FOR THE MAN WHO DEMANDS THE BEST

For this man, the choice in amateur band receivers must be the TRIO R599D. This is the receiver packed with features and facilities which make it the most sought after equipment in the amateur market. All band coverage from 160 to 10 metres also includes the 27 MHz CB section and WWV for accurate frequency checks. Provision is made for fitting optional VHF or UHF converters to extend your listening activities and all the converter switching is built in to the receiver so there are no connectors to fiddle around with.

Local stations—loud and clear with the unique TRIO feature of being able to use any filter on any mode. Weak DX; simply switch to AUTO selectivity and the R599D will match the bandwidth to the mode in use. Noise; just switch in the noise blanker to take out impulse interference. Want to read out the frequency? Just use the 25 kHz calibrator to check the dial and read off the frequency in use to better than 1 kHz. The velvet smooth dual reduction dial drive is a joy to handle.

Extensive use of the latest dual gate FET devices endow the R599D with all the sensitivity and freedom from cross modulation that you could wish for. All mode operation is standard, giving AM, USB, LSB, CW and FM with separate detectors for each mode at optimum performance. The AGC time constant can be switched for fast or slow characteristics and can also be turned off for the CW operator. An effective squelch system is fitted for suppressing inter station noise and works on any mode.

The R599D can be used from ac mains supplies or from a 12 volt dc external source using the power cord supplied. Used in conjunction with the matching T599S, you can assemble a station which is second to none.

Sole Importers: LOWE ELECTRONICS
Cavendish Road, Matlock, Derbyshire
Tel.: Matlock 2817 or 2430
5 Band SSB/CW Transceiver TS520

The Transceiver with everything

The TS520 System
TRIO have now completed the first stage of the total system concept for amateur radio equipment. With the TS520 and its associated accessories, the amateur radio operator can assemble a station to suit any or all requirements for his hobby enjoyment. All modes and all bands, fixed and mobile/portable are provided by the TS520 system.

SSB/CW Transceiver TS-520
A real "compact"; powerful, rugged and reliable. It has everything which otherwise is available only as an accessory at extra cost; built-in power supply for fixed-station use, transistorized DC/AC power converter for mobile operation, loudspeaker, fixed-channel provisions, VOX control, etc. All these are the TS-520's special features in short format:

Versatile Transmit- and Receive Operations-USB, LSB and CW on all radio amateur bands from 80m. to 10m., and—with the aid of the 2m.-Transverter TV-502—also on the VHF-band from 144 to 146 MHz, as well as fixed frequency operation on four channels. The TS-520 also allows reception of WWV stations on 10 MHz for dial calibration. By adding the External VFO-520 (optional) the TS-520 demonstrates utmost versatility: independent RX- and TX operation with different frequencies transceive operation with slightly variable RX frequency by means of the built-in RT circuit (Receiver Incremental Tuning) plus fixed channel operation totaling nine different combinations.

Advanced Circuitry—With the exception of the transmitter driver and final stage which are equipped with blower-cooled vacuum valves of type 12BY7A and 2 x S2001 the TS-520 is fully transistorized. The semiconductor complement consists of 44 transistors, 18 FETs, 1 IC and 84 diodes. The reliability and stability of this circuit has been substantiated by numerous contests and during rugged mobile operation.

Outstanding Receive and Transmit Performance—The transmitter section of the TS-520 features separate driver, plate and final tuning, a 2-stage ALC circuit for local and DX operation, thus assuring undistorted clearly legible TX signals even after hours of continuous operation. Provisions for linear amplifiers, such as ALC input, antenna relay switching output, etc., are available and ready for use. Dual-gate MOSFETs are employed in all critical receiver circuits to improve the input sensitivity, cross-modulation response and spurious rejection. An 8-pole SSB crystal filter in the IF amplifier provides exceptional selectivity and stability. An optional 500Hz CW filter is available as an accessory and can be installed at any time. The switch-selectable time constant of the AGC assures perfect reception of SSB and CW signals.

Precision-type VFO—a feature of all TRIO receivers, transmitters and receivers also contributes to the supreme performance of the TS-520. The VFO is fully encapsulated and is controlled by a meshed dial drive (reduction ratio 4:1). Dial accuracy is better than ±1 kHz, frequency drift will not exceed ±100Hz per hour. Dial calibration is accomplished by means of a built-in 25 kHz crystal marker oscillator.

Built-in Power Supplies—for fixed station use with 120/240v. AC 50-60Hz line voltage or for mobile operation with 12-13.8v. DC by means of the built-in DC/AC converter.

Loaded with Extra Features: threshold-type RF gain control; break-in CW keying with sidetone; VOX/PIT/MOX-control; RIT; TUNE switch; LED function indicators for RIT, VFO and FIX channel operation; WWV receive pushbutton; 4-position fixed channel selector switch; built-in 25kHz crystal marker oscillator; two-stage AGC; multi-function meter; terminals for optional accessories such as: 2m.-Transverter TV-502, External VFO-520, External Speaker SP-520, linear amplifier, headphone, microphone and key.

Sole Importers
LOWE ELECTRONICS
119 Cavendish Road
Matlock, Derbyshire
Tel.: Matlock 2817/2430
TS520 £432 inc. VAT
If your station is equipped for FM only, and you wonder where other 2 metre operators have gone when conditions are good—just borrow a receiver and listen to the SSB around 144.3. Direct DX contacts with continental stations are commonplace because of the sheer distance covering ability of SSB. With the freedom from channel restrictions and the ability to have multi-station QSOs with ease, SSB capability can add a new dimension to your amateur radio 2 metre operations.

SSB and CW operation. Following the well deserved success of the TS700, Trio used its basic design and put together the ideal mobile/fixed station SSB/CW package—the TR7010.

Combining high receiver sensitivity and clean transmitted signal, the TR7010 gives continuous frequency coverage from 144.1-144.335 MHz to cater for CW, SSB, and beacon activity. 48 synthesised 5 kHz channels with VXO and RIT ensure crystal controlled stability with the freedom to move around the band.

Design expertise. Both transmitter and receiver in the TR7010 are of the single conversion type using an IF of 10.7 MHz. This gives a clean transmitter signal and a receiver that is free from unwanted image problems. Double balanced mixing is used throughout the transmitter and the carefully tailored audio system in conjunction with a first class crystal filter produces that good signal quality for which TRIO equipment is renowned. The PA stage uses a 30Watt device which is run at only 20 Watts input to give optimum linearity and protection against misuse.

The construction of the TR7010 follows the rugged reliable package style of the TR7200G—and fits the same mobile mount so that one can fit either rig in the same mounting slide.

Fixed (using the matching PS5 supply), or mobile, the TR7010 is the DX SSB/CW rig for everyone.

SPECIAL OFFER

Trio have agreed to maintain a special low price for the TR7010. Stocks are limited. Contact us for the current price on this model.
With the advent of many more repeaters on 70 cm, in April as phase 2 of the band plan gets under way, you don't want to be left in the cold by not having a rig ready.

The KF 430 is the ideal mobile rig for 70 cm. operation for many, many reasons. There is the size—only 240 x 85 x 60mm. (or 9 1/4 x 3 1/4 x 2 1/2" if you still think like me)—which will fit into the smallest car. The performance packed into this tiny package is tremendous. Power output is 10 watts with switched reduction to 3 watts if required and the transmitter speech quality is excellent.

The receiver section is very sensitive at 0.4 microvolts for 20 dB quieting and the IF limiting characteristics are first class. The entire receiver front end is enclosed in its own fully screened enclosure, as is the transmitter output section. Multiple tuned circuits ensure a clean output signal at all power levels. All crystals are fitted with individual trimmers for spot on accuracy. The receiver selectivity is to current UK and European standards and the filter response is level.

The KF 430 comes complete with 9 channels factory fitted, automatic tone burst, matching microphone and mobile mount. NOW compare the price with other 70 cm. mobile equipment. Only £202 including VAT. Absolutely unbeatable at any price, the KF 430 is incredible at this level. See it soon.

*Small size 9 1/4 x 3 1/4 x 2 1/2*. *Light weight only 1.2 Kg. *Frequency range 433-436 MHz. *Power output 10W or 3W switched. *Receive sens. 0.4 microvolts for 20dB quieting. Fitted nine channels and auto tone burst. £202 including VAT

TRIO have always set the pace in the handy portable field starting with the TR 2200 2 metre powerhouse. Following the success on 2 metres, the TRIO TR 3200 gives the radio amateur the lead on 70 cm. as well, with all the quality engineering for which TRIO are famous.

The transmitter section of the TR 3200 features the latest semiconductor devices to give a high power output in excess of 2 watts, with switched reduction to 400 mW for local contacts. The audio section has a tailored speech response and an integrated circuit limiting amplifier which, together with a new style miniature microphone, gives that first class speech quality you like.

The sensitive (less than 1 microvolt for 20 dB quieting) double conversion receiver provides an output of more than 0.7 watts into either the built-in speaker or an external speaker or earphone. Multiple filtering at 10.7 MHz and 455 kHz, together with no less than five 455 kHz limiters, guarantees top performance, noise free reception.

A noise detection squelch system allows optimum sensitivity so that you do not miss those weak signals.

Multi function metering provides S meter, RF output meter and battery check facilities at any time.

The TR 3200 has space for 12 channels and is fitted at the factory with crystals for SU9, SU18 and SU20. Most repeater channels are available ex stock. The TR 3200 is fitted with the TRIO exclusive tuning fork controlled tone generator which ensures access first time every time.

The TR 3200 comes complete with microphone, carrying case and shoulder strap, removable high gain 3/8 wave antenna, battery charger for the optional Nicad pack and three factory fitted channels. Contact us now for further details of the best portable rig around.

It was with deepest sorrow that we learned of the death of Austin Forsyth, G6FO. Amateur radio has lost a friend, champion and a man of principle. We should all mourn his passing.

Prices are subject to alteration without notice.

HEAD OFFICE 119 Cavendish Road, Matlock, Derbyshire. Tel. 2817 or 2430 9 a.m. to 9 p.m.
BRANCH OFFICES
Communications House, Wallington Square, Wallington, Surrey. Tel. 01-669 6700
Soho House, 362-4 Soho Road, Handsworth, Birmingham. Tel. 021-554 0708
27 Cookridge Street, Leeds. Tel. 0532 452657
AGENTS
John G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Tel. Ringmer 812071
Sim GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. Tel. 041-771 0364
OPENING HOURS: 9.50 TO 5.30 TUESDAY TO SATURDAY INCLUSIVE
THE TOP TRANSVERTER RANGE

The MMT144/28 pictured below is representative of our current range of professional quality all mode solid state linear Transverters which now comprises:

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
<th>RX</th>
<th>TX</th>
<th>Price (inc. VAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMT144/28</td>
<td>28 MHz to 144 MHz</td>
<td>Gain: 30 dB</td>
<td>Required input: 0.5 watt</td>
<td>£88.88</td>
</tr>
<tr>
<td></td>
<td>all mode solid state linear Transverter</td>
<td>Noise Figure: 2.5dB</td>
<td>Power output: 10 watts continuous</td>
<td></td>
</tr>
<tr>
<td>MMT432/28</td>
<td>28 MHz to 432 MHz</td>
<td>Gain: 30 dB</td>
<td>Required input: 0.5 watt</td>
<td>£109.13</td>
</tr>
<tr>
<td></td>
<td>all mode solid state linear Transverter</td>
<td>Noise Figure: 3.0dB</td>
<td>Power output: 10 watts continuous</td>
<td></td>
</tr>
<tr>
<td>MMT432/144</td>
<td>144 MHz to 432 MHz</td>
<td>Gain: 10 dB</td>
<td>Required input: 10 watts</td>
<td>£149.63</td>
</tr>
<tr>
<td></td>
<td>all mode DOUBLE CONVERSION solid state linear Transverter</td>
<td>Noise Figure: 3.0dB</td>
<td>Separate receive converter output gives independent second receiver facility</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TX</td>
<td>Power output: 10 watts continuous</td>
<td></td>
</tr>
</tbody>
</table>

All three models are designed around latest state of the art devices, and high stability construction techniques are the main theme throughout.

A spurii rejection of better than —65dB is achieved on all models by high-Q circuitry, and the incorporation of ultra-linear amplifier stages ensures the best possible “ON THE AIR” sound.

FEATURES

★ Highly stable zener-controlled oscillator stages

★ Latest state of the art front end RF amplifier transistors ensure consistently low noise figures

★ PIN diode aerial changeover relay has a through loss of less than 0.2dB

★ High quality double sided glass-fibre printed circuit board is incorporated for RF stability

★ Separate internal PA compartment ensures excellent electrical and thermal stability

★ Low distortion balanced transmit mixers achieve a high degree of linearity and spurious rejection

★ By virtue of their linear mode of operation our transverters will accept SSB, FM, AM or CW modes

For further data on these and our converters, frequency counters etc., please do not hesitate to contact our sales department at your earliest convenience. If you need any technical advice just a phone call will put you in touch with our technical staff.

GUARANTEE? All of our products are fully guaranteed for 12 months.

MICROWAVE MODULES LIMITED
BROOKFIELD DRIVE, AINTREE, LIVERPOOL
L9 7AN

TELEPHONE: 051 523 4011
TELEX: 628608 MICRO G
DIGITAL II from KYOKUTO
SCANNER AND CRYSTAL T.B. OPTIONS

The Digital II offers complete 5 kHz step coverage across 2 metres and now with the Scanner 33, 28 kHz channels from 145 MHz upwards covered in around 1.75 seconds. It offers full lock and lockout on all channels. The scanner stops on a required channel for 10 seconds, then unless locked moves on. The bright digital readout comes from 6 seven segment LEDS.

KLM Solid State Mobile Lines

2 metre, SSB/CW/FM, RF sensing with manual override, "Microstrip" 12v, D.C. 10W drive. 2 x 6-5 kHz. 5.0 W (11.0 dB) output. (15 different models—S.A.E. details) (VAT 12.5%).

PA144/160/BL 145MHz 160W, output £155

YAESU & OTHER CRYSTALS

FT57(B), FT57(B), FT20(B), FT20(B)
SIMPLEX 600 600 Hz £16
YF30P12 12 kHz P + 1M £18

SEND A LARGE (10 x 12) SAE OR 15p STAMPS FOR YOUR FREE DIGITAL II £235; CRYSTAL T.B. £100; SCANNER £49.50
All prices exclude VAT at 12.5%
THE FT223 NEW LOW COST HIGH QUALITY 2m TRANSCEIVER

23 channels, 12v, DC, 1 or 10W output. Automatic tone burst, supplied complete with hand microphone, and mounting bracket, etc. Provision for sub audible tone squelch. Ex Stock.

G WHIP HP MOBILE (Carriage 90p) VAT 121/2%

TRIBAND BEAMS (Carriage £3.50) VAT 121/2%

SMC TRAPPED DIPOLES (Post 45p) VAT 121/2%

THE FT223 NEW LOW COST HIGH QUALITY 2m TRANSCEIVER

23 channels, 12v, DC, 1 or 10W output. Automatic tone burst, supplied complete with hand microphone, and mounting bracket, etc. Provision for sub audible tone squelch. Ex Stock.

G WHIP HP MOBILE (Carriage 90p) VAT 121/2%

TRIBAND BEAMS (Carriage £3.50) VAT 121/2%

SMC TRAPPED DIPOLES (Post 45p) VAT 121/2%

THE FT223 NEW LOW COST HIGH QUALITY 2m TRANSCEIVER

23 channels, 12v, DC, 1 or 10W output. Automatic tone burst, supplied complete with hand microphone, and mounting bracket, etc. Provision for sub audible tone squelch. Ex Stock.

G WHIP HP MOBILE (Carriage 90p) VAT 121/2%

TRIBAND BEAMS (Carriage £3.50) VAT 121/2%

SMC TRAPPED DIPOLES (Post 45p) VAT 121/2%

THE FT223 NEW LOW COST HIGH QUALITY 2m TRANSCEIVER

23 channels, 12v, DC, 1 or 10W output. Automatic tone burst, supplied complete with hand microphone, and mounting bracket, etc. Provision for sub audible tone squelch. Ex Stock.

G WHIP HP MOBILE (Carriage 90p) VAT 121/2%

TRIBAND BEAMS (Carriage £3.50) VAT 121/2%

SMC TRAPPED DIPOLES (Post 45p) VAT 121/2%
THE FRG7 GENERAL COVERAGE RECEIVER Ex-Stock
UNSURPASSED IN ITS CLASS! NOW DOWN TO £145 + VAT!!

The FRG7 is a general coverage solid state receiver with specifications unmatched in its price range. It uses a Barlow Wadley Triple-mix, drill cancelling loop for continuous, spin-tuned inclusive coverage of 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 with calibration accuracy better than 5 kHz. 

THE FT301 RANGE EX-STOCK—NEW LOW PRICES
The New FT-301 transceiver range (with options installed) offers — Full solid state, 12V. DC working with external matching mains supplies with speaker, and an external VFO are available. Plug in board construction, 160-10m. operation in 500 kHz segments, MSF and CB receive, RF speech processor, noise blanker, front panel controlled VOX (with P.P.T. and P.P.T.) and P.P.T., semi-break in keying with side tone, clarifier with separate ON/OFF switch, 1 1/2" x 5" x 13 1/2", 25 kHz crystal calibrator, internal VFO or 11 crystal per band (or external VFO with same facility) 3W. audio to internal or external speaker.

ROGER BAINES, G3YBO
79 CHATSWORTH ROAD,
CHESTERFIELD, DERBY.
Tel.: (0246) 34982
Open: Tuesday-Saturday 9-5.

PRICES EXCLUDE VAT, 8 or 12½%
items on this, or other SMC advertisements are available from
SMC, SMC Leeds, Tweedy and Agents

Jack Tweedy, G3ZY
"HAM SHACK"
RUGGED "BINE"
WOODHALL SPA, LINCS.
Tel.: (0526) 52793
Open:

J & A TWEEDY
DERBYSHIRE AND LINCOLNSHIRE

WE TAKE PLEASURE IN ANNOUNCING THAT FROM THE 1ST MARCH, 1977 OUR COMPANY WILL COMBINE WITH SOUTH MIDLANDS COMMUNICATIONS LTD. AND IT IS PROPOSED THAT THE NAME BE CHANGED TO S.M.C. (TWEEDY) LTD.

OUR USUAL PERSONAL SERVICE WILL CONTINUE BUT REINFORCED WITH AN INCREASED RANGE AND LARGER STOCKS.

Thank you for your patronage in the past, and assuring you of our best attentions in the future.

Signed: J. R. TWEEDY, R. BAINES, B. A. TWEEDY.

Jack Tweedy, G3ZY
"HAM SHACK"
RUGGED "BINE"
WOODHALL SPA, LINCS.
Tel.: (0526) 52793
Open:

WE TAKE PLEASURE IN ANNOUNCING THAT FROM THE 1ST MARCH, 1977 OUR COMPANY WILL COMBINE WITH SOUTH MIDLANDS COMMUNICATIONS LTD. AND IT IS PROPOSED THAT THE NAME BE CHANGED TO S.M.C. (TWEEDY) LTD.

OUR USUAL PERSONAL SERVICE WILL CONTINUE BUT REINFORCED WITH AN INCREASED RANGE AND LARGER STOCKS.

Thank you for your patronage in the past, and assuring you of our best attentions in the future.

Signed: J. R. TWEEDY, R. BAINES, B. A. TWEEDY.

Jack Tweedy, G3ZY
"HAM SHACK"
RUGGED "BINE"
WOODHALL SPA, LINCS.
Tel.: (0526) 52793
Open:

WE TAKE PLEASURE IN ANNOUNCING THAT FROM THE 1ST MARCH, 1977 OUR COMPANY WILL COMBINE WITH SOUTH MIDLANDS COMMUNICATIONS LTD. AND IT IS PROPOSED THAT THE NAME BE CHANGED TO S.M.C. (TWEEDY) LTD.

OUR USUAL PERSONAL SERVICE WILL CONTINUE BUT REINFORCED WITH AN INCREASED RANGE AND LARGER STOCKS.

Thank you for your patronage in the past, and assuring you of our best attentions in the future.

Signed: J. R. TWEEDY, R. BAINES, B. A. TWEEDY.

Jack Tweedy, G3ZY
"HAM SHACK"
RUGGED "BINE"
WOODHALL SPA, LINCS.
Tel.: (0526) 52793
Open:

WE TAKE PLEASURE IN ANNOUNCING THAT FROM THE 1ST MARCH, 1977 OUR COMPANY WILL COMBINE WITH SOUTH MIDLANDS COMMUNICATIONS LTD. AND IT IS PROPOSED THAT THE NAME BE CHANGED TO S.M.C. (TWEEDY) LTD.

OUR USUAL PERSONAL SERVICE WILL CONTINUE BUT REINFORCED WITH AN INCREASED RANGE AND LARGER STOCKS.

Thank you for your patronage in the past, and assuring you of our best attentions in the future.

Signed: J. R. TWEEDY, R. BAINES, B. A. TWEEDY.

Jack Tweedy, G3ZY
"HAM SHACK"
RUGGED "BINE"
WOODHALL SPA, LINCS.
Tel.: (0526) 52793
Open:

WE TAKE PLEASURE IN ANNOUNCING THAT FROM THE 1ST MARCH, 1977 OUR COMPANY WILL COMBINE WITH SOUTH MIDLANDS COMMUNICATIONS LTD. AND IT IS PROPOSED THAT THE NAME BE CHANGED TO S.M.C. (TWEEDY) LTD.

OUR USUAL PERSONAL SERVICE WILL CONTINUE BUT REINFORCED WITH AN INCREASED RANGE AND LARGER STOCKS.

Thank you for your patronage in the past, and assuring you of our best attentions in the future.

Signed: J. R. TWEEDY, R. BAINES, B. A. TWEEDY.

Jack Tweedy, G3ZY
"HAM SHACK"
RUGGED "BINE"
WOODHALL SPA, LINCS.
Tel.: (0526) 52793
Open:

WE TAKE PLEASURE IN ANNOUNCING THAT FROM THE 1ST MARCH, 1977 OUR COMPANY WILL COMBINE WITH SOUTH MIDLANDS COMMUNICATIONS LTD. AND IT IS PROPOSED THAT THE NAME BE CHANGED TO S.M.C. (TWEEDY) LTD.

OUR USUAL PERSONAL SERVICE WILL CONTINUE BUT REINFORCED WITH AN INCREASED RANGE AND LARGER STOCKS.

Thank you for your patronage in the past, and assuring you of our best attentions in the future.

Signed: J. R. TWEEDY, R. BAINES, B. A. TWEEDY.

Jack Tweedy, G3ZY
"HAM SHACK"
RUGGED "BINE"
WOODHALL SPA, LINCS.
Tel.: (0526) 52793
Open:

WE TAKE PLEASURE IN ANNOUNCING THAT FROM THE 1ST MARCH, 1977 OUR COMPANY WILL COMBINE WITH SOUTH MIDLANDS COMMUNICATIONS LTD. AND IT IS PROPOSED THAT THE NAME BE CHANGED TO S.M.C. (TWEEDY) LTD.

OUR USUAL PERSONAL SERVICE WILL CONTINUE BUT REINFORCED WITH AN INCREASED RANGE AND LARGER STOCKS.

Thank you for your patronage in the past, and assuring you of our best attentions in the future.

Signed: J. R. TWEEDY, R. BAINES, B. A. TWEEDY.

Jack Tweedy, G3ZY
"HAM SHACK"
RUGGED "BINE"
WOODHALL SPA, LINCS.
Tel.: (0526) 52793
Open:

WE TAKE PLEASURE IN ANNOUNCING THAT FROM THE 1ST MARCH, 1977 OUR COMPANY WILL COMBINE WITH SOUTH MIDLANDS COMMUNICATIONS LTD. AND IT IS PROPOSED THAT THE NAME BE CHANGED TO S.M.C. (TWEEDY) LTD.

OUR USUAL PERSONAL SERVICE WILL CONTINUE BUT REINFORCED WITH AN INCREASED RANGE AND LARGER STOCKS.

Thank you for your patronage in the past, and assuring you of our best attentions in the future.

Signed: J. R. TWEEDY, R. BAINES, B. A. TWEEDY.
The FRG7 is a solid state mains and 12v. receiver offering continuous coverage 0.5-30 MHz with specifications unparalleled in its price range.

Its advanced circuitry provides superb performance either as a standby receiver or for SWL’s (BC and Amateur Bands alike).

The use of a Wadley loop (using the same VHF oscillator to mix up, then after pre-mixing with a stable crystal source down again (this cancelling all drift from the variable oscillator)) it provides equivalent performance to 30 crystal controlled converters facing a 1IF, but without the image problems of such an arrangement.

The signal path starts with the choice of 3 antenna connectors: for 1.6-30 MHz, a 50/75 ohm feed (to a SO239 (UHF) coax socket and a binding post) and for 0.5-1.6 MHz (medium wave) a separate high impedance binding post. A 3 position 0-40dB switchable attenuator aids reception of very strong signals and reduces adjacent channel interference. The low noise MOSFET RF amplifier provides a SSB sensitivity of 0.25µV (for 10dB N+ S/N at 105 MHz) and is sharply tuned by a well calibrated “pre-selector” capacitor with 4 band switched coils. Its output is low pass filtered (fc = 35 MHz), removing VHF image problems from the following mixer. This comprises a pair of JFETS, driven by the “MHz set” 55.5-84.5 MHz oscillator, which upconverts the signal to the band pass first IF to 55 MHz ± 500 kHz where it is MOSFET amplified. The second IF of 2.3 MHz is produced by a FET mixer by heterodyning with the synthesiser derived 52.5 MHz signal. A 1 MHz crystal oscillator and the harmonic generator produces a 3-2 MHz comb spectrum. This, with the first heterodyne oscillator (MHz set) is fed to a dual balanced i.e. pre-mixer. The output is expurgated by a multiple stage selective amplifier producing the 52.5 MHz second oscillator. A small fraction of this is rectified, DC amplified and lights the “lock” LED (saving power) when the MHz oscillator is malset. The 2-3 MHz signal is MOSFET amplified and fed to the third mixer (a JFET whose input and output are tuned by capacitors ganged to the main tuning control) where it is heterodyned to the fined IF by the main VFO which covers a 1 MHz range (2.455-3.455), is clearly calibrated, to 5 kHz (or better), well buffered, and highly stable. The third (455 kHz) IF starts with the ceramic selectivity element and is followed by two stages of bipolar (the first in the signal path) amplification before the choice of detectors; twin diodes for AM, or a 4 diode product detector, with well buffered switched frequency (for selectable sidebands) B.F.O. A diode rectifies, a fraction of the output from the final IFT, this is boosted to drive the illuminated “S” meter and automatically gain control the MOSFET amplifier in the RF, second and third IF stages, reducing facing and distortion. Immediately following the demodulator is an automatic noise limiter, highly effective in suppressing pulse type interference on AM signals, and a three position “tone” switch (a high, low or band pass) audio filter, reducing the bandwidth to that required. A transformerless AF amplifier: delivers a generous 2W to the internal 5” x 3”, or external speaker, drives a phone jack, and a “volume” independent output for tape recorder. The receiver is, mains (234VAC), external (12v. DC) or internal dry cell powered, the most economic source being automatically chosen. This is reduced to a stable regulated 10v. (or 9v. for oscillator and the harmonic generator). A dial lamp switch is provided to conserve power when battery operation is employed.

**OUR AGENTS**

Amateur Electronics, 508-514 Alum Rock Road, Alum Rock, Birmingham B8 3HX

South Midlands Communications Ltd. S.M. House, Osborne Road, Totton, Southampton, Hampshire SO4 4DN

Western Electronics (UK) Ltd. Fairfield Estate, Louth, Lincolnshire LN11 0JH
**WATERS &**

Telephone : HOCKLEY (03704) 6835 2 lines

---

**FDK**

**MULTI-2700 SUPERB ALL-MODE 2 METRE TRANSCEIVER**

USB/LSB/FM/FMw/CW/AM PLUS 10M_DOWNLINK OSCAR RECEIVER

Normal/Reverse
Repeat
VOX/IRT/Calibrator
DX Speech Clipper
High/Low Power
Noise Blanker

---

**IN STOCK NOW** STILL AT £449 inc. VAT

Don't consider any other model until you have sent for the 4-page booklet on this superb transceiver. The 200, crystal controlled channel synthesizer (at £2.50 per crystal) is worth £500 alone. Send today for full details.

---

**MICROWAVE MODULES**

- **MMC 2m. conv. IF 2-4, 4-6, 28-30**
  - £20.25 (36p)
- **MMC 70 MHz conv. 28-30**
  - £22.50 (36p)
- **MMC 70 MHz conv. 28-30 + local osc.**
  - £22.50 (36p)
- **MMC 2m. conv. 28-30 + local osc.**
  - £22.50 (36p)
- **MMC 70cm. conv. 28-30 or 144-430**
  - £22.50 (36p)
- **MMC 1296/144 or 28-30**
  - £28.12 (36p)
- **MMDO 50 MHz counter**
  - £66.95 (36p)
- **MMDO 500MHz prescaler**
  - £177.00 (36p)
- **MMT 432/28 70cm. transverter**
  - £94.50 (36p)
- **MMT 432/144 2m. transverter**
  - £184.50 (36p)
- **MMT 432/28 70cm. transverter**
  - £28.12 (36p)
- **MMT 432/28 70cm. converters 28-30 IF**
  - £184.50 (36p)
- **MMT 144/28 2m. transverter**
  - £88.87 (36p)
- **MMT 144/28 2m. transverter**
  - £66.95 (36p)
- **MMT 1296 MHz converters 28-30 IF**
  - £184.50 (36p)
- **MMT 2m. converters and 5 dB co-linear modules**
  - £109.15 (36p)
- **MMT 2m. or 4m. Europa transverter 200W pwr**
  - £198.00 (36p)
- **MMT 2m. Europa transverter 200W pwr**
  - £198.00 (36p)
- **MMT 2m. Europa transverter 200W pwr**
  - £198.00 (36p)
- **PA3 2m. miniature pre-amp board**
  - £6.27 (36p)

---

**NIHON DENGYO**

- **Liner-2 Mk.II 2m. ssb trcvr. 12v.**
  - £184.50 (36p)
- **Liner-430 70cm. ssb trcvr. 12v.**
  - £198.00 (36p)
- **R115E reg. p.s.u. for liner-2 and 430**
  - £31.50 (36p)

**SOLID STATE MODULES**

- **2m. or 4m. Europa transverter**
  - £109.15 (36p)
- **2m. or 4m. Europa transverter**
  - £109.15 (36p)
- **2m. or 4m. Europa transverter**
  - £109.15 (36p)
- **PA3 2m. miniature pre-amp board**
  - £6.27 (36p)

---

**WATERS**

- **Stable tone-burst modules**
  - £198.00 (36p)
- **Wavemeter 65-230 MHz**
  - £18.00 (36p)
- **Magneto 2m. linear 230v. AC**
  - £112.50 (36p)

---

**FDK**

**FOR 70cms FM MULTI-U11**

**IN STOCK NOW £249 inc. VAT**

Price includes :
- 9 Channels fitted
- Automatic Tone-Burst
- New FDM-10 Microphone
- 24-hour Delivery.

This transceiver has to be the ultimate in 70cms. fm. Like all FDK models it combines performance with those little extras that others leave out. The December RSGB review confirms its extremely sensitive front-end (+4v for 20 dB) and generous power capability (13 watts output). Add facility for safer driving and R.I.T. control, and you have to admit there is no other choice.

---

**NEW MODEL !**

**TM56-B VHF MONITOR RECEIVER**

**IN STOCK END OF MARCH**

Introductory Price £69-50 inc. VAT

Features :
- 12 Manual Channels
- 4 Scan Channels
- 12v., DC/230v., AC
- Built-In Speaker
- 5 Channels Fitted

This sensational monitor receiver has exactly the same configuration as the Multi-11 famous for its sensitivity. Its 1.5 watts audio output makes it ideal for mobile use whilst the 230 volt p.s.u. enables it to be used as a base station. This is yet another winner from FDK and at £69.50 you had better get your order in quickly.

---

**FIGHT MAIL ORDER SERVICE**

**BY PHONE** Simply telephone your Barclaycard or Access No. for immediate despatch.

**BY POST** State clearly your requirements enclosing cheque or postal order.

You are always welcome to come and inspect the equipment at our showrooms.

---

**FOR 70cms FM MULTI-U11**

**IN STOCK NOW £249 inc. VAT**

Price includes :
- 9 Channels fitted
- Automatic Tone-Burst
- New FDM-10 Microphone
- 24-hour Delivery.

This transceiver has to be the ultimate in 70cms. fm. Like all FDK models it combines performance with those little extras that others leave out. The December RSGB review confirms its extremely sensitive front-end (+4v for 20 dB) and generous power capability (13 watts output). Add facility for safer driving and R.I.T. control, and you have to admit there is no other choice.
Fitted 7 Channels + Autoscan, Toneburst, £199-68 inc. VAT
Special Offer: 221, 22 and 23 £10 inc. VAT if ordered at the same time as Multi-11

MULTI-11 This transceiver is now undoubtedly the best on the market. No other model has greater receiver sensitivity or cleaner transmitter output. And there's plenty of power output too! whilst other models struggle to give 10 watts out the Multi-11 soaks along at 13-13 watts output effortlessly. But FDK doesn't stop here, they have gone on to add those extras which makes owning an FDK mobile a pleasure. Things like auto-scan, IRT control, tx monitor switch and of course that superb audio quality that brings you excellent reports. Send for full details today and see why others have changed to FDK.

NEW MODELS

Matches Multi-11 transceiver. 144-146 Rx/Tx. Plus 600 kHz repeater shift. Price (inc. VAT) £89.0

TESTED TRADE INS

L430 as new ... £247.00
Lcom IC-70A 70s, FM ... £150.00
Ltrio QR666 ... £139.00
LCD Q-10 Q-multiplier ... £15.00
Lferrite rings for a.f.i. ... £12.65
Lxk 407A 70 cms. FM ... £15.00
Lszf, telegraph key ... £12.65
Lham 11 antenna rotator ... £12.65
Lfold pass filter ... £13.95
Lrace rings 1/4 for a.f.l. ... £12.65
Lpfa 100 MHz filter ... £12.65
Lset of 10 HP7 ni-cads ... £12.65
Lyamaha HA-63 Rx 50 MHz ... £20.00
Ltrio 80-120 Transceiver ... £135.00

2M FM HANDHELD TRANSCEIVERS

FP200B matching AC p.s.u. ... £150.12
FV101B matching remote vfo ... £150.12
FRIO1DD as above with digital control, tx monitor switch and of course that superb audio quality that brings you excellent reports. Send for full details today and see why others have changed to FDK.

FOR 2M FM

THE SUPERB MULTI-11

STATION ACCESSORIES

MFJ audio filter boards 80/10/180 Hz ... ... £125.00 (50p)
Shure 444 table microphone ... £25.00 (50p)
Shure 201 hand microphone ... £25.00 (50p)
Drape low-pass 1kW filter ... £25.00 (50p)
SWR single meter ... £25.00 (50p)
SWR dual meter ... £25.00 (50p)
Telegraph key ... £25.00 (50p)
Drape low pass filter ... £25.00 (50p)
Ferrite rings 1/2" for a.f.l. ... £25.00 (50p)
HP3A high pass tv filters ... £25.00 (50p)
Set of 10 HP7 ni-cads ... £25.00 (50p)
Balan insulator 50 ohm (beams or dipole) ... £25.00 (50p)

TRIO

HC2 ham clock ... £3.00 (50p)
New R.J300 General coverage receiver in stock ... £18.00 (50p)

STATION ACCESSORIES

MFJ audio filter boards 80/10/180 Hz ... ... £125.00 (50p)
Shure 444 table microphone ... £25.00 (50p)
Shure 201 hand microphone ... £25.00 (50p)
Drape low-pass 1kW filter ... £25.00 (50p)
SWR single meter ... £25.00 (50p)
SWR dual meter ... £25.00 (50p)
Telegraph key ... £25.00 (50p)
Drape low pass filter ... £25.00 (50p)
Ferrite rings 1/2" for a.f.l. ... £25.00 (50p)
HP3A high pass tv filters ... £25.00 (50p)
Set of 10 HP7 ni-cads ... £25.00 (50p)
Balan insulator 50 ohm (beams or dipole) ... £25.00 (50p)

TRIO

HC2 ham clock ... £3.00 (50p)
New R.J300 General coverage receiver in stock ... £18.00 (50p)
Western the First Name for YAESU

Western offers the latest model
FRG-7 RECEIVER
★ Sensitive
★ Stable
★ Versatile
★ Value for money

SEE REVIEW IN “RADCOM” THIS MONTH

WESTERN — NUMER ONE for YAESU

£144 + VAT

★ STAR OFFER — FT221R £299 + VAT

Yes—owing to a significant reduction in manufacturer’s prices—YOU ARE THE WINNERS!
Brand-new, full-spec., guaranteed FT221R—the leading 2m. all-mode transceiver—brought to you at this NEW LOW PRICE by—

WESTERN the FIRST NAME for YAESU ★

OTHER

YAESU
PRICES—

FT101E £440.00
FR101 D. £355.00
FR101 D. Dig. £455.50
FL101 £350.00
FT200 £252.00
FP200 £58.00
FT301 D. Dig. £580.00
FP301 £85.00
FTV250 £150.00

ALL £585.00

VAT
FDK VHF/UHF EQUIPMENT from WESTERN

★ SPECIAL OFFER of MULTI-2000 for ONLY £299 + VAT

Also ex-stock now, the new—
MULTI-2700—All mode 2m./Oscar transceiver
—£399 + VAT

MULTI-U11—70 cm. FM scanning transceiver
—£219 + VAT

ALL CARRIAGE FREE

— MARCH MADNESS ON ROTORS/ANTENNAS —

AR30 ROTORS for £24 + VAT . . .

LOOK! These are slight seconds in maker’s sealed boxes—fantastic value—and carriage free too!

LOOK AGAIN!! HY-GAIN ANTENNAS . . .

TH6DXX Tribander beam—
£129 + VAT (£160 or more elsewhere)
18AVT/WB Trap vertical (10-80m.)—
£59 + VAT (list £73)

All the usual WESTERN lines as previously advertised still available
STEPSHENS-JAMES LTD.

47 WARRINGTON ROAD, LEIGH, LANCs. WN7 3EA

THE NORTH WEST'S LEADING SUPPLIER FOR ALL YOUR REQUIREMENTS. EASY ACCESS FROM THE M61, M63, M64 - WE'RE 5M. TURN AT THE GREYHOUND HOTEL ON THE A580 (East Lancs. Road). OPEN 9.30 TO 5.30, MONDAY TO SATURDAY.

TEL. 0942 - 676790

Please note new telephone number.

UNIDEN 2020, AC/DC power supplies, CW filter, Noise blanker, Blower. Digital and analogue display give direct readout. 2-61468 in PA 80-10 metres. Receiver is pre-mixed single conversion using phase lock loop oscillator circuit. Separate filters for USB/LSB. Heavy duty 75 ohm twin feeder 10p metre, post 1p metre; Heavy duty 75 ohm twin feeder 20p metre. PL269 46p. Cable reducers 16p.

UNIDEN 2030, 144-146 MHz FM Transceiver. 12 channels. 12v. DC operation. 10 watt or 1 watt output. Antenna impedance 50 ohm. Complete with microphone and mounting brackets. Price £178.74

BARLOW WADLEY

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

Complete with FM range ... £170.00

Accessories

Morse Keys ..... £7.85
Auto-Cq-Sender (post free) £41.11
Eddystone 898 Dial Assembly (post 75p) £15.00
Drake Low Pass Filter (post 50p) £18.00
Omega TE-701 Antenna Noise Bridge (post 25p) £21.00
Omega TE-702 Antenna Noise Bridge (post 25p) £24.00
Whip antenna gutter bracket (post 25p) £2.81

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

YAESU

FT101E Transceiver ... ... ... ... ... ... ... ... ... £482.50
FT200 Transceiver ... ... ... ... ... ... ... ... ... £326.00
FT401 Transceiver ... ... ... ... ... ... ... ... ... £412.00
FR101S Receiver ... ... ... ... ... ... ... ... ... £386.37
FR101D Receiver ... ... ... ... ... ... ... ... ... £438.75
FR101D Digital Receiver ... ... ... ... ... ... ... £540.00
FRG7 Receiver ... ... ... ... ... ... ... ... ... £167.00
FT221R VHF Transceiver ... ... ... ... ... ... ... £403.50

ATLAS

210X Transceiver ... ... ... ... ... ... ... ... ... £482.50
215X Transceiver ... ... ... ... ... ... ... ... ... £482.50

CALLETTI

Introducing a new range of VHF mobile and static antennas. All these were exhibited at the Leicestershire Exhibition.

5/8" Gutter mounted whip ... ... ... ... ... ... ... £12.00
5/8" wave standard mount ... ... ... ... ... ... ... £11.50
5/8" Standard mobile base mount ... ... ... ... ... ... £12.00
Base station ground pane 4 radials ... ... ... ... ... ... £13.59

Professional antennas at an Amateur Price

BARLOW WADLEY

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

Complete with FM range ... £170.00

Accessories

Morse Keys ..... £7.85
Auto-Cq-Sender (post free) £41.11
Eddystone 898 Dial Assembly (post 75p) £15.00
Drake Low Pass Filter (post 50p) £18.00
Omega TE-701 Antenna Noise Bridge (post 25p) £21.00
Omega TE-702 Antenna Noise Bridge (post 25p) £24.00
Whip antenna gutter bracket (post 25p) £2.81

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


Send us a large S.A.E. or 20p in stamps and we will forward you all the latest details and prices. All our prices include VAT at the current rate at the time of going to Press. S.A.E. with all general enquiries please. H.P. and Credit facilities. Barclaycard and Access facilities. Trade-ins always welcome. We would be pleased to sell your unwanted equipment on a commission basis.

We can supply most items from stock. All equipment is sold from the above premises. We do not supply any agents or agents of agents who work from home in their spare time. All equipment is air tested and carries normal guarantee.
We enter our third year as sole distributors for the S.T.E. range in the U.K. The popularity of this equipment is growing all the time. With the kind help of the Directors of S.T.E. we have managed to keep the prices stable for the past three years. This equipment sell for about 20% in some of the ECC countries and to keep costs to the customer down, we have not sold to the trade and therefore you get the benefit of lower prices. The quality of these P.C.B's are the finest we have ever seen. Following on from the ARAC 102 receiver for 28-30 MHz and 144-146 MHz fully tunable we now have the ARAC 107 28-30 and 430-440 MHz with AM FM and SSB facilities. The base station AK20 transceiver will be soon supplied with mobile mount and also available in kit form. We also look forward to many new models from S.T.E. in the next year.

Price List (including postage)

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARAC 107 Receiver</td>
<td>£127.50</td>
</tr>
<tr>
<td>ARAC 102 Receiver</td>
<td>£100.00</td>
</tr>
<tr>
<td>Atal 228 Transmitter</td>
<td>£126.00</td>
</tr>
<tr>
<td>ASAP 154 AC PSU with speaker</td>
<td>£35.00</td>
</tr>
<tr>
<td>AR10 Receiver Module</td>
<td>£37.50</td>
</tr>
<tr>
<td>AA1 Audio Amplifier</td>
<td>£64.10</td>
</tr>
<tr>
<td>AD4 FM Discriminator</td>
<td>£5.00</td>
</tr>
<tr>
<td>AL8 Linear Amplifier</td>
<td>£27.00</td>
</tr>
<tr>
<td>AT22 Transmitter</td>
<td>£75.00</td>
</tr>
<tr>
<td>AR20 C.C. Receiver</td>
<td>£50.00</td>
</tr>
<tr>
<td>AT23 C.C. Transmitter</td>
<td>£36.00</td>
</tr>
<tr>
<td>AS 15 Stabilised psu D.C.</td>
<td>£10.00</td>
</tr>
<tr>
<td>AG 10 Tone Generator</td>
<td>£4.50</td>
</tr>
<tr>
<td>AC2A Converter 28-30 MHz</td>
<td>£20.00</td>
</tr>
<tr>
<td>AK20 Transceiver Kit</td>
<td>£120.00</td>
</tr>
</tbody>
</table>

AK20, STE. Latest model from the famous STE Milan range of equipment. 12 channel operation in the 144-146 MHz range. 11-12V, DC operation. 8 watt output. Sensitivity 0-2 uv R.I.T. tone burst. Complete with microphone and mobile bracket.

Price £174.00

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

Price £106.00

Electronic Keyers
Iambic operation—Weighted transmission—Three memory lengths up to 1024 bits. Internal monitor. Transmitter keyed through internal relay. Silver plated contacts. 220V. AC operation.

Price £106.00
THE ICOM RANGE FOR 1977

IC-240 The revolution in 2 metre transceivers. This rig uses a synthesiser in place of a bank of crystals. It has 22 channel capability, and you can programme for any of the 80 channels at 25 kHz spacing between 144 and 146 MHz. A scanning facility and external VFO will be available as optional extras in due course. We supply the set ready programmed for 5 repeater and 10 simplex channels and a facility to listen on repeater input channels is built in. If you think of the cost of crystals you can see why the IC-240 is the best value for money at £198 inc. VAT and delivery.

IC-215 The new 15 channel 3 watt portable from ICOM. This is a sturdy little set ideal for use with repeaters—see last month’s RADCOM for further details. This set is becoming very popular. Fitted with 12 channels for £162 inc. VAT and delivery.

IC-202 The popular SSB 3 watt portable which is sweeping the market. The VXO gives continuous coverage over the ranges 144-0 to 144-2 and 144-2 to 144-4 MHz. The coverage can be extended with extra crystals. See the August 76 copy of Radcom for a review. £172 inc. VAT and delivery.

IC-211E The most attractive multimode 2 metre rig on the market for use on SSB, CW or FM. There are two fully synthesised VFOs which are tuned with a single knob—a feature of the patent ICOM "LSI" synthesiser. Features include repeater, reverse repeater, VOX, automatic RIT, digital frequency display to the nearest 100Hz, two rate and electrically lockable tuning and mains or battery operation. Send for more details on this aristocratic 2m. rig. £529 inc. VAT.

IC-245E A digital pli controlled FM/CW/SSB rig for mobile or fixed station use—again with the single knob tuning covering 5 kHz steps on FM and 100Hz steps on CW and SSB. Another new concept in amateur radio £396 incl VAT.

IC-30A The ICOM 70cm, mobile transceiver that sees the pace in sensitivity and quality—not the cheapest on the market but well worth considering. 22 channel capability. Comes fitted with SUP for £225 inc. VAT.

IC-225 SPECIAL OFFER. For a limited period we can offer this 80 channel rig at £198 inc. VAT and delivery. See previous adverts or send for details.

IC-3PA The companion mains power supply for the IC-22A, IC-240, IC-225 or IC-30A. This supply has built in electronic protection which is far faster than any fuse and incorporates an extra forward facing speaker. There is a bracket supplied to hold ICOM transceivers. £58 inc. VAT.

IC-3PS The companion power supply to the IC-202 and IC-215 which is designed to incorporate the IC-20L linear and supply power for it. £70-29.

IC-20L A linear amplifier for the IC-215 or IC-202 to increase the output power to a full 10 watts. A neat compact module with PA protection and automatic change over powered from the rig. £74.

IC-5M2 An attractive swan neck condenser microphone with a built in pre-amplifier in the base for use with the 202 or 215 which supply power for the amplifier via the mic cable. £26.

RECHARGEABLE BATTERY PACK AND CHARGER BC-20 An ingenious ICOM product of a set of 10 ni-Cads which fit into two of the battery channels of the IC-215 or 202 giving a full supply voltage, and a charger which fits into the third channel which operates from 12 volts—you can charge it from your car or bench power supply while using the rig. The charger incorporates an inverter and current regulator to ensure correct charging conditions. £42.

C TYPE Ni-Cads. A set of nine "C" type (UL1) rechargeable cells £22.00 (+75p p. & p.).

Flexible antenna for IC-215 £4-75.
JUST A FEW OF THE EXCITING RANGE
OF ICOM 2 METRE AND 70 cm EQUIPMENT

ICOM — FOR QUALITY IN 1977
I LIKE ICOM — DON'T YOU?

THANET ELECTRONICS
HERNE BAY KENT
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). £184.50 inc. SECURICOR DELIVERY
AMATEUR ELECTRONICS UK

YOUR FIRST CHOICE FOR YAESU MUSEN

As direct importers we offer you —

* Largest selection
* Large stock of spares
* Full warranty service
* Free Securicor delivery on major items

Sensational ATLAS-21O/215X

FT-221R

FT-101E

MAIN AGENT ATLAS SOLE UK AGENT FOR SWAN ELECTRONICS

A COUPLE OF STAMPS (NO ENVELOPE) BRINGS THE FT-221R, SWAN OR ATLAS LEAFLET. A POSTAL ORDER OR STAMPS FOR 25 PENCE BRINGS THE LATEST YAESU MUSEN MAIN CATALOGUE TOGETHER WITH OUR CREDIT VOUCHER VALUE £1 FOR USE AGAINST YOUR FUTURE YAESU PURCHASE.

USED EQUIPMENT — An S.A.E. please for our latest list.

ATTENTION GM's—NEW SCOTTISH BRANCH!

WE ARE PLEASED TO ANNOUNCE THAT OUR FULL-TIME BRANCH — AMATEUR ELECTRONICS UK—SCOTLAND—IS NOW OPEN AT 287 MAIN STREET, WISHAW, LANARKSHIRE. GORDON McCALLUM, GM3UCI, WILL BE AT YOUR SERVICE DURING NORMAL BUSINESS HOURS AND WILL BE VERY PLEASED TO SHOW YOU THE LATEST PRODUCTS.

Tel.: WISHAW 71382.

BRANCH: AMATEUR ELECTRONICS UK—COASTAL, CLIFTONVILLE, KENT. KEN McNES, G3FTE, THANET (0843) 291297

AGENT: WALES & WEST—ROSS CLARE, GW3NWS, CAERLEON 422232

508-514 ALUM ROCK ROAD
BIRMINGHAM 8 021-327 1497 6313
The late Austin Forsyth, O.B.E., G6FO.
AUSTIN FORSYTH O.B.E., G6FO — Obituary

AUSTIN (“ANGUS”) JAMES ESSLEMONT FORSYTH, who died on January 15, 1977, was born in London on May 11, 1907. At the age of three he moved with his parents to a tea plantation in India where his father was the local doctor; in 1914 he started as a pupil at St. Paul’s, Darjeeling, where he stayed for seven years until the family returned to England in 1921. He completed his education at Victoria College, Jersey, and it was whilst there that Austin really became interested in radio communications—constructing, experimenting and making it his business to find out all there was to know about this new and fascinating subject. There were few high-spots and beacons in the country which he hadn’t climbed with his gear to see who and what he could hear.

It is also a matter of interest, perhaps, that at this time he was a very fine all-round athlete and was a member of the reserve swimming team for the 1926 Olympic Games. He was first licensed in 1928, and in that same year he started his working life underground as a mining engineer in the pits of South Wales (he always had a very great regard for Wales and the Welsh in spite of entirely Irish/Scottish origins).

In 1930, G6FO and Jack Hum, G5UM, got to know one another as a result of a mutual interest in developing the then-neglected 160 metre band. They both became members of Group 10A of the Research and Experimental Section of the RSGB and gathered about them a number of like-minded transmitting amateurs whose interest was to see more activity on a band which had become virtually deserted during the great rush to the DX bands of forth and twenty metres. Their objective was to prove that 160 metres had DX possibilities that might not be altogether apparent to those who preferred the easier pickings of 7 and 14 MHz. To this end a series of trans-Atlantic tests were set up to be conducted just before dawn every day during the winter of 1931 and 1932, a long and painstaking slog which had its reward when G6FO was “first across the Pond” on 1.75 MHz from his site in Newport, Mon. (transmitter: a P650 valve in a self-excited oscillator with a 200v. DC mains supply; receiver: a one-valve detector with a one-valve audio amplifier; aerial was a ¼-wave long wire). Never will those who participated in those tests forget the bell-like note of W1DBM pinging weakly into and out of the 1932, a long and painstaking slog which had its reward when G6FO was “first across the Pond” on 1.75 MHz from his site in Newport, Mon. (transmitter: a P650 valve in a self-excited oscillator with a 200v. DC mains supply; receiver: a one-valve detector with a one-valve audio amplifier; aerial was a ¼-wave long wire). Never will those who participated in those tests forget the bell-like note of W1DBM pinging weakly into and out of the band during the 1934-35 period; with one of the first (if not the first) crystal controlled transmitters and an O-V-1 receiver he maintained regular contacts from Newport with G5JU in Bristol and G5BY in Croydon.

To his great disappointment Austin was forced to give up his mining career in 1936 owing to a lung condition (G6FO had for the last 30 years a superb cough which he always said was because his lungs were half-full of South Wales coal dust!). He moved to Appledore, North Devon, and became South Western area representative for National Benzole.

From here in North Devon the superiority of West County over-the-sea sites for trans-Atlantic working again became evident, demonstrated both by G6FO and by G6GM, the late Harold Merriman, not far away in Holsworthy, with a high-up site looking straight out over the Atlantic. Any spare moments not connected with amateur radio were occupied in his capacity as the Secretary of the Appledore Lifeboat Association (Austin had a lifelong love of ships and the sea and for him the idea of a holiday was to sail to France and back over the course of a weekend on a friend’s yacht!). It was during this period 1937-38 that Austin first conceived the idea of starting a magazine to cater specifically for the needs and interests of the radio amateur; he found that he possessed a considerable ability for writing and in fact several articles he had written had already been published in electronic journals of the day. Now a certain “Short Wave Magazine” had been started in 1937 by others with the same aims, but by early 1938 the Magazine was in a distinctly weak and fragile condition; the first Editor, G5GQ, resigned and Austin who felt sure he could make a success of the Magazine, took the plunge and produced his first Editorial in the March 1938 issue. That he did make a success of it is now a matter of amateur-radio history.

Another important pioneering activity for which Austin was responsible was, in 1938, to write a series of articles for the RSGB called “The Helping Hand”; this later came out in leaflet form and did an immense amount of good in influencing people favourably towards amateur radio, not only in the technical aspect but also by encouraging common-sense in operating. Also in 1938 he assisted Scott-Farnie in the formation of the Civilian Wireless Reserve.

However, his first period as Editor of “Short Wave Magazine” was short lived for in 1939 came the Second World War. Austin (who had already been granted a Commission as a Pilot Officer in the Royal Air Force Volunteer Reserve in March 1939) felt that he could contribute something to the war effort on the signals side, put the Magazine in “mothballs” and joined-up full time in the Administration and General Duties Branch in September 1939 with immediate promotion to Flying Officer. In April 1940 he transferred to the Technical Branch (Signals) and with his move began his highly significant and effective war-time career, his knowledge and abilities being stretched to the full. His chief concerns were radio- and radar-countermeasures and he made numerous operational sorties as the “boffin with his head in the office” checking and calibrating the various devices (in several cases his own ideas) designed to try and keep one jump ahead of the enemy in this intensely competitive field. But perhaps his major contribution was as one of the team working on the...
design, development and deployment of “window”—strips of aluminium foil which were dropped literally by the million to jam the enemy’s radar. G6FO, who had reached the rank of Wing Commander by April 1943, served at Hq. Bomber Command from October 1941 to January 1946 and was twice Mentioned in Despatches. (As a contribution to his own effort he had married one Elizabeth Coates, a WAAF Code & Cypher Officer, in 1940).

At the end of the war, in spite of having been offered the security of a Permanent Commission, he opted to return to Civilian life and take up the reins of “Short Wave Magazine” once again. For his services during the war he was awarded the O.B.E.

From that time until the moment of his death he worked continuously and tirelessly for the furtherance of amateur radio in all its forms and for the success of the Magazine, always maintaining a firm and independent view. He gradually replaced his home-built gear with Commercial equipment—always British! Eddystone, K.W. and Raymart (although it must be admitted that he did have a Heathkit oscilloscope and a standby Hammarlund transmitter!) A particularly interesting Magazine landmark came in 1957 when, in association with J. M. Osborne, G3HMO, he produced a solar powered transistor transmitter and an actual contact was witnessed by a member of the National Physical Laboratory and the Daily Telegraph.

On the other side, perhaps his biggest personal loss during this long post-war period came a few years later with the very sudden death of his great friend and Magazine colleague Howard (“Tommy”) Thomas, G6QB.

Austin was always most helpful to aspiring amateurs and was even willing to lend his own equipment in order to get them started. A man of strong-minded and determined character, G6FO was never afraid at any time or place to make his views on amateur radio matters perfectly clear, and vigorously promoted and defended the pursuit against all-comers. As a first-class operator himself, the maintenance of good operating standards was something on which G6FO was very sensitive; in fact he was one of those telegraphists who enjoyed the gift of talking through the finger-tips, something that comes more easily perhaps to those who are naturally articulate—as G6FO certainly was—and his writings demonstrate.

He was also a man of astonishing physical as well as mental fortitude; it is not generally known that ten years ago he suffered a severe lung haemorrhage and was given only a faint chance of surviving. Austin, however, had other ideas: deadlines for the next issue were approaching and so he called for the essential paperwork and typewriter to be brought from his office to the hospital side-ward—the issue appeared right on schedule and Austin made a full recovery.

This, then, is something of the man behind “Short Wave Magazine” for so many years—a truly dedicated man. Undoubtedly, within the amateur radio context, G6FO was one of the very few “right men at the right time” and as an epitaph there can be only one—For The Radio Amateur and Amateur Radio.

Austin Forsyth leaves his wife, son and daughter.

We are grateful to G2JL, G2CAV, G3HMO, G3IYX, G3VA, G5BG and G5UM for providing details of G6FO’s life.

G6FO — Tributes

So world-wide has been the response to the announcement of G6FO’s death—from Readers, the Trade, old friends and colleagues—that it would be absolutely impossible to reply to every letter individually as each one of them deserves. May we take this opportunity, then, to thank in print all these kind people who have written so appreciatively of his efforts for Amateur Radio over so many years, and to tell them that his family have derived enormous comfort from their words; further, as for Short Wave Magazine itself, if any encouragement were necessary to carry on then it has been received in full measure.

As ‘6FO always did himself, we must now of course turn our attention to the future (this issue marks the start of Volume 35), but there will be many issues of Short Wave Magazine before the influence of Austin Forsyth G6FO is finally lost.
COMMUNICATION and DX NEWS

Top Band

This is one area where things have shown up, various countries not normally to be heard appearing: YU, I, F, and a Russian. However the Russian is disowned by the UA's, although UF6CX did tell G2HKU that the Russian amateurs are pressing their authorities for Top Band privileges; and although several G's have worked I stations, and received their QSL's, other reports.

For the Spring Equinox W/VK-ZL Tests, both sides will be on the 1800-1808 kHz; W’s first 2_1/2 minutes of the five-minute period for calling, VK/ZL’s the last 2_1/2 minutes for calling, except when in QSO—this one should be of interest to us Europeans if only as listeners! On a different tack, as some sort of indicator of possibilities on this band, W1BB and others near the top of the tables seem to average about sixty countries each season. Lots more of interest in Stew’s bulletin will have to wait until next time—we already, at this early stage in putting the material together, have perhaps the biggest bundle of mail since first we began this task a decade ago!

A new reporter on Top Band is G3JFF (Clanfield) who has made a considerable improvement radio-wise by moving from Horndean; he tangled with 9H1CG, EA8CR, OH2KA, OH2BEJ, F3AT, F8EX, F8DB, DL’s, OK/OL’s, YU3EY, GU4EON, OE5KE, EI9J, EI4BK, and all the U.K. call areas—the Gotaway list is quite impressive too, with 9D5A, VE1CD, and K1PBW.

G2NJ (Peterborough) was one of many who commented sadly on the passing of G6FO. Nick worked F3AT, who is located at Auxerre, and of course had lots chasing him; G2NJ reckoned this was the first F station to be on Top Band since pre-War. An interesting QRP signal was the one from G3URU, about 1-3 watts input to an invisible aerial made of 30 gauge enamelled wire, at a height of around twenty feet and with a couple of bends to obtain the desired half wave.

A new reporter on Top Band—or anywhere else for that matter—is G4EOK, the call of the club station of RNARS aboard HMS Belfast in the Pool of London, where the rig is the Bridge Wireless Office, where they have a FT-101, plus a KW Viceroy/Racal RA17 combination to play with, the aerials being a trap dipole, and 215 feet of end-fed aerial strung between the masts. The main operator has been G3HDL, but G3KP, G3LIK, G3DRE, G3PED, G3PZP, G3ZQS, G4BZW, G4CJY, G4CPY, G6BJ have also had a significant hand in the game. Since November the score has been: ZC4IO, IK4AMO, ELON/MM off Miami, K4V4FZ, YU1PCF, YU1BCD, YU1NPZ, YV1OB, YU3EY, YU3TFB, F3AT, F8DB, F8EX, 4X4NJ, 9D5A, 9H1CG, all W call areas with the exception of the Elusive Sevens, VE1-3, VE7, VO1, with Gotaways in the form of ST2AY, VS6DO, PJ2VD, and VP9. This mark you, on Top Band!

Nice to hear from G2BY (Wroxall, Lo.W.) again, Bert having given all the bands a bit of a tweak. By and large, the bands were pretty indifferent at Wroxall, with the Top Band activity being the odd contact with mainland G’s, and one turn- out at 0300 which yielded—nothing!

Back to G2NJ for a later letter in which Nick pokes gentle fun at the character calling 4UI1TU on the evening of February 4, by, apparently, sending 4UI1TX! That’s one advantage of an iambic-mode keyer, it either sends perfect characters or complete gibberish, while the old pump-handle can send everything from Morse as Morse meant it, right through mildly individual and slightly wacky through to the purebred Martian Morse; and yet we are still optimistically trying to copy it, while the guy on the receiving end of the el- bug knows instantly when Master loses the initiative to the machine!

Interjection

Which is to say how nice it is to see another copy of Geoff Watts’ DX News Sheet. Geoff is going to stick to his intention to only handle copies for the G’s; but if any of his fans from overseas—and there were so many of these before that they well out numbered the G’s—can come to an arrangement whereby a G station receives an extra copy and forwards one on to the DX station, (which in effect removes from Geoff the hours of toil which caused his breakdown in health), then Geoff will be only too pleased. And, of
course, there is the Prefix List which he does for 35p to the U.K. of five IRC's for overseas airmail; this latter is very useful indeed. Nice to have you back aboard, Geoff.

Eighty

This old greyboard must admit that although he has SSB on the band, it is somewhat of a penance if anything in the DX line is to be sought. Like the Irishman's name for King Kong—Begorrah. On the other hand the CW portion is often quite pleasant, the more so during the daylight hours, and when working the QRP lads who have, of necessity to be better operators than average. Let us look, for instance, at F9UO, who is in a high-rise block some 20 KM south of Paris, and never ceases to amaze everyone with his QRP and Joystick. Rene has a rather neat idea with his log-keeping; he uses a black pen for Eighty, blue one for Forty, and a red one, for Twenty, of which more anon. Looking at the story on Eighty, we see F9UO not only working the usual ones, but also getting over to VE3ATF, and hooking GJ2LU; but it must be said that quite clearly the F9UO heart is on 14 MHz.

This seems as good a time to mention the White Rose Award as any; stations in Europe need fifty points, DX thirty points, obtained by way of ten points for the club calls G3XEP and G8LVQ (either/or), five points for working any member of the White Rose Radio Society, or three points for working a station in Yorkshire. It is understood that in order to cope with the expected trade, the members will be on about 3710 kHz depending on the QRM, from 1700z for around 2 hours; later they hope to set up shop on Twenty in a similar fashion. The Award Manager is Diana Hughes, G4EZI—QTHR.

Returning to our main theme, we have another letter from Leeds, this one from G3DNF. Gordon had a very good run in the Winter DL/AGCW contest, but says he understands that GB4UE at least was ahead of him, despite the G3DNF effort being the best ever. That's life, but frustrating!

Next comes G3RJV (Calverton), who remarks that he worked ZL4HX with QRP at both ends, with the ZL reporting 59 on SSB; of course, there has to have been a snag, and it was that ZL4HX was on leave from his religious activities and at the time of the QSO was in the very next village, of Woodborough! It seems that ZL4HX is a keen QRP buff with a hand-held rig at one watt of SSB, and the Plessey SL-series of IC's, used to a throw-out dipole about twelve feet high which netted good SSB reports all over England and to GD.

Our next reporter is himself rare DX. A4XGZ (Salalah) has WB4NND as his QSL Manager, who is OK in the current call book. Tony will be at his present spot for the next two years, and will give all bands from Eighty right through to Ten a whirl as the conditions prompt. His speciality, at the moment at least, is to be on from 2200z right through to 0400z on Eighty, Thursday and Friday evenings. Looking at the logs, Tony seems to have given all the European countries a fair crack at the whip, albeit one does notice the odd diversion, such as the snapping-up of AP2KS, W's on occasion, EA8CR, and such-like, when they appear on the scene. It seems from Tony's latest letter that the next step in the game is to acquire a Linear—which should help to persuade Tony's own DX to bend an ear in his direction as well as making life a bit simpler for we Europeans trying to work him.

G2BY worked a few G's, and also got up and tried in the wee sma' hours, but to no avail—on the night he turned out, even 20 dB of attenuation in the front end could only yield a nice loud sharsh!

G4EDG (Newton Abbot) is nothing if not an optimist; on the other hand, Steve mentioned the pessimist Stateside who claims he has a "diode antenna"—signals can get in to the receiver, but no RF will go out to the desired spots! G4EDG comments on how much better the receiver is when an attenuator is used up front instead of just turning down the RF gain—between the receiver feed he has 470 ohms in series with the inner of the coaxial feeder into the receiver and 56 ohms right across the coaxial pins of the receiver as his simplest possible attenuator. CW gave him C3IFR, HC2SL, JA6LZG, KV4CT, N6DX (California), N8AA (Ohio), VE7AON, VK3MR, W6PVB, W6PM, and SSB countered with PY3APH, VP2DAD, and XE1KB.

Eighty aboard H.M.S. Belfast has been a matter of sixty-one countries hooked since November 1, among them ZC4IO, W, VE, UA9, UL4, KP4, HK, 9Y4, OK, UF6, YV, 7X4AM, VK3MR and VK3XB.

Forty

G3PKS (Wells) notes that plenty of DX has been heard around the "peak" times of sunset and sunrise, while W1ZW added a boost to morale at about 2000z one evening. The Aerial, G3PKS explains, is a Peculiar Pyramid—it comprises an Eighty-metre Windom and a Forty-metre Windom, back-to-back in the shape of a pyramid, the centre pole being at 33 feet, and right beside the shack which was deliberately located at the best place with reference to the available airspace. The single wire feeders of each Windom are led down together in the form of a three-inch spaced open-wire line to the shack where a Z-match tunes 3.5 to 28 MHz very nicely, the feeders being strapped for Top Band operation.

G5FF is at the moment using the call F0AYC, with QRP to an HW7 unmodified; aerials include, for 7 MHz an ungrounded quarter-wave fifteen feed in the air; he is right under Mt. Agel, atop which hill are the aerials of Radio Monte Carlo—this can by the sound of things be a bit of a nuisance. However, Arthur is of the opinion that the band is just as good as ever it was, saving for the QRO and QRM. If you would like a contact, FOAYC is to be found from 0900 to 1000z on either 7020 or 14070, looking for the QRP chaps.

Forty for G3DNF seems to have been very largely a matter of Europeans, mainly worked over the contest weekend January 15/16. The log shows Gordon making QSO's from 160 through to 15 metres for a claimed score of 3758.

F9UO largely treated Forty as a place for local working; one must admit to a feeling that Forty is not really a good place for QRP working, if only because of the QRO BC stations all around the band who mean the high noise level has to be combated by the use of attenuation.
of sufficient degree to wipe out all but the "big" signals; which means that the time to work DX on Forty with QRP is the peak time, at sunset or sunrise—and this is easier said than done!

Forty is the usual stamping-ground of G2BY but he found it a bit of a task to get out early enough for the good stuff; 0830z was managed, and this was good enough to make the grade to ZL, HI, W and JA on CW.

G4EDG's CW activities on Forty seem to have been lucrative in DX terms, with EA8LK, HK8MOG, JA's, KV4CI, PJ8KG, PT7AC, UI8ADF, UM8MBQ, UJ8JCL, UA0BBN, VK3MR, VPIKS, VP5CI, VU2GW, 3V8BF, and 6W8EX.

G4EOK, at H.M.S. Belfast didn't seem enormously keen on 7 MHz; they only note ZC4IO and a CX as being worthy of note since November 1 last year.

G3JFF (Clanfield, Hants.) is now setting up shop at the new place which is about five miles away from his earlier home at Horndean. Forty metres was rather bedevilled by the Pestilence thing from Russia (of which more anon), to mention the broadcasters in "exclusive amateur" territory—are they, we wonder, amateur broadcasters? We wonder, because their efforts are often so amateurish! Nevertheless Mike stuck to his guns, and patience was rewarded PY0ZAE on Trindade Is. for a new country, PY0FOC, PY0RO both on Fernandode Noronha, 7X4AN, YV4BBT, LU6ABX, PJ2VD, H8MOG, PY7PO, for as nice a collection as could be desired.

**Now Twenty**

Where all the action tends to be, regrettably when one thinks of the number of kHz not being used below 30 MHz although allocated to us. Still, at least we haven't any repeaters on the band! And, it is interesting to notice, more 14 MHz reporters than for a long time.

G3RCA (Wigan) has noted the "close for a bit then re-open" effect on Twenty, pretty obviously, as his QSO's are nearly all in the daytime—morning, lunchtime, teatime—save for the odd late one. Looking at the early-morning ones, we see SSB with 5T5KJ, OE8PRK/YK, EP2NC, FK0TX, AP5HQ, 7X5AS, YJ8RD, KX6BS, JY6ZZ, KG6RI, HL9TS, 9K2EH, TU2FL/M, 7X0BI, KG6JA, KG6JIG, and CX2DH. Lunch-hour activity knocked off A9XBE, while the afternoon came up with FR7BE, FR7AE, 3R8CN, F08DO, TR8BA, 7X2ARA, F08EI, FR7BL, FR7AW, 5T5JD, TR8MM, 7S9DF, ZS3KC, A2CBN, FR7AD, FR7WV, FR0CZY, HR3JJR, YB0ACB, UV7ANI, OX3KS, VP2DQ, VP2DAC, XE1SAN, VP5DLH, HK0LE, ZS3LK, VU2UK, OX3GW, FM8COO, 3B8CS; and the evening times did the trick to H18XPD0Z3/5T5, leaving the rest to be filled up by VK6, VK7, JA's, UAO, FL, and the regular sked with 5N2ESH.

Our next reporter is GI4DAV (Carrickfergus), who has a W3DZZ aerial at twenty-five feet, fed with 180 watts; David assures us that the absence of reports from GI for a long time does not mean there is no activity; in his own case, Twenty was the one that came across with CW contacts to W4M4QO, G3TZL/MM in the Med., W7ULC (Oregon), 3Y3CC, WB5DJQ, KP4DOP, W1, W2, W3 and WBOMLU (N. Dakota) —this last at 2030z!

Next G2HKU; Ted had his usual sked with ZL1WN, ZL3SE, ZL1AFF, ZL1BOJ, and UF6GCX, all SSB, plus CW contacts with PY7CPB, and PY7PO.

G5ACW (Hillindon) found precisely the opposite of the usual "dead band if you have a visitor" situation; he and his twin junior ops are all licensed, and while son Roland was telling the YL reporter from the local paper what it was all about, Jim was idly tuning round for something interesting and tripped over VK0TB just signing with an F6. A quick call, and back the VK came. The YL reporter was quite shaken, and certainly the result was a very good write-up in the local paper, complete with a picture covering most of the top of a page, from which we gather that the rig is a mix of commercial, modified stuff, and home-brew. Seems VK0TB runs full power to a two-element beam, and as a result of this interesting contact—rare DX in any man's language—a regular sked is being run—14250 or 14330 kHz around 1600z on Saturdays and Sundays, until the ship comes to pick up the whole expedition from Casey Base around March 7. Incidentally, VK0TB has VK3ADD as QSL Manager, David Brain, 40 Ann Street, Dandenong, Victoria, Australia.

A4XGZ next. Tony's first log, covering the early part of January, did not copy all that well, but looking through it we glean that on Twenty as on Eighty, G's were snapped up whenever they were to be had on SSB, perhaps the prize catch being S8AAA—although there are rumbles that this one was possibly a Phoney. Tony will no doubt be pleased to receive a QSL for that one, or to work the S8AA which is understood to be coming on the band ere long. From a place like that, given time and inclination to operate, it would probably be difficult not to work DX—but the pile-ups must pall after a while.

G3PKS was a little taken back when he worked PY1RO/O, who then proceeded on his merry way without announcing his whereabouts—Rolf was in Fernando de Noronha at the crucial time, and for the record, while PY1RO has been out of his usual Top Band environment of late, he still tries the band when he can, producing a trickle of Top Band ones on Fernando de Noronha, and, of course a very flood of contacts on higher bands.

We have already mentioned that F9UO and his Joystick plus QRP managed to get over the Pond on Eighty; thus it will come as no surprise to see the very first contact on the very first page is a W on Twenty! There are several pages of log copies, and we see that F9UO made WAC—indeed it would have been unempteen WAC's but for a slight dearth of African contacts, although the ones in the log showed good signal reports in both directions.

Like the curate's egg, Twenty has been good—in parts. This is the considered opinion of G2BY, who found the mornings good to JA and ZL and the late afternoons good to W6, W7 and ZS in the late afternoons plus VR3AH (Christmas Is.), W7NW, XE10E, VE7DDH, FM0COO, HL9VA, FY7YE, VP9HT, CO2BB, and the usual East Coast W's and JA's.

The G4EOK gang at H.M.S.
Belfast note they have worked 9Y4, KP4, PY, 4X4, UL7, VK, PY1RO/O, ZS, 9L1CD, and ZD8RR during their evening sessions in the Bridge Wireless Office.

This is the band for DX avers G3JFF, provided you have a knife to carve your way through the European QRM; Mike did so quite successfully to EP2VW, PY1RO/O, YB0ACT, W6, W7, UA0, FY7YE, ZS6OS, D2AAI, KL7MF, 5Z4IN and VK, ZL, JA.

Fifteen

Served it’s notice that it wanted a mention on your scribe by leading his old eye from one band-report to the next in G3JFF’s 14 MHz line! However, it is very much of a daytime band, and of late it has been up and down like the proverbial yo-yo. G4EAN (Nottingham) mentions a couple of W’s and a couple of UA’s, adding somewhat wistfully “I usually leave my operating to the weekend, and then something always crops up!”

G14DAV keyed on this band to find ZS50V, WB4QJZ, WA4SCL, 4Z4N UT, WA4VSB, find ZS50V, WB4QJZ, WA4SCL, which says he is the exotic, which is there in plenty, sports; so we look, not so much for the virtue of the DX’y call he himself scribe go green with envy, he of his old eye from one band-report to the next in G3JFF’s 14 MHz line! The farthest one being a signal which has opened to DX, and people have been there to take advantage of them. G2BY for example, notes a five-minute hearing of 3B8MS on the morning of January 22 at 1015z.

G2ADZ (Chessington) comes up with an all-tent metre report; he recalls being jimmy-in-the-middle when G6FO and G5BY were doing their five-metre thing, receiving on both five metres and later two metres with a straight receiver. Now he looks at Ten more than most, and his account of the period from November-end to date shows lots of openings to Europe, plus FG7XA, PY0ZAE, 9G1JN, 4X4FU, SV11W, ZC4IO, 4Z4LM all worked, plus hearings of EA7TL, EA8FF, 9H1CH, 4X4WB; and of course quite a lot of openings to Europe by VHF-type propagational modes.

G3PKS had a couple of ten-minute CQ calls on the band brought forth a UA4AE from Volvograd at 579 but before the QSO was ended the Russian signal had sunk without trace.

G3JFF found a few local G stations, and also the local club net trying out Ten in case their 21 MHz spot is swamped by DX in the summer!

Comments

CR61K, as he used to be, is now in Portugal again, and is a subscriber; he lost all his gear, left in the summer of 1976. And when the troubles were on, and is now studying-up on RTTY. Let’s hope Wil has better luck this time, and enjoys reading his Short Wave Magazine.

Somewhere, the letter from GM3RFR (Baltasound) managed to get itself under a paper-clip when it should have been being reported; so Sam gets a bit of room all to himself! GM3RFR is still pursuing his lonely road of DX-ing with five watts p.e.p. input, the score at the time of his letter being 38 countries worked.

Mike worked LU5EJO, PJ8KG, 9J2BO, ZS6OS, ZS6BNH, EP2GJ, and 6W8EX, plus the local club net on Sunday evenings.

Ten?

Not really very popular generally, most people tending to write it off completely—but even a fruitless CQ or two would serve to give an impression of activity to those who would swipe it from us! On the other hand, there have been odd moments when, for a few moments the band has opened to DX, and people have been there to take advantage of them. G2BY for example, notes a five-minute hearing of 3B8MS on the morning of January 22 at 1015z.

G2ADZ (Chessington) comes up with an all-tent metre report; he recalls being jimmy-in-the-middle when G6FO and G5BY were doing their five-metre thing, receiving on both five metres and later two metres with a straight receiver. Now he looks at Ten more than most, and his account of the period from November-end to date shows lots of openings to Europe, plus FG7XA, PY0ZAE, 9G1JN, 4X4FU, SV11W, ZC4IO, 4Z4LM all worked, plus hearings of EA7TL, EA8FF, 9H1CH, 4X4WB; and of course quite a lot of openings to Europe by VHF-type propagational modes.

G3PKS had a couple of ten-minute CQ calls on the band brought forth a UA4AE from Volvograd at 579 but before the QSO was ended the Russian signal had sunk without trace.

G3JFF found a few local G stations, and also the local club net trying out Ten in case their 21 MHz spot is swamped by DX in the summer!

Comments

CR61K, as he used to be, is now in Portugal again, and is a subscriber; he lost all his gear, left in Angola when the troubles were on, and is now studying-up on RTTY. Let’s hope Wil has better luck this time, and enjoys reading his Short Wave Magazine.

Somewhere, the letter from GM3RFR (Baltasound) managed to get itself under a paper-clip when it should have been being reported; so Sam gets a bit of room all to himself! GM3RFR is still pursuing his lonely road of DX-ing with five watts p.e.p. input, the score at the time of his letter being 38 countries worked.

For the period in question Sam found DL, SM, PA0, OH and LA on 7 MHz, DL, I, UB5, UA2, ON, OH, 4J3, YU, VO, FP8, EA8, LA, GM and OE all on 14 MHz; and YU, I, LZ, F, G, 4Z4, and 7X2 on 21 MHz.

G3PKS is very much of a home-brew merchant; and he has a recommendation that a couple of nail files make a great improvement on the traditional bits of hacksaw-blade for a keyer paddle; which sounds to this writer to be a very definite bright idea, to be adopted on his own keyer in the near future.

G2BY mentions working G6ZY/CN/M a couple of times; G6ZY must be all but part of the furniture there now in CN-land with his /M gear working the DX—which prompts your scribe to think it is about time he moved all his gear into the car for a quick look at the bands on the way to and from the salt-mine.

Back to the W1BB Bulletin, and Stew says this will be remembered on Top Band as the “Year of the Super- Stations.” K1PBW and K6SE lead the way, each with phased verticals for the transmitter, and Beversages for the receiver; KV4FZ is almost in the middle of the sea, and has a 350-foot tower at command, plus many kinds of receiving aerials, including underwater ones, not to mention the quiet location which is the greatest boon a Top Band operator can hope for.

Let’s now turn to the West Coast DX Bulletin, that regular indicator of what’s afoot in the world of the Californian Kilowatts. The question of the status of Southern Sudan is still taxing the minds of those who rule on what is and what is not taxable the minds of those who rule on what is and what is not. Perhaps the best way is to tax them; they still have not ruled on this one since Bill Rindone was there back in the summer of 1976. And when this is perhaps the hottest news around at the moment, you realise how many people are holding fire on their DX-pedition thoughts until the sunspot cycle lifts band conditions at least a little.

Finale

That’s it for this time. Deadline for next time is March 8. That is, to arrive, first post, at Short Wave Magazine, 34 High Street, Welwyn, Herts., AL6 9EQ (and of course be marked CDXN).
DESIGN FOR A TELESCOPIC TILT-OVER MAST

L. METCALFE, G3TPA

AFTER operating on two metres exclusively for some time, an SSB rig for the HF bands was obtained, and not unnaturally my thoughts turned to the need for a suitable antenna for Twenty and Fifteen metres, plus a suitable mast or tower for support. A glance through the advertising pages of SHORT WAVE MAGAZINE soon made me realise that a commercial tower was too costly an item, and since the light alloy mast which had supported my 4-4 Two-metre beam was too flimsy for an HF band antenna, I decided to try the DIY approach.

The requirements were:

(a) A height of 35-40 feet.
(b) Strong enough to support the antenna.
(c) Able to telescope and tilt over, in order to facilitate maintenance, but particularly to get it down quickly because of the not infrequent gales which are a feature of the Pennine area.
(d) Not needing more than two persons to erect or lower.

Having used a wooden tripod for my cameras for some years, I decided to base the design of the mast on the extending leg action of the tripod.

Three sections of 2½in. square timber were bought from the local timber yard, two of 20 feet length and one of 21 feet long. The two shorter ones form the lower half of the mast, and are fixed, while the longer section slides between them, and is raised and lowered U-boat periscope fashion, by a winch, to the required height. The outer sections are spaced by 2½-inch strips of metal §in. thick, drilled with §in. holes at each end and spaced to allow §in. or §in. space between the centre section and the outer ones to allow free movement. (See Figs. 1 and 2).

Pulley blocks are attached at the top of the fixed section and bottom of the extending section, and used in conjunction with a winch and the use of poly-propylene rope, the whole is used to raise and lower the extension. The brackets for this winch are bolted to the outer sides of the fixed section and also incorporate the pivot point to enable the whole mast to be tilted over to the horizontal position. (See Figs. 3 and 4.)
A Tabernacle of 6in. x 3in. timber of suitable length, and spaced by more strips of 2in. x 4in. metal is sunk into the ground and firmly fixed into a bed of cement or concrete. The whole mast is mounted in the tabernacle at the pivot point, and a second winch bolted to the tabernacle is used to raise and lower the mast between the horizontal and vertical positions. A suitable stop pin ½in. dia. prevents the mast going beyond the vertical position, and a hinged bar drops into position behind the mast to prevent it falling when the tension on the winch is released. (See Fig. 6.)

Guy-wires may be used if required, either at position “B” in Fig. 1, which would probably be best if a quad antenna was used, whereas position “A” would be all right for a Yagi.

During construction care should be taken to ensure holes drilled in the wood are accurate and run at right angles through the work. The timber should be “TANALIZED,” a process of wood preserving, which will be carried out by the timber merchant if required at slight extra cost, before delivery.

You should also ensure that the mast sections are as straight as possible, selecting them yourself if the merchant will allow.

All metal work should be painted with a good outdoor paint and varnished, and should be examined periodically for rust or corrosion.

The dimensions in this design may be modified to one’s own requirements, as may the design itself. I submit it only as a practical design which I have found suitable to my requirements in particular, and which other readers may find of interest. One item which I did not mention is a method of locking the centre mast section in position when it is raised. Perhaps some reader might incorporate it in his own version of this mast.

I usually wind the mast up to operate on the air, and wind it down again when the station is closed down. This ensures the mast is not exposed to the winds longer than necessary, and does not become something of a “permanent landmark,” which could with the passing of time, be viewed with a jaundiced eye by officialdom and unsympathetic neighbours.
There it is then. If you can afford a Strumec 60- footer and super-beam—O.K. If you can't, but want a mast for under £30, you might give this effort of mine a try.

Stolen

David Andrews G4CWB, reports to us the theft from his car in Reading of a Trio TR-2200G (s/n 230247) and a VB-2200 (s/n 060961); would anyone coming across this equipment please contact their local Police.

RADIO AMATEUR LICENCES

From January 1, 1977, the Home Office will be issuing four new types of radio amateur licence which will replace all existing amateur licences when they become due for renewal.

The new Amateur Licence A (full facilities) and B (having certain limitations) will include all those facilities available to holders of the existing Amateur (Sound) Licences A or B, and will also include operation from a vehicle, or vessel other than at sea, or as a pedestrian; facsimile, amateur television, slow scan television, data on amateur bands 144-146 MHz and above, as well as double sideband suppressed carrier operation will also be included; and Emergency County Planning Officers will be added to the categories able to call upon Raynet (emergency communications).

The purposes of the new-style licences are:

1) to give more flexibility to British radio amateurs, so that they may pursue their hobby without having to make special application for several of the above facilities at present needing separate licences or authorities;

2) to enable the Home Office to deal with the increase in applications for amateur licences and regulatory work over the next few years with the minimum of delay.

Existing facilities authorised by a total of 20 licences and special authorities will thus be contained (with a few exceptions) in the new Amateur Licence A or B; and for Aliens combined fixed and mobile facilities in the Amateur Licence C or D. The new fee for all UK amateur licences will be £5.50.

MOBILE RALLY SEASON—1977

The following lists details of events received so far. April 3, White Rose Rally, Lawnswood School, Leeds, junction A660/A6110, opening noon, with talk-ins on two-metres FM by G8LVQ on S22, and on eighty-metres SSB by G3XEP on 3.7 MHz, free parking, Trade stands etc. April 17, North Midlands Mobile Radio Rally, Drayton Manor Park, nr. Tamworth, Staffs., talk-ins on two-metres, seventy-centimetres and 160-metres, all usual events. May 1, Spalding Tulip-Time Rally, Gleed Boys School, Halmer Gardens, Spalding. May 22, Barry College of Further Education Radio Society, Barry Rugby Football Ground, Merthyr Dyfan Road, Barry, talk-in on two-metres by GW3VKL on S20 and via GB3BC on R6, Trade stands, bar, etc. July 10, Upton Radio Rally, Hill High School, Upton-on-Severn. July 24, Anglian Mobile Rally, Stanway School, Colchester.

We would be glad to have reports and pictures covering these events—address to Editor, "Mobile Scene" Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ—also details of other Rally events.

April issue will appear on Friday, March 25th.
NOTES ON POWER SUPPLY DESIGN USING THREE TERMINAL REGULATORS

P. BURNETT (G4BLL)

Most readers will, by now, have noticed the Three Terminal Integrated Circuit Voltage Regulators making their appearance in low voltage (0-24v. positive and negative) power supplies. They simplify considerably the task of obtaining a well regulated output voltage (or current) and replace the many discrete components which would otherwise be required.

The range of regulators to be discussed will give maximum output currents (Io) of 100mA to 3 amps at the specified output voltage (Vo) and are available in a variety of packages from small signal transistor TO39 or TO92, 14-pin DIP, TO220 (flat plastic), to the familiar TO3 power transistor package.

The future trend in voltage regulation is towards the use of several of these low current fixed voltage devices placed strategically throughout the circuit eg. one device per card (p.c. board). This method exhibits the following advantages:

1. Smaller packages possible.
2. Little or no heat sinking required.
3. Elimination of bulky high power regulators or the equivalent circuit using discrete components.
4. Elimination of common impedance paths and associated by passing or decoupling capacitors.
5. Elimination of voltage drops due to connectors and long interconnecting leads.

The basic three terminal regulator circuit is shown in fig. 1, the stabilising capacitor C2 is only required if the regulator is located more than two inches from the filter capacitor C1. C2 may be a 0.22 µF disc ceramic (not easy to obtain) or 2-2 µF (or larger) solid tantalum or 22 µF (or larger) aluminium electrolytic. The difference in values necessary is due to the higher effective series resistance exhibited by each type of capacitor. C3 is added to give improved transient response and ripple rejection but is mandatory in certain cases to ensure stable operation.

The design of a supply giving the following outputs will be discussed:

\[\pm\ 12\ \text{volts at 600mA. (Up to a max. 1 amp.)}\]
\[\pm\ 5\ \text{volts at 2A amps. (Up to a max. 3 amps.)}\]

as these are the voltages commonly required for analogue and digital IC devices, but the same design criteria can be adapted for any other voltage required; eg. the writer also required an output of \(-8\ \text{volts at 500mA}\) to feed the input line buffers (AM2521) of a slow to fast scan converter.

The initial step is to determine the type of regulator and package to use. In the case of the \(\pm\ 5\) volt supply the choice was simple as there is (at the time of writing) only one range generally available which will give these voltages at the required current and they are the LM323 3 amp 5 volt positive and LM345 3 amp 5 volt negative regulators in the TO3 package. For the sake of uniformity the TO3 package was also chosen for the \(\pm\ 12\) volt supplies (LM340K 1 amp 12 volt positive and LM320K 1 amp 12 volt negative) and the \(-8\ \text{volt supply (LM320-8 1 amp 8 volt negative)}\) although the TO220 flat plastic package also giving one amp output could have been used. The TO3 positive regulators may be bolted direct to the heat sink as the case is grounded. The negative regulators require to be insulated as the case now forms the input terminal. To ensure maximum heat dissipation use silicon grease between the making surfaces of the regulator, mica washer and heat sink. It was also found that the negative regulators required a 4.7 µF solid tantalum capacitor across the output to ensure stable operation.

The next step is to determine the type and size of heat sink to employ to maintain the junction temperature (Tj) of the device below the specified maximum. Under short circuit conditions the internal thermal protection circuits will limit the junction temperature but extended operation under these conditions could adversely affect the reliability of operation. In general, use a heat sink with a thermal resistance of at least 4-7°C/watt unless the regulator is being run well within its capabilities when a large heat sink will not be required.

We can now determine the input voltage (Vin) requirements and whether half wave, full wave or bridge rectification is to be employed. Normally the nominal input voltage to the regulator is between two and fifteen volts higher than Vo. However, these devices should not be operated close to the “dropout voltage” (the difference between the input and output voltages at which regulation will not be maintained for any further reduction in input voltage) as the ripple on the filter output may cause the regulator input voltage to drop below the threshold value. Neither should an input voltage close to maximum be used as the maximum available output current will not be realised. As a practical guide Table 1 gives the “preferred” transformer output voltages. They are readily available from standard transformers.

It is not proposed to consider the use of half wave rectification as this gives poor transformer utilisation,
high ripple and a high value filter capacitor requirement (approximately four times higher than the value required for full wave circuits). Also integrally packaged bridge rectifiers are available in a wide range of voltages (piV) and currents and at quite modest prices.

Neither is it necessary to use a choke input filter circuit as the family of regulators under discussion will cope adequately with the ripple output from a capacitor filter circuit. To keep ripple to an absolute minimum use a high value electrolytic 5000 µF to 15,000 µF allowing for a commercial tolerance of -50%. Also note that the case may not be isolated from the negative terminal and in negative supplies the capacitor will need to be insulated from the chassis mounting. (The final circuit is shown in Fig. 2.)

It is sincerely hoped that readers will have found this short discussion of interest, the use of formula has been “deliberately avoided” but those who wish to probe deeper into the subject and to prove the values given or determine the parameters for themselves are referred to a booklet entitled “Voltage Regulator Handbook” published by National Semiconductors.

PHOTOGRAPHS ALWAYS WANTED

Readers are reminded that we are always glad to have good photographs of Amateur Radio interest for general illustration in SHORT WAVE MAGAZINE. Though colour prints can sometimes be satisfactorily reproduced black-and-white, we much prefer the latter in the original. Except that we cannot conveniently make use of photographs that are either very small or very large, size is not of great importance as this is in any case determined to our requirements in the block-making process. What is important is that the picture should be clear and sharp with fully descriptive notes—and this description should not be written on the back of the print itself, but on a separate piece of paper lightly attached to the photograph. Payment is made for all pictures used, immediately on publication.

Send to: Editorial Dept., SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ
BEGINNER'S GUIDE TO OSCAR

N. A. S. FITCH (G3FPK)

ATTITUDES to the amateur satellite programme vary from those of the devotees, who seldom use any other mode, to those of the fraternity who declare that any artificial aid to communication is cheating and is to be deplored. In between there are those, like the author, who enjoy the challenge of communicating through orbiting transponders from time to time, especially when UHF/VHF conditions are flat, and those who are keen to "have a go" but who do not know how to get started. This article is intended for this last group.

Brief History.

Oscar 1, the first Orbiting Satellite Carrying Amateur Radio, was launched on December 12, 1961 and lasted 20 days. Its 1000 milliwatt transmitter on 144-98 MHz ground out "Hi" in morse. Oscar 2 lasted 18 days after its launch on June 2, 1962 and consisted of another "Hi" beacon on 144-99 MHz. The first amateur communication satellite was Oscar 3 which was launched on March 9, 1965. It lasted 15 days, receiving signals on 144-1 MHz, relaying them on 145-9 MHz but was only partially successful. Oscar 4 was put into orbit on December 21, 1965 and lasted three months. It received signals on 144-1 MHz, relaying them on 431-938 MHz but was not very successful, either. The Australis Oscar 5 was launched on January 23, 1970 and was the first amateur satellite to be ground controlled. It lasted two months but only carried beacons on 144-05 and 29-45 MHz.

What is an Oscar?

Oscar 6 and Oscar 7 are the two active amateur satellites currently operational and they orbit the Earth near enough every 115 minutes at a height of approximately 1470 kms. They consist of small packages containing solar panels, batteries, receivers and transmitters with appropriate aerials. The batteries are charged via the solar cells each time the satellites come into sunlight. They receive signals in part of one amateur band and re-transmit them in part of another. Unlike single frequency, terrestrial repeaters, they will transpose linearly any type of narrow band signal, such as CW, SSB, RTTY, SS/TV, NBFM and AM, although the first four are recommended. Oscar 6 and 7 can be fully commanded from several ground stations.

Where to Listen

Both satellites can be heard in the 10 metre band, Oscar 6 between 29-45 and 29-55 MHz, Oscar 7 from 29-40 to 29-50 MHz. Oscar 7 can also be received in the 2 metre band between 145-925 and 145-975 MHz. The majority of signals heard will be CW and SSB but there is a little RTTY and SS/TV activity. Both satellites continuously transmit telemetry in the form of code groups on CW plus RTTY on Oscar 7. More of this later.

Orbit Information

The simplest way to understand Oscar orbits is to imagine you are out in space observing the Earth, rotating on its axis from west to east, with the north pole at the top as in Figure 1. If you could detect an object as small as a satellite, you would see it coming from behind the Earth, over the Antarctic region proceeding northwards, passing the equator then disappearing over the north polar region. This part of the orbit is known as the ascending node. The remaining half of the orbit, when the satellite travels from north to south, is called the descending node.

You would have noticed that the orbit is tilted anticlockwise or is retrograde in space parlance. The satellites never go right over the poles and the most northerly or southerly latitude Oscar 6 would reach is 78°-24'. For Oscar 7 it is 78°-18'. In round figures, an orbit of either satellite takes 115 minutes during which time the Earth will have rotated eastwards by 28½ degrees. (The Earth rotates one quarter of a degree per minute.)

An orbit commences when a satellite crosses the equator travelling north and all orbit predictions relate to this time in Universal Clock Time (UCT) and the degrees west of the Greenwich meridian where it occurs. This method of stating longitude often confuses the uninitiated more used to degrees east and west of Greenwich, but it is really quite simple. Up to 180°W there is no problem. After that, 230°W is equivalent to 130°E; 305°W to 55°E and so on.

Where to get Orbit Details

The orbits of Oscar 6 and 7 are highly stable so it is possible to issue accurate predictions of the times of equatorial crossings and corresponding longitudes of every orbit for a year ahead. Probably the best known of these predictions is the W6PAJ Calendar which is available through AMSAT-UK. (Ref. 1). Alternatively, predictions for the week ahead can be obtained from the Sunday news bulletins over GB2RS, from the 80 metre AMSAT net at 1015 local time on 3780 kHz or from the London area VHF net on 144-28 MHz at 1930 local time, both on Sundays.

The first orbit of the day is called the reference orbit and will obviously occur in the first 115 minutes of the day. These are always out of range of the U.K. The data given in Table 1 will enable future orbits to be calculated with great accuracy, given any reference orbit information. For daily use, it is quite accurate enough to add multiples of 115 minutes and 28½° to the reference orbit to derive data for each orbit subsequently within range.

How to Use the Predictions

Having looked up or calculated the basic data for an orbit, they have to be turned into beam headings, acquisition of signal (AOS) and loss of signal (LOS) times for your particular location. Numerous ingenious ways of deriving such information have been published. (Refs. 2 & 3).

The Receiving System

The reception of the 10 metre signals relayed by Oscar 6 and 7 differs from normal reception from distant ground stations in that it is basically line of sight. Furthermore, it is likely that only a few milliwatts is being radiated by the satellite per station. The performance of many amateur band LF/HF receivers and transceivers falls off in the 10 metre band, particularly at the high end. Consequently, a simple preamplifier to provide 10-20
**The Transmitting System**

Dealing first with *Oscar 6* and *Oscar 7*, mode “A,” the maximum e.r.p’s at 3200 kms. slant range are 80 and 100 watts respectively. This means that a 150 DC input CW transmitter or an SSB TX using a QCV06-40A PA stage at 200 watts p.e.p. input should be quite sufficient just feeding crossed dipole mounted above a ground plane give good results.

As most dual gate MOSFET devices tend to oscillate at UHF, the ferrite bead over Gate 2 lead should not be omitted.

A simple dipole or ground plane aerial will enable good signals to be heard from the nearer passes but for serious “DX” work at horizon distances, a low angle beam of some kind should be considered, mounted in the clear above the local noise blanket. Simple and compact beams with good gain for their size are the **HB9CV** and **ZL-Special** designs. A compressed version of the latter was described in Reference 4; it measured only 3.58 x 1.07 metres overall. To cope with the nearly overhead passes, a fixed dipole running east-west is sufficient since the satellites will be travelling north-south south-or north on such orbits.

Most VHF operators will have some kind of beam for the 2 metre band, consequently, reception of the downlink signals from *Oscar 7* on mode “B” should be quite good provided the beam is correctly aimed. Again, for high passes, a dipole or crossed dipoles mounted above a ground plane give good results.

---

**Table 1**

**SATellite PARAMETERS**

<table>
<thead>
<tr>
<th>Satellite</th>
<th>Oscar 6</th>
<th>Oscar 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period (mins.)</td>
<td>114-99441</td>
<td>114-94513</td>
</tr>
<tr>
<td>Longitude progression per orbit E</td>
<td>28-75015°W</td>
<td>28-73707°W</td>
</tr>
<tr>
<td>Retrograde inclination</td>
<td>101-6015°</td>
<td>101-7010°</td>
</tr>
</tbody>
</table>

---

**TABLE OF COIL DATA**

| L1 | = 22µH RF Choke. |
| L2 | = 22 turns 24g. enam on iron powder toroid T50-6. |
| L3 | = 19 turns 24g. enam on T50-6 core tapped 6 turns from “cold” end. |

Secondly, dealing with *Oscar 7*, mode “B,” a 70 cm. TX is required and the recommended maximum e.r.p. at 3200 kms. slant range is 100 watts. Here again though, experience has shown that the spacecraft’s receiver is sensitive enough to pick up and retransmit very low power signals, provided the QRO merchants keep off. Most amateurs who use mode “B” will have gear for 2 metres and 70 cms. already, including rotatable beams for both bands on one mast. Such a set up is ideal for satellite communication over the longer distances when the elevation is low, especially if crossed Yagis are used enabling different polarisations to be selected for best results. For reliable communication via the overhead passes, dipoles for transmission and reception are convenient.
Polarisation

The aerial polarisations for Oscar 7 are given in Table 2. Satisfactory results will be obtained with linear polarisation but fading will be more trouble-some at times.

**TABLE 2**

**AERIAL POLARISATIONS — OSCAR 7**

<table>
<thead>
<tr>
<th>System</th>
<th>Polarisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/10m. repeater uplink</td>
<td>Left hand circular</td>
</tr>
<tr>
<td>2/10m. repeater downlink</td>
<td>Linear</td>
</tr>
<tr>
<td>70cm./2m. repeater uplink</td>
<td>Right hand circular</td>
</tr>
<tr>
<td>70cm./2m. repeater downlink</td>
<td>Right hand circular</td>
</tr>
<tr>
<td>435.1 MHz beacon</td>
<td>Left hand circular</td>
</tr>
<tr>
<td>2304-1 MHz beacon</td>
<td>Right hand circular</td>
</tr>
</tbody>
</table>

N.B. These polarisations are for the northern hemisphere only.

Band Plans

As with other amateur allocations, there are band plans for the orderly use of the space sections of the 2 and 10 metre down link bands and these are shown in Table 3.

**TABLE 3**

**SATELLITE BAND PLANS**

<table>
<thead>
<tr>
<th>Satellite</th>
<th>Band (MHz)</th>
<th>Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oscar 6</td>
<td>29.450-29.510</td>
<td>SSB</td>
</tr>
<tr>
<td></td>
<td>29.490-29.550</td>
<td>CW</td>
</tr>
<tr>
<td>Oscar 7</td>
<td>29.400-29.445</td>
<td>SSB, RTTY, SS/TV</td>
</tr>
<tr>
<td>Mode &quot;A&quot;</td>
<td>29.445-29.455</td>
<td>All modes</td>
</tr>
<tr>
<td></td>
<td>29.455-29.495</td>
<td>CW only</td>
</tr>
<tr>
<td>Oscar 7</td>
<td>145.925-145.950</td>
<td>SSB</td>
</tr>
<tr>
<td>Mode &quot;B&quot;</td>
<td>145.945-145.955</td>
<td>All modes</td>
</tr>
<tr>
<td></td>
<td>145.955-145.975</td>
<td>CW</td>
</tr>
</tbody>
</table>

* The top 5 kHz should not be used but kept as a guard band for the beacon on 29.502 MHz.

Range of Communication

For a station at sea level in the British Isles, the horizon distance to the satellites is about 4550 kms. equivalent to a ground distance of 3950 kms. It follows that the maximum ground range is twice the latter, or 7900 kms. However, this range can be exceeded considerably when there is anomalous propagation on the 2 metre, 70 cm. and/or 10 metre bands. For example, a tropospheric duct will enable a VHF or UHF signal to be received by the satellites when they are below your horizon. For instance, G3IOR has worked W6CG over a ground distance of 9570 kms. The normal 7900 kms. distance brings within range of London such places as Salt Lake City and Seattle in the U.S.A. Lusaka in Africa, St. Helena in the South Atlantic and Goa and Lhasa in Asia.

Telemetry and Codestore

It is hoped that the foregoing will have enables a newcomer to amateur satellite communication to understand the subject sufficiently to at least calculate when and where to listen for Oscar 6 and 7. Short wave listeners will be able to hear many countries via satellite and it is interesting to copy down the telemetry or TLM sent down continuously on the beacon frequencies.

The CW TLM consists of 24 three-figure groups which, when decoded (Ref. 5) give details of such parameters as battery voltage, current and temperature, the power output of the transponders, etc. The TLM is an essential feature of the satellites as it enables the ground control stations to take appropriate action if excessive battery current is being drawn or the PA stage of the TX is getting overheated, for example.

On Oscar 6, the TLM is on 29.45 MHz the CW only code groups being transmitted at either 10 or 20 w.p.m. On Oscar 7 mode "A" the beacon is on 29.502 MHz and on mode "B," 145.972 MHz and it is sometimes transmitted on RTTY on which it transmits 60 channels of information. On certain occasions the TLM is not transmitted but instead, messages are loaded into the beacon TX from ground command stations and radiated from the satellites. Such "Codestore" messages have included Christmas, New Year and Birthday greetings and urgent instructions to other ground command stations and users.

Special report forms for TLM reception are available from AMSAT-USA (Ref. 6) and records of the TLM are of great use to the organisation as they give valuable clues to any odd behaviour, such as erratic mode switching on Oscar 7.

Practical Communication

Undoubtedly the most common misuse of the satellites is the use of far too much power. Particularly on the 2/10 metre modes, this seems to be due to rather inferior receiving systems employed by some operators. This causes these stations to run a lot of power before they can find their own signal. The downlink sensitivity required is 0-1 microvolt for 5 dB over the noise and this will enable weak signals to be heard.

There are few amateurs fortunate enough not to be troubles with RF interference from switched mode power supplies and line timebase oscillators in TV sets, faulty domestic thermostats and sundry industrial and other "funny noises." Much of this interference can be dealt with by a good noise blanker as opposed to a noise limiter. Circuits worthy of consideration are noted in References 7 and 8 if your receiver is deficient in this respect.

To illustrate how to communicate through an amateur satellite, let us take a step-by-step example for Oscar 7 in mode "A."

1. From the W6PAJ calendar or other publication of broadcast data, check when a convenient orbit will occur.
2. Tune up your 2 metre TX in the 145.85-146.95 MHz segment before the calculated AOS time.
3. If your transmit and/or receive aerials are rotatable point them in the direction from whence the satellite will come over the horizon.
(4) Set up your receiver to cover the 29.4-29.5 MHz part of the 10 metre band and make sure the RX is not muted when the TX is on.

(5) Next, listen for the TLM which is nominally on 29-502 MHz. However, remember that the satellite is travelling towards you at an orbital velocity of about 4½ miles per second, causing a Doppler shift upwards in frequency of up to 700 Hz.

(6) Having established that the satellite is within range and functioning, you should hear a number of mainly SSB and CW signals as you tune across the band 29.4-29.5 MHz so the next goal is to find out if your signal is being received by the satellite. What you must not do is to transmit a powerful carrier, swishing your VFO across 2 metres trying to hear yourself. This is very anti-social and unfortunately all too prevalent.

You can quickly calculate where your signal ought to be within a few kilohertz on 10 metres. For example, if you transmit on 145-900 MHz, right in the middle of the uplink band, your 10 metre signal would be near the middle of the downlink band, i.e. 29-450 MHz. Similarly, a signal on 145-925 MHz would be found near 29-475 MHz. Figure 3(a) should make this relationship clear. Again, due to the Doppler effect, you should tune up to 4 to 5 kHz higher, if the satellite is approaching, or lower if it is receding from you.

(7) If you put out a "CQ" call, monitoring your own signal on 10 metres, be prepared for someone breaking in; that's the beauty of satellite working, it is the ultimate in break-in operation. Some CW stations are crystal controlled so you should tune around in case anyone is answering elsewhere in the band. Once contact is established, a QSO would proceed in the usual way.

(8) If you generate the required e.r.p. by a low power TX feeding a gainsy beam, do not forget in your initial enthusiasm to turn the aerial from time to time. A convenient approach is to turn the array in increments equal to the half power beamwidth, say 45° for an 8 element Yagi. At extreme range, accurate aiming is important.

Oscar 7 Mode "B"

So much for a mode "A." For mode "B" you must be able to transmit between 432-125 and 432-175 MHz, reception being nominally 145-975—145-925 MHz. To minimise the Doppler shift, which gets more pronounced as the frequencies increase, the spacecraft's downlink band is inverted. This means that if you increase your 70 cm. transmit frequency by 10 kHz, your received frequency on 2 metres will decrease by the same amount. Figure 3(b) should make this clearer. Furthermore, this inversion means that an upper sideband signal on 70 cm. will become a lower sideband signal on 2 metres. Apart from these points, the procedure for mode "B" operation is very similar to that for mode "A" except that Doppler shifts will be much more pronounced.

Funding the Satellite Programme

As with terrestrial repeaters, the orbiting repeaters have to be designed, built, tested, launched and subsequently controlled from ground command stations. All this takes a great deal of time and money. It is only right that those who regularly use amateur satellites should contribute something towards the programme. Membership of AMSAT-UK is open to anyone. There is a minimum subscription of £3.00 for the 1977 year but extra donations are always welcomed. "Oscar News" is the publication which keeps members in touch concerning past achievements, present activities and future plans. The secretary's particulars are given in reference 9.

Conclusions

It is hoped that this article will have persuaded those who have been thinking about satellite operation for some time to take the plunge. It really isn't all that mysterious or complicated. As to the future, Oscar 8 is due for launch later this year and will carry another 145/29 MHz transponder—like Oscar 6—and a 145/435 MHz one for the first time. In late 1979, it is planned to launch the most ambitious amateur satellite yet into a highly elliptical orbit enabling far greater ranges to be achieved. Progress on these projects will be covered in our "VHF Bands" feature.

References

1. "1977 Orbital Predictions for Amsat-Oscar 6 and Amsat-Oscar 7" by W6PAJ. Available from AMSAT-UK price £1.50 to members, £3.00 to non-members. Amsat from Pat Gowen, 17 Heath Crescent, Hellesdon, Norwich, NR6 6XD. Send large s.a.e. with 11½p stamp.
4. "ZL-Special Compressed for 10m." Short Wave Magazine September, 1972, pp. 412-413.
5. Telemetry decoding formulae are given in the W6PAJ calendar.
6. AMSAT-USA, P.O. Box 27, Washington, DC, 20044, U.S.A.
9. Current Operating Schedules: 0-6—Mondays, Thursdays and Saturdays, ascending orbits and Sunday morning descending orbits; 0-7—Mode "A" on odd days of the Julian calendar, Mode "B" on even days. Wednesdays reserved for special experiments sanctioned by AMSAT-USA.
**S W L**

By Justin Cooper

**SHORT WAVE LISTENER FEATURE**

This time round your conductor has a heavy heart, indeed, as have all of us who have a direct working connection with the Magazine. Quite apart from the void in terms of the Amateur Radio scene, we are all finding out as we continue our various tasks just how fine an organiser G6FO was—G3KFE and the writer had, over the years, got to the state where a phone call every three months was about all the contact needed, the rest being catered for in the course of writing a covering letter and posting the copy; G6FO was a real professional in every sense of the word. Perhaps the only thing that could upset him was to see anything disorganised, whether a group or an individual.

However, the show must go on, and we now turn to the letters; and here of course we are somewhat light on mail, possibly due to late arrival of some January copies which seem to have dropped into a void for several days in a manner as yet unexplained. All we can say is that they were due to be out on January 7, and in fact we at this end were a week late on that, which was a reflection of the sudden action—stations call once we realised we had a problem; so that hang-up between printer delivering and newsagents receiving was a double disaster. However, with fingers duly crossed, your scribe can say that as he arrives in this morning’s post, and the intention is most definitely that this is the way we are going to continue.

Last couple of times, we have muttered on about the receiver, and detailed some at least of the important points; and on re-reading these, we begin to imagine that we could well be putting lots of potential SWL’s right off at the thought of the price they would have to pay for a receiver. But, it’s not quite like that, really. The most important component is the bit between the headphones, and the little grey computer inside, which marshals all our resources into the exercise of turning the electrical signals on the aerial into letters written in the log or on the scratch-pad which have meaning. Many moons ago, we were thinking, the Editor and your J.C., that some sort of series could be worked up, based on an imaginary new chum and his adventures between the start and the time of his first QSO as a licensed amateur. One of the results of this exercise was the purchase of a CR70, which when all is said and done is a pretty basic sort of receiver—and it is quite amazing how many prefixes have been picked out on this little box, which we switch on every so often, just to remind ourselves how lucky we are to be able to use first class gear all the times we want to. And, we contend, it’s the finest way to start—struggle with a simple, basic, homebrew receiver using transistors or valves until you can firstly get the best performance out of it, and secondly use its performance in the manner calculated to get the best results. And, we would add a rider to the effect that if you have the wish to keep your skills at an absolute peak, never fail to keep a simple receiver in the shack and at regular intervals use it; also, whether you like the mode or not, listen to the CW ends of the bands. The object of this last is not to try and make you like CW if you don’t, but to sharpen up your realisation of the mental processes involved in copying a signal through heavy QRM. Watch a skilled CW operator adjust his beat note within the narrow pass band, such that, for example, in QRM, he will often so adjust the BFO that the beat note is very low in frequency; he may not realise this but what he thus does is to increase the percentage difference between the wanted and unwanted signal; consider two beat notes, one at 850 Hz unwanted, t’other at 800 Hz and rare DX you’ve been waiting for years. None to easy with the simple receiver, or the expensive one for that matter, to copy the wanted one and neglect the unwanted. However, take the beat note down as low as the speaker or phones will stand; at 50 Hz beat note for the wanted one, the QRM signal has become 100 Hz, and instead of a few per cent difference in the beat notes there is now a 2:1 difference, which makes the copy as easy as pie. The same sort of tricks are as applicable to SSB as CW operators and SWL’s, though of course the precise how and why is not quite so obvious; for example one recalls years ago logging for an old fellow in one of the contests; there was a terrible heterodyne whistle on one signal, which made it all but uncopiable to J.C., while the old chap not only worked him but then took on a string of others, while on the same frequency and with the same QRM—and it was a long time before we realised that the only difference between our reception was simply age—the whistle annoying the writer was quite inaudible to the Old-Timer, because his ears just did not respond that high in frequency!

**New Chums**

S. Hammond (Solihull) has managed to become one of the gang who mistake prefixes for call-signs, so we are sure he won’t mind if we take this opportunity to explain the make-up of an amateur radio call-sign. Consider the G stations; say, G3SWM. In this case the call-sign and the prefix are a little mixed, insofar as the prefix is G3, and the call-sign 3SWM; but that’s the way it is wherever you have more than one possible number in the middle of a complete call-sign, such as G3AAA and G4AAA. The number may also be an indication of location, as for example in Russia and America; W1AAA will be up in the Maine/Connecticut neck of the woods, but W6AAA would be in California. What it boils down to is that you must collect one G3, one G4, one GM3, one GM4, and so on, until you have a total of 200, or 500, depending on which Table you are entering. And it you think it’s hard, let us just say that a good week-end at the receiver will net the required 200 and probably show representatives of all six continents!

Another one with doubts was J. Grice (Castleford)
who took the trouble to write in and offer a proposed log layout for comment; and about all we can say is that if everyone submitted logs as neatly as readers Hammond and Grice, old J.C. would be in Paradise!

A. Dimnick (Glasgow) is a lucky chap with a father taking the R.A.E. after a career as a ships Radio Officer; which explains why at 15 years old, Alan can copy CW with the best, although he has concentrated on listening to SSB with the shack KW2000B.

Now to Banbury, where S. W. Allsopp resides; the interest first started back in 1962, when Stuart was about ten years old. By twelve, he had his own receiver, a Murphy "all-band" BC set with which he discovered 7 and 14 MHz, and later, with accumulating technical know-how tweaked the medium wave down to Top Band. When this box gave out, there was a gap for a couple of years before an AR88D became the shack pride-and-joy, which added Eighty, Fifteen and Ten to the scene. However, that had in its turn to go, after which there was a hiatus of umpteen years, marriage, house-buying (and doubtless the paint-pots which always seem to accompany a new house!), in which the interest was sustained by seeing the listings in the WPB. So-until next time, J.C. will have to exercise his knowledge of HPX Rules and only include recent claims.

Another taciturn type is H. A. Londesborough (Swanland) who confines himself to a very neatly-written list, which is largely bumped up by the current crop of assorted IK prefixes.

One of the both-modes merchants is H. A. Londesborough (Swanland) who is over the "ton" on Phone and all but at the same level on CW.

And, talking of CW, N. A. Phelps (Devizes) who has knocked one off his claimed score—probably a logging mishap. However, OM Phelps has J.C. with all his sails flat aback over "GJ3DVC." It must be a typing error for certain, but, of course, Murphy's Law says that the beam heading for all the stuff heard was South, down into North Africa heard; it is interesting to note that the beam heading for all the stuff heard was South, even though, for example, UA6 was among the loggings.

Other Reports

As we have already commented, thin on the ground through so many probably not "getting their reminder" for this piece due to the problems already discussed. A. Gascoigne (Hitchin) had a few queries on the HPX List, which we have resolved; his station comprises SMC-73, Veritone CR-150, and a Pye T190, with a couple of end-fed wires to pick up the signals.

J. Aspinall (Leeds) didn't get any takers to the request for "gen" on his SX-17, so he has lashed out on a Trio R300; but if anyone has the know-how to help reader Morrison get on the air, it would be much appreciated—contact them direct at 35 Burnbank, South Belmont, Ayr.

P. Ramsay (Stevenston, Ayrshire) is another one in a bit of a twist over the HPX rules, he having sent in a starter with but 73 prefixes on it, heard on 3-5 and 7 MHz phone. That leaves quite a way to go for the magic 200 which gets you into the listings, but it will no doubt come given time; meanwhile Peter is hunting round for all the American States; the aerial is a helical vertical, all-same G3KHC's article in the January issue.

R. Montgomery (Lisburn, Co. Antrim) reports on an opening he noticed on Ten from 1300 to 1435z on December 19 1976. The "starting-gun" was to hear GW4BLE breaking in on the Seventecms converter, after which gentle hint the Elan beam was turned South, the 28 MHz band properly tuned, and all Europe and down into North Africa heard; it is interesting to note that the beam heading for all the stuff heard was South, even though, for example, UA6 was among the loggings.
thousand. Times change!

M. Rodgers (Harwood) has been a bit out of it by way of his University studies during term-time but when Christmas came, the break was used to give the receiver a run and so keep himself in the Ladder.

Not only has he moved his address, but P. Barker (Sunderland) seems also to have changed his handwriting! Anyway, as usual there were some interesting snippets in his letter; he notes that QST carries a comment that the WT call your scribe gave the thumbs-down to not fooled; and it did so this time over the question of美. If the latter, then we are talking of licensed copying! Anyway, as usual there were some interesting snippets in his letter; he notes that QST carries a comment that the WT call your scribe gave the thumbs-down to not fooled; and it did so this time over the question of美. If the latter, then we are talking of licensed copying!

Next on the list we come to K. Kyezor (Richer) who remarks that in the week prior to his letter, he had on several occasions noted the "echo" effect on W station, but on looking at the band (14 MHz) a couple of hours later found it dead to all but the Europeans. The echo effect, of course, is just that; the signal is first heard, and then again 1/7 second later, by which time the wave has done a complete circle of the globe, implying that, in the case of W's, the echo has been 1 1/2 times round the world!

B. F. Hughes (Worcester) found himself with a same-day deadline when he got his copy, and so his threatened complete recheck of the list has had to be postponed—but with a current claim of 1382, a complete recheck would be quite a mammoth task! On a different tack, the old home-brew slow-scan TV monitor has been replaced by a Robot 70c, with which Paul is delighted; and his slow-scan score is now 123 prefixes seen and 47 countries. Not a bad score, at that!

Next on the list we come to M. Cuckoo (Herne Bay) who of late years seems to have joined the ranks of the quiet ones—again this time he has just his Table entry to take in.

B. T. Mackness (Dagenham) was feeling pretty despondent about the bands last time, but even though he didn't find much in the way of new stuff, he has noticed how the proportion of spots in Cycle 21 and Cycle 20 is changing month by month, giving a pretty fair indication that by the end of 1977 things will be on the upturn. The really good openings are associated on the one hand with plenty of sunspots, and on the other with the quiet geo-magnetic field conditions; the difference between "Normal" and "High Normal" conditions being often the difference between a given solar flux in conjunction with a quietening in the geo-magnetic field as indicated by the A number pushed out by the observatories.

K. Whiteley (Castleford) found himself a bit pushed for time this month, but his list contains two GU's—odd that so far no-one has included GU and GJ in a list.

L. Gibson (Barrow-in-Furness) notes that over the past couple of years his QSL return has gone up—doubtless as a result of studying the requirements of the recipient—and in this context, Les reckons that Forty is good hunting territory; among the murk and QRM one can find stations who probably have no idea they are being received at DX. For example, your scribe recalls two lads in Coventry nattering on Forty between their two shack—a matter of a hundred yards apart. Imagine their surprise to receive reports from a VK SWL who listened to them night after night!

P. Rooney writes from Worcester College Oxford to let us know he is still alive and kicking; but although there has been no lack of the desired success in exams, there also has been no lack of the hard work, which will of course get harder as the time for Finals looms up. Even then, there will be no let-up, as a six-month course in Chester is required for professional examinations; it all means mid 1978 before the Rooney spare time is available for the receiver, to any degree.

G. Ridgeway (Ardleigh) closes his 1976 list, and makes a first claim for 1977's Table, at 347 prefixes, accumulated over fifteen days of spare time; and since he ended 1976 at 499 prefixes, Graham says 1977 has to be the year when he gets onto the All-Time Ladder! In fact, your J.C. is prepared to take a small bet that Graham could in fact by studying his log, make an all-time entry right now, if he could but spare the paper and the time.

That blasted woodpecker-noise is still around says R. Carter, although at the time of his letter it seemed to have dropped as low as 7 MHz and to be being heard only on alternate days. Anyway, in Blackburn they are made of tough stuff; Ben reckons that if you close your ears to it you can still winkle the odd signal out from under. On the line of doubtful starters, a station was noted twice on Eighty signing ML8DU, both times under. On the line of doubtful starters, a station was noted twice on Eighty signing ML8DU, both times under. On the line of doubtful starters, a station was noted twice on Eighty signing ML8DU, both times under.
1976 final score of 350 prefixes.

T. Scrimshaw (Birmingham) is still scratching along at getting the TCS receiver on the go—one would have thought by now someone would have come up with the needed information to help Tim—his address is 69 Pamela Road, Northfield, Birmingham 31. On a different tack, Tim is scratching up the components for the active filter mentioned in the June 1976 issue of this Magazine, and apropos this wants to know how op-amps work. A Good Question! Well now, the name is really Operational Amplifier, and it can best be summed up as a block of gain; this block has an output which, in the absence of input signal, tends to “sit” midway between the positive and negative supply rails, which in their turn have their common terminal grounded. Round at the input end, there are two input terminals, one of which is “inverting,” and one “non-inverting” the phrase here referring to the phase relationship of the terminal to the signal at the output. There are usually facilities for ensuring that with zero input the output can be trimmed exactly to where it belongs while in addition there are usually some frequency-compensation facilities which have to be added externally. Having the two possible inputs, which by their very nature are in anti-phase with each other and phase-related with the output, all sorts of interesting things can be done with them. A useful little book on the subject is “Elements of Linear Microcircuits,” by T. D. Towers, which looks at the theory and practice of the little beastsies.

In conclusion we have a couple of letters to deal with which, to put it mildly, should have seen the light of day earlier! The culprit, need you ask, is the joke of a filing system your old J.C. has used for years, and which, to be fair to it, has never let him down before.

A. C. Geer (Oadstock) says he is “only an SWL” but having been playing with wireless since before 1920, and building all the “trick circuits” of the day, Armstrong, Flewelling, Scott-Taggart, Cossor, Austin is now going to get stuck in to the R.A.E. stuff and get his licence—and as we have said before in this piece, it is a great pleasure to hear of an Old-Timer actually sitting down and having a go rather than letting the brain run to seed. As Tony Buzon points out, the actual loss of brain power through life is probably less than ten per cent, and even that could be largely attributed to rustiness in the techniques rather than in the loss of power pure and simple. Again, one hears of people who “cannot remember” things as they get older—any actor learning his lines can disprove this hoary old myth. Again, take a look at the sort of conventional notes taken by the average student—around ninety per cent of what he writes is redundant material, just used to connect and inter-relate the key words; the key words therefore are the only ones which need to be down, provided they are correlated with the other key words. Buzon has it all in a book, by BBC Publications, at £1.20 paperback; and any OT with R.A.E. ideas in his head would do well to buy a copy, and adopt the methods used, both to speed up the learning, and most of all, to improve the retention of what has been learned.

J. White (London E.1) raised in his letter, pretty well all the novice-listener’s early questions in one go! However, to answer his thirst for the real “gen” needs a certain basic hint of “propagation” which we haven’t mentioned in this piece since long-ago time. Now, in essence, the long-range signals heard between ten metres and the medium wave band are heard by the “sky wave”; this means the signal leaves the aerial and goes up into the blue sky, through various ionised layers of atmosphere, until it gets to the “F layer” which is about the highest and thinnest atmosphere to be ionised. There it is refracted, just like the rays of light when a pencil is placed in a bowl of water make the pencil appear to bend at the interface between air and water; light waves and radio waves being but the same sort of animals of different wavelengths. Now, our radio wave is hitting the layer at a very glancing angle which means the refraction turns the wave gently down at a similarly glancing angle and sends it back down to earth again. OK so far; but, as we have indicated, there are several layers of ionised air below the F region, notably D and E layers, which are absorbers of RF, and these latter attenuate signals passing through them, the effect being greatest at low frequencies and least at higher frequencies. Still with us? Right, now for the punch-line, which is to comment that all the ionised layers are thus because of the action of the sun’s rays, which in turn are affected in some mysterious way with the presence of sunspots. Thus, in the daytime each layer is at its strongest; at night the lower ones just disappear for all practical purposes, and the F layer also weakens, and recombines if it has split into two during the day. So—what it all adds up to, essentially is that the higher frequencies will tend to be daylight only efforts, while the low ones are night-time only. Forty and Twenty tend more toward daylight-only at the trough of the sunspot cycle, and night-time bands at the peak of the cycle—which can be summarised as saying that 7 and 14 MHz are well worth a look-see at any time when they are showing signs of life.

The cycle described above is of course over-simplified, and in addition it is overlaid by smaller cycles; we have already talked about a daily and an eleven-year effect, and to that we can add a monthly effort, and a seasonal one, these last being effects of the posture of Sun and Earth to each other rather than fundamental effects.

What it boils down to is that even if your receiver has some stations marked on the dial, you may not be able to pick them up just by turning the set on; but if they are operating at the right time, and if you listen at the right time, there is a sporting chance you may pick the station up. But, of course, just as we amateurs have a series of bands, so has a BC station a set of frequencies, and to maintain his services he will have to change from one to another round the clock; and like the broadcaster, so it is with the amateur, picking the band to suit his needs and for which he may have gear in the station, or even in the amateur case for pure preference.

Finale

So there it is for another month. Because of the hiccup we have had in distribution, it has been decided that in next “SWL” we will run the final 1976 and the first 1977 entries side by side, to give everyone a chance to put in their finals for 1976; and of course the All-Time Post War table will also appear. So, for the next piece, your deadline is March 24, addressed to “SWL,” SHORT WAVE MAGAZINE, 34 HIGH STREET, WELWYN, HERTS., AL6 9EQ.
**VHF BANDS**

**NORMAN FITCH, G3FPK**

**Television**

It is not often that there is any A/TV news to report in this column since the practitioners of the art rarely correspond. So it makes a change to be able to review *Amateur Television*, a booklet published in October last year by the British Amateur Television Club.

*Amateur Television* is edited by Mr. A. Hughes from contributions by several authors and comprises ten chapters. The first one, "Background," is a brief history of the club founded in 1949, compiled by Don Reid and is followed by a short piece on aerials and reception by Cyril Chivers. Chapter 3, "Transmitting," by J. J. Rose, discusses the special requirements for a TV TX's PA stage and presents circuits for screen grid and control grid modulation. For those possessing a 2m. TX, the circuit and layout of a two-stage tripler is included. Ideas on operating techniques are briefly dealt with in the next chapter by J. Wood. The section on licences has become a little out of date as there is now no need for a separate TV licence. However, the requirements for frequency measurement, monitoring, etc., are still necessary.

The sixth chapter, "Picture Sources" by J. Lawrence, is very well written and copiously illustrated with circuit diagrams, layout drawings and waveform pictures and is the real meat of this booklet. It is followed by "Monitors" by B. Summers which covers the modification of the domestic TV set for use as a monitor. J. J. Rose is the author of the 8th chapter on recording and deals with the subject narratively and with block diagrams. No manual on A/TV would be complete without reference to SS/TV and C. Grant Dixon is the author of this chapter of 15 pages and it is very well written and illustrated with numerous circuit diagrams. The final chapter by Nigel Walker deals with colour TV by the NTSC and PAL systems.

*Amateur Television* is professionally printed in A5 format on 90 g.s.m. bond containing 112 pages. Being offset litho produced by photographic reduction of normal typewriter script, the text is very small and rather "thin." Whilst there is no list of contents, nor an index, the chapter headings are bold. The diagrams vary from excellent to decidedly amateurish and some that run up and down the page have to be viewed from the left, others from the right. As one would expect, much of the booklet comprises previously published material from the club's journal, "CQ-TV" which probably accounts for the non-uniformity of component identification; e.g., 2.2K and 2K2. But these are rather carping criticisms of a very useful publication which any A/TV enthusiast is bound to want. It is available from BATC at "White Orchard," 65 Showell Lane, Penn, Wolverhampton, W. Midlands at £1.75. The editor and contributors are to be congratulated for a very fine effort.

**North Atlantic Project**

In the column last November, mention was made of the *North Atlantic Project*. Serge Canivenc, F8SH, who is IARU Region 1, VHF Sporadic-E co-ordinator, has just sent along the very latest information on Project VESNA (VHF E's over North Atlantic). Permission has been obtained from C.N.E.T. to use the laboratory at the top of the water tower in the Long Lines Department area in the Lannion industrial estate. Permission is now being sought to use part of the upper platform for installation of the aerials for 50 MHz and for 28, 144, 435 MHz and maybe 10 GHz later on. The crystal for the 50 MHz TX has been received.

Serge reports excellent transatlantic cooperation in Project VESNA with Ray Clark, K5ZMS, Secretary of the Six-Metre International Radio Klub, SMIRK! Transmission of reports will be made on a weekly basis. F8SH is preparing a report for publication in Radio REF this April and promises to keep your scribe informed on the progress of test transmissions on 50 MHz from Lannion. These are planned to start on April 15 in time for the beginning of the E's season a month later. It is hoped that many readers will participate in Project VESNA. Anyone with 6m. receiving capability should contact F8SH whose address is:—6 Rue du Pont-Hélé, F-22700 Perros-Guirec, France.

**Beacons**

Dealing firstly with overseas beacons, F8SH writes that a 6m. beacon is operational continuously from Costa Rica on 50-080 MHz signing TI2NA but he did not mention any further details. This could be a useful one during the E's season. G3POI mentioned two "private" Dutch beacons. PA0JTA on 144-135 MHz, running 50 watts, mainly evenings and weekends when the licensor is home, and on 70 cms., PA0CBR on 432-075 MHz. In a 40m. QSO on January 14 with G3COJ, CT2BS said that his 2m. beacon is now back at his house being modified from one watt to 15 watts. During last summer's E's season, it was operating from a TV station but will resume from his house this year on a QRG to be advised, hopefully in the beacon band. Despite reports of a CT2BB beacon, CT2BS says there is no such thing. David Jarrell is very enthusiastic about achieving a 2m. contact with the British Isles. (He has heard BBC Radio 2 on VHF FM). Your scribe would not be at all surprised if this does come about in 1977 as the distance is similar to those over which many worked via E's last summer.

On the home front, GB3NEE, the Durham beacon, is operating again on 144-127 MHz with 3 watts e.r.p. to a pair of 5-e. Yagis beamimg simultaneously 135° and 315° at 360m. a.s.l. This to be increased by 10 dB soon. On 23 cms., the Dunstable Downs beacon, GB3DD, has had slight aerial changes made. Currently on 1296-05 MHz, the new QRG will be 1296-89 MHz. The Emley Moor beacon is now licensed, callsign GB3MLE, for 1296-93 MHz and should soon be on with 100 watts e.r.p. The Yagi beaming 120°. Our thanks to G3COJ for this information.

**VHFCC Award**

The only VHFCC Certificate
awarded this month goes to John White, GW8IQC, from Newport in Gwent. His no. 275 was for 2m. operation. John was licensed in February, 1974, after several years’ “apprenticeship” as an s.w.l. The first station consisted of a Standard C826B and a pair of crossed dipoles. About 20 months ago, he graduated to a Trio TS-700 and 5-ele. Yagi at 18ft., the QTH being 75ft. a.s.l. with a good take-off east and south, poor to the west and non-existent to the north.

Contests
The 144 MHz Fixed contest last December 5 was won by GW8JHL/A with a total of 1625 points from 246 QSO’s. Runner up was G8HCL with 1104 points from 230 contacts. There were 72 entries compared with 110 the previous year when the contest was a two-fold affair with a section for non-SSB participants. (Acknowledgments to RSGB News Bulletin Service, GB2RS).

By the time this issue appears, the 144 MHz Open contest will be upon us the weekend of March 5/6 from 1600 to 1600 GMT. The published rules include 4b, which is all entries lumped together; e.g., fixed, portable, -/A and mobile. G3SEK, to whom entries should be sent, confirms this should be 4a. i.e. separate Fixed and Portable sections.

The 432 MHz Open contest is scheduled for March 20, followed by the 70 MHz Open event on April 2/3.

The Tables
This month sees the start of the 1977, Three Band Annual VHF Table. Since it covers a period of only four weeks of rather flat conditions, there are not many entries. For the benefit of new readers, just send in your accumulated totals of counties and countries worked on 4m., 2m. and 70 cms. when you write to “VHF Bands.” It seems that some are still using the older counties such as Middlesex, Huntingdon, etc., but it is the present day English, Northern Irish and Welsh counties and the Scottish regions which are the basis of this table, plus all the Irish Republic counties. One of the best maps to buy is the “British Isles County Map” from Geographia Ltd. which shows the newest counties superimposed on the old ones. Incidentally, this map is ideal for drawing the 50 kms. radial rings around your QTH for contest scoring covering all the British Isles.

The 23 cms. All Time Table has not been published for some time due to lack of space so it is being included this time based upon your latest claims. The QTH squares Table had to be omitted last month too, but there has not been much movement in it due to the lack of any real auroral and tropospheric openings. Please note that all these tables are based upon what you have worked, whether confirmed or not, and that no QSL cards should be sent.

Scottish News
Jack Wilson, GM6XI (Edinburgh) has sent one of his periodic, concise reports covering activity North of the Border. The main news is that, at a meeting in Motherwell on January 14, a properly constituted Central Scotland FM Group was formed with GM3KMG as Chairman and a “top line” committee behind him. The new group wasted no time as GB3CS came on the air on January 30 with one watt e.r.p., proof of the competence of the new management. Except for parts of Edinburgh, coverage is excellent. Jack reports that so far, behaviour is excellent and that no doubt, coverage will improve when a higher powered TX and new aerial are installed. GM6XI is off the 70 cms. band at the moment due to aerial failure so that Oscar 7 has one less client.

Meteor Scatter and E-M-E
Doug Parker, G4DZU (Leeds) has launched four 14-ele. Parabeams for 2m. and not unnaturally, is quite loud wherever he is beaming. He had arranged an E-M-E sked with Reinhard Koch, DK1KO, in FN12g for 0600 on Feb. 6 preceded by a possible tropo. contact. Unfortunately, neither came off but Doug did hear an SM calling “CQ M/B” on tropo.

Dennis Boniface, G4DSC (Ripon, N. Yorks.) now has a 4CX250B amplifier going at full legal input on CW with digital keyers on the way. His results so far are 8 complete QSO’s out of 33 attempts, a not insignificant performance considering the limitations of the QTH in a valley, 100ft. a.s.l. As to results, Dennis summarises the Geminids as a “washout” with EA, YU and I skeds no good at all and that with UC2AAB hopeless with nothing heard at all in two tests. The successes claimed are SM2CKR (KX12g) and SM0FFS (JT5If). The Quadrantids were better but tests with SM3FGL and I4PWL on Jan. 2 failed to come off, although OE5JFL (G148h) was worked next day. The sked with YU2ROG was marred by QRM from the OE5JFL/E19V test. Tests on the 4th with SM3BIU and DJ5MS failed although Dennis received 44 pings and 17 short bursts from the German between 0600 and 0800. However, DJ5MS was successfully contacted.

<table>
<thead>
<tr>
<th>Station</th>
<th>FOUR METRES 1600-2000</th>
<th>TWO METRES 2000-2400</th>
<th>70 CENTIMETRES 2400-2900</th>
<th>TOTAL Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3FPK</td>
<td>53</td>
<td>8</td>
<td>16</td>
<td>61</td>
</tr>
<tr>
<td>G8HQJ</td>
<td>31</td>
<td>6</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>G4FOR</td>
<td>43</td>
<td>10</td>
<td>7</td>
<td>53</td>
</tr>
<tr>
<td>G8GML</td>
<td>38</td>
<td>2</td>
<td>11</td>
<td>52</td>
</tr>
<tr>
<td>G3FIJ</td>
<td>19</td>
<td>1</td>
<td>5</td>
<td>51</td>
</tr>
<tr>
<td>GM4CXP</td>
<td>30</td>
<td>6</td>
<td>1</td>
<td>45</td>
</tr>
<tr>
<td>G4FCD</td>
<td>35</td>
<td>5</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>G4DEZ</td>
<td>31</td>
<td>4</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>G8ITS</td>
<td>23</td>
<td>3</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>G4ERX</td>
<td>18</td>
<td>5</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>G8JHX</td>
<td>17</td>
<td>2</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>GD2HDZ</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>16</td>
</tr>
</tbody>
</table>
in G115e by random MS on Jan. 9 between 0600 and 0825 in just two bursts at 0759 and 0818 GMT. G4DSC monitors Radio Gdansk on 70-31 MHz and, on the morning of Jan. 3, he was not getting pings so much as one long burst, giving almost continuous reception.

Four Metres

Graham Badger, G3OHC (Sutton Coldfield), took part in the 4m. CW contest on Jan. 23 and bemoans the very poor conditions. The highest serial number he heard was 14! He concludes that many participants gave up early. From the Borders Region, Derrick Dance, GM4CXP, reckons that the contest was “a real challenge as it coincided with ‘super punk’ conditions!” He only had five contacts despite trying hard, viz: GM4DUJ (Edinburgh), G3JYV (Appleby), GM3ZXP/P (Tayside), G4AEQ (Mchstr.) and G8KB near Sheffield. 

To exemplify the sub-standard conditions, Derrick normally hears the GB3SU beacon RST 319/429 but for conditions, Derrick gives up early.

Two Metres

“Aurora—fact not fiction!” is how GM4CXP’s letter starts referring to the first genuine such event heard for the GM operators. Derrick was alerted to the first genuine such event heard on the night of Jan. 30 0053 GMT on the night of Jan. 30 to the first genuine such event heard in these latitudes this winter. He reports that many participants gave up early. From the Borders Region, Derrick Dance, GM4CXP, reckons that the contest was “a real challenge as it coincided with ‘super punk’ conditions!” He only had five contacts despite trying hard, viz: GM4DUJ (Edinburgh), G3JYV (Appleby), GM3ZXP/P (Tayside), G4AEQ (Mchstr.) and G8KB near Sheffield. 

To exemplify the sub-standard conditions, Derrick normally hears the GB3SU beacon RST 319/429 but for conditions, Derrick gives up early.

Three-Quarter Metres

Graham Badger, G3OHC (Sutton Coldfield), took part in the 4m. CW contest on Jan. 23 and bemoans the very poor conditions. The highest serial number he heard was 14! He concludes that many participants gave up early. From the Borders Region, Derrick Dance, GM4CXP, reckons that the contest was “a real challenge as it coincided with ‘super punk’ conditions!” He only had five contacts despite trying hard, viz: GM4DUJ (Edinburgh), G3JYV (Appleby), GM3ZXP/P (Tayside), G4AEQ (Mchstr.) and G8KB near Sheffield. 

To exemplify the sub-standard conditions, Derrick normally hears the GB3SU beacon RST 319/429 but for conditions, Derrick gives up early.

Two Metres

“Aurora—fact not fiction!” is how GM4CXP’s letter starts referring to the first genuine such event heard in these latitudes this winter. The happening lasted from about 2030 to 0053 GMT on the night of Jan. 30 to the first genuine such event heard in these latitudes this winter. He reports that many participants gave up early. From the Borders Region, Derrick Dance, GM4CXP, reckons that the contest was “a real challenge as it coincided with ‘super punk’ conditions!” He only had five contacts despite trying hard, viz: GM4DUJ (Edinburgh), G3JYV (Appleby), GM3ZXP/P (Tayside), G4AEQ (Mchstr.) and G8KB near Sheffield. 

To exemplify the sub-standard conditions, Derrick normally hears the GB3SU beacon RST 319/429 but for conditions, Derrick gives up early.

Two Metres

“Aurora—fact not fiction!” is how GM4CXP’s letter starts referring to the first genuine such event heard in these latitudes this winter. The happening lasted from about 2030 to 0053 GMT on the night of Jan. 30 to the first genuine such event heard in these latitudes this winter. He reports that many participants gave up early. From the Borders Region, Derrick Dance, GM4CXP, reckons that the contest was “a real challenge as it coincided with ‘super punk’ conditions!” He only had five contacts despite trying hard, viz: GM4DUJ (Edinburgh), G3JYV (Appleby), GM3ZXP/P (Tayside), G4AEQ (Mchstr.) and G8KB near Sheffield. 

To exemplify the sub-standard conditions, Derrick normally hears the GB3SU beacon RST 319/429 but for conditions, Derrick gives up early.

Two Metres

“Aurora—fact not fiction!” is how GM4CXP’s letter starts referring to the first genuine such event heard in these latitudes this winter. The happening lasted from about 2030 to 0053 GMT on the night of Jan. 30 to the first genuine such event heard in these latitudes this winter. He reports that many participants gave up early. From the Borders Region, Derrick Dance, GM4CXP, reckons that the contest was “a real challenge as it coincided with ‘super punk’ conditions!” He only had five contacts despite trying hard, viz: GM4DUJ (Edinburgh), G3JYV (Appleby), GM3ZXP/P (Tayside), G4AEQ (Mchstr.) and G8KB near Sheffield. 

To exemplify the sub-standard conditions, Derrick normally hears the GB3SU beacon RST 319/429 but for conditions, Derrick gives up early.
It seems that far too many folk give up all too easily unless there is a "lift" on. Surely we should seize upon rotten conditions to see what can be achieved rather than throw in the towel without even trying?

Incidentally it is when conditions appear flat that the calling frequency should be kept well clear. All too often lately, a local QSO has been in progress either on it or very near it, just because the participants couldn't hear any distant stations, thus denying those who could the chance of establishing a contact.

Before concluding this section, and there are no 70 cms. reports to follow, did any reader hear any auroral signals from 1600-1900 GMT on Jan. 9? The GB2RS news bulletin the following Sunday reported that south coast stations had worked a number of SM's but so far no confirmation of this has been forthcoming. Furthermore, G3USF reported normal, low gamma readings for this period.

Satellite News

For the past three months Oscar 6 has been exposed to maximum sunlight so battery temperatures of 58°C. have been recorded, far too high for NiCads. The Surrey 0-6 commanding is now very reliable and is keeping a very close eye on the telemetry. Although the battery temperature has fallen rapidly, there is very little charge going in so 0-6 might be taken out of regular service any time and only switched on for special purposes, such as inter-satellite tests due on Feb. 9-11.

The second of the 0-6 QRP days on Jan. 19 was quite successful. Your scribe, using an old Pye "Ranger" running about five watts output to an indoor 3-ele. Yagi got RST 559 on 2m. G3POI, G4BWG, G3XN, G3CHN, GM4CXCP, G3COJ, G3FPK, G4BAH, G3OHC, 9H1CD, G4CDF, G8GLM, G8HYV, G3XCS, G2AXI, G4DKX, G8WA, G8KR, G6UW, G8FOP, G3FIJ, G8HHI, GD2HDZ, G8GII. A high of 259°C. have been recorded, far too high for NiCads.

"C" quite a bit, recently, that is, in the quarter power mode 70 cms./2m. presumably due to low battery voltage. Persistent use of high power on the 70 cms. uplink will result in more Mode "C" days: the remedy should be obvious. Sad to report, it is not only certain continental stations which use far too much e.r.p. One G8*** was heard with a signal so loud that it was calculated he must have been radiating several kilowatts at 0-7. Selfish behaviour of this sort will merely result in the premature demise of the transponder for everyone.

Anyone fancy an expenses paid trip to the U.S.A.? AMSAT-USE urgently seeks a volunteer to assist with the mechanical construction of Oscar 8 and the Phase 3 programme. The sting is that it is travel expenses paid, not salary, apparently. Anybody interested should contact Perry Klein, W3PK, at AMSAT, P.O. Box 27, Washington, D.C., 20044, U.S.A.

QTH LOCATOR SQUARES TABLE

<table>
<thead>
<tr>
<th>Station</th>
<th>23 cm.</th>
<th>70 cm.</th>
<th>2 m.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>G8FUJ</td>
<td>1</td>
<td>79</td>
<td>172</td>
<td>252</td>
</tr>
<tr>
<td>G3POI</td>
<td>10</td>
<td>169</td>
<td>169</td>
<td>169</td>
</tr>
<tr>
<td>G4BWG</td>
<td>23</td>
<td>110</td>
<td>133</td>
<td>133</td>
</tr>
<tr>
<td>G3XN</td>
<td>16</td>
<td>50</td>
<td>66</td>
<td>122</td>
</tr>
<tr>
<td>G3CHN</td>
<td>16</td>
<td>130</td>
<td>130</td>
<td>130</td>
</tr>
<tr>
<td>GM4CXCP</td>
<td>21</td>
<td>107</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>G3COJ</td>
<td>15</td>
<td>49</td>
<td>63</td>
<td>122</td>
</tr>
<tr>
<td>G3FPK</td>
<td>50</td>
<td>124</td>
<td>124</td>
<td>124</td>
</tr>
<tr>
<td>G4BAH</td>
<td>32</td>
<td>92</td>
<td>124</td>
<td>124</td>
</tr>
<tr>
<td>G3OHC</td>
<td>26</td>
<td>91</td>
<td>117</td>
<td>117</td>
</tr>
<tr>
<td>9H1CD</td>
<td>2</td>
<td>110</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>G4CDF</td>
<td>10</td>
<td>109</td>
<td>109</td>
<td>109</td>
</tr>
<tr>
<td>G8GLM</td>
<td>34</td>
<td>74</td>
<td>109</td>
<td>109</td>
</tr>
<tr>
<td>G8HYV</td>
<td>10</td>
<td>92</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>G3XCS</td>
<td>14</td>
<td>82</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>G2AXI</td>
<td>34</td>
<td>59</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>G4DKX</td>
<td>2</td>
<td>23</td>
<td>66</td>
<td>91</td>
</tr>
<tr>
<td>G8WA</td>
<td>17</td>
<td>74</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>G8KR</td>
<td>6</td>
<td>79</td>
<td>86</td>
<td>86</td>
</tr>
<tr>
<td>G6UW</td>
<td>8</td>
<td>85</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>G8FOP</td>
<td>8</td>
<td>38</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>G3FIJ</td>
<td>25</td>
<td>54</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>G8HHI</td>
<td>7</td>
<td>71</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>GD2HDZ</td>
<td>8</td>
<td>24</td>
<td>45</td>
<td>77</td>
</tr>
<tr>
<td>G8GII</td>
<td>11</td>
<td>62</td>
<td>73</td>
<td>73</td>
</tr>
</tbody>
</table>

DX Notes

From G3POI comes news that DB5NA is planning a trip to the Aland Islands, OHO, dates to be announced. This would take in JB and/or KU squares. For the peak of the E's season, LZ1AB plans to operate portable from NC59d at the end of June and beginning of July. Both SM7CRO and SM7EWG are in IR14f and are QRV on 2m. SM9BYC plans to operate from SM2BYC in the summer. There is just a tiny bit of Sweden in that square around Haparanda only 80 kms from the Arctic Circle.

Deadlines

If your contributions to this issue have been missed out, it is likely copy was not re-mailed from Buckingham in time. Readers will appreciate the sad reason for this. Please send all your future contributions to: "VHF Bands," SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts., AL6 9EQ. Deadline for April is March 4 and for May, April 6.
THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for April issue: March 4)

ONE feels rather diffident at commenting on the death of G6FO in this piece; however the readership of SHORT WAVE MAGAZINE may have seen him, we on the part-time staff saw a man who did his utmost to smooth our path to the meeting of deadlines, and did his utmost for our hobby in so many ways. There were those who feared him; but their fear was of their own divising, in that they instinctively knew that he had sized them up for what they were, or are—and that his assessment did not agree with their own.

However, "Clubs" must go on, and it is our first duty to mention the howler we perpetrated in setting the reader deadline last time round; just one complete week adrift in the wrong direction from your scribe's point of view, though doubtless in the right one for many Hon. Secs.! They'll all go in, though, somehow; and for the record, let us say that the "Clubs" reader deadline is to arrive twenty-one days before the issue date, which in its turn is always set for the last Friday of the month preceding—which the March issue is due to appear on February 25, the April one on March 25, and so on; just work back three weeks from the date so found and that's your arrival deadline; the post time has then to be taken into account, to give your posting deadline. The only time this essential rule goes overboard is with the January issue, which has to be prepared in the light of the long Christmas break now favoured, the generally increasing delays in the mails as the festive post builds up; all these factors work in one direction, while the fact that for this one month it is now impossible to issue on our due date, so we have to go back to the first Friday in January for the issue. However, we'll sort out that when we get a bit nearer the date!

But, of course, in essence, the message is that you can go on sending your reports, knowing full well that they will go on appearing—and we would add that our policy on Clubs reports is that we accept them from any club or group; our only restriction is that we will not become involved in inter-club rivalry to the extent of taking sides—in such cases we confine ourselves to giving each group its mention.

The Mail

Here we can commence with Radio Fraternity Lodge No. 8040, who write to advise that the new Master is G3BEZ, while the Secretary is G3TY; if you would know more, G3TY's address is in the Panel on p.00.

As you will have guessed from our opening paragraph we are taking them as they fall from the clip; and it is Wirral for our first visit. They have Hq. at the Sports Centre, Grange Road West, Birkenhead, and they can be found there on the first and third Wednesdays in each month; March 2 for Part four of the G81VW Semiconductor Saga, in which the gang are to be introduced to the FET; and March 16, for which the activity has yet to be decided.

Down south now, to Basingstoke with lots of plans for the coming year being laid; but, most unusually for him their Hon. Sec. forgot to mention dates or venue! Thus, if you want to look in on the lads, you have to get in touch first with G3CBU, whose address appears in the appropriate line of the Panel.

Farnborough have their club contest for both the transmitters and the SWL's over the weekend March 5/6; then there follows the monthly meeting at the Railway Enthusiasts Club, for a lecture on Weather Rockets and Satellites. The venue mentioned is in Hawley Lane, Farnborough.

The Big Day for Sutton & Cheam this month is on Saturday, March 19, for the Annual Dinner and Dance; all the gen, and the tickets, from Bob Tillin, G3MES, who is doing the donkey-work on this special "do." Turning to the more humdrum matter of the normal routine, we see—that there just isn't much "normal" this month! From March 16-19 they will be manning a stand at the Wallington Hobbies Exhibition organised by the Rotary Club. Callsign not known yet, but there will be stations operational on HF and VHF, and, it is hoped, talk-in facilities. Before all this, there is the informal get-together at Rays Social Club, while the "formal" drops right in the middle of the busy period, on March 17, for G8AAI to talk about Amateur Television, at Sutton College of Liberal Arts, Cheam Road, Sutton.

Way down in the West Country now, to Cornish, who foregather at the SWEB Clubroom, Pool, Camborne each month. On March 3, the subject is Electrical Safety in the Home, the speaker being G3XFL.

The Scout Hut, Occupation Road, is the home of Peterborough Radio and Electronics Society; they have a Junk Sale on Friday, March 18, for which the start is set at 7.30.

There are two dates for Cheltenham (RSGB Group) in March—the normal effort on March 3, and another one on March 18 (a Friday) when they join with the GCHQ gang to listen to Dr. B. Marsh of Coventry talking about Aurora and Radio. Both these dates are reserved at the group Hq., the Old Bakery, Chester Walk, Cheltenham.

It is still a question of every Friday except the third one, for York—and, says the Hon. Sec., what a problem it is to recall which is the blank date each month! This month the address has changed, in that the club is now called the United Services Club, 61 Micklegate, York—it used to be known as the British Legion.

Now we have the Radio Amateur Invalid and Bedfast Club, better known to all and sundry as RAIBC. In the current issue of their "Radiat," your scribe was highly amused at the "Christmas Dinner for a Harassed Ham," one course of which was Special Bamboo Power Pack Pie (in Black Box)! If you know of anyone eligible for full membership, you should put him in touch with the Hon. Sec.—see Panel—and if you can possible do so, join yourself as a supporter.

"CQ TV" is the title of the magazine put out by the BATC chaps, who are of course bound in the common interest of transmitting pictures, either in the normal way or by Slow-Scan. Details from the Hon. Sec.—see Panel.

Southdown will be at the Victoria Hotel, Latimer Road on March 7, to hear G8AAI giving his well-known talk on Amateur TV. Looking rather further into the
future, we must advise you all to contact the Hon. Sec. for the details of the venue for future dates—there is a change of Hq, in the offing we gather.

**Cray Valley** will be in session on March 3, at the United Reformed Church Hall, 1 Court Road, Eltham, on March 3 for another of their famed Junk Sales; and on 17th there will be the informal, at the same address.

Passing on to **Reigate** we see their Hq. address is the Constitutional Centre, Warwick Road, Redhill, and the booked date is March 15 at 2000 sharp; the speaker will be G3GVV and his theme the work of the IARU in the context of the World Administrative Radio Conference in 1979. March 1 is set down for their Natter Nite, at the Marquis of Granby, Hooley Lane, Redhill.

Our next is a group who are part of the **Royal Navy club**; they are based on HMS **Belfast**, and as most people will know, the **Belfast** is moored as a floating museum in the Pool of London, almost opposite the Tower. They have their normal club activities, but in addition they will be operational from the ship between April 8-17—the Easter period. For more details on the group, contact the Hon. Sec.—see Panel.

At **Verulam** they have a regular place at the Market Hall, St. Albans on the fourth Thursday in each month; March 24 for a Film Show. The informals take place at the R.A.F.A. Hq., Victoria Street, St. Albans, on the second Thursday in each month.

The **Brains Trust** is revived—shades of Prof. Joad! This version is all to do with Amateur Radio, and was the programmed item for the **Surrey** group, on February 2. It is a scheme for self-entertainment that could well be used by any club with a hole in their programme. Looking on to March at T.S. Terra Nova, 34 The Waldrons, Croydon, where they will foregather on March 2—the programme being as yet not announced; there is another meeting in their programme each month, but as there appears to be a misprint in the Newsletter now to hand, we feel it best for you to refer to the Hon. Sec. at the address in the Panel.

The **Association of Sheffield** clubs produce a common newsletter and hold joint meetings on occasion; from the latest copy of the Newsletter we hear that the University club has revived, holding lunchtime meetings at the Red Deer off Mappin street at lunchtime on Wednesdays; while the **Polytechnic** lads have Thursday evening in their shack on the third floor of the Phoenix in Charles Street. The **Sheffield** club are based on the Sheaf House Hotel, Bramall Lane—details from the Hon. Sec.—while the **Worksop** group are in session every Thursday evening at the Anchor Inn.

At **Melton Mowbray** things have been overshadowed by the recent death of their member G3FDF—a founder and at one time Hon. Sec. of the club there. The suggestion has been made that a trophy be purchased and named in his memory, and at the time of writing thoughts were being turned to the precise way in which the honour of holding the Trophy could be decided each year. Turning to the group meeting, the next one will be on March 18, by a member of the Wireless World staff, telling them about production of a magazine. The venue, as usual will be the St. John Ambulance Hall, Asfordby Hill, Melton Mowbray.

It seems quite a while since we last heard from **Sheffield**, who were at one time as regular as clockwork with their reports; however, they assure us, they are still very much alive and kicking, still in the Church Hall, Ampthill, Sheffield (this must be one of the easiest club addresses in the country to find), and still on a weekly basis. March 3 is set aside for a planning session for Field Day, and a spot of inventory checking for good measure, and on 10th they have their favourite “mini-lectures” programme. March 17 is down for a Quiz by G3EUS, and on 24th there will be a Junk Sale; rounding off the month on March 31, there will be an exhibition/demonstration/discussion on members equipment. A final comment by the Hon. Sec. indicates that they are open to have their arms twisted by hopefuls wishing to give them a talk; and he also adds that if there is anyone who would like to attend but cannot for want of transport, will they please get in touch with him and he will see if anything can be done. The address for this generous offer is to be found in the Panel.

Our next stop is up at **Chester** where the group are based on the Chester YMCA, where they get together on the 2nd, 3rd and 4th Tuesdays in each month. Since they have just gone through an AGM, the new committee is at the time of writing still fixing up the programme of events, for the latest on which we have to refer you to the Hon. Sec. in the address shown in the Panel.

Last month saw **Wakefield** indulging in a spot of self-criticism through answers to a questionnaire; this month they have March 1 for a Ragchew session, and 15th given over to a talk by G3TDZ; all of course at Ings Road School, Wakefield.

Over now to **Bishops Stortford**, where the problem of an Hon. Sec. was solved at the AGM by electing two of them! It might have resolved their problem but it added one for us, so your scribe tossed a penny for which one to include on his card-index. As to the club, they continue to foregather at the British Legion in Windhill; 7.30 in the bar for a nominal start, up in the Committee Room at 8. Adequate parking exists on the left as you go up the hill, and as for finding the gang—straight through the outside door, through the double doors into the bar and listen for radio talk! And, if you are too late to find them in the bar, then straight up the stairs and turn right at the top into the Committee Room.

More than once your scribe has commented on the way clubs with YL members always manage to lumber the ladies with a task; this fate has befallen **White Rose's** G4EUI, who is custodian for the White Rose Award. As for the Club, they have their own place at 83 Town Street, Armley, Leeds 12, where they are “at home” every week on Wednesday evening.

Still in that general area, we come to **Northern Heights**, at the Peat Pitts Inn, Ogden, Halifax, on alternate Wednesdays; but the Newsletter omits details of the goings-on (or should it be “goings-off” up there?) at each meeting. This being so we must pass you on to the Hon. Sec.—see Panel.

The **Wessex (Bournemouth/Poole)** group have now moved to their new venue at the Dolphin Hotel in Holdenhurst Road, where they will be in session on March 4 and 18; on the first date G5HD will be talking about VHF contest planning while on the later date the theme will be the SWL’s, with some attention also being paid to those who are interested in CW operation.
Our next stop is with East Lancs, from whom we have not heard for years—but the handwriting on the report is much more familiar having been last heard of from 5N2-land. Eric is now G4DGR, and his QTH is shown in the Panel, under East Lancs. He tells us that the venue is the YMCA in Blackburn, on the first Thursday in each month; the March date shows a Junk Sale, with April for a Quiz evening—East Lancs v. Preston with Bury setting the questions.

Stourbridge are to lose their Newsletter Editor this month—after a slightly shaky start a year ago he was beginning to really swing; and he can be proud of his record of coming out on time. What a pity he has had to give up; but studies and career must always come first. 

April for a Quiz evening—East Lancs v. Preston with the YMCA in Blackburn, on the first Thursday in April. 

Moving along a bit we next come to Wolverhampton, who notify that as of last October, the Hon. Sec. has moved to the Roxeth Community Centre, Scott Crescent, West Harrow, Middx.

On to Harrow where big things seem to be happening; the AGM has thrown up a new Hon. Sec., and in addition they have moved Hq. to the Roxeth Community Centre, Scott Crescent, West Harrow, Middx.

Down West again, to Yeovil, where they have every Thursday; details from the Hon. Sec. as to the venue, but we can say that G8AVR has the first, third and last dates in March for talks respectively titled “Speak to me only with your PI’s—How to bring your computer to life” on to “Big fleas and little fleas—the progress of miniaturisation,” and finally “The computer under the stars, 1984”:

- on March 10 G3MYM talks about QSL Card design, and on March 24 there is a trip out to the Control Tower at R.A.E. Yecovilton.

- Having had a fine Wine and Cheese Party last month, the Bangor lads are back at the Redcliff Hotel on Friday, March 4, for a talk on the development of the Electricity Supply Industry in Northern Ireland.

Microwaves will be the topic for Milton Keynes on March 14, with G3WKL doing the honours on this interesting subject; the spot to aim for is the Loyal Hall, Silver Street, Newport Pagnell. Looking onwards a little their April date falls at a time when the Loyal Hall is closed for the Easter Monday; so there will instead be a Social Evening in the Rose and Crown, which is also in Silver Street.

A.R.M.S. are of course the group for the Mobile types, whether licensed or SWL; their M.C.A. is the equivalent of DXCC, and it is interesting to notice that the leader has 262 countries confirmed—which isn’t a bad score from a home station chasing countries, at that! The name and address of the Hon. Sec. appear in the Panel.

Then there is the G-QRP Club—which we now believe could well shed its “G” as it has become so international in its membership, with over 250 on the books now, a very fine newsletter with lots of interest for the technical types, as well as the operating-only gang. Well worth the cost of a subscription.

Worthing lads have a base at the Adult Education Centre, Union Place, Worthing, every Tuesday evening, the kick-off being set for 8 p.m. On March 8 there is a Construction Contest, and on 15th a Ragchew evening; March 22 is down for a talk on Construction Techniques. Any further details may be obtained by dropping a line to the Hon. Sec. at the address in the Panel.

Up at Nottingham, things are also on a weekly basis. March 3 is down for a Forum—a popular item with the group but one that has never been described to us. On 10th, there is to be a talk on RTTY by A. Pollock, with an Activity Night on 17th. “The one that got away” comes in for consideration on March 24, referring in this context to the home-brew gear that didn’t work (!); and on 31st there is a Junk Sale. Whilst that is it for March, perhaps we should mention that April 7 is the date set for the AGM.

New Clubs

Our first stop in this group is the Kent Coast set-up, based on the Grosvenor Court Hotel, First Avenue, Eastern Esplanade, Cliftonville, Margate. It is here you go on March 10, when G8DHJ will be talking about the transmission and reception of Colour TV.

Our second stop is in Ormskirk; here the position...
at the moment is that the group get together in each other's homes, taking it in turn to be host, to a full assortment of A and B licensees and SWL's—and they say they could do with a few more members! This sounds good, but of course it means that it is only courteous to get in touch with the Hon. Sec.—see Panel—before planning a visit.

Old friends are back again at Hull in more ways than one; the group itself used to be regular reporters to this piece, and the new Hon. Sec.—see Panel—used to write to CDXN regularly before he went on an extended trip to ZS-land, from which he has evidently returned for a while.

No messing about with the Derby scribe; if you took just one word out of his offering, you would lose some useful information! For March he sees things as: March 2 for a Surplus Sale, and a Night on the Air on 9th; then the all-important AGM comes up on March 16. On March 23, instead of the normal meeting, everybody goes off to a lecture by Dr. Saxton, given at St. Helens House. Finally there is March 30, for a “Technical Topics” evening.

Now we have Aberdeen, who have recently been modulating Radio Aberdeen, and getting mentions in various publications, certainly seem to be livening things up in their part of the woods. March 4 is a Junk Sale, while on 11th, GM3ZBE will be giving a simple explanation of SSB, AM, and FM. March 18 sees Bill Williams talking about recent building projects, and on 25th, J. Gall is to talk over the problems he ran into and overcame in building a counter. All these are in the hall at the rear of 91 Crown Street, Aberdeen; if you are going down Crown Street, take the second on the left; the entrance to the hall is at a blue door in the lane on the right-hand side. On an entirely different tack, the club included with the newsletter, minutes of a meeting of the Central Scotland FM group held at Wrangholm Hall in Motherwell, called by the Mid-Lanark group. If these minutes are to be taken as a correct record of what transpired, then there is a moral to be drawn. It seems the repeater license had been held since May 1976, and the existing committee could not promise the repeater would be operational within even two years—a new committee was then elected and the machine was testing on the air within six days and fully operational within fourteen days from the date the new committee was elected to office. The moral to be drawn from this is clear to all clubs sitting at their AGM's and voting people into office for the next year, and it is very simply this. There is no good whatever in electing someone just because he is too soft-hearted to refuse to take on a task that is beyond him, and if you do, the club, just like a company, will die of inanition. If this happens, don't blame the chap you shotgunned into office because you have asked of him more than he can give. A democratic organisation, like any other, requires someone to lead; and leading people often means you have to be dictatorial if the enterprise is to be a success; if the dictator is benevolent, you have a happy group of people, if he is motivated by selfishness you have the “dictatorship” against which the Second World War was fought. That was won, in the event, because this country at that time had a man who was a tougher dictator than the one in Germany, and at the same time was motivated by the best interests of the world at large rather than pure selfishness taken to the point of Hitler's mania.

Scotland is well to the fore this month—our next letter is from the newly-formed Edinburgh and District gang, who are based on Hq. at the City Observatory, Catton Hill, where they foregather every Tuesday evening; it is requested that should you wish to look in on them you contact the Hon. Sec. at the address in the Panel.

At Southgate the Newsletter cover has received a face-lift; but it still doesn't tell us that they get together at the Scout Hut, Wilson Street, on the second Thursday in each month—lucky we happen to know that much, even if the crystal ball doesn't tell what will actually happen! But, never mind, the Hon. Sec. will be delighted to tell you—get in touch with him at the address in the Panel.

Torbay next, and the Annual Dinner and Dance on Saturday, March 12, at the Templestone Hotel, Torquay. As for the regular meeting, that is down for Saturday March 26, subject to be arranged, at Hq., Bath Lane, rear of 94 Belgrave Road, Torquay.

A new variation on Murphy's Law is expounded by the scribe at Edgware, who claims that all deadlines expire two days before you thought they did! However, be managed to get in (by the skin of his teeth!) with the information that March 10 and 24 are the dates, and the venue the usual one at the Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware.

Now a couple of Brummies come to the top, sent in by the same scribe—which leads us to hope the clubs split the savings in postage fifty-fifty! South Birmingham first; the shack is open every Friday evening for a Construction-and-Natter Night, and on Wednesday, March 2 there will be either a Film Show or a Test Equipment lecture by G4ELO. Hq. is at Hampstead House, Fairfax Road, West Heath, Birmingham B31.

The other group is Midland who have March 1 and 29 at Brasshouse Centre, off Broad Street, for Construction Nights; plus March 15 when G8AMD and G8FTU will be talking about 70 cm. Repeaters, at the University of Aston, Gosta Green.

Sign-Off

We have already discussed the routine for locating your deadline in the preamble to this piece, at March 4 arrival, latest, addressed to your Club Secretary, Short Wave Magazine, 34 High Street, Welwyn, Herts., AL6 9EQ.

See you all next month!

Late Flash

Just as this piece was being finished, a telephone call reached your conductor from Welwyn, to let us know that last time round we “got it wrong” as to the Surrey club routine—giving only one of their two dates for the month and placing that on the wrong day. Since they took the trouble to ring us and point this out, we read between the lines that someone turned up on the wrong night and found no meeting; and that is a situation which is not very pleasant either for the club itself or the visitor or potential member who was unlucky. We can only hang our heads in shame, and say we try never to slip-up like this; and we hope the potential member will not blame the club officials who are among the most regular and reliable reporters to this feature. Sorry, chaps.
Not just another new firm, but people with a wealth of technical experience and know-how, relating to amateur radio techniques, requirements and servicing—who will always be pleased to advise and assist in all respects, whether it be Sales, Service or Information.

To all our amateur friends who have dealt with us in the past we extend a welcome and invite you to call and see us at anytime. We are easy to find on the A577 Wigan/Ormskirk Road, ½ mile from M6 Motorway, Junction 26.

See us for your requirements of:
- **YAESU**: HF and VHF Receivers, Transceivers, etc.
- **UNIDEN**: HF and VHF Transceivers.
- **ELECTRONIC DEVELOPMENTS**: VHF Transvertor Liners, Wavemeters, etc.
- **J BEAM LTD.**: VHF Antennas
- **HY GAIN**: HF Antennas
- **C.D.E.**: Rotators.
- **BELCOM**: VHF Transceivers.
- **S.S.M.**: VHF Converters, Transvertors, etc.
- **WESTERN ELECTRONICS**: Antennas, Multiband Traps, Antenna Switch, Towers, etc.

**PART EXCHANGES WELCOME**

**S.A.E.**
**ALL ENQUIRIES**
**H.P. AND CREDIT TERMS**

---

**AMATEUR RADIO EXCHANGE**

**PROPRIETORS: BRENDA APTAKER, BERNARD GODFREY (G4AOG)**

The Aladdin’s Cave for the enthusiast, with a secondhand selection that is second to none. Converters, Transverters, Transceivers (HF/VHF/UHF). Receivers, Linear Amplifiers, Power Supplies, Rotators and much, much more. . . . Come and browse. . . . Come and buy. . . . Come and have a cup of Brenda’s coffee either way!

**JUST IN ★ TERMIPRINTER 5 plus VDU—as new**
**★ Good secondhand equipment always wanted**
**★ plus**

**NEW EQUIPMENT:** Yaesu, Icom, Standard, FDK, Swan, Microwave Modules, QM70, Antenna Specialists, Bantex, Jaybeam, KW, Hy-Gain, etc.

**★ NOW IN STOCK ★**
- ICOM IC202, IC215, IC240
- YAESU FRG7 and FT101E
- MULTI UII and U11
- TRIO R300

Phone for full details of current stocks and opening hours
NEW PRODUCT

UP-CONVERTER

MODEL UC/1

SYNTHESHER CONTROLLED GENERAL COVERAGE RECEIVING ADAPTOR PLUS TWO-METRE CONVERTER FOR RECEIVERS COVERING 28-29 MHZ AND/OR 144-145 MHZ

Model UC/1 converts any existing amateur-bands-only receiver which has coverage of 28-29 MHz or 144-145 MHz (e.g. HF bands receivers or transceivers and 2-metre "all-mode" transceivers) into a general coverage receiver with equivalent high performance.

Compared with the alternative of purchasing a separate receiver for general coverage, Model UC/1 avoids wasteful duplication and gives better performance for less outlay.

FEATURES:

- Gives complete no-gap coverage from 90 kHz to 30 MHz, 30 MHz, in thirty switched 1 MHz bands.
- Also operates as a 2-metre converter with receivers covering 28-30 MHz.
- Two separate outputs are provided, one for 144-145 MHz and the other for 28-29 MHz receivers.
- No receiver modifications are required. Model UC/1 simply connects in series with the aerial feeder.

- Overall performance is limited primarily by that of the main receiver.
- Straightforward digital switch selection of the desired 1 MHz band segment eliminates critical adjustments such as "tuning for lock."
- Built-in aerial attenuator.
- Frequency synthesiser locked to 1 MHz crystal.

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

Data Sheet for UC/1 available free on request. Also available: Frequency-Agile Audio Filter Model F11; Universal RF Speech Clipper, details on request, or refer to our advertisement in December's issue.

DATONG ELECTRONICS LTD.

11 MOOR PARK AVENUE  •  LEEDS LS6 4BT  •  TELEPHONE 0532-755379

LEE ELECTRONICS LTD.

01-723 5521  CLOSED THURSDAYS  •  G8JVL

400 EDGWARE RD., PADDINGTON, W.2

LONDON'S LEADING STOCKISTS OF  •  YAESU  •  ANTENNA SPECIALISTS  •  STANDARD  •  ICOM  •  BANTEX  •  JAYBEAM  •  REVCO  •  QM70  •  ETC.

SPECIAL EXCLUSIVE OFFER

Perspex Dust Covers designed and manufactured by us to keep your Yaesu equipment in mint condition.

Suitable for Models FT101, 101B, FL101, FR101, FT201, FT102, FL2100, FT277, FT288A, FRG7, etc. Price £4.00 each inc. VAT. Carriage 45p.

FT301, FT221, FT220, FT320, £3.00 each inc. VAT. Carriage 45p.

MICROWAVE MODULES (ALL MODELS IN STOCK):

MMD.432128 70cm. Transverter (+ P. & P. at 50p) £97.00

MMD.144/28 2-metre Transverter (+ P. & P. at 50p) £79.00

MMD.144/144 Transverter (70cm. to 2 metres) (+P. & P. P. 50p) £133.00

SPECIAL OFFER

A.T.P. Electronics. Ex-Computer, fully stabilised. DC power supply 6V. to 30V. DC at 5 amps (+8% VAT) £18-00

Ideal for working your mobile rig at home. CARRIAGE £1-95

ALL PRICES + VAT

Will customers kindly note that we will be closed from 6th to 20th April inclusive for Easter holidays and Stocktaking.

SE Habla Español
R. T. & I. ELECTRONICS LTD.

where equipment is fully overhauled

TRIO 9R-39DS. Receiver ... ... ... ... £65-00 (£3-00)
TRIO JR300. Receiver ... ... ... ... £75-00 (£3-00)
TRIO GR666. Receiver ... ... ... ... £100-00 (£3-00)
EDDYSTONE 840C. Receiver ... ... ... ... £80-00 (£3-50)
HAMMARLUND HQ170A. B.S. Receiver ... ... ... £180-00 (£4-00)
R.C.A. AR856L. Receiver ... ... ... ... £40-00 (£4-50)
R.C.A. AR85D. Receiver ... ... ... ... £90-00 (£4-50)
YAESU FRD400. Receiver ... ... ... ... £150-00 (£4-00)
KW 201. B.S. Receiver ... ... ... ... £130-00 (£4-00)

Linor 2. Transceiver with mike ... ... ... ... £120-00 (£1-50)

We are MAIN DISTRIBUTORS for AVO, MEGGER, TAYLOR and LINER 2. Transceiver with mike.. K.W.20I. B.S. Receiver
R.C.A. AR88D. Receiver
R.C.A. AR85I6L. Receiver
TRIO QR666. Receiver
TRIO 9R-59DS. Receiver ... ... ... ... ...


Terms: C.W.O., Approved Monthly Accounts, Hire Purchase
Carriage for England, Scotland and Wales shown in brackets,
and secondhand, except Test Equipment which is

NOTE : 123% VAT must be added to all prices, new

tion without notice.

YAESU MUSEN FT -22I -R Transceiver
S. G. BROWN'S HEADPHONES. Type "F" 120 ohm, 200 ohm, 400 ohm

antenna specialists

THE ULTIMATE CHOICE

ANTENNAS FOR EVERY REQUIREMENT FROM 27 - 512 MHz

Listed below are examples from their wide range of products.

AP201
1W, 108-512 MHz mobile ant. (plus 75p P.P.) £3-23

AP629
1W, 130-174 MHz 3 dB gain, DC grounded mobile ant. (plus 75p P.P.) £6-61

AP677
1W, 140-174 MHz 3 dB gain mobile ant. (plus 75p P.P.) £13-51

AP642
1W, 420-440 MHz 3 dB gain mobile ant. (plus 75p P.P.) £16-91

AP667
425-440 MHz 5 dB gain Collinear mobile ant. (plus 75p P.P.) £18-30

AP799UK
425 MHz Hi-Band Splitter £18-45

AP619
No hole boot mount, suitable for AP201, AP677, AP667, easily adaptable for use with AP629 (plus 50p P.P.) £1-70

AP332
Gutter mount suitable for use with AP629, AP639, complete with 10" RG-SBU cable and PL-259 connector ... (plus 50p P.P.) £8-09

AP332
Gutter mount suitable for use with AP677, AP667, easily adaptable for use with other antennas. Complete with 10" RG-SBU cable and PL-259 connector ... ... (plus 50p P.P.) £6-19

New Magnetic Mount
Pits AP629, AP639, AP677 and AP667. Complete with 10" RG-SBU cable (plus 50p P.P.) £6-19

AP655
130-174 MHz 1W 3 dB Gain DC grounded base station ant. Complete with mounting brackets for masts up to 18" O.D. Available Now (plus 75p carr) £14-44

AP659UK
425-440 MHz 5 dB gain, base station collinear. Power capability 100W. Termination female "N" type connector. Complete with mounting brackets for masts up to 18" O.D. Available Now £15-49

AP686UK
350-440 MHz 6 dB gain base station collinear. DC grounded, power capability 350W. Length approx. 12'. Weight approx. 4 lbs. Rated wind velocity 118 mph. Termination Male "N" type connector £47-25

AP670UK
625-440 MHz 12 dB gain DC grounded base station collinear, Power capability 250W. Length approx. 18'. Weight approx. 9.5 lbs. Rated wind velocity 128 mph. Termination Male "N" type connector. Available now (plus £20.00 carr) £105-00

NEW !!

Helical Ants. for the following portables ;
Tri Tone 2200X ... ... ... ... ... (plus 40p P.P.) £3-85
Tri Tone 2320 ... ... ... ... ... ... ... ... ... ... (plus 40p P.P.) £3-35
Icom IC215 ... ... ... ... ... ... ... ... ... ... (plus 40p P.P.) £3-85

Please add 12.5% to above prices for VAT

FREE SHURE MIC. WITH ANY KW TRANSMITTER OR TRANSCEIVER PURCHASED

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.


TRIO EQUIPMENT.

New Trio R-300 Receiver, in stock £164-00 (3-00)
All Bands with stax calibrator.

SHURE MICROPHONES, 526T, £27-80 (£1-00); 445, £28-00 (£1-00); 414A, £18-00 (£1-00); 414B, £48-00 (£1-00), Full details on request.

KEYNICTORS, piano key connector unis, £4-25 (40p). Trade enquiries welcome.

VALVES. Please state your requirements.

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

TNK METERS : TM500, £19-75 (75p), TW20CB, £33-75 (50p), TP5SN, £14-50 (50p), Model 700, £39-75 (50p), also cases for same.

PHILIPS PM2403 ELECTRONIC MULTIMETERS, £85-00 (£1-00), etc., etc.
We also supply PHILIPS & LABBEAR colour TV TRS.

K.E. EQUIPMENT : Don't forget your FREE mic. with every Trio. and Trec. 1) KW200E & P.S.U., £32-00 (£5-00); KW202, £210-00 (£2-50); KW304, £230-00 (£3-00); KW300 Linear, £220-00 (£4-00); KW107, £68-00 (£5-00); KW E-Z MATCH, £23-00 (£5-00); KW208 monitor Scope, £58-00 (£5-00); Speaker for KW202, £18-00 (£3-00); KW305, £90-00 (£5-00); KW antenna Switch, £16-00 (£5-00), etc.

Ashville Old Hall, Ashville Road, London E11 4DX Tel. 01-539 4986
NEAREST STATION: LEYTONSTONE (Central Line)
J. BIRKETT
Radio Component Suppliers

25 THE STRAIT . LINCOLN . LN2 1JF

Telephone: 20767

6 TO I REDUCTION BALL DRIVES 2" Spindle at 55p each
3" Dia. CERAMIC ROTARY SWITCHES. 1 Pole 11 Way 2 Bank. £1.80 each
2 Amp R.F. CHOKES. Wire Ended at 6 for 50p
TANTALUM BEAD CAPACITORS. 34uf 10v.w. £1.15 each, 4uf 10v.w. 75p each
20 MULTITURN TRIMPOTS. Assorted for £1.20
MINIATURE SILICON DIODES. Assorted Voltages 100 for £1.20
DUAL GATE MOS FET'S like 4067 at 38p, 33p for 40, 13p each
MICROPHONE CAPSULE

25 THE STRAIT . LINCOLN . LN2 1JF

Telephone: 20767

6 TO I REDUCTION BALL DRIVES 2" Spindle at 55p each
3" Dia. CERAMIC ROTARY SWITCHES. 1 Pole 11 Way 2 Bank. £1.80 each
2 Amp R.F. CHOKES. Wire Ended at 6 for 50p
TANTALUM BEAD CAPACITORS. 34uf 10v.w. £1.15 each, 4uf 10v.w. 75p each
20 MULTITURN TRIMPOTS. Assorted for £1.20
MINIATURE SILICON DIODES. Assorted Voltages 100 for £1.20
DUAL GATE MOS FET'S like 4067 at 38p, 33p for 40, 13p each
MICROPHONE CAPSULE
Get the Optimum from your Rig

-STOP MISTREATING IT!

Match your antenna system to the PA stage with a KW 107 - observe your TX 'Waveform' with a KW 108

KW 107 ANTENNA TUNING SYSTEM

Incorporates E-Z match, SWR/RF Power meter dummy load. Antenna switch. High power version KW 109 is available.

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.

Optimum Performance Receiver

KW 108 MONITOR SCOPE

Monitor your transmissions 10-160m. Two-tone test generator incorporated to ensure optimum linearity for SSB.

KW 107

KW 108

KW 202

Communications Products
DECCA COMMUNICATIONS LTD
Crampton's Road, Otford, Sevenoaks Kent, TN14 5EA. Tel: Sevenoaks (0732) 50911

S.S.M. SOLID STATE MODULES

63 Woodhead Road, Solid, Lockwood, Huddersfield, HD4 6ER

Telephone 0484-23991

Manufacturers and Suppliers of Communications Equipment

NEW SOLID STATE EUROPA B

2 Metre or 4 Metre Europa B

* 200W drive input 50% efficiency.
* 2dB N.F. gain on receive.
* -80dB spurious responses.
* Price £97.78 + VAT = £110.00.

EUROPA COMPLETE POWER SUPPLY TYPE CPS10

Price: £40.00 + VAT = £45.00

SENTINEL 2 METRE CONVERTER KIT 28-30 MHz IF only. Price: £115.00 + VAT = £121.75. A well proven kit supplied with printed circuit board, drilled and with all coils mounted to make assembly easy. If it doesn't work, send it back with £25 and we will fix it...

SENTINEL X 2 METRE CONVERTER

Contains a mains power supply and a front panel RF gain control. Stock 2-metre IFs: 2.4 MHz, 4.6 MHz, 28-30 MHz. Price: £220.00 + VAT = £247.50.

SENTINEL M.F.

Another Dual Gate MOSFET converter which converts to medium wave in two switched bands. Price: £185.00 + VAT = £208.89.

SENTINEL 70 70cm. to 2 metre FET converter. N.F. 3dB, gain 30dB. Price: £418.00 + VAT = £463.89.

SENTINEL H.F. PRE-AMPLIFIER

A wideband pre-amplifier covering 1-40 MHz, gain 15dB, N.F. 1dB. Input and output Z 50ohms, supply 12v. (9-15v.). The box size is 24" x 7" x 11" and an internal clo relay allows the unit to be inserted in a transceiver aerial lead, and is also used to switch the pre-amp out of circuit. Price £9.00 + VAT = £10.12.

THE PA10 printed circuit board version of the above—less clo relay. Twin paddle key to complement our keyer. Price: £20.00 + VAT = £23.75.

NEW SOLID STATE EUROPA 70

70cm. input and output 1500 ohms. Price: £28.00 + VAT = £31.50. Ex-Stock.

SENTELHM LS MATCH. 80-10 metres matches 15-5000 ohms, 2kW at 50 ohms. Size 8" x 4" front panel, 7" deep. Price: £28.00 + VAT = £31.50.

SSM 2 MATCH.

80-10 metres matches 15-5000 ohms, 2kW at 50 ohms. Size 8" x 4" front panel, 7" deep. Price: £28.00 + VAT = £31.50.

SSM AMBIG MORSE KEYER

CMOS circuit for use with "Squeeze" or single paddle keys. Price: £38.00 + VAT = £43.74.

THE ACCESS BARCLAYCARD

We offer same day COD (£50 limit). Just phone your credit card number for same day service. 12 month guarantee on all units. 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 collect or inspect equipment. Paul G3MXG.
Can YOUR Antenna do all this?

You've read our ads with their recent testimonials and user histories—so this month we thought we'd remind readers of the selling points of the

JOYSTICK VFA (World Patents)

- Only 7' 6" long, comes in 3 easily assembled sections.
- Tunes 5-30 MHz, no gaps.
- Matching Antenna Tuner.
- No harmonic resonances—means that the highest efficiency transfer of power and waveform from TX to ether takes place. In turn this ensures that TVI and other spurious emissions are just not substantially present.
- Low angle radiation as an effective ground plane—that husbanded power goes on to reach destination with the least number of loss-making skips.
- Gives receiver additional front end selectivity and gain—reduces cross-mod and out of band blocking.
- Your installation can be "tailored" to space available. Install VFA on mast or chimney or in roof space with a long or short feeder—or SIMPLY STAND IN THE SHACK. One delighted user proved his VFA by operating FROM A BASEMENT!

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

SYSTEM 'A' £32.40
250w.p.e.p. OR for the SWL

SYSTEM 'J' £38.60
500w. p.e.p. (improved 'Q' on receive)

PARTRIDGE SUPER PACKAGES
COMPLETE RADIO STATION FOR ANY location
All packages feature the World Record Joystick Aerial (System "A"), with Bx. feeder, all necessary cables, matching communication headphones. Delivery Securicor our risk. ASSEMBLED IN SECONDS! — BIG CASH SAVINGS!

PACKAGE No. 1 As above with R.300 RX
SAVE £18-77!

PACKAGE No. 2 Is offered with the FRG7 RX. SAVE £13-87!

PACKAGE No. 3 Budgets may come and do their worst—so here is a lower-price, high-quality package, featuring the all solid state SMC 73 Rx., with the Partridge extras. SAVE £26.05 PLUS!

RECEIVERS ONLY, inclusive delivery, etc.
R.300 £184.50 FRG7 £167.06 SMC73 £128.81

Phone 0843 62535 (or 62839 after office hours) or write for details—send 84p stamp

NOTE: All prices are those current at time of closing for press, inclusive of then current VAT and carriage.

BOX 4, PARTRIDGE HOUSE, PROSPECT ROAD, BROADSTAIRS, CT10 ILD. (Callers by appointment).
Become a radio amateur.

Learn how to become a radio amateur in contact with the whole world. We give skilled preparation for the G.P.O. licence.

Brochure, without obligation to:

BRITISH NATIONAL RADIO & ELECTRONICS SCHOOL,
P.O.Box 156, Jersey, Channel Islands.

NAME
ADDRESS

(8 bit)
P.M. ELECTRONIC SERVICES

VAT—PRICES EXCLUDE VAT WHICH SHOULD BE ADDED AT THE HIGHER RATE (12½%) FOR ITEMS MARKED (H) AND AT THE LOWER RATE (5½%) FOR ITEMS MARKED (L)—OVERSEAS ORDERS (inc. Eire and Channel Islands) NO VAT CHARGEABLE

2M TX & RX CRYSTAL AVAILABILITY & PRICE CHART

CRYSTAL FREQUENCY RANGE

USE (Tx or Rx) and HOLDER

OUTPUT FREQUENCY

144.000 MHz
144.100 MHz
144.200 MHz
144.300 MHz
144.400 MHz
144.500 MHz
144.600 MHz
144.700 MHz
144.800 MHz
144.900 MHz
145.000 MHz
145.100 MHz
145.200 MHz
145.300 MHz
145.400 MHz
145.500 MHz
145.600 MHz
145.700 MHz
145.800 MHz
145.900 MHz

PRICES: (a) £2.36
(b) and (c) £2.90 + VAT (H).

AVAILABILITY: (a) and (b) Stock items, normally available by return (we have over 4,000 items in stock).
(b) Four weeks normally but it is quite possible we could be able to supply from stock.

M.B. frequencies as listed above but in alternative holders and/or non stock loads are available as per code (b).

ORDERING. All we require to know is (1) Output frequency, (2) Crystal frequency range, (3) The Holder and, (4) Either the Load Capacitance (pf) or equipment.


CONVERTER/TRANSVERTER CRYSTALS—HC8/U

All £1.00 + VAT (H). 38-666 MHz (144/28), 42 MHz (70/28), 58 MHz (144/28), 70 MHz (144/41), 71 MHz (432/52), 95 MHz (432/52), 96 MHz (1006/321/52 101 MHz (432/52) and 105 MHz (432/52). £2.95 + VAT (H).

CRYSTALS SPECIALLY MANUFACTURED FOR AMATEUR USE TO CUSTOMERS REQUIREMENTS

Now supplied to our new improved amateur specification (temp tol ±30ppm, freq tol ±25ppm, adj tol ±25ppm) as follows

(21-105 MHz) to series resonant conditions unless otherwise specified. For details of closer tolerance crystals please send S.A.E.

TERMS: CASH WITH ORDER—MAIL ORDER ONLY—S.A.E.

RADIO AMATEUR PREFIX-COUNTRY-ZONE LIST

published by GEOFF WATTS

The List you have always needed, the list that gives you everything, and all on one line 1. For popular prefixes...
CREATE YOUR OWN REFERENCE LIBRARY

The "EASIBINDER" is designed to bind 12 copies of the Magazine as you receive them month by month, eventually providing a handsomely bound volume for the bookshelf.

No need to wait until twelve copies are assembled. As each copy is received, it is quickly and simply inserted into the binder. Whether partially or completely filled, the binder is equally effective, giving the appearance of a book, with each page opening flat.

Strongly made with stiff covers and attractively bound in maroon Rexalon and Milskin, the binders have only the title gold-blocked on the spine and the date frame.

Price £1.75 (incl. P & P)

PUBLICATIONS DEPARTMENT
SHORT WAVE MAGAZINE
34 HIGH STREET,
WELWYN,
HERTS. AL6 9EQ

Subscription rate to Short Wave Magazine is £4.80 for a year of twelve issues, post free.

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 aerials; reception techniques.

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

160 pages £3.30 inc. post

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

HAM RADIO
A BEGINNER'S GUIDE
by R. H. Warring

Written by a well-known author, this book deals with transmitting and receiving equipment; its installation and maintenance; the operation of amateur stations; call signs; amateur transmitting licences; Morse Code transmission described in detail.

Excellent reading for those wishing to gain a sound knowledge of Amateur Radio without the need to become too technically expert.

152 pages £2.50 inc. post

Publications Dept.,
Short Wave Magazine Ltd., 34 High Street,
Welwyn, Herts. AL6 9EQ. Tel: Welwyn (04387)5206/7

BUTTERWORTH TITLES NOW IN STOCK...

The Practical Aerial Handbook, 2nd Edition
by Gordon J. King
232 pages (Hard Cover) £6.10 inc. post

Foundations of Wireless and Electronics, 9th Edition
by M. G. Scroggie
521 pages (Soft Cover) £4.40 inc. post

Radio and Electronic Laboratory Handbook, 8th Edition
by M. G. Scroggie
614 pages (Hard Cover) £8.65 inc. post

Available from Publication Dept.

Short Wave Magazine Ltd.
34 High Street, Welwyn, Herts. AL6 9EQ
SMALL ADVERTISEMENTS

"SITUATIONS" AND "TRADE"

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., 29 High Street, Welwyn, Herts., AL6 9EE.

TRADE


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

Radio Amateurs Examination City & Guilds. Pass this important Examination and obtain your G3 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 25p extra. No responsibility accepted. Add 50% for Bold Face (Heavy Type). Box Numbers charges payable with order.

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.

READERS

Sale: R.390A/URR general coverage receiver, fitted mechanical filter etc., in very good condition, complete with three manuals and in cabinet, £325. — Kennedy, 24 Fraser Avenue, Reading, Berks. (Tel: 0734-85222 daytime).

For sale: Hammarlund HQ-180 general-coverage amateur bandspread receiver, all modes, with notch filter, BFO, S-meter and clock, perfect condition, £120. Icom 202, 144-144.4 MHz, 6 months old, £130. Modular Electronics 15w.-output linear for Icom 202, £25. Codar AT-5 transmitter with PSU, £15. Three ‘Vanguards’ 25-AMB, only one with speaker and control box, £10 each. Carriage extra on all items. — Ferguson, GM3TRI, QTHR. (Tel: Perth 26941).

Manuals: A.510, CT-436, Mercury, CT-218, 770, R.1475, £2, B.40, CR-150/3, BC-348, £1.75. Many others. — Brooks, 5 Farrant House, Winstanley Road, London SW11 2EJ.

Sale: ‘G3ZVC’ SSB transceiver with preselector and IC’s for PA, £45. AM-25T Vanguard with control cables, £20; AM-25B Vanguard with cables, £10; both working on two-metres, Channelmaster rotator, £20. — Taylor, 11 Minehead Street, Leicester. (Tel: Leicester 854241).

TECHNICAL ASSOCIATES

COMMUNICATION AIDS

Audio Compressor * Suitable for SSB/AM/FM * pure compression, no clipping * 24 to 26dBs of compression, with less than 1% distortion * variable decay time, on front panel * variable noise gate on front panel prevents ambient noise level tripping vax or being tripped in pauses in speech * all functions routed to output in "off" position * goes between mic and tx no mods involved * these compressors have been tested alongside commercial rf clippers, the only difference at the receiving end was superior audio quality. £12.50 + VAT (12%) + 50p P. & P.

Printed Circuit Module. Supply your own case and knobs. Assembled and tested. Type A.C.I., £12.50 + 12½% VAT + 25p P. & P.

R.F. Peak and Notch Filter * no gimmicks * all integrated circuits * will clear QRM in seconds * 1 watt o/p stage * headphone socket * goes between RX and loudspeaker * by-pass switch * notch control for optimum width of notch * tone control allows you to pu the notch or peak where you want it * runs from internal PP9 battery or any supply from 9v. to 15v. * will also peak up CW signals, £24-50 + VAT (12½%) + 50p P. & P.

Printed Circuit Module including all pots and switch, Assembled and tested, £13-50 + VAT (12½%) + 25p P. & P. (Type P.N.I.)

R.F. Band Pass Filter * 9 integrated circuits * 1 watt O/P stage * headphone socket * 8 switched positions of filter * High-pass — 2.5 kHz to 2.5 kHz; Low-pass — 7 kHz to 7 kHz; Bandwidths selected for optimum readability on AM, SSB, FM, CW giving the operator control over bandwidth and QRM conditions * makes the poor RX superb and the superb RX better * runs from internal PP9 battery or any supply from 9v. to 15v. * £24.50 + VAT (12½%) + 50p P. & P.

Printed Circuit Module including rotary switch, £12-50 + VAT (12½%) + 25p P. & P. (Type B.P.I.)

XTAL Calibrator * A deluxe unit with seven ranges down to 1 kHz * Switch selected from front panel * 1 kHz, 500 Hz, 100 Hz, 50 kHz, 10 kHz, 1 kHz, 1 kHz * Radiates from its own 8 inch ant. * Markers usable from 1 MHz to UHF * Complete with ant., ready to use, just connect a 9v. battery. £19-00 + VAT (6%) + 25p P. & P.

64 CRIMPLE MEADOWS, PANNAL, HARROGATE, N. YORKS.
G. W. M. RADIO LTD.

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

A fresh delivery of BC221 FREQUENCY METERS. Complete with charts, less power supply. These are recently recalibrated, £20.

Also a few VHF version, TS174M, £37.50.


AERIAL INSULATORS. Egg type, white china, £3/6. Suitable TTL/Nixie or BC221 PSU, good used condition, £1.75.

Transmitting CAPACITORS, 1800pf twin stator, £1.50.

Reed relays for recent auto keyer designs, 200 ohm coil, £5 each plus 10p post any number.

WATCHES. G5 Smiths, sweep second hand, £20.

Lemania stop 1/5th second, £16.75.

Lemania 1062, £1.50.

MR4A6, and both types complete with control gear, £25.

AERIALS. Egg type, white china, clean and tested, £20 pair (one Rx one Tx).

ALARM CLOCKS. WEHRLE COMMANDER, large, magnificent and brand new, £170. EC-10.

Lemania stop 1/5th second, £16.75.

Bases large ceramic for 4-15 or 4-30, etc. £1.25, 829 valves with base, ex equipment, £1. Meters modern plastic type, 500v. DC or Ima DC, £1.50.

FOR SALE:

RADIO TELEPHONES

POCKET PHONES. PFI for 410 Mc/s. Clean and complete, unused because crystals removed by supplier. Less batteries. With circuit and tuning instructions, £20 pair (one Rx one Tx).

WESTMINSTER WISAM - 12p band ruggesed ex Police Motor Cycle. With accessories, £50. Unit only £30.

CAMBRIDGE AM108. Lo band with control box, no cable, £25.

ULTRA VALIANT MRA6 AM. 123 kHz Lo band. Solid state except driver and PA which are quick heat valves, £35.

COSOR COMMANDO CC 303, similar specification to the above MRA6, and both types complete with control gear, £25.

VANGUARD units only single channel valve Lo band, no accessories, £11.

PFI mains battery chargers for 12 Tx and 12 Rx batteries, £11.

L.T.T. STAR AM7 mid-band solid state, 12v. with dropper for 24v. 123 kHz. Unit weight 6 lbs, (11.5 lbs. with speaker dropper and mounting). Single channel, £20 or four channel, £37.50.

INTRUDER ALARMS. Photo electric Tx/Rx and control unit, £10.

Airline model 62 headsets, with NATO plug and very clean. £5.50.

AERIAL INSULATORS. Egg type, white china, £3/6.

Transmitting CAPACITORS, .1B 100pf twin stator. £1.50.

METERS modern plastic type, 500v. DC

UNIT weight 6-1- lbs.

Single channel, £32.50 or four channel, 137.50.

OFFERING:

CODAR AT-5 transmitter with Codar mains unit. Labgear LG-50 transmitter. Both in excellent condition, £100.

Also a few VHF version, TS174M, £37.50.

All Receivers and Test Equipment are in working order at time of dispatch. Carriage charges included for England and Wales only.

Telephone 34892.

Terms: Cash with orders. Early closing Wednesday, 40-42 PORTLAND ROAD, WORTHING, SUSSEX.

NEW!

CALL BOOK 1977

DX LISTINGS £9.55

U.S. (Only) ,, £10.20

The above prices include postage and packing.

Publications Dept.

SHORT WAVE MAGAZINE

34 High Street, Welwyn, Herts., AL6 9EQ

Tel.: Welwyn (043871) 5206/7

March, 1977

Selling: Trio R-300 with manual, Joystick VFA and ATU, five months old, mint, £100 cash. — Ring Shuttleworth, 061-643 3196.

Wanted: Heathkit Mohican Rx with handbook, and suitable mains PSU. Handbook or any information on ex-Army Rx Selective Carrier No.2 Mk.II, Cat. No. YB-05377. Any books on amateur radio astronomy. Details and price please. — Roberts, 9 High Street, Bala, Gwynedd LL23 7AG.

For sale: Henpecked amateur going QRT: IC-210, £170. EC-10 Mk.II, £100. Both mint condition. (London). — Box No. 5564, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Selling: Drake R4-B with speaker, 15 crystals, spare set of new valves and manual, mint, £215; includes Beyer dynamic earphones, Joystick and Joymatch III tuner. Buyer collects. — Harman, 3 Moreton Court, 212 Dover Road, Walmer, Kent. (Tel: Deal 64398).


Selling: Line-430, as new, few hours use only, £225. Sony Trinitron Secam TV, 819/625, VHF F2-F12, UHF 21-69, as new, £130. — Ring Lewis, Coventry 711199.


Wanted: Transceiver, preferably K.W. Must be in excellent condition, will collect within reasonable distance. Details and price please. — Harlow, G3SHL, QTHR. (Tel: Leicester 402013).

For sale: Liner-2 with PA-3 pre-amp. and QM70 70cm. transverter, £155. Must go together — bargain price. — Passfield, 30 Greenleaf Close, Tulse Hill, London S.W.2. (Tel: 01-886 6843 after 7 p.m.).

Selling: Drake SSR-1 general coverage receiver, as new, £160 cash. Buyer collects. — Ring Richards, Bodmin 3738 (Cornwall).


Selling: UHF radio/transmitter performance tester, £10. Type 51 wave form generator, £6. Mobile Pye Cambridge VHF Tx/Rx, working on 2m., with microphone, £35. BCC VHF base station transmitter, £6. AC-mains stabilised PSU. Will drive many ex-govt. equipments, £1.50. Carriage extra, s.a.e. with enquiries. — Hayward, Sunnyfields, Lighthouse Road, St. Margarets Bay, Dover, Kent.

For sale: Drake R4-C, as new in carton, with manual, only bench tested, all 10 and 160m. xtals, extra 1-5 filter, £350. Hy-Gain Model 400 rotor and control box, unused, £80. Wanted: Collins 75S-3B and 32-53 spare parts. — Box No. 5559, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.
Selling: Heathkit GC-1U Mohican general coverage receiver, £26.50. Two-metre converter, IF 4 MHz, with pre-amp. and 3-element beam, £22.50. 70 cm converter, IF 144 MHz, with pre-amp. and 4-over-4 beam, £22.50. Post paid. — Jenkins, 15 Tiltstone Avenue, Eton Wick, Berks.

Wanted: KW-500 or KW-600 linear amplifier. Details and price please. — Ring Acton, G3MBJ, Burton-on-Trent 63767.

April issue: Due to appear March 25th. Single copies at 45p post free will be sent by first-class mail for orders received by Wednesday, March 23rd, as available. — Circulation Dept. Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.


For sale: Belcom FS-1007P, 16-channel, auto-scan, base transceiver, with five repeater and nine popular simplex, auto tone-burst and narrow filter fitted by importers, 3 months old, as new, £170. **Panda ATU**, 80-10m., £45. **Heath HW-12A** 80-metre SSB transceiver, with HP-13 DC power supply, £85. — de Bono, G3NJK, QTHR. (Tel: 0533-774477).

Sale: Lowe monitor Rx, five channels fitted, unused, £35 or near offer. — King Fulcher, Norwich 55236, evenings.

Sale: KW-204, used sparingly, but with minor fault in tone osc./mic. amp. section, and slightly marked case, hence only £140. Trio JR-310 with Top Band, narrow filter, calibrator and full 28-30 MHz, £70. IC-22A, fitted eleven channels, little used and in excellent condition, £120. — Elliott, G3ZOG. (Tel: Sunderland (0783) 280080).

Wanted: AR88LF receiver in first class condition, positively no modifications. Details and price please. — Ring Glover, Farnworth 75345 (Lancs.) after 6 p.m.

Selling: Trio TR-7200G, transmit unused, original transceiver, with mount, mic., manual, 4-wave aerial and 16 crystals, £160 or near offer. — Ring Saxby, 0521-41572.

Sale: FT-DX500 transceiver, excellent condition, £220 or near offer. Liner-2 with pre-amp., also 'FB' rig, £120 or near offer. — Macleod, GM4DZK, QTHR. (Tel: 041-959 4455).

For sale: Yaesu FR-50B Rx, 80-10m., boxed with manual, little used, perfect, £75. — Ring Salt, G8LVE, 0279-20478 (Harlow), evenings.

Selling: Yaesu FRG-7, new condition, in makers' box with handbook, used very little, £135. (London). Box No. 5561, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

For sale: Drake SSR-1 Rx, boxed, in original condition, used approx. 10 hours, best offer over £170 secures. — Ferguson, 16 Erracht Road, Inverness IV2 4RE.
For sale: VHF/UHF power transistors/valves: 2N5707, £5; 2N5641, £5; BLY90, £14; QQV03-10, £3; 4CX250B, £10. Send s.a.e. for other goodies. Or will part-exchange the above for general coverage Rx (e.g. AR88, Eddystone etc.). — Mourao, 31 Chaucer Way, Colchester, Essex. (Tel: Welwyn Garden City 23434 ext. 3403, working hours).

For sale: Extendable lattice aerial, 25-ft. approx. Buyer to dismantle. Offers! — Parker, 46 Abingdon Road, Drayton (368), Abingdon.

Sale: Telford TC-10 Mk.II all-mode Tx, £60. Or Road, Drayton (368), Abingdon. Buyer to dismantle. Offers? — Parker, 46 Abingdon Garden City 23434 ext.

Buyer to dismantle. Offers? — Parker, 46 Abingdon Garden City 23434 ext.

For sale: Heathkit HW-32A Tx/Rx with AC/PSU, £52. — Heathkit, !corn, Ken, Standard, Trio and Yaesu. Groups 5 to 11-4 to 8 weeks.

LOW FREQUENCY STANDARDS (8% VAT) 100 kHz in HCI3IU 100kFls in HC6/U. Price £2.80.

Dipole II, 13, 16, 19, 25, 31 and 49 metres Price L14.25

Prices correct at time of going to press

MOSLEY ELECTRONICS LIMITED

All antennas available ex works carriage and VAT extra

SOME ANTENNAS

Mustang 3 Elements, 10, 15 and 20 metres ... £90.00

TA-33 Jr. High Power Model incl. Balun

3 Elements, 10, 15 and 20 metres ... £82.00

TA32 Jr. 3 Elements, 10, 15 and 20 metres ... £70.00

TA31 Jr. Rotatorpole, 10, 15 and 20 metres ... £49.00

ELAN 3 Elements, 10 and 15 metres ... £58.00

TD-2 Trap Dipoles 40 and 80 metres ... £27.00

TCD-2 Trap Dipoles 40 and 80 metres compress ... £33.00

V-3 Jr. Trap Vertical 10, 15 and 20 metres ... £22.00

Atlas Trap Vertical 10, 15, 20 and 40 metres ... £40.00

SWL ANTENNAS

SWL-7 Dipole 11, 13, 16, 19, 25, 31 and 49 metres £21.00

RD-5 Dipole 10, 15, 20, 40 and 80 metres ... £21.00

Orbit Vertical 11, 13, 16, 19, 25, 31 and 49 metres £36.00

OFFERING: AR88LF with product detector, new RF stage and other mods; 2m. converter, with case, S-meter and manual; also Pye Reporter radiotelephone, needs PSU. — Ault, 23 Newton Street, West Bromwich.

For sale: Eddystone 840C general coverage Rx, mint condition, with manual, £50 or near offer. — Ring Newlands, Tonbridge 359291 (Kent).

Exchange: GR-78 receiver, compact, one micro-volt sensitivity, 190 kHz to 30 MHz in six bands, 5 watt AF output, mains or 12v. external supply FOR AR88D. Please write or call. — Peters, 9 Hospital Road, Arlesey, Beds.

Wanted: R.1116, R.208, R.109 and National 1-10A; also wireless Sets No.22 xtal, No.9, No.11, No.52 complete or Tx only, No.58 or accessories, scrap No.22 with variometer, No.22 power unit, and aerial tuning unit for Tx No.12. Any other interest-ex govt. equipment? — Morriss, Pippingford Park, Nutley, Sussex. (Tel: 082-571 2205).

Wanted: External microphone for Standard C146A. — ILbury, G3MMW? QTHR. (Tel: 0252-51245).

Selling: 'Realistic' DX-160 general coverage receiver, one year old, £70. Buyer collects. — Ring Wanklyn, 021-429 3918.

QTH for sale: 17 miles N. of London at Broxbourne, Herts.: 6 years old, centrally heated, 3-bed semi-detached with tho' lounge, kitchen, downstairs cloakroom, integral garage including shack; roof-mounted TA-33 with BN86 balun, mast, guys, rotator and feeder, £17,250. — Ring Ludwell, G5ZZQ, Hoddesdon 64896.

For sale: Heathkit HW-32A Tx/Rx with AC/PSU, GH-12A microphone, crystal calibrator and speaker, £60. Eddystone 840C receiver, £30. The above in excellent condition; prefer buyers inspect and collect, or carriage at cost. — Gordon, G4AQJ, 46 Waltham Crescent, Nuneaton, Warks. (Tel: 0682-68510).

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

Receiving:
CASSETTE A For Amateur Radio examination preparation. Speed slowing increasing from 1-12 w.p.m.
CASSETTE B For Professional examination preparation. Computer produced morse from 12-24 w.p.m. Including international procedure signs and symbols and their incorporation into messages.

Sending:
Morse Key and Buzzer Unit for sending practice and own Tape preparation. Phone output. Headphones available.

Prices: Each cassette, including booklets, £4. Morse key and buzzer unit, £4. Headphones, £4.

Prices include VAT, postage, etc.

M H ELECTRONICS
12 LONGSHORE WAY, MILTON, PORTSMOUTH, PO4 8LS

FOR ALL VALVE REQUIREMENTS (s.a.e. lists)
Contact:— (Specialists in radio and television types).
Southern Valve Company
P.O. Box 144, Barnet, Herts. Tel.: 01-440 8641

BREDHURST ELECTRONICS
FOR VHF IN THE NORTH WEST

FDK
MULTI II 2m. FM fitted 7 channels ... ... ... £199.00
MULTI UUI 70 cm. FM fitted 9 channels ... ... ... £249.00
MULTI 2700 2m. all mode ... ... ... £449.00
VFO for MULTI II ... ... ... £89.00
AC PSU for MULTI II ... ... ... £63.50

New from FDK
TM 56B Scanning 2m RX fitted 10 channels ... ... ... £69.00

TRIO
R300 General coverage RX ... ... ... £184.50

ANTENNA SPECIALISTS
ASP 677 2m. £ wave ... ... ... £15.20
ASP 629 2m. £ wave ... ... ... £6.57
ASPE 667 70 cm. 5dB collinear ... ... ... £19.02
ASPE 462 70 cm. 3dB collinear ... ... ... £8.14
All mounting options ... ... ... POA

SECONDHAND GEAR
KW2000 ... ... ... £130.00
TRIO JR500S £ spkr. ... ... ... £85.00
NATIONAL NCX500 HF TX/RX ... ... ... £180.00

SPOT CASH PAID FOR GOOD SECONDHAND EQUIPMENT
HP—PART EXCHANGE—ACCESS—BARCLAYCARD

Callers by Appointment All Prices inc. VAT

WILLLOWBROOK, SCHOOL LANE, BUNBURY, TARPORLEY, CHESHIRE. Tel.: Bunbury (0829) 260708
Northern Distributor for Waters and Stanton G3OQT

The Short Wave Magazine
March, 1977

— Box No. 5556, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Sale: AR88D, one of the original models, immaculate condition, with S-meter, xtal calibrator, two speakers, and set of spare valves. Offers over £75. (Norfolk).
— Box No. 5557, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

Selling: Liner-2 with pre-amp, stabilised power supply, mic., mobile whip, as new, £130. — Ring Berkeley, Weybridge 40842.

Sale: Heathkit DX-100U transmitter and Heathkit RA-1 receiver, both in good order and with manuals, £25 each or £40 the pair. Buyer collects. — Foot, G4FOH, 20 The Furlongs, Needworth, Huntington. (Tel: Slepe 6850).

Active VHF amateur, responsible professional person, seeks share in flat or single bedsitter within easy reach of London; must be good VHF location. — Nelson, G8HAL/G4FRX, QTHR. (Tel: 01-602 5855).

Wanted: Several NR-56 2m. Rxs, 2200G transceivers, Microwave Modules 432/28 MHz converter. Parcels to friends' address in Dover. — Vanden Bussche, ON6WR, 8 Van Iseghemlaan, 8400 Ostend, Belgium.

Selling: Zenith 80 24-sq. SLR camera, complete with two backs, filters, meter etc. (similar to Hasselblad). Yaeus-Musen YO-100 monitor 'scope, complete and boxed; Belcom autoscan VHF/FM transceiver; Belcom AF/RF signal generator; Electronic digital and Kenwood clocks; Redifon TT-10 transistor T.U.'s. All new and unused. s.a.e. essential for reply. (Northants). — Box No. 5558, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts AL6 9EQ.

For sale: KW-2000 transceiver with AC/PSU, £95. — Wilson, G3PNH, QTHR. (Tel: Chippenham 3548).

Wanted: Communications receiver in good condition. Or would exchange perfect Philips stereo system; or three very old radios, complete but needing attention. Cash adjustment if necessary. — Ring Williams, Sunderland (0783) 42905, evenings.

Sale: Heathkit DX-100U transmitter and Heathkit RA-1 receiver, both in good order and with manuals, £25 each or £40 the pair. Buyer collects. — Foot, G4FOH, 20 The Furlongs, Needworth, Hunting-
HONDA
GENERATORS
AT KEENEST PRICES!
300-4000 Watts AC, 6-24 Volts DC. Other makes 1-3000 KVA, incl. the new E3500-115/230V AC and 12V DC

MICROWAVE
COOKERY BOOK
£2.25 INC. POSTAGE
LEADING MAKES OF MICROWAVE OVENS SUPPLIED
KEENEST PRICES Include U.K. delivery. Open Tues-Sat 10.30-1.30, 2.30-6.30 (AoSats out of hours)
Ashley Dukes Farncombe St, Farncombe, Godalming (Tel 23279) Surrey.

G3ACQ Offers;
all YAESU from our Western Electronics department
surplus crystals—J Beams components—Solid State Modules gear, etc.

S. MAY (Leicester) LTD.
12-14 and 27 CHURCHGATE, CITY CENTRE, LEICESTER
Telephone: Leicester 58662

G2DYM AERIALS
ANTI-T.V.I. AERIALS INDIVIDUALLY DESIGNED BY Ex-B.B.C.
TRANSMITTER AND AERIAL ENGINEER. CUSTOM BUILT FOR THE TRANSMITTER OR S.W.L.
Details S.A.E. and 3 Gp stamps.
LAMBDANTENNA STUD FARM
WHITEBALL, WELLINGTON, SOMERSET

SNOOPING LOW?
NOW you can uncover the EXCITING 100-600 kHz band—with YOUR receiver. CONVERTER has 20dB gain, antenna matching and 3-5-1 MHz output. EASY to make, all parts, coils, printed circuit, case etc., instructions, money back assurance, send £8-00 NOW.
CAMBRIDGE KITS
45 (5G) Old School Lane,
Milton, Cambridge

G3EKX S.S.B. PRODUCTS G3EKX
TELETYPE 19. Teleprinters. As NEW ... ... ... ... £65.00
COMMAND RECEIVER. 6 to 9.1, unmodified ... ... £15.00
B.C.C. 4 METRE Mobile. 12v. DC 1/P (Type 69D—5 channel) ... ... ... ... ... ... £30.00
A.V.O. SIGNAL GENERATOR. CTJ78A. (New condition) with leads. 0-250-500 MHz ... ... £60.00
HALLICRAFTERS, HT1/B. Radio telephone 12v 1/P ... £50
★ PRICES INCLUSIVE. Please ADD Carriage and safe packing
NEW CRYSTALS. 15,000 in Stock. 10-245, 24-225, 48,025, £1-50 each + 15p P. & P.—108 kHz to 108 MHz, S.a.e. essential.
TOWN QUAY . TRURO
CORNWALL
Telephone 0872-862575

ROBOT SSTV
(Isn't it time you joined in the fun)
New and secondhand equipment always available
Large S.A.E. for full details please.
AERO & GENERAL SUPPLIES
Nanaimo House, 32 Rufford Avenue, Bramcote, Nottingham, NG9 3JH
Tel.: 0602 397588

EX GOVERNMENT SURPLUS
2 Gang 7-70pf. RF26-27 type, unused, for G2DAF designs, etc., £3
Morse keys, Army No. 9 type, dirty, stored 30 years, £4
Headphones type DLR with jack plug, £5
Microphones, throat LL No. 2, used, £2; in original packing, £3
Oxygen mask type microphones No.48; in original packing, £3
Valves by the thousand, octals, UX, B4-5-7-9, B7g, B9A, B9G, etc., suitable for AR88, CR100, CR150, Command, E358, HRO, RA1B & J, R107, R1155, R1475, SP400, SP600, SX17, and many other receivers. Send list of valve requirements for quotation.
CRYSTALS: Still 1000's in stock per previous adverts £2 each

Call or phone our Mr. Stefan for a quotation
01-749 3934

ALL VALVES & TRANSISTORS
We are one of the largest stockists of valves etc. in the U.K.

BAGINTON ELECTRONICS LTD
170 GOLDSHAW ROAD
COVENTRY AIRPORT
S.A.E. ALL ENQUIRIES
Tel. (0203) 302449
Have you got all these ARRL titles on your shelf? . . . .

ELECTRONICS DATA BOOK (new title) ... ... ... ... ... £3.20
ANTENNA BOOK, 13th Edition ... ... ... ... ... £3.38
UNDERSTANDING AMATEUR RADIO ... ... ... ... ... £3.23
LEARNING THE RT CODE ... ... ... ... ... ... ... ... 70p
A COURSE IN RADIO FUNDAMENTALS ... ... ... ... ... £2.13
FM AND REPEATERS FOR THE RADIO AMATEUR ... ... ... ... ... £3.00
RADIO AMATEUR HANDBOOK 1977 (soft-cover) ... ... ... ... ... £6.60
RADIO AMATEUR HANDBOOK 1977 (hard-cover) ... ... ... ... ... £9.85
SPECIALISED COMMUNICATIONS TECHNIQUES FOR THE RADIO AMATEUR ... ... ... ... ... £2.55
HINTS AND KINKS ... ... ... ... ... ... ... ... £1.83
SINGLE SIDEBAND FOR THE RADIO AMATEUR ... ... ... ... ... £3.25
VHF MANUAL ... ... ... ... ... ... ... ... £3.15

(all prices include post/packing)

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

### (ENGLISH AND AMERICAN)

*NEW 5th Edition* RSGB ........................................... £8.31

#### AERIAL INFORMATION
- Practical Aerial Handbook, 2nd Edition (King) .......... £6.10
- Aerial Handbook (Briggs) ........................................... £2.60
- Bead Antenna Handbook ........................................... £3.20
- Cubical Quad Antennas, 2nd Edition .................. £3.05
- Simple Low Cost Wire Antennas, by Orr .......... £3.30
- 73 Vertical Beam and Triangle Antennas (E. M. Noll) ........ £2.20
- 73 Dipole and Long-Wire Antennas (E. M. Noll) .......... £3.35

#### BOOKS FOR THE BEGINNER
- "Short Wave Magazine" R.A.E. Questions and Answers, 1971-1975 ........................................... £2.10
- Solid State Short Wave Receivers for Beginners (R. A. Penfold) ........................................... £1.05
- Electronics Self-Taught ........................................... £2.15
- Beginners Guide to Radio ........................................... £2.60
- Beginners Guide to Electronics ........................................... £2.25
- Course in Radio Fundamentals, ARRL ..................... £2.13
- Ham Radio (A Beginners Guide) by R.H. Waring .......... £2.50
- Learning the RT code (ARRL) ........................................... £70p
- Morse Code for the Radio Amateur (RSGB) .......... £4.00
- Radio Amateur Examination Manual (RSGB) .......... £1.15
- Simple Short Wave Receivers (Data) ........ £1.20
- Understanding Amateur Radio (ARRL) .......... £3.23

#### GENERAL
- FM & Repeaters for the Radio Amateur (ARRL) .......... £3.00
- Easblender (to hold 12 copies of "Short Wave Magazine" together) ........................................... £1.75
- Practical Wireless Circuits ........................................... £2.45
- Prefix List of Countries ........................................... £28p
- Radio Engineers Pocket Book (Newnes) (N.E.) .......... £1.35
- Test Equipment for the Radio Amateur (RSGB) .......... £2.35
- Walkie-Talkie Radio Operators Guide, ........ £1.95

### HANDBOOK AND MANUALS
#### Radio and Electronic Laboratory Handbook, 8th Edition (Scroggie) ........................................... £8.65
- Amateur Radio DX Handbook ........................................... £3.30
- Electronic Circuit Handbook Vol. 1 ........................................... £1.73
- Electronic Circuit Handbook Vol. 2 ........................................... £1.73
- New RTTY Handbook ........................................... £2.75
- Radio Amateur Operators Handbook ........................................... 85p
- Slow Scan Television Handbook ........................................... £3.10
- Television Interference Manual (G3JGO) .......... £1.00
- Specialized Communications Techniques for the Amateur (ARRL) ........................................... £2.55
- Practical Wireless Service Manual ........................................... £2.45
- Advanced Communications Systems ........................................... £9.97
- Working with the Oscilloscope ........................................... £1.85
- Know your Oscilloscope ........................................... £1.95
- Know your Signal Generators ........................................... £2.30

#### USEFUL REFERENCE BOOKS
- Foundations of Wireless and Electronics, 9th Edition (Scroggie) ........................................... £4.40
- Engineers Pocket Book, 6th Edition ........................................... £1.98
- U.K. Call Book 1977 ........................................... £2.10
- Hints and Kinks (ARRL) ........................................... £1.83
- Radio Data Reference Book (3rd Edition) RSGB .......... £1.35
- Single Sideband for the Radio Amateur (ARRL) .......... £3.25
- Sun, Earth and Radio (Hard Cover) ........................................... £2.70
- NBFM Manual (RSGB) ........................................... £1.13
- Q and A on Short Wave Listening ........................................... O/P Electronics Data Book (ARRL) .......... £3.20

#### VALVE AND TRANSISTOR MANUALS
- Field-effect Transistors (Mullard) ........................................... £2.15
- MOS Integrated Circuits & their Applications (Mullard) ........................................... O/P
- Transistor Audio & Radio Circuits—2nd Ed. (Mullard) ........................................... £3.00
- Towers’ International Transistor Selector ........................................... £3.45
- Principles of Transistor Circuits (5th Ed.) ........................................... £3.43
- Service Valve and Semiconductor Equivalents ........................................... 50p
- Radio Valve and Semiconductor Data (10th Ed.) .......... £2.35
- Transistor Pocket Book ........................................... £1.70
- Popular Valve/Transistor Substitution Guide .......... £2.10

#### VHF PUBLICATIONS
- VHF Handbook. Wm. 1 Orr (New Ed.) ........................................... £3.90
- VHF Manual (ARRL) ........................................... £3.15
- VHF/UHF Manual (RSGB), New 3rd Ed. .......... £5.60
- Amateur Radio Awards (RSGB) .......... £1.75
- Teleprinter Handbook (RSGB) ........................................... £6.75

### Available from

**SHORT WAVE MAGAZINE**

Publications Dept.

34 High Street, Welwyn, Herts. AL6 9EQ - Welwyn (043871) 5206/7

(Counter Service. 9.30-5.00. Mon. to Fri.)

**Volume XXXV**

THE SHORT WAVE MAGAZINE
ALL BELOW — ADD 8% VAT

SPECIAL OFFER...

STARCHOL HIGH BAND RF BOARDS, with conversion data for making into a GOOD 2MHz BAND. All the reservoirs, 1x,t 35, 2x, resistors, and 30, DC. PCB contains a dual gate Mos Fet RF stages (3IN1). A 3 stage Oscillator, all on one PCB, size 6" x 9", 4x DC, audio output (can be left fixed bias, or RF gain control) Ant. input. IF output (works from a few MHz upwards) with All Brand New, 64p each, while stocks last.

PYE S2/127F P.C.B. CARDS (All brand new in circuit, 12v, DC. SSB RF FRONT END PCB, 4 channel, 1-35MHz. RF and Mixer stages, att in. 1/4 MHz out, £2.00.

PYE CHANNEL OSCILLATOR PCB, 4 channel, with trimmers, for 4 fundamental xtals (2 stage), £1.00.

PYE D.C. RF Mixture DETECTOR PCB, 1/4 MHz 338 in, AF demodulated out, £2.50.

PYE AUDIO AMP PCB (3 stage), £1.50.

PYE 1/4 MHz OSCILLATOR & AGC AMP PCB (2 stage), £1.50. LIMITED SUPPLY ONLY.

ORDER NOW!

BUILD YOUR OWN Lab TRANSFORMER, 75p.

CAMBRIDGE Mod Transformer, £1.00.

ANCHOR D.C. VIDEO BLOCK TRANSFORMER, £1.00.

CAMBRIDGE AM AUDIO PCB. Brand new, packed, £25.00 pair (ITX Emergency.) ORDER NOW, while stocks last.

ULTRALUX D.C. TRANSFORMER, £1.00.

Ferrite Bead for Circuit Board, 50p.

SMALL MAINS SUPPRESSORS (small chokes, 3 for 30p, 5 for 50p. Ideal for radio, HI-FI inputs, etc.), approx. 1" x 1", 3 for 50p.

DIN 3 -pin LINE SOCKETS. 15p each.

TV PLUGS (metal type), 5 for 50p.

SO239 SOCKETS (PTFE). Brand new (4 hole fixing type), 50p each or 5 for £2.50.

N-STYLE PLUGS, 50 ohm, 60p each.

GREENPRINT (GE10015). Chassis Lead Terminations, for the chassis, the lead is secured by screw cap, with the screw holes being the circuit points. These are the units which bolt on to the chassis, the lead is secured by screw cap, tines. (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines. (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines.) (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines.) (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines.)

DISSIPATION CAPACITORS. Up to 50v.

NEXT MONTH'S SCOOP PURCHASE, PYE CAMBRIDGE AM AUDIO PCB. Brand new, 60p each, or 5 for £3.00.

UPGRADE YOUR OWN Lab TRANSFORMER, 75p.

PLUGS & SOCKETS

BNC PLUGS (ex-equip.), 5 for £1.50.

PL239 PLUGS (PTFE). Brand new, Packed with 5 pack, 10 for £3.00.

SO239 SOCKETS (PTFE). Brand new, 4 hole fixing type, 50p each or 5 for £2.50.

N-STYLE PLUGS, 50 ohm, 60p each.

GREENPRINT (GE10015). Chassis Lead Terminations, for the chassis, the lead is secured by screw cap, tines. (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines.) (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines.) (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines.) (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines.) (These are the units which bolt on to the chassis, the lead is secured by screw cap, tines.)

HEAVY DUTY RELAYS, 24v. DC operated (will work on 12v.) 3 heavy duty make contacts, 10 rated (10A rating) + 5 change over. Contact ratings, 24v, 5A, £3.00.


PYE CAMBRIDGE PC BOARDS (Removed from high band AM1063 KESTREL 2000, 545 kHz IF BOARD, £2.00.

AM AUDIO BOARD, £1.20.

AM 500, 59p.

CAMBRIDGE Mod Transformer, £1.00.

Mod Driver Transformer, 73p.

12/24v, Inverter Transformer, £1.25.

PLUGS & SOCKETS

BNC PLUGS (ex-equip.), 5 for £1.50.

PL239 PLUGS (PTFE). Brand new, Packed with 5 pack, 10 for £3.00.

SO239 SOCKETS (PTFE). Brand new, 4 hole fixing type, 50p each or 5 for £2.50.

N-STYLE PLUGS, 50 ohm, 60p each.