td>
</tr>
<tr>
<td>FT-101E 10-160m. AC/DC</td>
<td>£482.62</td>
<td></td>
</tr>
<tr>
<td>FT-101E as above ifcs RF</td>
<td>£484.87</td>
<td></td>
</tr>
<tr>
<td>FT-220 10-80m., 260w.</td>
<td>£264.37</td>
<td></td>
</tr>
<tr>
<td>FT-250 2m., Transverter</td>
<td>£156.37</td>
<td></td>
</tr>
<tr>
<td>FT-605B 4m. Transverter</td>
<td>£135.00</td>
<td></td>
</tr>
<tr>
<td>FT-400B 6m. AM/CW/SSB</td>
<td>£336.37</td>
<td></td>
</tr>
</tbody>
</table>

**VFH EQUIPMENT**

| Sigmasizer 80K 80Ch. | £237.50 | |
| FRG-7 9-30 MHz AC/DC | £162.00 | |
| FRG-101 10-160m. | £336.37 | |
| FRG-101F sig. above | £435.37 | |

**SPECIAL OFFER!** UNTIL STOCK IS SOLD! We offer at LESS than the cost of the components the FT470 MHz CONVERTER with 25MHz I.F. (as used in the FR400). Don't miss this 4m. converter bargain. All brand new units (no guarantee) at £35-40 (inc. VAT)!!

NEW EQUIPMENT in accordance with company policy we do not generate interest by advertising equipment which is not available. In August 1975 we were asked by YAESU to keep the FT-301 "confidential." However, as mention has now been made we can tell you that the FT-301 is a new all solid state HF SSB Transceiver due at the end of the year. The "S" suffix denotes a low power 10 watt Japanese domestic market model. We could tell you about the FT-301 DIGITAL with Notch filter, CW Key and auto indents, but what's the point! We have none nor any price so please don't ask for details! When they are in stock of course we'll let you know. The same goes for the FT-312, FT-110, YC-500 and YC-500L. Meanwhile, if you must have the spec., on the FT-301 then please send a S.A.E and we'll tell you all the secrets! FRG-7, full colour leaflet sent upon receipt of S.A.E.

**COMPARISON OF ROTOR BREAK TORQUE FIGURES** (kg. /cm.)

<table>
<thead>
<tr>
<th>CDE model</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR30</td>
<td>575</td>
</tr>
<tr>
<td>AR40</td>
<td>920</td>
</tr>
<tr>
<td>CD44</td>
<td>1,152</td>
</tr>
<tr>
<td>HAM-2</td>
<td>4,025</td>
</tr>
<tr>
<td>E moto model</td>
<td>1,500</td>
</tr>
<tr>
<td>110M XX</td>
<td>1,500</td>
</tr>
<tr>
<td>1100M XX</td>
<td>10,860</td>
</tr>
</tbody>
</table>

**FEATURES**

*Robust design*
*Heavy duty stainless bolts*
*100 V supply to motor reduces voltage/power loss*

**PRICES (Garr. pd.)**

<table>
<thead>
<tr>
<th>1100M XX</th>
<th>£115 + VAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>102LBX</td>
<td>£35 + VAT</td>
</tr>
</tbody>
</table>

DOES YOUR ANTENNA TURN IN THE WIND?

DOES YOUR CONTROL UNIT "CUT-OUT" AFTER ONLY A FEW REVOLUTIONS?

We have been in the business long enough to know your requirements for a first-class antenna rotor, and we have gone "overboard" for the EMOTO range. There is a variety of antenna rotors, some of them completely unsuitable for the majority of amateur applications, and for this reason we do not stock them. Most likely your present antenna rotor will turn your antenna but it will not hold its position under strong wind conditions i.e. YOUR ROTOR LACKS SUFFICIENT BRAKE TORQUE, the ability to hold the antenna still whilst a gale is blowing. HERE IS WHERE THE EMOTO SCORES.

Take a look at the comparison figures above. Then compare the prices of all the rotors and you will have to agree that the EMOTO 102LBX and EMOTO 1100M XX are the best value. AND THEY DO NOT "CUT-OUT" AFTER ONLY ONE OR TWO REVOLUTIONS, THEY KEEP ON GOING!

Finally, EMOTO ANTENNA CO., is not a new company. They have been making rotors for many years. Have no fears about this being a new and untried product!

Having obtained samples (all rotors are individually tested by EMOTO before dispatch) and had them tested by an independent authority, SOUTHAMPTON UNIVERSITY, we are now confident to recommend them as THE FINEST ROTORS AVAILABLE. The 1100M XX received the following comments from the University: "Very rigid, NO SLACK, WELL MADE, GOOD DESIGN." NEED WE SAY MORE! AT LAST WE HAVE A ROTOR THAT SELLS ITSELF!
The WESTOWER
TELESCOPIC STEEL TOWERS

a “WESTERN” brand quality product

BUYING A TELESCOPIC STEEL TOWER:

... then here are a few facts which you should consider:

Firstly, the head load (horizontal load due to wind) which will be placed on the top of the tower should be determined and the manufacturer of your antenna or lighting equipment can tell you what the head load will be at a particular wind speed, e.g., 100lbs. (45Kg.) at 75 m.p.h. This means that when the wind is blowing at 75 m.p.h. you would need a HORIZONTAL pull of 45Kg. to restrain the antenna. The actual weight of the antenna is usually a factor of much less importance and is ignored. If you wish to have an installation which is rated at 100 m.p.h.—then the wind load on the antenna will be much greater than 100lbs., 176lbs. in fact. Obviously, a stronger tower would be required to take this additional load.

But then there is the second consideration. At what wind speed would you like the structure to be safe? No doubt the answer you have in mind is “about 150 m.p.h.” That was, it will never fall down! However, economics must come into the picture and the costs go up very considerably in achieving strength.

There is a British Standard Code of Practice (BS 449), which relates to the “Wind Loading on Structures” and they recommend Basic Windspeeds of about 85 m.p.h. for the London Area to as high as 110 m.p.h. for Edinburgh and 120 m.p.h. for the North of N. Ireland. This “Basic Windspeed” is the maximum gust speed likely to be exceeded on the average only once in 50 years at 10m. above ground in open level country. An average figure for England is therefore 100 m.p.h. Commercial installations are designed to this standard and we recommend a minimum design speed of 75 m.p.h. for an amateur installation. Most towers currently available are designed for 60 m.p.h. ONLY! This is why they blow down with no aerial on or when only partly raised! Because of our considerable experience in this field we have now designed and manufactured our superior quality product AND—IT COSTS LESS!

QUALITY-UP and PRICE DOWN—that can’t be bad!

- Designed by Chartered Engineers to B.S. 449
- Constructed of High Quality Special Alloy Steel
- Fabricated Using the Latest Electronically Controlled Techniques

A foolsap S.A.E. will bring you our specification sheet and list of prices. No “WESTOWER” tube prices were increased by more than 10% in May—we should know! We are manufacturers and actually buy the tubes ourselves!

HERE’S HOW THE “WESTOWER” COMPARES:

<table>
<thead>
<tr>
<th>Height</th>
<th>Brand X</th>
<th>Brand Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL</td>
<td>PRICE</td>
<td>HEAD LOAD</td>
</tr>
<tr>
<td>P40</td>
<td>£208</td>
<td>150 lbs.</td>
</tr>
<tr>
<td>P60</td>
<td>£256</td>
<td>100 lbs.</td>
</tr>
<tr>
<td>P90</td>
<td>£306</td>
<td>60 lbs.</td>
</tr>
</tbody>
</table>

FROM THIS YOU WILL SEE THAT A 60” “WESTOWER” IS 40% STRONGER THAN ITS NEAREST RIVAL AND COSTS LESS! ABOVE PRICES EXCLUDE VAT.
Very quiet

A/B/E or
input

Amplifier.

PSU. PA
power rating. In-built
be
metres.

336
"driven"
also
Supplied
ADVANCED
I
*

A notch
features
in
This
Fast
FREQUENCY -AGILE
1000
max. Designed
to
of interference
Fully variable bandwidth
whistles
Band pass
filtering with fully
phone
Multiplier.

One
KW
202
Receiver
One of the finest Amateur
Band Receivers on the
market. SSB filter and
"Q" Multiplier. Excellent
sensitivity and stability.
Two speed tuning 10-160
metres.

Write or phone
for
catalogue.

KW 204 Trans-
mitter. Well
known for really good
audio quality (SSB) and
a favourite with CW
enthusiasts. 10-160 metres.
Reliable PA tubes (2 x 6L6).

Communications Products
DECCA COMMUNICATIONS LTD
Cramtons Road Otford Sevenoaks Kent Tel. Sevenoaks 50911

ADVANCED TECHNOLOGY FOR THE DISCERNING AMATEUR

FREQUENCY-AGILE AUDIO FILTER
MODEL FL1
Fast becoming a classic, Model FL1 delights and amazes all who hear it in action.
This unique product improves any receiver and is installed simply by connecting
in series with the receiver's loudspeaker. It offers the following advanced
features:

* A notch filter which tunes itself for fully automatic removal of unwanted
whistles in phone reception. With Model FL1 in circuit you can ignore tune-up
whistles.
* Fully variable bandwidth tailoring for enhancing phone reception in the presence
of interference and sideband splatter.
* Band pass filtering with fully variable centre frequency and bandwidth (1000Hz
to 25kHz) plus A.F., for the kind of CW reception which you would not have
believed possible.
Supplied with connectors and full instructions. Ready-made connecting loads
also available. Price £67.50 plus 12½% VAT (£53.44 total).

All Datong products are designed and built to professional standards using high quality
components and glass-epoxy printed circuit boards.
Prices include free delivery in U.K. only. Free data sheets on any product are available on request.

DATONG ELECTRONICS LTD.
11 MOOR PARK AVENUE • LEEDS LS6 4BT • TELEPHONE 0532-755579
THE UNIQUE
STRUMECH
VERSATOWER
SYSTEM.

Designed and manufactured by PROFESSIONALS for PROFESSIONALS.

Fully complying with the latest BS Code of practice CP3, chapter 5, part 2.
All Strumech Versatowers are designed to withstand wind speeds of up to 117 mph, depending upon area of array.

ENQUIRIES TO:
SOUTH MIDLANDS COMMUNICATIONS LTD
OSBORNE ROAD, TOTTEN, SOUTHAMPTON
Budmarsh

We must return now to our old friend the Budmarsh of Coochpawani,* leader (imaginary) of the Afro-Asian bloc on the International Telecommunications Union, Geneva, the body responsible for producing frequency allocations for all the world's radio services and requirements. The Budmarsh—who was first introduced in this space in the October 1963 issue—will be in action again during the next World Administrative Radio Conference in 1979. This will be when a particular matter of the utmost importance to us all as radio amateurs will be discussed—a problem fully recognised and clearly understood in responsible circles throughout the world of Amateur Radio: That of retaining reasonable areas of frequency for AT-station operation. It is, of course, still not at all clear what the solution is going to be.

What we have to remember is that the Budmarsh and his friends have a voting power out of all proportion to their true status, which is that of junior and somewhat inexperienced members of the Union, with little interest in and less understanding of Amateur Radio. Some of these nations have populations hardly more than that of an English county—yet they enjoy equal voting rights with the U.K., the U.S.A. and the U.S.S.R. In these circumstances, it could well be that in the process of bargaining against heavy voting odds, the European nations will have to give way in some directions in order to get their requirements met in others.

At the I.T.U. conference table (and this is the point of the foregoing) some of these bargains could well be struck at the expense of the amateur frequency bands, as being one of the easiest channels along which to secure agreement.

Of course, it may never happen—but all the signs are that it very well might. Unfortunately, the central fact emerging from all this is that the greatest menace to the future of Amateur Radio is not so much the "crowded state of the bands," or the "excessive use of power," or the "irresponsible behaviour of some amateur elements," or even "disincentive licensing"—but the Budmarsh of Coochpawani and his Afro-Asian friends.

And what, you may now ask, is likely to be the outcome of it all? The broad answer as we see it is that, whatever decisions may be taken on paper, they will remain paper decisions because Amateur Radio cannot now be destroyed simply be decree.

*(A loose rendering from the Hindustani would be "Villain Who Couldn't Care Less")
COMMUNICATION and DX NEWS

FOR most of us, the month in retrospect has been one of heat, with shacks uninhabitable for much of the day and sleep elusive most of the night; while for the gardeners among us it has been an unmitigated disaster and a revelation in shades of yellow.

So—there will be many of the less dedicated ones who have not even switched on during this month after just a whiff of the heat coming out of loft or garden-shed shack, and who can blame them?

On the other side of the coin, this month saw a letter from an ex-G8 type who took the Morse and got his A-ticket; in the happiest letter one has had in years he extols the working of his 100th country. Good for him—working a repeater will never have that sort of thrill to offer!

On a different tack, there have been many writers to this piece over the years who have been hot under the collar about operating standards in and out of pile-ups. For any of these, the writer’s advice is this: Spend an hour or so listening to the abuse and the obscenities on GB3LO, then look at the operating standards on the FM simplex channels and be thankful our HF band operating is as good as it is!

Ten Metres

Use, or lose! The local net activities on the band are slowly increasing—we have already mentioned several in these pages, and we hear of more through the grapevine. Swansea’s idea of giving the first few minutes over to CW, and then changing over to SSB is even better than it would seem on first sight, because it not only gives a bit of practice to the phone-only wailahs _just in case_(!), but it also gives some QSO-type practice to the SWL’s learning code. This is a very-positive incentive as compared with just listening to old Joe done the road banging out prepared passages.

The only other report on Ten at the moment of writing is from G2BY (L.O.W.), back from his run to W9-land and _hotter_ at home! Bert happened upon a ten-minute opening on June 26, and worked KILWI for his first W on the band since 1970.

Right on the last moment in came a packet containing three letters all bearing references to Ten! G3N0F (YeoVil) found short-skip Europeans aplenty, and, apart from the June 21 opening to the States, he has noticed that it opens up on occasion after midnight with weak East Coast W’s, at least up to July 6. Don made contact with HP1GD, K1BCG, K1RQF, K1VUJ, W2FPG, W2PIC, W3LIT, W41WZ, WA91GN/4, WB8FAG and WB8IZO, all SSB of course.

GW4BLE (Newport, Gwent) noted the ten-metre openings and theorises that they may have been due to some sort of double-hop Sporadic-E effect. He worked SSB to E12CI, EL7F, FO0CQK/FC, G4AKF in Essex, plus other London-area G’s, G4DMN in Liverpool, six assorted LU’s, LX2HC, a brace of PY’s, W1-2-3-4-8, 5T5KJ, 9X5PT, a lot of other EU stations, and a 4X4—quite like old times indeed!

G4DMN exults that his exams are now over, and he can get down to the bands. Richard, back in Wirral, now is saving up for a Versatower to get the beam up another 20 feet; meantime he has heard his first signs of life on Ten, with W’s and signals from the Caribbean, though he didn’t work anything.

Fifteen

Again the doldrums. G2BY worked a few Europeans but nothing he would consider as DX. G3KFE looked at the band a few times, mostly near what he would have expected to be the closing-down period and was rewarded for his pains on one occasion by some South American signals gently fading away into infinity as his PA heaters warmed up, and for the rest was able to assure himself that his neighbour’s colour TV was duly switched on. Otherwise Nix.

G4MEQY (Paisley) mentions a long list of DX in his letter, of which more anon, and, hidden among the small print, has just one QSO on the band, which was with LU2AFH—fair enough since his dipole is cut for Twenty!

G4DMN offers only the comment that stations were heard but none worked—from which one may deduce that they were not of enough interest to justify a call.

The midnight openings on Ten referred to by G3N0F were also noted with respect to 21 MHz, saving that the signals were S9 on this band—notably W2HCW and WA2VFA, both of whom have big aerial systems. Outside Europe, the only actual QSO’s recorded were with K2LG/MM in the Persian Gulf, and TU2GF.

Twenty

Here we must start with GM4EQY from Paisley, being ex-GMBHDB and the writer of the enthusiastic letter mentioned earlier. John runs a Trio TS-520 with an indoor dipole, and with this has run up the 100 countries since November 1975. Looking at the current 14 MHz list, we see all the U.S. call areas save W5, all the VE call areas, plus YV5DUW, CE5RC, HP2FY, PZ1BG, CP5DT, FY0BDH, ZP5YD, HK1CIC; H18MOG, PJ8CO, 9Y4VV, 6Y5DA, KP4BCL, 8P6FV, FG7TD, 9G1UX, 6W8DY, 5T5ZR, ZE1EA, 9J2WR, 5N2NAS, 5Z4PG, CN8BE, 9X5RK, VK3AKK, VK1BH, UL7, UA9, EA8FF, 9K2DT and A6XR.

G2BY worked CW with KH6IJ, 8P6DA, UA0FAC (Sakhalin Is.) and the usual crop of JA’s; but from the westward the only contact of interest was with WITU, active since the early twenties.

G3CED/G3VFA (Broadstairs) has been rather too busy with work, to the point where the XYL suggested that he must have been a galley-slave in an earlier incarnation—now that is a _polite_ sort of brickbat! When he has been able to get on, George frankly admits that usually it is possible to make and complete a SSB QSO with his two watts and old seven-and-sixpenny mike while still tuning round the CW end.
The callsign GW4BLE is well-known on the air and also as a regular DXCC correspondent. Stephen Cole is at 28 Fernlea, Risca, Newport, Gwent, and keeps GW4BLE active on all bands Eighty to Ten, running a Yaesu FL-PK combination with an FL-2900B linear, into a TH3 Mk. III on a Struncheon tower, with a long-wire as back up. Stephen's interest is mainly in DX and contest work, and he also holds GW4ENT for the Gwent Contest Group.

Looking for someone to call. True enough, and also a statement containing a Great Truth—if you want a QSO on either mode, don't call CQ but search around.

G4DJY uses 120 watts to a Joystick, and it might be commented, has an eminently readable logging fist, unlike some of the spider-in-the-ink ones that are about! All his contacts but one were on Twenty, and included lots of W's, both in their normal and ITU or Bicentennial variations! EA8LK, VP9BY, a doubted "YI3A," calling for QSL's through W2GHK, PY's, 3AOGY, UA9JAA in the almost Welsh-sounding Khantymansisk, UI8, UL7, UV9BA, WA1WGV/MM (who wasn't saying where he was), JW5NM in Svalbard and AC2GHK/4—this last was a chance missed to enquire as to the goodness of that YI3A claiming Stew as his QSL address.

G4EVO runs a couple of watts to a Joystick, and is now in our end of radio after 47 years of the sea-going variety—he would have been about 75 when he took the R.A.E.! On Twenty, the two watts were, not surprisingly, deployed on CW, with which mode the whole of Europe was covered with good exchanges both ways, up to the Asian and African edges.

G2HKU (Sheppley) stuck to his key, and raised KZ5RQ, UA0AG and UA0GF. On a different tack, Ted is a bit unhappy about the proposal to run the "WG1JFK" station at Runnymede past the DXCC desk for separate country status; he reckons that on this basis every embassy in the world would qualify! However, one wonders whether this is quite true, in that an embassy is, as it were, a patch "lent" to the country concerned, whereas that patch at Runnymede on which the memorial stands and on which the WG1JFK station was given to the U.S.A., which makes it an American station on U.S. territory without any possibility of argument. However, one could have wished the decision could have been made to run it as a possible "new country" rather earlier and more publicly, so that people would not have passed it up as not worth the effort, which one is sure many folk did.

Ray, GW4CXM, has given 14 MHz the occasional once-over. On CW, there were AA0WCR, D2AZB, FY7YE, FL8IC, HK0BXK, K7KBX, KH6CF, LUICAH, PY7DBZ, UD6CM, U1AG, UJ8BQ, VE7MH, XN1KE and Z5EL, while SSB accounted for CX7BF, M1D, N4ISC, Z65ST and ZL4FT. A bare crop this time, he complains, blaming it all on the naging he is getting from GW4BLE (both are at Newport, Gwent) about his VHF DX. GW4BLE, prudent chap, refrains from comment!

G2BJY (Walsall) says he is giving up wondering about this 14 MHz "funny" aerial and going back to Eighty soon, so he can fill in the rest for his 5BDXCC. Before we go any further let us make comment on that; This old scribe has seen the G2BJY acres, and would say that, not only is it as postage-stamp-sized as any he has visited, but it is also intensively cultivated, Geoff liking fresh food with his DX. This means a low mast, to keep the guys in the garden, a take-off surrounded by buildings on all sides to soak up the outgoing RF, an end-fed wire for all bands, and an all home-built station; when he changes his band of activity, he usually has a rebuild in the process, as from Ten to Top Band a year or so ago. What Joe Average would have considered to be a more or less ideal situation for a QSO-less existence—and yet G2BJY has his hundred up on all bands save Eighty for 5BDXCC, and that same aerial has managed the U.S. on Top Band. To paraphrase a popular song of years ago—"It Ain't what you Run; it's the way that you Run it!" Geoff notes this time CW contacts with EP2's, JA, UI8, UL7, UA9, UA0, UG6, WB7ACT (Montana) and W7KEY (Arizona, who said he had been in London the previous day) A47UQE (Oregon) and K6CR—thus did the W-less aerial finally vindicate its honour! However, one sad getaway was JD5AAD; Geoff had "G2BJ?" from him, went back to resolve that
problem, and then lost the quarry under the European QRM who continued calling the JD when the latter had swung round and was calling CQ Africa!

For your scribe there has been a problem, over and above the universal one of trying to keep the garden at least faintly alive, and that has been that in order to keep the shack “cool” one has to have a fan running—and our thirty-year-old specimen has chosen this year for its first display of tantrums since it was saved from the scrapheap ten years ago; its then owner declared it wouldn’t work, not any way at all “so take it away.” We did, we cleaned it, oiled it, put a plug on it and away it went.

GW4BLE has, like the rest of us, tended to keep out of the shack—as he says, it’s bad enough doing its convector-heater act then things are Just Not Acceptable! However, D6A was collected, plus a crop of Northern and Southern Americans in the intervals of activity not spent listening on Ten.

G3NOF again mentions the prevalence of short-skip—this seems to have been more marked than usual for most of the summer, which leads one to wonder just why it should be so noticeable. Is it just the poor conditions which show these short-skip stations up or is there some mechanism which has been more active this year? Anyway, the morning VK/ZL’s were not conspicuous around 0600, but instead W6-7, VE4-5-6-7-8, Pacific stations and the odd KL7, and on the occasional morning even the East Coast W’s. These in any case have often been heard around 0900 and on through the day. Africans have not been too good in general but there have been a few openings into the Indian Ocean around 1600. Don added it all up to SSB QSO’s with AA0CPX, AB6HEQ, AC6RKP, C5AR, C31FO, C31JW, D6A, HB9ED/MM on Lake Zurich, HK0BKX, HR6SWA (Swan Is.), IE9SEZ (Ustica), JA’s, KH6SB, KL7EN, OY8I, TU2EG, VE4WZ, VE6KW, VE8RCS, VQ9HCS, VQ9R, lots and lots of W’s in the rare areas, W6EWH/VQ9, (Chagos, this one), YU7GY, WS2JRA, XJ3RO, YS1GMG, ZL1KN, ZS5PG, ZS6BNH, 5Z4HZ, 9J2GF and 9L1NP.

G4DMN reckons that Twenty staying open well into the night is a good thing, he having sat at the rig till three in the morning on occasion. He booked in CX2CL, CT2BS, FG7AN, FG0CRZ/FS7, G3ZY, G31FLH, GM3MBP, HI8MVF, HK0LE, OH5MJ/HB0, WA6QFO/KM6, G3KZR/M/VA, PJ2CW, VP8HZ, W5TVM in Oklahoma for the 48th state for the Bicentennial WAS, XJ4CX, XJ8RCS and XN2AB.

On the home front, GM3YOR (Kirkcaldy) has spent most of his time on Twenty, his CW having included CO2OM, PZ1AP, EP2DO, VE2RY, VP2KK, VE7SV/8, YV3AGT, UK8AAK, UA9MAX; Drew mentions that the Glenrothes crowd had two stations for Field Day. One had a Quad, a TH3 beam, and dipoles at 60 feet for the LF’s and worked all sorts of DX, while the other station had almost exactly the same power availability into a “G5RV” aerial, which also made lots of contacts but no DX on any band. A convincing demonstration of the aerial given equal equipment in the shack and equally good operators, which is the only time when the comparison is valid.

Round Off

Which is where we try to account for some of the odd things on the DX scene over the past few weeks. We have already mentioned W6J1FK as being in the running for new country status, and ARRL are on record as saying quite specifically that “It is considered a U.S. station operating from U.S. territory” which seems to say that it will get thumbs-up from the DXAC.

Bill Rindone, WB7ABK duly set off on his travels, and showed from TA, some reporting him signing WB7ABK/TA and some ZK2AQ/TA. He then went on to the Sudan where he was momentarily stymied for want of a way out of Khartoum airport, thanks to an unsuccessful military coup. He was, at the time of writing, being heard from ST2AR and also ST2SA, already a week overdue for his original estimated arrival at D6A, and indicating a further week of delay as likely before he gets back on the countries-run.

And, for what it is worth, that provides us with our lead in to the D6A operation carried out by K5QHS from Moroni in the Comoros group, during which some local back-up occurred, with San being reported as using the rig of FH8CE; the exercise ran from July 5 to July 9, with a little side dish from Mayotte as K5QHS/FH8 beforehand and FL8CB after, before flying back to the States where he was to be met by W2DIE, and led in the general direction of ARRL Hq. QSL’s to Box 2588, Hot Springs, Arkansas 71901. Now, why the indecent haste to get to ARRL Hq., you may ask? Well, ’twould seem that while most of the Comoros voted for independence, Mayotte voted for staying with France, which

<table>
<thead>
<tr>
<th>Call</th>
<th>AM</th>
<th>CW</th>
<th>SSB</th>
<th>Counties</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>G4CZE</td>
<td>76</td>
<td>72</td>
<td>69</td>
<td>11</td>
<td>226</td>
</tr>
<tr>
<td>G4CBQ</td>
<td>23</td>
<td>86</td>
<td>71</td>
<td>13</td>
<td>193</td>
</tr>
<tr>
<td>GM3YOR</td>
<td>2</td>
<td>130</td>
<td>18</td>
<td>28</td>
<td>178</td>
</tr>
<tr>
<td>G4EAX</td>
<td>50</td>
<td>25</td>
<td>80</td>
<td>10</td>
<td>161</td>
</tr>
<tr>
<td>GW3WMY</td>
<td>71</td>
<td>80</td>
<td>—</td>
<td>10</td>
<td>161</td>
</tr>
<tr>
<td>G4EPL</td>
<td>17</td>
<td>46</td>
<td>76</td>
<td>10</td>
<td>151</td>
</tr>
<tr>
<td>G4AEJ</td>
<td>62</td>
<td>52</td>
<td>14</td>
<td>8</td>
<td>136</td>
</tr>
<tr>
<td>G4AYS</td>
<td>30</td>
<td>76</td>
<td>—</td>
<td>7</td>
<td>112</td>
</tr>
</tbody>
</table>

Scoring is on the following basis: one point for a county on SSB, two per county on CW and three per county on AM. In the case of an AM/SSB contact, claim two points, scored in the AM column by the AM station and in the SSB column by the SSB station. No other cross-mode contacts permitted.
For a recent meeting at W1BB's QTH, there gathered ace 160-metre DX men W1HGT and PY1RO, with W1BB himself on the left.

discharged the other islands and seems to have led to a bit of a hou-ha; so possibly ARRL will wait for the dust to settle a bit before it tries to decide on this one.

Juan da Nova, Tromelin and Glorioso are all blank of amateur activity, but on July 15, that situation will be altered as far as Europa goes, as FR7ZL will be there, either at 14025 kHz CW or at around 14195 kHz SSB, generally using an HW32, dipoles and a 12AVQ. Guy will be there for about two months, and is well known for his reliability and speed in the matter of QSL cards.

In the matter of the sunspots, there seems to be some confirmation for the optimistic 8KG (as against pessimistic W4UMF) approach to the question of Cycle 21; undoubtedly, over the past few weeks there has been a tendency for the sunspots visible to observers like you and me to be near the solar poles rather than the solar equator, a location which indicates they are connected with Cycle 21, as the spots from cycle 20 are to be found near the equator. Of course, everyone is in the same boat when it comes to long-term forecasting, and anyone could be right; but as anyone will know, when it comes to the short-term W4UMF is better than the weather-forecasters any day.

That 7J1RL operation didn’t go so badly, really—100 contacts on Top Band and 500 QSO’s on 50 MHz as part of a sum total of 9000 contacts made... A station signing CZ30 is said to be in the Olympic Stadium, Montreal.

Lower Bands

All three, Top Bands, Eighty and Forty, receive scant word, even though in long letters. Let’s look at Eighty and Forty.

Eighty, of course, is, above all in our contest, the home of the QRP buff—and, incidentally, raises the question of where is G3RV of late? No QRP Club newsletter, no reference to it, no reference to him or the Club in others letters otherwise full of QRP news, not even a sub renewal notice, let alone a Final Demand—we must have been seen supporting the wrong side! But, seriously, one hopes all is well with the QRP Club organisation and G3RLV as its sparkplug.

G2NJ finds river-bank operating, as at Alwalton, to be quite the nicest way of going/P and interested some other people in the incoming CW signals, notably from G3RIL and G3CED; the latter was a thirty-minute QSO with note a letter lost at the Alwalton end. Other contacts were, from home, with G6PG (North Walsham) who was using an HW8, and with G3GET in Sittingbourne, also QRP.

G2HKU tried both Eighty and Forty; on the “lower plane” he found W1IFP on SSB, while CW gave him a QSO with UV9WL. Up to 5 MHz and here there were CW contacts to not, on SSB, with UA9WS, UL7AO and YV4LF, while the brass came in for KV4CI, VK1BE, W8DI in Arizona, and ZL3JC.

Eighty for G2BY meant a QSO with G2NJ, and another with G3KPO, now back on the air after his move to the Isle of Wight. As for
Forty, Bert was able to renew contact with his old friends VK3MR and VK3XB, but in his opinion the band is not a patch on what it was at the same time last year. On a different point, G2BY comments that among the large and complex rotatable TV aerials he saw on his Stateside trip (Wisconsin), he reckons a six-element beam for Amateur Radio would hardly be noticed! Be that as it may, there is no doubt whatever that the W's have no difficulty in getting some wonderful amateur arrays passed by the authorities for planning.

Calling the YL's

We have a letter from Diana Hughes, G4EZI, who is interested in the formation of a YL net in this country. She suggests that a Saturday morning session, between 11 and noon, clock time, be tried on a frequency of 3705 kHz-ish depending on the QRN situation, but would be interested in any alternative proposals—drop her a line at 3 Primley Park Crescent, Leeds LS17 7HY and let her know you are interested and your suggestions if you can't make the Saturday time proposed. And, others, don't create too much QRN (either at home or on the channel) and give the lasses a chance.

Top Band

For a start, we have G2HKU, who reports that despite the heat he did manage to get in the shack for long enough to work PA0PN and DL6KK, respectively on SSB and CW. His other activity has been winding RF chokes for his Linear and trying them out—and still he finds the most successful is the old National design which was adjustable, despite the modern trend to continuous-wound types.

Many of the Top Band enthusiasts will be looking for GI on counties on Top Band; between August 27 and September 13, GM3YOR and GM3OLK are proposing to activate all six GI counties, spending two days each in at least, with the pattern to be 160/80 one evening, VHF the next, other bands during the daytime. Skeds welcome, to GM3YOR—QTHR. On the operating front, Drew has sent in his long-threatened entry for the Ladder after a careful check of his score, from which we rather gather that Drew's indexing system must be a bit like the G3KFE one!

Now G4CZE, who returns to the fold after being at a series of different /A locations during his work, training as a transmitter engineer for the BBC—he reckons nine so far since he started the training! However, wherever he has been, his faithful 140-foot bit of wire and CW/SSB rig has been with him (yes, it's the same bit of wire!) while the old AM/CW rig is kept at home near Wigan, taped to a 240 foot wire at 18ft., fed on all bands through at ATU. However, the present (Droitwich) location is reckoned to be the worst so far encountered with the colour-TV timescales really cutting things up to the extent that in TV hours the only usable band is two metres! Alan also has an entry in the Ladder, as will be noted.

At G4AEJ (Yardly, Birmingham), eyes will be first turned to the Ladder, he being interested in seeing the GM3YOR score and reckoning Drew will be on top. The second look no doubt will be to make sure his own score is correctly entered; Lem's latest efforts seem to have been directed towards the AM stations to judge by his score amendment, but he also has booked in three new countries to keep the score rolling nicely on.

Contests, Expeditions and the Like

Malaysian Amateur Radio Transmitters Society will be putting on a DX-pedition to the Islands of Tioman, Rawo, Penang, Aur and Tinggi off the Southeast coast of Malaysia in the China Sea, operating 24 hours daily between August 14 and 18. For a special QSL, sent direct, send a dollar or its equivalent in any currency or sufficient IRC's to: DX-pedition 9MOEXP, P.O. Box 777, Kuala Lumpur, Malaysia. Thanks to Tan Bin Hassan, 9M2DV, for this information—he is a real OT, having held a license since before the War.

A brief note of the results of the BARTG Contest results, which show nine U.K. entries from the licensed chaps, one in the SWL section, and one check log from the U.K. Of this lot, I8AA was the overall winner with 200 contacts and 28,624 points, while G3VXO was top G in 11th place overall, with 130,800 points from 145 QSO's. In the multi-operator section the only G entrant was G4ALE, placed fifth with 60,392 points from 84 contacts.

Now we have to announce the World-Wide Contest of SEANET, this year being sponsored by ORARI, the Indonesian national society, commemorating the 31st anniversary of Indonesian Independence Day. This one runs over August 21-22; Top Band to Ten, and in previous years has been quite popular. We suggest you airmail for the rules for this one, but get it quite clear that although phone and CW operations are over the same weekends, you can only participate in the phone leg or the CW one—you can't send in a mixed phone/CW entry. Rules and scoring otherwise are fairly clear so airmail for them to 9M2FK, Ismail Razak, 281-C, Jalan Pekeling, Bukit Glugor, Penang, Malaysia, to whom also the logs should be addressed, to reach him by October 30 1976 latest—he has to get the results out in time for them to be announced at the SEANET Convention at Djakarta, Indonesia, on November 14.

BATC are co-sponsors in the Albatross SS/TV contest over the weekend September 4-5, 1500-2200z on the first day, and 0700-1400z on the second. Exchange picture with callsign, signal report and contact number. Score one point per QSO on 14 MHz, five on any other band, or fifteen if the QSO is via an Oscar; multiplier five per country, ten for each continent. Total score QSO points times multiplier. Logs to be received by Franco Fanti, I4LCF, Via Dallolio n. 19, Bologna, Italy by October 2. Frequencies to be used 3754, 7040, 14230, 21340 and 28670 kHz.

Conclusion

We seem to have reached the end of our allotted space for another month, thanks to all those who have written in, not to forget the assistance of West Coast DX Bulletin, Geoff Watts DX News Sheet, and of course W1WY's invaluable bulletin of forthcoming contests.

For now, then, that's it. For next month the deadline will be August 10 latest arrival, addressed as always to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.
QRO LINEAR FOR MULTI-BAND WORKING
WITH VHF POSSIBILITIES

The linear here described will run to very nearly the full legal SSB output on the LF bands and will give quite a high output on 144 MHz. The DC input possible is some 600w. p.e.p. Initially, it was the intention to build a QRO Linear for two metres only.

Some 4X150A valves were available also a suitable blower motor. During the design process it became apparent that if the linear could be induced to run on the LF/HF bands as well there would be many advantages — saving in space, equipment and avoidance of much costly duplication.

No information on a suitable circuit could be found from any of the usual sources so the actual construction work was undertaken with some trepidation. The necessary bases were obtained for the 4X150A’s. It was thought essential to use the correct bases in this project as the built-in screen by-pass capacitor would probably be quite an asset if neutralisation problems and parasitic oscillations were to be avoided.

Design

Since VHF circuitry calls for more careful design and layout, this part of the unit was first built using quarter-wave anode lines and conventional cross-neutralised push-pull circuitry. For ease of tuning and a better Q-factor half-wave grid lines were employed.

The LF circuitry then had to be fitted in and the tank circuit was considered first. Due to the relatively high capacitance of most switches it was decided to use plug-in coils and the only components readily available suitable for use at the contemplated power level were the old Eddystone 5-pin transmitting types (still available from some sources.)

There were insufficient contacts on these for push-pull use, or even parallel operation into a parallel-tuned tank with link coil, which would have required seven or six pins respectively. Parallel operation in a pi-network circuit was incorporated, however, as this could be done with the 5-pin type available.

The plug-in socket was mounted on brackets quite near the valves and short braided connections run from the outer pins to the valve anode clips. These leads have negligible effect on VHF operation. There appeared to be no easy way of disconnecting the two-metre tank from the valves during LF operation and since the valves were going to be strapped in parallel anyway, this would result in the Lecher-line tank being shorted at both ends, thus only adding a small amount of capacity overall to the circuit. It would, however, be necessary to transfer the DC feed point, by direct switching, from the Lecher lines to the pi-network in order to prevent loss of RF when used on LF (or loss of HT when operating on VHF). This is easily accomplished by a ceramic switch (S5 in Fig. 1).

The remaining problem was then how to feed the LF energy to the grids. The first method tried was to feed the power from C1 to the junction of R2, RFC1 and RFC2; this was all right on 3-5 MHz, but the impedance of the chokes made things difficult on higher frequencies, so the arrangement shown was adopted. This consists of a rather elementary but quite effective switch S1A-S1C which shorts the grid lines together for LF use, but adds just a very small capacity across the grid lines in VHF operation.

The oscillator/driver section of the transverter was rebuilt on a small chassis mounted at the rear, between the blower and the small power supply. This is incorporated to provide bias voltages for the PA and also power for the transverter.

Testing

The power packs should be checked through and, with the blower on, the heater voltages to the 4X150A’s adjusted to ensure that it is exactly 6-0v. The resistor R11 in Fig. 1 must be set to give this voltage. The bias to the PA should be 50v with the relay contacts closed and HT applied to the transverter. RF energy at 144 MHz from the transverter or other drive source should now be fed to the grid line. If the dimensions are followed closely resonance of the grid lines will occur at some setting of C1; if the strays are low, however, it may be necessary to add the small capacitor C2 as shown in Fig. 1.

With the transverter giving maximum output, at least 2-3 mA of grid drive should be available, using the grid circuitry shown.

The grid shorting switch should now be selected to the LF position and the application of some 10-30w. from the LF/HF SSB source should result in grid current flowing, depending on the value of R1. If no grid current appears, then the output of the exciter is insufficient and will have to be increased, or R1 increased. It is inadvisable to increase R1 to more than about 250 ohms, as the PA stage may become unstable. The preferred value for R1 is:

\[ R1 \text{ ohms} = \frac{(V)^2}{W \text{ peak}} \]

Where \( V \) = 4X150A bias voltage (about 50v).

\( W \) = Peak watts from exciter.

The next step is to put the valves into operation by application of some 250-300w. stabilised to the screens and about 400-600 to the anodes. (N.B. Ensure that S5 is selected to VHF to avoid damage to the valves through running with screen voltage but no anode voltage. Screen and anode supplies should always be switched off before S5 is operated or coils are changed.)

The standing anode current will be about 100 mA with 50v bias. Each valve should be checked individually for balance which ought to be within a few milliamps to avoid uneven power distribution and excessive distortion at full drive. The circuit should remain stable at all settings of the tank and loading condensers. Single-tone SSB drive should then be applied unit a milliamp or so of grid current flows, and with an 80-ohm load connected, the PA should be loaded to some 200-300 mA. The neutralising capacitors should then be adjusted until grid peak, screen peak and anode dip all coincide. (In practice this adjustment was very simple to perform.) The tank condenser should be approximately half open at resonance, and there should be no trace of instability.

When all is well at this power level the HT can be increased in steps, and the tuning and loading checked.
To transverter or 144MHz source

**Fig. 1.** Circuit of the Linear Amplifier, using forced-air cooled 4X150A's, and designed to operate at full power - 600w. p.e.p. SSB - on the HF bands, and also on two metres at reduced power. This band flexibility is achieved by an ingenious arrangement whereby the VHF grid and tank circuits remain in being when the PA is operated on the other bands using a set of plug-in coils. Thus, all bands two metres to 80 metres are covered. On VHF, the 4X150's are in symmetrical push-pull, while on the HF bands they are in parallel, this switching being effected, on the tank side, by the mere act of plugging in the required HF band coil and, on the grid side, by the shorting action of S1A-S1C; since the valves are then in parallel, the Lecher lines for VHF have no more than a slight capacity effect. Conversely, when the PA is on two metres, the short braid tails V3-P and V4-R are “in the air” and any effect they have can be taken up by the C8 tuning of L2. Sk1 is the HF-band drive point; Sk3 the aerial connection for the HF bands; and Sk4 the RF output point for two metres - and this PA could probably be taken to 70 centimetres as well!

Each time. The coupling between L2 and LK2 may need slight adjustment to obtain satisfactory loading. There should be no sign of flash-over in the tank condenser and stability should remain unimpaired.

At full drive, i.e., Class-AB1, just on the point of grid current, full loading occurs with a screen peak of about 10-20 mA and an HT anode current peak of 420-450 mA, depending on the particular valves. One peculiarity with valves of this type is that the screen current can be negative, especially at low drive levels, and this negative current will be greater at higher anode voltages.

For LF operation, S1 should be selected to the LF position and the correct tank coil plugged in. The HT switch S5 should then be selected to the correct position after which power may be applied to the anodes and screens. Standing current should be the same as in the VHF case and again there should be no trace of instability. No neutralising is necessary as the passive grid resistor R1 ensures stability.
Table of Values

Fig. 1. Circuit of the 4X150A Linear

| C1 | 15 ± 3.0 | µF, split-stator |
| C2 | 2.0-3.0 | µF* |
| C3 | 0.01 | µF, s/m |
| C4 | 0.01 | µF, tуб. cere, 500v. |
| C7 | 0.024 | kV, rated |
| C8 | 8.8 | µF w/s, split-stator* |
| C9 | 0.005 | µF, rated |
| C10 | 230 | µF, Tx type* |
| C11 | 0.05 | µF, rated |
| C12, C13, C14, C15, C16, C17 | 0.018 | µF, in 300 µF steps |
| C18, C19, C20 | 16 | µF, 450v. elect. |
| CB1, CB2 | 2 in 4X150A base |
| CN | see text |
| RL | Control relay, as required |
| Blower | Type 26BT (Airflow Development) |
| R1 | 100-200 ohms, 10-20 ohms, carbon |
| R2 | 3,000 ohms, 10-20 ohms, carbon |
| R3 | 120,000 ohms, 10-20 ohms, carbon |
| R5, R6 | 1,000 ohms, 10-20 ohms, carbon |
| R7 | 68,000 ohms, 10-20 ohms, carbon |
| R8 | 5,000 ohms, 10-20 ohms, carbon |
| R9 | 10,000 ohms, 50 ohms, w/wound |
| R10 | 25,000 ohms, 50 ohms, w/wound |
| R11 | 0.06 ohm, 2* |
| R12 | 40,000 ohm w/wound potentiometer, set bias |
| D1, D2 | 0.0210, or similar silicon diodes |
| V1, V2 | 500v. or 1000v. |
| V3, V4 | 4X150A, forced-air cooled |

Note: For all items marked*, see text for explanation or discussion.

TABLE OF COIL DATA

VHF — 2m.
L1 — Grid lines: 3in. dia. copper rod, 9in. long spaced 1in. centres.
L2 — Tank lines: 3in. copper pipe, 10in. long, spaced 1in. centres.
LK1 — Grid link: 26g. p.v.c., hairpin 2in. long, 1in. wide.
LK2 — Tank output link: 14g. p.v.c. insulated, hairpin 4in. long by 1in. wide.
HF Bands
80m. — 14 turns 14g. copper on 2in. ceramic coil former.
40m. — 8 turns 14g. as above.
20m. — 4 turns 14g. as above.
15m. — 3 turns 12-gauge copper, silver plated.
10m. — 2 turns 3in. dia. copper tube, plated.

Note: Actual coil sizes for 10-20m. bands will depend on circuit minima, and may require adjustment.

General Constructional Notes

Extra 0.01 µF tubular ceramic capacitors are used in each screen circuit to provide additional decoupling at the LF end of the range. No ill-effects need be anticipated by their inclusion. Despite the lumped VHF circuit elements present no parasitic occurrences have been noted. Efficiency is high and distortion is low.

In order to eliminate shot noise and other undesirable effects relay RLI is incorporated. This mutes the PA valves and transverter during “receive” periods.

The VHF anode lines are made from 3in. copper water pipe. For maximum efficiency they could be silver-plated and more elaborate arrangements made for short circuiting the remote ends and for connecting the open ends to the anodes. However, any improvement would probably be marginal. The remote ends are short circuiting by a clamp made from a 3in. wide strip of copper which is made to grip each tube tightly. Similar clamps are made to provide connections to the valve anodes and these latter clamps are joined to the lines by short lengths of braided copper.

Both anode and grid lines are mounted on ceramic pillars of the type used as condenser mounts in such as surplus TU units, formerly available. If these are not to hang stand-off insulators, of ceramic or polystyrene rod, could be used.

The tank condenser C8 for the VHF lines is a wide-spaced split-stator type (as used in the 19 Set) of about 8-8 µF capacity. (One of the large parallel-disc type neutralising capacitors of the original Eddystone pattern could equally well be used). The RF voltage at the position at which this capacitor is mounted is somewhat less than the maximum occurring at the open ends of the lines and there is no sign of flash-over with the condenser used. In order to obtain the desirable tank-circuit symmetry, however, the front mounted plate of the specified condenser was trimmed to match the rear plate in shape and size. This also facilitated mounting the capacitor on the lines (by sweating the two stator lugs). The rotor earth connection was also cut away leaving the rotor fully isolated. The front panel control is connected to the condenser by a length of polystyrene rod.

For the output link the wire used should be well insulated as there is a chance that it could come into contact with the anode lines, thus presenting the full HT voltage at the aerial socket. When the final position for this link has been ascertained it should be fixed into position using ceramic or polystyrene insulators.

The LF tank condenser C10 is one of the “Command” transmitter wide-spaced types. The maximum capacity is in fact rather too low as it stands, but by slight adjustment of the stator end locking screws the air-gap can be altered (increased on one side and decreased on the other) resulting in an increase in total capacity. Using a GDO, some fixed capacitors of known value and a small coil, it is a simple matter, by substitution, to set this tank condenser to a maximum value of about 220 µF at which capacity the gap is more than enough for the RF voltage involved. The reason for using the condenser suggested was simply that it was available and would fit more easily into the space provided. Any other suitable tank capacitor could equally well be used. The minimum capacity of the circuit as a whole is quite low but slightly too high for optimum results with regard to Q-factor for full efficiency on 10 metres and possibly also on 15 metres. The ideal solution here would be probably to use a separate condenser of about 5-50 µF for 10, 15 and 20 metres—but this would require the use of a 6-pin coil or separate switch to bring into circuit the larger capacitors necessary for 40 and 80 metres. These points would have to be considered in the design stage as they will affect space requirements and panel layout.

On the LF side, the loading arrangements are quite conventional. A 300 µF variable condenser C11 is used with several fixed capacitors switched in parallel, giving a wide range of capacity for output matching. These are C12-C16 in Fig. 1.
Very short leads and the minimum of stray capacity and inductance are achieved by the layout. In order to provide a good return to the cathode for chassis currents, a small hole is drilled through the chassis near the tank condenser and a stout lead is run directly from its frame through the hole to the cathode ground connection beneath the chassis.

The RF choke used is not specified as this was homemade and many constructors will wish to use chokes that are to hand. One point to note, however, is that the mounting bolt at the "cold" end passes through the chassis via a ceramic bush. This bolt is connected to the cold end of the choke and permits a very short return path to cathode through the decoupling capacitor, thus preventing RF currents from circulating all round the chassis, which could lead to instability.

A resistor R7 is connected across the LF/HF output socket in order to prevent voltages from building up across the loading condensers. (Before this resistor was fitted C11 flashed across every few seconds as the charge on it rose!)

The diagram Fig. 1 shows the method by which the LF tank circuitry is connected. The two outer coil socket connections (P and R), which go to the 4X150A anodes, are short-circuited by the corresponding connections on the coil base. The latter are taken to the centre-pin of the coil base (Q) as well. The corresponding connection on the socket goes to the pi-net RF choke and also to the blocking condenser C7. The remaining two sockets—(S and T)—are connected to the tank and loading condensers respectively, while the corresponding base pins on the coil unit are joined to the coil.

The neutralising capacitors are made from short lengths of tinned copper wire of about 26g. Care should be taken during their adjustment to avoid touching these wires against the anodes or anode lines. These very small condensers should be adjusted with an insulated tool, preferably of polystyrene. A small piece of copper shaped to form a hook can be used for this purpose; it can be fixed to the end of the rod by heating and then pressing it into the end of the rod.

Full dimensions of the unit are not given as the size required will depend on the exact layout and dimensions of components adopted in individual cases, but as a guide the Linear as illustrated is built on a chassis of 18in. x 12in. x 3in. deep and the PA compartment measures 18in. x 73in. x 9in. high. Flanges should be provided around the bottom edges of the chassis to permit a base panel to be fitted using self-tapping screws; this is absolutely essential in order to ensure that all the available air from the blower is directed through the only two exits—the valve anode columns. Any gaps which could permit air leakage must be suitably sealed.

The valves should not be run unblown for more than a few seconds, even with only heaters on, as there may be over-heating of the base seals which could lead to fracture. When HT is applied care should always be taken to ensure that over-heating does not occur. The writer has so far been unable to find any data on the limiting temperature for the anodes but the base seals should not be permitted to rise above 150°C. In practice, with a quiescent DC input of about 130-140 watts, the stream of air from the valve anodes becomes noticeably warm when the Linear is “talked up” to some 600 watts p.e.p. input.

Use on Other VHF/UHF Bands

Although no experiments have been tried there is the possibility that this Linear Amplifier could be used on either 4 metres or 430 MHz. The following suggestions are offered:

(A) 70 MHz. If a very low minimum tank capacitor is used a passive pi-network could be tried. The coil required for this band would, however, be very small and efficiency would be poor. A better approach would be to try push-pull; in this case a condenser could be fixed to the 144 MHz cold point of the grid lines, this being of sufficient size to resonate the grid lines to 4 metres. This would result in a fairly low-Q grid line as far as 70 MHz is concerned, but for Class-AB1 operation drive requirements would be quite low. The anode lines could be resonated to 70 MHz by plugging in a suitable condenser across the two outer socket connections of the coil. Again the Q would be fairly low, but even with low tank efficiency it should be possible to run the unit to 100 watts or so p.e.p output. The maximum allowable output to 70 MHz is 2/3 x 50 x 4 watts (about 132 watts p.e.p.). The quiescent DC input can be reduced by switching off the heater supply to one of the 4X150A's or by reduction of HT.

(B) 430 MHz. For 70 centimetres, it may be possible, at some reduction in efficiency, to use the Linear simply by tuning the grid and anode lines in the three half-wave and three quarter-wave modes respectively. (It may be necessary to alter the length of the anode lines or the size or position of the tank condenser C8 in order to get to resonance.)

In either case there may be reasons why these proposals may not work, but there is considerable scope for experiment. Even if the Linear could be induced to work at only 15-20 per cent efficiency, the results would be worthwhile for the sake of convenience and flexibility.

Mention has been made above of switching off one of the valve heaters. At one stage in the construction of the Linear the author was left with one good and one rather poor 4X150A. Quite successful results were obtained both at LF and VHF by using just the good valve, the other being plugged in with heater disconnected in order to balance the VHF circuit. (Note: Where experimental operation on 70 cm. or 4 metres is required the RF chokes RFC1-RFC3 may need alteration, or several chokes in series may be required.)

Power Supply

Although several transformers were available rated at voltages from 500 to 1,000 volts at about 250 mA, none would deliver the 1,400-1,500 volts which was considered necessary for this RF Amplifier. It was therefore decided to try a circuit (which had been seen in various publications) in which two transformers are used, the outputs being connected in series, and thus either adding together or subtracting. This circuit has proved a great success in practice and so a brief description is given here.

Both transformers at hand were of good quality,
one being rated 1000-0-1000 volts at 250 mA. These transformers were wired to a pair of 866A mercury vapour rectifiers, as shown in Fig. 2. The 866A requires 21/2 volts at 5 amps for the heater, and from a well insulated source. A suitable heater transformer was not available so it was decided to use the 5v. 3 amp windings of one transformer, incorporating 4-ohm 15 watt dropping resistors in series. This moderate over-running of the 5-volt windings has no noticeable effect on the temperature of the transformer which remains very cool at all times. In addition, the insulation level of these heater windings is more than adequate for the voltage experienced.

The switch S3 enables the transformer taps to be selected at will and S2 permits reversal of the mains polarity to the 1,000v. transformer. Thus, outputs of some 400, 650, 900, 1150 and 1400 volts are available, depending on the position of these switches. As no time-delay of HT switching is included it is suggested that S3 be selected to intermediate positions, i.e., to “off,” after each period of use and left in this position for a minute or two after S1 is closed. This will ensure that the MV rectifiers have warmed up before HT is applied. It is also suggested that S2 be used to switch to the higher voltages and returned to the lower voltage position, each time it is necessary to change the taps, to avoid excessive burning of the contacts of S3 (S2 being more suitable for this duty due to the higher current rating).

Although rated at 250 mA the transformers will easily supply the high peak currents required by this Amplifier without any sign of distress. The output filter consists of a 10 Henry choke and two 8 µF capacitors which results in low ripple content, and as the impedance of the choke is low (40 ohms) regulation is excellent.

The voltage falls from 1460 to 1360v, when the load current is taken from 140 mA (PA and VR chain) to 300 mA. The VR chain supplies 300 volts stabilised to the screens and is capable of giving up to about 30 mA at the higher HT voltages, although the output current range would be less at lower voltages unless R3 (Fig. 3) is reduced.

Conclusion

This Linear Amplifier and its associated power supply have now been in operation for several months. Per-
formance has been all that was expected. During initial testing the snags were leakage of RF through the original pi-network choke, and the flash-over of C11 already mentioned. Some trouble was also experienced with the first 4X150A's tried due to their low emission; substitution of good-quality valves resulted in the currents coming up to expectation. The only other trouble was a breakdown in the screen by-pass capacitor of one of the

4X150 holders. (This was not a new holder.) Since a new base could not be located the trouble was repaired by stripping down the holder and repairing the fault. (This proved much simpler than expected and provided care is exercised in lifting the flanges the operation can be tried on damaged 4X150 bases with confidence.) The repaired base has now been in service almost as long as the Linear without further trouble.

The power required for the unit can be derived from the Liner 2, or by fitting a small dry battery within the case of the clipper itself, some 2-6 mA only being required. Several different forms of construction are possible. The Mk. 1 & II versions were both built on Veroboard with the clipping level control brought out to the front or back panel. The Mk. III version uses a specifically designed printed circuit board which is shown in Fig. 2, and which is built around a push-button switch with the clipping level internally pre-set. The circuit as given is capable of providing up to 20 dB of clipping. Fig. 3 gives the front and rear panel and case dimensions for the Mk. III version.

Getting It Going

Setting up the unit is simplicity itself and can be carried out without special test gear, although it is useful to be able to view the output signal on an oscilloscope when a one kHz tone from a signal generator is

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C3</td>
<td>470 µF</td>
</tr>
<tr>
<td>C2</td>
<td>100 µF</td>
</tr>
<tr>
<td>C4</td>
<td>0.1 µF</td>
</tr>
<tr>
<td>C5, C6</td>
<td>0.022 µF</td>
</tr>
<tr>
<td>C8</td>
<td>0.001 µF</td>
</tr>
<tr>
<td>R1, R10</td>
<td>22,000 ohms</td>
</tr>
<tr>
<td>R2, R5</td>
<td>470,000 ohms</td>
</tr>
<tr>
<td>R3, R6</td>
<td>15,000 ohms</td>
</tr>
<tr>
<td>Tr1, Tr2, Tr3</td>
<td>BC109, or similar</td>
</tr>
</tbody>
</table>

P. BURNETT (G4BLL)

THERE are many different species of speech “modifiers” available on the commercial and home-brew scenes today, which vary in their performance from downright unsociable, or “... you’d be better off without it” to “very good if you can afford it.”

Not wishing to attempt anything as ambitious as an RF processor and accepting the “limitations” of AF processing, it was resolved to try and design a unit which was simple but effective, easy to construct while achieving a professional appearance. The version shown here evolved as a true, matching, add-on unit for the Liner-2. There is no basic reason why it should not also function satisfactorily with other transmitters.

The circuit is shown in Fig. 1 with no claim to originality. However, in practice and in conjunction with the Liner-2 it words very effectively. It will be seen that it amounts to a two-stage pre-amplifier followed by a logarithmic clipping stage, with input and output filtering to reduce the bandwidth to about 500-3000 Hz, which is essential if distortion is to be kept within acceptable limits. In practice no reports of audible distortion have been received on any of the units which have now been in regular use for some months.
Material: Front and rear panels 32thk aluminium angle
Case 16swg aluminium

Cut-out to suit push-button

-450 dia hole for jack plug

.350 dia hole for jack socket

2 holes 1/8 dia

All dims. in inches

Fig. 3

Liner-2 with the matching Clipper Unit at right.
fed to the input, as the optimum clipping level can be determined before the onset of distortion. However, in the final analysis it is reports over the air which matter and the clipping level control should be set from reports received from distant stations only. As a guide, with the component values given, maximum usable clipping consistent with speech clarity should be obtained with the level control turned to about the three quarter position, with probably half-way proving to be the best one from reports received.

In conclusion, it can be stated that, providing some discretion is used to avoid overdriving, Liner-2 owners will find the relatively small amount of time and effort involved in building this little unit well worth while.

"Short Wave Magazine" is independent and unsubsidised

and now in its 34th volume
**TWO-METRE TRANSISTOR CONVERTER**

**HIGH GAIN WITH TWO TRANSISTORS — CIRCUITRY AND CONSTRUCTION**

The present offering is a development of the idea of a fully transistorised VHF converter using a low intermediate frequency.

Referring now to Fig. 1, the full circuit of this converter, it will be seen to consist only of an RF stage, Tr1, grounded base, and a crystal controlled self-oscillating mixer, Tr2, also in grounded base configuration. The 11-834 crystal is oscillated in overtone at 35-5 MHz, feedback from collector to emitter being via 12 µF capacitor C10, the coil L3 being resonant with the strays at this frequency. The IF transformer, L4, L5, almost untuned, covers 2-4 MHz and is in series with L3 and the collector; the junction between L3 and L4/5 is partially decoupled by C12. Oscillation could take place even without the crystal connected from emitter to ground, but in this position it does lock the frequency very successfully.

Transistors are not noted for their freedom from harmonics, especially when oscillated in this manner, and considerable 4th harmonic appears at 142 MHz, enabling the 144-146 MHz band signals to be tuned over 2-4 MHz on the main receiver after frequency changing.

**The RF Stage**

The RF stage has no input tuning, but its collector is tuned (L1, C6) and 5 µF coupling to the emitter of the mixer is provided (C7). If one sorts out the manufacturers' data on these transistors it transpires that, whereas the input to a valve is capacitive, the input to these transistors at this frequency is inductive, or negative capacitive! A simple series capacitor C1 from the aerial can therefore "tune" the transistor, matching being improved by C2, of 8 µF, from emitter to ground, and C5 (twisted pair of wires) from emitter to collector.

The collector tuning is quite sharp when C5 is properly adjusted, though if made too large, oscillation can occur.

It must be obvious from the way the circuit is closely interwoven that the dependence of one transistor on the other one is very considerable and quite difficult "calculations" are involved if a satisfactory design is to result.

**Performance**

Of course, it is perfectly ridiculous to suggest that two transistors will do what five would do. From this circuit, a gain of around 15 dB may be expected with a consumption of 74 mA at 9 volts, about equal current to

---

**Table of Values**

<table>
<thead>
<tr>
<th>Table 1. Two-metre Converter using Transistors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 = 15 µF</td>
<td>R1 = 1,500 ohms</td>
</tr>
<tr>
<td>C2 = 8 µF</td>
<td>R2 = 6,800 ohms</td>
</tr>
<tr>
<td>C3 = 500 µF</td>
<td>R3, R7 = 680 ohms</td>
</tr>
<tr>
<td>C4, C8, C9, C11 = 0.003 µF</td>
<td>R4 = 68 ohms</td>
</tr>
<tr>
<td>C5 = 1 µF (see text)</td>
<td>R5 = 1,000 ohms</td>
</tr>
<tr>
<td>C6 = 2-10 µF</td>
<td>R6 = 10,000 ohms</td>
</tr>
<tr>
<td>C7 = 5 µF</td>
<td>TR1 = AF10 Mullard</td>
</tr>
<tr>
<td>C10 = 12 µF</td>
<td>TR2 = AF114 (OC171), Mullard</td>
</tr>
<tr>
<td>C12 = 180 µF Z</td>
<td>XTal = 11-834/35-5 MHz overtone type.</td>
</tr>
</tbody>
</table>

**COIL DATA FOR TRANSISTOR CONVERTER**

| L1 | 3 turns 16g. enam., 3/16 in. diameter, slightly spaced. |
| L2 | 34 turns 30g. enam., close-wound on small dust core.   |
| L3 | 12 turns 26g. enam., on 1j. nylon former with dust slug, turns slightly spaced. |
| L4 | 50 turns 40g. enam., on piece of 1/16 in. aerial ferrite. |
| L5 | 15 turns 32g. enam., wound over cold end L4. (Note: Lugs of 22g. tinned copper should be bound to L4, L5 former before winding to made solder connections. These coils are low-Q to avoid self-oscillation). |
SIDEBAND/CW ADAPTOR FOR
BC RECEIVERS

RESOLVING AMATEUR SIGNALS
ON A BROADCAST RX.

F. G. RAYER, A.I.E.E. (G3OGR)

In the writer’s experience of radio (over 40 years) he has known of many" who started their own activities by hearing amateurs on 40, 80 or 160 metres with a domestic receiver. Numerous transistor receivers now tune "shipping" or bands including some amateur frequencies, but AM is little used and they will not resolve CW or SSB. The unit described here overcomes this. Whether made to keep in listening contact with a net while on holiday, or as a gift for a young SWL, its main advantage lies in the fact that it requires no modification or contact with main receiver circuits, and no setting up for the receiver IF. It avoids the bugbear of cheap transistor receivers fitted with a BFO for the IF—touchy tuning due to the wide coverage and poor type of drive usually provided.

The unit is a separate, stable oscillator working at signal frequency. It actually tunes about 1.75-2.0 MHz, with harmonics covering higher bands, and is calibrated for 160 and 80 metres, bandspreading these over most of the capacitor swing. Fig. 1 is the circuit. VCI is a readily obtainable Jackson component with integral reduction drive and its value makes C1 necessary for bandspreading. If VCI were 100 µF C1 could be omitted. Transistors other than the 2N3704 will be found to work quite well.

Finally, it might be mentioned that a later version of the present design—using an untuned RF stage with 4 µF injection from the collector of the oscillator-mixer into the emitter of the mixer, instead of inductive injection—is giving even higher gain and efficiency than before.

Construction

A die-cast box for rigidity is good, but not essential. L1 has fifty-two turns of 32g. enamelled wire, side by side on a 7/16in. diameter former with adjustable core. Slight changes in diameter will not upset coverage too much. A little Bostik or other adhesive will hold the turns in place.

Table of Values

| R1 = 100,000 ohm | C3 = 680 µF silver mica |
| R2 = 33,000 ohm | C4 = 220 µF mica |
| R3 = 330 ohm | C5 = 10 µF mica |
| R4 = 7,700 ohm | C6 = 0.1 µF mica |
| U1 = 330 µF silver mica | VCI = 176-200 µF, with slow-motion dial |
A bracket fixed by the capacitor carries the small perforated board. The pictures show a suitable placement of components, but this is not critical.

Solder about 12in. of thin flex to C5 and lead this out through a small hole in the box. Make a clip to hold the battery in position. A card scale is cemented to the box lid. A stout wire pointer can be soldered to VC1 spindle, or a transparent cursor can be made to fix with a bush and screw, or can take a small rubber grommet which is a tight fit on the spindle.
Calibration and Use

Check with the station receiver for coverage, so that the coil core can be set for about 1.75-2.0 MHz with a little to spare each end of the scale. The core is cemented in place. Final calibration is with the oscillator in its box, and can be from the station receiver, preferably with a crystal marker, or by heterodyning the oscillator with the Tx VFO. Higher frequency bands are direct multiples or harmonics of the fundamental range.

Some adapters fail with all but weak SSB and CW because the BFO carrier injection is not strong enough at the detector. This is not so here because the carrier is amplified by the whole of the receiver. Place the lead from C5 near the receiver front-end, or near its external aerial (if fitted) or behind or under the set as found to be satisfactory. The amount of oscillator coupling into the receiver has to be reasonable, but is not critical. In one unit of similar type tested, R4 was a 2500 ohm pot., with C5 to the slider, thus giving adjustable output, but this was felt not justified.

When a CW or SSB signal has been tuned in with the main receiver, its adjustment can be left because critical tuning for best results is with the VFO, e.g., it is the relationship between transmitter and VFO frequencies which matters when getting the CW pitch or SSB right.

The output lead can be cut down, and it is not wound round the end of a 132ft. aerial, unless you want to put a signal out! The aim is to provide coupling to the receiver. It will be found that the VFO can be used right through the 1-8, 3-5, 7-0 and 14-0 MHz bands, though if HF bands only were in view an oscillator based on 7 MHz would be better.

CC BFO FOR SSB

CRYSTAL OSCILLATORS FOR STABILITY

ALTHOUGH most SSB operators regularly use a standard communications receiver and the BFO technique for their reception of Sideband signals, it seems that many of them encounter the same disadvantage—namely, BFO drift, necessitating constant realignment.

One way of getting around this problem is to use a crystal-controlled BFO, as shown in the circuit, made up as an additional screened unit. Although admittedly this is not a complete answer—for if the receiver's own local oscillator drifts it will still necessitate retuning—it does help considerably by eliminating one source of drift.

The CC/BFO, as shown here, consists of two conventional crystal oscillators, one working on the lower sideband, and the other on the upper, the correct oscillator (or sideband) being selected by switching the triode's cathode to ground.

Crystal Selection

Obtaining crystals at the correct frequencies may be the main difficulty in making up this unit. The writer was lucky, but those having receivers with an "odd" IF channel may have trouble in getting crystals.

Mainly by trial-and-error, it was found that the crystals should be, one, 2 kHz above the IF; and, two, 2 kHz below it. That is to say, with a 455 kHz IF, the crystals would be 453 and 457 kHz. A slight tolerance either side of the correct frequency is permissible, although it is surprising how much difference a crystal a few cycles off frequency will make.

Construction

Complete screening is essential, and the CC/BFO should be built into a small metal box, with all leads into the box decoupled at the point of entry. The output of the unit must be by screened cable to the feed point for the BFO already fitted in the receiver—this tunable BFO should, of course, be disconnected (but not discarded, as it will always have its uses for other receiving functions).

Results

This writer has had the CC/BFO as described here in use for about six months and (as the receiver's own oscillator is pretty stable after a warm-up period) SSB signals can be tuned in easily and accurately, and no tuning realignment is necessary for periods of half-an-hour and more.

Of course, the idea discussed here only goes part of the way towards obtaining better SSB reception. Much improved results would be given by a phasing-type adaptor and crystal-controlled front-end for the receiver—but for those not prepared to go to such lengths, the CC/BFO suggested here is well worth trying as a first step towards improved stability.

The USB/LSB fixed-tune BFO unit described in the article, to overcome BFO drift in SSB reception. Condensers C1-C7 are all .01 µF; R1, R2 are 4.7 kΩ; R3 is 27K, kΩ. the valve is a 12AT7, and X1, X2 are the crystals, respectively 2 kHz above and below the Rx IF channel. The appropriate sideband is selected by the switch.
VHF BANDS

NORMAN FITCH, G3FPK

THE volume of mail this month is greater than usual, reflecting the recent E’s and tropo. openings. It seems that most readers worked something new and the table scores have shot up accordingly.

VHFCC Awards

Paul Lock, G8HTE (Probus, Cornwall) has earned VHFCC No. 262 for 2m. operation. He was licensed in 1974 and has used a Yaesu FT-220 with an additional two-stage, 20 dB gain preamplifier on “receive.” The aerial is a Para-beam at 30ft. a.g.l., the site being 318ft. a.s.l. with a clear take-off over the water to the East and South. No. 263 for Two goes to Richard Haysom, G8HQN (Bristol) who started operations in January 1974. The equipment includes a Telford TC9 Tx and TC7 Rx into a Halli-crafters SX-110 tuning 28-30 MHz. A Trio TR-7010 is also used. Richard has a Heath HW-202 amplifier whilst the aerial is an 8-ele. Yagi at 25ft. a.g.l., the QTH being 200ft. a.s.l.

It is over four years since a VHFCC was awarded to an overseas reader so it is a pleasure to record that certificate No. 264 went to Vicente Torres, EA5IG, from Castellón de la Plana. The majority of the QSO’s were with other EA5 stations and EA3’s, but his list includes nine EA6’s worked on AM and FM, plus FC2CU and some Italians.

The Scottish Scene

Convalescing in Kintyre from a prolonged illness, Jock Wilson, GM6XI, has once more sent concise notes on Scottish activity. Edinburgh amateurs GM3ZVB, GM3ZVL and GM8CWH are all ex-members of the George Watson’s Boys College Radio Club and have now graduated from the Heriot Watt University with Honours Degrees in Electronics and Electrical Engineering.

Generally, the VHF bands are very quiet in Kintyre but activity leapt up upon the arrival of GM3RFA/P and GM8AOB. The latter, whilst mobile in Islay, was RS59 from a hand-held SSB rig and whip. When conditions are good in southern Kintyre, the GB3MP repeater comes in at good strength and can be accessed. It is anticipated that the GB3CS repeater could be operational in late August or early September. The signals from GB3MP in southwest Scotland are likely to be strong enough to interfere with GB3CS. No FM stations could be heard from southern Kintyre and only two were worked from the northeast end of the peninsula.

An 80m. QSO with GM3BQA revealed that the GM’s in the east were experiencing fine openings on 2m. and 70 cm. GM3ZBE (Aberdeen) has worked 150 stations on 70 cm. and GM3BQA (North Berwick) fifty! The OZ, 70 cm. beacon was very strong at Jim’s QTH. GM8BJF (Edinburgh) has “tasted his first blood” of 70 cm. Euro-DX and likes it, but in Kintyre nothing was heard. Many favourably placed GM’s have been working through the Scandinavian repeaters. GM5VG’s son, GM3PNB, says that Bill is active again after recovering from a recent eye operation and that, despite his recent disposal of gear, GM3EOJ “is still with us” multimode on Two.

Robert Dixon, GM3ZDH (Wick), also writes about the fine VHF/UHF conditions both on the amateur and marine VHF bands. GM3ZDH had to work over most of the VHF NFD weekend but did manage to raise his first continentals in the shape of OZ9HBO, OZ10F and LA5UG, with the beam fixed south! Local portables were working strings of PA’s and some ON’s, GM8DKQ/P, using just an IC-202 and 8-ele. beam. ’DQK has an FM rig too whilst GM3SFH is expected on two metres soon with AM.

Contests

Results have been received of the Verulam Club two-metre contest on
November 23 last. G3YLG (Hemel Hempstead) was the winner with 3030 points from 92 QSO's with 31 counties. G8DKK (Henley-on-Thames) was second with 2607 pts. and G4BWG third with 2072 pts.

Winner of the Fixed section of the 1.3 GHz Open on April 24/25 was G3JXN (London) with 827 pts. from 20 contacts, whilst the accolade for the Portable section went to G3WDG/P with 21 QSO's worth 2093 pts. Forthcoming events are the 4m. Portable Contest over August 7/8 (1900-2300 & 0700-1500 GMT) and the 2m. Open Contest at the September 4/5 weekend.

There has been insufficient time for any detailed reports from participants in VHF NFD and it would be nice to seem that stations on the eastern side of the country did better than those further west. The Hull boys are claiming 22,215 pts. divided roughly into 2000 on 4m., 4000 on 2m., 6000 on 70 cm. and 6000 on 23 cm. Their spokesman G3IWA says, "... conditions were superb with good lift prevailing to the continent all the time."

Satellite News

AMSAT reports that the June 16-18 low power tests on Oscar 7, mode B were a great success. W6BG records 45 stations worked using just 500 milliwatts to a dipole, whilst Pat Gowan, operating as GD3JOR, managed 65 QSO’s with 5 watts of CW and 10 watts p.e.p. on SSB. TUF2EF lists a number of G and GI stations worked on QRP. DX stations active on the satellites include ZD8RD, ZS2AB, K5JPH and 9X5SP. GW8BR should be on very soon and W1NU will be in VP9 in September. E15Q/1’s trip to HV1CN has been put back to October but he planned to be on from IS from August 2/3. The Surrey Telecommand station at Guildford is now operational with automatic tracking of the 43 tons ex-Admiralty AZ-EL dish mounted aerial.

Once again Oscar 6 has "caught up" Oscar 7 and they will cross the Equator together on August 9. This means that it will be possible to access 0-7 in mode B, signals being picked up by 0-6 and relayed down on the appropriate days around this date. Readers interested in Satellite communication are reminded that the UK-AMSAT VHF net is held on 144-280 MHz each Sunday evening from 7.30 p.m. local time on SSB with G8CSI (Surrey) in the driving seat. As well as orbit predictions for the coming week, the latest DX news is given plus details of any special experiments. All are welcome to join in whether or not they are members of AMSAT.

DX-Peditions

G3SCP/LX/P should have been worked by the time this issue appears. Gregg Gilman was testing out the complete portable station from Luton on July 11 and it sounded fine. From August 27 to September 13, GM3YOR and GM3OLK are considering a portable expedition to G1 to activate all six counties. At least two full days would be spent in each with 2m. and 4m. operation every other night. QRG’s proposed are 70-17 MHz CW/SSB and 144-275 MHz CW/SSB plus, possibly, S20-S24 FM. Requests for skeds to: GM3YOR, QTHR.

Those who missed the G4DMY/P operation from the Scilly Islands earlier this year will be pleased to learn that G3NNY/P plans to be QRV on SSB during September 3-6 to give us a crack at WJ square again. Wilt is an experienced portable operator and many readers will have contacted him -/P from the Isle of Wight recently. Operation each evening 1700-2100Z 144-27 MHz SSB and 144-10 MHz CW using a Liner 2 and 8-ele. Yagi. Skeds via G3MNY (Q THR).

Beacons

The Dunstable Downs 23 cm. beacon, GB3DD, is back on 1296-05 MHz on low power on a 190ft. mast. To date, the new low-loss coax has not been fitted. As we go to press, the Sutton Coldfield beacon, GB3SC, is off the air for maintenance and should be back soon, presumably on its newly allocated QRG of 432-89 MHz.

Twenty-Three Centimetres

Your previous conductor, Mike Dormer, G3DAH (Herne Bay) has increased his all-time score on this band to 28 counties and eight countries, taking advantage of the recent fine conditions. In addition to strings of DL, ON and PA stations, he worked SM6ESG (GR72h), OZ1US/P and OZ5ESB/P (both EP14c), plus GC3EGV/P in Alderney. Also on 28 counties now is G3JXN (London), plus five countries. If some of the other participants in the all-time table would like to send in their latest scores, the list can be published next month.

G4DGU (Abingdon) ran the Reading Club’s 23 cm. station in NFD and had 42 contacts in 5 countries. The gear ran 6 watts output on CW/SSB to a pair of loop Yagis with the BRF91 preamp/filter/converter at the feed point with the aerial p-i-n switch. Chris is QRV with the same basic equipment from home but with the preamp, etc. indoors. The aerial system is due for a major overhaul. G8UF (Bentleet) is busy with a 23 cm. SSB transmit mixer, "... which is causing no end of headaches..." It seems we can soon expect some square chasing from Keith on this band. G8IFT (Birmingham) using 3-4 watts of NBFM worked PA0LV (CM72d) on July 2 at 2200Z and ON6DH (CL51h) at 0618Z on the 3rd.

G2AXI (Basingstoke) is now on the band trying to perfect the aerial changeover system. G4BYV (Norfolk) added SM6ESG for a new country for a total of nine and worked another 20 more stations, "... all locals, like OZ, etc.!!" John’s 23 cm. SSB is all home built. A “DJ9ZR,” 144 MHz SSB source mixed with 1152 MHz from the 13 cm. rig. Mixer and PA are 2C39A’s, the output being 20 watts. The receive converter employs a BFR90 preamp into a "DL3WR" design, whilst the aerial is a 4ft. dish with dipole feed at 70ft. To date 73 different stations have been booked in. G4BYV has worked PA0WTW on 13 cm. getting 5 & 8, and says that G3LQR raised OZ9OR on 13 cm. which must be a first?

Seventy Centimetres

Activity from G3BW (Cumbria) was somewhat curtailed due to holidays but Bill worked his 9th country in the shape of EI6AS/P with a little help from GW3NNF and others. For G3DAH, the best DX was GC4FAM/P on Sark, GM3JFG/P and GM8AGU/P during their Scottish tour, SK6AB, SM6's
ESG, FYJ and GWA, LA3EQ, LA80J and lots of ON, PA and DL stations. G3XCS is now on the band from Cornwall with SSB and would welcome skeds (QTH) G4DGU was a little disappointed in that only weak D, OZ, PA and SM6 signals had been heard. Only the night before NFD was Chris able to work any DX, including an OZ running 6 watts at a dipole! There are plans afoot for a 22-ele. long Yagi for 70 cm. MS experiments. G8HBQ (Leeds) caught the G8AGU/GM3JFG team in seven counties/regions and Paul writes, "70 cm. has been the best I have heard to date."

On July 2 and 3, G8IFT's 10 watts of SSB to the 18-ele. Parabeam brought Gordon five PA's and an ON in BL, CL and CM squares. John Locke, G8LOC (Solihull) is mobile with a U10B Cambridge on 433-2 MHz and says that activity is rare at present in the Birmingham area. He wonders who the portable station was in the Chilterns, heard on May 20 between 6.30 and 8.30 p.m.? GC8AAZ (Jersey) has his rotatable and tiltable 12XY 70 cm. array ready to go up. He, GC8EZA and GC8GDX now have Pye U450L's, soon to have video modulators provided.

GD2HDZ (Laxey) has heard the Midlands lads working Continental DX which has been inaudible with him. From across the water, G18EWM has had contacts with G3BW, GD2HDZ, G18HXY, GM4CXP, GW3NNF and GW4DHR, plus the G/GM8AGU/P on all but two nights. The Emley Moor beacon has been received well and Steven is also QRV on Oscar 7, mode B. The rig is a TS-510 into a Modular Electronics transverter with a 46-ele. Multibeam at 50ft.

From north of the Border, GM4CXP is another who has heard nearby stations giving and getting good reports to the Continentals which were barely audible in Maxton. Nevertheless, Derrick did work LA, OZ and SM, plus G, GI and GM. He reckons backscatter to be commonplace on 70 cm. For example, on July 3 he was copying G's at RS 21-41 working OZ's and signals were peaking to the east, whilst PA and DL stations beamning to the U.K. were peaking to the northeast. On July 4, SK6AB had his beam heading on GM and was called by DC1XC, but when they turned their beam south, they lost each other!

Two Metres

Although there has been some excellent propagation on tropo. in the last few weeks, undoubtedly the E's sessions have taken pride of place. As reported last month, the first 2m. QSO between Malta and the British Isles was achieved by GC8AAZ and 9H1CD on June 6. Since then, 9H1CD has worked 94 F, 60 G, 8 GW, 34 PA, 13 ON, 18 DJ, one SM and one OZ for a total of 230 contacts! Henry was in on six E's openings on June 23, 25, 28, two on the 29th and the 30th. Four of them lasted between 107 and 120 minutes, the one on the 28th 10 minutes, the last one 50 minutes. The following are "Firsts": GC8AAZ, GW4CXM, ON5UN, G3CHN and PA0GNK. 9H1CD's QTH score is now 82 squares, the County score 19, out of which 16 were firsts. There were very short E's openings on July 1 and 2 also, which yielded G2AKQ and another four F's. Best DX for Henry is
G4CIG (ZO22g) at 2283 km, but 9H1BT (HV03f) has worked GD3YE0 (XO68a) the QRB being about 2500 km. 9H1BT runs a Brown SE400, also a TS-515 plus home-built transverter and 2 x 11-ele. Yagis. Henry has a similar set up but uses 4 x 11-ele. Yagis. Other 9H1's use either TS-700 or FT-221 transceivers and include 9H1B, 'C, 'DW, 'DY and 'EU.

The first U.K. station heard and called by 9H1CD was G4BAG (London) shortly before the QSO with GW4XCM. Bob got Henry's call but then he just disappeared. On behalf of all readers, we say, "Thanks, Henry, for your dedicated efforts—and Viva E's!"

G2AXI worked LZ1BW (LC27e) on June 28, the following day yielding 9H1CD on SSB. Father-and-son team G2AXQ and G8GIN managed 9H1C (HV03e) on June 25 using 6 watts p.e.p. to an HB9CV aerial just 2ft. above their caravan roof from a site at Great Yarmouth, providing that QRO and big aerials are not essential for E's success.

G3BOC (Shrewsbury) netted IT9BXX (GY67d) and 9H1BT (HV03f) plus IT9GYR on the morning of the 29th, his first E's for 12 years. G3XCS (Cornwall), in the space of six minutes around 1900z on the 28th, raised YU1NPW (KE13f), YU1EXY and YU1BLK (KE13f). The following morning brought QSO's with 18G1A (HA22d) and IT9PLT (HX77h) and the evening of the 30th, EA5IO (ZX36b) —all that on SSB. G4CIG (Co. Durham) after no success on the 25th and 28th, even though B and II FM was full of strong Italian stations, did hook IT9TAl (GY66c) with just 2 watts and the beam due south on the 30th; a subsequent QSO with 9H1CD is thought to be the DX record from G via E's at just under 2500 km. Any challengers? G8GXA (Herts.) worked IT9ZHA on FM plus some others and advises that IT9BXX only QSL's direct. Reg says there was not so much E's from Sicily as there was from Malta.

G8HHI (Yateley) landed OE3UP (H710j) and LZ1AB (LC27d) and heard OE, YU and I. G8HTE (Cornwall) worked IT9TAl and IT9PLT on the 23rd and very unsafely dashed out to telephone G3CHN about the opening, enabling Roger to achieve the first G-to-9H 2m. QSO. How's that for the Ham Spirit? On subsequent days Paul worked OE3UP, 9H1BT, 9H1CD and EA5IO. The 29th brought 9H1's 'B, 'BT and 'CD, plus IT9TAl to G8KLN (W. Sussex) and G6JDX/P on Dartmoor, on the evening of the 29th, got IT9PLT, IT9JJL (HX56j) and IT9TDX (HY68b) in three minutes! G8LHT (Doncaster) was pleased with his 2309 km. QSO with 9H1CD the morning of the 29th using just a Liner-2 and 4-ele. Quad. From the Isle of Man, GD3YE0 made the first 2m. contact with Malta, 9H1BT, QRB 2500 km. and also worked YU1BKL. GM4CXP reports EA4OK (Madrid) at S9-plus-30 dB the evening of June 30, but Derrick could not raise him, Spanish beacon EA3URE (BB13f) was heard twice with "snatches" from HA, I and YU. From Wales, GW3XQG got OE3UP on the 28th from Dyfed whilst GW4XCM has the satisfaction of being the first GW station to work Malta on 2m. For the record, June 23, 1728z with 9H1CD, QRB 2227 km. Ray worked YU9BDE on the 29th whilst the 30th yielded 18G1A, 10JDL (GB03f) and EA40K. GW4EAI (Gwent) was monitoring 145-0 MHz with the beam east when up came EA41Z who was worked at 1910z on the 30th. Your scribe managed IT9, 9H1 and LZ and heard YO2IS, HG1SW and EA5IO for G2AXI including GD3FLH/P on the 14/15th, coincided with duct into PA, DL and ON. GM4CXP says he is thinking of QSY-ing to 20m. to avoid the QRM! In the period June 29 to July 7, Derrick worked all U.K. except GC, plus D, LA, ON, OZ, PA and SM. But the prize gotaway was OY5NS copied at RS 31. EA1KC (XD32d) was raised twice on June 11 by GW4XCM, the EA on CW, Ray on SSB.

At G3FPK, the two Scottish trips gave new regions and squares and many were pleased that the G6UW lads activated the rare ZR square in Grampian region. The E's and tropo. brought 16 countries and some new squares, including CU, thanks to LA6CU and LA6LU in the first week of July. Those seeking county Cleveland should listen for G8FTZ from Billingham who was kind enough to call your scribe to give him his penultimate, mainland, 1976 county, on June 30.

Four Metres

NFD brought in a nice crop of counties for G2AXI including GC3VPF/P (Alderney), G13KVD/P...
(Antrim) and G3M4BYF/P (Strathclyde). G3BW (Cumbria) spent most of NFD weekend on the band and was pleasantly surprised to hear so much activity. Bill worked Cornwall, the Isle of Wight, Guernsey and Alderney and has done exceptionally well on the band this year so far. During NFD, G4CJG/P worked 99 stations and comments that conditions were “fairly good.” GD3YEO has modified a low-band Pye Ranger to a 4m. transverter. Richard says that the mods, were “ridiculously simple”!

This set up, plus a QV06-40A PA, were used in the recent Region 1 contest, when 22 stations were worked—best DX G3AUS (Devon).

**Final Round Up**

So much news this month that several items have had to be cut. Perhaps if things return to normal for a few weeks, we will be able to catch up! To clarify some points about the tables: In the Three-Band Annual, you may include Irish Republic counties in your scores. Some do, some do not, it seems. The island of Islay is not a county, just part of Strathclyde region. About the status of G3FK, it is illogical that this could be given country status even though the little bit of ground at Runnymede is American territory. So are all the foreign embassies here and abroad and they merely count as stations in the host countries.

**Deadlines**

Contributions for the September issue by August 6, and for the October edition, September 3 to:

“VHF Bands,” SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. 73 de G3FK.

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

**NEW QTH’s**

G4CZE/A, A Mercer, 15 Princes Avenue, Droitwich, Worcestershire, WR9 7DE.
G4EOJ, T. K. Iott (ex-GXKFC), 69 Upperfield Drive, Felixstowe, Suffolk, IP11 9LT.
G4ESL, S. T. McClean, 13 Maple Road, Ballymaggongy, Strabane, Co. Tyrone, N.I.
G4WESL, P. J. Edwards, 14 Northfield Close, Lodge Farm Estate, Caelevecum, Newport, Gwent, NP6 1EZ.
G4XWM, G. Cum, 37 Coniston Crescent, Hamilton, Grimsby, South Humberside, DN36 4AY.
G4EFZ, W. D. Logan, 27 Shaw Street, Mottram, Hyde, Cheshire, SK14 6LE.
G4Z1 (Mrs) D. Hughes, 3 Primley Park Crescent, Leeds, LS17 7HY, West Yorkshire.
G4FBK, M. A. Kipp (ex-GSHOW), 43 Southdown Crescent, South Harrow, Middlesex. (Tel. 01-894 1412.)
G4PCA, J. A. Haddon, Morley House, Munstone, Hereford (2690).
G4FCL, P. Lawson (ex-G8ING), 46 Gerald Street, Derby, DE1 1PA.
G4PCN, C. J. Coker (ex-G8GCS), 2 Causeway Cottages, East Street, Ipplepen, Newton Abbot, Devon. (Tel. 0893 822177.)
G4FCJ, J. N. Gunn, 8 College Gardens, Hornsea, North Humberside, HU18 1EF.
G4FCU, R. F. Restall, 418 Newport Road, Middlebrough, Cleveland, TS5 4BT. (Tel. 0642 40883.)
G4EFV, V. Cunningham (ex-G8KCE), 8 Viney Close, Eastfield, Peterborough, Cambs, PE1 5LS.
G4FDG, R. G. W. Taylor, Courtland, Dalford, Cullompton, Devon, EX15 2EQ.
G4FPL, M. France (ex-G8YUB), 106 Harvey Lane, Golborne, Warrington, Cheshire, WA3 3QL. (Tel. 0942 275049.)
G4FDP, P. G. McGuinness (ex-G8FDN, E162GY), 27 Fellowes Road, Carshalton, Surrey, SM5 2SX. (Tel. 01-669 7210.)

GM4FDU, R. McKinlay (ex-GM81QR), 36 Griston Terrace, Edinburgh, EH10 7AE.
GM4FPF, F. R. Hallstones, 13 Mercury Terrace, St. Cyrus, Kincardineshire, DD10 0AY.
G4FFH, P. Cook (ex-G8KKX), 21 More Close, Sinfin, Derby, DE2 9LL.
GM4FFP, J. D. Campbell (ex-GM8KJY), 35 Radner Place, St. Andrews (6590), Fife KY16 8QR.
G5BQR, K. S. Amos (WW8YRF), 1 Byron Close, Upper Caldecote, Nr. Biggleswade, Beds.
G5KL, T. Valleris, 1 Grove Cottage, Mill Lane, Chestoe, Nr. Sheringham, Norwich, NR26 2PB.
G5KNX, P. D. Harrison, 2 Penny Avenue, Brooklands, Sale, Cheshire.
G5MLY, W. J. Muir, 53 Deantown Avenue, Whiteharg, Musselburgh, East Lothian, EH21 5NXL. (Tel. 0334-665 2592.)
G5LOW, J. G. F. Locke, 64 Brucear Road, Otton, Solihull, West Midlands, B92 8BD.
G5LHR, D. Dougherty, 49 Thomas Street, Ryhope, Sunderland, Tyne & Wear.
G5LST, S. A. Thompson, 5 Wigton Way, Harold Hill, Romford, Essex, RM3 9HA. (Tel. Ingateborne 41935.)

**CHANGES OF ADDRESS**

GM2FLQ, W. D. Oliphant, 11 Bridge of Westfield, Thuro, Caithness, KW14 7QN.
G3WS, F. S. A. Jenkins (VK2BFJ), 90 Wyong Road, Killarney Vale, New South Wales, 2262, Australia.
GW3CBA, J. Kelloway, 50 Winston Road, Biggleswade, Beds.
G3FRM, M. Page, 26 First Street, Pont Bungalow, Ledgate, Consett, Co. Durham.
G3GOY, J. A. Porter, Hollybush, 237 Close Road, Derry (51937), N.I.

G4HDDJ, L. J. Smith, 118 Charnwood Avenue, Westone, Northampton, NN3 3DY.
G3III, G. P. Lovelock, The Shambles, Whateote, Warwickshire, CV36 3EE. (Tel. Tyseley 543.)
G3IRW, R. W. Simple, 1 North Road, BelFAST, BT5 5SE, N.I.
G3IOGO, J. M. Niblet, Bank Cottage, Waverley Village, Nr. Kidderminster, Worcs., DY11 5XK.
G3KRZ, B. R. Tibbets, 11 Darwin Road, Mickleover, Derby.
G3LQV, M. A. Tindal, Flat 6, 28 Granville Road, Reading, Berks.
G3LZX, D. Barry, 13 Mill Rise, Burton, Notts.
G3XZ, J. T. Ozier, 9 Bainbridge Court, Colebrook, Plymouth, Devon.
G3ZII, M. Rathbone, 36 Portland Street, Southport, Merseyside.
G4ATN, F. L. Coldwell, L.D.S., R.C.S., 120 Chester Road, Poole Town-pk-Fylde, Lancs., FY6 8B.
G4BZ, So. Ldr. M. B. Reed, RAF, 12 Larch Road, North Colerne, Nr. Chippenham, Wilts.
G4CZJ, J. B. Jenkins (VP8JI, DA2YJ, WA5A), 18 Valley Road, Blandford Camp, Blandford Forum, Dorset.
G4CMD, M. R. Holiday, Tosea, 11 Cedar Drive, Loddon, Norwich, Norfolk, NR14 6LE.
G4ERW, D. G. Lurcock, 1 Copse Bank, Childsbridge Lane, Seal, Sevenoaks (61677), Kent, TN15 ODE.
G4ABU, M. C. Davidson, 31 Harthill Close, Hillington, Middlessex, UB10 9LH.
G4BSK, P. G. Robins, 290 Priory Road, St. Denys, Southampton, Hants. (Tel. 536274.)
G4GDD, F. M. Moss, 7 The Paddocks, Worksop Road, Aston, Nr. Sheffield, South Yorkshire. (Tel. 0742 87287.)
G4HFX, K. Haywood, 191 Somerton Street, Brightenhill, Belton, Greater Manchester.
G4LMO, H. G. Moody, 59 Helston Road, Sheffield, South Yorkshire, S8 8QI. (Tel. 0742 54047.) Correction.
THE MONTH WITH THE CLUBS
By "Club Secretary"
(Deadline for September issue: August 4)

No doubt many groups have noted falling attendances over the past few weeks, and there may possibly have been the odd Club worrying about it—but it is as well to be reminded that rise and fall in the attendance register seasonally is quite normal in the absence of a "star attraction," which may well cause a lot of chaps to "slip the collar" despite wily urgings to the contrary. In the absence of these, the routine is almost like the annual cycle on the HF bands, with Spring and Autumn the best times, midsummer and midwinter the poorest for attendance—and therefore, the best times to get that "extra-special" activity on to the calendar! It is so easy, having missed a couple of meetings on the trot, to get out of the old habit and before the Secretary can say Hi, a member has been lost to the Club unless someone is deputed to get the truant back into the fold.

At the time of writing, one could not blame anyone for missing a date; the tropical heat, which has made workplaces into purgatories, and shacks uninhabitable, has caused many of us to lose hours of precious beauty-sleep on hot nights, and been very strong factors in the minds of those who have not turned up.

However, enough about weather and attendance! Let us instead look forward and see what is offered us for August.

Scotland & North

Nice to hear again from West of Scotland, and a new Secretary appears after the AGM—see Panel. He makes the very valid point that they welcome SWL's, and, more, SWL's can and do play an active part in the running of the Club. Find them at 22 Robertson Street, Glasgow G2 8DU, on any Friday evening from 7.30 p.m.

At York there has been much of a special-event station nature of late, but the Friday evening sessions are still enjoyed each week (except, be it noted, the third Friday), and visitors welcomed; G3WVO reckons they add a tremendous lot to Club life, which is based on Hq. at the British Legion Club, 61 Micklegate, York.

For Scarborough who normally foregather at the local Technical College, there is a problem for July-end through to mid-September; but a later letter indicates they have found a Friday-evening spot at the Salad Bowl Cafe, Queen Street, near Boyes Stores, from 7.30 to 9.30, on Friday evenings while the College is closed.

Over to White Rose, who have "their own place" for Hq. rather than a hired room, so that they can knock down walls and hang things up as part of the activity; thus they now have a lecture room, lounge, canteen/workshop, and shack to enjoy every Wednesday evening at 83 Town Street, Armley, Leeds 12, not to mention the string of talks and lectures which are "in the pipeline." One is amused by the statement that the equipment fund is now "of useable proportions," which brings to your scribe a thought of a White Rose pantechnicon full of pint pots each laden with silver and copper coinage collected each week, and the dismay on the face of a seller faced with counting it all!

Midlands

We have now to leave the Ridings and Caledonia for an area where rather more of the groups write letters to tell the world they exist; the first one is at Wirral. However, the Newsletter doesn't go far enough ahead for us to go into August detail beyond saying simply that they have the first and third Wednesdays at the Sports Centre, Grange Road, Birkenhead at 7.45 p.m.

After umpteen years, the Midland committee have decided to move, from the Midland Institute to the University of Aston, Gosta Green, in Room 110; they may be found here on August 17, albeit we have no details on the activity.

The same handwriting under a different letter-head tells us about the South Birmingham crowd, who are based out at West Heath, at Hampstead House, Fairfax Road. Only problem was, he got tangled up with dates and we haven't the current story, for which you must contact G8BHE—see the Address Panel. However, we believe the usual routine to be to book the first Wednesday in each month.

At Wolverhampton, at their Hq. at Neachells Cottage (which is in Danescourt Road, Stockwell End) they make it Monday evenings each week, with the proviso that the Bank Holiday Monday of August 25 is "no meeting." August 2 is down for G8IZS and G3UBX to discuss the Oscar satellites, while on August 16, equipment will be available to measure noise figure,
intermodulation, crystal frequency, and so on, the intermediate August 9 date being held for a general matter.

If you are in Cheltenham, there are, we believe, three or four Clubs to choose from, but only one—the RSGB group—report regularly to this piece. They now foregather on the first Thursday of each month at the Old Bakery, Chester Walk, which is behind the Public Library in Clarence Street, the start being set for 8.0 p.m.

For Hereford the newsletter has the date August 20, and the legend “something in the pipeline!” However, there is no doubt about August 6, when they have a Constructional Contest, with a visiting amateur to Judge. The Hq. address is County Control, Civil Defence Headquarters, Gaol Street, Hereford.

The letter from Derby is a model of brevity and yet contains all the information we need. Namely, the venue at 119 Green Lane, Derby, the Secretary’s name and address, and the details, as follows: A surplus sale is the opener, for August 4, followed by Preparation for the Mobile Rally on the 11th (the Rally itself, at Rykneld School is on August 15); a D/F session on the 18th, and finally an evening of Technical Topics on the 25th.

Going West

Our first stop in this direction is Cornish, who continue at the SWEB Clubroom, Pool, Camborne. They have G4DMY down for August 5, taking VHF as his topic—no doubt the recent repeater in Cornwall has sparked off interest there, as it has done in so many other parts of the country.

The revived Plymouth newsletter makes an excellent start, with improved duplication, and plenty of interest to the reader, be he local or, like us, at a distance. The group still have their Hq. at Virginia Settlement, Virginia House, Bretonside, Plymouth, where they assembly on the first and third Tuesdays in each month. G3GDW, reporting for Torbay put us in a bit of a spin when he wrote an addendum which arrived before the letter to which it referred! However, they are still thriving, taking their summertime Friday evenings, plus the formal monthly affair, which this time is on Saturday, August 28, brought forward a week from the usual routine in view of the Club participation in the Marldon Apple Pie Fair. In addition to all this, on each morning about 3/75 kHz roughly, there is a Club net, except on Sundays—doubtless G3U1Q (see Panel) could pass on the times for all these activities.

South & East

These are the areas where, it is alleged by some, civilisation has penetrated more deeply, thus accounting for the greater number of reports from Clubs in the area; but having himself emigrated from elsewhere to this part, your conductor rather subscribes to the view that the Home Counties’ only real virtues are the invention of cricket by the Kentish men, and the avoidance in the area of those soul-less and enormous public houses of the Midlands and North, against which must be set the sad fact that this South-East area led off with the idea that amateur-radio aerials are not things of beauty in the landscape but rather things to be planned out of existence. However, the natives do at least form Clubs—so let’s see what they have to say.

At the top of the pile we have North Kent, who foregather on the second and fourth Thursdays in each month at the St. Mary’s Institute, 2 North Cray Road, Bexley. The Newsletter to hand is taken up largely—and very properly—with matters AGM, but it does mention that several talks had been lined up for the near future while not mentioning specific dates, for which we must refer you to G4ARQ, as Panel.

Names and Addresses of Club Secretaries reporting in this issue:

ACTON, BRENFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W3 8LB.
A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Exekeald Gardens, Parley, Surrey, CR2 1EZ.
B.A.R.T.G.: J. P. G. Jones, GW3IGG, Heywood, 40 Lower Quay Road, Hock, Haverfordwest, Dyfed, SA62 4LW.
BISHOPS STORTFORD: M. G. Long, 17 Lea Close, Bishops Stortford (SK76B), Herts.
CHELTENHAM (RSGB): G. D. Lively, G3KII, 26 Priors Road, Cheltenham (34783), Glos.
CHILTERN: I. Eamus, G3KLT, Windrift, Shortlade Lane, Princes Risborough, Aylesbury, Bucks.
CORNISH: S. Halfyard, G4EIS, Studio 12, Rosewall Terrace, St. Ives (3576), Cornwall.
CRUYVALLEY: M. Trapp, G3YWO, 57 Cathcath Drive, Orpington, (BR6 19J), Kent.
DELEON: F. C. Ward, G2CVW, 5 Uplands Avenue, Littlecove, Derby (21931), DE7 3GE.
ECHESPARK: R. S. Hewes, G3TDR, 24 Brightside Avenue, Laleham, Staines, Middx.
HARROW: R. Light, G3KDL, 22 Chippenden Avenue, Wembley, Midddx., HA9 9NQ. (01-902 2570)
HEREFORD: S. Jesson, G4CJY, 181 Kings Acre Road, Hereford, HR1 1YY.
MIDLAND: A. L. Walton, G3ZKQ, 243 Barnes Hill, Birmingham, B29 5UJ. (021-427 3088)
MILTON KEYS: M. Probart, G8YW, 29 Agnes Road, Semilong, Northampton, NN2 8EU.
NORTH KENT: R. Wells, G4ARQ, 12 Bulbank Road, Belvedere, Kent.
PLYMOUTH: E. A. P. Swainbury, G4EJO, 106 Plymstock Road, Plymouth, PL9 7PJ.

REIGATE: F. H. Monday, G3XSZ, 2 Conifer Close, Reigate (3130), Surrey.
ROYAL NAVY: FCRS M. Matthews, G3JFF, c/o Royal Navy, H.M.S. Mercury, Leyden, Hants.
ROYAL SIGNALS: Capt. (TOT) J. Cooper, G3DPS, Royal Signals, Blandford Forum, Dorset.
SCARBOROUGH: C. H. Whitaker, 1 Ryfield Close, Eastfield, Scarborough, YO11 1DN.
SOUTH BIRMINGHAM: N. Gutteridge, G3BHE, 68 Max Road, Quinton, Birmingham, B32 1LB. (021-422 9787).
SOUTHDOWN: B. Chuter, G9CVW, 15 Cooper's Hill, Willingdon, Eastbourne, East Sussex, BN20 1JG.
SOUTHEAST: B. Oughton, G4AEZ, 48 Morley Hill, Enfield, Essex.
SURREY: S. A. Morley, G3FWR, 22 Old Farleigh Road, Selston, South Croydon, CR2 8PB. (01-757 3253)
TORBAY: M. Yates, G3UIQ, Top Flint, 23 Waverley Road, Newton Abbot (3217), Devon.
VERULAM: B. H. Pickford, G4DUS, 130 The Drive, Rickmansworth, Herts.
WAMRAC: J. Colley, G3AOX, Micasa, 13 Ferry Road, Wavne, Nr. Hull, Yorks. HU7 5XU.
WEST OF SCOTLAND: G. Milne, GM4BLO, 22 Norse Road, Renfrew, Glasgow.
WHITE ROSE: R. R. Hughes, G4DZL, 3 Primley Park Crescent, Leeds, LS17 7HY.
WIRRAL: H. J. Crofts, G3DFF, 3 Barmouth Road, Wallasey, Wirral.
WOLVERHAMPTON: D. T. Pugh G8BSR, Brigands, 38 Applebrooke, Shifnal, Salop.

YORK: R. C. Cass, G3JWO, 4 Heworth Village, York.
For the Acton, Brentford & Chiswick group, the high spot of the meeting on August 17 will be the hook-up with member G3CCD who will be on holiday in France as F0UT, arrangements having been made in the line of gear, aerial, and sked; the venue as always is 66 High Road, Chiswick.

Now to Verulam, who meet in the Market Hall, St. Albans, and on the fourth Thursday of each month. This gives August 26 as the date, and the subject the Construction of Digital Counters. There is in addition an informal meeting on the second Thursday in each month at Salisbury Hall, London Colney.

Crystal Palace book the third Saturday in each month, at Emmanuel Church Hall, Barry Road, London S.E.22, and looking down the programme list at the bottom of the Newsletter we see that the subject is Aerials, although the name of the speaker is not given.

The compilers of the Newsletter at Southgate absolutely hate making any firm statement as to the date of the meeting and the subject, far enough ahead for us to write into this column; however, by careful scrutiny of last month’s calendar we guess their date as the second Thursday in each month, while the Hq. address we know to be at the Scout Hut, Wilson Street. Subject, not known—but no doubt G4AEZ would be pleased to give you the gen should you care to contact him at the address in the Panel.

There is no meeting in August for the Chiltern group, at least in the formal sense; however, it is stated that, if enough are interested, an informal, casual, meeting could doubtless be arranged. However, this is no indication that the Club is folding up—far from it, as they will be back in full swing on September 22, at 42 Castle Street, High Wycombe.

Although the normal venue for Southdown is at the Victoria Hotel, Latimer Road, Eastbourne, the set-up for August is that they will all foregather on the evening of August 2, at Butt’s Brow, NGR TQ 580 017.

St. Martins Court, Kingston Crescent, Ashford, Middx., is the place, on the second Monday and the last Thursday in every month, for the Eltham United Reformed Church Hall, 1 Court Road, London, S.E.9, and by a bit of deduction we get the first and third Thursdays as the normal monthly dates, of which, generally, the first meeting in the month is the formal, complete with lecture, demonstration or whatever; and the other one is the Natter evening.

The Harrow offering this time is quite clearly a copy of a “hand-out” at some special-event activity, and as such is a model of its kind. From it we can instantly gather that the Hq. is at the Sea Cadets place, Woodlands Road, Harrow, every Friday evening from eight till ten.

Reigate have two homes; on August 3 they have the natter at the Marquis of Granby, Hooley Lane, Redhill, while the “main” meeting, which will consist of short talks and equipment demonstrations, is on August 17 at the Constitutional Hall, Warwick Road, Redhill.

As far as Surrey are concerned, we have a bit of a problem. We know that the speaker will be G3GVV, who will be talking about the Region 2 meeting in Miami, and the date August 18. The venue, however, is given simply as T.S. Terra Nova, with no more address data, for which latter we must refer you to the Secretary—see Panel.

The group at Milton Keynes have their Hq. at Lovat Hall, in Silver Street, Newport Pagnell, on the second Monday. This gives August 9 for a Chat night, and we are asked to give advance warning that in September there is the AGM.

A letter from Shelburne says the group are at Hq. in White Lion Street, Angel, London, N.I, but are closed through August until September 6, after which they will resume their normal Monday and Thursday weekly routine. Since the Secretary (see Panel) recently married G8ILY, a change of QTH is in the offing, and so while letters may go to the address in the Panel, telephone calls, if not successful to the number shown, may be dialled to 01-368 7081 for a second try.

We nearly forgot the Bishop Stortford lot, who have Hq. at the British Legion Club in Windhill. For them, August is normally not a heavily attended session, so they make it a Ragchew evening on August 16.

The Nationals

B.A.R.T.G. had a very good turn-out for their annual convention, held at Meopham in Kent. This group is aimed at all those who have an interest in the use of a teleprinter in connection with their radio amateur activity, whether as listener or as transmitter.

R.N.A.R.S. comes next, with a very good and very readable Newsletter, giving details on all the goings-on of the members, who are, essentially, the Naval or ex-Naval types, with room for those of foreign navies and the Merchant Navy, too. It’s well worth a sub—all the details from G3JFF—see Panel.

Another very interesting Newsletter is that by Royal Signals, possible even faster than the Royal Navy compendium—one wonders how these groups cope with the postage on such enormous issues! Nonetheless, to the members they are certainly worth the sub., as the healthy membership list shows only too well. Again, all the details from the G3JFF—see Panel.

If you operate /M then you are catered for by A.R.M.S., who do all sorts of things in the interest of world-wide mobile operation, as well as producing the Mobile News so regularly (and so well).

A final one in this group is WAMRAC, catering for a membership, licensed or SWL, who are of the Methodist persuasion, in any part of the world. After 19 years of activity, the group now have some 350 members, and the current issue of the Newsletter is Number 100.

Signing

That’s the lot for another month; next time we need the details on your September programme, plus the address to look for, the Hon. Sec’s name and QTH, and, if possible, telephone number. All this, to arrive by first post on August 4, addressed to your “Club Secretary,” SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 IRQ.
Radio Shack Ltd

Models W-4 and WV4

Directional RF Wattmeters

The new Drake directional, through line, wattmeters represent a significant advance in wattmeter design. The use of printed circuits, toroids, and state of the art techniques permits versatile performance and higher accuracy than units selling for more than twice the price.

In contrast to VSWR measuring devices employed in the past (VSWR bridges, ratiometers, and monimatch), the new wattmeters are frequency insensitive throughout their specified range, requiring no adjustments for power or VSWR measurements. The wattmeters negligible insertion loss allows continuous monitoring of either forward or reflected power for fast accurate tune up, as well as continuous checking of transmitter-antenna performance.

SSR-1 COMMUNICATIONS RECEIVER

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

TRIED AND TESTED WITH MANY THOUSANDS ALREADY IN USE. (SAE FOR DETAILS). £202.50 inc. SECURICOR DELIVERY

SAE FOR DETAILS PLEASE

SECURICOR ★ DRAKE ★ B.R.S. ★ SALES ★ SERVICE ★ ACCESS ★ BARCLAYCARD ★ HP

RADIO SHACK LTD.

188 BROADHURST GARDENS
LONDON, NW6 3AY

Just around the corner from West Hampstead Underground Station
Telephone: 01-624 7174 Cables: Radio Shack, London, N.W.6
Telex: 23718
STEPHENS-JAMES LTD.
47 WARRINGTON ROAD, LEIGH, LANCs. WN7 3EA
TEL. 052-35 76790

The North West's leading supplier for all your requirements

YAESU-MUSEN
We stock the full range of Yaesu-Musen equipment at the current prices. Receivers, Transmitters, Transceivers, etc. Full information sent on receipt of large S.A.E.

DRAKE
We normally have the full range of this equipment available. Check with us for prices and details.

UNIDEN
The new Uniden 2030 Transceiver proving to be very popular indeed, this proved to be a real good seller in May.

We can offer this equipment by Icom, Decca Communications, Belcom, Swan and the new Atlas range. Along with accessories, antennas by Hy-Gain, G-Whip, Jaybeam, Microwave Modules, Barlow Wadley, COD Tech, SpaceMark, Technical Associates, etc. Send large S.A.E. and we will send any information you require.

Please note all equipment is air tested before sale. We do not employ any part time employees for sale of equipment all sales made from the above premises and we do not supply to any individual for re-sale from private accommodation.

ACCESSORIES

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morse Keys</td>
<td>£7.85</td>
</tr>
<tr>
<td>Katsuri Electronic Keyer</td>
<td>£40.50</td>
</tr>
<tr>
<td>SpaceMark ETM-3b Keyer (post 48p)</td>
<td>£54.00</td>
</tr>
<tr>
<td>Boker Keying Paddle unit (post 25p)</td>
<td>£8.30</td>
</tr>
<tr>
<td>P/L299 Plugs</td>
<td>£45p</td>
</tr>
<tr>
<td>SO239 Sockets</td>
<td>£45p</td>
</tr>
<tr>
<td>Cable reducers</td>
<td>£15p</td>
</tr>
<tr>
<td>Line connectors</td>
<td>£75p</td>
</tr>
<tr>
<td>Elbow Adaptors</td>
<td>£85p</td>
</tr>
<tr>
<td>UR41 Co-ax</td>
<td>£18p</td>
</tr>
<tr>
<td>UR67 Co-ax</td>
<td>£18p</td>
</tr>
<tr>
<td>Single meter SWR Bridge 50 ohm (post 35p)</td>
<td>£8.80</td>
</tr>
<tr>
<td>Osker SWR Power Meter (S) (post 48p)</td>
<td>£25.92</td>
</tr>
<tr>
<td>Osker SWR Power Meter (B) (post 48p)</td>
<td>£29.00</td>
</tr>
</tbody>
</table>

For the caller we have a wide range of cabinets, etc.

SECONDHAND EQUIPMENT

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drake TRC Transceiver, PSU-Speaker</td>
<td>£425.00</td>
</tr>
<tr>
<td>Swan 700 CX Transceiver</td>
<td>£385.00</td>
</tr>
<tr>
<td>Heathkit HR108 Receiver</td>
<td>£45.00</td>
</tr>
<tr>
<td>Heathkit HW7 Transceiver</td>
<td>£30.00</td>
</tr>
<tr>
<td>Hammerlund HQ70 Receiver</td>
<td>£100.00</td>
</tr>
<tr>
<td>Trio TS510 Transceiver</td>
<td>£100.00</td>
</tr>
<tr>
<td>Barlow Wadley XCR 30 RX</td>
<td>£110.00</td>
</tr>
<tr>
<td>Trio TS500 Transceiver</td>
<td>£112.50</td>
</tr>
</tbody>
</table>

NEW MODELS

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniden 2030 2M FM Mobile Transceiver</td>
<td>£126.30</td>
</tr>
<tr>
<td>S.T.E. AK20 2M FM Mobile Transceiver</td>
<td>£123.00</td>
</tr>
</tbody>
</table>

Electronic Developments MAGNUM 2 and 4 Metre Transverters. 28 MHz low drive input, CW, SSB, AM and FM. Inclusive of relays and power lead, size 10" x 6" x 7". £112.50

70 CMS LINEAR AMPLIFIER 2G3G triode valve drive power 5 watts output 50 watts AM-FM. SSB-CW. £50.40

VHF Absorption Wavemeter. 65-230 MHz. Post free. £6.00

Our overseas agents will be pleased to supply any of the Magnum products. Overseas Private and Trade enquiries welcome.


All our prices include VAT at the current rates. SHOP HOURS 9.30 TO 5.30 MONDAY TO SATURDAY A.R.R.A. EXHIBITION LEICESTER—OCT. 26, 29, 30
During the last two years the popularity of the range of equipment by S.T.E. has been growing. The ARAC 102 receiver has been a "Best Seller" (have you seen any second-hand?). Later in the year the Atal Transmitter came into stock and all reports have been good. Now we are offering the complete range of modules for the D.I.Y. enthusiasts. Transmitters, receivers, etc. The construction of these modules are first class — the P.C.B’s are the finest we have ever seen.

Price List (includes postage)
ARAC 102 Receiver ... £100.00
Atal 228 Transmitter ... £126.00
ASAP 154 AC PSU with speaker £35.00
AR10 Receiver Module ... £25.00
AAL Audio Amplifier ... £4.10
AD4 FM Discriminator ... £4.75
AL8 Linear Amplifier ... £27.00
AT22 Transmitter ... £50.00
AR20 C.C. Receiver ... £50.00
AT23 C.C. Transmitter ... £36.00
AS 15 Stabilised p.d.C. ... £10.00
AG 10 Tone Generator ... £4.50
AC2A Converter 28-30 MHz ... £20.00

Two new models from S.T.E.
ARAC 170 Receiver. Two bands 28-30 MHz — 430-440 MHz AM-FM-SSB/CW. Tuning 10 MHz from 430-440 MHz in 3 bands. SSB-0.2 mv (10 db S.N.) FM 0.3 mv (20 db S.N.) 12 v D.C. OP. ... £127-50
AK20 FM Transceiver. 12 channel FM operation. Tone burst, 4 watts output. Sensitivity 0.2 mv (10 db Quieting) 0.35 mv (20 db quieting). Complete with microphone. From £113

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

AR22. A complete transmitter exciter unit for 144-146 MHz on AM or FM. VFO controlled or fixed channel operation. Complete with microphone pre-amp, speech processor including active audio filter. 1 watt output. FM, 25 watt AM. Output impedance 50-75 ohm adjustable. Frequency deviation 3-10 kHz adjustable.

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

Linear Amplifier. Frequency 144-146 MHz output 10 watts FM, 8 watts PEP SSB, 8 watts AM. Input power 7 watts FM, 25 watt AM-SSB. Input impedance 50 ohm output impedance 50-75 ohm. 12 V. DC.
J. BIRKETT
Radio Component Suppliers

25 THE STRAIT. LINCOLN. LN2 1JF

Telepheno: 20767

<table>
<thead>
<tr>
<th>OP-AMPS 741</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Lead DIL</td>
</tr>
<tr>
<td>5 for £1</td>
</tr>
<tr>
<td>OP-AMP UA709 at 25p</td>
</tr>
<tr>
<td>TTL 7490</td>
</tr>
<tr>
<td>at 3 for £1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMMUNICATION SERIES OF I.C.'s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untested consisting of</td>
</tr>
<tr>
<td>1 x R.F., 3 x I.F., 2 x VOGAD,</td>
</tr>
<tr>
<td>2 x AGC, 1 x Mike Amp, 2 x</td>
</tr>
<tr>
<td>Double Balanced Modulator, 1 x</td>
</tr>
<tr>
<td>Mixer. The 12 I.C.'s wth data</td>
</tr>
<tr>
<td>for £3</td>
</tr>
<tr>
<td>TV R.F. CHOKES, 5p each, 12 for</td>
</tr>
<tr>
<td>55p POWER TRANSISTORS.</td>
</tr>
<tr>
<td>MP B112 NPN at 15p, MP 8512</td>
</tr>
<tr>
<td>NPN at 15p</td>
</tr>
<tr>
<td>F147 200 PIV 3 Amp WIRE ENDED</td>
</tr>
<tr>
<td>SILICON DIODES. 6 for 50p</td>
</tr>
<tr>
<td>GERMANIUM TRANSISTORS. AC 141K,</td>
</tr>
<tr>
<td>AC 142K, AC 153K, AC 176K, AC</td>
</tr>
<tr>
<td>187K, AC 188K. All at 20p each</td>
</tr>
<tr>
<td>10 or 27 Volt 400 mW ZENERS, 3</td>
</tr>
<tr>
<td>for 25p</td>
</tr>
<tr>
<td>TV SEMICONDUCTORS. AE 102 at 35p</td>
</tr>
<tr>
<td>R2008 at 50p, R2010 at 80p,</td>
</tr>
<tr>
<td>TIS 91 at 10p, U3847 at 12p.</td>
</tr>
<tr>
<td>SCR 700 PIV 6-5 Amp at 50p</td>
</tr>
<tr>
<td>100uf 40v.w. CAPACITORS. Size</td>
</tr>
<tr>
<td>±1/4 ± 3 at 3 for 35p</td>
</tr>
<tr>
<td>100 ASSORTED SUB-MINIATURE DISCS.</td>
</tr>
<tr>
<td>50v.w. From 33pf to .01uf at 5pf</td>
</tr>
</tbody>
</table>

| VHF DUAL GATE MOS FETS          |
| like 40673                      |
| 33p each, 4 for £1 -10          |

| SILICON SOLAR CELLS             |
| -5 volt 5 mA at 35p             |
| -5 volts 50 mA at 50p            |
| -5 volt 100 mA at 60p            |
| -5 volt 200 mA at £1             |
| -5 volt 500 mA at £2 -20        |

| FETS LIKE                        |
| 2N3819                           |
| BE5565 at 20p                    |
| 6 for £1                         |

| TRIACS 400 PIV, 1 Amp, 3 for 57p |
| TRIACS PLASTIC, 50 PIV, 6 Amp,   |
| at 15p, 400 PIV, 6 Amp at 60p    |
| DIACS FOR TRIGGERING TRIACS at 25p each. |
| FET's like 2N 3819 at 6 for £1    |
| TAG ENDED ELECTROLYTICS. 3300uf 64v.w. at 50p, 4700uf 60v.w. at 45p. Both size 21 x 13. |
| VHF FILTER FEED THRO's. 1000+1000pf at 20p doz. |
| STC 12 Volt 2 POLE CHANGE OVER RELAYS at 50p each UHF AERIAL CHANGE OVER RELAY (USA make). 100 volt DC coil. Require PL 259 socket fitting at £3 |
| TEXAS TIP 117 PNP DARLINGTONS. HFE 500 2 Amp at 35p each. |
| TEXAS TO3 PLASTIC POWER NPN TRANSISTORS TYPE R2600A. No information available at 50p each. 3 for £1 -10. |
| ITT BLOCK CRYSTAL FILTERS. 10-7 MHz B.W. ± 6 kHz at £4 |
| MULLARD SEMI-AIRSPACED TRIMMERS. 5 to 60p at £4. |
| Please add 20p post and packing on U.K. orders under £2. |

| TUNING VARACTOR DIODES          |
| BA102 at 20p                     |
| BB110 at 15p                     |
| BB121 at 15p                     |
| MV1636 at 25p                    |

| TUNING CAPACITORS               |
| 150+150+25+25PF at 38p          |
| 200+200+25+25PF at 38p          |
| 500+500+17+17PF at 38p          |
| 300+300+300PF at 66p            |
| 365+365+365PF at 66p            |

| MULLARD 455kHz                  |
| Version of L1175 with connections at 55p each |
| Toko 470 kHz ceramic filter at 46p |
| Murata ceramic filter 10-7 MHz with data at 27p |
Buy with confidence from U.K.'s longest established VHF/UHF manufacturer. Our equipment is now used in over 100 countries world wide.

EUROPA B THE WORLD'S BEST SELLING 2M TRANSVERTER

Ideal for long distance V.H.F. use, either direct or via satellites, The Europa B plugs into Yaesu/Sommeramp equipment for instant V.H.F. operation. For other H.F. equipment use our power supply type CPS 10.

EUROPA COMPLETE POWER SUPPLY TYPE CPS 10
Supplies all voltages to Europa and contains a dummy load attenuator to make the Europa compatible with any HP equipment. Price: £48.00

SSM Z MATCH 80-10 MÈRES
This unit has been produced to satisfy the constant demand for a compact matching unit to meet the critical load requirement of the modern P.A. Receivers are also becoming more sensitive to aerial matching and our Z Match can of course be used to match the aerial to your receiver. The units have been tested at 2KW CW output power into a Bird Termawatt Dummy load. The aerial connections can be used with balanced or unbalanced feeders and the connectors are screw terminals for wire aerials AND SO239s for coax feed aerials. Don't forget that multiband aerials respond as well to your harmonics as to the wanted signal. Our Z Match will provide harmonic attenuation as a bonus. Price is only £18.00.

All prices include 12½% VAT and delivery. 12 months guarantee on all units. We offer same day COD (£50 limit)

ACCESS

BARCLAYCARD

JUST PHONE YOUR CREDIT CARD NUMBER FOR SAME DAY SERVICE
If you require more detailed information or help, we are a telephone call or a letter away, so do not hesitate to ask.

You can call in anytime to inspect or collect equipment. Paul, G3MXG.
THANET

ICOM

IC-22A

THE FAVOURITE MOBILE WHICH COMES WITH ELEVEN CHANNELS FITTED

6 SIMPLEX
5 REPEATER

11 CHANNELS WITH A CRYSTAL CONTROLLED AUTOMATIC TONE BURST
£175.50 including VAT (or £35.50 deposit)

11 CHANNELS WITH FACTORY FITTED R/C AUTOMATIC TONE BURST
£168.00 including VAT (or £34.00 deposit)

HOW ABOUT TREATING YOURSELF TO AN IC-22A IN ORDER TO GET THE BEST FROM ALL THE NEW 2 METRE REPEATERS WHICH ARE OPENING UP?

WITH THE OPENING UP OF THE REPEATERS IN NORTH WALES, LANCASHIRE, BIRMINGHAM AND KENT THE COVERAGE IN THE U.K. IS GROWING ALL THE TIME.

The IC-22A is the most suitable mobile rig for repeater use. Both the crystal controlled and the factory fitted R/C tone burst are arranged by us to be entirely automatic, operating only on repeater channels when a burst of tone is given at the start of each transmission. There is no need to press buttons while driving!

The audio tailoring and limiting are ideal for repeater use, giving the characteristic clear sound associated with the IC-22A.

Your IC-22A comes fitted with SIX simplex channels, SO, S20, S21, S22, S23 and S24 PLUS the FIVE U.K. Repeater channels R3, R4, R5, R6 and R7.

Look at this list and find where your nearest repeater is (those shown in capitals are already in operation).

R3 SUFFOLK and YORKSHIRE.
R4 Central Scotland, DERBYSHIRE AND CHESHIRE, Cornwall and KENT.
R5 HAMPSHIRE and BIRMINGHAM.
R6 CAMBRIDGE, SOUTH WALES, NORTH WALES AND LANCASHIRE.
R7 LONDON, WORCS., Aberdeen, N. LANCs. and W. Wales.

PLEASE NOTE:—Recent reports about problems with radiation by IC-22As on 72 MHz have over exaggerated the situation. This only occurred when operating into poor aerial systems, and then only at very low levels. All new sets have a modification done by us to eliminate the problem. We will be pleased to let you have details of this on receipt of an S.A.E.

SILLY DITTY CORNER !!
This news really ought to be sent,
That slight protrusions in Kent,
Won't cause aircraft flying Lowe,
To roll over in t'snow,
And sent Billy home with a dent.

P.S.—Does this apply to Liners too?

THANET ELECTRONICS
34 CLIFF AVENUE, HERNE BAY
KENT
(02273) 63859
ICOM

IC-201
THE MULTI-MODE RIG THAT SETS THE PACE IN LUXURY AND QUALITY

£357.75 inc. VAT

ICOM IC-201 £357.75 inc. VAT

The luxury multi-mode rig which was described in full in our advertisement in May, providing full 2 metre coverage on FM, SSB and CW using its ultra stable VFO. Full facilities for Repeater and reverse repeater use at the flick of a switch, built in automatic crystal controlled one burst fitted by us, full break-in facilities on CW and VOX are but a few of the excellent facilities found on the increasingly popular IC-201. Send for further details or leave a message on our answering service during the evenings.

ICOM IC-202 £161.10 inc. VAT (refurbished £168 extra)

This new rig from the ICOM stable is going to be another winner. You have a hand-held portable, giving 3 watts output on SSB or CW, with VXO tuning giving you continuous coverage from 144-0 to 144-4 and the option, of other frequencies if you use crystals in its spare sockets. Add a linear and you have a hefty base station. To introduce this excellent transceiver it is offered at a price of £161.10 INCLUDING VAT. Send for a data sheet for further details—just the thing for going portable this summer! SEE RAD COM AND JUNE SWM FOR REVIEW.

ICOM IC-3PA £42.18 inc. VAT

The perfect companion to convert your ICOM mobile into a base station. Provides 13-6v at 3-5A. Well regulated, with automatic electronic overload.

ICOM IC-225 £250.00 inc. VAT (still same at £225 without crystal controlled tone burst)

The ultimate luxury in 2 Meter mobiles. Comes FITTED with 88 channels to suit the 2 meter band-plan, complete with crystal controlled tone burst and repeater facility. Nothing else to buy unless you want reverse repeater which can be obtained by adding ONE extra crystal. Covers all the UK simplex and repeater channels and provides a very clean signal by virtue of its excellent PLL circuitry. Send for further details of this and the rest of the excellent range of ICOM equipment.

We also stock MICROWAVE MODULES products and REVCO antennas for mobile

HIRE PURCHASE TERMS AVAILABLE

See ICOM at your nearest agents by telephoned appointments:

LONDON—Terry, G8BAM
01 556 9355

MIDLANDS—Tony, G3AVH
021 329 2305

CHESHIRE—Gordon, G3LEQ
0565 4040

DEVON—Bob, G3HQ qthr.

AUTHORISED IMPORTER OF ICOM AMATEUR RADIO EQUIPMENT IN THE UNITED KINGDOM

FREE SECUICOR DELIVERY ON ALL TRANSCEIVERS
NOTE OUR TELEPHONE NUMBER CHANGED

THANET ELECTRONS
34 CLIFF AVENUE, HERNE BAY
KENT (02273) 63859
AMATEUR RADIO
BULK BUYING GROUP

WE'VE MOVED

Please note our Mail Order and Administration departments have now moved to Wallington Square.

NEW PREMISES + NEW STAFF = NEW SUPER SERVICE

NOW IN STOCK, the
NEW

Catronics

CRYSTAL CONTROLLED
TONE BURST GENERATOR
2in x 1in x 0.5in—£8.75 inc VAT

Dept. 618, COMMUNICATIONS HOUSE,
20 WALLINGTON SQUARE,
WALLINGTON, SURREY, SM6 8RG
Telephone: 01-669 6700

NOW OPEN

A Superb New Showroom
dedicated exclusively to
Amateur Radio & Electronics

Catronics Limited—the Amateur Radio Bulk Buying Group people plus, of course, “VHF Communications”—and Lowe Electronics (Southern Branch) have pleasure in announcing the opening of what is without doubt the finest showroom devoted to Amateur Radio anywhere in the country. With the combined resources of two of the best known names in the business we are able to provide, under one roof, the widest range of components and equipment ever offered to the Radio Amateur.

Open MONDAY TO FRIDAY 9 a.m. till 6 p.m.
SATURDAY MORNING 9 a.m. till 1 p.m.
CLOSED FOR LUNCH 12.45—1.45

Hire Purchase available on all equipment.

Well equipped service workshop for after-sales service.

COMMUNICATIONS HOUSE,
20 WALLINGTON SQUARE,
WALLINGTON, SURREY, SM6 8RG
Telephone: 01-669 6700

300 yards from Wallington Railway Station (London Bridge or Victoria). Large car park with vehicle entrance from Stafford Road (car park fee refunded with all purchases over £1),

OR large free car park in Shotfield.
AMATEUR RADIO - G3YFV

CHAS. H. YOUNG LTD., 170-172 Corporation Street, Birmingham B4 6UD. Tel. 021-236 1635

ICOM
IC-222A 2 Mtr. FM Transceiver fitted with 10 ch. £1,688-42 (£1-50)
IC-222A 2 Mtr. FM Transceiver for 80 channels £1,687-75 (£2-50)
ETC-1 122 VFO TX/RX £1,687-75 (£2-50)
IC-FP12 V/D, DC PSU-240V, AC IN £1,687-75 (£2-50)
ALL ICOM FITTED WITH TONE BURST

EDDYSTONE
EC50 Mk II, 11 Gen. Coverage Receiver £8,132-44 (£2-50)
EB37 L/W 1/2W-22 MHz £8,132-44 (£2-50)

AERIAL FEEDERS AND WIRE
T2324 50 ohm coax £23-50 (50p)
UR67 75 ohm coax £50-50 (50p)
UR43 50 ohm coax £50-50 (50p)
I4 SWG H/D Copper Wire (140ft. approx.) £1,61-30 (£1-00)
Hanks of PVC Aerial Wire (150ft.) £1,61-30 (£1-00)

RAYMART
3" Ribbed Ceramic Insulators Centre T Piece Insulators £1,27-75 (£1-75)
ML3 Polythene Cord 250 lb. B/S. (170 yds. approx.) £7-19 (50p)
ML4 Polythene Cord 400 lb. B/S. £8-46 (46p)

MANUALS FOR EDDYSTONE RECEIVERS OVER 70 TYPES. PLEASE ENQUIRE

SERVICE
WE SPECIALISE IN THE SERVICE OF EDDYSTONE RECEIVERS AND CAN ACCEPT OTHER MAKES OF COMMERCIALLY MADE COMMUNICATION EQUIPMENT.

Postage may be arranged if a number of items are being ordered. Minimum postage 50p. Please make sure there is sufficient postage.

Midland Agents:
for EDDYSTONE, JOSTY KITS, J BEAM, ICOM.

Multi-Storey Car Park at rear of Shop

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 iambic 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 was both a 4-channel (250v., 0.5 amp., 25w. max.) and a switching transistor (100V, 30 mA max.)—either keying method can be used.
- Has the well-known fully-adjustable Samson precision twin keying lever assembly.
- Operate/Tune button.
- Sideslave oscillator.
- Grey case 4" x 2" x 6".
- ETM-3C, £24-15.

BUILT FOR DEPENDABLE MARINE AND COMMERCIAL SERVICE

JUNKER PRECISION HAND KEY

A superbly engineered straight key used for many years by professionals aloft and ashore. With this key you can’t help but send good Morse, free-standing—no screwing down. Front and back contacts—all-adjustable gap/tension. Key-click filter. Hinged grey cover, £25-24.

BAUER KEYING PADDLE

Single-paddle unit on 1¾" x 2" base for home-built EI-bugs. Adjustable gap/tension, £8-95.

82 mm TOROIDS

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

All prices post paid UK and include 12% VAT.

Please send stamp with enquiries.

SPACEMARK LTD.
THORNFIELD HOUSE, DELAMER ROAD
ALTRINCHAM, CHESHIRE
(Tel: 061-928 8458)

For Your Antenna!

Send for HANDBOOK containing full details of Antennas and other technical information. 33 pages 40p. Refundable upon purchase of Antennas.

SOME ANTENNAS

Mustang 3 Elements, 10, 15 and 20 metres £82-50
TA-33 Jr. High Power Model incl. Balun 3 Elements, 10, 15 and 20 metres £67-00
TA33 Jr. 3 Elements, 10, 15 and 20 metres £64-00
TA22 Jr. 2 Elements, 10, 15 and 20 metres £64-00
TA21 Jr. Rotary dipole, 10, 15 and 20 metres £57-00
ELAN 3 Elements, 10 and 15 metres £53-00
TD-2 Trap Dipole 40 and 80 metres £25-00
TC-2 Trap Dipole 40 and 80 metres compressed £28-50
V-3 Jr. Trap Vertical 10, 15 and 20 metres £20-00
Atlas Trap Vertical 10, 15, 20 and 40 metres £34-50
SWL ANTENNAS

SWL-7 Dipole 11, 13, 16, 19, 25, 31 and 49 metres £19-50
RD-5 Dipole 10, 15, 20, 40 and 80 metres £19-50
Orbit Vertical 11, 13, 16, 19, 25, 31 and 49 metres £33-00

MOSLEY ELECTRONICS LIMITED
196 Norwich Road, New Costessey, Norwich, NR5 0EX

Administrative Address only ENGLAND

(All antennas available ex works carriage and VAT extra)
P.M. ELECTRONIC SERVICES

CRYS'LS FOR THE NEW 70 cm. CHANNELS
GET SWITCHED ON! TO THE NEW British 70 cm. Band Plan, with
respective CRYSTALS: RB2 (434-435 MHz), RB3 (434-435 MHz), RB5 (434-
435 MHz, RB10 (434-435 MHz) and RB14 (434-435 MHz) and the new calling
channel SU20 (433-440 MHz). SU12 (433-440 MHz) is designated for RTTY use.
N.B. RB = Repeater British System, SU = Simplex UHF.

VAT - PRICES EXCLUDE VAT WHICH SHOULD BE ADDED AT THE RATE OF 12½% EXCEPT IN THE CASE OF TEST EQUIPMENT.
CRYS'LS 8½% - OVERSEAS ORDERS (inc. Eire and Channel Islands) NO VAT CHARGEABLE.

CRYS'LS FOR PROFESSIONAL USE
CRYS'LS FOR COMMERCIAL SPECIFICATIONS
We can supply crystals to most commercial and MIL specifications, with
an expression service for that urgent order. Please send S.A.E. for details or
telephone between 4.30 - 7 p.m. and ask for Mr. Northlie.

TERMS: CASH WITH ORDER - MAIL ORDER ONLY - S.A.E. ENQUIRES IN ENGLISH (EUROPE ISLES) EXCEPT WHERE STATED - OVERSEAS CHARGED AT COST.

BAGINTON ELECTR.
(GST FC)

COVENTRY AIRPORT
Phone (0203) 301449
base in N. W. KENT,

wishes to make the following appointments:

**Design/Development Engineer (H.F. SSB)**

Having a background of recent work in analogue and digital design techniques in communications equipment. Able to work with minimum supervision in a small laboratory. Capable of eventual project leadership with 2/3 engineers team.

**Assistant to Sales Manager**

With sufficient knowledge of technical aspects of communications engineering to be able to deal with telephone enquiries and to liaise with laboratory/service department in customer relations.

The Company has the dual advantage of small unit involvement and the conditions of employment which apply throughout the Decca Group of Companies.

Applicants of either sex are invited to reply to Manager, Group Personnel & Training Services, Decca Limited, Decca House, 9 Albert Embankment, London SE1 7SW.

---

**DECC**

*The Queen's Award for Export Achievement to Decca Ltd 1976.*

---

**2 METRE 2 EL. PORTABLE BEAM.**

- COMPACT
- LIGHTWEIGHT
- 5-6 dB gain
- 25dB front to back ratio
- S.W.R. better than 1.5 to 1.0
- £7-70 plus £1 p. & p.

---

**“XG8” MORSEMASTER CASSETTES**

**ONE TAPE — ONE HOUR — ONE SPEED**

**Speeds:** 4, 5, 6, 7, 8, 9, 10, 11, 12, wpm

**Types:** CODE, or P.L., or FIGURE EXERCISES

State SPEED(S) and TYPE(S) required

Single cassette — £3, or any three for £7·95

Also available: BEGINNER PACK (2 tapes), £5·60

---

**R.O.R. SERVICES**

KENSINGTON CHAMBERS, MERIDALE ROAD, WOLVERHAMPTON, WEST MIDLANDS

---

**“XG8” MORSEMASTER CASSETTES**

**ONE TAPE — ONE HOUR — ONE SPEED**

**Speeds:** 4, 5, 6, 7, 8, 9, 10, 11, 12, wpm

**Types:** CODE, or P.L., or FIGURE EXERCISES

State SPEED(S) and TYPE(S) required

Single cassette — £3, or any three for £7·95

Also available: BEGINNER PACK (2 tapes), £5·60

---

**“XG8” MORSEMASTER CASSETTES**

**ONE TAPE — ONE HOUR — ONE SPEED**

**Speeds:** 4, 5, 6, 7, 8, 9, 10, 11, 12, wpm

**Types:** CODE, or P.L., or FIGURE EXERCISES

State SPEED(S) and TYPE(S) required

Single cassette — £3, or any three for £7·95

Also available: BEGINNER PACK (2 tapes), £5·60
SMALL ADVERTISEMENTS

9p per word, minimum charge £1.50. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50% for Bold Face (Heavy Type). Box Numbers 25p extra. No responsibility accepted for transcription errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, Ltd., 34 High Street, Welwyn, Herts., AL6 9EQ.

TRADE

Radio Amateurs Examination City & Guilds. Pass this important Examination and obtain your G8 Licence with an RRC Home-Study Course. For details of this and other Courses (GCE, professional examinations, etc.) write or phone: The Rapid Results College, Dept. JV/1, Tuition House, London, SW19 4DS. Careers Advisory Service, 01-947 7272 or ring 01-946 1102 for prospectus only (24 hr. answering service).

Vintage radio: Receivers, valves, components, service sheets, books and magazines, 1920-1950, send s.a.e. with enquiries or 50p for full catalogue. — Tudor Rees, 64 Broad Street, Staple Hill, Bristol, BS16 5NL. (Tel: Bristol 565472).

Amidon Toroidal Cores, W2AU Baluns, and Used Equipment, send s.a.e. to GW3TMP, QTHR, Tel: 035-287 846.

Yaesu, Hy-Gain, Cushcraft, Jaybeam, etc., all Amateur Equipment needs supplied, S.M.C. agent.—GW3TMP, QTHR, Tel: 035-287 846.

Lee Electronics closed August 4 to September 1st. No orders or correspondence can be dealt with during this period.

JR-310 owners: Last few 160-metre conversion kits, £6.99, s.a.e. for details. Xtal converters, WWV 29.5-30 mHz, £3.0 — or the lot for £9.50, VAT and post paid. — Holdings, 39-41 Mincing Lane, Blackburn, Lancs. (Tel: 59595/6).

FT-200 owners get de-luxe performance with G3LLL’s FT-200 clipper. G3VSD reports “reception vastly improved”, “on transmit clipper works superbly, very favourable reports”. Send s.a.e. for details, introductory price £39 inc. VAT. Special offer clipper £20 with FT-200. — Holdings, Ltd., 39/41 Mincing Lane, Blackburn, Lancs. (Tel: 59595/6).

Quality QSL Cards: Send s.a.e. for samples by return post. Quick delivery. — Comapath Printing Services, 115 Promenade, Cheltenham, Glos., GL50 1NW.

September issue: Due to appear August 27. Single copies at 45p post free will be sent by first-class mail for orders received by Wednesday, August 25, as available. — Circulation Dept., Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts, AL6 9EQ.

READERS’ ADVERTISEMENTS

5p per word, minimum charge 70p, payable with order. Add 25% for Bold Face (Heavy Type). Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 25p extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, Ltd., 34 High Street, Welwyn, Herts., AL6 9EQ.

READERS

Sell or exchange: Yaesu FT-DX560, E-Zee Match, 14AVQ plus 80m. accessories. Offers? Or part-exchange for FT-2B or similar plus cash. — Ring Trout, G3VQN, Guildford 70082.
Record-breaking Space-saving Antenna

The JOYSTICK VFA (Variable Frequency Antenna—a six-band, patented omni-directional antenna of extreme flexibility) is a MUST for confined locations—at the worst it can stand in the corner of the shed and still show up! But space problems or no... what you need most is EFFICIENCY.

In recent test runs, using extreme QRP and under poor current sunspot conditions, the VFA produced good QSO’s with four continents. The makers claim that its low angle radiation conserves the precious watts going out and the equally desirable microwatts coming in on receive. High angle radiation, however, so scatters your signal power that locking up becomes the order of the day. And then what happens? Harmonic radiation and risk of TVI is on the increase... QRO men beware! The name of the game is to achieve solid communication efficiently at the minimum power... we claim the winning name for this game is JOYSTICK!

ALREADY IN USE BY AMATEUR TRANSMITTING AND SWL STATIONS WORLD-WIDE AND IN GOVERNMENT COMMUNICATION

JOYSTICK VFA £17.25, JOYMATCH ATU's: 111 (Med. wave -30 MHz) £17.25, 111A (1-6-30 MHz) £17.25, 111B (L-match, 1-6-30 MHz) £15.76, LO-Z 500 (£15.65 to 30 MHz), £240. BUDGET LINE ATU 1-6-30 MHz, £16.77, ATU Med. and SW Bands £16.77, Artificial Earth £17.12, DX CRYSTAL SFT (Home and world-wide reception) ready to use £61.45, COMM. HEADPHONES 8-ohm, £4-54, FIELD STRENGTH METER £4-34, SET VALVES 9SPS £5-85, CO-AX CABLE 50 or 75 ohms, per 10 metres £1.50, SYSTEM "A" VFA + 111B £24-20, SYSTEM "D" VFA + Aerial B/Switch £24-20, SYSTEM "J" VFA + LO-Z 500 £38-60.

PARTRIDGE SUPER PACKAGE

COMPLETE RADIO STATION FOR ANY LOCATION


ASSEMBLED IN SECONDS! £189-00

— OR TR-666 £163-12 INCL.

PRICES INCLUDE VAT, INSURANCE AND DELIVERY BY POST OR CARRIER

BARCLAYCARD

Buy it with Access

Tel.: 0843 62535 (or 62839 after office hours)

Send stamp for details and expert advice

BOX 4 CAROLINE HANTS

G3CED G3VFA
For sale: Racal RA-63 SSB adaptor, £50. KW-77 amateur band receiver, with speaker. Or exchange both for 160-10m. HF transmitter. — Mac, 13 Elmstead Road, Erith, Kent.

Selling: Codar CR-70A receiver, good condition, £25 or near offer. — Taylor, G8HPL, QTHR. (Call evenings/weekends).

For sale: 35-ft. crank-up tilt-over mast with ground post, £60. Four-metre Europa transverter, £70. AR-22 rotator, £20. 8-ele 2m. Yagi, £5. — Ring Thurleow, G3WBN, 01-654 2761.

Selling: ‘Drake R-4A’, coverage 160-10m., very good condition, £195 or near offer. Unused 70-ft. Alinum, £40 (buyer collects). SL600 series, £1 each. Also 1.8, 3.5 and 36 MHz xtals, £1 each. — Ring Smith, Combe Down 833433 (Somerset).


For sale: FT-101B, immaculate condition, £300. (Reason for sale, owner short of money). West Midlands. — Box No. 5521, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted: 10X xtals, by OAP for calibrator. Must be cheap. — Smith, 2 Stevens Close, Blandford Forum, Dorset.

Wanted: Barlow-Wadley XCR-30 Mk.II receiver. Details and price please. — Cartwright, 1 Patshull Road, Albrighton, Wolverhampton.

For sale: Condor CSP-11 speech processor, complete with instructions and circuit diagram, as new, £29. No offers. — Ring Stead, G2UZ, Leeds 784074.

Wanted: AR88D main tuning dial; also BC-221. Must be mint. — Box No. 5515, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Selling: Trio 9R-59DS Rx, very good condition, £45. MMC144/2, 3 months old, suits above Rx, £15. — Ring Szczepanek, Blackburn (0254) 53988 (Lancs.)

Sale: Teleprinter equipment: 85R printing reperators; £6; power units 26B (80-80.8V), £4; 43A (115V), £4; seat of three tension gauges, £3. Send s.a.e. for list. — Bonner, 6 Broadway Road, Bristol BS7 8ES. (Tel: Bristol (0272) 46365).

For sale: Trio TR-7010 2m. SSB transceiver with extra crystal, as new in box, £180. Tavasu whip, with 80/40/15m. coils and base, £8. Marconi TF-390G signal generator, 16-150 MHz, £15. All 'or near offer'. — Ring Sears, G3YE(G, 024-026 3919 (Bucks.)


Selling: Drake R4-C receiver, new, boxed and unused, £295. — Roberts, G3AQQ, Cottage Farm, Wessington, Derbys. (Tel: Alfreton 2943).

Sale: Liner-2 with pre-amp., very good condition; J-Beam 8-over-6 slot fed Yagi. — Brown, G8JJB, QTHR, Tel: Thurston 213, evenings (Norwich).

Wanted: Army Wireless Sets Types 58, 48, 46 and 52; also R.208, R.209, BC-611 handle-talkie and suitecase transmitter. Any other interesting wartime equipment considered. — Morris, Pippingford Park, Nutley, Sussex.

For sale: Eddystone 940 general coverage receiver, tuning 500 kHz-30 MHz in five ranges, re-valved and re-arranged, £130 inc. personal delivery up to 150 miles, or £120 buyer collects. — Smith, G3PZQ, 38 Leasway, Wickford (2791), Essex, SS12 0HE.

Selling: FT-401, £230. HRO-500, £210 or near offer. FT-243 crystals 5675-8650 every 25 kHz, £4 set; 8000-8106 kHz, nine different, £2; many more, SASE please. VHF BC-221 complete, £35. Two TR-4A mini-printers, £40 pair. BC-221 dial drive capacitor, £3. Manuals: AR88, Pye 125 and BC-221, £2 each.

Wanted: TS-520. — Quantrill, G3OFF, 10 Milford Avenue, Stony Stratford, Milton Keynes (562379), Bucks. MK11 1HA.

For sale: Drake 2B receiver and matching Q-multiplier/Speaker, £80 or near offer. Trio TR-2200 2m. transceiver, £61 or near offer. — Ring Rollin, G4AFU, Barnsley 89441 office hours.

For sale: Drake SPR-4 general coverage receiver with broadcast and amateur band crystals, AL-4 loop antenna, mains and DC power cords, manual, perfect condition, a real bargain at £275. Sony TC-124CS stereo cassette-recorder, mint condition, with two speakers, mic., leads and carrying case, £55. — Alis, 7 Hillside Avenue, Wembley, London. (Tel: 01-902 4358, evenings).

Sale: Codar 70A, £25. B.S.R. unit, new, £7. Buyers collect. — Farrer, 16 Duncan Road, Gillingham, Kent. (Tel: Medway 56853).

Selling: Heathkit HW-7, £30. Pye U-10B UHF 'Cambridge', complete and working on 433.2 MHz, £35. Icom IC-22A, fitted with 14 channels, complete as new, very little used, £140. ASPE-667 433 MHz cofinear, £10. — Oxford, G4AZZ, QTHR. (Tel: 025-584 632, Clacton).

Wanted: Crystals in range 1050 kHz to 1630 kHz, 960 kHz to 990 kHz, and 550 kHz to 820 kHz; also 813 valves. Exchange or sell: New HCGU crystals 1111-1112 kHz (Merseyside). — Box No. 5516, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted desperately: HRO and R,1155: Consider any condition, even incomplete or u/s. Will send my crate and pay generous expenses for long distance. Write or call. — Barker, 42 Swinhoe Gardens, Woodlands Park (North), Widenopen, Newcastle-upon-Tyne.

Selling: Codar mini-Clipper, built January, hardly used, £12 posted. Exchange: Small RX including aircraft band. — Short, 49 Shaw Road, Dudley (52563), West Midlands.

Wanted: Heathkit GR-78 receiver. Details and price please. (Worcs.).—Box No. 5517, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted: K.107 tuning unit in good condition. — Nash, G3EJA, QTHR.

Wanted: "Roller Coaster" inductor, dual section, 200 pF per section, also 350 pF wide-spaced variables, for ATU. — Daly, E13CV, St. Kierans, Rope Walk, Blackrock, Cork City, Eire.

Wanted: Aircraft ADF, Nav./Com., DME and Markers. Cash and will collect. Please reverse charges. — Ring Wallis, 0432-6280 (Hereford).

For sale: SB-101 Tx/RX with AC/PSU-Speaker and spares, fitted with CW and SSB filters, external condition very good, £180. — Ring Gall, Downland 55342 (Surrey) after 7 p.m.

---

**BETTER SHORT WAVE RECEPTION**

by William I. Orr W6SAI and Stuart D. Cowan W2LX

New 4th Edition

In the latest edition of this excellent work for all those who own (or intend to own) a radio receiver, these two well-known and respected writers have produced chapters covering: the radio spectrum and what you can actually hear world-wide; the tuning of a shortwave receiver; the business of buying a receiver, both new and secondhand; a description of the SW Rx in non-technical terms, together with receiver adjustment and alignment; DX-ing above 30 MHz; a description of the VHF receiver; building and adjusting efficient ariels; reception techniques.

Thoroughly readable and "digestible," this book is without doubt a very valuable addition to the bookshelf of any SWL.

160 pages

£2.98 inc. post

Order from:

Publications Dept.,
SHORT WAVE MAGAZINE LTD.,
34 High Street, Welwyn, Herts., AL6 9EQ

---

**WORLD RADIO/TV HANDBOOK 1976**

The World’s only complete reference guide to International Radio & Television Broadcasting Stations.

It includes: Frequencies, time schedules, announcements, personnel, slogans, interval signals and much more besides of value to the listener.

Lists all International short-wave stations, including frequencies, for each country; foreign broadcasts, long and medium wave stations (AM broadcast Band), TV stations and domestic programmes. Long recognised as the established authority by broadcasters and listeners. It is the only publication that enables you to identify BC stations quickly and easily. Enables you to fill more pages in your log book on the SW BC bands and helps you add more BC-station QSL cards to your collection.

£5.00

(The above price includes postage and packing).

from:

SHORT WAVE MAGAZINE
34 High Street, Welwyn, Herts. AL6 9EQ.
Sale: Trio TS-700, in excellent condition, £290. Prefer buyer collects. — Girrill, GM8BOV, QTHR. (Tel: Bathgate 54025).

Selling: R.C.A. AR88LF receiver and matching speaker, little used, £30 or near offer. Buyer collects. — Ring Payne, 0249-2468 after 5 p.m. weekdays.

For sale: AR-22 rotor with J-Beam 2-metre and 70cm. antennae, £20. — Davidson, G8ABU, 31 Hartshill Close, Hillingdon, Middx.

Exchange or sell: Hammarlund SP-600.JX6 Rx, coverage 540 kHz to 54 MHz, table model, good condition, no mods., with manual; £140. Or exchange for EA-12. — Ring Brin, 01-476 7313.

Exchange or sell: Trio TS-510 SSB CW transceiver, 80-10m., complete with matching PSU, recent realignment, new PA, £180. Or will consider exchange for two-metre transceiver. — King, GW3ENN, 33 Hastings Avenue, Penarth (017830), S. Glam.

Sell or exchange: Slow Scan: Nearly complete "DJ6HP" fast-to-slow converter kit. — Brown, 1 Silverdale Road, Falmouth, Cornwall.


S.O.S.: My Drake SSR-1 has gone sour. Is there anyone within 30-mile radius who would undertake repairs? Block and schematic diagrams, but no manual. — Millington, 29 Higdown Drive, Littlehampton, Sussex, BN17 6HH.

Selling: Liner-2, fitted pre-amp., good condition, £125. Microwave Modules converter, 70/2 MHz. £15. — Costello, G3YPP, QTHR.

For sale: HW-101 complete with AC/PSU and speaker, excellent condition, £170. — Tibbert, G3RKZ, 16 Nicola Gardens, Littleover, Derby.

Exchange: "Olympus Auto-Eye 2" fully automatic 35mm. camera, £2.5 Dzuiko, 10 speeds, with leather case; also Leitz Pradolux £2.8 by 100mm. projector and case, with "Hunter" portable screen 48-in. by 36-in. For: KW-1000 or similar linear amplifier; must be perfect and with manual. — Ring Lewis, Devoran 863198 (Cornwall).

Wanted: Trio TR-2200G; also Telford TC-7 Rx with 2m. converter. Details and price, please. — Ring Kearns, 061-794 5365 (Manchester).

Sale: Atlas 180 transceiver, complete with mains console and spare boards, six months' use only, £325. Nombrex 46 oscilloscope, new in box, £60. Prefer buyers to check and collect. — Sharratt, G3XKF, 64 Marsworth Road, Pitstone, Leighton Buzzard, Beds. LU7 9AS.
Exchange: Liner-2, fitted with pre-amp., for FM rig or W-H-Y? Selling: FR-100B Rx, £80. (Hants.)—Box No. 5518, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted: CV-89A RTTY frequency shift converter, must be in good condition, and working.—Ring Glasson, 0202-707013 evenings (Poole).

Must go: K.W. Valiant Tx, £15. Minimitter MR-44 Rx, £15. Or Offers?—Ring Poole, G3YWX, Sunbury 88162 (Middx.).

For sale: Drake SPR-4 receiver, 18 months old, excellent working order, £200.—Ring Deards, Welwyn (043871) 6633.

Selling: TF-390G signal generator, £10; Mullard 5-10 unit with pre-amp., £7; D/F Rx, 28-100 MHz, £15; Two-metre Tx, £5; 30-watt modulator, £10; New valves, 50p each: 807, 6CH6, EL34, RG1-240A, QSL105/15, PCL83, 2C34, PL36, 7R7. Send s.a.e. for list of valves, components etc.—Parker, G3KAG, QTHR. (Tel: Ellastone 393).

For sale: Trio 9R-59DS receiver, SP-5DS speaker, Codar PR-40 preselector, Joystick, Joymatch III, Eagle SE-5 headphones, £80. Koyo 11-band receiver, £70. Almost new condition, Buyers collect.—Ring Branch, Woking 64827 after 6 p.m.

For sale Eddystone EC-10 Mk.II, mains/battery, brand new, £110 (retail £220).—Ring Leighton, Guildford 66543 evenings.

Sale: 572B’s, new and boxed, £10 pair. Carriage extra.—Ring Surman, Rudgwick 2909 (Sussex).

Selling: KW-77 receiver, good condition, complete with handbook, £70.—Ring Pearson, Titchfield 43410 (Hants.).

September Issue: To appear Friday, August 27, single copies at 45p post free will be despatched first-class mail on receipt from printers. Orders by Wednesday, August 25, with remittance to: Circulation Dept., Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Sell or exchange: Trio TS-510, immaculate, £170 or near offer. Or exchange for FT-75B or FT-200.—Ring Bowfield, Cardiff 611532.

Wanted: Eddystone 888A or KW-77 receiver in good condition.—Hayes, G3JBU, QTHR. (Tel: 0604-43020).

Wanted: Park-Air receiver for aircraft bands.—Ring Pesani, 0734-785746. (Berk.)


Wanted: Eddystone 8.640 or similar general-coverage receiver; Cassette Morse Course, various speeds and groups, etc.; Junker or similar hand-key; six-metre, 70 cm converters and pre-amp.; two-metre general-purpose antenna; LM-2, BC221: mains PSU; xtal calibrator to UHF. (Ireland).—Box No. 5512, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts., AL6 9EQ.
REG. WARD & CO. LTD. (G285W)

KW 108 Mon. scope
KW 103 VSWR Meter and Combined Power Meter
KW 107 Combined E-Z Match, VSWR and RF Power Indicator
Yellow Load and Antenna Switch for 3 Outlets
KW Trip Dipole Coaxial Feeder
KW Trip Dipole with Balun
KW 3-way Antenna Switches for (coax)

YAESU

Yaesu FT208 Transceiver and FRP200 A/C PSU
Yaesu FT 201 Transceiver
Yaesu FR-110D
Yaesu FR-210D
Yaesu YO100 Mic

FT221-2M TCVR: CW/AM/FM

Sentinel 2m, Preamps and 2m. Converters/Europa Transverters.

SHURE MICROPHONES

Model 444, £19-20 & Model 201, £8-40.

USED EQUIPMENT:

Yaesu FL101 TX. Mint—few hours use only, inc. speaker processing tool (to be fitted) £30.50

WANTED:

Yaesu FR508B in good condition.

VALVES for YAESU, etc. GMBH, 6826, GU8, CE1J, 6AV6, 6K6D, 12AX7A, 12B7A, 12AU7, R.C.A. VALVES for KW and Heathkit equipment. £146, 6146B, 6HF5, 6LQ6, 6G65, 6GB6, 6GB7, 6L6G, 12AT7, 12B85, 12B82, 6J6C, etc. and many other types.

Janssen and Stolle Rotators: 140c. copper ant. wire; Ribbed and T-I conservators; 62 and 75 Ø-coax, and U.H.F. plugs and sockets. Most Couplings for Masts and Masts. W. G.-W. M. 2m., 2m. antenna, 12AVQ and 18AVT, etc. SWR 10 (Twin Masts). SWR/PWR Meters.

ANTENNA KITS

TRADE INS WITH PLEASE, OUR STOCK OF GOOD SECOND HAND EQUIPMENT CHANGES DAILY—LET US KNOW YOUR REQUIREMENTS.

Due to currency fluctuations prices of imported equipment are liable to alteration. Add 12.5% VAT to all prices except used equipment.

HP TERMS AVAILABLE CARRIAGE EXTRA ON ALL ITEMS

AXMINSTER—DEVON Telephone: 33163

G4DSG

D. P. HOBBBS LTD.

THE COMPONENT SPECIALISTS

Trio Q666 communications Receiver, £145.00.
Inoue. Mains Power Unit for IC22A, £35.00.
Inoue IC201 FM/SSB/CW Transceiver, £318.00
Linier 2 SSB 2 meter Transceiver, £145.00. Power supply £21.00.
Yaesu FT200 HF Band Transceiver £255.00 with power supply.
QM70 Products. 28/144 MHz Solid State Transverter, 2 watts output. Linear and clean output, £41.40.
28/432 MHz 10 watt output Transverter, £75.80.
28/144 MHz High Power Transverter up to 200 watts P.E.P. Input, 2½F outputs, £80-86.
144 PA-50. All Solid State 50 watts RMS, Output 2 metre. Linear Amplifier will accept F.M. SSB, AM, CW, £44.00.
432 VLA Linear Amplifier providing up to 50 watts RMS output, £60-64.
2PM70. 70 Cms. or 2 metre at the flick of a switch, £46.40.

MICROWAVE MODULES

144 Converters 2, 4, 6, 8, 12, 16-18, 28-30 MHz output, £16.00.
70 MHz Converters, £16.00.
70 Cms. Converters, £16.00-£76.00.
1296 MHz Converters, £21.60.
2 metre Pre-Amp, £9.04. 1296 Varactor Tripler, £25.04.
322 Varactor Tripler, £17.60.
332 Transverter, £60.00.

Above all plus 12½% VAT

50 MHz Counter, £81.11. 500 MHz Precal. £25.00.

Above plus 8% VAT

Also in Stock: Jaybeam Aerials, Densco Coils, Bantex Aerials, Die-Cast and Alum. Boxes and thousands of components.

PART EXCHANGE WELCOME ACCESS OR BARCLAY CARD

II KING STREET, LUTON, BEDS.

Telephone 20907

G3HEO

IS YOUR ANTENNA OKAY?

Working PROPERLY? Find out FAST with an ANTENNA NOISE BRIDGE. Measure radiation resistance and resonant frequency 1-150 MHz. IDEAL for mobile antennas, verticals, etc. EASY to make. All parts, case, rf transformer, etc., instructions, money back assurance, ONLY £7.70 inc. post, £7.90 airmail.

CAMBRIDGE KITS

45 (AM), Old School Lane, Milton, Cambridge

Call or phone our

ALL MR. STEFAN FOR A QUOTATION

01-749 3934

VALVES & TRANSISTORS

We are one of the largest stockists of valves etc. in the U.K.

COLOMOR ELECTRONICS LTD. 76 GOLDSHAW ROAD LONDON W12

MORSE MADE EASY BY THE RHYTHM METHOD!

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

Using scientifically prepared 3-speed records you automatically learn to recognize the code RHYTHM without translating. You can't help it. It's as easy as learning a tune. 18-W.P.M. in 4 weeks guaranteed. For complete courses, records & books send £4.95 including P.P.I. etc. Overseas surface mail (£1 extra).

For further details contact: Ring 01-660 2894. Or send 7p stamp for explanatory booklet to S. BENNETT, G3HSC.

(Rox 14) 45 GREEN LANE, PURLEY, SURREY
G. W. M. RADIO LTD.

All prices include VAT and post/carriage. Discount for orders.

ABRAIL INSULATORS. EGG type, white with 1½" 6 for £1.

CAKES. Best quality for £13.

CRITICAL FREQUENCIES CT242, 110 to 250 A.C. 12½ x 9½" 9½ x 10¾, 27½ x 11¼, 27½ x 11¼.

TRANSMITTING equipment ideal, £60. STABILISED power supplies, £15. G3MU, £20.

WANTED WANTED WANTED WANTED

... ... ...

RA17's and 117's in stock p.o.a.

WANTED WANTED WANTED SECOND-HAND GEAR OF ALL TYPES

Ample Parking

Closed Wednesday Late Night Thursday, 8 p.m.

MORE CRYSTALS - All New HCU type, £1-50 pp. Post/VAT paid.

-... ... ...

40-42 PORTLAND ROAD, WORTHING, SUSSEX

The ideal combination for a good FM station

THE EMUPRESSOR

This old favourite will give your audio a lift at low cost. No clipping, so minimum distortion, practically the same output whether you speak into a microphone or test audio input and forget it. A sample gave 10 dB change output or 60 dB change of input. Paced with controls to fit for a good quality receiver.

Price £7-80

THE EMU VFO

This unit is proving a huge success so it is now available for £6, 8, 12 or 16 when ordered. It's a complete unit. There is a sine wave output of not less than 2V into low impedance via a coax socket. It is tuned by a potentiometer (supplied) and the VFO is housed in a die-cast box 114 x 64 x 30mm. and a polyethylene block for optional thermal isolation. A separate diode to give you good quality FM or OSS. Even 2v. DC. No earth is required to power the unit. Stability is adequate for most Amateur applications.

Price £11-00

THE EMU FM-UNIT

This will add to the FM side of the FM station. A compact add on unit measuring 6 x 3 x 1½" containing limiters, squelch, audio and output stages giving approx, 115 for a low imp output. There is also an output from the 'A' curve that can be used for AFC etc. There is one connection needed to the main RX, a small capacitor to the last IF stage and via co-ax to the Unit. A negative earth 12v. DC supply is required to power it. For those wishing to include inside the RX there is a PC board version, £5.00 or 45s. Price £10-00. PC version £11-50

THE EMMARKER

The well-known crystal calibrator still available in a 12½ x 1½" box. It can be used for FM calibrations, the outputs being 1 MHz, 100 Hz and 10 kHz or in the EMMARKER 25 the last output is 25 kHz instead giving 4 useful for finding spot frequencies. This needs a supply of 9v, DC at 100mA.

Price £11-00

EMU-CALL

We will send your own calibrator at intervals from Morse and from a jack socket to line in the modulator if preferred. It is all solid state with TTL 74 series and will give your station a distinctive sound.

Price £25

Post and packing all units to UK 25p

Money-back guarantee if not satisfied. Please write for any further details required to:

I. N. CLINE (G3EMU)

15 KNIGHT AVENUE, CANTERBURY

CT2 8PZ, KENT
Axial Products Ltd.
DEPT. 312,
23 AVENUE AVENUE, DONLEY, HIGH WYCOMBE, BUCKS.
Telephone: High Wycombe 0494 33868

DERBY RALLY — AUGUST 15
Don’t forget to visit our stand in the main hall.

1 MHz XTAL
These are superior grade crystals and carry our full one year guarantee.

NOTE
In CODAR EQUIPMENT, S. AVOMETERS.

WE CAN
K.W. Vanguard
EDDYSTONE
Hammers
CHEYENNE
HEATHKIT

SUPER ETCH
The very best in P.C.B. etchants.
Once you have tried Super Etch you’ll never go back to ferric chloride.
2 part mix £1-33 per kit

AVAILABLE ONLY AT RALLY STANDS

R. T. & I. ELECTRONICS LTD.
where equipment is fully overhauled

HEATHKIT Comanche MRI and HEATHTK Cheyenne MT1 complete with 12 volt P.S.U. and Speaker
HAMMERLIND HQ170. B.S. Receiver
EDDYSTONE 7700
HAMMERLIND SP600. G.C. Receiver
NATIONAL HRO 5OT. Receiver
NEW EDDYSTONE 9905-250-850 MHz
EDDYSTONE ECIO Mk.2. Receiver
EDDYSTONE EB35.
K.W. Vespas. Mk2. Transmitter
K.W. 204 Transmitter
K.W. Vanguard Transmitter
PAN ADAPTOR BCI0314 545/465 KHz.

WE CAN ALSO SUPPLY ANY MAKE OF NEW EQUIPMENT—and have pleasure in giving a few examples which are normally in stock:

AVOMETERS. Model 7, Mk 2, £62-46; Model 8, Mk 5, £65-75; Model 40, Mk 2, £62-46; Model 72, £25-63; Multiminter Mk 5, £22-15; Standard Leather Case Carrying (Models 7, 8, 40). £11-50; Ever Ready dicto, £14-00; Multiminter Leather Case, £6-40; 30V D.C. Multiplier for Model 8 or 9.


TRIO EQUIPMENT. Please enquire.

SHURE MICROPHONES. 444T, £21-90 (75p); 444L, £17-28 (75p); 401A, £9-18 (60p); 402, £17-56 (60p); 4021, £8-10 (60p). Full details on request.

KEYNCTORS, piano key mains connector units, £5-25 (40p). Trade enquiries welcome.

VALVES. Please state your requirements.

ADVANCE TEST EQUIPMENT—we are agents—your enquires please.

TNK METERS: TM800, £19-75 (75p), TV2000B, £35-75 (50p), TP235, £18-30 (50p), Model 700, £22-90 (75p), etc., etc.

PHILIPS PM2403 ELECTRONIC MULTIMETERS, £15-00 (£1-00), etc., etc.

We also supply PHILIPS & LAGBARBO COLOUR TV TEST EQUIPMENT, including Colour Bar Generators, Cross Hatch Generators, Deagussing Coils, Oscilloscopes, CRT Testers, Transistor Testers, etc., etc.

KW EQUIPMENT: Don’t forget your FREE mic with every TX and Transmitter. 1 KW2000 & P.S.U., £242-50 (£3-50); KW201, £210-00 (£2-30); KW204, £250-00 (£3-00); KW1000 Linear, £180-00 (£4-00); KW107, £65-00 (60p); KW 2-750, £22-05 (60p); KW160, £180-00 (£6-00); KW101, £80-00 (£1-50); KW103 Monitors, £85-00 (£3-00); Speaker for KW202 and KW203, £6-00 (50p); KW103, £6-00 (50p); KW Low Pass Filter, £10-00 (£10); KW Antenna Switch, £4-00 (25p), etc.

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

The SHORT WAVE MAGAZINE
August, 1976
Have you got all these ARRL titles on your shelf?...

<table>
<thead>
<tr>
<th>Title</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTENNA BOOK, 13th Edition</td>
<td>£3.15</td>
</tr>
<tr>
<td>UNDERSTANDING AMATEUR RADIO</td>
<td>£1.82</td>
</tr>
<tr>
<td>HOW TO BECOME A RADIO AMATEUR</td>
<td>£1.15</td>
</tr>
<tr>
<td>LEARNING THE RT CODE</td>
<td>70p</td>
</tr>
<tr>
<td>A COURSE IN RADIO FUNDAMENTALS</td>
<td>£2.13</td>
</tr>
<tr>
<td>FM AND REPEATERS FOR THE RADIO AMATEUR</td>
<td>£3.00</td>
</tr>
<tr>
<td>RADIO AMATEUR HANDBOOK 1976 (soft-cover)</td>
<td>£5.30</td>
</tr>
<tr>
<td>RADIO AMATEUR HANDBOOK 1976 (hard-cover)</td>
<td>£7.65</td>
</tr>
<tr>
<td>SPECIALISED COMMUNICATIONS TECHNIQUES FOR THE RADIO AMATEUR</td>
<td>£2.25</td>
</tr>
<tr>
<td>HINTS AND KINKS</td>
<td>£1.60</td>
</tr>
<tr>
<td>SINGLE SIDEBAND FOR THE RADIO AMATEUR</td>
<td>£2.25</td>
</tr>
<tr>
<td>VHF MANUAL</td>
<td>£3.15</td>
</tr>
</tbody>
</table>

(all prices include post/packing)

Available from SHORT WAVE MAGAZINE
Publications Dept.,
34 HIGH STREET, WELWYN, HERTS., AL6 9EQ. Telephone: Welwyn 5206/7

A selection of specially recommended titles...

<table>
<thead>
<tr>
<th>Title</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>* SIMPLE, LOW-COST WIRE ANTENNAS, by W. Orr W6SAI</td>
<td>£2.90</td>
</tr>
<tr>
<td>* A GUIDE TO AMATEUR RADIO, 16th Edition (RSGB)</td>
<td>£1.15</td>
</tr>
<tr>
<td>* HAM RADIO, A BEGINNERS’ GUIDE</td>
<td>£2.50</td>
</tr>
<tr>
<td>* THE RADIO AMATEUR’S EXAMINATION MANUAL 6th Edition (RSGB)</td>
<td>£2.15</td>
</tr>
<tr>
<td>* PRACTICAL WIRELESS CIRCUITS, 18th Edition</td>
<td>£2.45</td>
</tr>
<tr>
<td>* WORLD RADIO TV HANDBOOK 1976</td>
<td>£5.00</td>
</tr>
<tr>
<td>* RADIO AMATEUR OPERATORS HANDBOOK (Data)</td>
<td>85p</td>
</tr>
<tr>
<td>* WORKING WITH THE OSCILLOSCOPE</td>
<td>£1.85</td>
</tr>
<tr>
<td>* AMATEUR RADIO TECHNIQUES, 5th Edition (RSGB)</td>
<td>£2.47</td>
</tr>
<tr>
<td>* TRANSISTOR AUDIO &amp; RADIO CIRCUITS, 2nd Edition (Mullard)</td>
<td>£3.00</td>
</tr>
<tr>
<td>* TOWERS’ INTERNATIONAL TRANSISTOR SELECTOR</td>
<td>£3.45</td>
</tr>
<tr>
<td>* VHF/UHF Manual, 3rd Edition (RSGB)</td>
<td>£5.60</td>
</tr>
<tr>
<td>* VHF HANDBOOK, by W. I. Orr W6SAI (New Edition)</td>
<td>£3.90</td>
</tr>
<tr>
<td>* RADIO VALVE AND SEMICONDUCTOR DATA, 10th Edition</td>
<td>£2.35</td>
</tr>
<tr>
<td>* TELEPRINTER HANDBOOK (RSGB)</td>
<td>£6.70</td>
</tr>
<tr>
<td>* TEST EQUIPMENT FOR THE RADIO AMATEUR (RSGB)</td>
<td>£2.35</td>
</tr>
</tbody>
</table>

(all prices include post/packing)

Available from SHORT WAVE MAGAZINE
Publications Dept.,
34 HIGH STREET, WELWYN, HERTS., AL6 9EQ. Telephone: Welwyn 5206/7