

RADio COMMunication

March 1981

*Watch out!
There's a thief about . . .*

See page 222
and loose inserts
included in this issue
for details of the

AMATEUR RADIO INSURANCE SCHEME

A new RSGB service to members



(Illustration from Home Office poster)

Journal of the Radio Society of Great Britain



SALE! SALE! SALE!

Catronics are holding a Great 'WAR ON PRICES' Sale

Everything reduced during Sale period 2nd March-28th March 1981

**BARGAINS in Components, BARGAINS in Equipment, BARGAINS
in I.Cs, BARGAINS in Jaybeam, BARGAINS in LEDs,
BARGAINS in Transistors, BARGAINS in Trio, BARGAINS in Yaesu.**

We have declared war on prices, with hundreds of items reduced including 20% off CSC Breadboarding Equipment, 10% off all Jaybeam Antennas, 10% off selected Trio Equipment (5% off some), 25% off Vero Boards etc, up to 75% off some discontinued items.

SOME EXAMPLES:

TS180S HF Transceiver (inc DFC)	£610.00	LM380	£4.10 for 5	SP8660	£3.90 each
TR2200G Portable (S/H)	£90.00	710	£1.70 for 5	TBA120	£2.60 for 5
FT101ZD HF Transceiver	£550.00	741	£1.20 for 5	ZTX500	55p for 5
2m Synthesizer Kit	£35.00	2112-2	£2.00 each	UL914	£6.00 for 5
1296/28 Transverter	£165.00	DL304	£4.00 for 4	2N918	£1.45 for 5
Matrix H Decoder	£35.00	NSB3881	£4.00 each	2N906	£1.10 for 5
Philips FM321 70cm Mobile	£220.00	PCB's: G3TDZ AMRx	£1.60	2N3904	85p for 5
BC143	£1.55 for 5	Airband Conv.	£2.40	2N3906	85p for 5
BCY71	£1.10 for 5	Teletext (5 x PCB's)	£23.00	2N5179	£4.35 for 5
BD131	£2.20 for 5	Teletext (Plt. Thru)	£46.00	2N6084	£11.20 each
BD132	£3.00 for 5	K100 Scanning Receiver	£170.00	3 pole min. toggle Sw	80p each
BF180	£1.15 for 5	Alarm (Ultrasonic type)	£45.00	D.P. Illuminated Sw	75p each
BF224	£1.20 for 5	12in Video Monitor	£120.00	BCD coded Thumbwheels	£2.00 each
6-8V Zener	55p for 5	TR8300 70cm Mobile (S/H)	£160.00	40W 2M PA Kit	£27.00
9-1V Zener	55p for 5	MLED500 Red LED	40p for 5	10W 2M PA Kit	£21.00
CA3046	£3.80 for 5	1/2 Window clip aerial	£5.00	CSC PB100	£11.00
CA3130E	£3.90 for 5	LM3900	£2.70 for 5	CSC PB103	£33.00

- + 20% off all CSC Breadboarding Equipment in stock
 - + 10% off all Jaybeam Antennas ordered during the sale
 - + 25% off all Vero Boards and accessories in stock
- Write or telephone for full list.

All items are offered subject to availability and only while stocks last

All prices include VAT but add carriage: £4.50 Courier Service, min. 50p post. Some sale items are ex-demonstration equipment, some others are second-hand but all carry a full guarantee. Pay by Barclaycard, Trustcard, Visacard, Access, Eurocard, Master Charge, etc; Cash; Cheque; H.P.; or the new Catronics creditcharge card.

We are 300 yards from Wallington Railway Station (London Bridge or Victoria). Frequent buses from Croydon and Sutton. Three large car parks within 100 yards. Hire purchase facilities available on all equipment. Credit cards accepted. Mail orders—normally dealt with on day of receipt. Securicor delivery arranged. All prices include VAT.



**CATRONICS LTD, DEPT 103, COMMUNICATIONS HOUSE,
20 WALLINGTON SQUARE, WALLINGTON, SURREY SM6 8RG. Tel: 01-669 6700.**
Shop/showroom open Monday-Friday: 9.00-5.30, closed for lunch: 12.45-1.45. Saturdays: 9.00-1.00.



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RADIO COMMUNICATION

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Technical articles on subjects of amateur interest are always welcome and should be sent to: The Editor, *Radio Communication*, 88 Broomfield Road, Chelmsford, Essex CM1 1SS.

All articles received are reviewed for technical merit by the RSGB Technical & Publications Committee, or an acknowledged expert on the subject, before acceptance. Payment will be made for all articles published.

The editor will be pleased to send intending authors a manuscript preparation guide and to give any other advice and assistance requested.

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GREAT BRITAIN 1981



TRIO *pacesetter in amateur radio*

TS-830S *V.B.T., notch, IF shift, wide dynamic range*

The TS-830S has every conceivable operating feature built-in for 160-10 metres (including the three new bands). It combines a high dynamic range with variable bandwidth tuning (VBT), IF shift, and an IF notch filter, as well as very sharp filters in the 455kHz second IF. Its optional VFO-230 remote digital VFO provides five memories.

TS-830S FEATURES:

- LSB, USB and CW on 160-10 metres, including the new 10, 18, and 24MHz bands. Receives WWV.

- Wide receiver dynamic range. Junction FETs in the balanced mixer, MOSFET RF amplifier at low level, and dual resonator for each band.
- Variable bandwidth tuning (VBT). Varies IF filter pass-band width.
- Notch filter (high-Q active circuit in 445kHz second IF).
- IF shift (passband tuning).
- Built-in digital display (six digits, fluorescent tubes), analog subdial, and display hold (DH) switch.
- Noise-blanker threshold level control.

- 6146B final with RF negative feedback. Runs 220W PEP (SSB)/180W dc (CW) input on all bands.
- Built-in RF speech processor.
- Narrow/wide filter selection on CW.
- SSB monitor circuit to check transmitted audio quality.
- RIT (receiver incremental tuning) and XIT (transmitter incremental tuning).

OPTIONAL ACCESSORIES:

- SP-230 external speaker with selectable audio filters.
- VFO-230 external digital VFO

with 20Hz steps, five memories, digital display.

- AT-230 antenna tuner/SWR and power meter/antenna switch; 160-10 metres, including three new bands.
- YG-455C (500Hz) and YG-455CN (250Hz) CW filters for 455kHz IF.
- YK-88C (500Hz) and YK-88CN (270Hz) CW filters for 8.83MHz IF. (VFOs for TS-830S, TS-130 Series, and TS-120S are compatible with all three series of transceivers.)

TS-830S £639.51 inc VAT
Carriage £4.50.

SP-230

TS-830S

VFO-230

AT-230



TS-130S/V *processor, N/W switch, IF shift, DFC option*

The compact, all solid-state HF SSB/CW mobile or fixed station TS-130 Series transceiver covers 3.5 to 30MHz, including the three new bands.

TS-130 SERIES FEATURES:

- 80-10 metres, including the new 10, 18, and 24MHz bands. Receives WWV.
- TS-130S runs 200W PEP/160W dc input on 10-15 metres and 160W PEP/140W dc on 12 and

- 10 metres. TS-130V runs 25W PEP/20W dc input on all bands.
- Built-in speech processor.
- Narrow/wide filter selection on both CW (500Hz or 270Hz) and SSB (1.8kHz) with optional filters.
- Automatic selection of side-band mode (LSB on 40 metres and below, and USB on 30 metres and above). SSB REVERSE switch provided.
- Built-in digital display.

- Built-in RF attenuator.
- IF shift (passband tuning).
- Effective noise blanker.

OPTIONAL ACCESSORIES:

- PS-30 base-station power supply.
- YK-88C (500Hz) and YK-88CN (270Hz) CW filters.
- YK-88SN (1.8kHz) narrow SSB filter.
- AT-130 compact antenna tuner (80-10 metres, including three new bands).
- SP-120 external speaker.
- VFO-120 remote VFO.

- MB-100 mobile mounting bracket.
- PS-20 base-station power supply for TS-130V.

Optional DFC-230 Digital Frequency Controller

Frequency control in 20Hz steps with UP/DOWN microphone supplied with DFC-230. Four memories and digital display. (Also operates with TS-120 and TS-830S.)
TS-130S £491.05 inc VAT.
TS-130S £404.34 inc VAT.
Carriage £4.50.



PS-30

SP-120

TS-130S

VFO-120

**LOWE
ELECTRONICS**

CHESTERFIELD ROAD MATLOCK TEL 0629 2817





TRIO *the new synthesized 430MHz FM mobile transceiver*
TR-8400 *70cm is on the move.*

• **SYNTHESIZED DESIGN**

Covers 430-440MHz in 25kHz steps, channel band-width is 10MHz.

• **FIVE MEMORIES**

Four of the five memories may be operated in simplex mode or the transmit frequency may be offset ± 1.6 MHz with the offset switch to access most repeaters. The fifth memory stores both receive and transmit frequencies independently, for operation on repeaters with non-standard splits (as well as standard repeater and simplex operation). A memory back-up terminal is provided on the rear panel.

• **TWO VFO'S**

Convenient for switching quickly from repeater to simplex portions of the band, or to any particular frequency selected by either VFO.

• **OFFSET SWITCH**

Allows four of the five memory frequencies and both VFO frequencies to be offset ± 1.6 MHz for operated simplex during transmit mode, for repeater access.

• **MEMORY SCAN**

Automatically locks on busy memory channel and resumes when signal disappears or when SCAN switch is pushed. Scan HOLD or microphone push-to-talk switch cancels the scan function.

• **AUTOMATIC BAND SCAN**

Scans 430-440MHz in 25kHz steps and locks on busy channel. Scan resumes when signal disappears or when SCAN switch is pushed. Scan HOLD or microphone push-to-talk switch cancels the scan function.

• **UP/DOWN MICROPHONE PROVIDED**

Included with the TR-8400 is an UP/DOWN microphone for manually scanning 430-440MHz in 25kHz steps, allowing easy frequency changes while driving.

• **VERY COMPACT AND LIGHTWEIGHT**

Truly a "miniature" mobile transceiver, the TR-8400 measures only 147.5 (5.9)W, 51.5 (2.1)H and 193 (7.7)D and weighs only 1.5kg (3.3lbs). Such a

small package is easy to mount in any car.

• **FOUR-DIGIT FREQUENCY DISPLAY**

A four-digit LED display indicates receive and transmit frequencies.

• **S/R/F LED BAT METER**

Received signal level and relative RF output are indicated on a multicoloured, eight-segments, LED bar meter.

• **LED MODE INDICATORS**

Three front-panel LEDs indicate BUSY channel, ON AIR, and REPEATER offset.

• **TONE BURST SWITCH**

The TONE BURST switch activates the accurate 1750MHz repeater access tone oscillator.

• **HI/LOW POWER SWITCH**

RF output power can be switched from 10W to 1W.

TR-8400 £279.00 inc VAT
 CARRIAGE BY SECURICOR
 £4.50



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Stephens-James Ltd
 47 Warrington Rd
 Leigh
 0942 676790

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 20 Woodside Way
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 Fife KY7 5DE. 0592-756962



All Trio equipment is available from the following authorised Trio dealers
LOWE ELECTRONICS LTD. Chesterfield Road, Matlock, Derbys. Tel: 0629 2430 or 2817



IMPORTANT INFORMATION



As the appointed distributors for Trio, we recommend that you purchase your Trio equipment from an approved stockist (list above). Any stockist not on this list has no connection with the Trio UK sales and service organisation and cannot, despite claims to the contrary, offer any meaningful guarantee of backup service on Trio equipment.

FROM THE JAPAN RADIO CO Ltd

The NRD 515 is a PLL-synthesised communications receiver of the highest class featuring advanced radio technology combined with the latest digital techniques.

The new NRD 515 is full of performance advantages including general coverage, all modes of operation, PLL digital VFO for digital tuning, 24-channel frequency memory (option), direct mixing, pass-band tuning, etc. JRC's 65 years of radio communications experience will give you "the world at your fingertips".

The NRD 515 is but a single item from the JRC product range which extends all the way to full marine radio installations for supertankers.



NRD-515

receiving for the discerning few

NRD 515 SYNTHESISED HF RECEIVER
NHD 515 MULTI CHANNEL MEMORY UNIT

£948.75 inc VAT
£161.00 inc VAT

NVA 515 LOUDSPEAKER
CFL 260 600Hz CW FILTER

£27.60 inc VAT
£34.50 inc VAT



LOWE SRX-30

THE SRX-30 IS THE MOST IMPRESSIVE MID-PRICE RECEIVER AVAILABLE TO THE KEEN DX-ER.

500kHz-30MHz CONTINUOUS COVERAGE. DRIFT CANCELLING SYSTEM.

£158 inc VAT. Securicor carriage £4.50



TS-770E The TS-770E dual bander is another successful result of Trio's advanced engineering capability and represents the peak of RF engineering for VHF/UHF. This is the world's first transceiver to combine the high activity 2-metre band with the 70 cm band of tomorrow in a single unit. Featuring Trio's renowned reliability, two-in-one design and compact dimensions, the TS-770E offers versatility in fixed station, mobile or portable operation.

TRIO
TS-770E 2 METRE & 70 cm MULTIMODE

£730.25 inc VAT. Carriage by Securicor £4.50



TR-9000 The exciting TR-9000 2-metre all-mode transceiver combining the convenience of FM with long distance SSB and CW in a very compact, very affordable package. Because of its compactness the TR-9000 is ideal for mobile installation; add on its fixed station accessories and it becomes the obvious choice for your shack.

TRIO
TR-9000 2 METRE MULTIMODE

£345.00 inc VAT. Carriage by Securicor £4.50

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ELECTRONICS

CHESTERFIELD ROAD MATLOCK TEL 0629 2817



TRIO R-1000

RECEIVER WITH DC KIT FITTED £285 inc VAT.
SP-100 MATCHING EXT. SPEAKER £26.45 inc VAT.
CARRIAGE BY SECURICOR £4.50

"Hear there and everywhere"
easy tuning, digital display

The R-1000 is an amazingly easy-to-operate, high-performance, communications receiver, covering 200kHz to 30MHz in 30 bands. This PLL synthesized receiver features a digital frequency display and analog dial, plus a quartz digital clock and timer.

R-1000 FEATURES:

- Covers 200kHz to 30MHz continuously.

- 30 bands, each 1MHz wide.
- Five-digit frequency display with 1kHz resolution and analog dial with precise gear dial mechanism.
- Built-in 12-hour quartz digital clock with timer to turn on radio for scheduled listening or control a recorder through remote terminal.
- Step attenuator to prevent overload.

- Three IF filters for optimum AM, SSB, CW, 12kHz and 6kHz (adaptable to 6kHz and 2.7kHz) for AM wide and narrow, and 2.7kHz filter for high-quality SSB (USB and LSB) and CW reception.
- Effective noise blanker.
- Terminal for external tape recorder.
- Tone control.

- Built-in 4-inch speaker.
- Dimmer switch to control intensity of S-meter and other panel lights and digital display.
- Wire antenna terminals for 200kHz to 2MHz and 2MHz to 30MHz. Coax terminal for 2MHz to 30MHz.
- Voltage selector for 100, 120, 220, and 240 VAC.



SP-100

R-1000

FOR THE HF RECEIVERS USE THE TRIO HEADPHONES HS5 OR HS4
HS5 £21.85 inc VAT. HS4 £10.35 inc VAT



SR9 DAIWA

2mtr FM TUNABLE/XTAL RECEIVER
£46.00 inc VAT carriage £1.50



XTLS £2.50/CH

SL-1600A

16 CHANNEL 2mtr SCANNING RECEIVER
£39.50 inc VAT carriage £1.50



AR22 FLEXIBLE
ANTENNA £3.00

AOR AR22

2mtr FM SYNTHESISED RCVR
£83.00 inc VAT carriage £1.50



TR-7800 Trio's remarkable TR-7800 2-metre FM mobile transceiver provides all the features you could desire for maximum operating enjoyment. Frequency selection is easier than ever, and the rig incorporates new memory developments for repeater shift, priority, and scan. The TR-7800 by Trio, the only FM mobile.

TRIO THE ULTIMATE 2 METRE MOBILE TR-7800

£268 inc VAT. Carriage by Securicor £4.50

TRIO THE VERSATILE 2 METRE PORTABLE TR-2300

£166.75 inc VAT. Carriage by Securicor £4.50

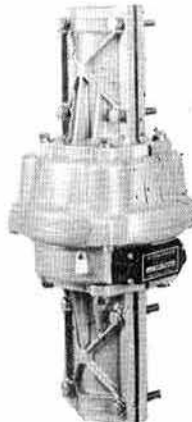
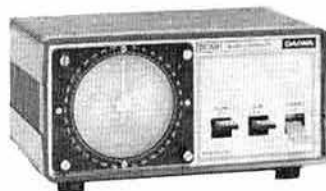
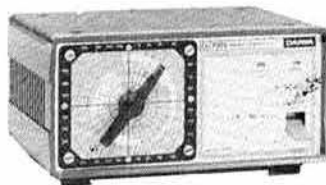


TR-2300 The remarkable TR-2300 is a compact 80 channel FM transceiver designed for use in the 2-metre band. The TR-2300 is engineered with the latest techniques in all solid state construction. The small and lightweight design of the TR-2300 offers you versatile use.

LOWE ELECTRONICS

CHESTERFIELD ROAD MATLOCK TEL 0629 2817





The Daiwa range of rotators are probably the best amateur rotators available. The quality of construction is up to the high standards we have come to expect from Daiwa and the rotator system is of a completely new design which eliminates "out of sync" operation and for the first time gives a true 360° indication on a circular scale based on a great circle map centred on the UK.

Both the DR7500 and DR7600 can be supplied with either of the controllers available, and both upper and lower mast clamps allowing mounting inside a standard tower or on the top of a pole. The DR7500 will handle beams up to and including 3-element tribanders, whilst the DR7600 will handle up to and including a 2-element 40 metre beam.

Each rotary system is supplied complete with rotator unit, control unit, and upper and lower mast clamps. The rotators can be ordered as either "R" or "X" versions. The "R" suffix denotes the controller with the back lit scale and control by switches marked "left" and "right" to drive the rotator round. The controller pointer then smoothly indicates the direction in which the rotator is pointing. However, as an alternative, the "X" suffix unit is of the preset type where the controller pointer is turned by the operator to the beam heading required. The rotator then turns to this heading and stops. Correct operation of the rotator is indicated by a discreet flashing light on the control unit. With this type of control unit, you can go into the shack, set the rotator turning to the direction you need and then do something else whilst the rotator comes round.

Either control unit can be specified with either of the two rotators, ie DR7500R is the smaller rotator with the round control whilst DR7500X is the same rotator, but with the preset control unit.

DAIWA ROTATOR SYSTEMS

DR7500X £98 inc VAT

DR7500R £108 inc VAT

DR7600X £135 inc VAT

DR7600R £144.90 inc VAT

The new CNA1001A antenna tuner from Daiwa has already changed the whole concept of antenna tuning in the amateur radio station. No longer do you have to fiddle with this control and that control in order to reach a match condition, simply push a button and let the tuner do it for you.

The CNA1001A incorporates a sensitive reflected power detector which monitors SWR all the time. At the first push of the operate button, a motor driven gearbox drives the load and match variable capacitors through their entire range in overlapping small increments seeking a correct match. When matching is achieved, the motor drive stops and that's that. The CNA1001A needs only a small snuff of RF to work on (typically 5 watts) so you needn't worry about blowing up your PA, and it covers all the current and future amateur bands from 3-30MHz, includes switching for two antenna systems, a 10 watt (50 watt 1 minute) dummy load and best of all includes a cross needle power and SWR meter.

This section measures power from 0-200W in two ranges and reflected power from 0-40W together with the unique Daiwa cross pointer SWR system. All this in one compact unit requiring only 12V dc to drive the tuning motors.

DAIWA CNA1001A ANTENNA TUNER

£129.95 inc VAT. HIGH POWER MODEL CN2002 £190 inc VAT



WHAT DO YOU KNOW ABOUT DAIWA CROSS POINTER POWER METERS?

Until recently, the in-line measurement of RF power and SWR involved calculation or the use of two instruments. Now, DAIWA have introduced a range of power meters which provide an elegant solution to the whole problem of RF measurements. Utilising two toroidal current transformers to detect true forward and reflected power, and feeding the outputs to a twin movement meter with crossed pointers, it is now possible to measure forward power (LH scale), reflected power (RH scale) and SWR (where the pointers cross) at a single glance. The photograph shows 130W forward power, 1W reflected, and an SWR of about 1.2 to 1. The DAIWA CN series power meters represent the ultimate power meter for the professional and amateur alike, and are indispensable in the fully equipped station. Three models are currently available covering frequencies right up to 2.5GHz so there's one for you whatever your interests.

CN620A 1.8-150MHz up to 1kW

CN630 140-450MHz up to 200W

CN650 1.2-2.5GHz up to 20W

£52.81 inc VAT

£71.00 inc VAT

£95.00 inc VAT

SENSOR



CORDLESS MICROPHONE



CONTROLLER & CHARGER



DAIWA
INDUSTRY CO., LTD

DAIWA
INFRA-RED MOBILE MIKE

£45.00 inc VAT carr £1.00

DISTRIBUTED IN THE UK BY LOWE ELECTRONICS LIMITED

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THE WAY TO HAVE TOMORROW'S EQUIPMENT TODAY

WRITE FOR FULL DETAILS TODAY



SHIMIZU *enjoy the satisfaction of "home brew" equipment.* SS 105S *80:10 metre ssb/cw transceiver.*

This super new transceiver covers 80:10 metres gives 10W out and is smaller than anything else we have seen so far. Ideal for transverter driving, the SS105S has FM transmit and receive options as well as excellent performance on SSB/CW for HF band use. The SS105S is supplied in semi kit form so as to keep down the price, but all of the RF and mixer boards are ready built and aligned so only simple test equipment is required. All the cabinet work has been carried out so all you have to do is assemble the IF strip, crystal oscillator and fit them to the chassis. Great idea and it brings back the flavour of home brew with the added advantage that the rig will work when you have finished it.

• 80 through 10 metres

Covers amateur bands from 3.5 to 30MHz (28 to 28.5 supplied) on lower sideband. Upper sideband and CW. Auxiliary band position available.

• Transceiver construction

By utilizing separate boards the rig can be checked section by section for adjustment and repair.

- SE.AF Mic amplifier and receiver audio amplifier.
- SE.IF Transmitter IF, amplifier, balanced modulator carrier oscillator, receiver IF amplifier, receiver detector.
- SE.PA 10 watt linear amplifier.
- SE.VFO VFO.
- SE.LO Local oscillator.
- SE.SW Switching and circuit.
- SE.LPR Low pass filter and relay.

• Optional boards

- SE.ND Noise blanker RF AGC circuit.
- SE.FMT FM modulator.
- SE.FMR FM DE modulator.
- SE.MK 25kHz marker oscillator

• Microphone

Will accept either high or low impedance microphone.

• Metering

Receive: Signal strength metre on all modes. Can switched to centre metre on FM.

Transmitting: This meter is selectable on transmit to read either relative power output or ALC.

• Use with transverter

100mW output from rear panel for driving transverter. Switch for disabling 10W PA also on rear panel.

• Specification

- Frequency Range: 80m band 3.5-4.0MHz
- 40m band 7.0-7.5MHz
- 20m band 14.0-14.5MHz
- 15m band 21.0-21.5MHz
- 10m band 28.0-30.0MHz
- (27.0 to 28.0MHz for export)



- Optional crystals for 14.5, 28.5, 29.0, and 29.5
- Emission: LSB, USB, CW, FM (option)
- Max. power output: 10 watts
- Image rejection: Better than 50dB
- Antenna impedance: 50 ohms
- Receiver sensitivity: SSB 0.25uV input S/N 10dB or more. FM 0.5uV input S/N 20dB QS.
- Max. Deviation FM: ± 5 kHz or ± 10 kHz adjustable by variable resistor.
- Modulation: SSB balanced modulation
- FM variable reactance modulation
- Frequency stability: Within ± 1 kHz after 1 minute to 60 minutes from power on, thereafter within 100Hz per 30 minutes
- Mic impedance: 500 ohms to 50K
- Audio output: 1.5 watts @ 8 ohms
- Power: DC 13.5V @ 3 amps
- Dimensions: 178 wide x 124 high x 272 deep (cms)
- Weight: 5kgs

	Net Inc. VAT Carr.		
SS105S 80-10m solid state S/B/CW/FM transceiver. Semi kit form.	225.00	258.75	4.50
SE-NB Noise blanker kit	6.75	7.76	.50
SE-FMRX RX FM discriminator kit	15.00	17.25	1.00
SE-FMTX TX FM generator kit	11.00	12.65	1.00
SE-MK RX marker kit	9.60	11.04	.50
0.5 CWF 500Hz CW filter	19.50	22.43	.50
Optional band crystals	3.00	3.45	.25

HEAD OFFICE AND SERVICE CENTRE

LOWE ELECTRONICS LTD, CHESTERFIELD ROAD, MATLOCK, DERBYS. TEL: 0629 2817 or 2430. TELEX: 377482. OPEN TUES FRIDAY 9.5.30, SAT 9.5
CLOSED FOR LUNCH 12.30 TO 1.30

For personal attention on the South Coast contact John, G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex, Ringmer BN2071.
For equally helpful attention in Scotland contact Sam, GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. 041-771 0364.

SEND 48p IN STAMPS FOR COMPLETE CATALOGUE AND ANTENNA BOOK.
PLEASE SPECIFY ANY PARTICULAR INTEREST AND WE WILL SEND FULL INFORMATION

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

FDK MULTI-700EX 2m 25W OUTPUT + PRIORITY SCANNING



COMPARE THE PRICE

£199 inc VAT

- Full coverage of the 144-146MHz band with facilities for 12.5kHz steps anywhere in the band.
- Large four digit LED frequency display tuned in 40 x 25kHz steps in each 1MHz range.
- A specially designed five stage helical-resonator assembly together with the latest dual-gate MOSFET front end ensures excellent cross-modulation characteristics.
- Built-in crystal controlled automatic tone-burst with $\pm 600\text{kHz}$ shift for repeater operation and optional +1.6MHz shift for use in conjunction with FDK/MJV-430A UHF transverter.
- Four additional priority channels—two diode matrix programmable in 12.5kHz steps and two crystal controlled for any frequency between 144-146MHz.
- Channel scanning of two chosen channels either synthesizer/matrix or matrix/crystal.
- Continuously variable RF output control from 1-25W.
- Advanced PLL technology provides good stability with low spurious output; integral power supply noise filter eliminates vehicle line noise and an automatic protection circuit protects the RF output power module against poor SWR, open or short circuit.

Complete with microphone and mobile mounting brackets.

PALM II 2m HANDHELD

BACK IN STOCK

£89.95

(Toneburst

£10 extra)

Illustration shows
70cm version
(PIV) £149



FDK MULTI-750E

2m (& 70cm) ALL-MODE

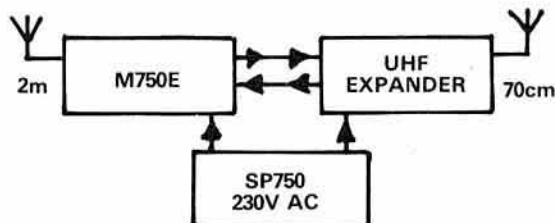


FREE CREDIT—ASK FOR DETAILS **£299 inc VAT**

- Simple and smooth VFO control gives either 100Hz or 5kHz steps on both FM and SSB modes for optimum convenience.
- The large green fluorescent display tube gives full frequency readout to 100Hz and provides safe and clear readout for both night and day operation.
- Standard features include noise-blanker, RIT control with switch, RF attenuator gain control, automatic crystal controlled tone-burst, high and low power switching and remote up/down frequency control microphone unit.
- Compare its compact size and light weight, its smart appearance and comprehensive front panel controls. Simple and reliable operation is made possible by employing advanced solid-state and logic techniques.
- A dual VFO is employed for the selection of two independent frequencies anywhere in the band. This also enables split frequency operation, particularly useful when used in conjunction with the optional "UHF-EXPANDER" transverter.

For normal repeater operation a pre-programmed shift is selected by front panel selector.

M750 BUILDS INTO A 2m & 70cm PACKAGE
(70cm module available end of March)



SUPER OFFER!

COMPLETE 2m SSB TRANSCEIVER £99

inc VAT
P&P £1.50

**MIZUHO
SB2M**



DEFINITELY NO MORE AT THIS PRICE!

This really has to be a super buy in today's inflation-riddled world. For just **£99** you can purchase a complete station for 2 metre ssb and cw. This compact little rig covers 144.2 to 144.4MHz with 1 watt output. Completely portable it is the ideal package for the coming spring. A built in whip means you are ready to operate the moment you open the box (microphone included). For fixed station working there is an SO 239 socket on the back panel. Power is either from internal batteries or an external 12 volt source. Price includes handbook and full 12 month warranty. If you recognise a bargain when you see one you'll surely be sending off for this one.

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY,
ESSEX. Tel: (0702) 206835

AZDEN THE TWO-WAY RADIO

144MHz or 28MHz FM Models

METHOD 1.—Boot mount with detachable centre head

PCS3000 25W 2m FM £199 inc VAT
PCS2800 10W 10m FM £169 inc VAT



- ★ COMPUTER CONTROL
- ★ 12½ or 25kHz STEPS
- ★ REMOTE MIC CONTROL
- ★ 8 MEMORIES (Ni-cad back-up)
- ★ BAND SCAN & MEMORY SCAN

METHOD 2.—Conventional dash mounting



WHO IS AZDEN?

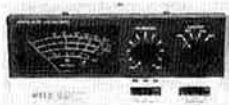
Azden began life back in 1963 specialising in audio products on which their business has been built. Now they employ over 400 employees of which 50 are licensed amateurs. Several years ago they began marketing communications products, including amateur radio transceivers for their home market. Now they have decided to expand into the World market and the PCS2800 and PCS3000 are the first European models to be released. Other products are already on the drawing board and the name of Azden should become familiar in the next few years.

SPECIFICATION?

5W/25W output. 144 to 146MHz. 25/12½kHz steps. 0.2µV for 12dB NO. LED Bar S-meter. 8-channel memory. Simplex/- = 600kHz/ + 600kHz = 1,750 tone burst. Boot mount option. Quick release computer control head. Band scanning (full or partial). Memory scanning. 4-digit frequency display. Remote control microphone. Ni-cad memory back-up (Ni-cad fitted). Illuminated key pad buttons. Mobile mount and hardware supplied. 12-month warranty.

EXCITING PRODUCTS—IMPORTED SPECIALLY BY US FOR YOU!—EXCITING PRICES!

"WELZ" TELLS THE TRUTH



MODELS

SP200 1-8-160MHz 20W-200W-1kW £49.95 (n.c.)
SP300 1-8-500MHz 20W-200W-1kW £69.95 (n.c.)
SP400 130-500MHz 5W-20W-150W £49.95 (n.c.)

Welz VSWR/POWER meters are high quality instruments approaching laboratory accuracy. They are capable of providing extremely accurate measurements of both power and voltage standing wave ratio. Features include high sensitivity (2-5W full scale 1-8-500MHz), & completely flat response.

VSWR/POWER FIELD STRENGTH METER 3-5-150MHz £11.95 inc VAT + 65p p&p



There really is no excuse for not owning one of these little units. It's a combined SWR meter, power meter and field strength meter covering HF and VHF bands 3-150MHz. It tells you all you need to know about your aerial system either mobile or fixed and gives an indication of power output and field strength. Each one is fully guaranteed for 12 months.

NO MORE SNAP, CRACKLE & POP SEIF PS134—THE RUGGED ONE 240V AC—12V DC 4AMPS

The message is beware of super cheap power supplies—they could destroy your transceiver! The SEIF unit is different. It's a really rugged unit with a heavy duty transformer ideal for running 10-15W mobile rigs. Completely stabilised and protected, this unit will give you good, reliable performances.



£22.95 inc VAT
£2.00 carriage

NEW

THE 'LONG JOHN' SUPER GAIN VERTICAL £19.95

A highly compact vertical aerial that will more than double your effective radiated power. Only 4ft tall yet really outclassing all its similar sized competitors. Construction features high quality plated aluminium and stainless steel fittings. The base matching section is fully protected against the weather and the SO239 socket is fully shrouded. The aerial comes complete with mast mounting clamps. The "Long John" really packs a knock-out punch.



NEW

HANDHELD CO-LINEAR £21.95

Surely the answer to the portable operator who seeks gain without increased battery drain. This highly compact co-linear completely folds down into its own carrying case. Yet in seconds it can be snapped together to give you up to 5dB of gain—that's nearly four times your power! Ideal for 2m handhelds and possibly a pretty good idea for RAYNET. Not only have you the advantage of the antenna gain, you also have the added gain obtained by the higher elevation of the handheld aerial. They really do work, we've tried them!



STILL THE MOST SENSITIVE MONITOR ON THE MARKET TM56B £79 inc VAT



Two models are available, one for the marine band and one for the amateur band. Each model comes fitted with 10 popular channels with a total capability of 16 channels of which four can be continually scanned. The TM56B can be operated from an external 12V DC source or from its own internal 240V AC supply. The loudspeaker is built into the base of this most sensitive monitor.

NEW

AT1000 SWL ATV IMPROVED SELECTIVITY 0-2 30MHz £29.95



Cross-modulation, intermodulation, poor sensitivity etc—all problems today's short wave listener is likely to suffer. That's why we have had the AT1000 specially designed for us in Japan in order to overcome these very problems. Insert the AT1000 between your aerial and receiver for an immediate improvement. Then sit back and really hear the DX roll in. A receiver without an AT1000 will soon be a thing of the past!



TVI CORNER

TV
If you are suffering TVI then you should try our HP3A high pass filter. Simply plug into the TV aerial socket to filter out the interference. As supplied to Home Office departments. £3.50 inc VAT

AUDIO
Even more of a problem today is Hi-Fi interference. Our special ferrite rings are ideal for fitting to speaker leads, signal leads and mains cables—they really are magic! £0.35 each, p&p 30p min.

MOBILE SAFETY MICS WHICH MODEL SUITS YOU?

AM202S

The boom mic with clip comes with control box which clips onto gear lever. This model suits all mobile transceivers except Icom IC255. £20.95 inc VAT

AM202H

The boom mic with clips comes with control box with up/down frequency control buttons. This model suits most modern synthesised transceivers that have remote frequency control. £29.00 inc VAT

If in doubt about suitability, please telephone.

Order by post or telephone with confidence
— you'll receive your order in 72 hours by
Securicor or post (aerials excepted).



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**OUR BEST ADVERTISEMENT
... IS OUR NAME!**

All goods sent are covered free by our own insurance

PRICE LIST—MARCH 1981

[illegible]

AMATEUR RADIO CENTRE OF THE SOUTH—well worth a visit

SPECIAL SALE PRICES ON SOME ITEMS TO PERSONAL CALLERS



Base mount single hole fixing + 3m cable 4.50 (1.50)
AERIAL ROTATORS (complete with control boxes)
 CDE AR30 (5 core cable) 47.00 (1.50)
 CDE AR40 (5 core cable) 59.80 (1.50)
 Channelmaster 9502 (3 core) 42.00 (2.00)
 Sky King SU4000 (6 core) 75.00 (2.50)
 Jaybeam KR400 (6 core) 106.00 (2.00)
 CDE alignment bearing 7.75 (1.00)
 Channelmaster alignment 11.75 (1.00)

HF ANTENNAS (various manufacturers)
 Mini-Products HQ-1 20/15/10m 2 el 96.50 (2.50)
 Mini-Products C4 20/15/10m vert dipole 48.50 (2.00)
 Mosley TD3JR 20/15/10m wire dipole 34.50 (1.50)
 Mosley "Mini-Beam" 20/15/10m 2 el. 600W 99.00 (2.00)
 Mosley "Mini-Beam" 20/15/10m 2 el. 2kW 129.00 (2.00)
 Mosley TA32 20/15/10m 3 el. 89.70 (2.00)
 Mosley TA33 20/15/10m 3 element 133.40 (2.50)
 Mosley Mustang 20/15/10m 3 element 2kW 166.75 (4.00)
 Hy-Gain 12AVQ 20/15/10m vertical 43.00 (2.00)
 Hy-Gain 14AVQ 40-10m vertical 60.00 (2.00)
 Hy-Gain 18AVT/WB 80-10m vertical 87.00 (2.50)
 HFS 80-10m vertical 200 watts 48.00 (2.00)
 Radial Kit for HF5 28.00 (2.00)
 Sagant EL40X 80-40 Balun fed dipole (79') 36.00 (1.50)
 Jaybeam TB3 HF 3 element Tribander 167.90 (4.50)
 Jaybeam VR3 HF Vertical Triband 42.50 (3.00)

DENTRON
 MLA2500B 6 band 160-10m 2kW linear 695.00 (n.c.)
 Clipperton-L 6 band 160-10m 2kW linear 459.00 (n.c.)
 DTR-1200L 5 band 80-10m 1-2kW linear t.b.a. (n.c.)
 GLA-1000B 5 band 80-10m 1kW linear 295.00 (n.c.)
 DTR-3KA 1-8-30MHz ATU/2kW t.b.a. (n.c.)
 MT-3000A 1-8-30MHz ATU/3kW 275.00 (n.c.)
 AT-1K 1-8-30MHz ATU/1kW 99.00 (n.c.)
 HF200A 80-10m transceiver 100W AC PSU 399.00 (n.c.)
 Spare set of D50A tubes 24.00 (n.c.)
 All band Doublet 1-8-30MHz + 470Ω feeder 22.50 (2.00)
 100ft 470Ω semi-air spaced feeder 22.00 (2.00)

ADONIS MICROPHONES
 AM202G Mobile safety mic 20.95 (n.c.)
 AM202S Mobile safety mic 20.95 (n.c.)
 AM202H Mobile safety mic 29.00 (n.c.)
 AM502G Base station compressor mic 39.00 (n.c.)
 AM802G Base station compressor mic 59.00 (n.c.)

SEM
 2m power amplifier/pre-amplifier 5/30W 50.00 (1.00)
 2m power amplifier/pre-amplifier 16/50W 66.70 (1.50)
 2m power amplifier/pre-amplifier 16/100W 126.50 (1.50)
 2m converter 23.00 (1.35)
 2m Auto switching pre-amplifier 21.73 (1.35)
 70cm Auto switching pre-amplifier 24.73 (1.35)

2m pre-amplifier 14.95 (1.35)
 70cm pre-amplifier 17.73 (1.35)
 2-40MHz pre-amplifier auto switching 18.66 (1.35)
 2-40MHz pre-amplifier 11.73 (1.35)
 PA3 miniature 2m pre-amplifier 8.00 (1.35)
 PA70 miniature 70cm pre-amplifier 10.00 (1.35)
 Z Match Aerial tun unit 1-8-30MHz 500W 47.15 (1.50)
 EZITUNE Aerial tuning aid 30.48 (1.75)
 IAMBIC Keyer 34.50 (1.75)

2 METRE PORTABLES
 SB2M 2m SSB portable 99.00 (1.50)
 AR245 2m FM synthesized handheld, 5W 178.00 (1.50)
 AR245 carrying case 4.10 (1.50)
 AR245 optional helical 4.10 (1.50)
 AR245 12V DC car adaptor/charger 4.10 (1.50)

VHF/UHF MONITORS
 TM56B FM Scanner 4 + 12 channels 79.00 (n.c.)
 Sound Air 008 8 channel FM monitor 69.00 (n.c.)
 Sound Air M161 16 channel FM monitor 59.00 (n.c.)
 MF083 Marine or Amateur + 3 FM broad. 85.00 (n.c.)
 BEARCAT 220FB VHF/UHF 258.00 (n.c.)
 SX200 VHF/UHF 240.00 (n.c.)
 SR9 Tuneable 144-148 or 156-162MHz 46.00 (n.c.)
 AR22 2m FM pocket synthesized handheld 83.00 (n.c.)
 AR22 flexible antenna 3.00 (n.c.)

MOBILE AERIALS
 ASP201 2m 1/2 wave with base 3.50 (1.25)
 ASP2009 2 5/8th wave with base 9.25 (2.00)
 ASP3009 2m 5/8th wave with base 9.75 (2.00)
 ASP462 70cm co-linear with base 8.25 (1.25)
 Magnetic base adaptor 8.50 (1.75)
 ASP677 2m 5/8th wave 14.95 (2.00)
 ASP667 70cm co-linear 17.95 (1.25)
 ASPM125 27MHz 1/2 wave 18.50 (2.00)
 Magnetic base adaptor 8.50 (1.75)
 ASP "no hole" boot mount adaptor 3.75 (1.50)
 2NE 2m 7/8th mobile whip 13.00 (2.00)
 RG4M Base for above aerial 3.50 (1.75)
 GSS Heavy duty gutter/boot mount 3.15 (1.50)
 MB5 Magnetic mount with 5m coax 7.95 (1.00)
 10SE 28MHz whip 1-72m long 11.50 (1.25)
 15SE 21MHz whip 1-72m long 11.50 (1.25)
 20SE 14MHz whip 1-72m long 13.80 (1.25)

WELZ PROFESSIONAL POWER/SWR METERS
 SP200 1-8-160MHz 20W-200W-1kW 49.95 (n.c.)
 SP300 1-8-500MHz 20W-200W-1kW 69.95 (n.c.)
 SP400 130-500MHz 5W-20W-150W 49.95 (n.c.)

SHORT WAVE LISTENER AERIALS
 3-30MHz Inverted "L" 9.95 (1.00)
 3-30MHz Broad band dipole 29.00 (1.00)
 Mosley RD5 all-band dipole 40.00 (1.00)

AIR BAND PORTABLE MONITORS (see also VHF/UHF Monitors)

SHARP FX213 tuneable receiver 13.50 (1.75)
 INGERSOLL MW/FM/Airband monitor 12.95 (1.75)
 R517 Tuneable + 3 Xtal controlled chan's 49.50 (1.75)

NAIGAI

500W pep 2m amplifier 429.00 (n.c.)

MISC STATION ITEMS

SEIF 13-8V 4 amp AC power supply 22.95 (1.50)
 PS125 6 amp AC power supply 28.00 (2.00)
 EK121 Katsumi Electronic Keyer 29.00 (1.75)
 EKM12 Matching side tone monitor 10.95 (1.50)
 CW2A general purpose morse oscillator 6.95 (1.50)
 Telegraph CW key (manual) 10.50 (1.75)
 YW3 Twin SWR/Pwr/Field strength meter 11.50 (1.50)
 MF210 Self powered 2M FM monitor 12.95 (1.50)
 FX1 d/l station w/meter 700kHz-250MHz 28.00 (1.00)
 DM801 700kHz-250MHz dip meter 51.75 (1.00)
 Station log books 1.95 (1.50)
 12BY7A driver valves 2.75 (1.50)
 6146B/S2001A P.A. valves 8.70 (1.50)
 6JS6C P.A. Valves Matched pairs 9.95 (1.50)
 PL259 plugs 63 (n.c.)
 PL259 reducers 17 (n.c.)
 SO239 chassis sockets 60 (1.10)
 PL259 joiners 85 (1.10)
 N. Plugs. Silver plated UR67 2.00 (n.c.)
 N. Plugs. Silver plated UR43 2.00 (n.c.)
 4 pin mic plugs 85 (1.10)
 3 pin mic plugs 85 (1.10)
 6 pin mic plugs (FDK 750) 1.00 (1.10)
 3 pin chassis socket 85 (1.10)
 4 pin chassis socket 85 (1.10)
 BNC plugs (bayonet) 90 (1.05)
 Pen Cell Ni-cads (HP7 size) 1.20 (1.05)
 Cigar lighter plugs 55 (1.10)
 UR67 cable 50Ω per metre 69 (1.10)
 UR43 cable 50Ω per metre 23 (1.05)
 5 core rotator cable per metre 30 (1.05)
 BL40X balun 50Ω 11.25 (1.35)
 3 core rotator cable. Per metre 22 (1.05)
 Ferrite rings 1 1/2" diameter 35 (1.05)
 Mosley aerial insulators 30 (1.05)
 KX2 SWL aerial tuner 0-5-30MHz 29.90 (1.50)
 APM1 Audio Peak and notch filter 33.00 (1.00)
 HP3A TVI high pass filter (UHF T.V.) 3.50 (1.50)
 Drake TV3300 LP Low Pass Filter 18.40 (1.20)
 Shure 444D high impedance desk mic 27.50 (1.50)
 Shure 201 high impedance hand mic 11.75 (1.00)
 Trio HCM10 Digital World Clock 55.20 (1.50)

TRIO TS830S £639.00



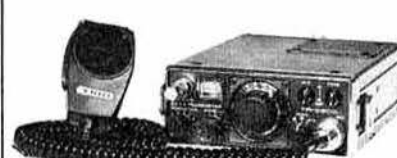
A brand new model having all nine bands fitted and providing 200 watts input SSB/CW. Built in 230V ac supply, 6146B tubes and full digital and analogue display. Plus a really comprehensive variable selectivity and notch filtering system. The DX'ers dream.

TRIO TS130S £491.00



Base or mobile this solid state HF transceiver covers eight bands SSB/CW with a genuine 100 watts output. No tune up, IF tuning and speech processing are just a few of its features. 12V dc operation with full digital display plus optional PS30 for 230V AC operation.

TRIO TR2300 £166.75



KING OF THE PORTABLES!

TRIO R1000 £285.00



The receiver that revolutionised short wave listening. Full 30 band coverage 200kHz to 30MHz SSB/CW/AM. Both digital and analogue readouts are provided together with 230V or 12V dc operation facilities. Trio engineering at its best and at a very competitive price.

TRIO TR9000 £345.00



An all mode 2 metre transceiver that serves the dual roll of mobile and base station. Features include digital readout, 12½ or 25kHz steps in FM, five memories band scanning and a lot more! Send for coloured leaflet.

TRIO TR7800 £268.00



The latest Trio 25 watt FM transceiver with a host of features that makes mobile operating a real pleasure. Built-in keypad, digital readout, 14 memories—the list of features is endless. Send a SAE for full details.

MONDAY - SATURDAY 9.5.30

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Thanet Electronics

for ICOM

the amateur's professional friends

This month we are showing you:

IC-451 UHF Base Station
 IC-720A — ICOM's new 9 band HF Transceiver.
 Theta 7000E — An outstanding communications computer.
 IC202S — A pair of magnificent sideband portables.
 IC402

On these, and all our other products:

- * we offer a full year's warranty on all parts and labour
- * Free delivery for all transceivers, using registered first class post

IC-451 UHF Base Station



£579 inc. V.A.T.

IC2E — Probably the smallest made, extra sensitive handy talkie.
 IC251E — Must be the best value in 2M base stations.
 IC255E — A great value 25W mobile transceiver.
 IC260E — The ideal choice for multimode mobile.

- * All prices including V.A.T.
- * H.P. and Part Exchange welcome.

ICOM are proud to announce the introduction of the 70cm version of their famous 2m base station — the IC-251. Of course, it is engineered to the usual high ICOM standards and includes such features as:-

- * 3 memory channels
- * Automatic repeater shift on switch-on
- * Additional selectable shift for European DX
- * Selectable channel steps for FM (supplied with 25KHz — others are diode programmable)
- * Full power control on SSB/CW/FM
- * Superb receiver performance using MOSFETS
- * Multipurpose scanning
- * Covers 430-440 MHz
- * Xtal controlled Toneburst
- * Cool running chopper power supply

Also available from our shop in Herne Bay are:

- | | | |
|---------------------|-----------|-------------------------|
| * MICROWAVE MODULES | * WESTERN | * ANTENNA SPECIALISTS |
| * J-BEAM | * G-WHIP | * YA ESU MUSEN |
| * RSGB PUBLICATIONS | * BEARCAT | * VIDEO GENIE COMPUTERS |

IMPORTANT

We would like you to phone, or write to us so that we can give you as much detailed information as possible on any particular product. Use our 24 hour ansafone when calls are cheap.

SEND FOR TECHNICAL DETAILS

Thanet for



ICOM

143 RECVLVER RD.,
 BELTINGE,
 HERNE BAY, KENT.
 Tel: 02273/63859



**All over the World
they haven't been able
to get enough!
(But things are getting better)**



ICOM's new 9-band HF Transceiver — the IC-720A beats the lot!

**IC-720A
£795 incl**

Some features.

- * 9 Bands Top to Ten including new ones!
 - * General Coverage Receiver — 100KHz to 30MHz.
 - * Tuning down to 10Hz steps — YES! 10Hz — yet stable as a rock!
 - * Built-in Speech Compressor which really gets excellent reports.
 - * The famous ICOM Band Pass Tuning.
 - * Memory — it even does all the band changing for you.
 - * Self cancelling RIT.
 - * 3 rates of Tuning.
 - * Two Independent VFOs (in band duplex possible).
 - * 100 W Output.
 - * Modes AM, SSB, CW and RTTY.
- A lot in a small packet for £795 incl. VAT (13.6V operation — matching mains PSU E100)
- * Solid State 500W linear available shortly.

**FOR
ONLY
£640.00
INCL.**



Tono Theta 7000E A great computer on offer from Thanet

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

Some of the Outstanding Features
COMMUNICATIONS COMPUTER THETA 0-7000E

UHF and Composite Video Output * Printer interface * Wide range of transmitting and receiving speeds — 10CW speeds + 8RTTY * Built-in demodulator for high performance for 170, 425 and 820 Hz shift * Crystal controlled modulator for ASFK — Hi or Lo tone * Convenient ASCII key arrangement * Large capacity display memory

— 2 pages 32chr x 16 lines split screen for Rx & Tx if required * Automatic transmit/receive switch * Anti-noise circuit * Battery backed-up memory 7 channels of 64chr * Send function * Buffer memory — 53 character type ahead, rub out function * Simultaneous access of the memory — 53 character type ah LF (line feed) cancel function * Cursor control function * Word mode operation * Automatic CR/LF (72, 60 or 80 chr's per line) * Echo function

* Word Wrap around function * Transmit/receive in ASCII mode or RTTY * CW identification function * Mark and break (space and break) system * Monitor circuit & CW practice function * Variable CW weights * Cross pattern checking output terminal * Log computer output provided * Test message function (Ry and QBF).

Phone or write for the price list of accessories for this unit.

**IC-202S
£169 INCL.**



What a tremendous pair

The IC-202S is a very well designed 2m SSB portable. It offers: 3W pep output on USB, LSB and CW. * Large Battery capacity (HP11 type) or Nicads if you wish * A special VXO circuit to provide smooth tuning and crystal stability needed for SSB operation on 2m * Each of the four 200kHz band positions allows operation anywhere in 2m. (Supplied with 144-144.2 and 144.2-144.4) * Top of the band Oscar xtals available for "cross-pond-working" * It has a DC socket and SO239 sockets for mobile or base station working, barefoot or as a prime mover * Mobile mounting brackets, Nicad packs, chargers, cases all available options. You must agree, a very versatile well proved rig.

Their versatility is well worth an enquiry.

**IC-402
£242 INCL.**



The 70cm twin of the 202S having very similar features, covering the frequency range of 432-435.2 MHz.

SEND FOR TECHNICAL DETAILS

Thanet for



ICOM

TELEX: 965179



It's Small- but very Sensitive

IC-2E Handy Talky £159^{INCL.}



CHECK THE FEATURES

FULLY SYNTHESIZED — covering 144-145.995 in 400 5kHz steps.
POWER OUTPUT — 1.5W with the 9V rechargeable battery pack as supplied — but lower or higher output available with the optional 6V or 12V packs.
BNC ANTENNA OUTPUT SOCKET — 50 ohms for connecting to another antenna or use the Rubber Duck supplied.

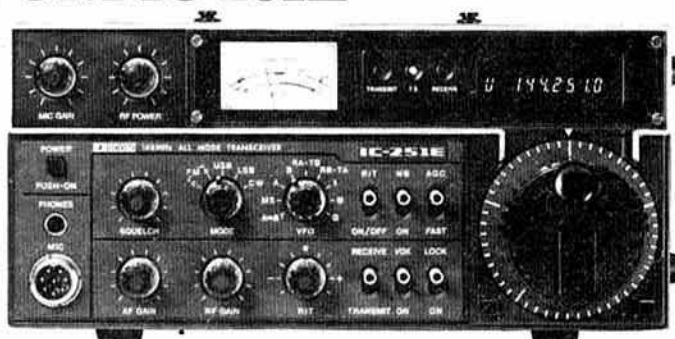
SEND/BATTERY INDICATOR — Lights during transmit, but when battery power falls below 6V it doesn't light indicating the need for a recharge.
FREQUENCY SELECTION — by thumbwheel switches, indicating the frequency.

+5kHz SWITCH — adds 5kHz to the indicated frequency.
DUPLEX SIMPLEX SWITCH — gives simplex or plus 600kHz or minus 600 kHz Transmit.
HI-LOW SWITCH — reduces power output from 1.5W to 150mW reducing battery drain.
EXTERNAL MICROPHONE JACK — If you do not wish to use the built-in electret condenser mic an optional microphone/speaker with PTT control can be used. Useful for pocket operation.
EXTERNAL SPEAKER JACK — for speaker or earphone.
 This little beauty is supplied ready to go complete with nicad battery pack, charger, rubber duck.

IC2E OPTIONS

BATTERY PACKS			CHARGERS ETC		
ICBP3	9 VOLT PACK (AS FITTED) REPLACEMENT	£15.50	IC-DC1	9 VOLT REGULATOR PACK	£7.50
ICBP2	(7.2 VOLT) (1 WATT)	£22.00	IC-CP1	CAR CHARGER LEAD WITH CIGAR PLUG	£2.75
ICBP4	EMPTY CASE (WILL TAKE SIX 'AA' SIZE NI-CADS)	£5.00	IC-BC25	CHARGER FOR BP3 AS SUPPLIED	£3.70
ICBP5	11 VOLT PACK (2.3 WATTS)	£30.50	IC-BC30	DESK TYPE AUTO CHARGER FOR ALL NI-CAD PACKS (1½ hours charge time for BP5.)	£34.00

It will seduce you in its own way the ICOM IC 251E



**only
£479^{INCL.}**

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for only
£255
INCL.

IC-255E

An experts mobile choice

NOW WITH
IMPROVED
FRONT-END



**25 Watts – 5 Memories – Scanning – 600kHz
AND User Selectable Repeater Shift – Full Coverage in 5kHz or 25kHz Steps.**

- Crystal controlled Tone Burst
- Full band coverage – extendable to 148MHz if required
- Four digit LED display
- 25 Watts output or 1W low power
- A superb receiver using grounded gate FET front end
- Scanning over a user programmable range
- Memory scan
- Stop on empty or busy channels
- Tuning in 25kHz or 5kHz steps
- 5 Memories – retained while the power is connected to the rig
- Built-in 600kHz Repeater Shift
- Alternative programmable shift
- Reverse Repeater facilities
- RIT (± 3kHz for those off channel stations)
- Scan control from the microphone (optional mic available)
- Good loud audio
- Optically coupled tuning between control knob and CPU
- Multiway 24 pin socket on back for touchpad, computer, or external control
- Rugged modular PA (Guaranteed of course!)
- Mobile mount which can be padlocked
- Up-down scanning microphone available

CAN YOU RESIST SUCH A TEMPTATION

Enjoy VHF mobile at its best-IC-260E

The IC-260E offers such extras as full frequency read out, upper and lower sideband, and scanning as well as FM and CW. Thus, it makes an ideal base station, when used with a DC power supply, as well as a mobile. Now supplied with up-down scanning mic.



£339 INCL.

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Wales	Tony GW3FKO (0874 2772)	North West	Gordon G3LEQ (Knutsford (0565) 4040)
Burnley	(0282 38481)		





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£10.50 (Carriage 50p)

YAESU WORLD CLOCK
QTR 24D (Quartz)
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Cross pointers indicate forward-reflected power and SWR
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A compact lightweight antenna tuner designed for base or mobile use with the TS-130
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also available
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£10.50 (Carriage 50p)

SHURE 444 DESK MIC
Most popular fixed station mic now in dual impedance form
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TRIO TS-130S HF TRANSCEIVER
The latest version of the very popular TS-120. Now fitted with the new bands, speech processor. Choice of filters
TS-130S £491.00 TS-130V £404.00 (Carriage free)

TRIO PS-30 POWER SUPPLY
Matching PSU for using the TS-130S in your shack
£85.00 (Carriage £3.00)

TRIO TR-9000 2m ALL-MODE TRANSCEIVER

This transceiver has full functions FM/SSB/CW modes but is still light and compact. Ideal for mobile, field or fixed station
£345.00 (Carriage free)

BO-9 SYSTEM BASE

Provides power supply for the memory back-up in the transceiver, manual standby switch for cw operation, headphone jack and switched ac outlet for PS-20
£32.00 (Carriage £1.50)

ADONIS AM-502 COMPRESSOR MICROPHONE
Hi/low setting—condenser insert—PTT/latch—matches 500Ω to 1MΩ
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AM-502 COMPRESSOR MICROPHONE
3 compressor settings
3 output settings
£59.00 (Carriage 75p)

PS-20 POWER SUPPLY
for use with TS-130V or TR-9000
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SP-120 EXTERNAL SPEAKER
for home station use
£25.30 (Carriage £1.00)

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MULTIMODES—MULTICHOICE

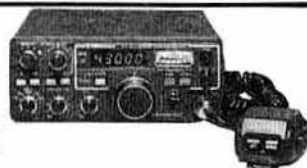
YAESU FT480R

£359, inc. VAT & CARRIAGE



TRIO TR9000

£345, inc. VAT & CARRIAGE



ICOM IC260E

£339, inc. VAT & CARRIAGE



FDK MULTI 750E

£299, inc. VAT & CARRIAGE



*"A handy talkie"
"A pocket portable"*



ICOM

IC-2E £159

inc. VAT & CARRIAGE

- Fully synthesized—covering 144-145.995 in 5kHz steps.
- 1.5W power output with 9V battery as supplied.
- Optional 6V or 12V packs for lower or higher power.
- BNC antenna output socket for helical or external antenna.
- Weight—only 450 grams with supplied battery pack and helical.
- Send/battery indicator—indicates transmit until time for battery recharge.
- Duplex/Simplex switch—Hi/Low power switch.
- Optional external speaker microphone available now.
- Full 12 months guarantee for all rigs bought from Bredhurst Electronics.



TRANSCIVERS

H.F.	
TRIO TS130V	£404.00
TRIO TS130S	£491.00
YAESU FT707	£529.00
YAESU FT101Z	£445.00
YAESU FT101ZD	£515.00
TRIO TS180S (with DFC)	£679.00
YAESU FT107M	£690.00
2.M. MOBILES	
ICOM IC-240	£169.00
FDK Multi 700EX	£199.00
STANDARD C8900	£250.00
ICOM IC255E	£255.00
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ICOM IC2E	£159.00
FDK PALM IV	£159.00
AOR AR245	£178.00
TRIO TR2300	£166.00
YAESU FT207R	£195.00
TRIO TR2400	£199.00
2.M. MULTIMODES	
FDK MULTI 750E	£299.00
ICOM IC260E	£339.00
TRIO TR9000	£345.00
YAESU FT480	£359.00
ICOM IC251E	£479.00

RECEIVERS

H.F.	
LOWE SRX30	£158.00
YAESU FRG7	£189.00
TRIO R1000	£285.00
YAESU FRG7700	£309.00
2.M. F.M.	
SEARCH 9	£45.00
A.O.R. AR22	£83.00
FDK TM56B	£79.00
BEARCAT 220FB	£258.00
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SEARCH 9	£45.00
FDK TM56B	£79.00
BEARCAT 220FB	£258.00

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KEEP BOTH HANDS ON THE WHEEL USING THE LATEST IN MOBILE MICROPHONES

These consist of a high quality condenser microphone used in conjunction with an F.E.T. preamplifier with approx. 12dB gain. Fix the boom microphone to a convenient point such as the sun visor. Position the amplifier and TX/RX switch on the gear lever. Connect the mic plug and power lead and its ready for use.

MM202S £20.95 inc. VAT (carriage 50p)
MM202H—Head band £29.00 inc. VAT (carriage 50p)

ACCESSORIES

	Price Carriage
KEYERS HK707 (Up/down)	£10.50 (£0.50)
KEYERS HK704 (Squeeze)	£10.50 (£0.50)
KEYERS EK 150 (Semi/fully auto with monitor) 240V/12V	£74.00 (—)
HELICAL BNC—2 metres	£4.50 (£0.25)
HELICAL PL259—2 metres	£4.50 (£0.25)
DUMMY LOAD DL20	£6.00 (£0.30)
DUMMY LOAD T100	£22.95 (£0.75)
DUMMY LOAD T200	£34.00 (£0.75)
MOBILE SPEAKERS YAESU 8ohm 6W	£9.95 (£0.75)
POWER SUPPLIES 13.8V 4A	£22.95 (£1.00)
POWER SUPPLIES 13.8V 6A cont.	£44.95 (£2.00)
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MICROPHONES, ADONIS desk compressor	£39.00 (—)
MICROPHONES, ADONIS 3 output desk compressor	£59.00 (—)
MICROPHONES, YAESU YD148 dual imp	£20.95 (£0.75)
WORLD CLOCK QTR24	£18.40 (£0.75)
WORLD CLOCK QTR24D (Quartz)	£24.50 (£0.75)
LOW PASS FILTERS TRIO LF30A	£18.40 (£0.75)
LOW PASS FILTER YAESU FF501DX	£22.25 (£0.75)
LISTENERS A.T.U. MIZUHO KX2	£29.95 (£0.75)
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WAVE METER FX1	£28.00 (£0.75)
SWR YW3	£11.50 (£0.50)
SWR110	£35.00 (£0.50)
SWR CN620 (2M)	£52.00 (—)
SWR CN630 (70cm)	£71.00 (—)
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AMATEUR RADIO EXCHANGE

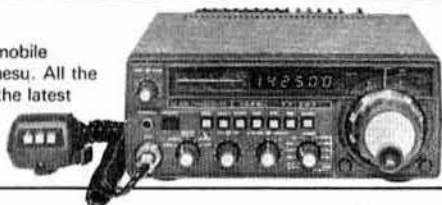


We've always aimed to hold in stock the widest possible range of Amateur Radio equipment, no matter who makes it. So, this month, as well as featuring such brands as YAESU, ICOM, TRIO/KENWOOD, STANDARD, MICROWAVE MODULES etc, we are giving particular prominence to a really marvellous new receiver from SONY . . . not a name you expect to find in these pages.

FT-707

The ultimate in HF mobile transceivers from Yaesu. All the new bands, and all the latest technology.

£499 inc. VAT



FT-101

Yaesu's '101' series HF base stations have earned an outstanding reputation for reliability over the years, and our 101s come complete with cooling fan and mic and the new bands

FT-101Z £488 inc. VAT

FT-101ZD £569 inc. VAT



FRG-7

Still the finest value-for-money communications receiver on the market at only

£185 inc. VAT and free Heliscan aerial worth **£15**



R-1000

Trio/Kenwood's successful new receiver with the PLL system that has proved so popular

£285 inc. VAT and free Heliscan aerial worth **£15**

FT-107M

Yaesu's solid state, broad band tuned HF transceiver, will operate into a 3-1 SWR and still bring in the DX

£690 inc. VAT



FRG-7700

Yaesu's latest receiver with FM right across the band and optional memory facility plus excellent filtering

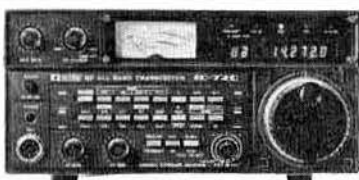
£299 inc. VAT and free Heliscan aerial worth **£15** (Memory extra)



IC-720A

Icom's superb new HF rig with general coverage receive 100kc-30MHz plus transmit facility across its entire range for commercial purposes

£795 inc. VAT



TS-830S

Another Trio/Kenwood development of an existing best-seller . . . the TS-820 gives way to the TS-830S, now with all the new bands, notch filter, IF shift, etc

£625 inc. VAT and free mic.

TS-130S

Trio/Kenwood take up where the successful TS-120 models left off with this new mobile HF transceiver with the new WARC bands

£479 inc. VAT



BEARCAT 220FB

The super scanner which brings you all the excitement of the VHF and UHF frequencies . . . aircraft, marine, amateur, plus so much more

£258.75 inc. VAT

FT-480R/FT-780R

Yaesu's pace-setting mobile format now available for either 2m or 70cm use.

FT-480R £359 inc. VAT

FT-780R £395 inc. VAT



TR-9000

Trio/Kenwood's long-awaited entry into the 2m all-mode mobile field with 5-channel memory, twin VFOs etc

£342 inc. VAT



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INSTANT HP AND 6-MONTHS NO-INTEREST HP TERMS AVAILABLE
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AMATEUR RADIO EXCHANGE



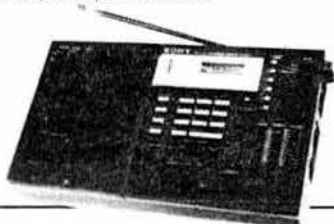
But then we've always said that the only way to buy a rig is to compare as many alternatives as possible side by side, and then choose the one that's right for you. So, whether the equipment you're looking for is new or secondhand, a major line-up or just some bits and pieces, Brenda (G8SXY) and Bernie (G4AOG) invite you to come and see London's widest selection of gear . . . and have a cup of Brenda's coffee too!

THE FANTASTIC NEW SONY ICF-2001

At last, from one of the world's electronics giants, a real HF communications receiver . . . and the very first with keyboard frequency entry . . . yet so compact you can slip it in your briefcase.

Super selectivity and sensitivity right across its range. AM/SSB 150kc to 30MHz and FM 76MHz to 108MHz.

And all for an amazingly low price of just
£149.00 inc. VAT.



C-78

Standard's new synthesised 70cm Portable/Mobile covering 430MHz to 439MHz, and featuring UK Repeater shift, tone burst, 25kc and 50kc shift, and internal batteries or external 13.8V power supply.

£209 inc. VAT



IC-2E

About the smallest hand-held on the market, but with simplex and duplex over the full 144-146MHz range in 5kc steps, and giving a full 1.5W out

£159 inc. VAT



MR-1000A

The finest value pocket VHF scanning receiver ever offered. 10 channels, with scan or manual tune across selected crystal-controlled channels. Complete with Nicads and charger

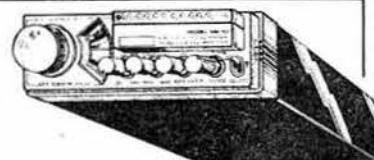
£39 inc. VAT
(2m amateur band crystals £2 per channel)



MK-10

VHF scanning receiver covering 144-152MHz. Scans up to 12 crystal-controlled frequencies or VFO control on main dial. Excellent sensitivity. 12V only.

£69 inc. VAT (2m amateur band crystals £2 per channel)



MMT 432/144

2-70 Transverter

£184.00
inc. VAT

MMT 144/28

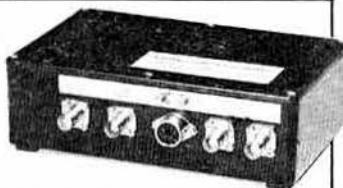
10-2 Transverter

£99.00
inc. VAT

MMT 28/144

2-10 Transverter

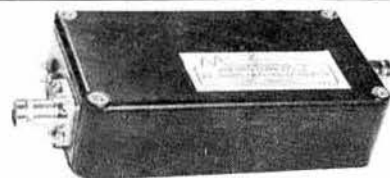
£99.00
inc. VAT



MMA-144V

Low-noise RF switched pre-amp for use in straight-through mode with up to 100W input.

£34.90 inc. VAT



MML 144/100

A really powerful RF amp with pre-amp. 10W in/100 out

£142.60 inc. VAT



MML 144/25

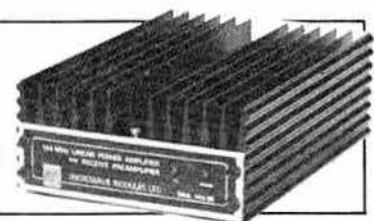
RF amp for 2m. 2W in/25 out

£59.00 inc. VAT

MML 144/40

RF amp for 2m. 10W in/40 out

£77.00 inc. VAT



MM-2000

RTTY to TV converter. This complete terminal unit and TV interface only requires audio from receiver to display RTTY on TV

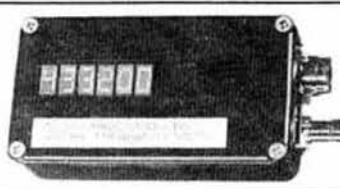
£169 inc. VAT



MMD 050/500

Pinpoint accuracy from this frequency counter covering from 0.050-500MHz in 2 ranges. 6 digit readout

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FT-107M Deluxe solid-state HF transceiver

A real thoroughbred from the YAESU stable – a superb receiver section in combination with a rugged, powerful, solid-state PA. 240 watt PEP input, 12 memory option, latest bands.

FT-480R High technology all-mode 2metre mobile



The most advanced 2 metre mobile available today – USB, LSB, FM, CW full scanning with priority channel, 4 memory channel, dual synthesized VFO system.

FT-707 All solid-state HF mobile transceiver



The definitive HF mobile rig, digital, variable IF bandwidth, 100 watts PEP SSB, AM, CW (pictured here with 12 channel memory VFO).

As factory appointed distributors we offer you – widest choice, largest stocks, quickest deal and fast sure service right through –



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

FT-707 In base station format



Here we show the 707 together with the matching FP-707 PSU, FC-707 ATU and FV-707DM VFO memory.



For full details of these new and exciting models, send today for the latest YAESU CATALOGUE and LEAFLETS. All you need to do to obtain the latest information about these exciting developments from the world's No. 1 manufacturer of amateur radio equipment is to send 36p in stamps and as an added bonus you will get our credit voucher value £3.60p – a 10 to 1 winning offer.

FL-2100Z High power all band HF linear

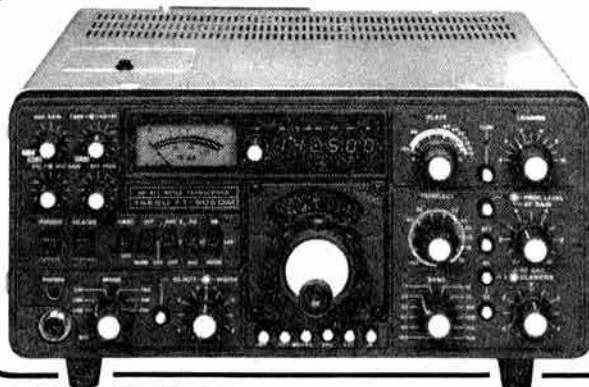


Conservatively rated at 1200W PEP input, the new WARC model incorporates all the new bands.

FRG-7700 Synthesized general coverage receiver



The very latest in receiver technology from YAESU. Receives USB, LSB, CW and FM—memory option with 12 channels and automatic band selection.



FT-902DM Competition grade HF transceiver

The YAESU world famous pace-setter with the acknowledged unbeatable reputation. Now with the new WARC bands.

FT-101ZD High performance HF transceiver (NOT ILLUSTRATED)

Next to the 902 comes the superb FT-101Z/D. This fine HF transceiver out-performs many a more expensive rig.

FT-225RD Deluxe 2 metre base station



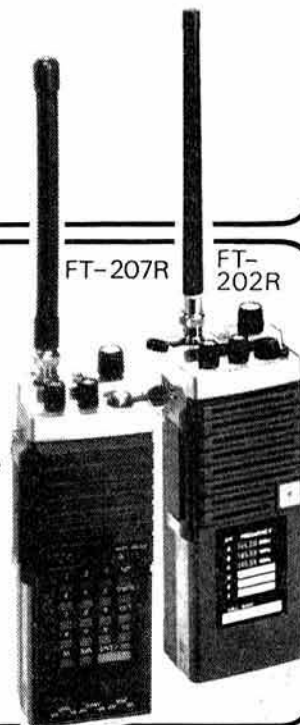
The tried and proven all-mode 225RD has a very comprehensive specification including memory option, variable power output and DC operation for portable working.

FT-202R 2metre hand-held

Ultra compact lightweight (400g) FM hand-held 1 watt 6 channel, rugged and reliable—many thousands in use.

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400 channels on 144–146 MHz. Memory back-up, 2.5 watt output.



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NORTH EAST—NORTH EAST AMATEUR RADIO, DARLINGTON 0325 55969
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As from May 1st, our new opening hours are 9.30–5.30 Tues. to Sat. continuous and CLOSED all day Monday.

WHERE TO FIND US

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

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

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

Amateur Electronics UK

508-516 Alum Rock Road·Birmingham 8

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- ★ Grand Raffle
- ★ Amateur Computer Stands
- ★ Home Office and Raynet Stands
- ★ Radio Society's Stands and Trophy
- ★ Morse Code Challenge

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J. Birkett
The Amateur Radio Shop
Radiotronics
Lowe Electronics Ltd
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S.M.C. (Jack Tweedy) Ltd
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N.W. Repeater Group (Bring & Buy)
S.G.S. Electronics
GH2 Enterprises
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Mechanelec Ltd
W.H. Westlake
D.S. Electronics
Microdigital Ltd

Arrow Electronics Ltd
Telecom
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Tandy Corporation (UK)
Ace Mailtronix Ltd
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Marco Trading
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BELLE VUE HAS AMPLE CAR PARKS

*FM Talk-in on GB3NRS & G8NRS/A on 145MHz Chs S22, R2 R6
and on 433MHz Chs SU8, RB4 & RB14*

ADMISSION 40p BY RAFFLE TICKET AND EXHIBITION PLAN

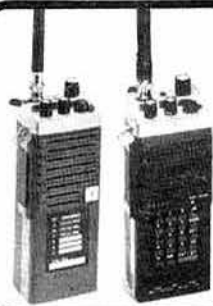
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 Our honest advice and evaluation of part exchange equipments' worth.
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AND DO NOT FORGET THE FREE FINANCE SCHEME

Give us a ring for full details (subject to clearance and a minimum of £100 invoice) we will help you to enjoy new regular priced Yaesu, KDK, Gem Quad, Ascot, SMCHS, CDE, Hy Gain, Stolle, Channel Master, SMC, Hansen, MFJ, KLM, Mirage, and Hi-Mound—Tomorrow!



**FT207R
£195**
144MHz 3W
12kHz Synth

**FT202R
£109**
144MHz 1W
6 Chan 13 incl

**FT404R
£179**
432MHz 3 W
6 Channel



*9 Band Models—6 Banders in stock

FT101ZD £569*

10 160m, SSB, CW, AM, Digital, Variable IF bandwidth, (Analogue version £488.57!!)



*9 Band Models—6 Banders in stock

FT107M £690*

160 10m + 2 Aux, SSB, CW, FSK, AM Memory option, Deluxe all solid state



*9 Band Models—6 Banders in stock

FT902DM £799*

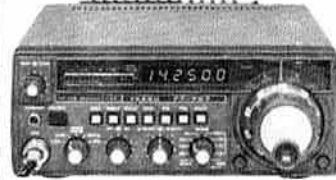
10 160m, SSB, CW, AM, FM, Deluxe Digital, (DE version £713.00, D version £724.50)

**FT7B £399**

80 10m, SSB, CW, AM, Audio filter for CW, 100W PEP 5 bands

*** SALE *****FT/FP200 £345**

10 80m, SSB, CW, 180W PIP, C/W, FP200 AC PSU/speaker, 5 Bander

**FT707 £500**

10 80m, 100W PEP, SSB, AM, CW, Variable IF Bandwidth, Digital, 8 Bander

**FT480R £359**

2m, Synthesised, 100, 25, 1kHz steps FM 1kHz, 100, 10Hz, steps SSB, 10W PEP

*** NEW *****FT780R £409**

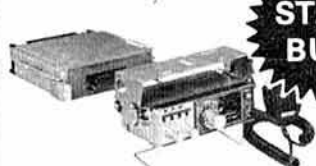
70cm, Synthesised, 100, 25, 1kHz steps FM, 1kHz, 100, 10Hz steps SSB, 10W PEP

**FT225RD £565**

2m, SSB, CW, FM, AM, Digital readout, 25 + watts, (Analogue version £449.00)

**FRG7 £199**

0-5 30MHz General Coverage Receiver, 230V ac, 12V dc, + Battery pack, AM/SSB



**STAR
BUY**

FT720RV £253

FT720R £120, S72 £56, E72S £23, E724 £28, 720RV £133, 720RVH £143, 720RV £156, MMB3

**FRG7700 £309**

0-15 30MHz General Coverage Receiver, AM/SSB/CW/FM (Memory Version £389)

PRICES INCLUDE VAT @ 15%

FREE SECURICOR DELIVERY

2 YEAR DISTRIBUTOR WARRANTY

Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton

KDK KYOKUTO

SYNTHESIZED TRANSCEIVER

144MHz - 25W - 12½/25kHz



KDK 2025

- ★ Custom designed microprocessor control
- ★ 25kHz and 12.5kHz synthesizer steps!!
- ★ 'Instant QSY', 10 times rate button
- ★ 25 Watts of reliable RF output
- ★ Band scan between any 'easy set' limits
- ★ 10 write-in non-volatile memory channels
- ★ Memory scanning with hold facility
- ★ Standard ± 600kHz or any repeater split

The KDK FM2025E is a 12V dc two-metre FM transceiver for mobile or base station use. Although feature packed, operational ease is assured by use of a "custom microprocessor".

Digital frequency synthesis provides full band coverage in 12.5kHz or 25kHz steps. "Single knob" frequency selection is by an optically coupled encoder. A dialling speed switch (increases tuning steps) facilitates rapid QSY's.

A 10 slot memory with Ni-Cad back-up, provides 10 simplex (with ±600kHz shift) and/or 5 semi-duplex channels, making the 2025 as easy to use mobile as a crystal controlled transceiver. One memory is semi-dedicated to "priority" and programmable when the 2025 is dial controlled.

The 2025 embodies the best non-lockout scanner. It scans occupied or empty channels and a flick switch enables immediate transmission. The scanner works on the memories and across any selected portion of the band (scan limits are defined by two of the memories).

Dual gate UHF MOSFETS in the RF and mixer provide superior intermodulation performance with high sensitivity maintained over the band by auto-varicap tuning. A monolithic crystal filter in the first IF and a 15 pole ceramic filter in the second provides excellent selectivity.

The single conversion transmitter uses a balanced mixer and a VCO on the signal frequency (directly modulated for superb FM) and a hybrid power module for 25W (or 3W) RF. The PA is impervious to breakdowns under infinite VSWR.

Necessary control function instructions are programmed into the microprocessor itself. But by re-arranging a diode matrix, the lower frequency transceiver limit, the high frequency receive limit and the high frequency transmit limit may be altered to allow for changes of band plan or location.

Switchable auto-tone-burst, RF attenuator, squelch, microphone, microphone clip, power lead, mounting bracket, handbook are, of course, part of the package.

"What's the catch?" "None!" Compare the specifications, the features, the construction, the quality and the price.

£225 INC. VAT AT 15%
INC. SECURICOR

The 2025 is available from the importers or selected dealers

**MICROWAVE
MODULES LTD**

L144/25 £51



2 METRE, 25W LINEAR AND PRE AMP
1W drive, (e.g. FT202R) 10W out, 3W drive (e.g. FT207R) 30W out. RF sensing with override. 10dB pre amp gain. Around 2.8A at 13.8VDC (@ 25W).

L144/40 £67



2 METRE, 40W LINEAR AND PRE AMP
10W drive (e.g. FT480R) 40W output. RF sensing with override. 10dB pre amp gain. Around 5A at 13.8VDC (@ 40W).

L144/100 £124



2 METRE, 100W LINEAR
10W drive, 80W minimum (100W typical) output Thermal and VSW shutdown. Excessive and reserve polarity protection 12A max. at 13.8VDC (@ 80W).

L432/20 £67



70 CMS 20W LINEAR AND PRE AMP
3W drive (e.g. FT404R) for 20W output RF sensing with override. 12dB pre amp gain. About 3A at 13.8V (@ 20W).

L432/50 £103



70 CMS 50W LINEAR AND PRE AMP
10W drive (e.g. FT780R) for 50W output. RF sensing with override. 10dB pre amp gain. Around 8A at 13.8VDC (@ 50W).

L432/100 £198



70 CMS 100W LINEAR
10W drive for 100W RMS output (-1dB compression). Thermal - VSWR - Excessive voltage and reverse polarity protection. 20A @ 13.8V for 100W.

T28/144 £86



10 METRE, 10W TRANSVERTER
10W on 10 metres output, from 2 metres. 2dB noise figure. RF sensing. 30mW or 10W drive (c/w 15dB pad).

T144/28 £86



2 METRE, 10W TRANSVERTER
10W on 2 metres from 10 metre source 5-500mW (on board attenuator). Current 2.1A peak, 0.3A quiescent.

T432/28S £129



70 CMS TRANSVERTER (SATELLITE)
10W on 70 cms from 10 metres (5-500mW drive). Dual crystal local oscillator chain, for 2MHz offset (434 up).

T432/144R £160



70 CMS TRANSVERTER (REPEATER)
10W on 70 cms from 2 metres. (10 watt drive). Double conversion. Dual crystal local oscillator chain for 1.6MHz offset.

T1296/144 £160



23 CMS 1.3W TRANSVERTER
1.3W on 23 cms from 2 metres (5-500mW or 10W drive). 2.9dB Noise figure.
T1296/144LN 1.5dB NF at £175.

PRICES EXCLUDE VAT (15%) P&P £1.50 WORLDWIDE



SOUTH MIDLANDS COMMUNICATIONS LIMITED

S. M. HOUSE, OSBORNE ROAD, TOTTON, SOUTHAMPTON SO4 4DN, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton



VERSATOWER

TELESCOPIC & TILTOVER RADIO TOWERS

Twelve years of continuous development has produced a range of over 50 models, all of which, being made in England, conform to the current B.S.S., requiring minimum designed wind speeds of 85mph and up to 117mph.

Before purchasing a Tower, we strongly recommend consulting one of our engineers for advice regarding the most suitable combination for an installation. It would be incorrect to nominate a specific headload as this is dependent upon load distribution, geographical location and siting.

25-120ft, post, base plate, wall, fixed base or mobile (on high-speed trailer) versions. 20ft sections (FB version does not tilt over).

Supplied complete with all Tower section(s), Luffing Gear Mount, Guys, Head Unit, Winch(es) and Telescopic Gear, as appropriate for any particular model.

Alternative head unit or winch(es) may be specified at order time. Standard item will be credited in full.

STANDARD TYPES		HEAVY DUTY	
Post mounting		Post Mounting	
13M20P25 25'	£259	16M20P40 40'	£525
13M20P40 40'	£355	16M20P60 60'	£595
13M20P60 60'	£429	16M20P80 80'	£899
13M20P80 80'	£815	16M20P100 100'	£1,079
Fixed Base		Fixed Base	
13M20FB25 25'	£175	16M20FB40 40'	£420
13M20FB40 40'	£269	16M20FB60 60'	£490
13M20FB60 60'	£349	16M20FB80 80'	£765
13M20FB80 80'	£735	16M20FB100 100'	£939
Socket Types		Socket Types	
13M20SP25 25'	£299	16M20SP40 40'	£579
13M20SP40 40'	£329	16M20SP60 60'	£649
13M20SP60 60'	£475	16M20SP80 80'	£955
13M20SP80 80'	£859	16M20SP100 100'	£1,140
Base plate		Base plate	
13M20BP25 25'	£305	16M20BP40 40'	£545
13M20BP40 40'	£399	16M20BP60 60'	£619
13M20BP60 60'	£475	16M20BP80 80'	£919
13M20BP80 80'	£859	16M20BP100 100'	£1,100
Wall Mounting		Wall Mounting	
13M20W25 25'	£209	16M20W40 40'	£429
13M20W40 40'	£305	16M20W60 60'	£495
13M20W60 60'	£379		
Mobile Type		Mobile Type	
13M20M25 25'	£1,395	16M20M40 40'	£1,795
13M20M40 40'	£1,520	16M20M60 60'	£1,875
13M20M60 60'	£1,615	16M20M80 80'	£2,280
13M20M80 80'	£2,025	16M20M100 100'	£2,355

*T Series Towers (20' sections)

13M20T85 85' £0,000.00 13M20T120 120' £0,000.00

'30ft': 10ft SECTION "MINITOWER"

Capable of supporting a HF beam or several VHF Ants. The head unit accepts 2" tube and provides for a rotator. Operation is easy with single winch system.

10M10P30 Post mount	£305
10M10W30 Wall mount (LG1013W extra)	£295
10M10BP30 Base Plate (HD Bolts extra)	£325
10M10FB30 Fixed base (HD Bolts extra)	£285

NB. PRICES ARE BUDGETARY AND EXCLUDE VAT

DELIVERY EXTRA (distance dependent)



HANSEN

IN LINE POWER/SWR BRIDGES P.E.P., R.M.S. 1-8-440MHz

The Hansen range covers 20 quality models with top-of-the-line the FS710. These are flat frequency response, peak envelope power and R.M.S. in-line wattmeters with many novel features. Most notable being the 'power independent' SWR scale—no forward power calibration knob, just direct reading SWR.

GET THE HANSEN HABIT TODAY!

FT710; PEP AUTO-SWR RMS LEVEL FS710 £68
FS710H: 1-8-60MHz, 15, 150, 1.5kW
FS710V: 50-150MHz, 15, 150W
 V.S.W.R.: 4:1 and to 20:1
 Accuracy: $\pm 7\%$ of FSD
 Impedance: 50-52 Ohms
 Connectors: SO239
 Power: 240 Volts AC 50Hz
 Weight: 3-lbs (1.5Kgs)
 Size overall: $8 \times 4 \times 5\frac{1}{2}$ "
 Size Meter: $2 \times 3\frac{1}{2}$ "
 Time Const: PEP follow 4 second

FS500 £53
FS600 £39
PEAK READING LEVEL RESPONSE
 FS500H 1-8-60MHz 20, 200 & 2kW
 FS500V 50-150MHz 20 & 200W
 Power $\pm 7\%$ FSD. SWR 1:1-5:1
 Size: $8 \times 4 \times 5\frac{1}{2}$ "

FS300 £35
LEVEL RESPONSE, LARGE METER
 FS300H 1-8MHz 20, 200 1kW
 FS300V 50-150MHz 20, 200W FSD
 Power $\pm 10\%$ SWR 1:1-3:1 $\pm 10\%$
 Size: $8 \times 4 \times 5\frac{1}{2}$ "

FS7 £31
VHF/UHF WATTMETER & BRIDGE
 FS7 145MHz & 432MHz 5, 20, 200W
 Power RMS $\pm 10\%$ SWR 1:1-3:1
 Power Max: 144MHz, 200W
 432MHz 20W
 Size: $6\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{2}$ " 'N' type sockets

FS711 £28
REMOTE INDICATOR TYPE
 FS711H 1-8-30MHz 20 & 200W
 FS711V 50-150MHz 20 & 200W
 FS711U 430-440MHz 5 & 20W
 Power $\pm 10\%$ SWR 1:1-3:1 $\pm 3\%$
 Indicator $5 \times 2\frac{1}{2} \times 1\frac{1}{2}$ "
 coupler $3\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$ "

FS5E £28
INDEPENDENT TWIN METER
 FS5E 3-5-150MHz 20, 200 & 1kW
 Power RMS $\pm 10\%$ SWR 1:1-5:1
 Power Max: 1kW 3-5-30MHz
 50W 50-150MHz
 Size: $7 \times 3 \times 3\frac{1}{2}$ " 'On the Air' LED

FS300M £27
LEVEL RESPONSE, POWER & SWR
 FS301M 1-8-30MHz 20, 200W
 FS301MH 1-8-30MHz 200, 2kW
 FS302M 50-150MHz 20, 200W
 Power $\pm 10\%$ SWR 1:1-3:1 $\pm 3\%$
 Size: $6\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{2}$ "

SWR3S £20
WIDE RANGE POWER & SWR
 SWR3S 3-5-150MHz 20 & 200W
 Power RMS $\pm 10\%$ SWR 1:1-3:1
 Power Max: 200W 3-5-30MHz
 50W 50-150MHz
 Size: $6 \times 2\frac{1}{2} \times 2\frac{1}{2}$ " Antenna/switch

SWR50B £20
TWIN METER, RELATIVE POWER
 SWR50B 3-5-150MHz Scaled 1kW
 Power RMS $\pm 20\%$ SWR 1:1-3:1
 Power Max: HF 1kW 1:1 300W 3:1
 VHF 50W
 Size: $6 \times 2\frac{1}{2} \times 2\frac{1}{2}$ " 'On the Air' LED

NB: PRICES EXCLUDE VAT (15%) BUT INCLUDE POST AND PACKING

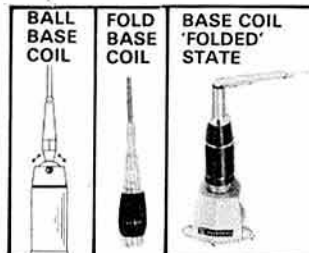


SMC-HS

INTERCHANGEABLE ELEMENT MOBILE ANTENNAS

SMC HS Mobile antennas, tabulated below, feature an in-built PL259M connector which mates with the SO239M of the cable assembly (fits a $\frac{1}{8}$ " hole in car body or the cast chromed gutter mount) or the magnetic base (recommended for smaller antennas only). This arrangement is ideal for easy removal (element change, car wash and anti-vandal), tests and portable operation.

MODEL	BAND	GAIN	TYPE	POWER	LENGTH
20SE	14MHz		($\frac{1}{4}$)	100W	1.72m
15SE	21MHz		($\frac{1}{4}$)	130W	1.72m
10SE	28MHz		($\frac{1}{4}$)	100W	1.27m
4E	70MHz	0dB	$\frac{1}{4}$	150W	1.03m
2VF	144MHz	3dB	$\frac{1}{4}$	50W	1.06m
2NE	144MHz	3dB	$\frac{1}{4}$	150W	1.30m
78F	144MHz	4.5dB	$\frac{1}{4}$	100W	1.75m
78B	144MHz	4.5dB	$\frac{1}{4}$	150W	1.72m
258	432MHz	5.5dB	$2 \times \frac{1}{4}$	100W	0.94m
358	432MHz	6.3dB	$3 \times \frac{1}{4}$	100W	1.36m



PRICES
20SE £12.00
15SE £10.00
10SE £10.00
4E £6.50
2VF £9.00
2NE £5.50
78F £10.00
78B £11.00
258 £10.00
358 £12.50

MAGNETIC BASE



Models have either a locking fold-over joint (for easy garage entry) or an in-built ball (in case the cable assembly is fitted askew).

The cable assembly (SOCA) is available in two versions—4 or 6 metres of cable. The magnetic base SMC50MM is also supplied complete with 4m of RG58/U cable.

The $\frac{1}{8}$ " are particularly recommended as the actual system gain, if the antenna is poorly sited, is usually very substantial.

SMCSOMM

CABLE ASSEMBLY



GUTTER MOUNTING



PRICES	T.B.A.
SOMM	£3.00
SOCA	£3.35
GCD	£3.00

CARRIAGE
 Complete antennas £1.00, or £0.50 for accessories, any quantity.

NB: PRICES EXCLUDE VAT (15%) CARRIAGE EXTRA AS INDICATED

SOUTH MIDLANDS COMMUNICATIONS LIMITED

S. M. HOUSE, OSBORNE ROAD, TOTTON, SOUTHAMPTON SO4 4DN, ENGLAND
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SOUTH MIDLANDS

SMC FOR ALL YOUR STATION ACCESSORIES

 <p>2m AMPLIFIER 160W out for 15W max drive. 12V DC (circa 18A) RF/manual switch. SSB FM. Excellent heat sink over temp trip out/reset. PA 15-160BL (p&p free) £171.30</p>	 <p>COAXIAL RELAYS (12V DC) 50 ohms. 1kW PEP @ 30MHz. 50dB isolation at 1GHz. 0-2dB loss at 0-5GHz (All are post free.) CX540D 3 BNC sockets £18.00 CX530D 2 BNC + 1N £18.00 CX520D 3 N sockets £18.00</p>	 <p>2m LINEAR AMPLIFIERS 12V. Switch SSB/FM, Low noise pre-amp. Switchable. B108 80W out 10W £105.00 B3106 160W out 30W £142.50 B1016 160W out 10W £165.00 RC1 Remote 18" cable £15.00</p>
 <p>DUMMY LOAD 52 ohms. 1kW for 3min. 300W continuous. Oil filled. 1-2:1 VSWR @ 1500MHz SMCDL1000 (p&p £1.95) £34.65</p>	 <p>HF BALUN 1:1 Ratio. 3-40MHz. SO239 Socket. 5/8 x 1/4" D. 7 1/2 oz. "Hang up type" High power H1Q (Post free) £8.70</p>	 <p>RF SPEECH PROCESSOR Audio to audio via SSB, Bar LED display of clipping 4-pin socket c/w power unit SMCSP4... (p&p £1.00) £60.00</p>
 <p>COAX SWITCH 50 ohms 2 in 1 out. Shorting type. 60dB @ 300MHz & isolation. SO239's. Low VSWR. High power. SMCS2 (p&p £0.70) £6.95</p>	 <p>HF/VHF SWR METER Twin Meter. 3-5 to 170MHz. SWR calibrated to 3:1. 50 ohms. Relative Power. SO239 sockets T3-107L (p&p £0.60) £10.30</p>	 <p>VHF/UHF SWR METER Power 10W on 50, 144, 432MHz VSWR. Calibrated to 3:1 50 ohms. Detachable RF-head/indicator unit UH74 (p&p £0.60) £12.65</p>
 <p>POWER SUPPLY 12V DC 200mA. 240V 50/60Hz 2-1mm + ve centre plug. SMCP12002 (p&p £0.60) £4.36</p>	 <p>FM BOOSTER 88-108MHz pre-amp. Type 4-5dB N.F. 20dB gain. T203 (p&p free) £6.95 SALE WAS £9.81</p>	 <p>COAX SLIDE SWITCH 50 ohms. SO239 sockets. 2 in 2 out. Ganged. TWS220 (p&p £0.40) £9.35</p>
 <p>POWER SUPPLY 12V DC regulated supply. 240V 50/60Hz input. 3 amps cont. 5 Amp peak. 3 x 4 1/2 x 6". 3 1/2 lb ODR123C (Post free) £13.65</p>	 <p>432MHz AMPLIFIER R.F. sensing 12V DC. 10W drive 45W out. 433MHz 2 1/2" x 5 1/2" x 7 1/2". APB57A (p&p free) £79.00 SALE WAS £102.25</p>	 <p>COAXIAL SWITCHES High quality. shorting types. KSW3 1 in 2 out (p&p foc) £10.30 KS23 1 in 3 out (p&p foc) £19.35 KS24 1 in 4 out (ills) (p&p foc) £25.65</p>
 <p>30MHz COUNTER 100kHz to 30MHz 12V DC 5 x 7 segment display (10Hz). RT750 (p&p foc) £39.00</p>	 <p>ANTENNA COUPLER 3-5 30MHz. Metered coax and single wire to 50Ω. To 500W PIP LAC895 (p&p foc) £69.00 SALE WAS £92.00</p>	 <p>DIGITAL MULTIMETER 1-1000 scale. 10MΩ AC (V/mA) DC (V/mA). Auto zero and polarity. ME521 (p&p foc) £39.00</p>
 <p>POWER SUPPLY, 12A 12V DC regulated supply 240V, 50/60Hz input, 12A @ 13-6V DC. Speaker built in. FP12 (p&p free) £68.00</p>	 <p>FREQUENCY COUNTER 500MHz Hi Sens., Hi/low Z. 12/230V. YC500J 10 ppm £165.00 YC500S 1 ppm £235.00 YC500E 0-02 ppm £300.00</p>	 <p>MOBILE SPEAKER Heavy duty external speaker, 8 ohms, 6 watts, 3-5" dia., Large magnet, 4" x 4" x 2 1/2". FSP1 (p&p free) £8.35</p>
 <p>POWER SUPPLY 4A 12V DC, 4A regulated supply 240V, 50/60Hz input. FP4 (p&p free) £36.00</p>	 <p>QUARTZ CLOCK World time clock. Wall or desk Mounting. Year battery life. 12 hour local, 24 hour DX times. QTR24D (p&p free) £22.35</p>	 <p>NOISE CANCEL MIC 500 ohm fist mic with switchable noise cancelling element. 6dB signal/noise ratio improvement possible. YM21 (p&p free) £12.50</p>
 <p>LOW PASS FILTER 52 ohm, 38MHz cut off. -80dB above 75MHz. loss <0.5dB. 1-2KW P.I.P. c/w 2 PL259 plugs etc. FF501 DX (p&p free) £19.35</p>	 <p>HEADPHONES Light weight, soft padded cushion headphones. 8 ohms curly lead fitted 1/4" jack. YM55 (p&p free) £8.65</p>	 <p>DESK MICROPHONE Dual impedance 500 ohm/50k. PPT switch with lock. Adjustable swan neck. YD148 (p&p free) £16.25</p>

PRICES DO NOT INCLUDE VAT (15%)—CARRIAGE (PLUS VAT) AS INDICATED

(5/6 band and discontinued items) YAESU "599" SALE (normal prices in brackets)

FT101ZD	Digital Transceiver	(£569.25)	£515	FR101DD	RX Dig./deluxe	(£707.25)	£549	FT301D	Transceiver	(£676.20)	£459
FT101Z	Analog Transceiver	(£488.75)	£445	FR101SD	Receiver Stan/Dig	(£592.25)	£449	FP301D	AC. PSU, digital	(£186.88)	£149
FT901DM	Super Deluxe Tx/Rx	(£799.25)	£715	FR101D	Receiver Deluxe	(£603.75)	£469	YO301	Monitor Scope	(£192.05)	£139
FT901D	Transceiver 160-10m	(£724.50)	£655	FL101	Transmitter	(£500.25)	£379	FT620B	6M Transceiver	(£316.25)	£249
FT901DE	Transceiver 160-10m	(£713.00)	£645	YO101	Monitor Scope	(£194.93)	£129	YC221	Digital Readout	(£83.37)	£ 49
FT107M	Transceiver 160-10m	(£690.00)	£625	FTV250	2M Transverter	(£212.75)	£119	DC200	DC Power Supply	(£97.75)	£ 59
FT200	Tx/Rx c/w FP200 AC PSU	(£483.00)	£335	FTV650B	6M Transverter	(£178.25)	£139				

(3-18MHz for FT/FR 101's. 9 & 10-7MHz for H.B) CRYSTAL FILTERS (normal prices in brackets)

TF30F350	350Hz 6 pole 3-18MHz	(£19.26)	£19	TF90H600	600Hz 8 pole 9MHz	(£22.83)	£20	YF107H600	600Hz 8 pole 10-7MHz	(£22.83)	£21
YF30F600	600Hz 6 pole 3-18MHz	(£19.26)	£17	YF90H2-4	2-4MHz 8 pole 9MHz	(£21.05)	£18	YF107F2-4	2-4kHz 6 pole 10-7MHz	(£18.29)	£17
TF30F12	12kHz 6 pole 3-18MHz	(£21.68)	£18	YF90H12	12kHz 8 pole 9MHz	(£21.05)	£20	YF107H12	12kHz 8 pole 10-7MHz	(£21.05)	£18
TF30H12	12kHz 8 pole 3-18MHz	(£25.24)	£21	YF90KIT	One each of above	(£64.93)	£50	YF107KIT	One each of above	(£62.17)	£50

SALE PRICES INCLUDE VAT (15%) AND CARRIAGE

COMMUNICATIONS LTD

SMC THE ONLY CHOICE FOR ROTATORS AND ACCESSORIES



<p>KENPRO KR500</p> <p>Elevation Rotator (180°). Up to 50kg of Load. 1½" - 2½" mast. 1½" - 1½" boom.</p>  <p>RC6W 6-core control cable per metre 00p KR500 (post and packing free) £69.35</p>	<p>KENPRO K5050</p> <p>Rotary bearing. Dual mounting. Takes 1½" mast. Post and packing £1.00 K5050 £10.65</p>  <p>KENPRO K5065</p> <p>Rotary bearing. Dual mounting. Takes 2" mast. Post and packing £1.30 K5065 £15.35</p> 	<p>CHANNEL MASTER</p> <p>Upper mast support bearing. Takes 2" mast and 1½" stub. Post and packing £1.20 9523 £10.20</p>  <p>CHANNEL MASTER</p> <p>Rotary bearing 3 way guying. Takes 1½" mast. Post and packing 85p 9525 £11.30</p> 	<p>SMC RLD3</p> <p>Automatic control box. 24V AC motor. Light-weight head. To 2½sq. feet. Takes 1½" - 1½" tube</p>  <p>RC50W core control cable per metre 26p RLD3 (Rail £1.65) £25.00</p>
<p>CDE AR30</p> <p>Accurate, silent self-calibrating control box. Dial up desired beam heading, push knob, motor rotates to that position and then switches off. For UHF and small VHF use</p>  <p>RC5W 5-core control cable per metre 26p AR30 (post and packing free) £41.00</p>	<p>STOLLE 2050</p> <p>Automatic control box. Dial desired direction and the rotator turns to the position and stops. Turning shaft (up to 1½") passes through rotator. For UHF and small VHF use.</p>  <p>RC5W 5-core control cable per metre 26p 2010 (post and packing free) £45.00</p>	<p>CHANNEL MASTER</p> <p>Automatic control box. Dial direction secondary pointer gives position during travel. Takes 1 2" mast and 1 ½" stub.</p>  <p>RC3W 3-core control cable per metre 26p 9502A (post and packing free) £46.00</p>	<p>CHANNEL MASTER</p> <p>Automatic control box. Dial direction secondary pointer gives position during travel. Stainless steel hardware. Heaviest duty "offset type". To 5sq. ft. Takes 1 2" masts and 1 2" stub.</p>  <p>RC3W 3-core control cable per metre 20p 9508 (post and packing free) £57.00</p>
<p>KENPRO KR250</p> <p>Twist and switch controller. Rotator 200kg/m. Brake 600kg. 1" - 1½" masts.</p>  <p>RC6W 6-wag rotor cable per metre 00p KR250 (post and packing free) £32.65</p>	<p>CDE AR40</p> <p>Accurate, silent self-calibrating control box. Dial up desired beam heading, push knob, motor rotates to that position and then switches off. For VHF use and light HF use c/w low casting.</p>  <p>RC5W 5-core control cable per metre 26p AR40 (post and packing free) £52.00</p>	<p>KENPRO KR400RC</p> <p>360° round type meter. Max. load 200kg. Rot. 400kg/m. brake 1500 kg/m. 1½" - 2½" masts. Lower casting option.</p>  <p>RC5W 5-way rotor cable per metre 26p KR400RC (post and packing free) £72.65</p>	<p>CDE BT1</p> <p>Four position preset plus normal manual controls. Handles aerials up to 5sq. ft. of wind area. Supplied with lower mast fit casting.</p>  <p>RC5W 5-core control cable per metre 26p BT1 (post and packing free) £79.50</p>
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FT-720R

ULTRA COMPACT VHF/UHF TRANSCEIVER

Maximum Performance

Consider the top ten 'S' parameters on which you would judge a conventional FM radio; sensitivity, selectivity, suppression of images, strong signal handling, size, scanner, stability, synthesizer steps, spurious suppression, stability of output and the '720 emerges as a pretty potent package, plus:

Choose your favourite Band

The control head may be used with the 2 meter RF (10 or 25W output) or the 70cms 10W RF decks.

Local or Remote operation

Short of space? The control head and deck can be separated by up to 4 meters with extension cable.

Dual Band Capability

The switching box allows operation of two decks from one control head. Single switch changeover.

Scanning

Fingertip controls on the microphone provide up/down scanner control. The scanner may be programmed to stop on a busy or clear channel.

Five Memory Channels with Priority

Five memory channels may be programmed for instant return to a favourite repeater or simplex channel. One of the memory channels may be used as a priority channel, where the microprocessor will search between the priority channel and your main dial frequency.

Simplex or Repeater

Plus and minus repeater shifts (600kHz for 144MHz and 1.6MHz for 70cms) are built in as is manual and automatic 1,750Hz tone burst.

Easy-to-Read S/PO Meter

A string of bright yellow and red LEDs gives you an easy-to-understand indication of the relative power output or received signal strength level.

Compact Size for Today's Amateur

LSI, single chip PLL and micros combine, so see your Yaesu dealer today and *think small*—ask for the exciting new FT720R series!

FT720 Control Head

- ★ Four easy write-in memory channels
- ★ Rx priority channel (auto check)
- ★ Scanning of band or memory channel
- ★ Up/down tuning/scanning from mic.
- ★ Scanning for empty or occupied channels.
- ★ Optically coupled tuning control
- ★ Easy selection of up/simplex/down
- ★ Manual and automatic tone burst
- ★ String LED's for 'S' and PO
- ★ Seven status report LED's
- ★ Convenient concentric AF and squelch
- ★ 1½W of audio to internal/external speaker
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- ★ Optional bracket for FR deck MMB3
- ★ Optional 200cm cable E725
- ★ Optional 400cm cable E726

720RV 10W, 2m deck

720RVH 25W, 2m deck

- ★ 144-145MHz (144-148MHz possible)
- ★ 12½kHz synthesizer steps
- ★ ±600kHz repeater offset
- ★ 0.3µV for 20dB quieting
- ★ Rx 0.5A, Tx; RV 3.5A, RVH 6.5A
- ★ 10.7MHz + 455kHz double conversion
- ★ 5.8(6.5)in D × 6in W × 2(2.2)in D

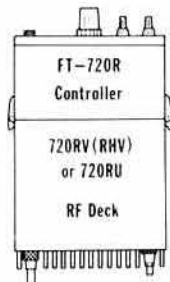
720RU 10W, 70cm deck

- ★ 430-434MHz
- ★ 25kHz synthesizer steps
- ★ 1.6MHz repeater shift
- ★ 0.5µV for 20dB quieting
- ★ Rx 0.5A, Tx 4.5A
- ★ 16.9MHz + 455kHz double conversion
- ★ 5.8(6.5)in D × 6in W × 2(2.2)in D

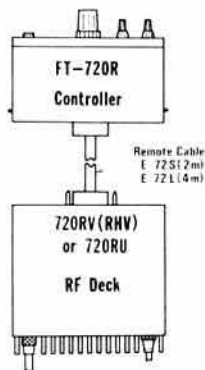
S72 Switching box

- ★ Permits control head with two decks
- ★ Single button change of band
- ★ Auto change of synthesizer steps
- ★ Auto change of repeater split

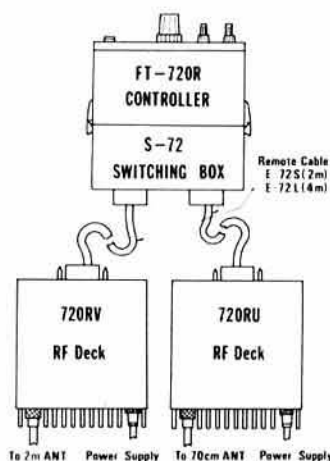
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REMOTE



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Correspondence to RRs and honorary officers should be addressed directly to them (QTHR) and not to RSGB HQ

RADIO SOCIETY OF GREAT BRITAIN

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The national society representing all UK radio amateurs

Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the general manager, from whom full details of Society services may also be obtained.

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D. A. Evans, G3OUF

EDITOR

A. W. Hutchinson

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UK corporate: £12.50, including VAT

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Students aged 18 to 25: £7.50 (Student applications should give the member's age at last renewal date and include evidence of student status)

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RSGB SUNDAY NEWS BROADCASTS

These broadcasts are made every Sunday morning on hf and vhf, giving almost complete coverage of the British Isles. All stations broadcasting these news bulletins use the callsign GB2RS, and information regarding them is given in the table below.

The purpose of these news broadcasts is to provide an outlet for amateur radio news items which, by virtue of their topicality or urgency, cannot wait for the next issue of *Radio Communication*. The bulletins are compiled on Wednesday mornings, and items for inclusion should reach RSGB HQ by letter (marked "GB2RS news") or telephone before 10am on Wednesday. No guarantee can be given of inclusion, in whole or in part, of any item submitted and, once broadcast, items are not usually repeated.

INTENDED RECEPTION AREA	NORMAL READER	RESERVE READER	LOCAL START TIME
Frequency: 3-640MHz. Mode: ssb			
NE Scotland	GM3HGA	GM3VEY	1130
Frequency: 3-650MHz. Mode: ssb			
SE England	G2MI	G4ARZ	0900
Midlands	G2CVV	G8QZ	0930
SW England/Wales	G8ML	G3JFH	1000
Northern Ireland	G13GAL	G13SXG	1030
NE England	G5VO	G3MCF	1100
E Scotland	GM4CUZ	GM4FLP	1430
Frequency: 3-660MHz. Mode: ssb			
Central Scotland	GM3TCW	GM3ULP	1130
Frequency: 7-0475MHz. Mode: a.m.			
UK (from Northern Ireland)	G13GGY	G12DHB	0900
UK (from N Midlands)	G3LEQ	G2CVV	1100
Frequency: 144-250MHz. Mode: ssb (horizontal polarization)			
SW from the Midlands	G3BA	G3KQF	0930
NE from S Devon	G3CHN	G3PBV	1000
NW from Manchester	G3SMT	G4IAL	1000
NNW from Cleveland	G4JJB	G8FTZ	1000
W from Carlisle	G8DVD	G8DAU	1030
SE from Lincoln	G8OFQ	(Vacancy)	1030
SW from London	G3FZL/G3VAG	G3IIR	1030
S from Aberdeen	GM8GHV	GM3ZBE	1030
W from Bristol	G4CJZ	G3ZWY	1100
W from Bangor, Co Down	G13TLT	G13SXG	1130
Frequency: 145-525MHz. (S21) Mode: fm (vertical polarization)			
Cornwall	G2ABC	G3NPB	0930
Hampshire, north	G8CKN	G3PZN	0930
Suffolk	G3ZNU	G4FSG	0930
Leeds	G3SPX	G8XGN	0930
Co Down	G13WEM	G14DOR	0930
Edinburgh	GM4EHO	GM4JFS	0930
E Cornwall/S Devon	G3ZYY	G4GWJ	1000
Londonderry	G12DHB	G14AHD	1000
London	G3FZL/G3VAG	G3IIR	1000
Birmingham	G3PWJ	G3BA	1000
Lincolnshire	G8OGQ	(Vacancy)	1000
Tyneside	G4FUT	G3WNR	1000
Glasgow	GM4HCO	GM4CXM	1000
Elgin	GM4ILS	(Vacancy)	1000
Southampton	G8LVC	G8ADM	1030
E Sussex coast	G8SC	G3ZFE	1030
Bristol	G4CJZ	G3ZWY/G8NNU	1030
Manchester	G3LEQ	G3JWK	1030
Jersey	GJ8KNV	GJ4ICD	1100
Gwynedd	GW4KEV	GW8TTM	1100

The Amateur Radio Insurance Scheme

INSERTED in this issue members will find details of a new membership service from the RSGB. Due to the increasing problems of obtaining full insurance protection for radio equipment at a sensible cost, and as a result of the demand from members, the Society has been working for some months in conjunction with Amateur Radio Insurance Services of Guildford to find the right solution.

The result is that we are now able to launch the **Amateur Radio Insurance Scheme**.

This is the first and only insurance policy that is specifically designed to meet the insurance needs of members for their radio equipment. Similar terms are also available to affiliated societies and clubs.

The main features of Amateur Radio Insurance are:

1. It fully insures all radio and ancillary equipment, including mobile and portable equipment as well as masts, antennas and rotators.
2. The insurance cover is for all risks, including accidental damage.
3. The claims payments are on a "new for old basis"—no deductions are made for wear and tear or the age of the equipment.
4. The cost has been kept down.
5. It is exclusive to members of the RSGB.

The leaflet inserted in this issue gives full details of the insurance cover and cost, but the "questions and answers" that follow will, hopefully, cover all your other points. If members have any other queries they should write to ARIS at their address shown in the leaflet.

1. Q. What equipment is covered by this insurance?
A. The lot. All your radio transmitting, receiving and ancillary equipment, your mobile and portable equipment, together with all masts, antennas and rotators.
2. Q. What risks will I be insured for?
A. You will be covered for **all risks**—fire, theft, lightning, accidental damage—in fact, just about everything you can think of. The exclusions are very limited—see the short list in the leaflet.
3. Q. What will the insurance company pay me if I claim?
A. You will be insured on a "new for old" replacement basis. This means, for instance, that you will receive enough to buy new, either the same piece of equipment, or, if it is no longer available, a piece of equipment of the same quality and capability. No deductions will be made for wear and tear. Alternatively the full cost of repair will be paid.
4. Q. How is it possible to offer such good "new for old" claims cover?
A. This can only be done so long as you insure all your equipment for its full replacement value at today's prices. Just list your equipment and values on the application form.
5. Q. Can my masts and/or antennas, as well as rotators, really be included too?
A. Yes. These are insured too. However, because they can be so exposed the insurers will ask you to pay the first £50 of any claim.
6. Q. I use a mobile and/or portable transmitter/receiver in the car. Is this covered too?
A. Yes, this is fully insured in the same way as all your other radio equipment. But remember you cannot just insure your mobile and portable equipment on its own. You must insure all your radio equipment.
7. Q. I take my mobile and/or portable equipment on holiday. Is it still fully covered?
A. Yes, you continue to have the full cover of Amateur Radio Insurance so long as you are within Great Britain, Northern Ireland, Channel Islands and Isle of Man.
8. Q. I operate my station from a prefabricated wooden building in the garden. Does this make any difference?
A. No, your insurance cover is not affected in any way.
9. Q. How do I work out what premium I must pay?
A. List all your equipment and the replacement values on the application form. The total of all the values is the sum insured. Find on the premium table in the leaflet the two sums insured which bracket your own figure. The premium is then shown. For instance, if the total of your values is £2,250 then your figure falls between the sums insured of £1,001 and £2,500, so your premium is just £25.
10. Q. How can such wide insurance cover be given at such a reasonable cost?
A. Because the RSGB is recommending the scheme to its many thousands of members. The more members there are in the Amateur Radio Insurance Scheme, the more successful this new membership service will be.

11. Q. Do I qualify for the FREE cover offer?
A. Yes, but you must reply quickly. The premium you pay would normally only cover you for 12 months. However, this special introductory offer gives you full cover from the date your application and cheque are received until the entry date shown at the top of the enclosed leaflet **and then for a further 12 months**.
12. Q. What happens after I have posted my application and cheque?
A. You will receive a letter by return of post confirming your insurance cover or, if necessary, asking for clarification of any outstanding point. Also you will be sent a full copy of the policy wording. All being well, a few weeks later you will receive your official Amateur Radio Insurance policy itself.
13. Q. Will my application be accepted automatically?
A. The insurance company has reserved the right to "underwrite" the policy: for instance, if you have made a number of claims in the last three years the insurance company may want to review your application with you. In the unlikely event your application is refused, your cheque will be refunded in full.
14. Q. Supposing I change my mind when I receive a full copy of the policy wording.
A. That's alright. Just send the papers back within 14 days and you are guaranteed that the whole of your premium will be refunded in full. We are that certain that this is the best insurance available.
15. Q. How do I renew my insurance in future years?
A. You will receive a notice a week or so before your renewal date inviting you to send your premium for a further 12 months' Amateur Radio Insurance cover.
16. Q. What should I do to make a claim?
A. Simply write to Cornhill Insurance Co Ltd at the address you will be given when your application is acknowledged, and they will send you a claim form. Be sure to advise the police immediately in the event of a theft. In most cases that is all that will be necessary.
17. Q. My equipment is already covered under my household policy. What should I do?
A. Many household policies will only pay the cash value of your equipment at the time of loss. This takes into account the age of the equipment, wear and tear. Amateur Radio Insurance provides the full replacement value.
Also it is most unlikely that your household, or any other, policy provides the full range and level of cover given with Amateur Radio Insurance—so apply now.
(If you do not have any household insurance at all, tick the box on the application form and you will be sent details).
18. Q. What about normal domestic tvs, stereos, hi-fis etc; can they be insured as well?
A. No. Amateur Radio Insurance is limited to the radio and other equipment only, as described earlier.
19. Q. Suppose I buy a new piece of radio equipment after I have joined Amateur Radio Insurance; will it be covered too?
A. Yes. So long as the new equipment is valued at not more than £500 it will be fully covered free of charge until your next policy renewal date, even though your new total sum insured may take you into a higher premium band. However, to obtain the cover you must write to Amateur Radio Insurance services with details of the new equipment.
20. Q. What if the new equipment is worth more than £500?
A. Write to Amateur Radio Insurance Services with details of the equipment. There will be no extra charge unless your new total sum insured takes you into a higher premium band, when you may be asked to pay a small proportionate premium. However, you may be selling some old equipment, so list that as a deduction.
21. Q. Can an affiliated society or club apply for Amateur Radio Insurance?
A. Yes, applications are welcome. Similar terms are available though there may be some minor differences depending upon the premises where club equipment is kept. The optional liability insurance premium could vary too. Club secretaries should write direct to Amateur Radio Insurance Services in Guildford for further details.
22. Q. I am not a member of the Radio Society of Great Britain. Can I apply for Amateur Radio Insurance?
A. No. This is an exclusive scheme designed for members of the RSGB only. We suggest you write to the RSGB for details of membership.

QTC

Amateur radio news

"Open Channel"

In November 1976 a statement concerning citizens band was published in *Radio Communication*. This statement was repeated in May 1978 without any material change. The points made in the statement remain valid at this time and continue to reflect the Society's attitude to a personal communications facility.

Due to the long delay in announcing the frequency chosen for "Open Channel", the number of illegal users of equipment transmitting on 27MHz has increased to alarming proportions. One effect of this upon the amateur service has been the illegal operation by citizens band stations in the amateur radio 28MHz allocation. Additionally, there are many cases of interference to domestic entertainment equipment which are being laid at the door of the radio amateur. These (and other) factors caused the President of the RSGB to write to the Prime Minister pointing out the dangers of the situation and repeating the views of the Council on "Open Channel". In the reply dated 28 January 1981 the following paragraph appears:

"The Home Secretary is very conscious of the interference which unsuitable equipment or misuse can cause, and indeed the problems caused by the present use of illicit 27MHz equipment are causing considerable concern. He will certainly give full weight to your views, coming as they do from a respected and authoritative body, in reaching his final decisions".

The Society will continue to monitor the position concerning "Open Channel" and will take whatever action is necessary to protect the interests of its members.

Raynet—important notice to all members

The 1981 RSGB Raynet Committee held its first meeting on 17 January and the following were elected to posts within the committee.

Chairman: E. W. Yeomanson, G3IIR.
Vice-chairman: Brian Goddard, G4FRG.
Group information officer: Mike Barker, G8CAC.
Publicity officer: Graham Cluer, G4AVV.
Minuting secretary: Ron Bassett, BRS16075.
Mrs "Taff" Crane continues in the post of registration secretary, and Mrs Jane Balestrini in the post of supplies officer.

Who to write to:
New registration and re-registration—Mrs Crane.
Supplies (badges, car stickers etc)—Mrs Balestrini.
Publicity matters, how to join Raynet etc—Graham Cluer, G4AVV.
Group information—Mike Barker, G8CAC.
Permits to operate at county shows, talkthrough etc—Emergency communications manager Peter Balestrini, G3BPT.

All other Raynet correspondence should be sent to the chairman of the committee. *Note:* a number of groups have not, as yet, sent back their 1981 Survey Forms. It is vital that these be returned to the group information officer without delay.

Interference

The Directorate of Radio Technology produces an annual report analysing the various types of interference complaints. The following paragraphs comprise a brief extract from one section of the report. The points made by the DRT reflect those of the RSGB held over a number of years. Attention to receiver design is obviously long overdue.

Statistics show that the number of complaints due to "conditions at the receiving site", 16,669, was considerably higher than that for any specific interference source, and accounts for 36.21 per cent of all complaints. This continues the situation which has existed for some years.

In 1979, complaints due to faults associated with the antenna totalled 4,185 (9.1 per cent) of total complaints—a decrease of 8.58 per cent compared with the 1978 figure;

REGION 9 ORM

Sunday 5 April 1981

"Lord Elliot", Liskeard, Cornwall

-Lecture Question time RSGB bookstall
Raynet and local repeater representatives
Talk-in on S22

those due to faulty or maladjusted receivers totalled 3,821 (8.3 per cent) of total complaints—a decrease of 5.84 per cent compared with the 1978 figure; and those due to inadequate receiver immunity and other receiver characteristics totalled 5,119 (11.0 per cent) of total complaints—an increase of 7.4 per cent over the 1978 figure.

It is considered that many of these complaints could be avoided if receiver design in respect of spurious responses and immunity were improved and if dealers supplying receivers to the public were always to advise and fit the antennas appropriate to the service area. In this connection it needs to be borne in mind that the requirements of an antenna to reject interference are more stringent than those for satisfactory reception when interference is absent, and that an antenna which gives satisfactory reception when a receiver is installed may therefore prove to be inadequate later when a local source of interference comes into being. Similarly, complaints due to receiver faults would be avoided if troubles were cleared up between the set owner and the dealer without Post Office involvement. In some cases, of course, it may be difficult for the average listener or viewer to distinguish between interference and a receiver fault when reception is impaired, particularly where a colour television receiver is involved.

Caveat emptor

The Society has been advised that a court order obtained in this country cannot be enforced against a company trading in the Channel Islands or the Isle of Man if that company does not maintain an establishment in this country.

Members are advised to bear this in mind when ordering goods from those parts of the United Kingdom.

Volunteers wanted

The RSGB Interference Committee would welcome applications from members of the Society who would like to serve on the committee.

The chairman of the committee, Mr P. F. Jobson, G3HLF, 41 The Avenue, Gravesend, Kent DA11 0NA (tel 0474 4571), would be pleased to supply further information.

(Continued on page 231)

AMATEUR RADIO CONVENTION

9am–6pm Sunday 22 March 1981

Restaurant area of Plessey Co Ltd, Martin Road,
West Leigh, Havant, Hampshire.

Talk-in on S22, (145-550) by G3WLE

This convention is being organized by the Plessey West Leigh Radio Society, G3WLE, by kind permission and assistance of the Plessey Co Ltd and the site general manager.

Lectures (start at 10am)

"Early detectors and ancient radio", by Len Newnham, G6NZ.
"Amor", by Peter Martinez, G3PLX.
"Practical aspects of tvf/af suppression", by Fred Robins, G3GVM.
"Applications of recent rf semiconductor devices", by Peter Tunbridge, G8DEK.
"Moonbounce", by Hugh Griffiths, G4CNV.
"Propagation in the rf spectrum", by Mike Walters, G3JVL.

There will be an exhibition of Plessey communications equipment but no trade exhibition.

Seating for 250

Ample car parking space

Bar and buffet facilities 12-2pm.

Admission fee 30p, all proceeds to RAIBC.

The organizers would appreciate an indication from members wishing to attend, preferably in writing with sae (QTHR) or by phone. This will assist with catering arrangements.

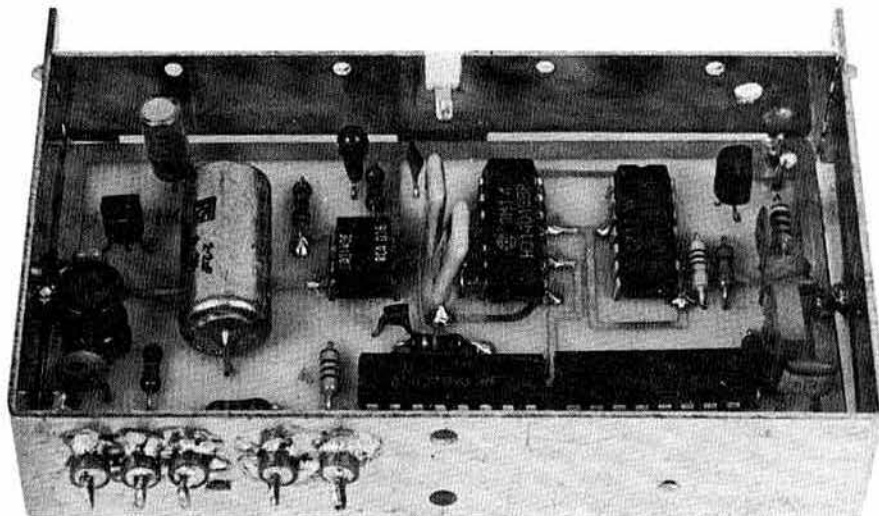
Further details from M. K. Curran, G4ITF (ext 278) or J. C. Benton, G8UXW (ext 425) both on Havant 486391.

The RX80 Mk2

A 3.0-4.0MHz ssb/cw receiver and tunable i.f. for a complete hf receiver

(Part 3)

A. L. BAILEY, G3WPO*



The ST80 vfo stabilizer. Photo: G8SUU

THE ST80 VFO STABILIZER

The "huff and puff" technique for vfo stabilization, due to PA0KSB, probably needs no introduction to readers of *Technical Topics*, and it is a version of this circuit that is used for the ST80 vfo stabilizer. Because of the number of articles which have already been written on the device, it is not described in any great depth here, and readers wishing to be more aware of the mode of operation are referred to the bibliography.

Although the RX80 vfo is stable enough for most purposes, the stabilizer provides a means of achieving long-term stability of the order of ± 5 Hz. Note that the use of this circuit is not limited to the RX80 vfo—any vfo with reasonable existing stability, and not operating above the 5MHz limit of the cmos ics used, can benefit from the circuit. The pcb shown accommodates all of the circuit except for three components mounted at the vfo itself, and is mounted inside a heavy-screened tinplate enclosure. No alignment is required.

Briefly, a simple frequency counter driven by the vfo output is used to monitor the frequency and the Qc output stored in a flip-flop, IC2a. The output of this drives an integrator (IC3/R6-7/C3) with a very long time constant of approximately 90s. The voltage from this integrator controls a varicap diode, capacitance coupled to the vfo, and gives a frequency shift of around 3kHz for the 10V swing of the integrator output. Any drift in the vfo is compensated for by the integrator voltage causing the diode to pull the vfo frequency in the opposite direction.

The vfo thus hunts around a centre frequency of ± 5 Hz. Due to the mode of operation of the circuit, these stabilization points are spaced at approximately 30Hz intervals, but these are not detectable by the listener. Normal tuning of the vfo is unaffected, as the long time constant of the integrator effectively ignores such rapid frequency changes.

For this reason, rapid warm-up drift is unlikely to be caught by the circuit, nor jumps in frequency due to poor vfo construction. If the stabilizer is used with the RX80, the +12V supply should incorporate simple filtering for transients, as these may affect the varicap diodes and cause small frequency jumps which, although not detectable by ear, could cause the stabilizer to malfunction and continually drive the vfo higher or lower in frequency.

Components

Component details are as for the source articles in the main, with the exception of the crystal clock. This has been replaced by a 500kHz ceramic resonator which provides the required clock stability for this application, but at a fraction of the cost of a crystal. The CD4060 is wired to divide by 2^{17} rather than 2^{18} for this reason.

C3 must be a very-low-leakage type capacitor as specified—an electrolytic will not be satisfactory and will definitely cause circuit malfunction. The metallized version specified is not cheap but will give the required results. As with all the modules for this receiver, the pcb and all the components are available from one source, together with the screening enclosure and indicating meter.

Construction

Unlike the previous modules described, the ST80 uses a double-sided pcb (Fig 17) to avoid multiple links and give a compact layout. If hand etching the pcb, no real problems are involved except that double-sided copper-clad board is required.

Assembly is straightforward but some care should be taken in handling the cmos ics and the CA3140 mosfet input op-amp. With the current B series cmos ics there is little chance of static damage, but avoid handling the pins when at all possible, and ensure that your soldering iron is correctly earthed.

Due to the small number of components, a detailed order of assembly is not given, but note the following:

(a) make sure that the ics are oriented correctly (Figs 16, 19); and
(b) components which can be soldered to both sides of the pcb should be for correct circuit continuity.

Checking operation

When the module is complete, and after making the usual double checks on component positioning etc, make the required connections to the RX80 i.f. module, referring to Figs 16, 19. The control circuitry is mounted as in Fig 20, with the varicap diode and capacitor mounted under the pcb as shown, and the 1M Ω resistor to the new connection pin. Fig 20 also gives details of a suitable screening enclosure for the RX80 module itself (more details under cabinet construction).

With power applied to the stabilizer and RX80 module, the circuit should function immediately, although it may be a minute or two before the stabilizer locks as the integrator charges up. A meter applied to pin 2 of

ST80 vfo stabilizer components

R1	10 Ω	CR1	500kHz ceramic resonator type CRM500A (Toko)
R2	12k Ω	TR1	BC109/BC239
R3	1k Ω	IC1	74LS93
R4,8,9,12,13	10k Ω	IC2	CD4013
R5	2.2M Ω	IC3	CA3140E (8-pin dip)
R6,7	22M Ω	IC4	CD4060
R10	68k Ω	IC5	CD4020
R11,14	1M Ω	IC6	78L05
C1,2,4,11	0.01 μ F disc ceramic	D1	KV1225 S (Toko)
C3	2.2 μ F metallized polycarbonate	L1	1mH choke type 8RB (Toko)
C5,6	100pF ceramic plaquette	M1	200 μ A f.s.d. meter type 904 (scaled 1.9)
C7,8	10pF ceramic plaquette		Screening box Type SCB3
C9	10 μ F 16V electrolytic		
C10	0.1 μ F 35V tantalum bead		
C12	10pF ceramic plaquette		
	5-off 1,000pF solder-in feedthrough capacitors		
	10-off 0.1in diameter pcb connection pins		
	Miniature coaxial cable (UR95 or similar)		

Resistors are 0.25W carbon film except for R6/7 which are cermet thick film types.

All of the above components are available from Ambit International, as is a complete set of parts together with a drilled, screened printed circuit board and screening box.

*9 Alberta Walk, Worthing, West Sussex BN13 2SG.

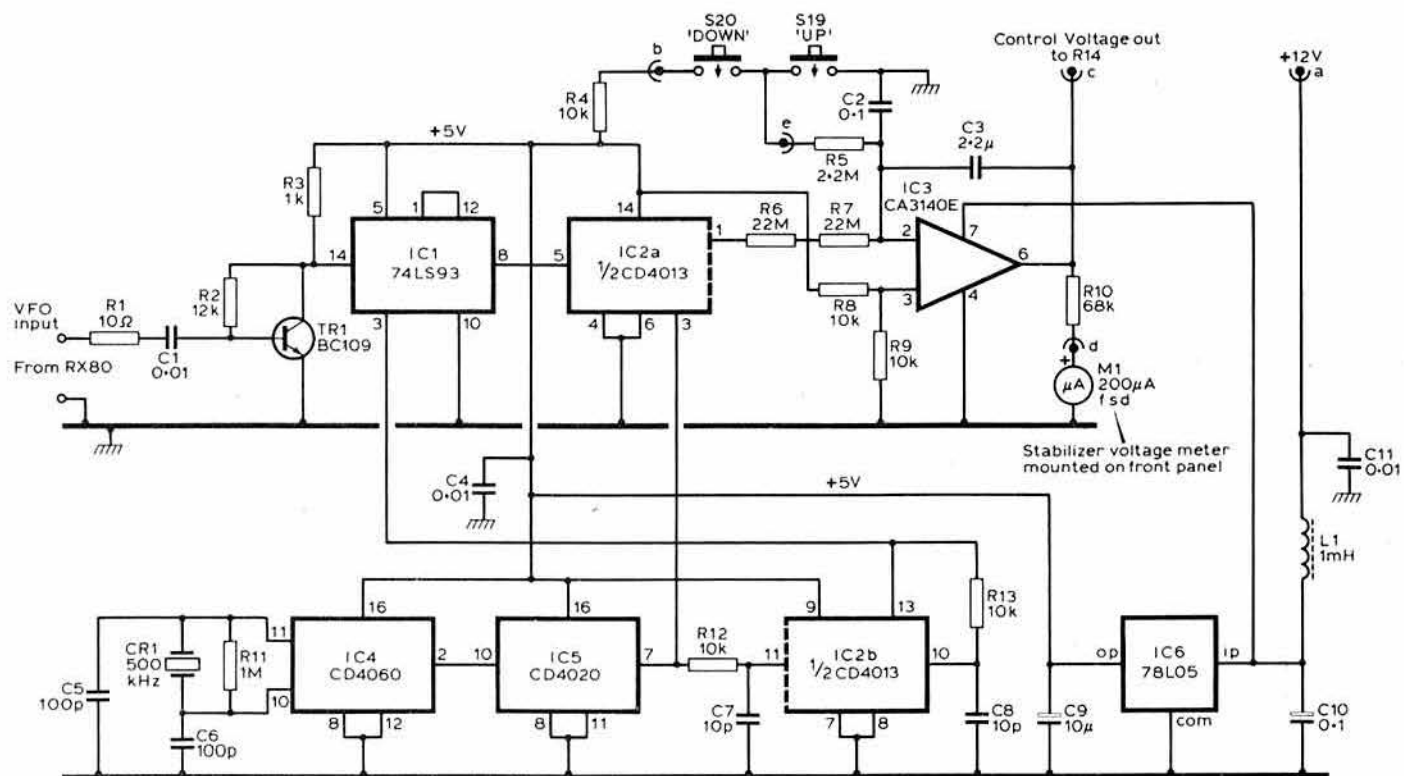


Fig 16. ST80 vfo stabilizer circuit diagram

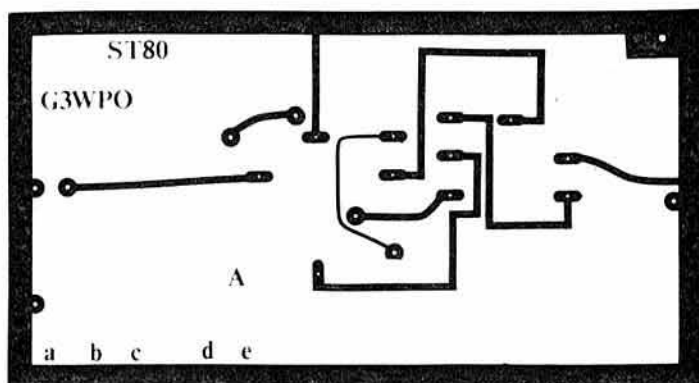
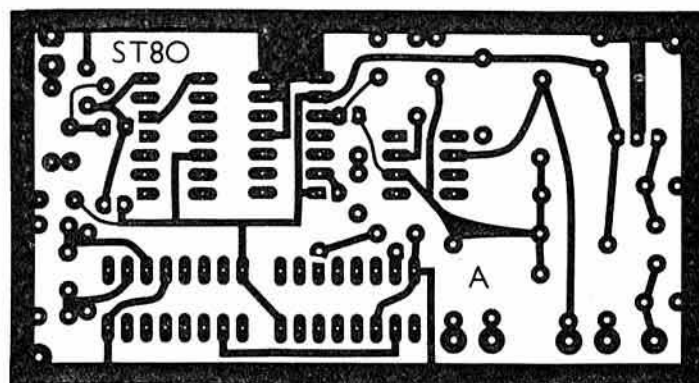
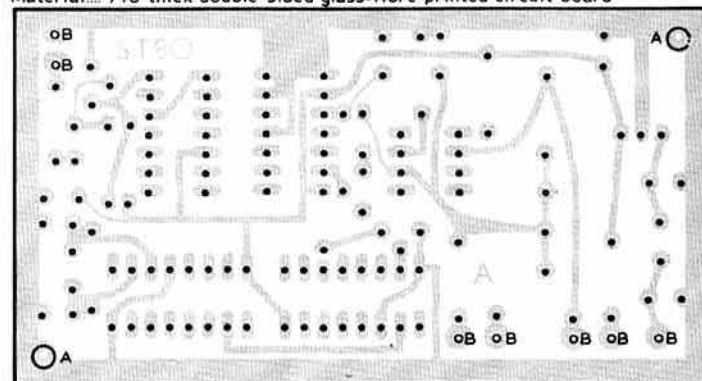


Fig 17. ST80 pcb (double-sided)

91 x 50mm Viewed from underside (copper track side)
Material... 1/16" thick double-sided glass-fibre printed circuit board



Holes shown • are 0.85mm dia 2 holes 'A'... 3mm dia 7 holes 'B'... 1mm dia

Fig 18. ST80 pcb drilling details

Table 2. Bandsread resistor values

Frequency	R	Value
1.8 - 2.0	1	10kΩ
3.5 - 4.0	2	3.9kΩ
7.0 - 7.3	3	100kΩ
10.0 - 10.2	4	220kΩ
14.0 - 14.35	5	68kΩ
18.0 - 18.2	6	220kΩ
21.0 - 21.45	7	33kΩ
24.8 - 25.0	8	10kΩ
29.25 - 29.55	9	47kΩ
	10	6.8kΩ

All resistors 0.25W metal oxide types mounted directly across switch contacts.

The meter should indicate a voltage of approximately 0.25 V on switch on. This may be brought up to mid-scale by depressing the UP button. The function of the meter is to indicate the control voltage value. Should this go to either extreme over a period as the integrator controls any drift in the

Once the checks are completed, the ST80 module should be housed in a screening enclosure made of tinplate, and all connections except for the vfo made via five solder-in 1,000pF feedthrough capacitors. A suitable enclosure is supplied with the kits, and only requires 5 by 4mm diameter holes drilled above the pcb's points a-e for the feedthroughs, and an entrance hole for the vfo coaxial cable feed. The pcb should be soldered to the underside of the retaining lugs punched in the sides of the enclosures. Alternatively, a suitable enclosure can be fabricated in a similar manner to the RX80 screening enclosure.

As mentioned in Part 1, it is possible to bandspread the RX80 tuning range for each of the bands covered, ie for the 14MHz amateur band, the nominal coverage of the receiver/converter combination is 14.0-15.0MHz, whereas the actual coverage required is only 14.0-14.35MHz. The 14MHz band is thus tuned in only 3.5 turns of the 10-turn tuning potentiometer. Fig 22 shows how each of the bands can be electronically bandspread so that an amateur band occupies most of the 10 turns of the tuning potentiometer. Using some of the spare changeover contacts on the band selection pushbutton switches, a series resistor(s) is introduced into RV5 tuning potentiometer circuit each time a band is selected, with unwanted resistors being shorted out by the unselected switches.

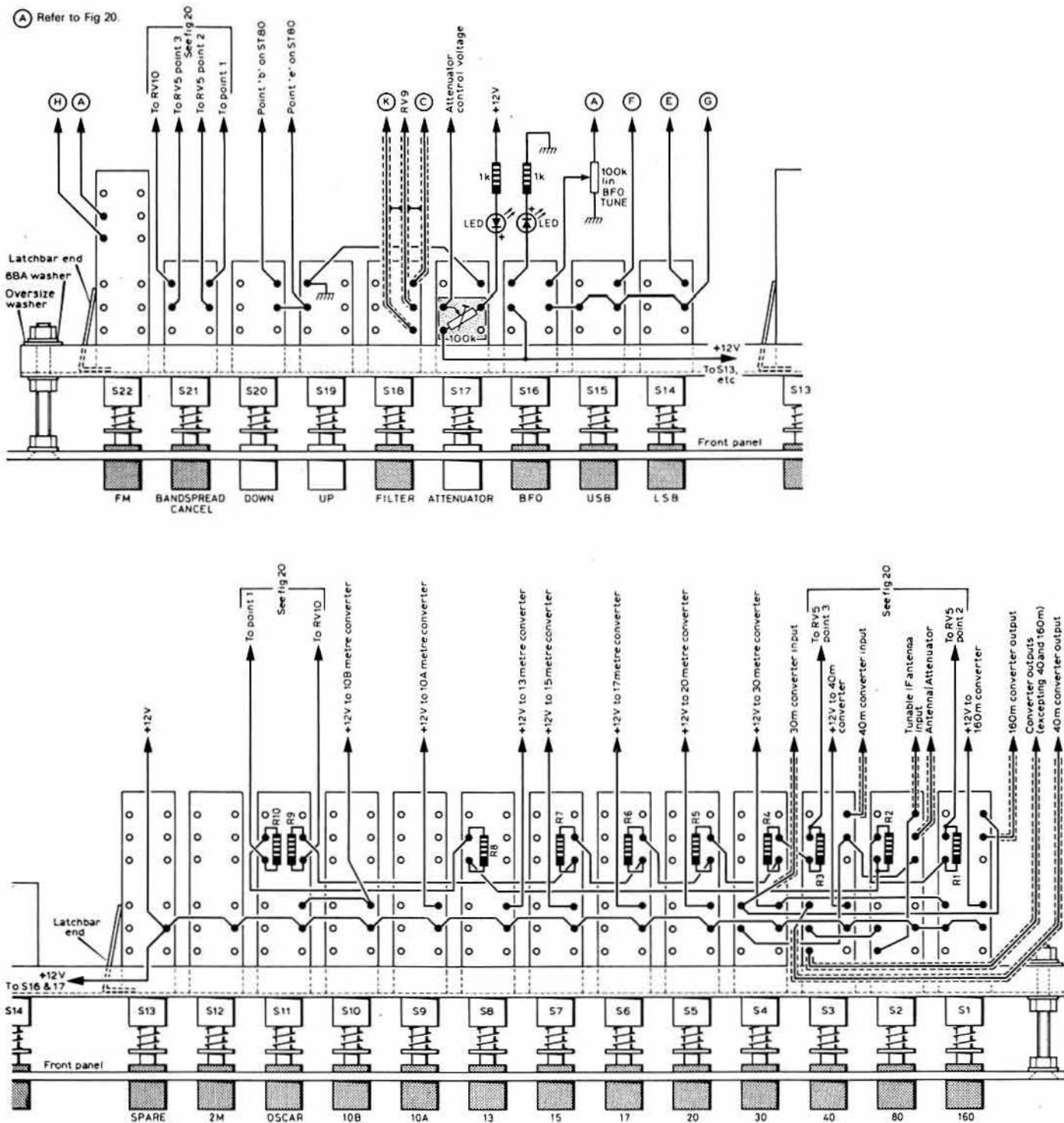


14-off (S1-S13, S22)	4-pole changeover latching switchblocks
3-off (S14-S16)	2-pole changeover latching switchblocks
5-off (S17-S21)	2-pole changeover push-push switchblocks
3-off (S17, 18, 21)	Cam followers
1-off	50-way mounting bracket
2-off	30-way latchbars
22-off	7-5mm buttons

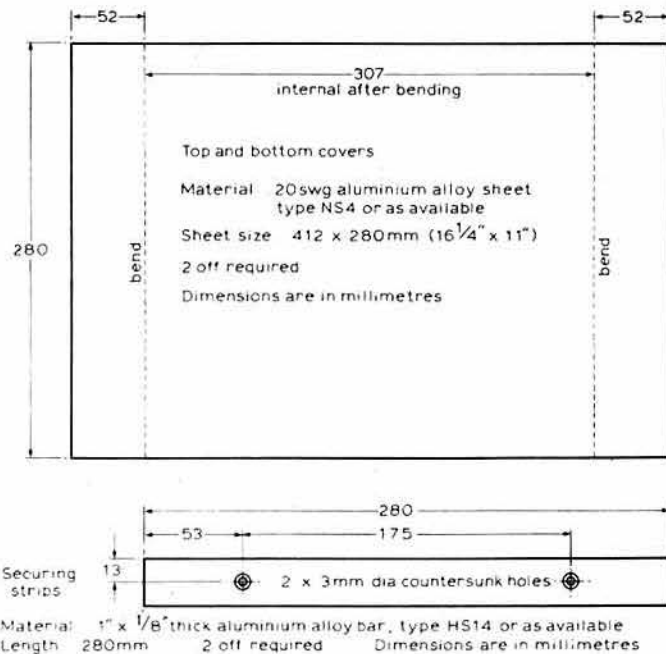
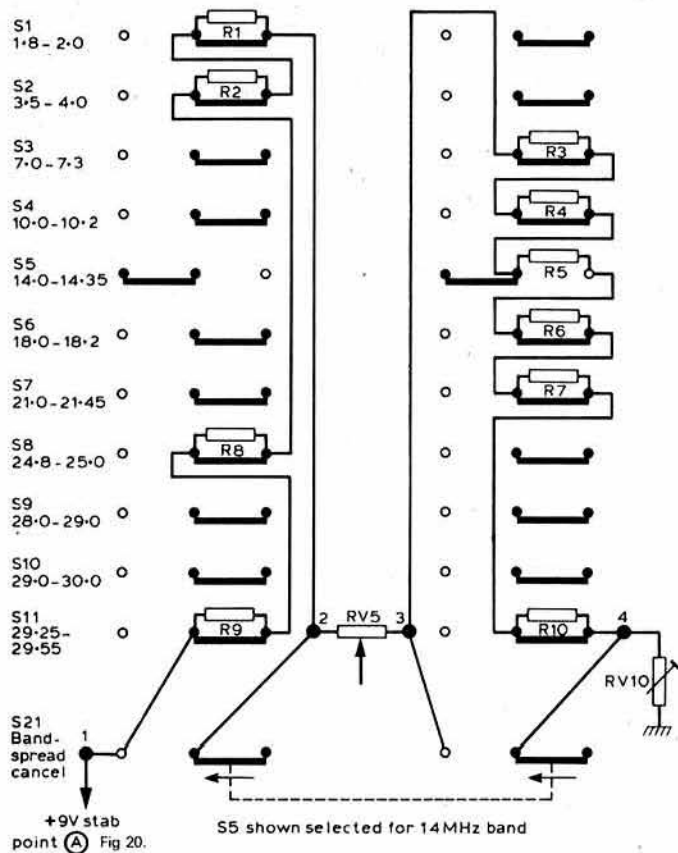
To bandspread from the low end of the tuning range (ie 21.0-21.45MHz) the resistor is placed between RV10 and RV5, and for the high end (ie 3.5-4.0MHz) between RV5 and the +9V stabilized line. When both resistors are placed in circuit at the same time, mid-range bandspread is achieved as in the Oscar sub-band of 29.25-29.55MHz.

Any desired bandwidth can be achieved by this method and the resistor values in Table 2 are given as a guide, allowing about a 10 per cent overlap of the actual amateur band. It is probable that the values may need slight alteration with individual receivers, dependent on the total tolerances existing in the vfo components. Metal oxide resistors should be used to maintain vfo stability.

Switch S21 performs a bandspread cancel function, and simply shorts out any resistors in circuit and returns to the nominal 1MHz coverage at any time.



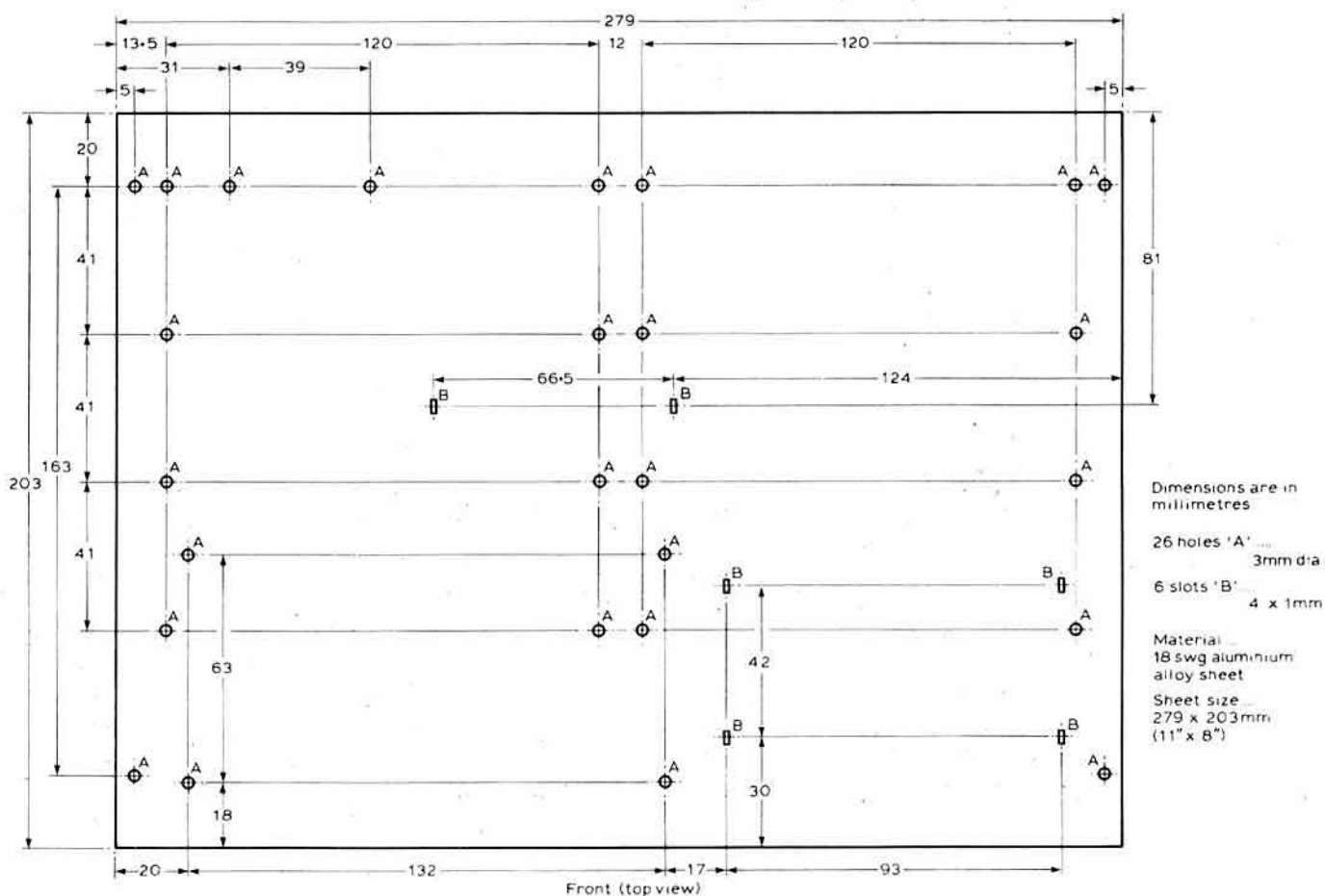
RADIO COMMUNICATION March 1981



▲ Fig 23. Covers and securing strips

◀ Fig 22. RX80 bandspread switching details

▼ Fig 24. Centre panel of cabinet



THE RX80 CABINET

General comments

Complete details of the cabinet used to house the prototype RX80 receiver are given in this section—alternatively fully drilled and punched metalwork is available from the kit suppliers, and includes knobs etc.

The case was designed in such a manner that a constructor with only limited metalwork facilities could build it, and has a minimum number of bends in critical positions to ease the problem of fitting it all together afterwards. Study of the photographs in Part I and the drawings in this part should be sufficient to enable the would-be constructor to fabricate the case using tools available in most shacks. The prototype was built using a hacksaw, a vice with two pieces of angle iron for bending, a selection of drills and a few files. An automatic centre punch for hole marking is a very useful extra.

If the constructor has access to a good metal dealer, the alloys specified are recommended. They will not snag when drilled or filed, and there are no burrs to remove after drilling holes. Failing this, ordinary aluminium sheet obtainable at most dealers will suffice, but a bit more care will need to be taken, especially with the row of holes for the pushbutton switches on the front panel.

The top and bottom covers are dimensioned slightly oversize to allow for bending variations. Once bent, the mating edges will need filing until

they meet and fit correctly. The covers are retained by solid strips of aluminium alloy which grip the covers against the solid aluminium spacer bars when tightened. These spacer bars are likely to need a small amount of packing behind them depending on the individual case, using washers or small pieces of aluminium until the covers rest snugly against them before securing. All screws are 6BA, countersunk where appropriate (front and rear panels and side strips). Lock washers should be used between all nuts and the aluminium where possible.

No cut-out for the speaker is shown, and the method of mounting is left to the individual constructor. In the prototype, the speaker was secured to the chassis with double-sided adhesive tape, and the cut-out placed immediately above it. The rear panel allows for an extension speaker jack. If a mains power supply is to be used, ventilation holes will be required above the top rear right-hand side where space has been left for the psu module.

The drilling plan for the front panel is as for the prototype. If more switches are required for additional bands or other functions, it is suggested that the existing row is devoted to the bandswitches, with a new row placed at the top-right-hand side of the panel for the other functions. The tuning meter will need moving to achieve this. It is important that with the existing arrangement of switches, the blank towards the centre of the row is left empty as otherwise the end of the latching bar which acts as a return spring will be fouled and the latching action will be impaired. Two separate latchbars are required within the switch unit—one for the band

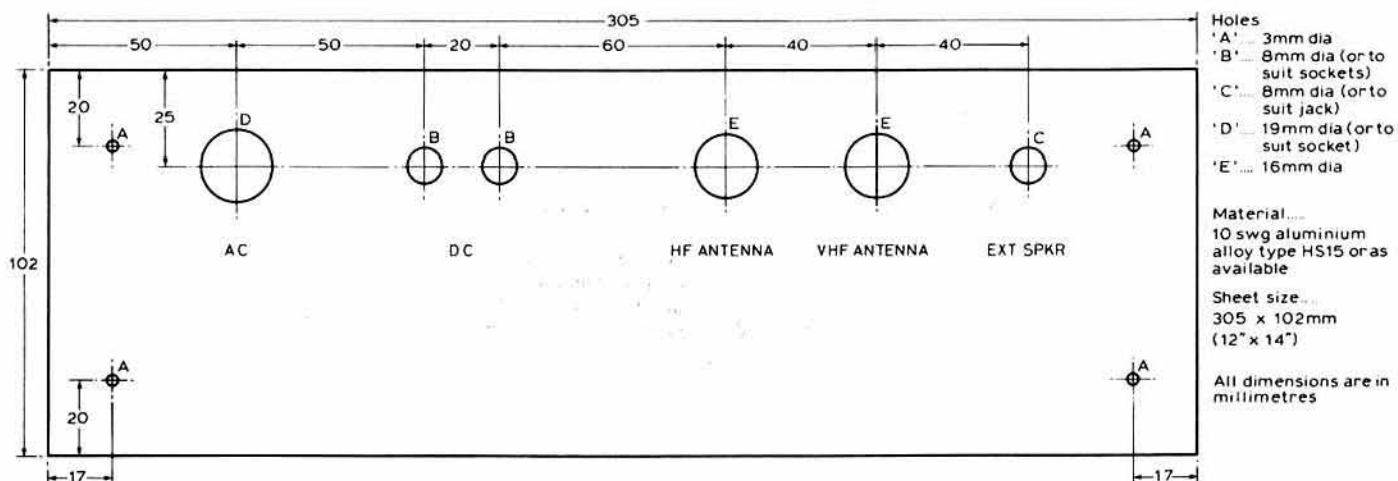


Fig 25. Rear panel of cabinet

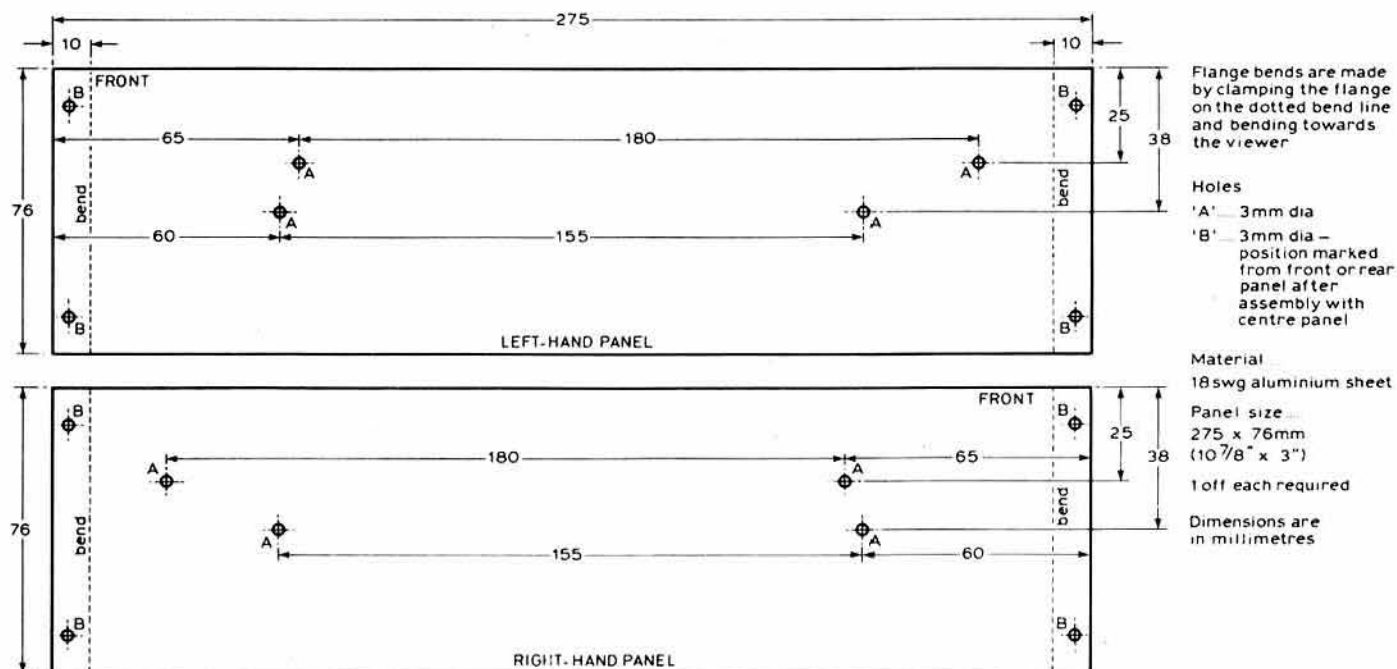


Fig 26. Side panels of cabinet

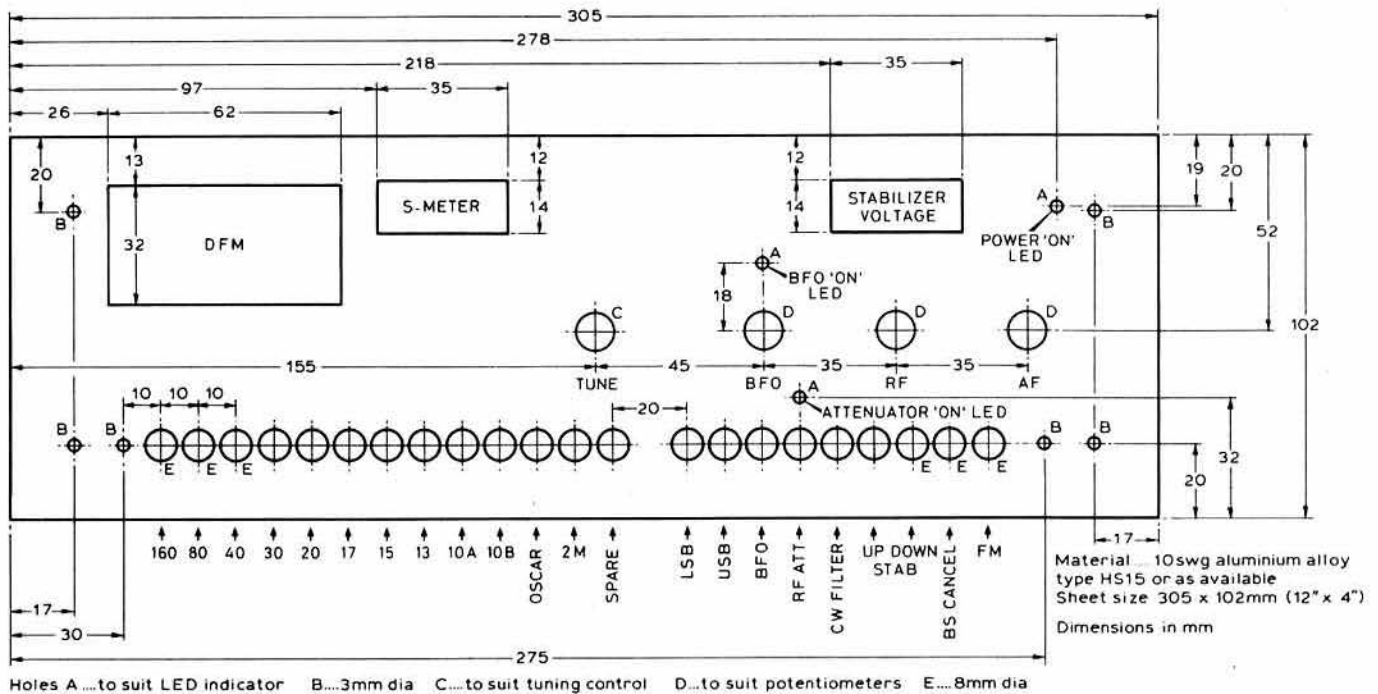


Fig 27. Front panel of cabinet

switches, the other for the usb/lsb/bfo/fm functions. Full instructions for assembly come with the switch units and Table 3 gives the materials required for the standard unit.

When wiring up the switch unit (Fig 21) as much of the wiring as possible should be completed before the unit is fixed to the front panel. Although the number of connections may appear formidable, provided care is taken and a colour code adopted there should be no problems. The resistors for bandspreading should be mounted last. Note that when mounting the unit to the front panel the arrangement shown in Fig 21 should be used with an oversize washer against the outside of the U-shaped channel—do not try to tighten up a 6BA nut inside the channel.

The various LEDs used as indicators are fixed into their holes with a small spot of cyanoacrylate adhesive (caution when using this adhesive!) and the current limiting resistors inserted into the wiring nearby and insulated.

The digital frequency display was mounted as shown in the photographs (Part 1) using a front panel bezel (type BEZ 10). This bezel does not incorporate any means of fixing the display to it, and a few further drops of cyanoacrylate adhesive will be needed for this.

Finishing off the case

The front and rear panels on the prototype were finished by cleaning with wire wool, and treating with a coat of "Joy" self-etching primer (thinned slightly). Once dry, the surface was rubbed carefully with flour grade wet-and-dry paper (used wet) to remove any imperfections. Matt black car enamel spray was then applied in several light coats, and left to harden for several days before applying the legends with Letraset or similar transfers. To finish, a coat of "Dupicolour" leveller spray was applied. This is purely the solvent used in the paint sprays and has the effect of fixing the lettering into place without destroying the matt finish of the paint.

The covers were not painted due to the ease with which such a finish could be damaged. Instead, black "Contact" sheet was applied, which gives a durable finish which can easily be replaced if required. An alternative material would be leathercloth which could be stuck into place with a contact adhesive. Remember to allow for the thickness of this material when bending the covers if this alternative is used!

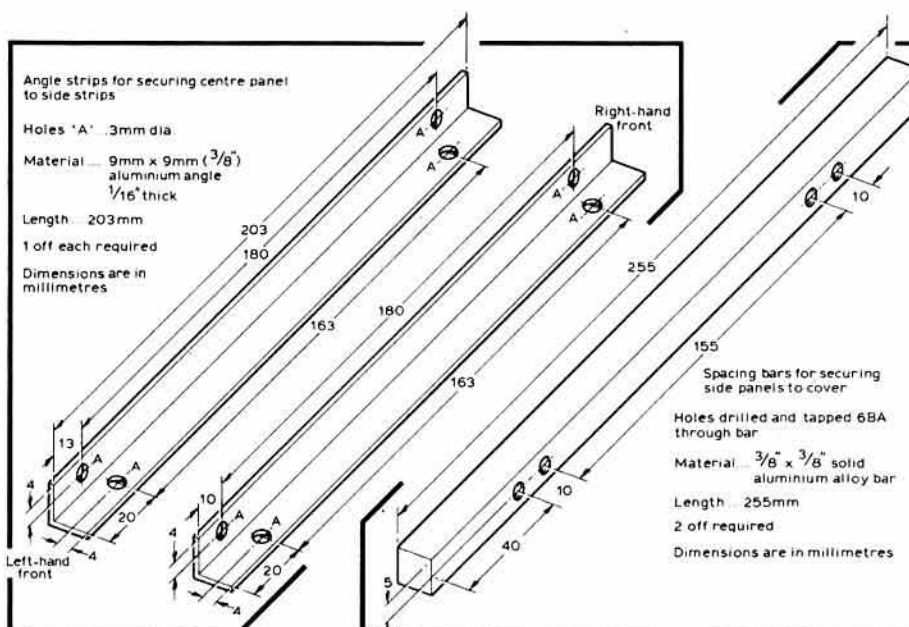


Fig 28. Angle strips and spacing bars

ERRATA Part 1, page 37

Components list: RV10 should be 4.7k Ω not 4.7 Ω .

Construction step 4: 2.7 Ω should read 2.7k Ω .

Construction step 14: T4 should read T3—amend Fig 5 accordingly.

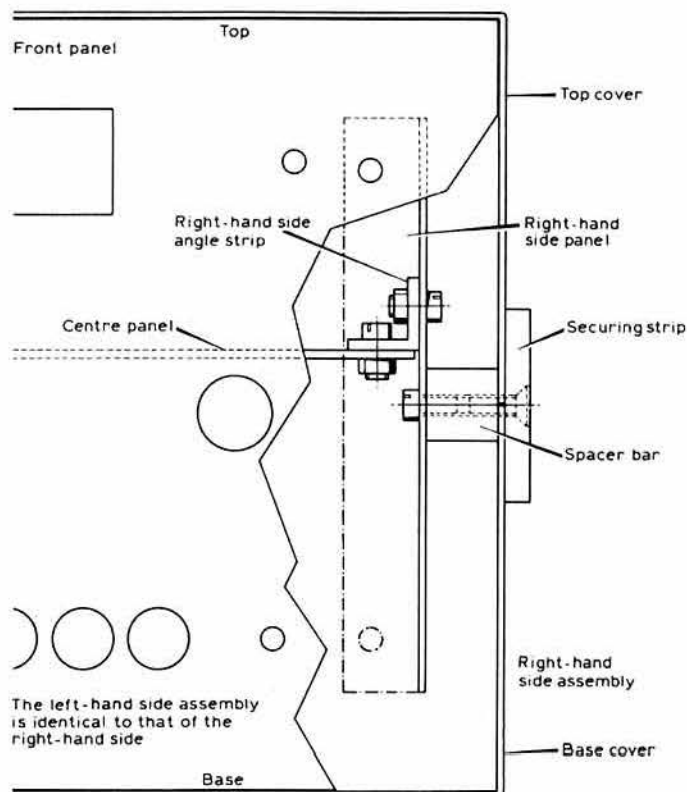


Fig 29. Case assembly, front view

Mounting the modules

The drilling plan for the centre chassis panel is as for the prototype and assumes that the Astec screening boxes supplied with the kits are used for the attenuator, fm i.f. and vfo stabilizer modules.

The converter modules are mounted using 6BA screws and nuts, with an extra two nuts between pcb and chassis as spacers. The antenna inputs of individual converters face each other across the chassis in pairs to keep the paralleled antenna lead as short as possible.

As advised earlier, the RX80 tunable i.f. module should be mounted inside a screened enclosure, and Fig 20 gives details of a suitable enclosure which can be fabricated from tinplate. This diagram also gives details of the various connections required for the external modules. Note that the cut in the pcb track by TR4 is not required if the fm module is not to be used (the connections for the fm i.f. will be given later). It is important that the RX80 pcb is soldered to the enclosure only at the points indicated by the solid-black half-circles, and that the separate earth for the vfo section is maintained by 6BA nuts and packing washers placed on the mounting screw under the top-right-hand corner of the pcb. The underside of the pcb must make good contact with these when tightened down. Although not shown, a simple cover for the enclosure should be made and fitted after final alignment.

Bibliography

1. "The RX80 Mk2, Part 1". *Rad Com* January 1981.
2. "The RX80 Mk2, Part 2". *Rad Com* February 1981.
3. "Huff and puff in cmos", G3VA. "Technical Topics", *Rad Com* April 1978, p323. Also *ART* 7th edn, p178.
4. "AFC circuit for vfos", R. Easton, K6EHV. *Ham Radio* June 1979, p19.

TO BE CONTINUED

QTC

(Continued from page 223)

The G3PAO Memorial Lecture

The Verulam ARC has pleasure in announcing that the G3PAO Memorial Lecture this year will be given by Pat Hawker, G3VA. The subject will be "Technical topics and the direct-conversion receiver". The meeting will be held on 24 March 1981 at The Charles Morris Memorial Hall, Tyttenhanger Green, Tyttenhanger, Nr St Albans. The lecture will commence at 7.45pm. All visitors are welcome.

Further details can be obtained from Hilary Claytonsmith, G4JKS, tel St Albans 59318.

International Year of Disabled People

The International Year of Disabled People is to be acknowledged by the amateur radio fraternity with an "International Weekend on the Air for the Disabled", 1-3 August 1981. It is hoped that disabled operators all over the world will contact each other and exchange greetings and QSL cards. It is suggested that stations should call "CQ IYDP from (station callsign)".

The date has been chosen to coincide with the opening of the international meeting of the Devon Sports Association for Disabled Persons at St Loye's College for Training the Disabled for Commerce and Industry, Exeter, Devon. The Exeter Amateur Radio Society will operate stations from St Loye's College over this weekend on all amateur frequencies from 3.5 to 28MHz, vhf and uhf between 0900 and 2000gmt using the callsigns GB2IYD and GB8IYD. Further details may be obtained from: G. Draper, 1 Carlyon Close, Exeter, Devon; tel Exeter 37170.

Sutton & Cheam RS annual dinner dance

The 33rd annual dinner and dance of the Sutton & Cheam Radio Society will take place at the Woodstock Hotel, Stonecot Hill, Sutton, Surrey, on Saturday 4 April 1981. Tickets are available on application to L. Sandell, G8XHB; 19 Mount Park, Carshalton, Surrey; tel 01-647 8399.

Coach from Birmingham to Alexandra Palace

If sufficient support is forthcoming a coach will be arranged for Saturday 30 May 1981 to take members from the Birmingham area to the RSGB Exhibition at Alexandra Palace (as last year).

Will anyone interested in this arrangement please contact the Region 3 representative, Henry Pinchin, G3VPE, QTHR, tel 021-777 1320 before 31 March 1981.

RAOTA AGM

The RAOTA AGM this year will be held at the Hotel Metropole, Brighton, on Sunday 26 April. There will be no formal dinner. To cover expenses, there will be an admission fee of £1.50.

The meeting will open at 2.30pm and close at 3.30pm. It will then be thrown open to give members a chance to meet delegates to the IARU Region 1 Conference which is taking place at the hotel from 27 April to 1 May.

Television Interference Manual (2nd edn) B. Priestley

A readable and illuminating introduction to solving both the social and technical aspects of this most challenging problem. Also contains much valuable reference material.

Chapter titles: *The general approach; Television channels; Spurious radiation tv; Strong-signal tv; Transmitter design; Other problems and solutions; Audio breakthrough; Data and reference section; plus 12 appendices.*

"... provides very good coverage of a most difficult and wide ranging subject. A definite must on the bookshelf of any ham shack." — *Amateur Radio* (Wireless Institute of Australia).

80 pages; paperback; 210 by 147mm; 1979

Obtainable from RSGB Publications (Sales)
(See final page of this issue for prices)

TECHNICAL TOPICS

Pat Hawker, G3VA



THIS month some knotty but hopefully exciting topics such as buying reliability (fact or fiction?), how to make an effective, vertically-polarized, low-cost hf directional array without breaking your back digging in radials, what to do with a "ptc thermistor", and lots more besides.

The change over the years which has converted "amateur radio" virtually into part of the "consumer industry" should cause us all to think deeply about questions of equipment and component reliability. Factory-made equipment is now being marketed at retail prices extending well into four figures. QST carries advertisements for the Signal/One CX-11A hf transceiver with a basic USA price of around \$5,900, while the recent Collins model at almost £2,000 cannot have been designed for "impulse buying"!

But price is less of a deterrent than is sometimes supposed. It is clear that even cost-conscious consumers buying electronic products put great emphasis on seeking, though not always finding, equipment capable of providing reliable service. It was largely, I suspect, fear of unreliability that created in the UK in the 'sixties the uniquely-large tv rental market. This removed from the customer the constant worry of what he would have to pay for repairs (always supposing he could get someone to do them effectively), even if in the process he ended up paying more in rental than the cash/hire-purchase price plus average cost of maintenance. In amateur radio, increasingly, we are likely to see above-average reliability more sought-after even than above-average performance, unless equipment rental becomes common!

Importance of good "production engineering"

Rental forced British tv manufacturers to make efforts to improve reliability and to produce easy-to-repair chassis, but even so the industry remained vulnerable to the inroads of the Japanese firms whose products gained a reputation for good reliability. A few weeks ago an ITV "World in Action" programme suggested that a major reason for this was the importance Japanese firms placed on the actual factory production of their colour tv sets (which are roughly comparable in complexity to amateur radio transceivers) giving great attention to the organization and morale of the assembly lines and to good production engineering. While this is now being successfully copied by a few British firms, undoubtedly there has been a tendency in the past for our consumer firms to regard management and design engineering as vastly more important, and carrying greater prestige, than the less-glamorous task of converting a laboratory design into something that can be assembled effectively and efficiently in a factory, with a minimum of hassle.

Design engineers have sometimes lived in their own world of R&D laboratories producing prototypes that may be first-rate electronically but which may turn out to be unnecessarily difficult to keep moving along an assembly line. And without wishing to be unfair to many excellent and practically-minded designers, it is fair to comment that they do not always take kindly to changes introduced or suggested by hard-pressed production engineers trying to straighten out factory problems.

A design which is difficult to produce tends, I would suggest, to result in less-consistent and less-reliable equipment. Such a design also requires (but does not always receive) much more stringent quality control. But, as pointed out by Mike Perry, PA3ASC/G4HWZ (TT October 1980, p1035) manufacturers are coming to regard sale under warranty almost as a substitute for effective quality control or quality assurance during production.

Buying reliability

How can we, as consumers, buy reliability? There would seem to be no simple answer. I personally have little faith in the way that reliability calculations, developed primarily for military equipment, are sometimes applied to non-professional equipment, nor, as discussed later, the way in which "life-test figures" for semiconductor devices are derived by the manufacturers of the devices.

Not all engineers would agree with these remarks. In the October TT I referred loosely to "bath-tub" reliability curves and suggested that these applied more to equipment than to semiconductor devices (although it was far from my intention to suggest that in practice semiconductor devices never fail but are *always* killed by misuse!). In doing so, I upset a number of readers familiar with the subject. H. R. Henly, G3IHR, for instance, although accepting that the reliability of components is a complex matter that has been brought into disrepute by marketing men often "bending" data to make good advertising copy, wrote:

"The comment that a 'bath-tub' curve relates to equipment and not to devices is completely wrong. This 'curve' has been deduced from a large mass of data on a very wide range of components collected over many years. Although it is true that 'life' data for semiconductors are derived by manufacturers from accelerated life tests, a considerable body of data is derived from other sources which are more application orientated (eg *Military Standardisation Handbook, Reliability prediction of electronic equipment*, MIL HDBK 217B, US Dept of Defence or *Electronics reliability—calculation and design*, G. W. A. Dummer and N. B. Griffin, Pergamon Press, 1966, or "Reliability" by H. R. Henly, *Wireless World* February 1978).

"The two areas of the bath-tub curve that require more comment are: (1) *the infant mortality region*—this is where most of the manufacturers' failures that escape quality-assurance tests are picked up (it is often used to cover up design/manufacturing mistakes); and (2) *the wear-out phase*—immortality is reserved for the conceptual device and is not true of real semiconductors or their associated attachments, eg connectors, soldered joints, other components etc.

"In practice, imperfections in manufacturing techniques, together with the long-term effects of operating environment (temperature, humidity, operating potentials, etc) take their inexorable toll. A device does not necessarily cease to function. Its performance may simply deteriorate to the point where it no longer meets the minimum specification requirements. This gradual degradation in performance is termed 'wear-out'. This condition is often accelerated by the changes caused by the failure of another component in the associated circuit. In the wear-out or 'end-of-life' region there are also catastrophic failures caused either by another component failure or by the degradation of a parameter such as V_{CEO} .

"Reliability data are often quoted and used out of context. The life performance of a component is closely related to the service to which it is put. It is imperative that reliability appropriate to the application be used when calculating reliability. Temperature is a crucial factor. High-power devices operating at high temperatures generally yield a lower reliability than the same device in a lower-power application. Accelerated life testing at elevated temperatures not only allows the life of the components to be reduced to a measurable value but also enables the component's life at lower temperatures to be computed.

"There are other factors besides the device temperature ratings which seem to be given scant attention. Failure due to secondary breakdown is a real problem in power amplifier design owing to the inductive nature of the load, particularly under conditions of mismatch. In this situation $V_{CE(sus)}$ is a more important consideration than V_{CEO} and must be specified at the full load current.

"Finally I would stress that the whole concept of reliability is based upon probability, and it enables one to estimate the probability that the life of a component/system will exceed a given value. It puts a confidence level on the probability—it does not calculate a certainty."

This is certainly fair enough. But unfortunately the typical amateur can be misled into thinking that a calculated "mean-time-between-failures" can confidently be applied to the black box he bought last week from "Do-the-boys Communications Unlimited". As someone connected with the advertising industry wrote the other day: "Statistics are dangerous things, and should be used by the young and excitable only under the strictest supervision".

Failure mechanisms and makers' data

One detects that G3IHR has some doubts about the value of data derived from accelerated life-test figures published by device manufacturers. This is a point that deserves a little more probing than it usually receives, and in doing so I draw gratefully upon the comments of a reader who, because of his connections with the semiconductor industry, will not here be identified, and also upon material which has been published by British Telecom Research.

The reader recalls an ARINC report which, some 20 years ago, pointed out that semiconductor devices, properly made, do *not* have *inherent* wear-out mechanisms. This does not mean, however, that they are immortal. Physical causes of failure are recognized that eventually result in either

checking an odd assortment of junk box components before tackling faulty equipment. With practice, it should usually be possible to identify immediately a "catastrophic" fault, although the technique is not really intended for tracing small drift of component parameters ("parametric" faults). The patterns shown in Fig 2(b) are examples only. Where a number of different types of component are wired together, the patterns will be modified but, with experience, this can be taken into account.

Size of the small test unit is governed by the size of the mains transformer. ZL1AYN built his in a 10 by 15 by 9cm metal case.

Frequency-shift for vfo keying

The increasing interest in full break-in cw operation is leading to some useful ideas on improving the keying characteristics of valve and semiconductor oscillators. One "ancient" technique that seems well worth reviving for "separates" is *not* to turn the oscillator on and off during keying, but instead to arrange that in the "key up" position, the frequency shifts well away from the "transmit" frequency, ie a form of fsk with wide frequency shift.

The problem in the old days (when a fast-acting relay was often used to switch-in extra capacitance across the vfo tank circuit) was that this resulted in the emission of a strong "back-wave" on another frequency during key-up conditions. However, this can be overcome where some form of differential keying is used that turns a subsequent stage on and off.

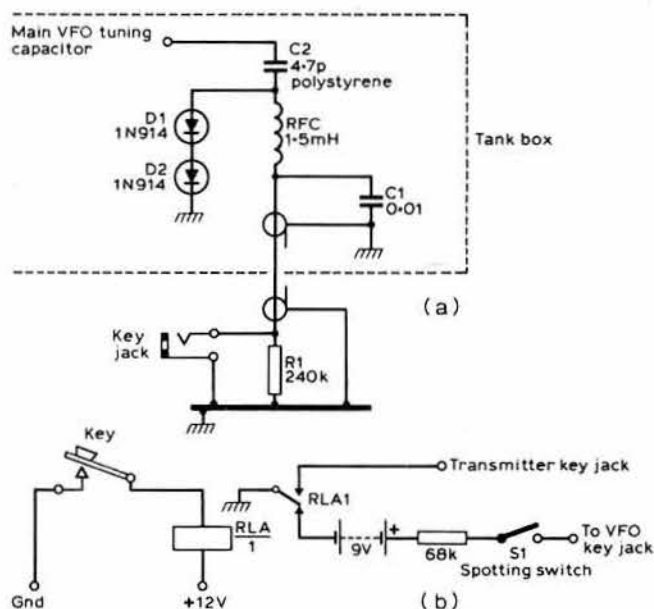


Fig 3. N3AXN's modification of a valve-type vfo to improve stability by frequency shifting an oscillator during "key-up" conditions can also facilitate full break-in operation provided that in all cases a subsequent stage of the transmitter is also keyed to prevent the radiation of a back-wave

In *QST* December 1980, Thomas Cock, N3AXN, replaces the old electromechanical relay with a switching diode system. This connects a 4.7pF capacitor across the main tuning circuit of a valve vfo when a positive voltage is applied to the two diodes D1, D2 (two diodes are needed to raise the diode bias above the tank operating voltage): Fig 3.

Continuous running of an oscillator not only provides chirpless break-in operation, but also helps minimize vfo drift. While the circuit shown was intended for an Eico 722 vfo, the same basic principles could be applied to any valve or semiconductor vfo. But remember, with this technique it is *essential* to also key a later stage or you will almost certainly put out a hefty back-wave on the vfo's stand-by frequency.

Cleaning variable capacitors

The importance of ensuring that any variable capacitor used in a high-grade vfo is really clean has been stressed on a number of occasions, up to and including the use of an ultrasonic cleaning bath. However, since not many of us have access to a suitable bath, a tip given by Bill Pickens, WB5NGF, in *QST* December 1980, p54, could provide an effective substitute. He writes:

"For corroded and otherwise dirty variable capacitors, which are almost impossible to clean with a brush, I use a mixture of 4oz (120ml) of concentrated lemon juice in eight to 10oz (240 to 300ml) of water placed in a

saucepan. By placing the capacitor in this mixture and boiling it for 10 to 15 min, the device can be made to look like new. A few drops of liquid detergent might be helpful. A drop or two of oil should be placed on the bearing when dry."

Your signal S9 (or S17)

The S-meter has been around for over 45 years but, like the RST code, needs to be regarded as a useful, rough-and-ready comparative guide than as a notable example of precise measurement techniques. It has long been evident that different manufacturers interpret the S-scale very differently, and one sometimes suspects that the calibration is intended more to conceal certain aspects of receiver performance than to reveal the true strength of incoming signals. Nevertheless it seems worthy of comment to discover that a signal which on one receiver results in the meter pointer flipping grandly up to "S9" may, on another, barely move it beyond "S1".

At least that seems to be the case from a table found in a detailed article on antenna testing by Hans Rueckert, VK2AOU (ex DL1EZ) in *cq-DL* 12/80, pp550-5. If my understanding of the German text is correct, the table indicates in microvolts typical input signal voltages to provide given S-meter readings for eight current transceivers. It is most unlikely that similar models will always prove consistent with these figures, but the table does provide a useful guide to the variations that may be encountered, and ties in roughly with the S9 figures reported by WB6CTW (*TT* January 1980, p47).

Model	S1	S2	S3	S4	S5	S6	S7	S8	S9	S9+10	S9+20	S9+40
FT901	0.8	0.9	1	1.2	1.4	2	3.3	6	11	50	200	1,700
TS820	0.5	0.7	1.1	1.7	3.4	6	12.5	25	50	200	1,000	22,000
IC701	1.9	2.3	2.7	3.5	5	8	12	20	30	—	120	930
SB104	10	18	28	40	52	68	95	125	170	265	460	10,000
FT301	1.4	2.4	4	7	10	13	18	24	30	95	450	2,700
TS520	0.55	0.7	0.92	1.25	1.9	3	5.6	12	25	110	500	15,000
FT7	1.5	3	4	6.5	11	15	21	28	40	180	1,800	25,000
TS120V	1.5	3	4	6.5	11	15	21	28	40	180	1,800	4,200

Vertical polarization on hf

HF directional arrays based on vertically-polarized dipole or monopole elements (see for example *TT* June/July 1980, pp637-8) are not as widely used as one might expect in view of the considerable attractions. These include the absence of any requirement for high (and costly) masts or tilt-over towers, etc; the unobtrusive way in which they can be fitted into an average garden or on a flat roof; the way in which, with the aid of phasing sections, they can be electronically "rotated" etc.

The analysis of British antennas by Ron Fisher, VK3OM (*TT* September 1980, p906) indicates that at present the use made of such arrays is minimal. On the other hand the single-element vertical monopole or ground-plane is much more popular than its performance really merits. What is it that puts so many people off the monopole array?

Several answers could be suggested. In the first place in an era of commercially manufactured beams nobody aggressively markets such a system. In the second place there is the important question of the earth system. Most of us have come to associate monopoles (particularly in arrays) with very extensive earth systems, influenced perhaps by the 120 radials used by mf broadcasters, involving much "buried treasure" in the form of copper, not to mention the sheer hard work of digging suitable trenches without the aid of a mole-plough. There are also questions relating to earth conductivity, which varies considerably and tends to be poor in urban areas. There is also the belief that the largest possible earth

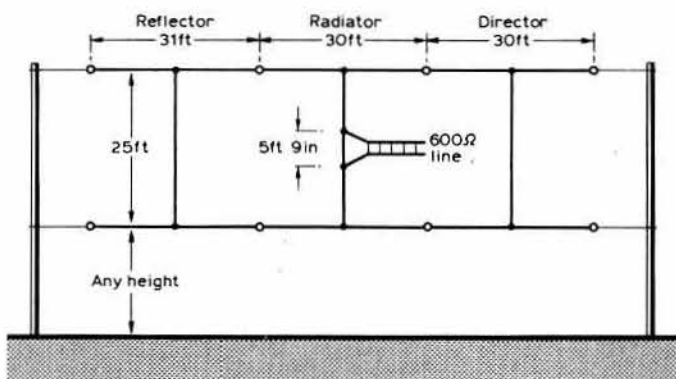


Fig 4. G6XN's 1970 design for vertically-polarized three-element fixed Yagi 7MHz array not requiring high poles. Reflector and director elements are tunable by adjusting the length of either vertical or lower horizontal end-loading wires

system is an absolute "must" if any attempt is to be made to shorten the height of a monopole by capacitive loading.

But what about the "old-fashioned" technique of using a counterpoise to turn an earthed Marconi antenna into a Hertz or resonant antenna? Buried away in old journals can be found plenty of evidence that the counterpoise can be an effective technique—and it can be applied just as easily to vertical monopoles as to $\lambda/4$ Marconi inverted-L antennas. In a 1970 article in *Wireless World* (see also many editions of *ART*), Les Moxon, G6XN, described a fixed 7MHz three-element beam based on top and bottom loading of each element: see Fig 4.

Recently, G6XN has again turned his powerful thoughts towards this subject, including the development of a new non-earthed monopole element that could be used either as a single-element vertical or more effectively for a vertically polarized array.

The vertical array

Last September, Les Moxon was struck particularly by the apparent complete absence from VK3OM's statistical table of any vertical beams. He promptly contacted VK3OM to verify that this was indeed the case; in the process using the vertically-polarized switched array outlined in *TT* April 1979, Fig 10, and so in fact adding a new category to VK3OM's list!

The original objective of G6XN's 1979 design was to provide a convenient all-round switched-beam system, and stemmed from his work in endeavouring to increase the gain of the UA31AR switched-quad. This objective was achieved and the work showed the array had a useful dx capability. But G6XN found that the vertical array: (a) was not quite good enough to justify using it to replace his high horizontally-polarized beam arrays; and (b) it seemed to work just as well at ground level as when raised to the top of the mast. Item (b) struck G6XN as very important since it provided solid grounds for thinking that it is possible (on 14MHz and above) to put out a hefty dx signal without incurring the usual hassle of masts, towers, planning permissions *et al.* G6XN believes the results were not unduly influenced by his location, which he regards as "average" (though some might dispute that!).

These findings encouraged G6XN to investigate other vertical arrays. He has now achieved results comparable with those of his 1979 array using Yagi designs based on a simple, but ingenious, form of non-earthed monopole element. Further, he believes, though this has not yet been confirmed, that the $\lambda/4$ height of the element could be reduced on 14MHz by top loading, etc to about only 8ft (under 3m) or so.

Among the reasons for non-use of vertical arrays, G6XN points to the obsession of the *ARRL Antenna Book* and others (*mea culpa*) with elaborate systems of buried radials—often impossible for those unable to buy up the neighbouring properties or find the energy to dig hundreds of metres of trenches, and then afford the copper to fill them. The standard ground-plane, he feels, is too much of a compromise (although 3dB gain has been reported from two elements having a common ground-plane).

There are other, seldom mentioned, serious objections to the ground-plane in its usual form: the *ARRL Antenna Book* insists on $\lambda/4$ radials, yet, G6XN believes, this is the one length which should at all costs be avoided! The reason is that near resonance the impedance of each radial changes very rapidly with frequency; if there is a finite difference in lengths there will also be a finite range of frequencies over which one radial is capacitive and another inductive, i.e. a phase-reversal situation. This will tend to generate earth currents and large losses (though in turn the losses oppose the phase reversal). As G6XN puts it: "Precisely what happens is anybody's guess".

G6XN surmises that one way of getting around this would be by using a number of non-resonant radials connected in parallel and (with the monopole) brought to resonance by a common impedance. But this immediately invites further questions: To what extent can one shorten radials? Why not replace the monopole by a short end-loaded dipole of the type shown in Fig 4, as this is known to be an effective radiator? Or why not use an "earth connection" like that shown in Fig 5?

It can be argued that there is also the important question of radiation losses with vertical antennas caused by the circulating currents induced in a non-perfect earth; but if, for the moment, one ignores this, then the only loss in an arrangement such as Fig 5 is that due to the rf resistance of the coil. With a 6ft-or-so rod at 14MHz and linear loading this need be only a

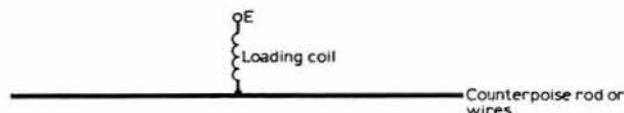


Fig 5. One form of counterpoise "earth connection" for use with vertical $\lambda/4$ monopole antennas. G6XN considers it as good as using buried radials—and much less work

small fraction of an ohm: G6XN is convinced that such an "earth" can be vastly more efficient than any conceivable arrangement of buried radials, yet allows the whole antenna to be readily moved.

But what about the induced ground losses? The literature yields little in the way of firm figures applicable to average sites, though there is some evidence to suggest that the contribution due to using such a counterpoise earth system rather than buried radials is negligible, provided that the horizontal rod (or wires) is more than a few millimetres above earth. Experiments with various counterpoise lengths at heights between 2 and 5ft have yielded no differences whatsoever.

A basic no-radial monopole element

Fig 5 shows the final form of G6XN's monopole element, requiring no buried radials. Dimensions are not critical, except that, when used as a driven element, the feeder must be connected at a point of minimum rf voltage to ground, and it may be necessary to adjust the relative lengths of radiator and counterpoise to achieve this. G6XN emphasizes that vertical antennas near ground are inherently asymmetrical and that it is almost always difficult to ensure that no common-mode current flows on the outer screen of the coaxial feeder. This, he notes, may be one reason why dx signals from ground-plane antennas tend to be weaker than might reasonably be expected, and may also contribute to their "noisiness" when used for reception.

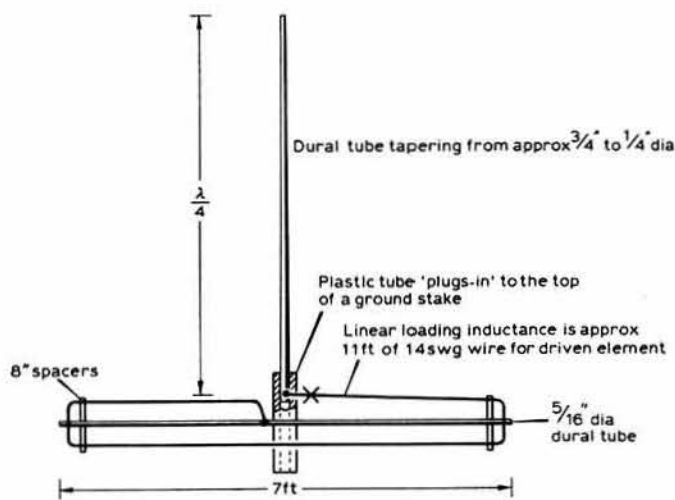


Fig 6. Final form of the G6XN 14MHz monopole element with counterpoise earth. Suitable for use in multi-element arrays or as a simple vertical. The driven element should be fed at point X using a 1:1 balun with coaxial feeder, but do not expect an swr of less than about two with 50Ω coaxial feeder unless additional impedance transformation is used

G6XN does not claim basic originality for the type of element shown in Fig 6. Military manuals often show pack sets working into a dipole in which one arm is run just above the ground; *TT* has included notes on using trap verticals by converting them into dipoles, and in particular VK3AM has been using a basically similar idea (often using small helices as counterpoises to short, loaded-verticals) in a successful project aimed at developing efficient antennas for use in confined spaces, including small boats.

Is the element shown in Fig 6 a monopole or a dipole? G6XN is convinced such a debate has little practical significance. He points out that of the three antennas in Fig 7, not only (a) but also (b) and (c) result (where the height is low) in "images" in the ground and so are, in effect equivalent to a dipole; above ground the vertical radiation patterns are all given by $\cos\theta$ and so, in terms of performance, are identical. But (a) and (b) share the important practical advantage that the low-impedance point is accessible at ground level for adjustment, beam switching, multibanding etc—and the elements are normally self-supporting!

Also, as already noted, (b) avoids the IR ground losses of (a). It thus seems appropriate to refer to (b) as a monopole when it is close to earth. In fact (b) and (c) have the advantage of not being tied to ground level, with the possibility of the 3dB colinear gain when they are at an effective mean height of just over $\lambda/4$; in such circumstance it might be more appropriate to regard (b) as a dipole none the worse for being asymmetrical, although G6XN feels that in raising (b) well above ground it loses many of its practical advantages.

He has used the "low" monopole element of Fig 6 in an array that shows only the expected 2-3dB reduction on the results achieved with the

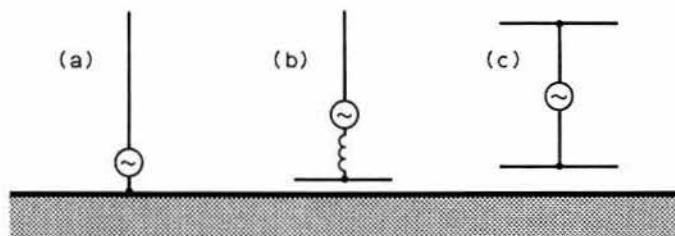


Fig 7. Three types of monopole/dipole vertical elements: (a) conventional Marconi-type earthed $\lambda/4$ antenna; (b) the G6XN/VK3AM form of monopole (dipole 7) with counterpoise earth; and (c) short end-loaded dipole element as used in the array shown in Fig 4

1979 type of vertical array, though very much simpler to implement. The difference could be removed by raising the elements, although if one has the space it is easier simply to put up a few extra (wide-spaced) elements as directors; and indeed this has been shown to work successfully in practice. The signals on the 14MHz path to Australia using three monopole elements have proved to be well up on those of other British stations using conventional ground-plane antennas. G6XN admits that an equivalent horizontally-polarized beam at a height of about 20ft would be marginally better, but points to the many practical and economic advantages of using monopole elements. These include portability, which allows the beam to be "swung" in any direction in about the same time as it takes to rotate a horizontal beam. Elements can be quickly taken down and stored away when not in use. G6XN uses short lengths of plastic pipe as base insulators, with sockets made from larger-diameter pipe which can be attached to wooden stakes in prepared positions.

There remains the disadvantage, when such a beam is erected near a house, of the considerable attenuation of signals "firing through" the building (a bungalow might not present much of an obstruction).

As with his 1979 modified-VK2ABQ antenna, G6XN finds it useful to increase the coupling between driven element and reflector (particularly important if only two elements are used). This can be done, as indicated in Fig 8, by increasing counterpoise lengths to about 10ft, assuming 8ft spacing between elements. Element currents should be equal when one element is driven. Note that, with two elements, the second *must* be tuned as a reflector (typical element resonances, when checked with a gdo, are 14MHz for reflector, 15MHz for directors).

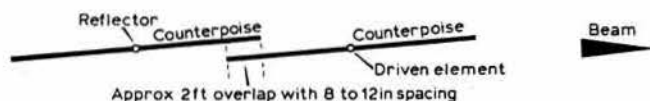


Fig 8. Arrangement used by G6XN to increase coupling between driven element and reflector (in plan view)

Some further recent work by G6XN will be reported later, but it is felt this detailed account of this novel monopole element will be of considerable interest to those seeking low-cost, easy-to-erect dx arrays, even though they should not be expected to outperform high horizontal beams. It would also seem to me that even the single-element form of this type of antenna would be well worthy of further investigation as an alternative to the usual vertical and ground-plane antennas.

PTC protection and temperature stabilizers

The thermistor is a thermally-sensitive resistor, and such devices have been around for quite a long time. But the common form of device consists of semiconductor material with a very large *negative* temperature coefficient: that is to say its resistance is initially high but decreases very rapidly as it warms up. Often an increase of about 20°C will result in a halving of the resistance, and such devices were popularly used as current-surge protection in series-connected valve heater chains, particularly in domestic television receivers.

More recently there has been increasing interest in the opposite form of thermistor: those with a very pronounced *positive* temperature coefficient (Fig 9). Such components provide current overload protection in applications where very quick action is not required. For example, they are now used for the protection of domestic electrical appliances, power supply units, loudspeakers, relays, measuring and test instruments etc. Usually all that is required is to connect a suitable ptc thermistor in series with the device to be protected: Fig 10.

A wide range of ptc thermistors is manufactured by Siemens AG of Munich, and I have recently been reading a six-page leaflet *PTC*

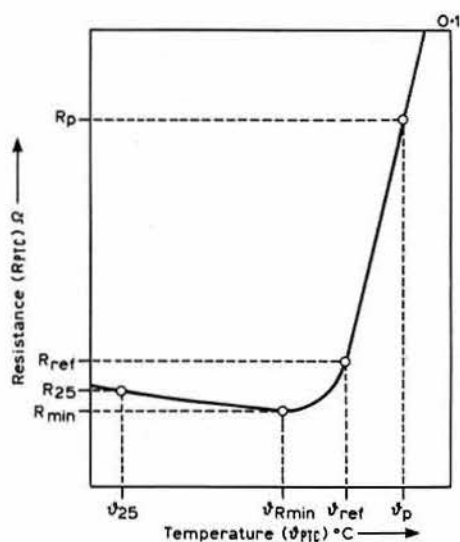


Fig 9. Typical resistance-temperature characteristic of a ptc thermistor. Temperature coefficient changes from negative to an increasingly steep positive coefficient

thermistors for overload protection and a useful 112-page booklet *Data book 1980-81—ptc thermistors* which includes application notes.

During normal operation of the protected equipment, the resistance value remains low, but should a defect cause the current to rise beyond the thermistor's trip current, the component quickly reaches its reference temperature (eg 120°C) and becomes highly resistive, limiting the current to a safe value. The ptc thermistor is not affected by fast transients so that it combines the advantages of a slow-blow fuse and a resettable circuit breaker; if the fault clears, the temperature of the thermistor drops to its normal level without any action on the part of the user.

An article "Current protectors take on surges without resetting or replacement" by George Bullog of Raychem Corporation (*Electronics* 13 January 1981, pp159-162) reports on a further development of this type of component: a new form of conductive polymer switches (marketed as PolySwitch protectors) that have very low resistance at normal temperature (under 0.05Ω) and so can handle relatively large currents. A typical application would be in the output of a telecommunications power supply (designed in accordance with the American Underwriters Laboratories Safety Standard 1012) normally supplying 24V at 1.9A and guarding against currents of 2A or more.

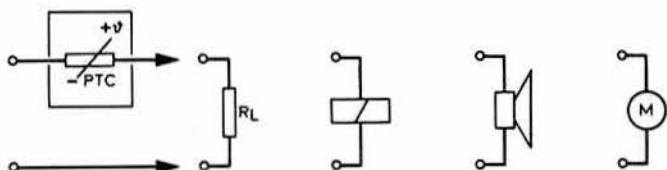
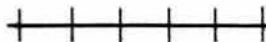


Fig 10. Typical uses of ptc thermistors for current protection of components such as relays, loudspeakers, meters etc. Recent types with very low initial resistance can be used directly in power supply units delivering up to about 1.9A.

A rather different application of ptc thermistors to amateur radio was brought to my notice recently by Frank Ogden, G8SNW. He has found that a standard type of ptc thermistor, recovered from a defunct television set (where such devices are often used for picture tube degaussing), can form an extremely useful temperature regulating element, much in the same way that transistors or LM3911 devices can be used to form proportionally-controlled crystal ovens (*ART7*). With a potential across the ptc thermistor, the temperature rises to its reference temperature and then stabilizes at this value. The Siemens data book indicates that a typical reference temperature for a degaussing device would be 60°C (at the coil side), so that such a form of temperature stabilization is well suited to crystal oven applications. This type of ptc thermistor can be connected directly across 220V ac mains, resulting in a degaussing current of 5A initially, less than 5mA after 30s, and less than 2mA after 180s, but Frank finds that by using a transistor as the actual heating element, the system works well off 12V supplies. □

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John Morris, G4ANB*

Aurora

Several correspondents have described the auroral opening on 19 December 1980 as the best they have ever heard. A magnetic storm commenced on 18 December with an "A" index of 16. This was followed by a major aurora which started at about 1500gmt on 19 December, continued uninterrupted until 2030gmt, and extended over Europe. The "A" index at Boulder reached 50. Auroral effects were noticeable on all bands from 1.8 to 432MHz, and Northern Ireland stations were able to see a visual display extending from horizon to horizon. Stations in all parts of the UK, from Cornwall to the north of Scotland, were able to make dx contacts into Europe, and it seems certain that the Region 1 auroral dx record has been broken.

Reports on this opening have been gratefully received from Paul Stokes, G8NOL, in St Ives; A. B. Whatman, G2BQ (ZK13g); Chris Easton, G8TFI (ZL38c); Martin Adams, G4IYA, in Kent; David Pellowe, G4IGZ, in Nelson, Lancs; George Grzebieniak, RS41733 (ZL39e); Jonathon Brisley, G8YQZ (ZM39j); Jim Rabbitts, G8LFB, in London; John Branagan, GM4IHJ, in Fife; Bryn Llewellyn, G4DEZ, in Essex; Brian Bower, G3COJ, in High Wycombe; Mike Dennison, G3XDV (AL56a); Bob McHenry, G3NSM (ZL14e); and Gordon Pheasant G4BPY (YM30d). It would be impracticable to reproduce all the log extracts in full, but some of the more interesting items are described below. All reports will be forwarded for detailed study by the Propagation Studies Committee of the RSGB, to which such information is invaluable in the study of auroral phenomena.

G2BQ was alerted to the opening by the raspy note of a G station on 21MHz. He moved up to 144MHz, and between 1700 and 1815gmt worked or heard several Scottish, Dutch and West German stations. The early part of the opening was unusual in bringing signals from as far south as HB9MY (EH63j), with many French stations also audible. For example, G8TFI worked F6ETH (ZI square) at 1644gmt, with several Scottish and German stations audible at about the same time. As the evening progressed the aurora moved eastwards, until by 1800gmt Scandinavian stations were being heard and worked at good strength by UK operators, at beam headings varying from 75° in Lancashire to 30° in London. Among the dx contacts made at about this time were G8YQZ to SM7DVR (GP36h); G4IYA to SM1BSA (IR22a); G8LFB to OZ1ELF (EP square); G8TFI to OZ1ELF; and G4IGZ to OZ1ELF and OZ1DPR (EP square); all of these contacts being on 144MHz.

The aurora peaked in strength at about 1830gmt, and allowed many contacts between the UK and eastern Europe to be made, including G4DEZ to SP8AOV (LL53d) and G4IYA to SP2AOZ (JO44f), UC2ABT (NN18a), UR2RDR (MS68f) and RC2WBR (NP78g). At least two of the contacts recorded exceed the current entry in the dx record table for 144MHz aurora (4-2-70 August 1980), which is 1,915km for a contact between G3CHN (YK61b) and UP2BBC (LP07d). ON5QY (BL80f) is reported to have worked UA3LBO (QO21h), a calculated distance of 1,921km. However, G3NSM has put in a claim for the record for a contact with UC2AAB (NN18c), at a calculated distance of 1,939km. Can any reader better this?

The aurora also had a very marked effect on 70MHz, as would be expected, and G4BPY concentrated his efforts on this band. Between 1500 and 2000gmt he worked many GM and GI stations, the best dx being GM3ZXE (YQ35a) and GM3YOR (YQ75f), and also made a crossband contact with SM6PU, the Swedish station transmitting on 28.895MHz. G4BPY commented that there was more 70MHz activity than he had ever previously heard during an aurora. It is worth remembering that auroral events will often become apparent on 70MHz a little before reaching 144MHz, and will also last about 15min longer on the lower band. GM4IHJ found himself in Lancashire with no 144MHz gear during the opening, but managed to set up a tv converter to get good pictures from Iceland on 62MHz between 1800 and 1830gmt.

The strength of the aurora was such that a few 432MHz contacts were made by this propagation mode. G3COJ worked DF3EE (DL75b) at 1838gmt, and G3XDV heard ON5FF, DL7ZL and DK2NH (FN13a) calling CQ, but could get no response to his low-power calls. One feature of the uhf signals noted by G3XDV was that they peaked much more sharply to the northeast than those on 144MHz, even when the different antenna beamwidths were taken into account.

During most of this spectacular opening G4ANB was sitting in front of a typewriter, 3ft away from a switched-off rig, blissfully unaware of all the frantic activity, conscientiously composing February's 4-2-70. Such is life.

50MHz

Bob Parkes, VS5RP, has written from Brunei with the news that the local licensing authorities gave permission for amateur operation on 50MHz outside tv hours during November and December. JA1BK took two rigs into the country, allowing operation to begin almost immediately from permission being granted. As well as many JAs, contacts were made with W, KH6 and VK stations during the two months.

UK amateurs have again been active on 28/50MHz crossband, and several operators have made contacts with Hong Kong stations by this mode. The "first" was claimed by G4BPY, who worked VS6BE on ssb at 0912gmt on 13 December 1980. On 14 December several European stations made crossband contacts with VS6BE and VS6FX between 0930 and 1030gmt, and EI6AS completed a two-way contact with Hong Kong on 50MHz.

Repeater news

The North Kent repeater, GB3NK, was used as part of the Raynet communication system during a recent exercise. The results were very encouraging, demonstrating the potential of the vhf and uhf repeater networks in aiding Raynet during local and national disasters.

One or more of the four London vhf repeaters are expected to be off the air for maintenance during the next couple of months. It is hoped that the full system will be operational again soon. GB3SC (Wimborne, Dorset, R1) is to be moved to the centre of Bournemouth. GB3NT (Newcastle-upon-Tyne, RB0) is also due to change site. GB3BN (Bracknell, RB0) has just received its first overhaul since coming on the air in October 1978, and an improved tone detector has been fitted. GB3VT (Stoke-on-Trent, R1) became operational on Christmas Day. GB3CK (Charing, Kent, RB0) is back on the air, but GB3DT (Wimborne, Dorset, RB0) and GB3MS (Malvern Hills, RB0) are temporarily off.

Following the 1981 elections, the Repeater Working Group now comprises representatives from the GB3BK, GB3CS, GB3HR, GB3MP and GB3PI groups. In addition there are three other members chosen by the elected members to perform specific tasks: G3XDV, chairman; G4AFJ, minutes secretary; and G4KUJ (ex-G8BBE), microwave specialist. There are also two corresponding members: G18AYZ, who acts as Northern Ireland representative and maintains liaison with the Republic of Ireland; and G3VZV, the television repeater co-ordinator.

Ken Anderson, BRS45914, is a regular listener to contacts through GB3WR, and has been surprised to hear complaints about misuse (not abuse) of the repeater due to operators not being fully aware of all of the features of the machine. He has made the sensible suggestion that those monitoring a repeater and hearing a user having difficulties should call in at the time with advice and information, rather than merely bemoaning the problem.

SSB repeater proposal

The proposal by G3RKL for an experimental ssb repeater, GB3SF, brought many letters, mostly in opposition, and extracts from some of these were published in last month's 4-2-70. In response to these comments, and in defence of the project, G3RKL has provided the following reply:

"It is quite clear that the large majority reaction against the proposal is based on the utterly erroneous concept that GB3SF and its successors are some form of replacement for the present ssb (A3j) activity around 144.3MHz, summed-up by the comment 'SSB doesn't require a repeater'. I agree, this type of operation doesn't, but 'SF' is in no way, shape or form designed to do this, nor is it the 'thin end of an utterly unacceptable wedge'. Another reaction is that repeaters are 'unwanted'. Wrong! Without raising the usual pros and cons, there is a large body of amateurs which wants a repeater service as part, not all, of the 2m band, but reference to back issues of 4-2-70 will show that the required full and comprehensive network in the UK cannot be completed because of co-channel interference. I see pilot ssb as eventually replacing fm as the mode for repeaters, which will then allow the system to be completed using only the

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present segment. Thus no more of the band need be taken (as in France), which is quite contrary to the fears expressed by G3TDG and others. GB3SF is designed for the repeater service, *not* for the ssb section, and has *always* been proposed as such.

"The choice of 2m is, in effect, mandatory, since there are strong indications that a pilot ssb system will not work at 70cm and above. I would have preferred 4m, but there are 'administrative problems' which prevent its implementation on this band. Also, 'SF' is not a linear transponder in the accepted sense, and so all the suggestions to make it so on some higher bands have no relevance. The choice of RS237 (145.185/145.785MHz) is the best compromise within the repeater section for the locations from which 'SF' will operate, R1 to R4 being used by local repeaters, with semi-local machines on the other four channels. However, as G3YAC points out, it is far more likely that interference will be caused to 'SF' by splash from R7 input and S8, than the other way round.

"Pilot ssb, whatever system, is entirely new to the amateur, and certainly not 'mere repetition of a well-known technique'. Contrary to G8RGQ's comments, most modern multimodes have both 600kHz shift and toneburst capabilities on ssb (eg my IC260E), so if pilot carrier were used that would be necessary as a first stage would be to leak through - 16dB's worth, tuning to zero beat on receive. This would mean getting inside the rig, and here, alas, I can sympathize with some of the comments. However, are we amateurs willing to experiment or just become vhf cbers? For the former, this is an opportunity to have a go, especially on the receiver locking side; the latter will just have to wait until JA-land brings out a box with a pilot on-off switch, which they will—eventually. The other systems mentioned do have possibilities, but, besides the frequency self-tuning capability, there must be some indication of a transmission on the input, even during speech pauses, for the repeater control.

"Finally, for the record, I do use ssb, mostly on 4m and 10m; I also hold a G9 licence; 'HH' and 'SF' contribute fully-baked projects for undergraduate teaching; and Marconi did use relay stations (cw at that!), although probably not repeaters as we know them. I would like to thank all who have taken the trouble to comment, both for and against."

12.5 vs 25kHz channel spacing

For some years the advantages and disadvantages of changing from 25 to 12.5kHz channel spacing for fm on the vhf and uhf amateur bands have provided a popular topic of conversation, both on and off the air, and it is very likely that this subject will be debated at some length during the forthcoming IARU Region 1 Conference. The main, if not only, advantage of a change would of course be a doubling in the number of channels available. Apart from the cost of modifying existing equipment, the greatest disadvantage has always been assumed to be that the reduced deviation implied by the closer channel spacing would give inferior performance.

This view was recently challenged by G3YGF, who contacted the Repeater Working Group with graphs and other data which indicated that there should be little practical difference between the two systems. Armed with this information, the RWG chairman, G3XDV, asked workers in the pmr field who had done practical research on the subject for their comments. They agreed with G3YGF that theoretically there should be no difference, but in practice it seems that impulse noise is not reduced as much as would be expected in the 12.5kHz system. This may be because as the bandwidth is reduced, ringing occurs and partially restores the amplitude of the pulse noise.

A second factor is that the theoretical comparisons are for perfect systems, while in the real world there is clearly twice as much chance of the narrower bandwidth system being degraded by a given frequency error than for the wide-spaced system. It is argued that even modern synthesized rigs are not stable enough for a 12.5kHz system to work reliably *under all conditions*. For example, a transmission only 1.5kHz off channel will be severely distorted, so that a station 750Hz high in frequency would have great difficulty in working a station 750Hz low.

For these reasons the RSGB has put forward a paper to the IARU Conference pointing out the problems and urging that a change to 12.5kHz channels should be regarded as a last resort in solving the difficulties of overcrowding in the fm portion of the 144MHz band. It must be said, however, that if IARU Region 1 goes against this advice and agrees to adopt 12.5kHz working, then the UK will be obliged to follow suit.

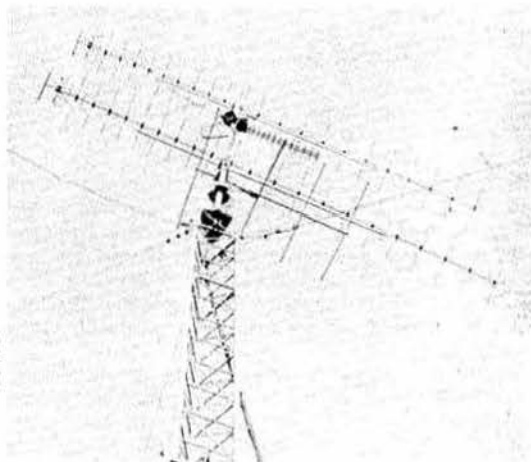
Using mast-head preamplifiers

Most vhf/uhf dxers are aware of the advantages of mast-head preamplifiers, but few have actually installed them. Peter Burden, G3UBX, has been using mast-head preamplifiers for some time, and the following notes on their installation, based on his experience, are intended

to encourage more operators to enhance their station performance in this simple and effective way.

- 1. Mast-head changeover relay.** This is critical and the best available, preferably one which shorts out the unused port, should be used.
- 2. Connection from relay to preamplifier.** Use an electrical half-wave of coaxial cable so that the short on the relay port is transformed to a short across the amplifier input on transmit.
- 3. The preamplifier.** A broadband high dynamic range design poses fewest problems. The DJ7VY design (*VHF Communications* spring 1978) has been found particularly satisfactory and does not need protective diodes or filtering on the input.
- 4. Power supply.** A separate supply lead is simpler than using the receive feeder and rf chokes. Arrange the relay so that it is energized on receive. This has three advantages: first, any failure (they always happen during an opening) does not put the station off the air, as the transmit feeder may be used for both sending and receiving, albeit with reduced sensitivity; second, the same power supply lead can be used for both the preamplifier and the changeover relay, and switched in the shack; finally, when the station is closed down, the preamplifier is disconnected from the antenna, so providing static protection. The power lead should be well filtered at the point at which it enters the amplifier box.

A view up the tower at G3UBX



- 5. Connections.** Separate transmit and receive feeders are simpler and cheaper than two changeover relays at the mast-head. Low loss tv coaxial cable is quite satisfactory for the receive side unless the preamplifier is "fussy" about the impedance presented to its output. It has the advantages of low cost and light weight compared with UR67.
- 6. Mounting.** An upturned and well-varnished die-cast box has been found to make a satisfactorily screened and waterproof "environmental enclosure" (box).
- 7. In the shack.** A typical preamplifier will have a gain of 10 to 20dB. This can have a very noticeable effect on the performance of most vhf/uhf receivers. A fairly sharp filter is essential, and an attenuator between the preamplifier down lead and the receiver input is highly desirable. Hard switching is altogether preferable to rf sensing, particularly on ssb and cw.
- 8. Sequencing.** A coaxial relay will carry far higher power than it will reliably switch. Indeed, making or breaking contacts with even a modest amount of power flowing can very rapidly lead to damage of the contacts. Sequential control should be used to ensure that the rf will arrive at the relay after the contacts have fully closed, and that the rf stops before the relay is opened again. With these precautions a 951 type coaxial relay will work reliably at the legal limit on 144MHz. Sequential switching also avoids transmitting transients on the air, or into the sensitive preamplifier!

Beacon news

The Great Lumley RS is planning a 432MHz beacon for County Durham. A permanent location has yet to be chosen, but a 285m asl temporary site at Sunniside, 15km WSW of Durham, in locator ZO22h, has been found. A Motorola transmitter with 10W output and a microprocessor-based keying unit will initially be used to drive a six-element Yagi beaming south. When a permanent location is found the antenna will be improved, and the beam heading may be altered. The group would welcome reactions to this proposal from active 432MHz users. Any comments or suggestions should be sent to C. J. Gill, G8EEM, School House, Sunniside, Bishop Auckland, Co Durham.

Lack of help has caused GM8SAU to shelve plans for a high-power 144MHz beacon on the island of Benbecula. Most of the paperwork is

complete, a site is available, and the callsign GB3WIL has been allocated. GM8SAU would be grateful for any help in completing this project.

A new 50MHz beacon is now operational from São Paulo in Brazil. The frequency is 50.055MHz and the callsign, PY2AA, is sent regularly on cw, prefixed by a "DE". The beacon runs 25W output to a ground plane antenna mounted 25ft agl on top of the building of the Liga de Amadores Brasileiros de Rádio Emissão. Reception reports would be greatly appreciated. They may be sent directly to PY2AA—Beacon project, PO Box 22, 01000, São Paulo, SP, Brazil.

Repeaters abroad

Greg Lovelock, G3III, has kindly provided a clipping from the Australian magazine *Amateur Radio Action* which describes the Argentinian vhf repeater network. The seven units in use in the country all have 600kHz offsets as usual, but the frequencies in use are distinctly unfamiliar. The four Buenos Aires repeaters have inputs of 146.070, 146.190, 146.280 and 146.340MHz, with the outputs 600kHz higher. In Lujan and Victoria the input frequencies are 146.010 and 146.220MHz respectively, with the outputs again 600kHz higher, but just to complicate matters the Adroque repeater uses 147.720MHz for input, with the output 600kHz lower! Simplex uses 146.520MHz and emergency 147.600MHz, with LU0ASC as control.

433MHz repeater networks are being considered in Portugal and Japan. The RSGB has supplied a great deal of technical and other information, based on long experience of uhf repeaters in the UK, to assist the Portuguese in their venture. Details of our unique 433MHz repeater band plan have also been sent to Japan, where there are currently no 144MHz repeaters.

It is always interesting to hear news of the repeater scene in other countries, especially when it differs from that in the UK. Readers who have had experience of operating abroad are invited to send their observations and comments to 4-2-70.

Awards

The Dutch amateur radio society, VERON, offers several awards for vhf and uhf operation. The PACC-VHF Award is given for working 100 different PA/PE/PI/PD stations on 144MHz, with a sticker for each extra 100 up to 900. For working 1,000 Dutch stations the PAMC Award is given! The PACC-UHF and LCC awards are similar, but for 432MHz and listeners on 144MHz respectively. The VHF-25 Award is available only to operators outside The Netherlands for working 25 different Dutch stations on 144MHz. The VHF-6 Award is given for working six different countries on 144MHz, with a sticker for each extra country. The corresponding 432MHz and listeners' 144MHz awards are the UHF-6 and VHF-6 Heard. The fee for each award is eight irs. Stickers claimed with the award are free, otherwise one irs and a self-addressed envelope. QSL cards should not be sent, but send a list certified by two other amateurs. The awards

may be claimed from J. Lourens, PA0BN, Keerweer 13, 6862 CD Oosterbeek, The Netherlands.

Alan Clemmetsen, G3VZJ, has forwarded details of two awards which he has recently received for 50MHz crossband operation with the USA. The Ten American Districts Award is given by the Lockheed ERC ARC (W6LS) for working stations in all 10 USA call areas, W0 to W9, and will be endorsed with the crossband details on request. To claim the award send a list verified and signed by an elected officer of the local amateur radio club, and one dollar in irs, cheque or USA stamps to W6LS, 2814 Empire Avenue, Burbank, California 91504, USA.

The Cycle 21 Award has apparently been sent out to stations on this side of the Atlantic who have been consistently active on 50MHz crossband. As G3VZJ comments, this is a very nice gesture on the part of the Americans.

The fastest ton in the Midlands?

The description in December's 4-2-70 of the exploits of GW8XPZ in working 100 stations on 144MHz during his first day on the air prompted Steve Haseldine, G8EBM, in Derbyshire, to pick up his pen and put in another bid for the title, although in this case the "ton" was made in a rather different way.

G8EBM received his licence on 5 September 1970, a date that coincided with the VHF NFD contest. He operated the 144MHz station of the Derby & D ARS, making over 150 contacts using a crystal-controlled a.m. transmitter and the old "tuning high to low for any calls" technique. Even though he was not using his own callsign when making the contacts, G8EBM must now take the title on purely numerical grounds, although due to the level of activity on 144MHz at that time it took three months for him to work the next hundred!

Are there any further claimants? G8EBM also wonders if anyone has managed to work 100 stations on 432MHz during the first day on the air—he doubts it!

RSGB awards

The closing weeks of 1980 brought a rush of award applications, including a remarkable claim by "Hoppy" Hopkins, G5CSZ, for the 4-2-70 144MHz 40 Squares and 10 Countries Award, with all of the contacts made by moonbounce. To commemorate this first-ever RSGB award made purely by eme, G5CSZ has been sent a special certificate endorsed with the details of the claim. At one time G5CSZ had hoped to be the first claimant of the Worked All States Award by 144MHz moonbounce, but his antenna system suffered from the effects of the high winds of North Yorkshire. In November 1979 the station was working well, and success looked close, but in the following month disaster struck for the first time, and G5CSZ was off the air until April 1980, missing the optimum operating months of the year for eme conditions and activity. Similar problems recurred in 1980, and so, with a return to the USA looming close, G5CSZ decided to "call it quits" before any real damage could be done to the antennas. Recently SM7BAE won the race by working K0ALL for his 50th state, all of which were by 144MHz eme.

Included in the award claim by G5CSZ were details of three contacts which he believes to be "firsts", all made by eme on 144MHz cw:

G5CSZ to VE7BQH	9 September 1979	0808gmt	first G to VE on 144MHz
G5CSZ to ZS5ZY	20 April 1980	1600gmt	first G to ZS on 144MHz
G5CSZ to G4DZU	20 April 1980	1656gmt	first G to G on 144MHz eme

Are there any prior claims?

Pam Rose, G8VRJ, received a batch of cards from the bureau on Christmas Eve which included confirmation for six new squares, making a total of exactly 40. 144MHz 4-2-70 40/10 Squares Award No 37 has been duly dispatched.

In the FMD series a rare 432MHz listener claim was received from Ron Percival, BR543977, who has been sent certificate No 7. David Coupe, G8LZM, sent in a double claim for the 432MHz Standard and Senior awards, Nos 157 and 71 respectively. On 144MHz the last two claims of 1980 were Seniors Nos 157 and 158 to G8NDF and GM8HEY.

Scatter

G4GGV offered a bottle of wine to the local club member with the best score in the September AGCW-DL 144MHz CW Contest, and won it himself. He donated it to the Christmas raffle... After a miscalculation during a recent mast erection exercise, G3SEK is now looking for a good home for a ton of sand... G3NAQ is moving to Geneva for two years, where he will be better known as F0ZY, and hopes to activate 4U1ITU... It is rumoured that GB3XMAS was heard in the London area in late December... Congratulations to Julie, wife of repeater supremo G3X-DV, on the safe arrival on 12 January of a 3.4kg intermodulation product, Paul.



The Cycle 21 Award given for 50MHz crossband working

RSGB NATIONAL VHF CONVENTION

Sandown Park Racecourse, Esher, Surrey

Saturday 11 April 1981

- One day exhibition and lecture programme
- Saturday evening dance and buffet supper
- Comprehensive trade exhibition
- Exhibition by specialist groups
- Home-constructed equipment exhibition
- Full lecture programme on vhf, uhf and microwave subjects

PROGRAMME

- 1030** **Convention opens.** Entrance through racecourse turnstiles. (Open to exhibitors from 0800 through special exhibitors' entrance) **Refreshments.** Snack bar in the hall will be open from 1100 to 1600, and the licensed bar during normal opening hours.
- 1400** **Convention address** by Basil O'Brien, G2AMV, RSGB President

LECTURE PROGRAMME

- | | Stream A—General | Stream B—VHF propagation and satellite communications | Stream C—Microwaves |
|-------------|---|---|---|
| 1430 | "Locator systems—present and future", John Morris, G4ANB | "Aurora—The boundary fence problem", Charles Newton, G2FKZ | "Making a start on 10GHz", H. D. Griffiths, G4CNV, and Mrs P. Suckling, G4KGC |
| 1530 | "Use and abuse of transmitting tubes of the 4CX-250 series", John Nelson, G4FRX | "VHF ionospheric propagation", Brian Bower, G3COJ | "Microwave eme", Charles Suckling, G3WDG |
| 1630 | "Repeaters—Where do we go from here?", M. Dennison, G3XDV | "The new series of Oscars—information and explanation", Ron Broadbent, G3AAJ, and members of AMSAT UK | "Microwave propagation", Barry Chambers, G8AGN |
| 1730 | Lecture session ends | | |
| 1800 | Trade exhibition closes | | |

The convention address and lectures will be held in the Wolsey, Claremont and Cavalry Rooms. Detailed arrangements will be notified on arrival

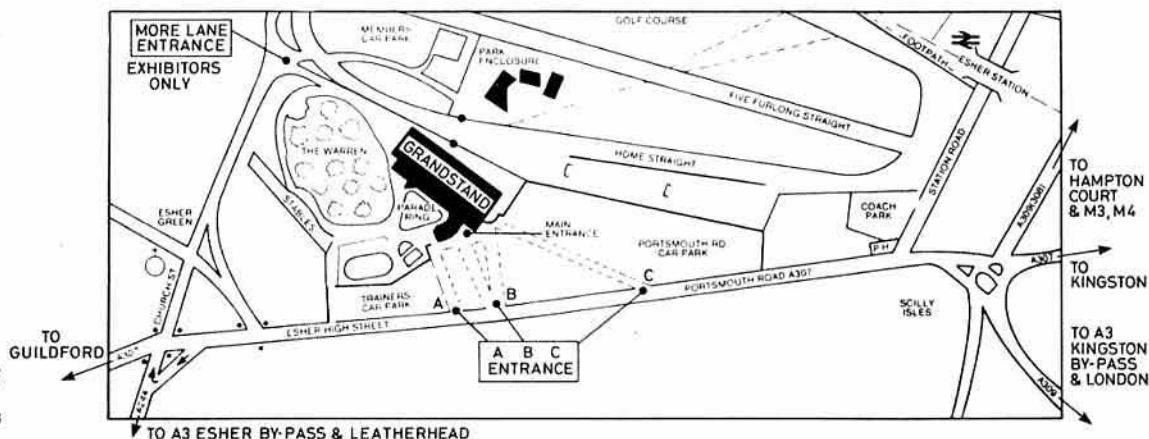
SOCIAL EVENING

- 1930** Social evening begins. Dancing to the Second Foundation Modern Dance Band
- 2100** Presentation of awards
- Midnight** Convention ends

A separate bar area will be provided for those not wishing to join the dancing. A substantial "knife and fork" buffet supper consisting of three courses plus coffee will be served during the evening

ACCESS MAP TO SANDOWN PARK

Map by courtesy of
United Racecourses



APPLICATION FOR TICKETS RSGB NATIONAL VHF CONVENTION 11 April 1981

Please supply tickets as under:

	Cost	Number	Total cost
Convention and exhibition only	£1.00		
Convention and exhibition (under 18)	£0.75		
Convention, exhibition and evening	£7.50		
Evening only	£7.50		

I enclose cheque/postal order for £.....

Name

Address

This application for tickets must be sent to: Miss D. P. Beisiegel, RSGB,
35 Doughty Street, London WC1N 2AE. Cheques to be made payable to RSGB

Early application will be greatly appreciated

MICROWAVES

Charles Suckling, G3WDG*

How to plot microwave paths

It is a characteristic of 10 and 24GHz wideband equipment that, at least for most of the time, overland paths can only be worked line-of-sight. Occasionally, during enhanced conditions, or if relatively large equipment is used (eg 4ft dishes and 1W or more of transmitter power), non-line-of-sight can be covered, but this is not the case very often. Thus it is usually a good plan to determine beforehand whether a path is line-of-sight, as this can save much wasted time attempting paths which stand virtually no chance of working.

Paths can often be worked which are somewhat longer than "optical" line-of-sight. This is due to a slight downwards bending, or refraction, of the signal by the atmosphere. The magnitude of this effect depends on the "K-factor", which is a function of the prevailing atmospheric/tropospheric conditions. Under normal conditions, $K = 1.33$, meaning that the curvature of the earth is effectively reduced by a factor of 1.33, and so the range increases.

Two factors contribute to making a path non-line-of-sight. The first is

the curvature of the earth. This is negligible at short distances (eg less than about 10 miles) but becomes very important at greater distances. The second factor is the presence of hills, trees, buildings etc which may block what might otherwise be an unobstructed path.

The first criterion for a path to be line-of-sight is that the heights of the stations are sufficient to overcome the curvature of the earth, as shown in Fig 1. In other words, the sum of the station's horizon distances ($d_1 + d_2$) must be greater than the path length. The distance d to the "radio" horizon for a station at height h is given by the formula: $d^2 = \frac{3Kh}{2}$ where

d is in miles, h is in feet and K is the K-factor. For $K = 1.33$, this formula reduces to: $d^2 = 2h$, (d in miles, h in feet); or $d^2 = 17h$ (d in kilometres, h in metres).

Table 1 gives the radio horizon distance as a function of height calculated from these formulas. Thus it is very easy to see whether a path is line-of-sight. For example, if two stations were located at 600ft and 1,500ft, their maximum line-of-sight range would be $35 + 55 = 90$ miles.

The above, of course, only applies for the ideal case when there are no obstructions on the path. In practice, ranges over land will be less, and it is necessary to employ a different technique to check if a path is line-of-sight. Perhaps the simplest method is to plot the cross-section of the path on special parabolic graph paper. This paper is unfortunately rather difficult to obtain and often has inconvenient scales. However, it is quite easy to draw one's own plotting paper, if the following method is used.

First, choose a suitable piece of graph paper, such as A4 size with 1cm squares and 1mm intervals. Decide on suitable height and distance scales, eg 1cm = 200ft in height and five miles in distance. Mark out the distance axis (horizontal) with zero in the centre and distance going outwards either side from the centre, as shown in Fig 2, and mark the vertical (height) axis

(Continued on page 248)

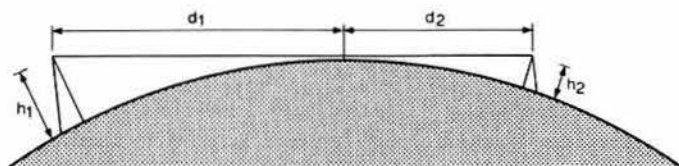


Fig 1. Geometry of a line-of-sight path with no obstructions

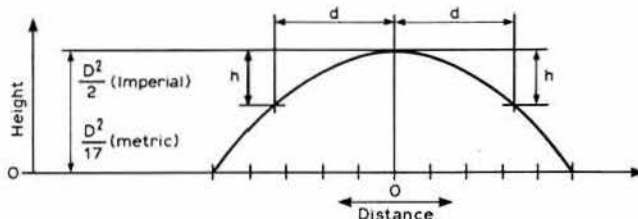


Fig 2. Construction of a path plotting chart

*31 Oakwood Road, Chandlers Ford, Hants SO5 1LW.

THE MONTH ON THE AIR

John Allaway, G3FKM*

REQUESTS for members' views on the use of the new 10MHz band and the ARRL proposals for the extension of the USA phone bands on 7 and 14MHz did not elicit an overwhelming response. However, according to *ARRL Bulletin* 79 only between 600 and 700 comments had been received from ARRL members concerning the two items, and when it is appreciated that the proposals represent an extension of privileges for USA amateurs and the 150,000 membership of ARRL this perhaps is not surprising. The proposals on 7 and 14MHz are receiving considerable opposition outside the USA—virtually all comments received by your scribe have condemned them, but those for the use of 10MHz have wide support—again reflected in the almost unanimous agreement among members who wrote to G3FKM.

The other new hf bands—18 and 24MHz—will be a matter for preliminary discussion at the IARU Region 1 Conference in April. They are unlikely to produce much controversy but the RSGB will discuss them, and once again members' views would be appreciated.

Your scribe would appreciate any information on a station using the callsign "7Z7FB" who requested QSL cards via G3DRN. Information is also anxiously sought concerning the present whereabouts of the operator of VS9AZ in 1969 (? Jack Boltiger) and also of 5A1TC in 1953 and 5A3TZ in 1952.

Volunteers required

Many readers of *MOTA* have strong ideas on various hf matters—would any feel like expressing them by writing a couple of hundred words as a guest editorial? Would an expert rtty operator care to write a few words about the current state of that mode on hf? Please drop a line to your scribe.

Amateur radio in New Zealand

Jim Meachen, ZL2BHF, Council member of NZART, has kindly submitted some information on the amateur scene in New Zealand. He points out that the New Zealand Association of Radio Transmitters Inc is controlled by an elected executive council consisting of president, vice-president, immediate-past president, and 14 councillors—five from each of ZL1 and ZL2, and two each from ZL3 and ZL4. A national conference is held annually on the Queen's Birthday holiday in June. In December 1980 the society had 3,764 members, 2,898 of whom hold transmitting licences. Membership costs US\$15.30.

There are three grades of licence: Grade 1, which allows operation on all ZL amateur bands; Grade 2, which allows operation between 1,803 and 1,813kHz, 1,875 and 1,900kHz, 3,500 and 3,900kHz, and 51 and 53MHz, plus all bands above 144MHz; and Grade 3, which covers bands above 144MHz only. All are limited to 150W dc input to the final amplifier on all frequencies. There is also a novice licence, non-renewable and issued for a period of one year. This permits the operator to use cw, a.m., and ssb of 10W input in the band 3,525–3,575kHz, and is distinguished by the letter "N" used as the first letter of a three-letter callsign suffix. The novice licence is issued after passing simple radio theory and licence regulations tests and a morse test at 6wpm.

DX news

The Western Caroline Is became independent on 1 January 1981 and are now known as Velau. It is not known whether there is likely to be any change in DXCC status as a result. Two Japanese amateurs—JA8JL and JA8DNZ—were in the area and operated as KC6KR.

Ron Wright, ZL1AMO, has pointed out an error in October 1980 *MOTA*—it appears that somewhere along the information line his callsign had been incorrectly copied as ZL1AMU and the latter's call and address was given for A35EA and ZK2EA QSLs. In fact QSLs for these two calls,



Peter Walker, G4HHH, worked a number of UK stations from the station of Father Moran, 9N1MM, during a brief visit last October

as well as those for 5W1CW, VR6HI, ZK1CQ, ZK1MB or ZL1AMO/C, should all be sent to his home address which will be found in "QTH Corner".

VK9NYG is from Holland and resident on Cocos-Keeling Is, and he should be there for about two years. Frank has an FT101E and a dipole, and originally seemed to be active only on 21 and 28MHz, but was expecting to acquire a beam and key. Favourite operating times are 1100 on 28,430kHz, and 1200 on 21,190kHz. QSLs go via VK6NE.

ZL3AFH/A on Campbell Is has been worked on 14MHz. His name is Warwick and he appears to be a fairly new operator who uses an FT101E and dipole antenna. QSLs should be sent via the VK bureau.

9M8PW is believed to keep a schedule with his QSL manager, G4DXC, around 14,258kHz at 0930.

3B8AE/3B9 has received his TS120S but is very busy with his work at the weather station on Rodriguez Is. However, he has been contacted by a number of British stations on 28MHz between 1400 and 1500.

The *DX Bulletin* mentions a letter from Pradhan, A51PN, which says that he has been inactive lately due to the lack of equipment. He has a Yaesu FV401 and hopes to build a low-power 14MHz cw transmitter using this as a vfo.

Those looking for a contact with Syria will be interested to know that VE7AAZ/SU is with the UN peace-keeping forces on the Syrian side of the Sinai desert. He should be there until July and will be found on 14, 21 and 28MHz—commencing on 14,210kHz at 1700.

D68AM, on the Comoro Is, has recommenced his regular schedules with K0VVV on 21,285kHz at 1800 on Tuesdays. CN8AT is WB3JRL and has also previously been DU1AT and ZB2GF. He is with the US International Communication Agency, and finally acquired his licence due to the efforts of the Moroccan society, other CN8s, W4KFC, Senator Goldwater and the US Ambassador! He prefers 14,305 and 21,305kHz and frequencies above 28,900kHz.

TJ1BB is being operated by N4JR who should be in Cameroun for two years and is hoping for his own callsign. TJ1SB is also active and has a TS120 and Windom antenna.

SU1BA has regular schedules with his new QSL manager, K1JL, on Sundays on 21MHz around 1600.

4U1UN, United Nations, New York, is now operated mostly by Wolfe, DJ6LV, who seems to appear mostly on Tuesdays and Thursdays around 7,025 or 21,025kHz from 2200. N2KW has completed his regular tour of duty at the station.

T3AT is now using the callsign T30AT—it would seem that this change is in keeping with the ITU ruling which requires two numerals in callsigns which have single-letter prefixes—in the same way as J7 has become J73 and S8 S83 or S84. QSLs should be sent via G3XZF.

DJ1TC acts as QSL manager for FH8OM, 5Z4OM, J28AC, VQ9OM, and FH0OM. Otto says that FH8OM is often to be found on 14,174kHz at about 1700.

World Prefix Map

Those who have not yet acquired a copy of this most useful operating aid are strongly advised to do so. It is designed for wall mounting and shows the world centred on the Pacific Ocean area. This enables the small islands in that area to be indicated in considerable detail and also shows most of the recent new prefixes allocated in that and other areas. See the RSGB mail-order price list on page 288 for ordering information.

*10 Knightlow Road, Birmingham B17 8QB.

News from overseas

Ray Woolley, formerly G3IMH and A4XVJ, is now back in Cyprus for a three-year stay. He is using a Yaesu FT101B and Mosley TA33 antenna, and is keeping a special look-out for British stations on 14, 21 and 28MHz.

Bob Hammond, G4DBW, returned to Ascension Is on 12 January and will be there for three or four months. He has the callsign ZD8RH and hopes to be on the air most evenings and at weekends on or near 14,185, 21,300 or 28,463kHz. Bob points out that there is no point in trying to QSL to him direct as mail service is not good. All QSLs should be sent to his home address (see "QTH Corner").

Roger Crofts, G3UPK (also ZB2AY/ZD8AY/ST2AY/VK6YA) may be back in Cameroun by the time this is being read. He has the callsign TJ1AY and will be using a Drake TR7 and dipole antennas.

Peter Walker, G4HHH, visited 9N1MM last October while undertaking a trekking holiday. He had the pleasure of going on the air from Father Moran's home, which is some 10 miles outside Kathmandu and is backed by a 9,000ft mountain which seems to reflect the signals from his TH6DXX towards Europe. Father Moran's strongest wish was for the continuance of the BBC World Service programmes which he believes are the best in the world.

Mark Hardaker, G4HJH, will be in Delaware for six months and on the air as G4HJH/W3. He will be using a Kenwood TS830S and a trap dipole, and expects to use the following frequencies: 7,010, 14,085, 14,250, 21,085, 21,300 and 28,660kHz. Mark will be looking particularly for UK amateurs in order to give them a contact with a rare state. He returns home on 21 June, and QSLs should be sent to the address in "QTH Corner".

Top band

The first *W1BB 160 Meter DX Bulletin* of the 1980-81 "season" contains a great deal of interesting information as always. The latest 1.8MHz DXCCs have been issued to N4EA, G3SZA and PA0HIP, and G3SZA is headlined as "most outstanding 160m station in Europe". It seems that he needed only KH6, KL7, Nevada, Oregon, Montana, Wyoming and both Dakotas for a WAS at the time the bulletin was written. PY1RO, a very consistent signal on the band, now has a new location and antennas, including a 110ft tower and inverted-V.

The question of the "gentleman's agreement" over apportionment of the band to cw and phone sections is discussed again, and the conclusion reached is that when a major dx contest is in progress which ever mode is in use should be allowed to occupy the whole band—either cw or phone. This always, of course, subject to the "dx window" being left clear of transmissions from USA and Canada.

GD4BEG reports that there have been some excellent dx openings on the band and that he now has 116 countries worked with 110 confirmed. Unfortunately, although he has two-way cw six-band DXCC he cannot obtain a suitably endorsed certificate!

Dxpedititions

Long Skip mentions a rumour that VK2BJL and VS5JB are planning a trip that would take them to Kingman Reef and Palmyra Is in April. The visit would take place during a 30-day voyage aboard VS5JB's yacht *Banyandah*. It was believed that the previous expedition to the area was going to be the last, as the area was expected to become closed.



Some of the members of the Gibraltar ARS, taken at the club QTH during a visit to Gibraltar last October by G3SXE (ZB2CV) and G4CWS/ZB2. Rear (l and r). In front (l to r) are a visiting G8, ZB2FA and ZB2GK

QTH CORNER

A35EA
CN8AT
CR9C

CR9CT
FO0VU
HK0COP
PY0CW
PY0ZZ
SU1BA

T30AT
TJ1AY

VP2E
VP2EV
VP2EEV
VP2ED
VP2SE
VP2EX
VP2EZ

G4HJH/W3
ZD8RH
ZK1XG

ZK2EA
5W1CW

R. Wright, ZL1AMO, 28 Chorley Avenue, Auckland 8, New Zealand.
(new) via OE3NH, H. Pfannhauser, J. Reiterstr 3, 3430 Tulln, Austria.
via KB9N, J. A. Kolata, jr, S86W 30541 Stonegate Drive, Mukwonago, Wis, 53149, USA.
via G3KDB, Box 73, Lichfield, Staffs, WS13 6UJ.
via DL2RM (see ZK1XG).
via W9UCW, B. Boothe, RFD 1: Bell Rd, Minooka, Ill, 60447, USA.
A. Sampaio, Box 601, Recife-PE-50000, Brazil.
F. Souto Maior, Box 557, Recife-PE-50000, Brazil.
(new) via K2JL, L. J. Moreno, 315 Riverside Blvd, Long Beach, NY, 11561, USA.
via W. Felton, G3XZF, 7 Riverton View, Lincoln.
R. Croft, Box 1228, Yaounde, Cameroun.

via K8ND, J. Maass, 4410 Norwell Drive, Columbus, Ohio, 43220, USA.

via AD8J, J. L. Getz, 6441 Goldfinch Drive, Westerville, Ohio, 43081, USA.
via WB4QBB, J. Camac, 5620 Muldoon Rd, Pensacola, Fla, 32506, USA.
via WB8VPA, J. Udvari, 828 Davis St, Akron, Ohio, 44310, USA.
via AA4GA, W. L. Hiers, 8 Scott Av, Cornelia, Ga, 30531, USA.
M. Hardaker, PO Box, Keighley, W Yorks.
via G4DBW, R. Hammond, 43 Durant Rd, Hextable, Kent BR8 7SR.
via DL2RM, R. Wolf, Alta Waldmuenchener Str 32, Regensburg, D-8400, W Germany.
via ZL1AMO (see A35EA).
via ZL1AMO (see A35EA).

RSGB QSL Bureau, G3DRN, 30 Bodnant Gardens,
London SW20 0UD.

Karl, K4YT, should be in Africa until April. He is on a business trip but trying to get on the air from each country he visits. He hopes to operate from 5T5DX, 6W8JO, C5ACO, D4CAD, J5, 3X, 9L, XT2AW, 5U7, TU4, 5V7KR, and as TY9ER or N4HX/TY, but these may come in any order. Stays in each area will be of 2 to 10 days' duration. All QSLs should go to W2TK, and they will be answered after Karl's return to the USA. Up-to-date news on his whereabouts may be obtained by listening to the Foreign Service net on Sundays on 21,416kHz at 1530, or on 28,616kHz at 1600.

According to *QRZ DX*, John, KP2A, is expected to return to Asia in the autumn and activate CR9A again in October. A seven-operator expedition to Bhutan is mentioned, as is a visit to the Seychelles.

QRZ DX says that three Chilean operators will visit CE0Z, Juan Fernandez Is, for six days commencing 13 April. Funds were being solicited, and should enough money become available it is possible that the expedition may take place in mid-March. This appears to be a renewal of previous rumours concerning such an operation.

Iris and Lloyd Colvin concluded their FG0FOL/FS operation on 15 January, and during their one-month stay made over 10,000 QSOs with 149 different countries. Their long callsign seemed to slow things down somewhat but its rarity more than offset that problem. FG0FOK was their next stop.

SSA meeting

There will be an international radio amateur meeting in Goteborg, Sweden, on 4 and 5 April this year. The Gothenburg Transmitting Amateurs (GSA), SK6AG, invites all interested amateurs to take part in the event which will be held in the Trade Fair Centre. The Swedish national society SSA, will hold its annual meeting there, and there will be an exhibition, stamp display, and meetings of speciality groups, together with lectures on vhf, uhf and shf. A hamfest will be held on the Saturday night. More information is available from GSA, PO Box 6009, S-400 60 Goteborg, Sweden.

World QRP Federation

The membership of WQF includes DL AGCW, the G QRP Club, Michigan QRP Club, QRP ARCI and the VK QRP Club. The federation's latest information bulletin, received from G8PG, welcomes the last mentioned and says that although formed only a year ago it already has 50 VK QRP enthusiasts as members. It publishes a bi-monthly bulletin and its secretary is Jack Swiney, VK6JS, 59 Collova Way, Wattleup, 6166 Western Australia. A "flash" addition announced that the Grupo QRP do Brasil had accepted an invitation to join and that their representative would be PY2TU—who, besides encouraging QRP activity would also support the idea of home-constructed equipment. G8PG points out that membership now covers four continents and that we could be at the beginning of a new era in worldwide low-power communication.

The G-QRP Club Winter Sports 1980 seems to have been a great success with over 100 stations in more than 20 countries taking part. The renewed interest in low power work in the USA was shown in the much higher level of participation, with at least 25 5W-or-under stations working into Europe. All call areas except the sixth were in evidence. VE7CGO was very successful and EA8EY was much in demand. South America was

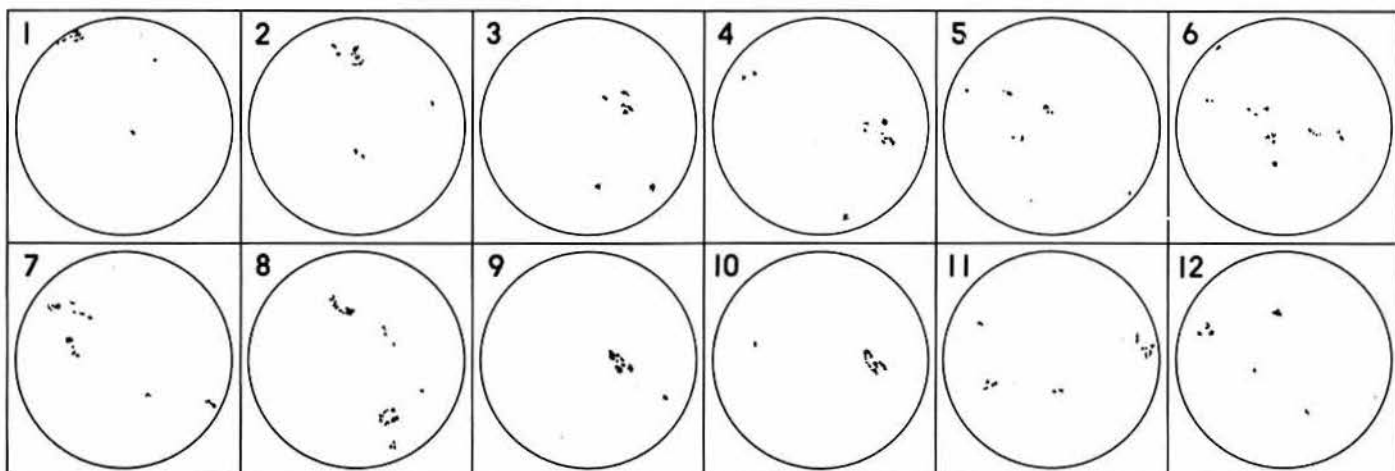
VISUAL SUNSPOT RECORDS

As suggested in the last "Visual sunspot records", (*Rad Com*, November 1980, p1175), sunspot activity has continued at a high level. Compare these records

with those shown in the reference given and with those shown on page 171 of the February 1980 issue of *Radio Communication* for the same period in 1979. These

latest records show some groups of very large sunspots.

G2UK



1. 18 October 1980. 2. 21 October 1980. 3. 23 October 1980. 4. 25 October 1980. 5. 29 October 1980. 6. 30 October 1980. 7. 2 November 1980. 8. 9 November 1980. 9. 12 November 1980. 10. 13 November 1980. 11. 16 November 1980. 12. 18 November 1980.

represented by PY2EGM whose 2W signal was RST 559 in the UK. The most easterly activity was from UA3ECB, whose 100mW were putting an RST 559 into Britain on 28MHz. G4BUE with 750mW worked WB2RZU (running 500mW) on 28MHz. The organizers wish to thank everyone who took part. Countries in which activity is known to have taken place include DL, F, G, GI, GM, GD, I, HB, LA, OH0, OK, ON, OZ, PA, PY, SM, SP, UA, UB, YO, LX, EA8, PY, VE and W. The DL AGCM QRP/QRP Party will take place on 1 May. More details later.

RAF Waddington open day

A special station will be set up to operate during this event, which takes place on 30 May. It will be manned by members of the RAF Scampton ARC and the Lincoln Short Wave Club. The callsign will be G5FZ—only recently regained by Lincoln SWC. A special effort will be made to contact both past and present members of the RAF especially those who have served at Waddington, and the station will be found on or near 7,060, 14,160, 14,260, 21,160 or 28,660kHz.

Contests

The Bermuda Contest

0001 21 March to 2400 22 March.

Full details of this event were given in last month's *MOTA*. Descriptive brochures, entry forms, and specimen log sheets are now available from G3FKM (large ssae please).

The Helvetia Contest

1500 25 April to 1500 26 April.

All bands 1.8 to 28MHz, phone and cw. Send RS/T plus serial QSO number (from 001). Swiss stations will also send two letters which indicate their canton. These are ZH, BE, LU, UR, SZ, OW, NW, GL, ZG, FR, SO, BS, BL, SH, AR, AI, SG, GR, AG, TG, TI, VD, VS, NE, GE and JU. Each contact with a Swiss station counts three points, and a station may be contacted once per band. The multiplier is the sum of cantons per band (a maximum of $26 \times 6 = 156$). Final score is total QSO points multiplied by this. Logs must be postmarked within 30 days of the contest and sent to: TM USKA. K. Bindschedler, HB9MX, Strahleggweg 28, 8400 Winterthur, Switzerland. The UK entry in 1980 consisted of G3ESF (10,455 points), G4GOY (2,394), G4JJE (2,046) and G3DQL (1,488). This contest is an excellent opportunity to work the rarer cantons for the Helvetia Award, (see "Awards").

The EEC DX Contest

0600 to 2400 11 April (CW).

0600 to 2400 12 April (Phone).

3.5 to 28MHz. Single-operator all-band, low-band (3.5 and 7MHz) or high-band (14, 21 and 28MHz), and multi-operator single-transmitter all-band categories. QSOs with other EEC countries count one point, with non-EEC European countries two points and with others five points. The multiplier for EEC entrants is the number of DXCC countries worked on

each band added together. Contacts with ON4UB also count as a multiplier on each band. Use separate logs for each band and show date, time, serial numbers exchanged and new multipliers. Include summary sheet and usual signed declaration. Mail entries before 31 May (not by registered mail please) to Le Bon Michel, ON4GO, PO Box 537, B-1000 Brussels, Belgium. Listeners may enter and earn five points for each complete QSO between an EEC and a non-EEC station logged. The multiplier is the same as in the transmitting section.

CQ WW WPX Contest

0000 28 March to 2400 29 March (SSB).

0000 30 May to 2400 31 May (CW).

1.8 to 28MHz. Contacts with stations in the same continent count two points on 14, 21 or 28MHz, and four on the other bands. Contacts with stations in other continents count three and six respectively. Stations in one's own country may be worked for multiplier credit only. The multiplier used is the total number of different prefixes worked, irrespective of band. Exchange RS/T plus serial QSO number (from 001). There are single-operator single- and multi-band, and multi-operator single-transmitter all-band categories. The latter must use only one transmitter and one band during the same 10min period (QSYing to another band for a multiplier during this 10min is not allowed). The physical boundaries of a multi-operator multi-transmitter station are now defined as "within a 500m diameter". The final score is total QSO points multiplied by the number of different prefixes worked. There is a QRP section for those running no more than 5W output and "QRP" must be clearly indicated on the summary sheet. Single-operator entrants may only operate for 30h with the 18h rest period taken in up to five sections. They must participate for a minimum of 12h to qualify for an award, and multi-operators for at least 24h. Logs should indicate date, time, station worked, numbers sent and received, if new prefix, and points claimed. A prefix check list must be submitted. Entries for the ssb section must be posted before 10 May and the cw section by 10 July. Please mark entries clearly "SSB" or "CW" and post to *CQ Magazine*, WPX Contest, 76 N Broadway, Hicksville, NY, 11801. USA.

Awards

January *MOTA* detailed two awards—the WAB Counties Award and the WAB Large Squares Award. The latter is, of course, for confirmed contact with one hundred 10 by 10km squares, and the address for applications is: K. Draycott, G3UQT, 175 Oliver Road, Kirk Hallam, Ilkeston, Derbyshire DE7 4JW. WAB record books are available from B. J. Burgess, G8JBI, 22 Burdell Avenue, Sandhills Estate, Headington, Oxford OX3 8ED; price £2 plus £1 postage and packing (inland), and a total of £3.50 for other areas.

Gibraltar ARS Award

Available to amateurs and listeners who have worked or heard ZB2BU (the society station) on at least three different bands. Contacts must have

been made since 13 January 1978 and may be on any bands or modes. Applications must consist of a copy of the log (not QSLs) showing date, time and frequency, and include US\$3 or equivalent.

The ZB2 Award

As above but five different Gibraltar stations must have been worked/heard on any band/s. Log details and US\$3 should be enclosed. Applications for either award should go to the Awards Manager, GARS, PO Box 292, Gibraltar.

Diplome 73

Issued by the Chambéry RC of Haute Savoie to those who have a minimum of five QSOs with that department. The cost is 20 ircs, and inquiries will be answered by M. Cyprien Denis, 14 rue de la Forgerie, 73160 Cognin, France.

Propagation predictions

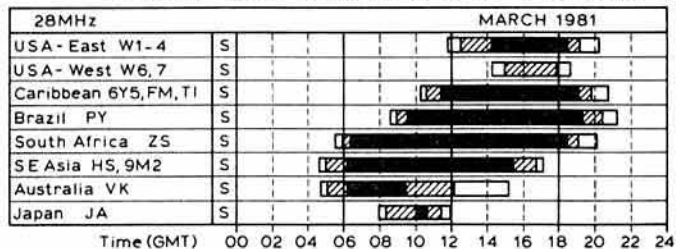
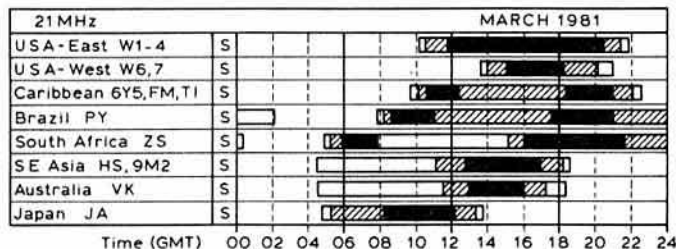
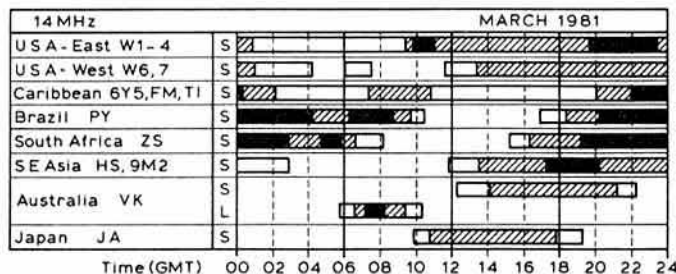
The seasonal decline in F2 mufs during the summer begins in March, and will be noticed mainly on 28MHz. Most probably North America will not be heard on this band with as much certainty as during the previous month. Traffic with all other continents will be possible, even if only for brief periods. Solar activity has decreased very little compared with March 1980. Conditions on 21MHz will not be affected by the above-mentioned decline in daytime frequencies. Lengthening days in March mean that both 21 and 28MHz will remain open longer in the evening. Seasonal changes mean that dx will be possible during the latter half of the night on 14MHz, but only in April will this band become an expressly night-time dx band.

At present, during the time of the equinox, dx via the indirect path is hardly possible on 21 or 14MHz. An exception is traffic via the indirect path with Australia; this path often being more favourable than the direct one. Traffic with Hawaii and Alaska will be possible on 14MHz under favourable conditions between 0700 and 0930gmt. As the great circle in this case leads through the polar light zone, traffic will frequently be interrupted by static.

During March the 7MHz band will still offer usable dx chances when the longer part of the path lies in darkness. Eastern North America will be heard on this band from about 2200gmt until shortly after sunrise. It may be possible to work western North America on 7MHz from about 0330 to 0630gmt, and under very favourable conditions Hawaii and Alaska from about 0430 to 0600gmt. Again, under very favourable conditions, the eastern coast of the USA will be heard from about midnight to 0530gmt. During the latter half of the night local traffic will be interrupted now and again by the dead zone.

The provisional sunspot number for December 1980 from the Swiss Federal Observatory was 176.1. The second half of the month saw a high range of daily numbers. The predicted smoothed numbers for April, May and June are 134, 132 and 130 respectively.

From December 1980 the service provided by the Swiss Federal Observatory has been assumed by the Sunspot Index Data Centre, 3 Avenue Circulaire, B 1180 Brussels. Details of the service available and subscriptions payable can be obtained from that address.



S...Short path L...Long path [White box] 1-5 days [Hatched box] 6-20 days [Solid black box] Openings on more than 20 days in the month

WBFG

The Belgian Forces in Germany District of UBA is awarding this for making contact with (or hearing) four such stations since 1 January 1965. Send log extract giving date, time, frequency, callsign, mode, reports and name of the Belgian operator. A vhf version is available and requires only three QSOs. Send the list with US\$3 or 10 ircs to D. Commeyne, DA2DC, Flandernweg 12, D 3548 Arolsen, W Germany.

Band reports

G8KG has once again reviewed the past month and his report reads as follows: "Following on the major upsurge of activity in the last quarter of 1980 the sun was distinctly quieter in January, though there were signs of increased activity at the end of the month. The average of the daily solar flux for the first 27 days of the year was only 170 sfu with a 'low' of 155 on 15 January, compared with an average of 227 sfu for the corresponding period in December.

"At the same time the geomagnetic field was very much quieter than in the preceding months, with the A-index only rising above 10 on a few days. As a result hf band conditions were generally good, but 50MHz was affected by the combination of low solar activity and the seasonal decline in North Atlantic mufs in January.

"The provisional sunspot number for December turned out to be 176, rather higher than last month's 'guesstimate'. The resultant three-month mean sunspot numbers centred on September, October and November 1980 were 151, 155 and 162 respectively, but the curve is probably falling again.

"However the sun may behave in 1981, this year has a special significance in the field of solar observation, since the responsibility for issuing provisional and final numbers—which for many years has been excellently discharged by the Swiss Federal Observatory in Zürich—has passed to a new sunspot data centre in Brussels under the auspices of the Royal Observatory of Belgium." (See "Propagation predictions".)

Lower frequency band enthusiasts may care to note that the periods of geomagnetic quiet are the best for dx working on 1.8 and 3.5MHz, and the ideal is when the Alpha index is seven or less and the K index no greater than two.

The following managed to beat the latest epidemic of industrial "inaction" in the Post Office to submit reports for this part of *MOTA*: G5JL, G2HKU, G3s GHY, GVV, HCT, IMW, KSH, NWG, GM3PPE, GD4BEG, GM4GHX, G4EHQ, GW4KGR and G8WQS, as well as RSs 1066, 25429 and 42876.

Stations listed in italics were using cw.

1-8MHz 0000 EA5MO, EL2FY, LU8DQ, OH0XX, UD6MR, UK9SAY, ZD8TC, 4X4NJ, 0200 EA8AK, N2NT, NP4A, W8LR, 0300 W1-W4, W8, 0400 KV4FZ, VE1BLV, 0500 AA1K, W1BB1, K5GO (Ark), W8LR, W2EQS/3, 0600 VE1BNN, W4PZV, W7RM (Wash), 0700 NP4A, K6DDO, LU1BAR/W9, W9RE, 1900 UA9AIK, 2000 JA5DQH, 2100 UD6MR, VK6HD, 2200 KP4KK/DU2, 14AMO, JA3 30NB, 5DQH, 6LCJ, 6WGE, SP9DH, UF6VAZ, 2300 EL2FY, OY7ML, UB5UCY/UF6, UL7PBX.

3-5MHz 0000 EA9JG, OA4AWD, PY7WGB, UM8NAN, 4X4DX, 0100 FM7WG, W1, W2, W4, 0200 UH8EA, 0700 C6AJV, HK0FBF, HP3JL, OH0NF, N6ZV, OX32M, W1-W4, 0800 FM0PJE, JA8DNV, KL7Y, N6YK/VP2A, 0900 HK0FBF, HT1KD, 1600 to 1700 ZLs 1BHS, 1BLQ, 1BQD, 2BGJ, 1900 JA6JPS, VK2-VK3, ZD7HH, 2000 FK8CK, JA, OD5MR, N2KK/ST, UA9AFO, 7X2MH, 2100 AP2KS, FC9UC (QSL to F5RV), VK6LK, 2200 JA1HVP, JX2AY, VE2XO, W1-W4, 2300 G6ZY/CN8, HS4AMI.

7MHz 0000 FG0FOL/FS, FM7AV, N7YY, 0600 TI2KA, 0700 FK8CR, H44DX, PY, W6-W7, 0800 FM0FJE, J3AAE, JA1s AEA, CWZ, JW2CF, KL7Y, N5JJ, N7KA, UA0QAA, VK9NS, ZK1XG, ZLs 0900 VKs, W0CCN, 1100 VU2WTR, 1700 JD1AMP, 1800 FROLO, 2100 SV0AW/9, 4K10C (QSL to UO2OC), 2200 N2KK/DU2, VU2BK, 2300 CX2BHH, JA6XMM, K2MME/VP2V, VU2WTR.

14MHz 0200 HK0COP, 0600 KH3AB (QSL to K6ZMO), 0700 JA, KL7, 0800 AH2D, 0900 KL7, W6-W7, ZK2NT, ZL, 1700 FR7BX, 1800 NL7L, 1900 T3AT, VK, ZL, 2000 J3AJ, PY0ZZ, 9X5AB, 2100 KA3BLP/J6, 600DX, 2200 NL7J, PY0ZZ (Fernando do Noronha), 2300 J28AP, F6GUP/TL8, 9V1UR.

21MHz 0700 JA, 0800 JA, VK, ZL, 0900 HM0I, JA, JD1AEV, M1C, NL7K, P29NBF, W3B7X/PJ7, VK, ZL, 1000 HM1SX, PY0ZZ, YD0XX, 1100 A9XBD, JT1KAA, KL7JGN, VS6DT, 6U25YP, 1200 KL7IB, 1300 KH6WW, WP2ABE (Box 57, St Croix), 1400 XE3LS, ZD7BW, 1600 W6-W7, 1700 PY0CW, TA1UA, VP2MEA, VP2SAM, W6-W7, 1800 KH3AB, VP5SDA, W6-W7, 7X2AP, 1900 FG0FOK, HH5CB, 2000 IAOKM (QSL to IOMGM), 2200 ZF2DX.

28MHz 0800 JT0KAI, 9Q5AQ, 0900 A51PN, AP2ZR, JD1ALV, VK9NYG, 1000 A22ZM, AH2E, HM1QO, VS6FI, VU2BK, 1100 PY0ZZ, DF3NZ/ST2, VE7AAZ/SU, TJ1CK, VK6, VK9ZD, 3B8BD, WD5FTP/5N4, 9N1MM, 1200 C5AAP, FG0FOK, HK0FBF, J3AH, SU1DA, VK, VU2IF, 5N0WNL, 1300 A4XIX, J73PP, TA8BE/TA1(?), ZD7BW, 5Z4SE, 1400 WB4ZNH/A2, FG0FOL/FS, J73PP, 1500 XT2AW, 3B8AE/3B9, 5N3PJR, 1600 W6-W7, 1700 VP2VGF (QSL to NP2AF), W6-W7, 1800 W6, 1900 CE5CBS.

Acknowledgements to the following for information supplied: the *Ex-G Radio Club Magazine* (W3HQO), the *DX Bulletin* (K1TN), the *Long Island DX Bulletin* (W4UL/W2IYX), *DX News Sheet* (Geoff Watts), *Long Skip* (VE3FRA), *QRZ DX* (K5FUV), *DX'press* (PA0TO), and *CQ Magazine* (WIWY).

All items for the May issue to reach G3FKM by 29 March, and for June no later than 24 April—please note that this is an abnormally early deadline.

SWL NEWS



Bob Treacher, BRS32525*

LISTENERS with equipment for 70MHz are asked to help G4JCC with some tests which he will be carrying out throughout the year. They will take the form of a slow morse transmission at about 8wpm on 70-100kHz. The transmissions will sign either "G4JCC" with a pause, or "VV de G4JCC pse QSL". The aim of the tests will be to try to compare 70MHz propagation with that experienced on 28 and 50MHz during the same period. He will QSL all listener reports, provided that they give sufficient information to be of use, ie signal strength, comparative strengths of any beacons which may be audible at the same time, and the depth of any QSB. If you have a beam antenna, this should be mentioned in the reports. G4JCC is keen that as many listeners as possible should help, and he would more than welcome dx reports—although your scribe is unsure how much of Europe has use of the band. For those interested, G4JCC's address for times of his transmissions and for QSL purposes is 52 Salterns Lane, Hayling Island, Hampshire PO11 9PJ.

Newcomers

Edward Baker, BRS45852, has recently joined the RSGB, although he has been involved in the hobby for over 20 years. He is very keen on the dx side of things, and sent a useful list of stations heard. He uses a Hallicrafters SX100 receiver and a 20m long wire. B. Wainwright, BRS44703, uses an FRG7000 with antennas for 28 and 21MHz in the loft, and a long wire outside.

The news

Mark Hattam has successfully negotiated the RAE and can now be heard as G4KGA. He will be happy to QSL all reports, also those for G3OUR, for whom he is QSL manager. Mark heard 257 countries during his spell as a listener, and at the time of writing had 133 confirmed.

Graeme Caselton, RS44984, commented on G8OEG's views in November *SWL news* on vhf QSLing; at the time of writing, Graeme had had a disappointing response to his reports. He suggests that as listener reports do not count toward transmitting awards, amateurs do not feel disposed to answer swl reports. However, your scribe's experience of sending vhf reports is very encouraging indeed. The answer seems to be to make the report as informative as possible, comment on the transmission, and indicate that the station "was the loudest signal out of Wales heard tonight". If you are chasing the QTH Squares Award or FMD Award, say so; transmitting stations know only too well how frustrating it can be to wait for that elusive QSL card which will make all the difference to an award claim or having to wait an age for a rare sporadic-E contact to be confirmed. The biggest courtesy, of course, is to enclose an sae for all direct cards.

Derek Casson, BRS41992, has recently invested in a Datong FL2 filter which he has found especially useful on 7MHz. He is also beginning to master the lower end of the bands in readiness for his RAE pass.

Dave Stewart, BRS40293, mentioned QSL returns from AP2HA, CX7BF, HZ1AB, TU2JD and 6W8FZ, and a number of good dx stations logged in early January on 28MHz—best dx probably being A9XCX and S83W.

Michel Delvaux, ARS42503, has now purchased an SRX30 receiver which has improved his station. He mentions QSLs received from W5JMM/SU (via KA5AZT) and KA4SQT/HC1.

Inactivity has been the reason for Ken Sketheway's lower score in 1980. However, he threatens far more activity in 1981, and hopes not to miss out on the dx trips which will no doubt materialize during the year.

John Doughty, BRS40705, added several all-time new ones during January, in the shape of HM, ZD7 and 3A2.

Brad Bradbury, BRS1066, achieved the 200 mark for entry into the 1981 table on 4 January. We will not publish the new table this month, as we only have a handful of entries; but it will appear next month.

1980 hf countries table
(final placings)

Station	28	21	14	7	3-5	1-8	Total	Mode
RS42604	221	244	221	177	138	36	1,037	ssb
BRS25429	214	238	243	149	125	34	1,003	ssb
BRS8841	162	190	232	112	102	10	808	ssb/cw
A8808	173	203	185	109	100	30	800	ssb/cw
BRS43475	160	208	218	104	86	18	794	ssb/cw
BRS18529	80	103	186	84	68	21	542	ssb
ARS42503	125	134	133	84	47	3	526	ssb
BRS1066	95	121	122	59	53	20	470	ssb/cw
BRS41992	88	95	158	54	51	14	466	ssb
BRS35943	97	97	93	76	85	5	453	ssb
BRS40705	128	119	118	47	27	0	439	ssb
A9191	92	109	127	57	24	10	419	ssb/cw
BRS43273	112	119	105	34	20	0	390	ssb
BRS44396	62	131	90	51	29	12	375	cw
ARS42591	52	89	129	31	64	0	365	ssb
BRS42559	55	79	113	38	31	5	320	ssb
BRS20185	86	85	94	20	27	2	314	ssb
BRS40293	56	94	97	30	23	0	300	ssb
ARS43457	72	70	80	31	26	1	280	ssb/a.m.
BRS40634	31	101	68	20	17	0	237	ssb
ARS43261	54	50	75	20	18	0	217	ssb
BRS43135	24	48	74	22	30	9	207	ssb
BRS40814	42	21	57	26	15	4	165	ssb
ARS43496	1	38	66	22	21	2	150	ssb
(late entry)								
BRS25901	203	219	231	87	112	28	880	ssb/cw

All-time countries table

Station	28	21	14	7	3-5	1-8	Total	Mode
G3KMA	298	317	322	241	173	41	1,392	ssb/cw
BRS17567	282	317	350	181	226	34	1,390	ssb/cw
BRS25429	264	301	326	227	219	52	1,389	ssb
BRS32525	258	292	311	220	242	41	1,364	ssb
BRS25901	252	290	321	191	195	22	1,271	ssb/cw
BRS35943	232	274	297	198	218	30	1,249	ssb
G3MCS	278	293	303	142	118	18	1,152	ssb
A8808	225	262	288	150	158	47	1,130	ssb/cw
RS42604	241	256	234	185	144	39	1,099	ssb
BRS8841	215	248	303	148	159	16	1,089	ssb/cw
G3ALI	180	206	299	162	184	0	1,031	ssb/cw
G3GIQ	286	309	318	115	68	27	1,123	ssb/cw
G3IGW	169	188	214	187	127	82	967	ssb/cw
G4FAM	195	220	225	160	114	31	945	ssb/cw
BRS43475	184	229	239	129	107	31	919	ssb/cw
G3ZBA	152	165	272	120	126	0	835	ssb/cw
A9191	144	187	232	72	95	11	731	ssb
BRS20185	155	153	197	45	48	6	604	ssb
BRS40705	164	139	136	62	50	1	552	ssb
BRS18529	80	103	186	84	68	21	542	ssb
ARS41386	136	152	145	56	43	5	537	ssb
ARS42503	125	134	133	84	47	3	526	ssb

Robert Small, BRS8841, commented on reasonable conditions on 14, 21 and 28MHz during January, although the bands were closing very early. Robert picked out these as his best loggings: 9N1AB and PY0ZZ (Fernando de Noronha) on 14MHz; HL2XV, VS6IC and CR9CT on 21MHz; and TA8BE/TA1, YC2BIU and 6U25YP (special prefix commemorating the 25th anniversary of Sudan. QSL via PO Box 1533, Khartoum) on 28MHz.

Dave Whitaker, BRS25429, reported VK4NIC/3X, JD1AEV (Ogasawara Is) and 4U1UN as new ones on 28MHz; and welcome QSLs from A35TW and 5W1BJ for 7MHz ssb.

Paul Tittensor, A8808, was pleased to add VK9NYG (Cocos-Keeling Is) to his 28MHz all-time countries. This station has also been reported at 1200 on 21,180kHz. QSLs via VK6NE.

The tables

As mentioned earlier, the 1981 table will appear in April. The rules were published in December's *SWL news*, p1311. Some people have asked where they can obtain a copy of the ARRL Countries list upon which the table is based this year. RSGB HQ should have copies but there is a list in *Amateur Radio Awards*. Alternatively, copies can be obtained from ARRL HQ, but basically, there is very little difference between the two lists. The 1980 list appears for the final time. Congratulations to the two stations who managed to reach 1,000—the first time that it has been achieved.

DX news

BV2B and A51PN have been elusive getaways for many on 28MHz during the month. Both are reportedly active on Saturdays around 28,550kHz at 1100. Rumours suggest that ARRL is not to give DXCC status to the recent operations from 5X, 3X, 5A and 600DX. Only time will tell whether such rumours are well founded. 9U5DS does seem to be a phoney, as the operator is currently living in Belgium.

Deryck, G3VLX, will be active during CQ WPX at the end of the month, signing 9H3AM. All QSLs to your scribe with sae (or ircs from the dx). VP8SSI did not materialize due to transport problems, but it is hoped that VK0HI will be active about now.

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Yet more lower frequency news

The dx season on the lower frequency bands continued during January to provide more than a sprinkling of choice dx on 1.8, 3.5 and 7MHz. It is pleasing that no less than seven reporters mentioned at length their exploits on these bands, and we will look at them in turn.

1.8MHz is often neglected, but so many countries are now licensed for the band that it has proved necessary to watch the band closely. Dave Whitaker reports great activity over the weekend of 17-18 January on ssb; between 0500 and 0700, he logged HK0COP, HP1XRK, NP4A and ZF2DX, plus assorted W and VE call areas. Paul Tittensor, A8808, reports VS6DO at between 5/4/9 and 5/7/9 at 2246-2313 on 4-7 January, and on ssb on the 4th and 6th. He also reports UD6DMR at 2226 on cw and UL7PBY also on cw at 2217.

3.5MHz tends to have taken over from 7MHz for the star rating this month. The band has proved to be a little more favourable and some interesting dx has been reported. 1981 started off well for some, with A7XD and FK8CR being logged on 1 January for new countries. K5UA/KH2 was also 5/5 at 1759 on 2 January. VE7IG was audible at 1604 on 6 January, and W6RR at 1548 on 8 January, but both were only just above the noise.

Unfortunately the long-path opening between G and W6/7 is very short

(not even 10min) and conditions have to be very good for a G to "make it". Conditions to the west coast USA have not really favoured us this winter, but several listeners reported weak signals just around sunset. Other good dx reported included 0500-0900: HK0FBF, OA4AWD, TG4NX (via WD8MOV), N6YK/VP2A, W6-7, ZL; 1500-1900: A9XZ, DU1JB, FK8CR, HM1PW, JAs, K5UA/KH2, VK2, 3 and 7 (around 1900 between 3,685 and 3,700kHz) and ZLs. Later in the evening, the best dx reported seems to have been VK6LK, VS6DO and YB0WR, although many report "easier" dx countries such as EA8, OD5, 4X4, 5B4 and 7X2. **On 7MHz**, Paul Tittensor mentions superb conditions on 9 January to the west coast USA; many W6/7/0s were logged, as well as VE4. K6MYC was 20dB over S9 using a five-element Yagi at 120ft and 1kW; and KH6ND was 5/7 at 0834. KH6AQ and ND were heard on 8 January at 0839 and 0832 respectively, and on 10 January KL7U was 5/5 at 0853. Several reported VK9NS regularly around 0800-0815, while others mention H44DX and H44SH. The band was also open around 1400, with JAs copied at 5/5 and UM8PAC also copied. Slightly later (between 1500 and 1945) the following were reported: HM1QM, JT0YFU, W5JMM/SU (via KA5AZT), UA0, UD6, UJ8, UL7, VU2IF and W8AR.

Next month's column will report how close anyone got to the magic 2 x 100s on 3.5 and 7MHz. □

SSTV SCENE



P. Burnett, G4BLL*

ONCE again we open the column with more news of the JA0BZC scan converter—there are now at least two working models: one built in this country by G3WCY, and the other by ZS6BNT (ex G3ZGZ), both with some modifications incorporated.

Dave Woodhall, ZS6BNT, started a six-page letter: "Regarding the JA0BZC scan converter, first can I call you a couple of four-letter words and then thank you!" He concludes by saying: "The four-letter words were for all the hassles we encountered, but fortunately overcame and got all of it working! You are forgiven, hi-hi." Dave's letter chronicles some of the difficulties that he and ZS6AEV encountered, which other constructors of the unit will probably find of interest. If difficulty is encountered in obtaining the Toshiba TA7612, a Siemens UAA180 appears to work well. Dave states that "Other mods were done to the A-D board to allow us to run on 625 lines/50Hz. The MN3008 chip could not be obtained, so the f-s converter was redesigned to avoid its use."

Dave went on to build the colour version with two additional memory boards and says: "On the original version three 'digital' boards were run from the same sync sources. When using colour I had to make one board a master, and the other two had vertical and horizontal shifts and width control for each colour—what a job to set it all up! That has now been modified; four ics were thrown out, all pulses etc are taken off one master board, all controls are now common and all three pictures sit on top of each other." Dave has copied colour signals from G3NOX, VE3EGO and ZS6BTD.

ZS6BNT goes on to say that he would be prepared to make pc layouts and track prints available to anyone interested in duplicating his unit, and possibly pcbs for the project, for around £14 per board (three boards required for the single-colour version) not including power supply. Send enquiries with ircs direct to Dave Woodhall, ZS6BNT, 26 Katlagter Street, Birch Acres, 1620 Republic of South Africa.

Brian Smith, G3WCY, wrote in similar vein and enclosed circuit details of his various modifications. He states that he is indebted to G8KLE for

his assistance in getting the converter working. In fact, G8KLE got so involved in the project that he now intends to build it himself. G3WCY has included an emitter-follower stage to ensure correct video matching, and has changed all the fixed resistors to presets on the 74121 to make alignment much easier (especially in the absence of a 50MHz scope). Also as the 7612s are not available in this country IC5 and IC6 were changed to RS3914. Finally the fast-scan sync circuits were modified to make them suitable for 625/50Hz.

Negotiations are currently in hand with Robot to allow the distribution of the 400 scan converter pcb only in this and other countries. The 400 pcb is an excellent-quality glass-fibre board with plated-through holes and, of course, it is a guaranteed product from a company with an excellent reputation in the slow-scan world. Your sstv reviewer will act as the centre for distribution of the boards with full technical details to enable the unit to be completed without too much difficulty. For further information write, with sae please, to the address given below.

Turning to the computer front, an interesting letter was received from G4JBU who has written a couple of programs for use with sstv for his "Video Genie". The first programs produced large capital letters and numbers taking up to a minute to fill the screen. The second program again produced letters and numerals as well as a variety of keyboard characters to fill the screen in approximately 12s. He also has a file of sstv contacts in the computer so that if a station comes up calling "CQ", Dave can immediately check if he has previously worked him, who the station is, QTH etc. Dave closes with an interesting statement: "I know absolutely nothing about computer programs—I hadn't even seen one before I produced the current ones—so tell your readers 'don't be frightened—have a go'".

A letter from G4HNG informed *SSTV scene* that he is experimenting with an ITT 2020 microcomputer with disc drive using the WB4JMD sstv package. Geoff says the system, written in machine code, appears to have considerable possibilities using the high-resolution graphics capability of the microcomputer, but it appears to have a fault in one of the timing loops. G4HNG would appreciate any assistance in locating the fault in the program.

As mentioned in November *SSTV scene*, G3GGJ can supply copies of the W9NTP colour memory boards. Working on a non-profit basis, the whole package works out at £38.50 including postage and packing. The package consists of:

1. A fully drilled pcb from the W9NTP negatives with plated-through holes and silk-screened top surface.
2. The W9NTP conversion data.
3. The ZL1BLV re-drawn circuit.
4. Copies of connections to the boards and the position of the major links.

Please send remittance with order, and G3GGJ will advise the up-to-date position by a brief telephone call.

Did anyone copy the W6V10 "Voyager in Outer Space" sstv transmissions originating from Saturn? □

*21 South Cross Road, Cowcliffe, Huddersfield HD2 2PH.

HF propagation study

Predicted hpf + luf in megahertz for March 1981

	00	02	04	06	08	10	12	14	16	18	20	22
Suva (s)	1812	1712	1610	1906	2408	3110	3410	3510	3208	2805	2310	2012
Wellington (s)	1711	1611	1610	2307	3008	3610	3810	3510	3308	2805	2208	1911
Osaka	1710	1611	1711	2611	3508	4010	3011	2410	2208	2105	1903	1907
Hong Kong	1708	1511	1912	3212	4111	4510	4611	3910	3208	2805	2203	1904
Sydney (s)	1711	1612	1912	3310	4208	4410	4211	4110	3608	3105	2205	1909
Moscow	1401	1302	1303	2305	3306	3707	3907	3907	3705	2903	2002	1601
Bangkok	1806	1610	2012	3512	4512	4710	4811	4810	4308	3205	2203	2002
Singapore	1907	1611	2012	3612	4412	4610	4711	4810	4308	3205	2203	2003
New Delhi	1903	1607	2010	3612	4612	4811	4911	4810	3508	2405	2202	2002
Perth	2008	1711	2112	3812	4911	5010	4411	3910	3508	3005	2402	2204
Teheran	2002	1703	2107	3810	4912	5012	5011	5010	4408	3305	2402	2202
Colombo	2003	1708	2112	3812	4912	5012	5011	5010	4508	3405	2502	2202
Bahrain	2202	1903	2107	3911	5012	5112	5111	5010	4408	3505	2702	2402
Cyprus	2002	1702	1704	3307	4609	4809	4709	4708	4406	3604	2602	2201
Aden	2502	2103	2107	3911	5312	5312	5212	5111	4808	4005	3102	2802
Seychelles	2602	2204	2209	3912	4212	4212	4511	4411	3708	3705	3103	2802
Mauritius	2702	2305	2209	3912	4912	5412	5311	5211	4908	4205	3302	3002
Nairobi	2902	2502	2206	3710	4812	4512	4812	4811	4408	4405	3602	3302
Malta	1701	1501	1302	2204	3606	3907	3907	3806	3805	3303	2302	1901
Salisbury	3202	2802	2205	3510	4512	4712	5012	5111	4908	4705	4003	3602
Cape Town	3202	2702	2104	3108	4611	4812	5112	5211	5409	4905	4203	3902
Lagos	3602	3202	2403	2905	5110	5612	5712	5512	5510	5005	4303	3902
Suva (l)	3612	3212	2410	2706	3808	3410	3111	2711	2609	3105	4310	3912
Gibraltar	1501	1401	1201	1503	2804	3506	3606	3406	3405	3203	2301	1701
Ascension	3402	3202	2502	2506	4608	5211	4412	4312	4512	4108	3703	3802
Wellington (l)	3411	3211	2510	2406	3608	3010	2711	2411	2209	2505	3708	3711
Dakar	3202	3102	2502	2305	4308	5611	5612	5412	5412	5108	4303	3602
Adelaide Is	3204	3003	2502	2305	2608	3510	4911	5411	5410	5110	4308	3606
Las Palmas	2301	2302	1902	2004	3706	4808	4908	4609	4608	4405	3503	2702
Falklands	3102	3002	2502	2305	3108	4010	5611	5411	5311	5111	4209	3505
Rio de Janeiro	3002	3002	2502	2205	2808	4710	4712	4112	4112	4411	4108	3504
Buenos Aires	2902	2902	2502	2205	3208	4010	5411	5012	5012	5112	4210	3406
Sydney (l)	2611	2611	2411	2109	3208	3010	2711	2411	2209	2106	3206	3210
Lima	2404	2502	2302	2005	2708	2510	5111	5011	5012	5013	4112	3108
Barbados	2402	2402	2202	1905	2308	3910	5211	5012	4912	5012	4110	3105
Bogota	2303	2302	2202	1904	2108	2610	5011	4912	4812	4912	4111	3107
Jamaica	2303	2202	2102	1804	2108	2510	4711	4711	4712	4712	4011	3008
Bermuda	2303	2202	2102	1804	2108	3210	4611	4611	4612	4612	3910	3006
New York	2204	2102	1902	1705	1908	2610	3811	4311	4311	4311	3710	2907
Mexico	2207	2103	1902	1605	2108	2010	2811	4311	4412	4312	3712	2911
Montreal	2204	2102	1902	1605	1808	2610	3711	4111	4211	4211	3609	2807
Denver	2207	2004	1802	1605	1908	1510	1911	3011	3609	3811	3411	2710
Los Angeles	2209	2005	1702	1605	1908	1710	1611	2511	3609	3711	3212	2611
Vancouver	2109	1906	1603	1605	1808	1510	1610	2010	2609	3010	3011	2410
Iceland	1201	1201	901	1103	1704	2605	2906	3006	3005	2704	2002	1501
Honolulu	2012	1910	1606	1605	2008	2410	2210	2010	2708	3108	2611	2212
Fairbanks	2008	1807	1605	1705	2108	2010	2110	2210	2308	2407	2408	2109

First two digits are hpf, last two luf; luf 00 indicates data not available.

Table 2

h (feet)	12.5	50	112.5	200	312.5	450	612.5	800	1,012.5	1,250
d (miles)	5	10	15	20	25	30	35	40	45	50

with zero at the bottom. Next, draw a horizontal line in pencil, so that it may be rubbed out later at a height $d^2/2$ feet (d in miles) or $d^2/17$ metres (d in kilometres), where d is half the total distance axis. For example, if the total required horizontal distance for the chart is 100 miles, then $d^2/2 = 1,250$ ft. The first contour may then be determined by plotting points h, height units, below the horizontal line previously drawn, at various distances d (eg every five miles) horizontally either side of the centre, as shown in Fig 2. The d and h distances are related through the formulas $h = d^2/2$ (h in feet, d in miles); or $h = d^2/17$ (h in metres, d in kilometres).

Table 2 gives values of h as a function of d for a typical chart. The h distances are best transferred to the graph using a ruler and measuring them from the horizontal line. The first contour may then be drawn by going up the points in a smooth curve, either carefully by hand, or using a "Flexicurve". The other contours are then added by drawing parallel curves, spaced 1cm vertically above each other, to produce the final chart as shown in Fig 3.

The example given is suitable for most likely line-of-sight paths in the UK, but different charts may be drawn for any particular application. Once drawn, a chart can also be rescaled: if the horizontal distances are doubled, the height scale is multiplied by four.

In order to plot a path on the chart, first draw a line on a map between the stations. Find the midpoint of the line and, working outwards towards one station at a time, mark the height of the intervening terrain on the chart, to produce the total cross-section. The path is then drawn on the chart as a straight line between the locations and, if it is above all the intervening terrain, then the path is line-of-sight.

In cases where the path is either marginally obstructed or marginally clear, it cannot be said with certainty whether or not the path will work. First, it will be very susceptible to changes in conditions affecting the K-value, meaning that the path might work one day but not the next! Charts are drawn for average conditions and do not represent the path exactly under different propagation conditions. Second, when the clearance above an obstruction is small, the signal level may be lower than expected due to diffraction effects, but provided that the path is just clear, this is unlikely to be a serious problem. For further information on this see G8AGN's article on microwave path checking (*Radio Communication* February 1978).

MICROWAVES

(Continued from page 241)

Table 1

Height		Distance to horizon	
ft	m	miles	km
50	15	10	16
100	30	14	22
200	61	20	32
400	122	28	45
600	183	35	56
800	244	40	64
1,000	305	45	72
1,500	457	55	88
2,000	610	63	101
2,500	762	71	114
3,000	915	78	125

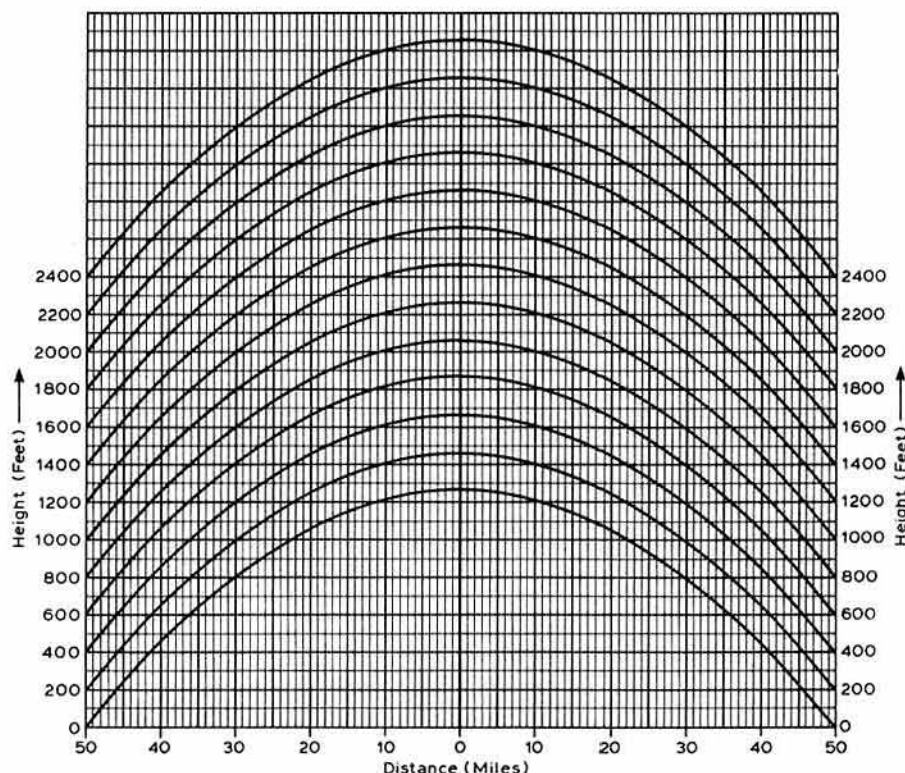


Fig 3. A typical path plotting chart

YOUR OPINION

THE NEW-STYLE RADIO COMMUNICATION

The Editor
Radio Communication

Sir—May "an old hack of a few decades of typewriting" add a small plaudit to the many you will undoubtedly receive about the new presentation and format of *Radio Communication*? Delighted comments about it were widely to be heard on the air in the first few days of January after the journal had been received and appraised.

The larger size, the increased area for text-matter and the smart typographical headlining of standing features are the obvious improvements that will strike all readers. But I wonder how many will have taken thought of the fact that the changes were made at a period of the year which is the bane of all publishers, ie December, when there are notoriously not enough man-hours to go round?

A triumph of organization? It may sound trite to say so; but there can be no doubt that a very considerable effort must have been put in by the editorial staff (not forgetting their contributors) and by the printing and dispatch folk further down the chain to bring about the result achieved, and on time. Altogether a very QRO effort!

Jack Hum, G5UM

PROPOSED NEW 144MHz BAND PLAN

The Editor
Radio Communication

Sir—I heard on GB2RS News about the proposal to divide up the ssb section of the 144MHz band, with dx working below 144.40MHz and local working above it.

There must be a few thousand Liner 2s and TR7010s in use which are only capable of tuning up to about 144.330, and these are likely to be used for local and mobile contacts. DX operators, on the other hand, are far more likely to be equipped to work anywhere on the band. I therefore propose that 144.150 to 144.300 be used for local working and 144.300 to 144.500 be used for dx. This would give limited coverage equipment access to the full local/mobile sub-band and a small part of the dx segment.

I must state my personal view that there is already too much bureaucracy on 144MHz in the form of calling channels etc, and I feel this whole plan is quite unnecessary in any case. We manage quite well without this sort of thing on the more crowded hf bands.

A few wealthy (judging by their QTHs) amateurs have been heard saying that the cost of putting rigs on to the new frequencies is "not much to pay these days". I would have thought that the majority of those owning secondhand Liner 2s, in this economic climate, might find the opposite to be the case.

In any case, I think it is wrong that a handful of influential amateurs in their ivory towers should be able to make hundreds of rigs obsolete overnight. The RSGB should either throw out this proposal, or modify it as I have suggested.

Julian V. Moss, BSc, AMBCS, G4ILO

Sir—It was with considerable dismay that, from the amateur radio pages on Teletext, I discovered that yet more "organization" was proposed for the 144MHz band.

Surely, the main object of our hobby is to communicate with other radio amateurs in a relatively free manner and, with this in mind, I wonder why it is necessary to decide how far we would like to have between our stations prior to attempting to make contact. Half the enjoyment of vhf working is the fact that we often have little idea how far our signals will travel, and a "rag chew" with a so-called dx station can often be as easy as with a local. This "pot luck" aspect of the band adds a dimension that will be lost if we are segregated into dx and local on ssb; after all, we can always use fm if we really only want relatively local contacts.

Obviously there are among us those who will say that they cannot work dx because of local QRM and, of course, there is an equally strong argument in reverse. Two things will help avoid this: one being always to move well clear of the calling channel once communication is established, and the second is to reduce power to the minimum necessary to maintain communication.

There is probably a case for keeping contest activity away from some part of the band, but there is already provision for this with the multi-mode section, which is seldom used by contest stations, and again it seems unnecessary to add further segregation. This is particularly the case when considering the new proposals in conjunction with the fact that during many major contests much of the Continental dx (?) can be found spreading well towards 144.5MHz—are we not to communicate with these stations if they are in our local sub-band, or do we redefine dx on such occasions? Judging from the sudden increase in activity during contests, most radio amateurs seem to like to get involved, even if only for a few contacts, so why more regimentation?

It seems that this new band plan proposal could be introduced for a minority without consulting the majority of band users (perhaps one should say ssb band users) who, I suspect, find the present system quite acceptable and would prefer to avoid what is effectively more channelization being applied to the band.

To add to the confusion that the proposal could introduce, I find that the last entries in my mobile log show DL, F and HB9, in that order, on ssb, being worked while travelling along the south coast. Obviously I should not have worked these stations since "mobile" is, apparently only capable of making "local" contacts. Perhaps a new definition of dx and local is in order.

M. Pharaoh, G3LCH

Sir—Having just listened to GB2RS for the first time for a while, may I express concern about the proposed 144MHz band plan changes.

The plan is voluntary and so has to be decided democratically. Also there have to be generally-accepted good reasons for the segregation. The split by mode—cw, ssb, fm—is obvious. So is the split by special application—eme, random ms, repeater channels and rty. The band would be chaotic without these arrangements.

However, I do not find the proposal to separate dx/contests from other ssb users (limited to 144.4-144.5) a logical or necessary thing. I cannot accept the implication that dx working and contests are so significantly more relevant than what is (rather disparagingly) referred to as chat, that a large sector of airspace has to be set aside for amateurs pursuing these aims.

The effect of the proposal would be to render many rigs less useful (Trio 7010, Liner 2, Mizuho SB2M etc) although I accept that at a cost, owners could get them working at higher frequencies at reduced efficiency. In my view it is unfair and unnecessary to put them in this position.

There is nothing particularly important about working dx. It is known by now that propagation varies, and if one uses high power through a huge antenna at great height, stations further away can be worked. Some amateurs obviously like working at the limits of propagation—a legitimate interest. Others like contests. Well, whatever turns you on—myself I switch off when contests are on the go. I have nothing against either pursuit, I merely point out that there is nothing special here.

The chat between locals often relates to technical projects; on-air experiments; low power; novel equipment/antenna tests; cw practice etc. I judge these of equal relevance to dx/contest work. Even general chat working, insofar as it provides companionship and pleasure, is not to be criticized. Surely it is the essence of the amateur spirit; perhaps even more so than the sometimes short-tempered pursuit of dx against other competition.

If RSGB is determined to pursue segregation, I would suggest three things:

1. Via the Home Office (Radio Regulatory Division) call for a postal vote of all amateurs to establish those for and against (postage at each amateur's expense).
2. To avoid amateurs having to modify large numbers of existing rigs, invert the proposal. Leave general ssb at 144.15-14.35 and during contests, or when conditions are good for dx, seek agreement that 144.35 and above be left free for dx/contest use.
3. Retain 144.30 as the main (low band activity) calling frequency, but re-establish 144.20 as a secondary calling frequency for general ssb under busy band conditions, and 144.40 as the dx calling frequency.

In any case, let us have more views considered before deciding.

G. W. Sutton, G4EVW

OBITUARIES

The Society records with regret the deaths of the following radio amateurs:

Mr A. Bayliss, BSc, CEng, FIEE, G8PD/PA0AAR
Alan Bayliss, who died a few days before Christmas, had been in electronics research and development all his working life. From 1971 until retirement in 1979 he was at the European Space Agency in Holland, where he was active as PA0AAR. He was licensed in 1937 and had been an active member of the RSGB since before the war.

He contributed several articles to the Society's journal: was co-author of *VHF Techniques* published in 1948; contributed to the third and fourth editions of the *Amateur Radio Handbook*, and to the eighth edition of the *Radio Amateurs' Examination Manual*. He was the organizer, at Wembley, of one of the first RAE courses in the country, and remained as its tutor until 1971.

He retired to Freckleton, Lancs, where he was active on hf and 144MHz. He was a regular attendee at meetings of Blackpool & Fylde ARS and Thornton-Cleveleys ARS.

Mr R. G. Clark, G6BJ

Bob "Nobby" Clark died on 2 January. He was well known to the members of RNARS for his services to GB2RN—HMS Belfast, and was a long-standing member of both the RSGB and SRCC.

Mr L. Davies, G3ZF

Les Davies died on 17 December 1980, aged 75. He passed the RAE and Morse Test early in 1979 to re-activate his pre-war call sign. He was an active Crawley ARC member, and enjoyed the local nets and dx "ragchews" on 3.5, 14 and 144MHz ssb/fm.

Mr W. K. Findlay, GM3RSZ

Kenny Findlay, who died on 17 June 1980, was a keen member of the RSGB and RNARS.

Mr E. Gaukrodger, G6GU

Eric Gaukrodger died on 22 December 1980. He was first licensed as 2ABW in 1930 and as G6GU in 1931. He was a leading operator in NFD in the early 'thirties and with Number Five District (Bristol and Gloucester) won the event in 1934.

He was always a staunch supporter of Bristol RSGBG and was well known for his stories of the early days of amateur radio. Since 1932 he had been a stalwart of top band.

Mr D. Kelsull, G3ERC

Douglas Kelsull died on 11 December 1980, aged 58. He served in the RAF Signals during the second world war. He was an active cw operator on all hf bands and latterly his main interest had been low power, using home-built equipment.

Mr C. J. Morris, G3ABG

John Morris, who died on 9 January, aged 57, founded WAB in 1969. Earlier he had been interested in cw dx chasing. He was very active on 1.8, 3.5 and 7MHz in WAB nets up to the time of his death, and had just returned to 144MHz.

He was a member of TOPS CW Club, RAFARS and a life member of the Cannock Chase ARS. He had been a member of the RSGB since 1946.

Mr D. Plunkett, G8RNP

Don Plunkett died on 6 December 1980. He was a member of the Crawley ARC, and although he had been licensed only a short while, his interest in radio dated back some years. He was very active on 144 and 432MHz until the time of his death.

Mr C. Reed, G3MQQ

Chris Reed died in August 1980. In earlier days he had enjoyed NFD, but latterly had been heard on 3.5MHz using cw from a home brew crystal controlled rig.

Mr G. Windsor, G8FIJ

George Windsor, who died in July 1980, was a keen and active member of the Preston ARS. He obtained his licence in 1971, and was a former secretary of the club. He showed an interest in all aspects of amateur radio.

We have also been advised of the deaths of:

Mr D. M. Gledhill, G8QJ, on 11 December 1980; and

Mr R. G. Smith, G4CHW, on 17 August 1980.

RSGB PRESIDENTIAL INSTALLATION

The installation of Basil O'Brien, G2AMV, as 47th President of the RSGB took place at the Queen Hotel, Chester, on Saturday 10 January, during a social evening attended by over 250 people. Not only were there many members from RSGB Region 1, of which G2AMV was regional representative for many years before being elected to Council, but visitors came from the length and breadth of the UK. Prominent among them was Mr D. E. Baptiste, of the Home Office, who was the Society's guest.

After the formal part of the proceedings the guests enjoyed music, dancing and convivial conversation until past midnight, and much pleasure was expressed at the excellence of the function. Thanks are due to the President and his lady for the organization, and to RR1 and members of local clubs who supported them.



Immediate past-President Peter Balestrini investing Basil O'Brien with his collar and badge of office as 47th President of the RSGB



The newly-installed and immediate-past Presidents with their ladies



Council's first lady member Joan Heathershaw receiving her Council member's badge



A happy time was had by all!



The first meeting of the 1981 RSGB Council held prior to the Presidential Installation. Above, 1 to r, Mr P. F. D. Cornish, Mrs J. Heathershaw, Messrs G. M. C. Stone, R. G. Barrett, E. J. Allaway, J. Bazley, G. R. Jessop, J. Anthony, B. O'Brien, D. A. Evans (general manager), Right, 1 to r, P. Balestrini, D. M. Pratt, D. S. Evans, K. A. M. Fisher, G. I. Knight, L. Hawkyard, A. W. Hutchinson (editor), R. Bellerby





Mr D. E. Baptiste, of the Home Office, and Mrs Baptiste in conversation with RSGB past-President Fred Ward, G2CVV (r)



Mr and Mrs O'Brien with just a few of those who enjoyed the social aspect of the event

COUNCIL PROCEEDINGS

A brief report of the Council meeting held on 15 November, 1980.

Present: Messrs P. Balestrini (President, in the chair), D. J. Andrews, J. Anthony, R. Bellerby, R. G. Barrett, T. P. Douglas, Dr D. S. Evans, Messrs K. A. M. Fisher, L. N. G. Hawkyard, G. R. Jessop, G. I. Knight, B. O'Brien, G. M. C. Stone (members of Council), D. A. Evans (general manager), A. W. Hutchinson (editor). Apologies for absence were received from Dr E. J. Allaway, Messrs J. Bazley, P. F. D. Cornish, W. F. McGonigle and D. M. Pratt.

Financial report

The general manager outlined the main points in the three-monthly accounts to 30 September.

The President said that the honorary treasurer had indicated his willingness to serve on Council for a further three years, and it was proposed and approved that Mr Cornish be invited to serve on Council for a further three years. Thanks were expressed to the honorary treasurer for his work on behalf of the Society.

General manager's report

The general manager circulated details of Society membership since the beginning of the financial year; the rate of membership increase in the first four months of which was just under 12 per cent. At the latest count the Society had 61 per cent of all UK licensed amateurs as members.

The general manager circulated copies of the ECM booklet from IARU, the new RSGB interference booklet and the new RSGB planning booklet.

A list of RSGB awards circulated, and after deliberation, Council awarded the Founders Trophy to Mr E. Yeomanson, G3IIR; the Calcutta Key to Mr R. F. Stevens, G2BVN; and the Mullard Award to the Oxford EME Group.

Council also confirmed the following awards: the Marconi Medal to Mr C. Suckling, G3WDG; and the RAEN Trophy to Mrs J. Balestrini.

The general manager reported on the Leicester ARRA Exhibition, at which approximately 280 RSGB identity cards were issued and 142 new members enrolled.

Review of committee business

Education (6.9.80)

Mr Anthony said that the Society had been invited to give a lecture at the Atlantic College in Wales.

In reply to a question from Mr Bellerby, Mr Anthony confirmed that the committee was preparing a paper for the IARU Region 1 Conference in 1981.

Finance & Staff (28.8.80, 9.10.80, 15.10.80)

The minutes of these meetings were accepted without discussion.

HF Contests (18.9.80, 16.10.80)

There was a brief discussion on RSGB-organized df events.

IARU (25.9.80)

The minutes were accepted without discussion.

Membership & Representation (4.9.80)

A brief discussion took place on size and composition of the committee, and it was agreed that it should continue as at present.

Microwave (7.10.80)

Dr Evans said that the main business of the committee at present was in preparation for the IARU Region 1 Conference to be held in Brighton.

Rally & Exhibition (14.10.80)

Council endorsed a vote of thanks to all the volunteers who assisted at the Leicester Exhibition.

Following a short discussion Council reaffirmed that no citizens band equipment could be advertised or sold at any RSGB organized event.

After discussion Council agreed that if the new 50,000ft² temporary building was not available for the 1981 Alexandra Palace Exhibition the smaller permanent hall be used, but that every effort be made to avoid cramped conditions. Council also agreed that using Sandown Park as an alternative venue for the exhibition would not be a good idea as it would mean that two main Society events would be held at the same venue.

Propagation Studies (4.9.80)

Mr Stone and the general manager commented on the 13 November 1980 propagation research meeting which had taken place at the IEE. Mr R. Flavell and Mr C. Newton had attended to look after the Society's interests. It seemed that the efforts of radio amateurs were much appreciated.

Raynet (4.10.80)

Mr Balestrini reported that the committee had, after much discussion, accepted the need for a structure based on a more regional system. Following a lengthy discussion, Council decided that it wished a new representation system to operate as from 1 January 1981, and empowered Messrs Balestrini, Bellerby, Jessop and Yeomanson and the general manager to arrange the first elections and send out ballot papers.

Technical & Publications (17.9.80)

Dr Evans reported on the current book production programme, and on the approval by the Finance & Staff Committee of the experimental production of a Microwave Newsletter at the cost of £3 for 10 issues.

Dr Evans reported that work was now continuing on the crystal calibrator kit.

Mr Jessop commented on the long delay to the new edition of the VHF/UHF Manual. In reply, Dr Evans reported that he was currently spending two hours per day on the microwave chapter.

Telecommunications Liaison (18.9.80)

There was some discussion on the Society's submission to the Home Office in response to the green paper on "Open Channel".

Council also discussed the present situation regarding the Society's proposal for a novice licence which it had submitted to the Home Office.

VHF (13.9.80)

Mr Douglas said that there was a possibility that Mr Fisher could take over as vhf manager and there was support for him within the committee. The President said that Mr Douglas had done an excellent job as vhf manager and thanked him for his efforts. These were endorsed by Council.

Mr Stone reported good progress with the 1981 VHF Convention.

VHF Contests (17.9.80)

The minutes were accepted without discussion.

Membership

Council approved the waiving of subscriptions in respect of three members.

Council approved the affiliation of North West of Ireland Amateur Radio Society, Leyton Linslade Radio Club, Mexborough & District Amateur Radio Society, Greenoch & District Amateur Radio Club, Ibstock Amateur Radio Society and Vale of the White Horse Amateur Radio Society.

Prestige presidents

Mr Jessop said that in the past the Society had benefited by having prestige presidents such as Lord Wallace of Coslany and Dr John Saxton, and suggested that the Society appoint a prestige president every three to four years.

After discussion it was agreed that this subject should be discussed by the President's working party.

IARU membership

It was proposed and approved that the Society vote in favour of the admission of the Associazione Radio Amatori Della Repubblica Di San Marino to the International Amateur Radio Union.

Retirements from Council

Mr Fisher said he was now at the end of his co-opted term on Council. He hoped he would be able to rejoin Council in 1981 and thanked those present for their help.

Mr Douglas said he too had come to the end of his term of office on Council. He was sorry to be standing down and wished to thank everyone for their help.

Working groups and honorary officers

After some discussion on the work of groups, it was agreed that committees could form working groups for specific purposes provided that the proceedings of such groups were fully minuted and attached to the minutes of the parent committee.

There was general agreement that honorary officers should be asked to submit a short report for the supplementary agenda at each Council meeting.

CONTEST NEWS

VHF NFD 1981 rules

The 1981 VHF NFD now has two sections, an *open* section under the same rules as last year, and a *restricted* section to enable the smaller clubs or groups to compete on an equal level.

Figures in square brackets refer to the general rules for vhf/uhf contests published in the January 1981 issue of *Radio Communication*.

- Duration.** From 1600gmt 4 July to 1600gmt 5 July 1981.
- Bands.** Up to four separate stations can be used, operating on the 70, 144, 432 and 1,296MHz bands. Only one station can score or give points on each band. Single-band entries on 144MHz will not be accepted.
- Operators.** Any RSGB member or group of members operating from the British Isles (excluding Eire) may enter. Two groups operating from the same site can combine their scores subject to rules 2 and 4.
- Stations.** All the stations forming one entry must operate from within a circle of 1km radius centred on the operating position of any of the stations. Proof of permission to use a site may be required. All equipment, including antennas, must be installed on the site during the 24h preceding the contest or during the contest. Only portable accommodation can be used to house the stations. The site may not be used for any transmitting activities by the group or member during the five days before this time.

Stations may not use public mains supply. Power for all equipment must be derived from an on-site generator or battery.

- Scoring.**
 - On the 70, 144 and 432MHz bands, contacts will be scored by the radial ring system [7a].
 - Contacts on 1,296MHz will be scored at one point per kilometre.

- Contest exchanges.**
 - Contestants must exchange both callsigns, signal reports, serial numbers (starting at 001 on each band), QTH locator and QTH [12a]. Only one scoring contact on each band may be made with a given station [11a].
 - The QTH given on 1.3GHz must differ in form from that given on the other bands, eg a location given as "10km north of Marlborough" on 432MHz could be given as "8km south-west of Swindon" on 1.3GHz.

The 1.3GHz station may operate on any other band for the purposes of arranging a contact, but the exchange of contest information must take place on 1.3GHz only and may not be interrupted by recourse to another band. CQ calls on another band should clearly be "for 1.3GHz only".

- Sections.** There will be two sections:
 - (R) Restricted section:**
 - The power output on any band may not exceed 25W p.e.p. or cw.
 - The height of any antenna may not exceed 35ft agl.
 - Only one antenna per band may be used (eg no stacked or bayed arrays).
 - (O) Open section.** As per licence.

- Inspections.** All stations are subject to inspection by members of the VHF Contests Committee or nominated representatives.

Competing stations must give site access details to any inspector if asked to do so, and must permit the station(s) to be inspected.

- Entries.**
 - All entries must be postmarked not later than 20 July 1981.
 - Separate sets of log sheets and 427 cover sheets are required for each band.
 - A summary sheet 4422 must also be completed. Otherwise the scores on each band will be listed, but the total will not appear in the overall results table.
 - Entries must be addressed to: The Chairman, VHF Contests Committee, 12 The Rampart, Haddenham, Cambs CB6 3ST.

- Other rules.** The following general rules will also apply: 5a, 6a, 8b, 9, 11a, 12a, 13-24.

- Awards.** The Surrey Trophy will be awarded to the overall winner in the Open section, and the Tartan Trophy will go to the leading Scottish entry. Certificates of merit will be awarded to the winners and runners-up in all sections.

Region Round-up Contest rules

TRANSMITTING SECTION

- The general rules for RSGB hf contests, published in January 1981 issue of *Radio Communication*, will apply.

- Eligible entrants.** All paid-up members of the RSGB resident in the British Isles (G, GD, GI, GJ, GM, GU, GW) holding a Class A licence. Single-operator entries only may enter.

- When.** 0700 to 1200 on Sunday 17 May.

- Contacts.** CW only. IARU Region 1 band plans must be observed. Bands 3.5 and 7MHz only. Entrants are requested to confine their operation on 3.5MHz to the section 3,510-3,590kHz.

Reports: RST and serial numbers must be exchanged, followed by R and the number indicating the operator's RSGB Region (eg R03).

Section (a) Up to 150W input.
Section (b) QRP—up to 10W input.

- Scoring.** Three points for each completed contact with a station within the British Isles (G, GD, GI, GJ, GM, GU, GW). Each station may be contacted for points only once on each band. The final score is the total points on each band added together and then multiplied by the total number of RSGB Regions worked on each band added together.

- Entries.** Separate log sheets must be used for each band, with the claimed score for each band clearly shown. A cover sheet with the combined score and a signed declaration must accompany the logs, which should be sent to: RSGB HF Contest

Committee, c/o Dr John Allaway, 10 Knightlow Road, Birmingham, B17 8QB, postmarked no later than Monday, 1 June 1981.

- Awards.** Certificates will be awarded for the first, second, and third places in each section.

RECEIVING SECTION

- The general rules for RSGB hf receiving contests, published in the January 1981 issue of *Radio Communication*, will apply.

- When.** As transmitting section.

- Operation.** As transmitting section.

- Logging.** A station may only be logged once in the column headed "Station heard" and not more than 10 times in the column headed "Station worked" on each band. When both sides of a contact are heard, claim for points may be made for logging one station only, not both.

- Scoring.** Three points for each contact correctly logged. Other details as in transmitting section.

- Awards.** Certificates will be awarded for the first, second, and third places.

1,296MHz Trophy Contest rules

1600-2400gmt, 4 April 1981

The following general rules, published in the January 1981 issue of *Radio Communication*, will apply: 1, 2, 3, 4a, 5a, 6a, 7b, 9, 10b, 11a, 12a, 13-24.

All entries and checklogs to: VHF Contests Committee, c/o Mr L. Hawkyard, G5HD, The Ery, Newton St Petrock, Nr Torrington, Devon EX38 8LU.

144MHz CW Contest rules

0900-1500gmt, 26 April 1981

The following general rules, published in the January 1981 issue of *Radio Communication*, will apply: 1, 2, 3, 4a, 5a, 6b, 7a, 9, 10a, 11a, 12a, 13-24.

All entries and checklogs to: VHF Contests Committee, c/o Mr G. M. C. Stone, 11 Liphook Crescent, Forest Hill, London, SE23.

432MHz Trophy Contest rules

0900-1700gmt, 5 April 1981

The following general rules, published in the January 1981 issue of *Radio Communication*, will apply: 1, 2, 3, 4a, 5a, 6a, 7a, 9, 10a, 11a, 12a, 13-24.

All entries and checklogs to: VHF Contests Committee, c/o Mr L. Hawkyard, G5HD, The Ery, Newton St Petrock, Nr Torrington, Devon EX38 8LU.

Second 1.8MHz Contest 1980 results

Activity from within the British Isles was less than usual, but this was offset to some extent at least by increased participation from the Continent—some 20 countries (outside G) featured in the logs. The HF Contests Committee is pleased with the interest being shown in this contest from overseas, and in particular is pleased to record its gratitude to the Norwegian authorities for exceptionally permitting LA amateurs to work 1.8MHz during the contest weekend.

The leading entrant, G3RBP, achieved a checked score of 699 points from 150 QSOs (53 of them attracting bonus points). In the first leg of the competition for the Maitland Trophy, GM4ALK with 632 points leads GM3ZSP (last year's recipient) by just 12 points. Leading "First timer" is G3BPM, who made 66 contacts, worth 344 points, some way ahead of the runner-up in this category, G3ZAY.

In general the standard of the logs was pretty good; there were few errors in the exchange of "contest information" ie RST plus serial number, and in callsigns. However, some entrants clearly failed to thoroughly examine their logs for duplicate contacts, and they have been penalized accordingly (see general rules for RSGB hf contests, rule 15). One northerly station's log contained six unmarked duplicate QSOs; he would have been highly-placed had he properly "de-duped" his entry.

Subject to Council approval, the Victor Desmond Trophy will be awarded to G3RBP. Certificates of merit will be sent to G3PDL and G3XTJ, and to those overseas stations indicated.

Comments from competitors

- "Lost QSOs because stations confused me with G3RBP" — G3RBP.
- "In view of increased EU activity we'd better have the extra hour back" — G3XTJ.
- "We in the far west are at a big disadvantage, especially when it comes to working the Continentals" — GW3NYY.
- "One third of my QSOs were with EU, but where were all the Gs?" — G3XTT.
- "Thanks for keeping the times reasonable" — G3LCH.
- "How about an article on contest technique" — G4JHQ.
- "It is very frustrating when your British Isles stations can work each other but we overseas stations cannot." — OZ1LO.

G3NKS

BRITISH ISLES SECTION					
Posn	Callsign	Points	Posn	Callsign	Points
1	G3RBP	699	22	G3OGY	458
2	G3PDL	661	23	G3YMC	456
3	G3XTJ	661	24	G3GC	450
4	GMAIPS	657	25	G3VRY	423
5	G4CP	644	26	G3PJX	415
6	GM4ALK	632	27	G4CZB	382
7	GW3NYY/A	624	28	G3KZK	379
8	G3SYM/A	619	29	G3KKQ	378
9	GM3ZSP	619	30	G3OJ	378
10	G3TMA	603	31	GM3OXC	375
11	G3XTT	585	32	G3XZK	362
12	G3OLB	581	33	G3BPM	344
13	G3PSM	573	34	G3COJ	300
14	G3ZGC/A	555	35	G3ZAY	300
15	G3RWL	552	36	G4GYS	286
16	G3SNX	539	37	GW3JI	282
17	G3SJE	537	38	G4ARI/A	277
18	GW4ALG/A	536	39	G3BGM	233
19	G3TQD/P	534	40	G4JHQ	216
20	G2MI	528	41	G3FVW	195
21	G3LCH	487	42	G4IYE	150

OVERSEAS SECTION					
Posn	Callsign	Points	Posn	Callsign	Points
1	±DJ4AX	496	14	OL8CKB	147
2	±DF3KT	364	15	±HB9QA	139
3	±OZ1LO	359	16	OL8CIR	125
4	OZ1WO	348	17	HB9BNB	117
5	DJ0OE	320	18	±SP9ADU	115
6	DF6JT	311	19	OK1MSB	108
7	±LA9SC	282	20	DK5XF	107
8	±OL5AWJ	243	21	OL8CLL	97
9	±UP2BAW	231	22	±UB5UGF	64
10	LA2EG	223	23	±UP2BBF	63
11	OK1DAV	205	24	OK2BQU	59
12	OK1KFQ	198	25	OK1KSH	16
13	OK2BWM	192		±UL7CAD	16

*First time entrants

± indicates certificate winner

Disqualified: G4HYU (claimed score 350) - Rule 8 (no serial numbers recorded).

Check logs are acknowledged with thanks from: G3FXA, G3NKS, G3YDX, LA2HC, LA9TG, UK2PCR, UO5ODB, UT5BN and UA1NA.

144MHz Fixed Contest results

This event continues to be one of the best supported contests in the vhf calendar. Conditions were poor to average, with occasional opportunities for most stations to work some dx. The two leading multi-operator stations took advantage of their position on the east coast to work a large number of Continental stations. GJ4ICD was well-placed to achieve a higher score from fewer contacts than runner-up G3NAQ in the single-operator section. The best dx in the contest was the contact between G8ZHP and DD3UD in EI14j at 770km.

A few bad signal reports were received, but they all referred to different stations. The quality of the logkeeping left something to be desired, with many entrants losing points for errors and omissions, particularly by not recording QTH information. If QTH details are available, they must be logged, even from Continental stations. Suggestions were received from several entrants for a 25W section, and this may be taken up for the 1981 event.

The equipment used by the leading stations was:

G3ZIG/A TX: 2x4CX250B RX: FT221R/Mutek Ant: 10-el quad at 110ft
G4DEZ TX: 2x8874 RX: 3SK88/diode ring Ant: 16-el F9FT at 35ft
GJ4ICD TX: 2x4CX250BM RX: TS770/BF981 Ant: 10-el Yagi at 35ft
G3NAQ TX: 2x8874 RX: BF960/MD108 Ant: 16-el F9FT at 60ft

Congratulations to the Norfolk VHF/UHF Contest Group G3ZIG/A, operated by G3ZIG, G8GTZ, G8ECN and G8VLL; and G4DEZ, operated by G4DEZ and G8NNJ in section "M"; and in section "S" to GJ4ICD and G3NAQ.

G3XDY

Contests calendar

7-8 March	ARRL DX (Phone) (Rules in February issue)
*7, 8 March	March 144/432MHz and SWL (Rules in January issue)
14-15 March	Commonwealth (Rules in December issue)
21-22 March	Bermuda 1981 (Rules in February issue)
21-22 March	Canadian ARF Phone Commonwealth (Rules in February issue)
21-23 March	BARTG Spring RTTY
28-29 March	CQ WW WPX SSB (Rules in March issue)
29 March	Barking R&ES 144MHz (Rules in March issue)
4 April	1,296MHz Trophy & SWL (Rules in March issue)
5 April	432MHz Trophy & SWL (Rules in March issue)
5 April	Ropoco 1 (Rules in March issue)
11-12 April	EEC DX (Rules in March issue)
12 April	Low Power (Rules in February issue)
18-19 April	Second Spring BARTG VHF/UHF (Rules in March issue)
25-26 April	Helvetia (Rules in March issue)
26 April	144MHz CW (Rules in March issue)
2-3 May	144MHz & SWL
2-3 May	432/1,296/2,304MHz
17 May	Region Round-up (CW) (Rules in March issue)
24 May	144MHz Low Power & SWL
30-31 May	CQ WW WPX CW (Rules in March issue)
7 June	70MHz & SWL
13-14 June	HF NFD (Rules in February issue)
27, 28 June	Summer 1-8MHz
4-5 July	VHF NFD & SWL (Rules in March issue)
19 July	3-5MHz Field Day
2 August	144MHz QRP & SWL
11-12 August	Meteor Scatter
16 August	70MHz Trophy & SWL
30 August	Ropoco 2
5, 6 September	SSB FD
*5-6 September	144MHz Trophy & SWL
*3-4 October	IARU VHF (144MHz)
October/November	RSGB UHF/SHF
11 October	IARU UHF/SHF
18 October	432MHz Cumulatives
25 October	1,296MHz Cumulatives
*8 November	21/28MHz (Phone)
14, 15 November	21MHz (CW)
6 December	70MHz Fixed
	144MHz CW
	Second 1-8MHz
	144MHz Fixed

* IARU co-ordinated date

SECTION "S"					
Posn	Callsign	Points	QSOs	QTH	Km
1	GJ4ICD	2,220	183	YJ70	380
2	G3NAQ	2,008	270	ZL34	400
3	G8EEM	1,324	173	ZO22	400
4	G8PJZ	1,177	209	ZL57	300
5	G4DEE	1,033	195	YN39	250
6	G4JZF	830	182	YM30	80
7	G8IQO	763	100	AK12	350
8	G4HYD	752	132	ZN18	350
9	G4ARI	690	163	ZM24	15
10	GW4EAI	686	121	YL25	250
11	G4ILI	641	151	YL10	200
12	G3SCZ	512	145	ZL45	400
13	G4FRE	498	62	AM76	400
14	G8RXX	494	150	ZL28	15
15	G4EUR	455	121	YL50	350
16	G3UFB	436	117	ZL19	80
17	G4HLX	424	120	ZM41	65
18	G8IFT	415	119	YM50	200
19	G3ZVV	410	167	ZL40	250
20	GW8NVN	405	104	YL55	100
21	G8KAX	383	108	AL32	100
22	G8ULU	374	67	AL56	40
23	GM8YJU	362	43	YO05	25
24	G8NRP	360	104	ZL24	300
25	G8VQJ	335	53	AM64	100
26	G8XNR	330	125	ZL48	80
27	G8VSW	323	57	AM64	80
28	G8XQS	313	91	ZM63	25
29	G3GDU	312	93	ZL80	200
30	G8GGG	308	82	ZL24	50
31	G8PRH	304	85	YN38	150
32	G8YQZ	301	62	ZM39	150
33	G8IQR	275	75	YN38	30
34	G8UVV	255	73	YN78	8
35	G4HIJ	251	69	ZN72	200
36	G8OMI	245	71	ZM41	80
37	GW8TVX	227	51	XL30	80
38	G4HYG	225	51	YN28	60
39	G4ALG	218	92	ZL27	20
40	G8TLC	204	62	ZM25	35
41	G3PBA	198	71	ZL38	10
42	G8LXY	175	74	ZL09	10
43	G4HUP	172	56	YM10	18
44	G3VIP	169	34	ZN40	50
45	G8WRD	162	67	ZL46	40
46	G8UYZ	162	51	ZN12	25
47	G3TWG	148	60	ZL37	90
48	G4HFT	147	53	YL09	3
49	G8YCV	128	49	YL59	40
50	G8XTJ	93	37	ZL27	10
51	G8NVV	92	39	YN38	20
52	G8AKB	85	25	ZM27	3
53	G8TJZ	83	19	YN07	10
54	G8NVP	76	36	ZN12	10
55	G5DF	73	14	ZO51	10
56	G2WS	55	13	YL56	65

SECTION "M"					
Posn	Callsign	Points	QSOs	QTH	Km
1	G3ZIG/A	3,266	264	AM27	400
2	G4DEZ	2,647	259	AL34	400
3	G3NNG	2,188	324	ZL23	400
4	G8VWA/A	1,732	309	ZL26	200
5	G8MDZ	1,649	212	AL76	75
6	G8ZHP	1,640	201	ZM29	300
7	GD4IOM	1,638	172	XO67	400
8	G5MW/A	1,574	222	AL53	300
9	G4DKB/A	1,442	163	AL33	30
10	G2BAR	1,215	197	YL47	400
11	G8PUB/A	1,167	221	AL52	300
12	G3UER	1,019	180	ZN35	300
13	G3OUL	862	186	YN46	300
14	G8TRS	856	209	ZM32	400
15	G3LTY/A	836	150	AL56	80
16	G4GKS	759	122	AM66	100
17	G4DOL	685	116	YK28	400
18	G3GJL	624	146	YM60	80
19	G3YMD/A	598	78	AL77	100
20	G8OHM	571	154	ZM41	200
21	G4JNI	566	149	ZL42	100
22	G8DPQ	556	153	ZL68	80
23	G4GSO	530	148	YN49	80
24	G3IGO	512	143	ZL68	400
25	G4HBA	494	110	ZN12	100
26	G4BVY	412	128	YM79	3
27	G8TPR	394	154	ZL39	250
28	G8EXW/A	352	120	ZM41	10
29	G8SAD	339	125	ZL10	100
30	G8TMI	326	91	ZM53	100
31	G4HRE/A	301	89	AL23	20
32	G8SIG	286	102	YN68	24
33	G8NPH/A	249	76	ZM39	60
34	G4DDL	218	86	ZL47	10
35	G8WYN	205	67	ZN13	80
36	G3FVA	201	80	YN49	100
37	G8COA	185	76	YL10	60
38	G3TAD	172	63	YL48	25
39	G3RAL	139	100	ZM15	400
40	G4KAL	111	46	ZN40	100
41	G8KUC	107	37	AL56	80
42	G8YTV	100	37	ZN12	25
43	G8PFY	89	83	YN70	70
44	G8MWA/A	50	28	AL53	50
45	G8NIP/A	11	5	ZO80	10

Disqualified: G8VYK/A: general rule 20b. Check logs gratefully acknowledged from G8TXV, G8WCU and G8XFT.

ROPOCO 1 1981 rules

Sending "rotating post codes" instead of serial numbers gives an interesting new aspect to contests. A satisfactory response to the first event held under these rules in August 1980 has prompted the HF Contests Committee to organize two further events during 1981.

1. The general rules for RSGB hf contests, published in the January 1981 issue of *Radio Communication*, will apply.
2. **Eligible entrants.** All paid-up members of the RSGB resident in the British Isles holding a Class A licence. Single-operator entries only.
3. **When.** 0800 to 1000gmt, Sunday 5 April 1981.
4. **Contacts.** CW in the 3-5MHz band only. Entrants are requested to confine their operations to 3,510 to 3,590kHz. Send RST plus—for the first contact, entrant's own postal code; for the second and subsequent contacts, the postal code received in the previous contact.
5. **Scoring.** 10 points per contact.
6. **Entries.** Logs must be sent to D. J. Andrews, G3MXJ, 18 Downsview Crescent, Uckfield, East Sussex TN22 1UB, postmarked not later than Tuesday 21 April 1981.
7. **Awards.** Certificates will be awarded to the first, second and third placed entrants.

Barking R&ES 144MHz Contest rules

1300-1700gmt, March 29, 1981

The following RSGB general rules apply: 4b, 5a, 6a, 10a, 11a, 13-16, 19, 20 21b, 23.

Section 1. All licensed operators residing in the county of Essex.

Section 2. All licensed operators residing outside the county of Essex.

Section 3. All short wave listeners.

Scoring. Sections 1 and 2: one point per contact; 10 per contact with G3XBF/P. The total score is to be multiplied by the number of UK postal counties worked. Countries outside the UK count as additional counties. Section 3: scoring will be as above but with these differences:

(a) Only contacts made by stations taking part in the transmitting sections of the contest will count for points.

(b) Logs must include: date, time, call sign of station heard; report RS(T) by swl of station heard; call sign of station being worked; and points claimed. A particular station must only appear once in the "station heard" column.

Contest exchange. The contest exchange shall consist of: (a) call sign; (b) RS or RST report followed by serial number beginning with 001; and (c) Postal county.

Awards. Certificates will be awarded to the winners and two runners-up in all sections. The ruling of the society's committee will be final in all cases of dispute.

Logs. All logs to be sent to: A. L. Sammons, G8LZN, 80 Lyndhurst Gardens, Barking, Essex IG11 9XZ. Telephone enquiries to 01-594 2471.

2nd Spring BARTG VHF/UHF Contest rules

1800gmt 18 April to 1200gmt 19 April 1981

The rules for this contest are the same as those for the 1st Spring BARTG VHF/UHF Contest published on page 286 of *Radio Communication* March 1980, with the exception that logs must be postmarked no later than 16 May.

Copies of the rules can be obtained from Mr C. Plummer, G8APB, 148 Porter Road, Brighton Hill, Basingstoke, Hants RG22 4JT.

12th BARTG VHF/UHF Contest results

Conditions were not good and activity was down: 63 UK and 31 Continental stations being active on 144MHz, and 21 UK and 10 Continental stations on 432MHz.

Congratulations to G. P. Shirville, G3VZV, operating Dunstable Downs club call G4ARD/A as a single operator, and to Ealing & DARS using GW3UUP/P in the multi-operator section.

SINGLE OPERATOR									
Posn	Callsign	Points	144MHz		Km	Points	432MHz		Km
			Contacts allowed	Best dx			Contacts allowed	Best dx	
1	G4ARD/A	105	23	F9XG	276	30	8	G8DVR/A	222
2	DC1ZN/P	166	28	G3NNG	795	17	9	DG6FX	53
3	G8LWY	78	24	GW3UUP/P	221	26	8	GW3UUP/P	221
4	G8CDL	58	16	F9XG	267	23	7	GW3UUP/P	196
5	G8MWU	143	22	G3VYV	328	3	3	G8MAF	37
6	G8RBY	106	18	G4BSF	247	7	1	GW3UUP/P	168
7	G8MAF	41	13	GW3UUP/P	226	11	5	G3NNG	101
8	G18HX	75	7	GW3UUP/P	370	3	1	G18DMX	55
9	G8QQH	86	18	G8MWU	271	—	—	—	—
10	G3VYV	80	12	G8MWU	328	—	—	—	—
11	G4IAT	62	10	G8MWU	325	—	—	—	—
12	G3HJC	45	13	G3VYV	180	—	—	—	—
13	G8CDW	28	12	GW3UUP/P	220	—	—	—	—
14	G3RDG	28	10	GW3UUP/P	223	—	—	—	—
15	G4EEV	14	6	—	—	—	—	—	—

MULTI-OPERATOR									
Posn	Callsign	Points	144MHz		Km	Points	432MHz		Km
			Contacts allowed	Best dx			Contacts allowed	Best dx	
1	GW3UUP/P	234	26	F9XG	376	69	10	F9XG	376
2	G3NNG	231	29	DC1ZN/P	795	44	6	G18HX	490
3	G8DVR/A	88	16	G8MWU	310	28	5	G3NNG	224

Looking ahead

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

29 March—Northern Radio Societies Radio and Electronics Exhibition, Belle Vue, Manchester.

11 April—RSGB National VHF Convention, Sandown Park Racecourse, Esher, Surrey.

27 April-1 May—IARU Region 1 Triennial Conference, Brighton.

28-30 May—RSGB National Amateur Radio Exhibition, Alexandra Palace, London.

12 September—Scottish Amateur Radio Convention, Glenrothes.

27 September—Welsh Amateur Radio Convention, Blackwood.

10 October—Midlands VHF Convention, Wolverhampton Polytechnic.

11 October—EI/GI Convention, Ballymascanlon.

Mobile rallies calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

15 March—Pontefract & DARS Components Fair, Carleton Community Centre, Pontefract. Open 11am. Talk-in, on-site parking, licensed bar, bring and buy, RSGB publications. Emphasis on build-your-own. Details from G4AAQ, QTHR, tel 0977 71071.

12 April—White Rose Rally, West Park Girls High School, Spen Lane, Leeds 16, 11am. Usual attractions, good food a speciality. Further details from rally manager R. Hughes, G4DZI, QTHR.

26 April—Drayton Manor Mobile Rally, Drayton Manor Park, on A4091, nr Tamworth, Staffs. Organized by Midland ARS and Stoke-on-Trent ARS. Start 11am. Attractions include trade stands, Post Office, BM/CB Repeater Group, Raynet, flea market and bring and buy sale etc. Radio talk-in on 144 and 432MHz. Further details from N. Gutteridge, G8BHE, QTHR.

26 April—Southend & DRS Mobile Rally, Southend Airport Exhibition Centre, Aviation Way, Southend-on-Sea, Essex. Many attractions, including licensed bar, refreshments, parking for 300 cars, aircraft museum, talk-in station, bring-and-buy stall. Details from F. Thorogood, G8ORV, QTHR, tel Southend-on-Sea (0702) 616239.

3 May—Maidstone Mobile Rally, Y Sports Centre, Melrose Close, Cripple Street, Maidstone, Kent. 10am-5pm, trade stands open at 11am. A beer tent will be open during the rally. Details from G4GKW, c/o Y Sports Centre.

17 May—Northern Mobile Rally, Victoria Hall, Victoria Park, Keighley. Organized by the Otley R&ES. Doors open 11am, 10.45 for wheelchair and blind visitors. Talk-in on 144MHz and on GB3WF, RB14. Many attractions including film shows and safe play area for junior ops. Details from P. A. Horne, G8KRU, QTHR, tel 0943 74986, after 5.30pm.

24 May—East Suffolk Wireless Revival, Ipswich. Talk-in on 144MHz by GB4SWR. There will be a transceiver clinic and antenna testing range plus all the usual attractions: sideshows, stalls, light refreshments and bring and buy etc. Further details from Jack Toothill, G4IFF, QTHR. Tel 0473 44047.

31 May—Hull & DARS Mobile Rally, Hull University. Further details later. Contact I. B. Carress, G8EAB, 124 Dayton Road, Priory Road, Hull, Yorks.

14 June—RNARS 21st Birthday Mobile Rally, HMS Mercury, 10am-5.30pm. There will be talk-in on 432, 144 and 3-5MHz. Plenty of parking, with on-site space for invalid visitors. The usual trade stands and arena events will be present. Details from G4DIU, QTHR.

21 June—Denby Dale & DARS Mobile Rally, Shelley High School, nr Denby Dale. More details at a later date. Enquiries to J. Clegg, G3FQH, QTHR.

28 June—Rolls Royce Radio Club (Barnoldswick) Mobile Rally, Sports & Social Club, Barnoldswick. Trade stands, refreshments, bring and buy stall etc. Radio talk-in. Details from L. G. Logan, G4ILG, QTHR.

28 June—Bangor & DARS Mobile Rally. New venue: Crawfordsburn Scout Camp, Crawfordsburn Country Park, nr Bangor (Co Down). Usual attractions, bring and buy, refreshments, coastal walks, beach within 1 mile. Further details tba. Enquiries to club sec Roy Evans, G14KZN, tel Bangor 4072.

28 June—Longleat Mobile Rally, Longleat Park, Warminster. Preliminary enquiries, G4FRG, QTHR, tel 0272 848140.

12 July—Worcester & DRS Rally, formerly Upton Rally. New venue: Droitwich High School, Droitwich, Worcs, three miles from M5, junction 5. Further information will be announced later. Details from Tony Blissett, G8NSL, QTHR, tel Worcester 620507 or Mike Tittensor, G4EKG, QTHR, tel Evesham 41105.

19 July—Sussex Mobile Rally, Brighton Raceground, Racehill, Brighton, Sussex, 11am. Special event station GB2SMR will be in operation. Many attractions including free minibus trips to Brighton beach. Free parking for 4,000 cars. Further details from A. K. Barker, 38 Elphick Road, Newhaven, Sussex BN9 9SY.

19 July—Cornish RAC Mobile Rally, at the Cornwall Technical College, Pool, Camborne. Details from G2ABC, QTHR.

9 August—Derby & District ARS Mobile Rally. Lower Bemrose School, Littleover, Derby, site as previous years. All usual attractions. Details from hon sec Jenny Sharrow, G4EYM, QTHR, tel Derby (0332) 556875.

16 August—Preston ARS 13th Annual Mobile Rally, Walton-le-Dale County High School, Bamber Bridge, Preston (one mile from M6 junction 29). Talk-in on S22. Usual attractions including bring and buy stand. Open 11am. Details from G4KMC, ex-G8SIV, QTHR.

6 September—Vange ARS Mobile Rally, Nicholas School, Basildon, Essex. 10am-5pm. 144MHz talk-in station, call sign GB4VMR. Many attractions including trade stands, bring and buy, raffle, and refreshments. Details from Albert Smith, G4FMK, QTHR, tel 03743 3805.

20 September—Peterborough Mobile Rally. New venue: Werrina Sports Stadium. Talk-in on vhf, uhf and hf, GB3PMR. Many facilities, plenty of free parking, overnight caravan sites by arrangement. All the usual radio attractions in the sports hall, bring and buy, bar, refreshments available. Details from D. T. Wilson, G4KSW, 4 Conway Avenue, Peterborough, tel 76238, after 2pm and weekends.

27 September—Harrow Mobile Rally. A new venue is being negotiated, details to follow. Further information from Phil Dunbar, G8FRG, QTHR, tel 0279 39851, ext 251, office, 32486, home.

Special event station

GB4DSG, 14 March

The Microwave Associates Amateur Radio Group is having a demonstration station for the 1st Dunstable Scout Group to coincide with 70th anniversary celebrations. The station will be at the Scout HQ, off Brewers Hill Road, Dunstable, Beds. Proposed operation on all hf bands, top band, 144MHz, fm, ssb, 432MHz fm. Details from Ian, G4ASH, QTHR, tel Leighton Buzzard 378580.

CLUB NEWS

This is the first monthly, modified, "Club news", as described in the January issue of *Rad Com*. It contains only new information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue. Basic unchanged information on other affiliated organizations was published in the January issue and will be repeated in the July issue.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the May issue should reach them by 18 March, and for the June issue by 18 April.

Club programmes are given in the former style of date, subject, time and place of the meeting. All callsigns of club secretaries and other contacts are QTHR (correct in the current *RSGB Call Book*) unless otherwise stated. All clubs welcome visitors and would be pleased to hear from potential new members.

REGION 1—RR W. M. Furness, G3SMM, 16 Coniston Avenue, Sale, Cheshire M33 3GT.
Barnoldswick (Rolls Royce ARC-Barnoldswick)—4 March ("Slow scan tv", by Peter Burnett, G4BLI), 1 April (Free and easy. Birketts of Lincoln will have stall of goodies), 8pm. RR Sports & Social Club, Barnoldswick. CW class, Mondays, 7.15pm. RAE class, Tuesdays, 7pm. Sec Leslie G. Logan, G4ILG.

Blackburn (East Lancs ARC)—5 March (Surplus equipment sale), 7.30pm. New venue: Shadsworth Centre, Blackburn. New sec G4TJG.

Bury (BRS)—10 March ("Getting started on 23", by G8GTP), 7.30pm. Informal meetings on other Tuesdays for Morse tuition and practice, constructional projects (the club mpu project is now taking shape) and "natter and noggins" sessions. Mosses Community Centre, Cecil Street, Bury. RAE course is well attended and future plans include participation in hf and vhf contests during 1981. Details from Chris Marcroft, G4JAG, tel Ramsbottom 2168.

Chester (C&DRS)—Meetings Tuesdays, 8pm. YMCA, Chester. New sec P. J. Holland, G3TZO, 28 Speeds Way, Farndon, Chester.

Manchester (South Manchester RC)—6 March (Night df), 13 March ("Raynet", by P. Swanson, G8VSM), 20 March ("The technology of colour photography", by W. L. Seddon, G3VIV), 27 March (Club quiz), 3 April ("A 14MHz cw tx", by T. Winter, G4AOK). Informal meetings Mondays, 8pm. Sale Moor Community Centre, Norris Road, Sale. The club will be running a series of 1-8MHz df events during the summer, anyone interested should contact either G4JLG, or sec David Holland, G3WFT, tel 061-973 1837.

Manchester (UoMISTRS)—Manchester and Salford Student Net on S23, Wednesday afternoons during term time. More details from Nigel Allison, G8KHE, c/o UMIST RS, UMIST Union, PO Box 88, Sackville Street, Manchester M60 1QD, tel 061-236 9114.

St Helens (StH&DARC)—5 March ("Japanese Morse", by G3CSG), 12 March (On the air night), 19 March ("Protecting your gear", by Jeff Mills, Crime Prevention Officer, Merseyside Police, St Helens Division), 26 March (Club forum), 7.45pm. YMCA, North Road, St Helens. 29 March (Participation in NRSA Convention exhibition, Belle Vue, Manchester). Club nets: Sundays 11.30am, 144-575 (S23), Wednesdays, 7.30pm, 1-95MHz. Club call G4LCK now issued. Sec Paul Gaskell, G8PQD, tel St Helens 25472.

Stockport (SRS)—Second, third and fourth Wednesdays in each month, 8pm. Blossoms Hotel, Buxton Road (corner of Bramhall Lane), Stockport. Club net, 3.692kHz, 11am, 28-430MHz, 10am, Sundays. The society now has its first lady chairman, Mrs Christine Barrow, xyl of G8ILD.

Thornton-Cleveleys (TCARS)—4 March (Slide show and demonstration of amateur radio equipment), 18 March ("Regulations and planning permission for antennas", by G8GG), 7.30pm. St John Ambulance Hall, Fleetwood Road North (next to Gardeners Arms), Thornton. From 30 March, meetings will be held every Monday at 7.30pm in the Sports Centre, Victoria Road, Cleveleys. These are new premises with a bar and

shack. The RSGB President, Basil O'Brien, G2AMV, will preside at this first meeting. Details from A. Parr, G3IWP.

Wirral (WARS)—4 March (1981 contests calendar and associated problems), 18 March (Film show), 7.45pm. Sports and Recreation Centre, Grange Road West, Cloughton, Birkenhead. Pro Gordon Lee, G3UJX, tel 051-677 1518.

Wirral (W&DARC)—11 March (Surplus equipment sale), 28 March (Home brewing—alcoholic variety), 8pm. Sports Concourse, West Kirby, Wirral. Sec Ian Brookes, 28 Paignton Road, Wallasey, Merseyside L45 6TT, tel 051-653 5555.

RR1 would like to record his thanks to the Chester, Wirral and Wirral & District clubs and all others involved either directly or indirectly in the planning/execution of the Presidential Installation in Chester on 10 January. Thanks also to all who attended and for making the event a resounding success.

There will be some of the regular entries that are conspicuous by their absence from this edition of "Club news". Please note the preamble to January's "Club news"—if revised details/information are supplied to RR1 they will be submitted for publication.

REGION 2—RR D. S. Smith, G4DAX, Red Roof, Goathland, Whitby, North Yorks YO22 5AN. Tel 054 786 333.

Many Region 2 members will, I am sure, be pleased to note the change of format to include more news. In order to keep delays as short as possible the more important items of news may be telephoned to me on the above number. I will be at the Pontefract Component Fair and the White Rose Rally.

Denby Dale (DD&DARS)—Second and fourth Wednesdays in each month, 7.30pm. Pie Hall, Denby Dale. Sec J. Clegg, G3FOH. The club has had to alter its rally date because some traders had been invited to a cb rally on the same day (sign of things to come?); the new date is 21 June, still at the Shelley High School.

Goole (G&DARS)—Mondays, 7.30pm. The Grammar School, Boothferry Road, Goole, during school term only. Out of term, at the Chamber of Commerce building, Boothferry Road, Goole. Details from chairman G3VBI.

Halifax (Northern Heights ARS)—4 March ("Science and society", by Dr Mills), 11 March (Committee meeting), 10 March ("Developments in hi-fi", by G3USH), 1 April (AGM), 7.45pm. Bradshaw Tavern, Bradshaw, Nr Halifax. Sec G8NUC. The 70cm repeater operated by the club, G83WY, has had a complete overhaul by G4TQA. It is now fit and well and running 5W instead of the former 2W.

Harrogate Repeater Group (HRG)—A repeater group, based at Harrogate, has been formed with the aim of building and operating a 144MHz repeater to serve that part of North Yorkshire not already covered by G83NA and G83TW. Some site tests have been carried out, cavities are being made, and main components of the repeater itself have been acquired. Contact G4ATZ.

Hornsea (HARS)—Wednesdays, 8pm. The Mill, Mill House, Attic Road, Hornsea. Sec Mrs J. Heathershaw, G4CHH. The Christmas social was a great success, and celebrated another good year. RAE courses come high on this club's priorities.

Leeds (White Rose RS)—8pm. Moortown Rugby Football Club, Moss Valley, Alwoodly, Leeds 17. Sec G4GDL. Club net 8pm Thursdays on 3-750MHz. Preparations for the White Rose Rally are well advanced, so make sure that 12 April is marked in your diary.
Leeds (L&DARS)—Mondays, 8pm. Old Hall Golf Club, Woodhall Lane, Calverley, Leeds. Sec G8NVP. With its membership approaching 100, this recently-formed club is really marching forward. Apart from entering a number of hf and vhf contests, the club has a rig checking night (using gear lent by G3YEE), and club building project (stabilized power supply). An interesting comment from its newsletter: "I'm afraid to say that quite a number of organizations who would have allowed us to look around their premises now say sorry but security will not allow it". Another sign of the times!

Mexborough (M&DARS)—Fridays, 7pm. Harrop Hall, Dolcliff Road, Mexborough. Sec G3ZHI, tel Rotherham 814911. New entry here, from what seems to be a very active club. One scheme which it is running, which other club committees may find useful, is a magazine exchange. Apparently this club also had a rig testing session recently—always a well-spent club night if you can get the test gear.

Pontefract (P&DARS)—Details from G4DTC. The club's component fair will be held on Sunday 15 March at the Carlton Community Centre, Pontefract, between 11am and 4pm. A number of dealers in both new components and surplus will be present, so here is an opportunity to refill parts bins after winter building projects.

Scarborough (SARS)—Mondays, 7.30pm. Scarborough Cricket Club, North Marine Road, Scarborough. Sec G4JAO, tel Scarborough 862638. Having recovered from the dinner dance and other Christmas festivities, some of the members got stuck into the Affiliated Societies Contest, and a club activities questionnaire provided some interesting replies. Members of the club are to compete for the Worked All Europe Award. Preparations for Scarborough Rally on 26 July are well advanced.

UK FM Group Northern—1 March, 5 April, 7.30pm. The Royal Hotel, Church Street, Barnsley. Sec G8PLJ. Ernie, G8PLJ, has asked me to mention, for the benefit of new licensees, that the vhf repeater G83NA is operated (and financed) by this group, and prospective members can contact him, QTHR.

Wakefield (W&DRS)—10 March ("Teletext", by G4BLT), 24 March (RR G4DAX), 7 April (AGM), 8pm. Holmfild House, Denby Dale Road, Wakefield. Sec G4BLT, tel Wakefield 255515. The club was fifth in the 144MHz multi-operator trophy; results like that indicate a group that works together. The club has bought a Morse tutor and a Tonna 16-el 144MHz beam to hire to its members.

Wakefield—West Yorkshire Metropolitan Police Radio Club—Second Tuesday in each month, 8pm. The Police Academy, Wakefield, W Yorks. Sec, G4EIJ, c/o West Yorkshire Metropolitan Police, Laburnum Road, Wakefield. This club, which must unfortunately be limited to members of the force and ancillary staff, already has over 20 members and is growing fast.

Wharfedale Repeater Group—This group operates the hf repeater, G83WF, on RB14. Details from Jack, G3KKP.

York (YARS)—Fridays, except the third in each month, 7.30pm. United Services Club, Micklegate, York. Sec Keith Cass, G3WVO. The old year went out



Members of the Leeds & DARS who took part in the club's first df hunt. The "fox", G4IDC, is here surrounded by the array of dipoles, halos, beams and plumber's delights which, in fact, failed to find him in the time allowed

Photo: G4HSZ



Tom Beaumont, G4DVZ, (l) a director of LAR Modules Ltd, presenting the LAR Construction Trophy to Colin Colbeck, G4IER, the winner of the White Rose RS Construction Competition. Dave Titheridge, G4EZC (centre), was runner-up with his electronic keyer. A joint effort—a 16-element ZL Special—by Mike Fisher, G8TWU, and Colin Thomas, G3PSM, (r) came third. Photo: G4HSZ

with a swing at York, with 40 members and families at the annual dinner. Another "do" nearer Christmas brought 60 members to the club room, complete with food and other goodies. Plans are already laid for the club's participation at the Great Yorkshire Show on 14-16 July.

REGION 3—RR H. S. Pinchin, G3VPE, 61 Cole Bank Road, Hall Green, Birmingham B28 8EZ. Tel 021-777 1320.

Birmingham (Midland ARS)—24 March ("Additional 2m repeaters in the Birmingham area" by Ray Withers, G4KZH), 8pm. Room 118, University of Aston, Gosta Green, Birmingham. Sec G8BHE, tel 021-422 9787.

Birmingham (South Birmingham RS)—Thursdays (HF night on the air), Fridays (Construction and Morse classes), 7.30pm. 1 April ("Synthesizers for rigs" by Brian Hudson, G3NFX), 8pm. Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Sec G4GZL, tel 021-427 7104.

Bromsgrove (B&DARC)—13 March (AGM), 17 March (Informal gathering at the Parkgate Inn), 10 April (to be arranged), 8pm. Avoncroft Art Centre, Bromsgrove. Club net Mondays, 8pm. Sec G4HFP, tel Stourport (02993) 3818.

Cannock Chase (CCARS)—The committee now totals 16 of the members. The club meets on the first Thursday in each month (formal); other Thursdays (informal); 8pm. Bridgetown War Memorial Club, Bridgetown, Cannock. Sec G8VSU, 24 Rosemary Road, Cheslyn Hay, Walsall WS6 7DY.

Coventry Technical College (CTCARS)—The club meets every Monday and on 6 April Tom Douglas, G3BA, will give his unique talk on radio construction during his period as a prisoner of war in Siam. 7pm, Winfray Annexe of the college. Sec G8ISJ.

Hereford (HARS)—6 March ("The transatlantic meteor scatter tests" by D. J. Butler, G4ASR), 20 March (Informal), 8pm. Civil Defence HQ, Gaol Street, Hereford. Sec G4CNY, tel Hereford (0432) 3237.

Lichfield (LARS)—The club would particularly like to have new members with an interest or experience in contest participation. The present small but successful group seeks to enlarge and strengthen the team for this year's NFD and SSB Field Day. Club net: Sundays, 12 noon on 28-530MHz. Meetings on the first Monday and third Tuesday in each month, 8pm. "Swan" (bar), Lichfield. Sec G3NLY, tel Burntwood (05436) 71447.

Malvern Hills (MHRAC)—The club has a new secretary, and meets on the second Tuesday in each month, 7.30pm. The Foresters' Arms, Wilton Road, Barnards Green, Malvern. Sec G4BYV, 9 Wyche Road, Great Malvern, tel Malvern (06845) 62900. Morse classes available.

Shrewsbury (Salop ARS)—A technical library is being created and the following meetings arranged: 10 March (Visit to local TA centre), 12 March (Natternight), 19 March (Surplus sale conducted by G8NKO), 26 March (Natternight), 2 April (Construction contest), 9 April (Natternight), 8pm. Albert Hotel, Smithfield

Road, Shrewsbury. Sec G3VWH, tel Shrewsbury (0743) 51833.

Solihull (SARS)—17 March ("Additional 2m repeaters in the Birmingham area" by Ray Withers, G4KZH), 7.30pm. The Manor House, High Street, Solihull. Club nets: (G3GEI), Fridays, 9.30pm on 1.960kHz; and (G8ZLJ), Thursdays, 9pm on S19 or next lowest vacant channel. Sec G4JDL, tel 021-745 3098. Morse classes available.

Stafford (North Staffs Poly ARS)—Wednesdays during term, 2pm. Lab D2. Sec G. S. Yemm.

Telford (T&DARS)—11 March (Display of members' completed project, three items), 18 March (Construction contest), 25 March (Question and answer session to help RAE candidates and others), 1 April (AGM), 8 April (Natternight and G3ZME on the air), 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G8UGL, tel Telford (0952) 584173.

Wolverhampton (WARS)—9 March (Natternight), 16 March (Discussion and preparation for an exhibition and demonstration of amateur radio at the Wolverhampton Fiesta from 28 to 30 May), 6 April (to be arranged), 8pm. Neachells Cottage, Danescourt Road, Stockwell End, Tettenhall, Wolverhampton WV6 9PH. Sec G8EDG, tel Wolverhampton (0902) 763617.



Members of the Lincoln SWC (G4KRE, G3EAM, G8XSO, G8WDV, G3VRD, G4JES, G5MQN, G8TJE and G4CTQ) looking on as Bill Felton, G3XZF, uses—for the first time in 30 years—the callsign G5FZ which was first held by the Lincoln Wireless & Scientific Society nearly 60 years ago.

Photo: G8VGF

Worcester (W&DARC)—6 April (Film evening—"One man's meat" and "The hams wide world"). These films, produced by RSGB and ARRL respectively, provide an interesting comparison of amateur radio in the UK and USA), 8pm. "Old Pheasant", New Street, Worcester. Sec G4EKG, tel Evesham (0386) 41105.

REGION 4—RR M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel Derby (0332) 556875.

Derby (D&DARS)—The annual dinner will be held on 7 March in the Derby Room, Albion Restaurant, Derby. This year the club, which incorporates the Derby Wireless Club, celebrates the 70th anniversary of the founding of the Derby Wireless Club in 1911—the oldest radio club still in existence. Tickets for the dinner are available from Jenny Shardlow, G4EYM, tel Derby 556875. 4 March (Bring and buy sale), 11 March (Film show), 18 March (AGM), 25 March (Night on the air), 7.30pm. 119 Green Lane, Derby.

Derby (Nunsfield House ARG)—At the AGM G3OZ was elected president; Ken Clamp, G3ZOW, chairman; G8GBU, treasurer, and Ian Cage, G4CTZ, sec. 6 March (Video lecture on satellite communications by Dr Karl Meinzer), 13 March (Hints and tips for the home constructor), 20 March ("Home video", by Ian Cage, G4CTZ), 27 March ("Building glass fibre canoes—or microwave dishes", by Dave Garrett, G8MZA). Nunsfield House, Boulton Lane, Alvaston, Derby. The group has a well-equipped shack, the use of which can be arranged through a member of the committee. Sec G4CTZ, tel Derby 71875 or 799452.

Grimsby (GARCG)—5 March ("Practical antenna systems" by G3RGC), 19 March (Talk on maths and amateur radio by G3HTI), 2 April (Talk on the RSGB by Trevor Matthews, G3SZJ). New Alexandra Social Club, Cleethorpes. Sec G3RGC, tel Grimsby 894060.

Lincoln (LSWC)—The club celebrated the diamond jubilee of amateur radio in Lincoln, by the reissue of the call G5FZ, first held by the Lincoln Wireless and Scientific Society. The first contact with the reissued callsign was with Fred Ward, G2GVV, in Derby, RSGB President in 1971. Second and fourth Wednesdays of each month, City Engineers Sports and Social Club, Water-side, South Lincoln. Sec Mike Wells, G4JES, tel Lincoln 721277.

Matlock (Derwent Valley ARS)—2 March (Talk by Richard Buckley, G3VGV, on broadcasting techniques). Matlock Teacher Training College. The newly-elected sec is Jim Geeson, G4IDI, tel Bakewell 3784.

Melton Mowbray (MMARS)—20 March (Quiz evening with G3WKM and G3XJW), 7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray. Further information from Richard Winters, G3NVK.

Nottingham (ARCON)—Most of the uhf/vhf equipment which was stolen from the club's shack has been replaced, and the shack is now available on each meeting night. 5 March (Open forum), 12 March (Members are asked to bring their rigs and give a short talk about them), 19 March (Activity night in the shack), 26 March (Preparation for the WPX Contest),

28-29 March (WPX Contest from the club shack), 2 April (AGM, which will only be open to club members). Further information from sec, Mike Shaw, G4EKV.

Scunthorpe (SARC)—3 March (G8VIZ on "Video cassette recording"), 10 March (Hospital radio), 17 March (A cross word), 24 March (G3CCH on micro games). Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe. At the recent AGM the officers elected were: chairman, J. Stace, G3CCH; treasurer, T. Wislocki, G4JRY; sec Joe Sheardown, G8TII; and assistant sec, John Carline, G4JJY. The club has a well-equipped station in its cosy clubroom. More information from G8TII, tel Scunthorpe 732438.

Wigston (S&DARC)—13 March (Talk on the RSGB by Martin Shardlow, G3SZJ). United Reform Church, Wigston, Leicester. Sec Steve Parker, G8TLC, tel Leicester 61541, during office hours.

REGION 5—RR R. E. G. Kendall, G8BNE, 19 Willow Green, Needingworth, Huntingdon PE17 3SW. Tel St Ives (0480) 67538.

Cambridge (CUWS)—Mondays, 9 March (AGM), 2 May (Annual dinner), 8pm, St John's College Buttery Bar. Further details from G8OPB, Chris Budd, St John's College.

Leighton Buzzard (LLRC)—Meetings second and fourth Thursdays in each month, 7.30pm. Mentmore Road Pavilion, Leighton Buzzard. Further details, G8GIK.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 7EA. Tel Penn (049481) 4240.

High Wycombe (Chiltern ARC)—25 March (Construction contest). Details from sec G4IWC, tel Great Missenden 4504.

Maidenhead (M&DARS)—17 March (AGM, members please attend). Sec J. Patrick, G3TWG, tel Bourne End (06285) 25275.

Reading (RARC)—3 March ("Video recording techniques", by David Stone, G3NGF). Details from sec Chris Young, G4CCC.

Sincere thanks to all members who gave me their support in the 1981 Council election—RR6.

REGION 8—RR D. N. T. Williams, G3MDO, Seletar, New House Lane, Thanington, Canterbury, Kent. Tel 0227 66586.

Canterbury (East Kent RS)—5 March (Teach-in), 19 March (Pub evening), 2 April ("Flying" Pt 2, by Dave, G4ELP), 7.30pm. The Dominican Hall, St Peters Lane, Canterbury. Further details from secretary, G8PFE.

Dover (South East Kent YMCA ARS)—11 March ("Aerials", continued), 18 March (Junk sale), 25 March (Idiot's guide to the ZX80), 1 April (Construction contest), 8 April (AGM), 7.30pm. YMCA, Leyburne Road, Dover. Talk-in on G3YMD and G8YMD. Further details from G8KEN, G4EGQ and G8EGT.

Maidstone (MYMCAARS)—27 March (Presentation by Ambit International), 8pm. Y Sports Centre, Melrose Close, Maidstone. Details from J. Hastie, G4IRV, tel Medway 251387.

Tunbridge Wells (West Kent ARS)—13 March (RSGB tape lecture on "Auroras", by G3FKZ), 27 March (Slides on "members' shacks"), 10 April (Prestel demonstration and tour of Tunbridge Wells zone centre telephone exchange), 24 April (AGM). Tuesdays following Fridays (Informal). Drill Hall, Victoria Road. Further details from Brian Castle, G4DYF, tel 0732 56708.

Kent Repeater Group (KRG)—Do you use GB3NK? A coverage map and full details of this and Kent's other vhf and uhf repeaters can be obtained from M. Denison, G3XDV, 5 Lambs Walk, Whitstable, Kent CT5 4PJ.

Sussex Repeater Group (SRG)—19 March (Lecture at the Chichester Club). The group is responsible for GB3SR and GB3BP on vhf; GB3BR, GB3HO and GB3NX on uhf, and the proposed 1-3GHz WX, CP and HM. Further details of the group from M. Senior, G4EFO. Subscriptions (£3) or donations to Sussex Repeater Group, c/o Roy Bannister, G4GPX.

REGION 9—RR H. W. Leonard, G4UZ, 4 Start Bay Park, Strete, Dartmouth TQ6 0RY. Tel Stoke Fleming 505.

Camborne (Cornish RAC)—5 March ("Testgear" by G3OCB), 2 April (AGM), 7.30pm. SWEB clubroom, Poole, Camborne. The club now has a computer section which meets on the third Monday in each month at the same time and address. Cornish net weekdays on 3-714MHz at 10am and on Sundays, 3-692MHz at 11am. Full details from pro Ron, G2ABC, tel Truro 78393.

Exmoor (ERC)—The club now has over 30 members, including two ladies and 18 licensed members and meets every Thursday, 7.30pm, at "Loughrigg", East Street, South Molton. The latest club project for younger and less experienced members is a signal generator which later can be used for Morse practice. The new sec is Mrs Pat Jemison, "Homedale", Brayford, Nr Barnstaple, tel Brayford 327.

Newquay (N&DARS)—11 March ("RTTY on the home computer", by G8XXK), 25 March ("Uses and problems with scrs and triacs", by G3XFL). At the AGM in January G3YJX was elected chairman, and G8XXK sec. The club has also started a computer section and shares its knowledge with the Cornish RAC. Full details from Bob Lawrence, G8XXK, 29 Greenhill Road, Wadebridge PL27 6AY, tel Wadebridge 3649.

N Devon (NDRG)—Second Wednesday in each month at Pilton College, Barnstaple, and at Bideford College on the fourth Wednesday. 11 March (G3XEF (ex-P29MF) will talk on his activities in Papua), at Pilton. The amateur population in this area is growing steadily. The North Devon Raynet Group has split into three sub-groups—Bideford, South Molton and Barnstaple, but meet together for exercises etc. G2FKO runs slow Morse practice on S21, Monday-Saturday for which many thanks. Full details of meetings from G4CG, tel Barnstaple 3683.

Torbay (TARS)—Every Friday, with special meeting on the last Saturday in each month, 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay. 14 March (Annual dinner and dance at the Templestowe Hotel, Tor Church Road, Torquay, 7 for 7.30pm). The club has a TS520SE for the hf bands and an IC260E for vhf and has just erected a new vhf antenna. Torbay net in operation on 3-756MHz Mondays, Wednesdays and Fridays at 10.30am and on Saturdays at 10am. For more details contact pro Les Mays, G2CWR, tel Paignton 558714.

Treverbryn (English China Clay RC)—Alternate Mondays at 7pm. 2 March (Discussion on Porthpean special event station at Pentewan Road Labs), 16 March (Meeting at "The Shack", Treverbryn, which has recently been refurbished). Club net on S22 in operation on meeting nights. Full details from Jack Redfern, G8HSZ, tel St Austell 3647.

REGION 10—RR P. A. Jones, GW4HAT, 68 Pastoral Way, Tycoch, Swansea SA2 9LY.

Cardiff (CRSGBG)—9 March ("Further progress with home construction", by Dave Thomas, GW3RXX), 13 April ("My visit to Denver Convention 1980", by Ellis Evans, GW3CDH), 11 May (To be arranged), 7.30pm. The Pantmawr Inn, Pantmawr Estate, Cardiff. Further details from Joe Brooke, GW3GHC.

Swansea (SARS)—Thursdays, fortnightly, commencing 5 March, 8pm. Technicians Common Room, 2nd Floor, College House, Swansea University. Club net each Sunday, 1100gmt, 28-530MHz, net controller, GW4BIQ. Further details from Roger Williams, GW4HSH, tel Swansea 404422.

West Wales Repeater Group (GB3WW)—The repeater is situated at Carmel, Dyfed, operating on R7. Subscriptions were due in September 1980, and those users who are not already members are urged to join to keep this repeater "alive". Further details from Steve Bleaney, GW3VPL, tel Briton Ferry 812361.

REGION 11—RR P. H. Hudson, GW3IEQ, Silhill, Dinas Dinlle, Caernarvon.

Bangor (UCNWAR)—Meetings on irregular Thursdays during term. Club active 1-8-1,296MHz, all vhf contests and major hf contests. Trips to Belle Vue, Derby and Alexandra Palace scheduled. Free pint with club members to licensed amateurs coming to Bangor for UCCA interview. Contact Simon Brown, GW4ELI, Room 216, School of Electronic Engineering Science, Dean Street, Bangor, Gwynedd, for information about club and guided tour of the parts of UCNW that really matter!

Dolgellau (Meirion ARS)—First Thursday in each month, Ship Hotel, Dolgellau. 5 March (Junk sale). Details from GW8SYX, tel 0654 710402.

Rhyl (R&DARC)—Last Thursday in each month, Ambulance Station, Coast Road, Rhyl. Other Thursdays (on the air on 144MHz), 8pm.

REGION 12—RR F. Hall, GM8BZX, 45 Priory Cottages, Llanunhead, Forfar, Angus DB8 3NR. Tel 0307 67565.

Aberdeen (ARS)—Fridays, 7.30pm. Intending visitors should note that the club may soon be required to move from its premises at 80 Guild Street, Aberdeen, and should contact the sec for details of new venues. Mail for the club must not be addressed to the club

premises, but to the sec, S. Sutherland, GM4BKV, 67 Greenfern Road, Aberdeen AB2 6TP.

Dundee (Kingsway TC ARC)—Tuesdays, 6.30pm, Electrical Laboratory, Kingsway Technical College, Old Glamis Road, Dundee. As the club may be soon required to move to other premises due to reorganization at the college, intending visitors are requested to contact the sec for details of venue. Mail should not be sent to the college, but to the sec, Nick Stewart, GM8YRT, 23 Clive Road, Dundee.

REGION 16—RR M. S. Appleby, G3ZNU, 45 Cedar Avenue, Kesgrave, Ipswich IP5 7HA. Tel Ipswich (0473) 622559.

Braintree (B&DARS)—16 March ("Airfield communications and navigation systems", by G4HFR, 7.30pm. Braintree Community Centre, Victoria Street. The club's 144MHz net, held on Monday evenings when there is no club meeting, is now on S15 (145-375MHz), starting at 8.30pm. The club now has 37 members, of whom half are licensed. Further details from Alan Heritage, G4EOG, tel Braintree 25109.

Chelmsford (CARS)—3 March (Talk and discussion on RSGB matters by G3ZNU), 7 April ("Weather by radio propagation", by Michael Hutton); admission to the April meeting will be by (free) ticket only, 7.30pm. Marconi College, Arbour Lane. Details from Andrew Mead, G4KQE (ex G8KQE), tel Silver End 83094.

Colchester (CRA)—5 March ("Tackling tv", by G3YWM), 19 March (Open forum), 2 April ("Some of the latest amateur radio equipment", by G3OJV), 7.30pm. Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 70189.

Haverhill (H&DRS)—Fridays, formal and semi-formal meetings, alternating with Morse classes. 13 March (Evening on the air), 27 March (Film evening), 7.30pm. Club premises, Bumpstead Road. Further details from Chris Kitchener, G8IMI, tel Haverhill 2852.

Ipswich (IRC)—The club has moved to a new meeting place, the "Rose & Crown", 11 March ("The pothunter's guide to the spectrum", by G4HMF), 8 April (Brain trust), 8pm. Club Room, Rose & Crown, Norwich Road. Further information from Jack Toothill, G4IFF, tel Ipswich 44047.

Lowestoft (L&DARC)—The club recently had a fascinating talk and demonstration on British Telecom's Prestel system, the current reality of what was seen by many members in experimental form some time ago. 6 March ("Meteor scatter", by G4GUF), 20 March (Film evening), 3 April (Junk sale), 7.30pm. North Suffolk Teachers Centre, Lovewell Road.

Norwich (Norfolk ARC)—Wednesdays, formal meetings alternate with informal meetings and Morse classes. 11 March (Member's film and video evening), 25 March (Surplus equipment sale (not junk, they say!)), 1 April (AGM), 7.45pm. Crome Community Centre, Telegraph Lane East, Norwich. Details from P. Gunther, G8XBT, tel Norwich 610247.

Thurrock (TARC)—The club now meets every Tuesday on the top floor of Grays Park Hall, Orsett Road, Grays, starting at 7.30pm. The club net has moved to Mondays at 8pm, and is to be found on S33 (145-825MHz). Morse classes are available at the club. Details from Alan Taylor, G4KJL.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. tel Ferndown (0202) 876018.

The attention of club secretaries is drawn to the announcement under "Forthcoming changes" on page 63 of the January *Rad Com*.

Basingstoke (BARC)—Third Wednesday in each month, 7.30pm. Chineham House, Popley, Basingstoke. At the AGM the following were elected: chairman, G8LSV; sec, G8NHL; treasurer, G8TZU.

Fareham (F&DARC)—4 March (Power supplies), 18 March ("Shacks", by G4ITF and G8VOI), 1 April (Receivers and modulation), 7.30pm. Porchester Community Centre. Current club project is an audio filter, to be followed by a 3-5MHz transceiver. New sec G4ITG, tel Fareham (0329) 234904.

Farnborough (F&DRS)—The club reports a membership of 73, which is an all-time record. A net is held every Sunday at 10.30am on 3,730kHz. Sec G4BJQ, tel Farnborough (0252) 43036.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ.

Chiswick (ABCARC)—17 March ("The 468 Tektronics 'scope demo", by G3CCD), 7.30pm. The Committee Room, Chiswick Town Hall, High Road, Chiswick. Sec G3GEH, tel 01-992 3778.

The RSGB's 25,000th member, Diane, G8VVV, was married to Tony, G4GPR, on 17 January; both are committee members of the Southgate RC. The photograph shows the bride and groom with other members of the club. L to r: (back) G3DZW, G3ZVW, G8EWG, G3KTZ, G4IEH, G4DFB; (front) G4ASR, G4KZD, G4GPR, G8VVV, G3RWL, G4BPR and G3XMV

Photo: Ann White



East London RSGBG—15 March ("The practical use of micros"), 3pm. Wanstead House, The Green, Wanstead, London E11. Sec G3PKQ, tel 01-558 2928.
Holloway (Grafton RS)—The club has a new venue: The Five Bells, Eastend Road, Finchley. Second and fourth Friday in each month, 8pm. Sec G8SYD, tel John, 01-959 8785.

Southgate (SRS)—Details from new sec Val Austin, G8PZY, tel 01-360 5832.

Edgware (E&DRS)—12 March (Fibre optics), 7.30pm. The Watling Centre, 145 Grange Hill Road, Burnt Oak, Edgware. Sec G3MNO, tel 01-907 1237.

St Albans (Verulam ARC)—24 March (The G3PAO Memorial Lecture, by Pat Hawker, G3VA, on "Direct conversion receivers"), 7.45pm. Charles Morris Memorial Hall, Tyttenhanger, Nr St Albans. Details from new sec Hilary, G4JKS, tel St Albans 59318.

Stevenage (S&DARS)—5 March (Computer night, bring yours), 19 March (AGM), 7.30pm. The Senior Staff Canteen, BADG, Gunnels Wood, Stevenage. Details from sec P. Byrne, G8MCV, tel 0438 64624.

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park, Portishead, Bristol BS20 8NQ.

Bristol (BRSGBG)—30 March, (Talk by John Cummings, G4ERR, entitled "Oscar Phase 3"), 7.15pm. Queens Building, Bristol University. Sec G8GLQ.

Cheltenham (CARA)—5 March (Constructor's contest), 20 March (Natter night), 7.30pm. The Old Bakery, Chester Walk, Clarence Street (rear of public library). Sec G4ILL, tel Cheltenham 43891.



Members of the Shirehampton ARC, which was founded in 1969, photographed in their club premises



The committee of the Mendip Repeater Group, which put GB3WR on the air, at its AGM in November 1980. L to r: (back) G3YBY, G4JQD, G3UGR, G8GMZ, G4JQP, G3VEH, G3UUR, G8KKA; (front) G4CJZ, G8NNU, G3CQE, G8GFZ and G80OU

Photo: G8VUZ

PARDON OUR SLIP

The caption on page 65 of the January issue contained the callsign G8UZO; this should have read G8UZO.

MOTHER'S DAY—29 March 1981

Mother's Day—just once a year,
With father home and children dear.
Sit down my love and have a rest
But no—there is yet one more dx contest.
With callsigns and "CQ, CQ"
You're 2 and 1—I can't hear you!"
Relax and put some music on,
("CQ" comes through my favourite song).
We xyls are all well used
To our pet "ham" perched in his roost.
The propagation's good you see,
I shall be rather late for tea.
So don't you think, for just **our** day,
The contest could just move away?

G3UYD's XYL

Mr M. Clift (r) of Halesowen, who won a competition on the Vero Electronics stand at the Breadboard '80 exhibition, receiving his prize from Mr B. Guy, Vero's sales director



MEMBERS' ADS

CONDITIONS OF ACCEPTANCE

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB only. They must be submitted on the Member's Ad form printed on the back of a recent address label carrier used to mail *Rad Com* to the advertiser: this will automatically provide proof of membership and should not be more than two months old. No acknowledgment of receipt will be sent, and advertisements not clearly worded or punctuated, or which do not comply with the conditions of acceptance, will be returned. No correspondence concerning this service will be entered into.

Trade or business advertisements, even from members, will not be accepted for "Members' Ads" but should be submitted as classified or display advertisements in the usual way. Traders who are members must enclose a signed declaration that the items for sale or wanted are part of, or intended for, their own personal amateur station.

The RSGB reserves the right to refuse advertisements, and accepts no responsibility for errors or omissions, or for the quality of goods offered for sale. Advertisements for 27MHz equipment will not be accepted.

Warning. Members are advised that they should, as far as possible, ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The "purchase" of goods legally owned by a finance company could result in the "purchaser" losing both the goods and the cash paid.

The current rate is £1 for 40 words or less: advertisements containing more than 40 words will cost an additional £1 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

No guarantee of inclusion in a specific issue can be given, other than the first possible issue after receipt. Closing dates in 1981 for issues in brackets, are: **23 March (May), 23 April (June), 20 May (July), 18 June (August), 16 July (September), 27 August (October), 24 September (November), 22 October (December), 19 November (January 1982), 17 December (February 1982).**

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS
Do not post to RSGB HQ or Advertising representative

FOR SALE

KW204 tx, 10-160, Shure 444 mic, £115. G8DA, QTHR Bristol area. Tel 027-583 2280.

Bulletins and Radio Communications, 30 yrs from 1948, unbound, best offer for lot collected. 63 *Short Wave Magazines*, April 1946-January 1952. G3EJA, QTHR.

FT200, FP200, full 10m coverage, good cond, £190 ono. G3NHE, QTHR. Tel 090-978 5744.

Yaesu FL/FRDX400 coupled tx/rx, hf and two rx, cal recent check, handbooks, transit cases, vgc, £320. G3KPV, QTHR. Tel Gravesend 62051, evenings.

IC201 2m multimode, incl mains psu, offers. Lafayette hf rx, 80-10m, good cond, offers. G4MFTB, QTHR. Tel 0224 631235.

Trio 2200GX/10W pa, nine channels, charger, helical, etc, £130 ono. GW4HBS, QTHR. Tel Colwyn Bay 46317, evenings.

Trio R1000, absolutely mint cond, boxed, dc kit fitted, six months old, £230. Bearcat 220FB vhf scanning rx, cond as above, £200. Can deliver 75 mile radius, otherwise Securicor. Graham Rust, Tel Cambridge (0223) 312448, work, 51298, home.

IC215 3W portable, with 1/4 (rigid), rubber duck, nicads, xtls S20-23, R3-8, R0, auto toneburst, waffle switch, £110 ono. 12V psu/charger, spare nicads, £10 ono. G4JHY, QTHR. Plymouth (0752) 53436, after 6pm.

TS120S tx/rx, as new, boxed, £295. Dentron Clipper-ton L linear, 1 or 2kW, as new, £295. Tel 0534 54186, after 6pm.

Atlas 210X 10-80m, nb 100W mobile tx/rx, £320. Trio TR7010 2m ssb, £125. Trio TR7200 2m fm, 22 channel, R0-7, S0, S8, S20-24, £120. Xtls TR7200 for transverting to 70cm without repeater shift, R80-14, pair, good cond, £3.50. Wanted: TR3200. G4DGM, QTHR.

FT101ZD, (non-WARC) virtually unused fan, mic, £425. Datong asp processor, used two hours only, £55. Catronics rty terminal CT100 Mk2, vdu CD300, both as new, virtually unused, with outboard modulator, £200. Kelly, GW4ACO. Tel 0492 55240.

TS120S, one year old, in exc cond, £330 ono. G4HVG, QTHR. Tel Herefordshire (0989) 5888, evenings.

Trio TS510/PS510, vgc, service manual, handbook incl, £200. G3MNEQ, QTHR.

Glassfibre quad spreaders, set of eight, £60 ono. G4CNY, QTHR. Tel 0432 3237.

FT101E, cw filter, fan, mic, speech processor, spare pa valves, instruments book, FV101 ext vfo, £350. Datong FL1 audio filter, as new, £50. G4IGY, QTHR. Tel 04012 3331/2874.

Yaesu FT101B, cw filter, fan, spare set valves, ac/dc leads, mic, manual, a well-cared-for tx/rx, £295. Buyer collects. GW4KGI. "Eleven" Bryn Derwen, Abergelle. Tel Abergelle 823674.

Radio compass indicators type 182A, Selsyn, £3 each. RAF aircraft morse keys, 10F606, £3.50 each. Aircraft vacuum pumps, 37J type B3, £10 each. All plus carriage. Wanted: US Solartron CD1400 oscilloscope. G3AFN. Tel Wormley (Surrey) 2364.

FT301S cw, rf processor, af filters, vox, all 10m xtls, psu, £340, or with 150W linear, 2X6146B, fan, driven by above, £360. Shibaden SV700 b/w video tape recorder, 24in tv/monitor, 12 tapes, £45. G3PDL, QTHR. Tel 0652 55736.

Drake T4XC, R4C, AC4/M54 pwr supply/loud spkr, W4 output/swr meter, Shure 444, all exc cond, covers new bands with additional xtls, £500 ono. G3CDR, QTHR Surrey. Tel Peter, 0642 86608.

Trio 9R59DS communications rx, absolutely mint, comp with matching spkr, manual, bargain at £48. 2-el cubical quad, 10-15-20, comp with tuned loops etc, 32ft steel mast, 3in od, comp with all mechanics. G4HSB, QTHR. Tel Peter, 0642 86608.

TR200GX, 12 channels, nicads, charger, orig packing, mobile mount, clean, little used, auto t/b, £115 ono. G4KTZ. Tel Camberley (0252) 879115.

Pye AM25T/X/6 Vanguard hi-band, boards for fm, xtls, comp with all control gear, £15. Solorscope CD1014-2, with long persistence tube, ok for 5MHz double beam, £15. PF1 rx, req little attn, £5. PF1 tx, battery, little attn, £3. Must sell all. G8MLMA, QTHR. Tel 0856 2797, evenings.

16-el Tonna, coaxial as new, £25. Cushcraft 10-20m vertical, coaxial, hardly used, £25. Telomast, 30ft galvanized steel mast, as new, own rigging, £20. All ono. Buyers arrange carriage/collection. G4GMV, QTHR.

Icom 260E multimode tx/rx, mint cond, £280. May take amateur band rx in px. G8CVO, QTHR. Tel 0204 57775.

FT301S 10W tx/rx, late model, cw, a.m., cw filters, processor, 5A stab psu, £385. G3TUX, QTHR. Tel 0256 23668, anytime.

EC10, comp with 2m converter, £45. Codar T28, 160m, 80m rx, £12. G4CGT, QTHR. Tel 0254 75037.

Yaesu FRG7, fine tune, narrow filter, handbook, orig packing, exc cond, £145. Carriage extra. G4IZE, QTHR. Tel Whitby (0947) 4589.

Yaesu FT7B mobile tx/rx, 80-10, a.m., cw, ssb, 100W pip, all 10m xtls, exc cond, £315. G4AKW, Tel Leeds (0532) 665765.

Bantam hb/a.m., nicads, vgc, £50. four new xtls for glider channels 130-1/130-4, £25. One lb/a.m., £30. HB/fm, nicads, vgc, £50. Six new xtls, marine ch6, 12/16, £30. Cambridge a.m. hb and lb, 12-5kHz, £30. GU3HKV, QTHR. Tel 0481 47278, 6.7pm.

Icom IC255E, vgc, £210 ono. O. Dixon, 100 Lindsay Road, Worcester Park, Surrey. Tel 01-330 2832, evenings.

Trio TR2200G 1W handheld fm tx/rx, VB220GX 10W linear, channels fitted: R4, R6, S20, S22, S24, comp with mic, nicads, charger, handbook, auto-toneburst, carrying case, £115 ono. J. Burling, G4CKA. Tel Macclesfield (0625) 25154.

PET rty program mark high screen edit optional diddle 10 pre-recorded messages very fast machine code, £5.25. Creed punch 7P/N3, £10 plus carriage. K. Williams, 38 Llugwy Road, Kinnel Bay, Rhyl, Clwyd.

Yaesu 202R handheld tx/rx, six channels: S20-23, Raynet, Susan, mint cond, NC1 charger, £80. Pye Vanguard AM25, control gear fitted, xtls 80-2MHz, cable for boot mounting, £30. G2IJ, QTHR.

QM70 28/144 transverter, high power Scorpion model, exc cond, new pa valve, manual, £60. G4ILQ. Tel Ray, Kidderminster (0562) 4930.

TR7200G 2m fm tx/rx, eight simplex channels, all eight repeater channels fitted, mobile mount with padlock, 5/8 whip antenna, the lot, £120. Heathkit wind-speed indicator £70. Cosina csm camera, plus 500mm telephoto, £130. G4HTO, QTHR. Tel 06234 3008.

KW204, £170. KW77, £70. Both exc cond, just been overhauled by KW (Decca). BC221, Heathkit model 1012U oscilloscope, all wave Avo oscilloscope, reasonable offers please. Prefer buyer collects. G2DZ, QTHR. Tel Byfield (0327) 60530.

CW filter type TF30F350 for FT101E, 350Hz, from SMC, never installed, £15 plus post. G3ISD, QTHR. Tel Sittingbourne 77431.

Antenna array, 4x16-el Tonnas with commercial phasing harness, £120. Liner 2 with preamp, £100. 5/8λ mag mount attached to blue TR7 (Nov 1978, 12,000 miles), £2,999.99 ono. G4IOZ, QTHR. Tel Derek, 0282 691165, daytime.

TS770 2m, 70cm multimode, orig packing, vgc, QTH purchase forces sale, £525. G8LLN, QTHR. Tel Radlett 6283.

Belcom FS1007P vhf tx/rx, 2W and 20W, full xtalld, 30 in all, good cond, £130 ono. Buyer inspect and collect. G4HMW, QTHR. Tel Chesterfield (0246) 36496.

Standard 2m mobile C8800, two months old, never used, boxed, instructions, £200. DX300 rx, £150. Tel 01-803 6678, evenings.

Super hf QTH, six miles east of Norwich, three bedroom bungalow, garage, shack, double glazing, ch, quarter-acre paddock with tower and wood pole, no tv, very low noise level, £28,500. Tel for leaflet. Buffham, G3TMA. Tel Norwich 712548.

KW Vespa, £60. KW201, £60. KW E-Zee Match, £15. KW coaxial switch, £5. Mosley TD3Jr, £15. Hygain 14AVQ, £15. All vgc. Postage extra or buyer collect. G3YIU, QTHR. Tel Brighton (0273) 602727.

TS520 and ext vfo, cw filter, 25 ac, 12V dc supplies, mint cond, orig packing, no mods, £390 ono. G4GFK, QTHR. Tel 021-476 8202, after 5pm, weekdays.

FR101D rx, covering hf 2m, 4m, broadcast bands, comp with spkr and YH55 headphones, £350. Allsopp. Tel 0632 462606.

Liner 2 with psu, £80. G3VWH, QTHR. Tel 035-43 3798.

KW202 hf rx, Q-mult notch filter, calibrator, exc cond, £135 ono. G8IPW, QTHR. Tel Camberley 62791, day, Brookwood 251, evenings, w/ends.

IC22A 2m tx/rx, comp with handbook, mic, mobile whip, 4-el Jaybeam quad, £100, or swap for hf beam or atu or gdo. G4IXQ. Tel 0284 66661.

Oldies but goodies: KW Viceroy and psu, £45. Minimitter MR44/2, £40. HW12 and dc psu, £95 ono. Frontier 5600, early Japanese tx/rx, £155. Nombrex sig gen, 150kHz-220MHz, £25. B44 4m mod, £10 pair. G3VFB, QTHR. Tel Antons, 01-892 2229.

Pye Bantam, S20-21, R2, 2W output psu, charger, case, nicads, helical, £50. ITT Starphone SF1, S8, nicad, charger, case, £45. G8XNY. Tel Grimsby (0472) 52974.

FT101, FV101, SP101, G3LLL clipper, handbook, mic, swr bridge, comp station in vgc, best offer around, £385 secures. Prefer buyer inspects and collects. G4FUW, QTHR West Yorkshire. Tel Otley 464184.

FT75, four extra xtls, FV50B vfo, ac psu, mobile dc psu, £150. G4MHD, QTHR. Tel Stirling (0786) 5472.

FT7 hf tx/rx, FP4 psu, exc QRP mobile rig, boxed, vgc, £275. G3CDC, QTHR.

Heathkit Marauder HX10, 10-80m ssb tx, exc cond, cw, 240/110V double-wound transformer, can be seen working, offers. XF9B filter, xtls, £25. Wanted: buy or borrow manual for Marconi TF801A/1 signal generator. GW3UZS, QTHR. Tel 0222 491046.

Heath HR10B five-band tx, HRA 10-1 xtal calibrator, DX60B five-band tx, HG10B vfo, five hf bands, 6 and 2m, manuals for all items, £150 or offer. G4FOF, QTHR. Tel Hunstanton 2836.

FT202R 2m handheld, fitted S20-3, R5 R0 nicads, YM24 spkr/mic, NC1 charger, £100. Bauer keyer, as new, £10. BC221M with charts, mains psu, £20. SVWR meter, £5. G3UOZ, QTHR. Tel 021-373 8806.

Decca KW E-Zee Match, £30. Xtls HC6U, 48-3333, 48-3583, 36-2500, 29-780, 8-7825, 29-8375, 8-7968, all £1.15 each. G4AOZ, QTHR.

2300 tx/rx, nicads, helical, orig packing, handbook, £130. Microwave Modules 70cm converter, 28MHz, i.f., £16. G3ZVC tx/rx, KVGX9B filter fitted, diecast box, working, £35. G4FBA, QTHR. Tel 0977 72978.

Marconi AD94 rxs, two, 150-500kHz, 2-18MHz, 230V, very compact, £30 each. Star ST700 80-10m tx, 200W, 230V, valved, £75. Pye PC1 compressor/controller, mic for ST700, £15. SBES4 hybrid 80-15m 12/115V tx/rx with handbook, £50. Ham-M rotator, no c/box, £25. G3JKV, QTHR. Tel Dorking 884359.

Yaesu FR101 deluxe cw 2m and 6m converters, mint cond, £200. New unused 9-el crossed Tonna, 144MHz, £20. Yaesu FT221R, D suffix, £250. G8VOD, QTHR. Tel Swindon (0793) 27913.

Yaesu FLDX400 frdx, mint cond, mic, spare valves, £320. Two 10 by 5in 15Ω spkrs, £2. Grampian SP4 quality mic, 25Ω, £5. 1kHz xtal, standard xtal, £2. *Wanted:* Two HC25U xtals between 5-2-5-4. G3KPW, QTHR. Tel Gravesend 62051, evenings.

QTH Weston-super-Mare: largish stone-built house, four beds, good garage, large flat roof, mini-garden on level, handy shops and beach, permission for HQ1, GPV5, colinear, £25,500. G4JPL. Tel 0934 26903.

2m handheld, Sorno CQP500 in leather case, toneburst, charger, spare nicads, cond indicator, handbook, antenna, £95. Sorno 600 dashmount 2m mobile, nine channel, 10W fm, £110. Spare boards, xtals etc. G8AKA, QTHR. Tel Reading 332582.

UHF buffs: have three 3CX100A5 high mu triodes, 27V, 500MHz, 9-5W, 2,900MHz, offers. G8FF. Tel Holt (026 371) 3210.

Trio R300 with marker, perfect cond, £70 ono. Buyer collects. N. Roussiano, 10 Sandleigh Road, Leigh-on-Sea, Essex.

FDK Multi 2700 2m all mode synthesizer/vfo tx/rx, £270. *Wanted:* Creed 75 with repert auto 45-50 and 75 baud gears, Baudot code. G8BBH, QTHR. Tel John, Hatfield 64342.

RAE correspondence course, 31 lessons, study notes, questions and answers, previous owner passed RAE 1980, incl postage, £15. Tel 0602 622763, evenings.

ASCL teletype, 110 baud, fully working, paper tape punch, stand, will deliver for petrol, £150. G3WRT. Tel 0206 45099.

IC245E multimode mobile tx/rx, £200. FDK Multi 3000 base station, £300. G3LBT, QTHR. Tel Essex (0268) 412177, after 8pm.

Heath HW101 hf tx/rx, 10-80m psu, £200. Western DX5V five-band vertical antenna, £30. 10ft lattice section, £10. G4HFR, QTHR. Tel 0279 815520.

Trio R1000, six months old, in exc cond, as little used, £250. Tel Loughborough 218153, evenings.

RTTY, Space Mark model ttu, solid-state fsk terminal unit, good wkg order, £30. Creed auto tape tx, 230V ac motor, £10. G3BXI, QTHR. Tel Great Easton (037-184) 235.

Trio TR3200 70cm tx/rx, RB4, 6, SU8, 18, 20, all accessories, nicads, helical antenna, in orig packing, good cond, current cost for same over £190, £140. *Wanted:* batteries and charger for ITT/STC/Pye Starphone SF1. G8JNJ, QTHR. Tel Martin 061-330 1992, 6-9pm.

CR100 S-meter, noise limiter, xtal calibrator, spare valves, manuals, in good cond, £39 ono. Deliver reasonable distance. Telequipment D31 double beam, 6MHz oscilloscope, needs attention, £5 ono. G3RVD, QTHR. Tel Twyford (nr Reading) (0734) 340961.

FT101E, immac, extras, £395. FC107 aut tuner, new, unused, £75. G4MH minibeam, 10/15/20, new, unused, £60. DX300 digital rx, 0-1-30MHz, as new, £150. Tel Richmond (Yorkshire) 811812.

Icom 211E with preamp, manual, 5-el cross Yagi, rotator, electret and hand mics, 5/8 whip, mag mount, mobile bracket, all as new, £400. G3GAD, QTHR. Tel Orpington 33408.

IC202E, complete, unmodified, orig packing, 25W linear, built-in preamp, gain control, £120 the lot. G8HKE, QTHR. Tel 0272 871175.

19in rack on castors, remote pan and tilt head, rtty station, picture and waveform monitor, another monitor, 2m tx/rx, offers. Tel 01-352 1412, after 16 March.

AR40 rotor, TA31Jr dipole, only six months old, cost £108, accept £70. Western Electrics Alimast, 40ft telescopic, £30. 2 x 21in stand-off wall brackets, £10. First offer of £99 secures the lot. G3SVX, QTHR. Tel 0533 302430, evenings and weekends.

Kyokuto FM 144105XR2 fm tx/rx, full digital readout, 144-149MHz, 25kHz scan, 40ch with pwr leads, very small, exc, as new, £255. NAG 144XL linear amplifier, 280W p.e.p., 10W drive, runs nicely, reason for sales, want change only. G8LZK, QTHR. Tel Holbeach 363404.

NAG 144XL 2m lin amp, £300. IC202S, £125. Western PM2001 peak reading wattmeter, 50-150MHz, £25. G8BWR, QTHR. Tel 0926 498388.

IC202E, two extra xtals, vgc, £125. TR2200GX 11-5 channels, nicads, etc, £105 ono. Both with orig

packing, £210 the pair. Tel Dave Wood, Southampton 463533 or Salford 3453.

Liner 2, fitted preamp, £80. G8DEA, QTHR. Tel Otley (West Yorks) (0943) 463742.

KW Viceroy, 80-10m, sbb KW77, £200 ono, may split. Eddystone 770U Eddystone, 770R/1, B40, B29, advance P1 sig gen, Cossor oscilloscope model 1035, other homebrew items, see for list. G3LCH, QTHR. Tel 01-672 7066.

Trio TS120V, immac, orig packing, mic, matching 100W output, solid-state amplifier, £325. PSU, 13-8V, 25A, continuous, fully protected, heavy, hence £45. Lonnor, G3ZUM, QTHR. Tel 025-681 298. After 8 March, 021-747 5077.

Yaesu station in mint cond: FT101E, £350; FL2100B, £200; YC601B digital display, £80; FTV250 2m transverter, £90; all just 12 months old. DX32 triband beam, £30. Big talk rotator, £40. Complete station, £675. G3XKN, QTHR. Tel 05255 2207.

FRDX500, FLDX500, vgc, offers over £300, might split. Many valves: 813, 6146, 2C39, 12AH8, etc. Brian Davies, G3OYU, QTHR. Tel 0342 832559.

Kenwood RS99S amateur band rx, with matching S599 spkr, £220. Will deliver Manchester area. G8RCG, QTHR. Tel Mike 061-494 0434.

FT/FP200, late model, black case, unmarked, incl spare driver modulator, pa valves, Shure 444 mic, used only on receive, genuine price to genuine applicant. Tel W. Love, Beith (Ayrshire) 3149.

Yaesu FT901DM, £650. FRG7, recent, £135. Heathkit 610 monitorscope, £50. All gear mint, one owner, no mods, used little, manuals, reason for sale, failing eyesight. Cash and carry. G3YYI, QTHR.

Trio 9R59DS, rx, 550kHz, 30MHz, 3-5MHz xtal calibrator, new cond, orig packing, £60 ono. WHY? McDonnell, 7 Boscean Close, Troon, Camborne, Cornwall. G3DOP. Tel Camborne 717515, evenings.

Heathkit SB101, HP23A psu, SB600 spkr, SB610 monitorscope, all manuals, good cond, £200. G3RUV, QTHR. Tel Exeter 69863, evenings.

Yaesu FRDX400, 160-10m rx, multimode, incl fm, external 4m and 2m mosfet converters, £120. Yaesu hf tx/rx FL50B, FR50B, £120. All manuals included. Buyer collects. G8NXT NOT QTHR. Tel Kevin Murphy, Reading 85373, ext 466, daytime only.

Creed 444 teleprinter, 50 baud, 230V, manuals, vgc, Spacemarc SRD1 fsk rtt, terminal unit, manual, old tones, other rtt bits, £100 or will split. Sorno Viscount 2m, converted 7ch, lots of spares, handbook. G8TKI, QTHR. Tel Camberley 31976.

FT200/FP200, mic, manual, vgc, £200 ono. Prefer buyer inspects, operates, collects, but could deliver reasonable distance. G3EWP, Park Lodge, Butternut, Newcastle, Staffs. Tel 0782 619575, day or evening.

HW8 with ir, in-built MFJ cw filter, S-meter mod, 10W pa units, £85. 4-el 4m Yagi, £7. Bendix RA1, offers? G3NKS, QTHR. Tel Cheltenham 41099.

MAST section, brand new aluminium tube, 1-375in dia, 10ft long, suitable for small masts or booms, £4 per length. Carriage extra at cost. John Balls, G4ALC, 31 Beechwood Avenue, Greenford, Middlesex UB6 9UB. Tel 01-578 9621, evenings.

Trio SP520 spkr, boxed, unused, £9.50. SWR25 swr/power meter, £7.50. Ferguson cassette recorder, £15. 10yd UR67, £2. Reel-to-reel t/recorder, £7.50. Carriage extra, G4DXG, QTHR. Tel 01-679 3215, after 7pm.

Trio DG5 digital frequency display unit/counter for TS520S or SE tx/rxs, absolutely mint cond, £85. Buyer collects or carriage extra. Reason for sale, have bought TS830S rig. G5BM, QTHR. Tel Newent 820960.

28/432MHz transverter, 8W o/p, incl psu, cavity wavemeter, £50. 432MHz 4CX250B pa, gives 250W, needs case/psu, £30. Stollie automatic rotator control box, £10. Automatic keyer, programmed by diode matrix, £15. G3XDY, QTHR. Tel 0473 44601.

IC22A, five repeaters, five simplex, mobile mount, buyer collects, £100. Standard 19in rack, 6ft black crackle finish, exchange for smaller suitable blue Pye, two preferred. G8LZ, QTHR. Tel Maidstone 54461.

FRSDX400, fitted vhf converters, FLDX400, both in vgc, manuals, £320 the lot. Will deliver radius 50 miles. Reason for sale, lack of space and imminent move. G2BIM, QTHR. Tel Sidmouth (03955) 4359, after 6pm or weekends.

Trio TS120V and PS20 psu, both as new, orig packing, still under guarantee, £325 ono. P. Scanlon, G3ZKL, 174 Lostock Road, Davyhulme, Manchester. Tel 061-747 8779.

Liner 2, comp with preamp, in good cond, £75. SEIF 13-5V 4A psu, £18. Sentinel 2m dual gate mosfet converter, 4-6MHz i.f., Sentinel fm 2m preamp, last two need attention, offers. G8GKX, QTHR. Tel Wakefield 826466, evenings.

70cm tx/rx, Wood & Douglas, scanner etc, £75. **PW** Purbeck scope kit, part-built, £75. Two TF867 sig gens, £15 each. OA1094 spectrum analyser, £15. ET1 2m pa, £15. G3TFM, QTHR. Tel Stratford (0789) 4477 ext 52, business, 294055, home.

Atlanta tx/rx 4AVFO, ac ps, Shure 201, handbook, circuits, some spare valves, £190 ono. G4QU, QTHR Suffolk. Tel 0359 50597.

FT101E, little used, mint cond, £400. G3WVP, QTHR. Tel 0202 644546.

Pye Cambridge AM108 2m with control unit, no mods, £25. Tel Ashbourne (0335) 43702.

JVC PV4500 monochrome vtr with handbook, needs attention, comp except for one tape guide roller and head bar, £20. New head bar available at £50. Prefer buyer collect or could deliver Birmingham or Cardiff. G8JAO. Tel Malvern 63270, evenings/weekends.

FDK2700 Mk2 2m ac/dc all mode tx/rx, 10W output with Oscar 10m converter built-in, exc cond, £295 ono. SEM PA5 2m preamp, as new, £15. G3JAU, QTHR. Tel 0202 514078.

TH6DXX Thunderbird tribander beam, takes up too much air space in my garden, sell or swap for KW108 scope, tribander, 3-el or any other useful hf gear. G4KZ, Tel Tony, Grays (0375) 78783.

TL820S digital and 500Hz cw filter, external vfo, comp hf station in mint cond, £495. G3UDR, QTHR. Tel Evesham (0386) 870 052.

FT101/2 cw filter, good cond, spare valves, £200. FDK Multi 2000 fm/ssb low noise preamp, 240/12V, £200 ono. G2HOS, QTHR. Tel 021-445 1397.

KW107 Supermatch, £79. Heathkit monitorscope SB610, £59. TenTec 208A notch/cw filter for Argonaut 515, £19. Heathkit regulated psu, 0-15V, 500mA, ip, £18. TTC C3022 transistor checker, £10. Carriage extra. G4CQK, QTHR. Tel Walton-on-Thames 27193.

FRG7 digital, three years old, £140. G4FBZ, QTHR. Tel 0952 613824, after 6pm.

Microwave Modules 2-10m transverter type MMT28/144, £75. G3AZT, QTHR. Tel Frilford Heath 390598, evenings.

Yaesu FT7 hf tx/rx, FL110 100W output linear, amplifier, both in exc cond, offers together or singly please. G4GAH, QTHR. Tel Wallingford (0491) 37188.

8k PET computer, Basic 1, £300. Bowers & Wilkins DM2 monitor spkrs with stands, £110. Quad 303 amplifier, £60. Icom 215 with nicads, charger etc, £110. G4GTN, QTHR. Tel Tunbridge Wells 24689.

FT201, exc cond, comp with manual, £290. TS700G, vox, exc cond, £300. AR240 handheld charger, £110. SSTV Robot 70 monitor, £80. Wolmd keyboard, £75. 12XY 70cm, £25. G4IBN, QTHR. Tel Pontefract 75749, 6-7pm.

Yaesu FT7, exc cond, £260. G3VGA, QTHR. Tel Poynton 873553.

TR2200GX, VFO30G, nicads, charger, mobile bracket, auto tone, xtals for R1-8, S16-24, manuals, £130 ono. G4KVI, G8VBY, QTHR. Tel 04946 3372.

TR7625, 25W, fm tx/rx, mobile mount, handbook, boxed, £170. QR666, standard, no mods, Joystick antenna, Joymatch Mk3B atu, £75. Carriage at cost. G8BUQM, QTHR. Tel 0847 5460.

FT223 tx/rx, 10W, 23ch, R0-1, R3-7, S12, S19-22, £95. Datel 200 modem ic, MC14412VL, unused, £6.50. Creed 7B with psu, £12. Transformer, 1,400V, 0.5A with matching choke, Creed keypunch, £5. AW4389 crt, new, £2. G8UDJ, QTHR. Tel Abingdon 20005.

Yaesu FT101 with cw filter, fan, exc cond, used little, £220. KW E-Zee Match, £20. A. Hoggarth, G4BNR, QTHR. Tel Andover 61345, office hours.

RX G2DAF, MF45510CK filter, full info, £40. Spkr, *Wireless World* Baxendall, £15. Spkr drive units, Goodman 12in Axiom 150, £18. Stentorian T12 tweeter, £10. Rascal digital freq meter, SA520, 300kHz, £12. The lot, £75. Collect. G3JNM, QTHR. Tel 0204 43999.

Spare Ham-M rotator head, 100 per cent ok, £65. Hallicrafters freq synthesizer and psu, £180. Lots of xtals. Enquire with see. *Wanted:* Monitorscope. G8LT, QTHR.

FR101S rx, fitted with xtals to cover 1-6-28MHz amateur bands, manual, as new, £250 or offer. G8EHT, QTHR.

KF430 70cm, 12 channels, 10W, 3W, £130. Iambic squeeze keyer, dot store, reverse polarity switch, built-in sidetone speed control, £18. EK121 electronic keyer, unwanted gift, £20. G4GPX, QTHR. Tel Lancing 3893.

Heathkit SB401 tx, SB303 rx, SB600 spkr, SB610 monitorscope, HM102 rf power meter, comp with manuals, £250 ono. Buyer to collect please. G8HPD. Tel Wheathampstead (058283) 3307, after 6.30pm.

Eddystone 888 with spkr, spare valves, £60. Eddystone 770U high frequency a.m./fm, requires attention, £80 ono. BCC221 US frequency meter, 125kHz, 20,000kHz, charts, £20. Type F field telephones, magneton battery, two, £20. G8YCN, Briar Bush House, Ivinghoe, Aston, Beds. Tel 0525 220565.

Cambridge FM108, comp with manual, control box, mounting cradle, six 2m channels, xtals, i.e.d. channel readout, toneburst, £55. Lewis, G4GGK, QTHR. Tel Rushden 4797, 01-491 2971, office.

Icom 701 hf solid-state rig, 160-10m, twin vfo, unmarked, as new, £495, might take p/ex. *Wanted:* Trio 120S. G4JKP, QTHR. Tel Leicester (0533) 899958.

FT200, all 10m, hf heavy duty matching psu, hardly

used hf, some spare valves, QM70 transverter, new pa, £270. *Wanted:* TS120V. G3PBV, QTHR. Tel 0392 77911, ext 571, day, 0626 833468, after 7pm.

FT7/FP4 tx/rx and psu, never used mobile, mint, matching mic, £250. Purchaser collects or carriage extra. Daiwa SR9 marine band rx, xtals, 0, 9, 16, £30. G4HZU, QTHR. Tel Churston (0803) 844407.

Heathkit SB104A, remote vfo, SB644, psu 1144, all manuals, professionally made, this is an all solid-state digital readout tx/rx, £350. G4JY, QTHR. Tel 038-483 3467.

Frequency counter, Heath 4100, time, Gents and frequency capability, Heath calibrated, £75. Teletext adapter, vhf in/out, full specification with remote control keypad, £150. Both items perfect, in unmarked condition, buyer collect or carriage extra. GM4EVK, QTHR. Tel 0505 690712.

TR7010 ssb, £150. TR2200GX, eight channels, automatic toneburst, mobile mount, £115. Both exc cond, boxed. 2m fm tx/rx, from GVM, radio, S20, case, almost comp, £45. 4CX250B, new, unused, £8. G8HAY, 47 Woldholme Avenue, Driffield, North Humberside. Tel 0377 46919, evenings.

Hard up! Must clear: KW Viceroy, cond fair, but in gwo, is heavy, buyer collects, all realistic offers considered. Codar AT5, home brew power pack, transmit/receive switch, anode voltmeter. G3WVC, QTHR. Tel 09297 534.

20A 13-8V regulated power supply, protection circuit, twin meters, £50 ono. FT7B mobile/base hf tx/rx, new cond, extra 10m xtals and transverter output, orig packing, handbook etc, £300 ono. Can deliver medium distance. G4HOJ, QTHR. Tel 0793 771153.

FT202R handheld, nicads, S20-22, R6, immac cond, £80. Trio TR2200G, S20-22, R1, R6, R5, 25W pa, £100. 8XY and Stolle rotator, £50. G8OWP, QTHR. Tel 0480 66708.

Standard 7800, 48-el beam, £260. RA17, £110. Two linear amplifiers, 2-5kV psu, comp in 6ft rack, £130. Garex Two mobile, £60. F450T, RB14, not wkg, £30. G4HVK, QTHR. Tel 021-353 3896.

KW2000B, unused since £55 plus service by KW, £225. FT101B, £300. KW202, superb ham band rx, £150. Tektronics D-beam scope 502A, £90. UHF rx P62, 580MHz, 1.201MHz, £10. 14-el 2m Paraband, £15. Sell, swap, see wanted ads. G3MOU, QTHR. Tel 023375 316.

FRG7 fine tune, narrow filter for ssb. 12V output for converters, £150. Will deliver 40 miles. Microwave Modules: 432/28S, £25; 144/28, £20; 1296/28, £25. ET1 40W pa, £15. Jaybeam 5XY, £12. Haverson. Tel Norwich 22233, ext 507.

Trio 9R59DS communications rx, fitted voltage stabilizer, with spkr, ideal first rx, £60. *Radio Communication*, June 1973-Dec 1979 (complete); *Short Wave Magazine*, Sept 1973-April 1978 (most), £20 ono. Buyer collects. G8OEF, QTHR.

FT101E, vgc, £425 ono. FRG7 gen cov rx, £130 ono. Carriage extra or collect. Letters only please. G3OBX, QTHR.

Practical Wireless, Jan 1962-Dec 1980. 18 volumes 100 earlier copies you collect, £18. Have cycle assist petrol engine Cucciollo 48cc four-stroke, two gears, wet sump, Ducati make, sell or swap. G3XLC, QTHR. Tel 0782 311811.

Grundig Satellit 2000 shortwave rx, comp with external bfo, £125. Fidelity CR2 clock radio, a.m./fm, £18. G8UXS, QTHR. Tel 0234 852865, evenings.

Standard Eight cine camera, f1.8 power zoom, auto exposure, filter etc, £25 or exchange for Datong cw tutor. Tel 048 482755.

QTH: mature well-maintained three bedroom and loft conversion semi, situated in very quiet area of Midleborough, Cleveland, double glazing, gas central heating, garage etc, mast planning permission, £20,950. Trio 9R59DE, mint, £48. Com rx. G4HSB, QTHR. Tel Peter 0642 86608, evenings.

Collectors items: Roberts valve tester, circuit analyser xtal set in wooden lidded case, has De-Forest plug-in coil, glass encap xtal cats whisker, Cossor ganging oscillator, offers. Manuals: Heathkit TV HFV11, £1. SB101 tx/rx, £2. Sell, swap. G3MOU, QTHR. Tel 023375 316.

Pye PF1 Pocketphones on RB14, with batteries, £35. Jaybeam 2m 6-over-6 Yagi, £9. G4HLX, QTHR. Tel 021-459 0579.

Manuals: AR88D, £3. Telequipment scopes, S52, S51, D52, £2 each; Cossor a.m. Packset CC3A83, £2; Ultra Packset 3A4, £3; Rank TR1005, £2; Advance ac m/voltmeter VM77C, £1. VM77B, £1. 1kW 250V to 115 ac transformer, £10. Carriage, post extra. G3MOU, QTHR. Tel 023375 316.

IC202, nicads, charger, vgc, £115 ono. Starphone 460MHz fm unmodified, offers? G8AKB, QTHR. Tel Gordon, Whissendine (Leics) (0664 79) 547.

Heathkit RG1 gen cov rx, £30. Trio 8-pole xtal 250Hz cw filter, £15. Tio spkr, £10. Both for TS520 series. All plus carriage. G3JBU, QTHR. Tel 0604 401800.

Wireless World, April 1913 Vol 1, No 1, to Vol 2, No

19, in exc cond, offers please. G4ILR, QTHR. Tel Pymore 341.

Lowes SRX30 communication rx, 0.5-30MHz, as new cond, comp with handbook, PW test report, orig packing, etc, £124. Reason for sale: purchase of hf tx/rx. G4KCR, G8TCR, QTHR. Tel Harrogate (North Yorks) 871960.

Heathkit HG12 vfo, £55. 3RPI crt, mumetal screen, base, ex-experiment, £350. Brand new valves, TT22, TT21, nine 807s, lot £10.50. All boxed. 600/3Ω transformer, £1. Carriage extra. G3LTU, QTHR. Tel 0472 66412, after 7pm only.

FT101E, good cond, £375. Magnum 4m transverter, £75. G3WBN, QTHR. Tel 01-654 2761.

Mostek VAB2 video display board, rtty 45-75 baud, ASCII 110-300 baud, Opto coupled input/output, keyboard input, 1V pp video output, 64 x 16 display, manual, £120 ono. G8GHO NOT QTHR. Tel 061-440 8811, after 7pm.

Yaesu FR50B tx, top band, xtal cal, attenuator, exc cond, £70. 5 Bridge Road, Oldfield Park, Bath. Tel 24058, after 5pm.

Starphone M5, xtalld, wkg RB0, fitted toneburst, DJ7VY preamp, £60. G4IDE, QTHR. Tel Wolverhampton 783181.

Trio separates: JR599 Custom Special rx, 2m and 4m converters, TX599 matching tx, manuals, connecting leads, both items in exc cond, £170 each. G3MXH. Tel Stratford upon Avon (0789) 294387.

Standard C8800, 2m, fully synthesized mobile, hardly used, still boxed, £210. Superb commercial psu, two, 30V, 8A outputs, one US, £20. Tech Instruments 3in scope, exc cond, £30 ono. G8XHO NOT QTHR. Tel Kings Langley 63773, evenings/weekends.

TR2200GX, S19-23, R0, R3-7, nicads, charger, auto toneburst, new leather case, back light, spare 1/4, helical, manual, boxed cw 10W pa, requires boxing, £120. liner 2, £100 ono. G8UGU, QTHR.

Heathkit SB102 tx/rx, psu, £150 ono. *Radio Constructor* 1964-72, what offers? Other oddments going cheaply. G8MSR, QTHR. Tel 01-549 3892.

Pye Compact, wkg on RB0 and SU8, both sets of xtals supplied, comp with toneburst and nicads, £25 or offers. Viscount Storno, supplied with S32, R7 xtals, wkg order, psu, £30 or offers. Reason for selling, buying larger equipment. Tel Boston (0205) 60801, after 5pm.

Heathkit continuing education series: dc, ac solid-state, electronic circuits, four books with experimenter trainer, comp with components, £145. FT901DM, mint cond, £700. G4BLB, QTHR.

Yaesu FT301, used low power only, two years old, £450. GC valve rx, incl Electronics front end, Ed-dystone 898 dial, £25. Buyers to collect please. Barker, G4AZT. Tel Oxford 770101.

CPU2500R, keypad, mic, under one year old, orig packing, £230 ono. G8RFN, QTHR. Tel Oxford (0865) 881398.

Liner 430 ssb tx/rx, still under guarantee, used little, prefer buyer inspect, collect, £150. GW3KYT, QTHR. Tel Colwyn Bay 55156.

Heath HW101 80-10m tx/rx, psu, xtal filter, £180 or exchange for 2m multimode or fm portable with cash adjustment. G4GZM, 30 Teignmouth Road, Torquay, Devon. Tel Torquay (0803) 34222.

KW2000 ac/dc psus, hf bands atu, dummy load rf power meter, swr bridge, QM70 2m transverter, the lot, £160, or exchange for IC202. G8HQX, QTHR. Tel Dartford 28833.

Pye Vanguard AM25B, two on 4m, xtals 70-26MHz control gear, indoor dipole, the pair, £22. Top band tx/rx mobile rig, 12V psu, mains psu, £15. Antique coils, variable capacitors, orig packing, ST era, offers. G4CTL. Tel Hornchurch (040 24) 55591.

Yaesu FT75B mobile/base tx/rx, 80-10m, 100W p.e.p., matching vfo FV50C, FP75B ac psu, DC75B dc psu, comp with handbook, mic, mobile bracket etc, £160. G4ERW, QTHR. Tel Sevenoaks (0732) 61677.

Datong FL2 multimode filter, new, hardly used, £80 ono, or will take FL1 in part exchange. R1132A rx, £10 ono. Hamgear PM2 preselector, £3. *Radio Communication*, Feb 1980-Feb 1981, £2.50. WRTVH 1977, £2.50. RCA No 19 set Mk 3, (no uhf), offers. Tel Dave, 01-892 1318, (Twickenham).

HW101, SB600, HP23, recent Heathkit overhaul, cw filter, manuals, spare valves, £200. Buyer collects. G3IBW, QTHR SW Norfolk. Tel 0842 3765.

Marconi fm deviation meter type TF791D, can be used as wavemeter, 4-1.024MHz, £75 ono. Marconi cavity wavemeter type 6050/3, 1-2GHz, £17.50. Bradley Tripercon, 2m-70cm, £13.50. Bradley Tripercon, 70-23cm, £17.50. The two Tripercons are designed to work together for 1.5V out at 23cm for 6W input at 2m, wavemeter and both Tripercons, £40. *Wanted:* Pye Pocketphone high band a.m., G8CIX. Tel 0734 661450.

TA32Jr 2-el beam antenna, unused, £43. Buyer collects. G4BGY, QTHR. Tel 01-777 9061.

TS520, immac, £300, or swap for TS120V. Heathkit SB200, 1kW linear, £250. Jaybeam 12-el stack, £7. G3NAS, QTHR. Tel Aldridge 53718.

FT101, exc cond, 160m and 10MHz, fan, mic, spare pas, orig packing, £299. 144MHz transverter, QOV640A, MMC rx converter, leads to match FT101, £50. Prefer sell together. G3TSO. Tel (0666) 53425.

Hammerlund HQ170A, 1-8-54MHz manual, exc cond, £100. Three brass keys, one Marconi type 365A, others in very fine cond, radio books from the 'thirties onwards, see for lists. Carriage extra on other gear. Tel Maidstone (0622) 61327.

RTTY equipment, Creed 7E printer, Creed 656 tape reader, ST5 terminal unit, £40 the lot. Buyer collects. 471 Rooley Lane, Bradford, West Yorkshire BD4 7SE. Tel Bradford (0274) 26898.

Pye Cambridges d/mount, h/b, £15 each. Vanguards b/mount, l/b, £15 each. All complete. Creed 7B teleprinters, comp, wkg, £20 each. Creed spares, state requirements. GMBLON, QTHR. Tel 0382 24341.

CW/rtty keyboard: send cw the easy way, as easy as typing, memory etc, full rtty capability, £125 ono. KW107 atu power meter, swr meter, dummy load etc, £70 ono. Tel Hastings (0424) 427994.

Trio TS120S, mobile mount, four-band self-selecting antenna, £350. Yaesu FT480R, four months old, as new cond, £300. G4IRT, QTHR. Tel Medway (Kent) 34803.

Trio R1000, still under guarantee, £255, or exchange for R390A. Rascal RA117E, £285. FB RA218, ssb unit, £65, or both, £340. SAE for replies. All with manuals, no reasonable offers turned down. Watson, 23 Fairlight Road, Eastbourne, East Sussex BN22 7PD.

Arac 102 rx, 2m, Trio JR310 amateur bands rx, £65 each, ono. Hartnell, Town Mills, Wiveliscombe, Taunton, Somerset. Tel 0984 23762.

Channel Master rotator, comp with control box, clamps, literature, £35. Heath monitorscope, professionally built, handbook, spares, £35. Will haggle or swap either for G2DAF lin amp, psu, G3YRB, QTHR. Tel 01-684 3974, evenings, weekends.

Trio TS520S tx/rx with cw filter, manual, as new, £355 for quick sale. G4IBG. Tel Hove (0273) 731391.

Trio TS700G 2m multimode, mint, orig packing, first £280 secures. G4GJ, QTHR. Tel 0274 562965.

Yaesu FTDX560 in good cond, spare pa and other valves, manual, mic, spkr, £200. G4EEP, QTHR. Tel Ash Bank 2904.

Sale: FT101B, mint, £300. GEM quad, requires new spider, £30. Hygain 4-el beam, 204BA, requires new nuts and bolts, £50. Tel 041-639 2173.

Yaesu FT7 hf tx/rx, 80-10m ssb/cw, 20W input, 13-8V dc, mic, manual, mobile mounting bracket, orig packing, fb cond, £250. G4GGN, QTHR South Birmingham. Tel 021-705 0759.

10ch solid-state mobile, 30W fm, fitted S20, S22, S0, R5-7, 144-80, £50. Pye F27 a.m. rx, 70MHz, £15. Car radio, eight-track cassette, £5. Pye F27 cabinets, tatty but ok, £2. LM309 regulators, used, 50p. G3NGK, QTHR. Tel 01-462 2178.

IC211E, fitted lunar low noise preamp, touchpad, £350. Lafayette HA350 rx, 160-10m, £40. G3UMWV, Skerrisdale, Kirk Michael, Isle of Man. Tel 062-471 436, after 7pm.

Trio TS120V with PS20 psu, £315 ono. MMT 144/28 10-2 transverter, late model, £60. Would consider part exchange 2m multimode with cash adjustment. G3GHB, QTHR. Tel 0386 792582, evenings and weekends.

Lion mobile hf tx/rx, fitted 433-2, RU8, multiway channel switch, tx ok, rx works but could do with pepping-up, mic incl, outboard toneburst, spkr missing, £20 plus carriage, G4GGC, QTHR. Tel Mike, 0787 71842.

Lafayette HA600A rx, solid-state, handbook, used little, a.m./anl/ssb/cw, 150kHz-30MHz bandspread, all bands, vgc, £40. 3½yr *Radio Communication*, write first. Buyer collect. C. J. Ellett, 5 Farley Lodge, Ruthin Close, Farley Hill, Luton, Beds LU1 5EN.

Working vhf base station, free to purchaser of superb three bed det bungalow, adjacent green belt: FT101E, FTV250, P40 Versatower (approved), rotator, Tonna, possession summer 1981: can be viewed by genuine prospective buyers, property current value, £55,000. Write (see please) G8PRB, QTHR.

TR9000 multimode, mint cond, used only for base station, six months old, still under warranty, comp with all accessories, mobile mount unused, manual, orig packing, as new, £295. G8CCI, QTHR. Tel Oxford (0865) 880229.

Collins antenna relay, mechanical filter new, vhf rx, £75. Redifon atu, £25. Marconi rcl bridge, £35. AF gen, £35. BC221, £5. Teletype CV89 converter, teletype printers 28-33, see. *Wanted:* HRO rx 490T atu. Wright, 249 Sandy Lane, Hindley, Wigan. Tel 55948.

FTDX401 tx/rx incl 160m and cw filter, some spare valves, buyer collects, £200. G3PLP, QTHR. Tel 021-744 3187.

Icom IC255E, boxed, as new, £190. MMT28/144 transverter, as new, £60. 30m UR67, unused, £12.

G3HSC morse course, £3. HK707 morse key, unused, £6. Leslie 145 tone cabinet for electronic organ, £275 or exchange radio gear. G3SEV. Tel 0702 585548.

TS820 cw filter, digital display, 12V supply at 200, £600. Can deliver up to 50 mile. *Wanted:* Radar PP1 display, any cond, must be cheap. Tel 0676 41248, after 5pm.

Yaesu FT207R, vhf synthesized handheld 2m fm tx/rx, with NC1 charger, spare NBP9 nicad, YM24 spkr, mic in orig pack, total £225 ono. G8UZY, QTHR. Tel Wolverhampton 764945.

Heathkit HW100, psu, cw filter, two speed dial drive, 160m transverter, manual, spare valves, vgc, £180 incl carriage. G3UCQ, QTHR. Tel Hayle (Cornwall) (0736) 752982.

Trio JR599 Custom, 160-2m, exc cond, £140. RSGB *UHF/VHF Manual*, as new, 3rd ed, £4. Buyers to collect please. G4BXY, 372 Gosbrook Road, Caversham, Reading, Berks.

Marconi TF144G sig gen, 85kHz-25MHz, vgc, £10. EMI VM16 oscilloscope, dual trace, 24MHz, vgc mechanically, needs attention, hence £20. HRO rx, six coils, no psu, works but needs attention, £10. All with manuals. G4GGI, QTHR. Tel Walton-on-Thames 23253.

NAG 144XL 2m linear, 500W p.i.p., little used, £300. FT101B tx/rx, £250. Must sell, getting married, best of offer secures. G4CQR, QTHR. Tel 01-330 2618.

Cushcraft FTV3 hf trap vertical antennas, 10-15-20, exc cond, orig packing, full instructions, £20. G4EJH, QTHR. Tel Bristol (0272) 843897.

IC202, case, nicads, charger, 40W linear/preamp, £150 ono. QRO transformer, 500-0-500 at 1-2A rms, £10. TV camera. G4HUP, QTHR. Tel 0782 642507.

FT75B companion vfo, mains and 12V psus, mic, h/book, 100W p.e.p., ideal mobile and base station rig, exc cond, £170. Prefer inspect and collect or carr extra. G3YCC, QTHR East Yorks. Tel 0482 650410.

TS770E, immac, boxed, etc, six months old, £630. GBWVV. Tel Cambridge 51544, evenings.

IC211E, 2m multimode, used little, £400. Heath HW202, fitted R6, R6, R20, S22, £100 ono. Prefer buyer collects. G8KHI, QTHR. Tel Robert, Letchworth 4603, after 6pm.

FT200, FR200, faulty, £160 ono. Sorno Viscount, ok spares, £5. Fane POP50 loudspkr, £20 ono. *Wanted:* TenTec Argonaut or Yaesu FT7, any cond. 82 Rugby Road, Binley Woods, Nr Coventry. Tel David, 543409, after 6pm.

Icom IC240 synthesized mobile fm tx/rx, fitted all repeater and most simplex channels, three spare, complete with mounting brackets, handbook, £110. G4IEZ, QTHR. Tel Leeds (0532) 672784.

Trio 510, psu, manuals, vgc, £175. Reason for sale, acquired TS180S. G3XBG, QTHR. Tel 0484 713788.

JVC3660 vhs video recorder, remote speed/slow play, freeze-frame, still under manufacturer's warranty, cost £625, accept £450. Ferguson camera adapter 3V18, £30. G3PDK, QTHR. Tel 01-692 0615.

Transformers: It, eht, 25V 100A, 2-5kV 100mA, 3100-0-3100V 65mA, many others, eht paper capacitors, eg 1µF 5kV, 4µF 3kV, 8µF 1kV, etc, large amounts of double-sided copper board, send for list. GBXCH, 210 Linkfield Road, Isleworth, Middx TW7 6DU.

FRD400 rx, all options fitted, matching spkr, £160. 2m '640 linear, 100W h/b, psu, £45. Technical Associates PNZ audio peak notch filter, £20. G4ILW, QTHR. Tel Newcastle (0632) 872661.

Trio tx/rx TS510, PS510, one owner, £210. Buyer inspects and collects. Datong rf clipper RFC101, £20, postage £1. G3NXM, QTHR. Tel Bradford (0274) 581373, anytime.

Trio TR2200GX, nicads, charger, etc, xtalld S18-23, R0, R3-5, immac cond, £100. G8VSC, QTHR. Tel 021-745 1968.

RF clipper (LLL) holdings for FT101 Mk2, cost £48, sell £28. Genuine reason for sale. G4GKI NOT QTHR. Tel 051-639 4250.

Nascom 1, NAS-SYS 1 monitor, psu, all info, some programs on tape, £115 ono. TR2200GX, S19-23, R0, R3-7, RR6, nicads, charger, orig packing, toneburst mod, £100. QOV06/40, 5 off, ex-equip, £3.50 each. G8JFF, QTHR. Tel Andy, Rushden 4008 or Bradford 573620.

G2DAF rx with Kokusai and 898 dial, TF144G sig gen, BC221 w/meter, Avo sig gen, grid dip osc h/kit, solarscope CD153, all with manuals, £75 the lot or offers. G4BAB. Tel 0533 393842.

TR2300, spare nicads, flexible whip antenna, £140. G4FEI, QTHR. Tel St Helens 50860.

Yaesu FTV901R 2m transverter, £220. YD148 desk mic, £16. Both used little, in exc cond. G3GJH, QTHR. Tel 01-422 6496.

Trio TS700G, £260. Lowe HF5 with full radial kit, £45. 16-el portable 2m tonna, 88-el 70cm multibeam, offers. 1.296/144MHz MM converter, late model, £40 ono. G4KCT. Tel York 411864, evening, York 59861, ext 361, daytime.

FTDX401, used little, confirm with log, mic, spkr, instr man, spare valves, still with orig box, £225. 2-el quad antenna, £10. G3NZY, QTHR. Tel York 55491.

4CX250B, boxed, new, £15. QOV06/40A, boxed, new, £15. Generator, 750W, 28V dc, petrol, offers. G8PJ, QTHR. Tel Orpington 26542.

Deceased amateur's equipment (G8KLI): FT221R multimode 2m Catronics digital freq meter; amateur freq meter; amateur freq rx FRDX400, incl two 6m converters; 1979 *ARRL Handbook*. SAE for list of bargains to J. K. Harvey, G4VJ, QTHR.

FT211RD, no mods, mint, £300. YC221, £35. Both together, £325. Westminster Cambridge 4MHz xtals, R0, R3-7, S20-23, tx and rx, £1.40 each. G3DGW, QTHR. Tel 0908 542119.

Kenwood (Trio) QR666 gen cov rx, fm bc band, xtal marker, as new cond, so bargain at £100. Tel Chestfield (Kent) 3262, evenings.

FT221R, suffix D, mint cond, unmodified, £295. Eddy-stone panoramic adapter, EP20, suit 730/4, EA12, etc, mint, £30. Datong rf clipper model No RFC, unused, £30. Two matched pairs 6J56C pa valves, new, £15. Carriage extra. Tel 0202 522796.

KW2000B ac p/u, £200. VFO4B, £40. Shure 444 mic, £15. Datong rfc, £35. G2HKW, QTHR.

IC255E, mint, 10 months old, not front end, up/down mic, orig packing etc, £210. Sorno 600 2m fm boot mount S20-24, S0, R6, toneburst, 15W, £80 ono. Pye W15U, RB14, all controls, £50. GM4EZJ NOT QTHR. Tel 031 665 7203.

Trio TS520 hf tx/rx, Datong up-converter, Yaesu FRG7 hf rx, Sentinel 2m converter, 2-4MHz i.f. Multi MU11 hf tx/rx, prices on application. G8SYD, QTHR. Tel John, 959 8785, daytime or evening.

Heath RA1 rx with manual, £20. Sentinel 2m converter, 28-30m i.f., £10. Sentinel 2m preamp, £7. B. Kemp. Tel Cambridge (0223) 64352, after 6pm.

SX200, vhf/uhf scanning, up-controlled rx, 32,000 channels, used very little, exc cond, boxed, £210 ono. Heathkit Marauder HX10, 80-10m ssb tx, exc cond, offers. *Wanted:* buy or borrow manual for Marconi FR801A/1 sig gen. GW3UZS, QTHR. Tel 0222 491046.

New, unused, 8MHz HC6U xtals, S20-24, R0, R3-7, £1.95 each or £19.95 the lot. New holders, 9p each. Creed 7E teleprinter, good cond, 45-5 and 50 baud governors, wired ready for terminal unit, £25. G4JSV, ex G8MFS, QTHR. Tel 021-421 1050.

Trio TR7500 fm tx/rx, 2m, fully synthesized mobile tx/rx, 80 channel, good cond, mobile mount, mic, buyer inspection welcome in Croydon, Bromley, Sevenoaks area, £170. Ken Hallam. Tel 0959 33350, or 01-777 6482.

FT101E, exc cond, orig packing, no mods, all leads, mic, manual, used little, £375. KW107 atu, £75. Prefer buyer collects. G4FVN. Tel 051-427 1949, after 6.30pm.

Eddystone S/830 rx, 300kHz-30MHz, usb/lb/ a.m./cw, nine bands, provides nine xtal positions, calibrator, S-meter, loudspkr, manual, £120. BC221 ministry psu, orig charts, £25. TR2200GX, S19-24, S0, five repeaters, accessories, £100. Philips N1500 vcr, £190. SAE for list. G3MHS, QTHR. Tel Sedgley (09073) 73465.

FRG7, mint, used little, fine tune, no mods, orig packing, £150. *Radio Communication*, July 1968-Sept 1978 incl, 120 issues, perfect, offers. G3UYG, QTHR. Tel 061-491 0688.

Nascom card frame, basic 8k rom, HRO eight coils, 3bs psu, LM14 (Navy BC221) charts, spares, psu, each £15. *Wanted:* serviceable Sealelectric and small 10-15MHz scope. GM3PKV, QTHR. Tel Largs (0475) 674329.

KW Atlanta 500W psu, £185. Remote vfo, £35. Cambridge compressor, £7. Circuits and handbook. G4FEU, QTHR. Tel 0695 622006.

Trio TS180S with dfc and extra cw and ssb filters, £560. PS30, £70. AT180, £80. G5HX, QTHR. Tel Coventry 412397.

Tangarine Microtan 65 plus 20 way keypad and instruction manual, factory checked, new, unused, list £107, accept £60. Power supply 5V, 3A on and ol protection, £10. G3AYJ, QTHR. Tel 021-354 5783.

Magnificent custom-built operating desk, fully covered with woodgrain laminate, masses of drawers, partially wired, dismantlable, made in California, £70. You collect. Heathkit MSP1 high voltage psu, £10. G3UML, 52 Park View Gardens, London NW4 2PN. Tel 01-202 7071.

Yaesu FR50B amateur bands rx, £60. Heathkit OS2 oscilloscope, £25. Both exc cond with manuals, buyers to collect by arrangement. Cleverly, 32 Cornwall Crescent, Devizes, Wilts.

144MHz solid-state linear amplifier VJ90 ssb, 10W in, 90W out, fm/ssb, 13-8V operation, brand new, £80. Chris Pedder, G3VBL, Thorncroft, 5 Royalty Lane, New Longton, Preston, Lancs PR4 4JD. Tel 0772 612289.

Linear pair 4CX250B, vacuum variable tuning, 4m, heavy duty pu with built-in Variac, very husky and reliable, £100. G4DRF. Tel 0526 52965.

Katsumi electronic keyer EK121, as new, £20. 10/15/20m traps, ex-14AVQ, any offers? Venerable, heavy but wkg, Taylor test meter, free to buyer collecting either of above items. Walters, G3IMK. Tel 01-397 6924.

TS700, exc cond, five fix channels, vox, orig packing, auto toneburst, £260. TR2200GX, EC10 Mk2 as February advert. *Wanted:* Trio SP120/PS20. G3TCG, QTHR. Tel Fairseat (0732) 822043.

TS700, all modes, 144MHz tx/rx, £260. FT101/2, 160/10m, fan, £260. FV101, ext vfo, £40. KW2000A battery psu, unused, £25 ono. GM6XW, QTHR. Tel 03245 2604.

Trio TR3200, 70cm, SU8, SU18, SU20, RB0, RB2, RB2R, RB4, RB6, RB10, RB11, RB13, RB14, nicads, charger, Trio VB3200, matching linear, 19W output, mobile mount, 5-5dB mobile antenna SMCHS/258, sold together, £185. G3KLF. Tel Fareham 236906, weekends or evenings please.

Drake R4B, nine additional bands fitted, first class rx, £220. MN4 atu, £45. MS4 spkr, £6. Deliver 50 mile London. D. Gray, G8YB, 2 Nightingale Court, 1A Haggard Road, Twickenham TW1 3AN. Tel 01-892 0343.

Trio MC50 dual impedance desk mic, £20. ETM3C Samson keyer, £40. FT7 28/28-5kHz xtal, £1.50. G3ZZR, QTHR. Tel Witney (0993) 3792.

Icom IC211E 2m all modes tx/rx, immac, no mods, faults or repairs, all accessories, orig packing, Securicor delivery, £385. Matching Icom ICSM2 electret condenser desk mic, £16, incl p8p. Lunar 2M10-150P, 10W in, 150W out, SS 2m linear amplifier, 12-15V dc operation, preamp, 10dB 'N'-type connectors fitted, rf cables incl, orig packing, hardly used, Securicor delivery, £160. Compukit UK101 microcomputer, professionally assembled with psu, in custom cabinet (requires finishing), fully operational, Microsoft Basic 8k ram, uhf tv, RS232 serial, cassette t/o, photo, Securicor delivery, £160. Transcendent 2000 32-note three octave (seven oct range) music synthesizer, versatile, professionally constructed and finished, fully operational, uses ext pa (such as hifi amp), Securicor delivery, £160 ono. Swift 3in astronomical refractor, superb quality coated optics, may accessories, details on request, beautiful cond, mount not included, Securicor delivery, £130 ono. Gould Advance TCD500 frequency divider +10 or +100, 500MHz max input at 30mV to 1V, 10mV sens below, 300MHz, mains operated instrument, physically small, exc cond, fully wkg, suits any freq counter, £55 ono. GM8JFZ, QTHR. Tel 03552 30860, evenings, 7pm on, (not Wednesdays).

FRG7, mint cond, fine tune, going tx, £150 ono. Deliver Hants. Tel Winchester 69155, evenings.

Icom IC2E handheld, boxed, five months old, vgc, guarantee, reason for sale: no time for radio, £130. G4HXD, QTHR. Tel Steve Braund, 0287 22848, early March, 061-225 5555, ext 18, room 5, after 6pm.

More goodies available: another huge selection of components for linear amplifiers just unearthed, complete equipment includes transverters, vidicon cameras, absolutely no rubbish, but hurry, hurry, complete shack clearance, everything must go. SAE. GM3WTA, QTHR.

Liner 2 ssb tx/rx, £90. Belcom psu for above, £10—free with Liner 2 4m fm dash mount, Cambridge, £40 or offer. Pye Pocketones, RB14 xtals, batteries wkg, comp, £30. G8HWZ, QTHR. Tel Tamworth 892741, after 6pm; work 021-373 2191, ext 167.

RAE correspondence course, comp with basic physics and maths, £15. D. E. Andreoli, Flat 2, Lister House, Lister Road, Margate CT9 4AE. Tel 0843 294656.

Yaesu FT225RD 2m all mode tx/rx, as new, unmarked, £410 ono. Possibility of delivering at low cost. G3LSD, QTHR. Tel 0752 51245.

Barlow Wadley XCR30 Mk2 gen cov rx, £80. FT101E hf tx/rx, £335. PR40 preselector, £7.50. Multi U11, 13 channels, £165. Palm 4, 9ch, £135. *Ham Radio Magazine*, 1978, £2.50; 1979, £2.50; *DX Callbook* 1979, £3.50. G8KMW, QTHR. Tel 0438 54689.

KW2000B tx/rx, psu, handbook, spkr, inspection invited, reason for sale, gone solid-state, £180 ono. Buyer collects or carriage at cost. Humphreys, G4GHR, "Willow" North Dimson, Gunnislake, Cornwall. Tel Tavistock 832146, anytime.

MM432/2BS transverter, mint, £80. KSR33 teletype, perfect, 230V ac, £120. Mizuho 2m ssb/cw tx/rx, nicads, charger, perfect, a first class rig, £75. Y0335 with extended range to 200MHz, £50. Willing to haggle or swap. G3AAJ. Tel Ron, 01-989 6741, evenings or weekends.

Yaesu FL101 tx, 160-10m, £200. Microwave Modules 2m converter, 28MHz i.f., £12. XF92A ssb, 9MHz filter, £10. G3RCE, 23 Bristol Road, Southsea, Hants.

Trio TS820S hf tx/rx, cw digital readout, cw filter, dc inverter, external SP820 spkr, switchable filters, absolutely immaculate, in orig packing, £550 ono. Icom IC240 2m tx/rx, £125 ono. FT202 2m handheld, cw,

nicads, S20-22, £80 ono. G4CCZ. Tel Walton-on-Thames 40688.

Shure model 444 mic, adjustable height, high impedance magnetic, £18. Gardners new transformer, 240V in, tapped, 400-0-400, 450-0-450, 250mA, two 6-3V, 4A, 0.4 5V, 3-5A, twice, £6. Three VT104 valves, ex-T1154, offers. Manual BCC69, £2. G3MBL, QTHR. Tel 01-445 4321.

Spotless BC221 frequency meter, spare valves, £20. Brand new ministry psu for above, superb, £9. Osker block SWR200, swr meter, 2kW power meter, mint, £25. The lot, £50. G4KRG. Tel Ron, Disley 3650.

TS120S matching ac power pack and SP120 spkr, MC50 desk mic, Drake low pass filter key, KW107 Supermatch, all nine months old, property of deceased amateur, £495. Contact G4FRC, QTHR East Cornwall. Tel Widgegates 432.

Trio TR2400, still under warranty, extra soft case, modified to operate 144-148MHz by Lowe, £180 ono. R. Nixon, 24 Georges Wood Road, Brookmans Park, Hatfield, Herts AL9 7BT. Tel Potters Bar (0707) 58496. **Icom 701**, £685. Yaesu FL2100B, £190. Drake MN4, £65. All in superb condition, the lot, £900. G3GAF, QTHR. Tel 01-458 2616.

Modular Electronics linear 40 2m 40W linear, £21. Sinclair Stereo 60 set of stereo amp boards, £11. Modular Electronics 432MHz preamp, BFR91, £4. Hexalator, suitable 2m, £5. MHW710, 430MHz pa module, 15W, £7. G8JHE, QTHR. Tel 0638 720545, evenings.

TR2200G/VB2200, 13W output, 12ch, R0-1, R3-7, R5-5, S20-23, nicads, charger, mic, auto toneburst (rpt only), timer, good cond, £125. SEM 4m conv, 70/28MHz, 12V, used 4m Senior Award, good cond, £12. G3RWM, QTHR. Tel 021-308 5171, after 6pm. **IC245E**, RM3, vgc, £275. Antennas as per Dec '80 advert, two blowers, 110V, £5 each, plus carriage. 4in sq outlet. G8ESK, QTHR. Tel Bradford 45611.

Uniden Tempo 2020 ssb tx/rx, 80/10, 2X6146B pa, separate filters, usb, lsb, cw, ac/dc supplies built-in, £300 or would consider exchange modern multimode 2m FT221 or similar. G2ACZ, QTHR. Tel 052-13 3233. **Lattice tower**, telescopic, 60ft trailer-mounted, tower mechanics exc, trailer needs wheel and paint, very heavy duty, ideal for club, mobile surveys etc, all winches, cables incl, £1300 new, £350. Must sell, emigrating. G3PCN, QTHR. Tel Ruislip 73265.

Yaesu FL2100Z, mint, 50h use, test or demonstration welcomed, £275 ono. G3VBW, QTHR. Tel West End (04218) 2584.

FT221R, xtalld S21, S23-24, no mods, immac cond, orig packing, £310. Stolle 2010 rotator, cw sp bearing, £40 ono. Tonna 2m/70cm Oscar ant, new, £20. Ringo Ranger, 2m, £5. 8-el Yagi, 2m, £5. MM432/144 converter, £20. Heathkit HM2102 vhf swr/pwr meter, manual, £15. 5/8 mobile whip, mag base, coaxial, £8. Teleprinter handbook, £4. **VHF/UHF Manual**, £4. **Amateur Radio Awards**, £1. **DX Listings Callbook**, '75, £2. Carriage incl all items. DA4DY, c/o 5FD Force HQ, STG STN, BFPO 36. Tel Osnabrück (0541) 432864, evenings.

AR88D and spkr, £55. AR88LF, and spkr, £35. PSU, Ediswan R1103A, 200/400V, 200mA, stabilized 6-3V, 4A, £30. Much modified Collins TCS5 tx, £5. B2 tx, coils, £15. PS suitable for B2 tx, £15. 2m pa, QV03, 2W ip, £15. Send sae. Buyer collects. G3IBK, QTHR. **Detached** four bed amateur QTH, full planning permission 60ft Versatower, 50ft Telomast, large garden, full-sized trap dipole slung N/S, all neighbours tv-i-proofed, worked DXCC and FMD Senior Awards, both 2m and 70cm, located at top of hill nr Beverley, N

Humberside, Hull 15min, motorway 15min, both antennas hf and vhf beams. FT901DM, TS700, Nag linear etc, incl in purchase by negotiation, for quick sale, £29,900. G4HYD, QTHR. Tel 0482 862292, evenings.

Eddystone EC10 Mk2, communication rx, exc unmarked cond, Eddystone mains unit, manual, circuits, £125, cash sale, buyer collects. G3FK, QTHR. Tel Ferndown 873175.

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ATU for Grundig Satellit 2000. Tandy tr signal tracer 220/0. 19 St Stephens Road, Winchester. Tel Ron, Winchester 66764, evenings.

KW107 or KW109 or w.h.y? El-bug. G. P. Van Brenkelen, 8 Grimshawe Terrace, Creetown, Scotland. **Manual for FR50B** for purchase or loan. Tel call and postage refunded. Tel 0255 34522.

EM530 Y-amp for SE EM102 scope. G3VXZ, QTHR. Tel Maidenhead 27350.

Wireless World November 1979 to complete volume for binding. Ring first. G8DPS, QTHR. Tel 01-399 8787, evenings.

Urgent—power unit, control box, antenna unit for Collins TCS, ex-US naval tx/rx, any cables or plugs/sockets for same. SSB adapter unit, (faz) for B40 rx, good prices given if in good cond. Wright, G8XEY, 22 Crown Street, Mansfield, Notts NG18 3JL. Tel 29473, evenings.

RSGB Bulletins prior to 1950. G4HUE, QTHR. Tel 01-554 0399.

Microwave Modules a.m. tx, any cond, please state asking price and details of tx and xtals included, if any, all replies answered. G4BLI, QTHR. Tel 051-722 9538. **Newly-formed school radio club** would appreciate any donations of idle/unwanted/old gear, AT5, some carriage available, help us work you! G4KXW. Manor School, Central Building, Ashgate Road, Chesterfield. Tel Don, 0246 73853, work, 0742 394515, home.

Facsimile machine suitable for weather satellite pictures, preferably with instructions to assist modification. Will buy or exchange with Liner 2 and preamp, KW107 antenna tuner, Tekronix plug-in type K and type 1A5, Marconi plug-in type TM6455A. G3HOX, QTHR Hants. Tel 0962 822403.

Fisk Solariscope CRT3RP7. Drake R4B or R4C. Eastfield, Beare Green, Dorking. Tel 0306 77236.

EC158 disc-sealed triode valves of EC157, TR5/ARC52 control box and leads. G4BEL, QTHR. Tel Ely 740355, evenings.

Polyskop 1SW0B BN4244/2/50 set of probes with plugs. Large plugs for "rf in and out", Rhode & Swartz type. Tel Byfleet 42406.

KW E-Zee Match. GM3SHB. Tel 031-443 6556.

Racal hf linear pa, Racal rtty demod, good mech cond, electrical faults accepted, will inspect/collect SW area. G4DND, QTHR. Tel 0637 880479.

TA12D circuit diagram, purchase or loan for photostat. Will refund cost involved. G8WOU. 28 Sidney Road, Twickenham TW1 1JR.

Anybody travelling to San Diego able to take old wireless for collector? 75A/32V, 30S1. QSTs March '48 and older. **T & R Bulletins**. Circuit R210. Cabinet S27 rx. For sale/exchange over 100 CQ from 1946. Baker, Glanyrafon, Bontnewydd, Aberystwyth, Dyfed. Tel 097-421 608.

Software for ZX80, PC1211. Exchange for ORA decode, great circle dists, etc. Gibbs, 50 Pre de L'Aumone, Castel, Guernsey. Tel 0481 57605.

FL101 tx in damaged or unserviceable state for rebuild.

Power unit for B2 tx/rx or any other B2 equipment. G4GEN, QTHR. Tel 082-571 2205.

G8KW trap dipole antenna. G3PXJ, QTHR. Tel 021-444 4312.

Two bases for 4-400 type valves or info about possible supplier read for father (ZL1BBW), offers or info. G3YCP, QTHR. Thanks.

FV50B or C for FT75B. Chimney for 4CX250B. Dr Jaggarao. Royal Sussex County Hospital, Brighton.

Manuals to photostat or buy for the Trio JR500S(E) rx and the AR88D rx. For a keen beginner with little cash, a gen cov rx. L. Straus, Prior Park College, Bath. Tel Bath (0225) 832406 or 837125.

Tektronics plug-in Y-amp for 545B 'scope, anything considered. CRT for above, type T5470-31-2, or faulty unit with tube. May exchange for atv gear. G4AZS NOT QTHR. Tel Shrewsbury (0743) 67049.

Jaybeam LR1/2M or C5/2M colinear vertical antenna. Datong morse tutor. RS35070, 29 Lymington Close, London SW16 4QL.

Rad Com April 1970, Jan/Feb 1976. Index for 1969, 1975. G3YTU, QTHR. Tel 0444 58992.

Valves type 811A. Bases, Transformer, 1,000V. Loan of handbook for 30L1. Buffham, G3TMA, QTHR. Tel Norwich 712548.

Heavy duty rotator. HF linear. Base for RCA7650. Manual for Telequipment scope D66. Manual for Ferrograph series 6. Data for Bush CTV167. IC202S. Professional portable tape recorder. 19250 ± 25 xtal. Buy or swap—see for sale ads. G3MOU, QTHR. Tel 023375 316.

MM2000 rtty to tv converter, Microwave Modules. G3VES, QTHR. Tel Luton (0582) 422905/424590.

Audio output transformers, suitable for Eddystone 680X rx. G4DBL, QTHR. Tel Winchester 880120.

Heathkit vivm with manual. Tel Lincoln (0522) 685675.

Datong morse tutor D70, good cond essential. G3UYV, QTHR. Tel 0482 48435.

CQ Magazine, March 1976, buy/borrow for Drake article, all costs refunded. HF/rf sig gen, Marconi or w.h.y? In good condition. Drake R4B rx. For sale: FTDX560, offers. G4DED, 38 Woodstock Road, Begbroke, Oxford. Tel Kidlington 2215.

Eddystone 640 gen cov rx or similar, good cond, reasonable price, for experiment. For sale: driver and modulation transformers, Panda or similar, transmitter. Hifi push-pull amplifier, preamp, tone, etc, cheap. G3AEP, QTHR. Tel 0253 720756.

Reverting to hf for RNARS nets, desire exchange Icom 280E with Slim Jim and pp or offers for KW2000B, any suggestions please. G8IX, QTHR.

For the National Wireless Museum: very old rx, tx, valves, testgear, components, books, catalogues, magazines, QSLs, pre-war calendar! Collection arranged. G3KPO, hon curator. Please note new QTH: Arlington House, 34 Pellhurst Road, Ryde, Isle Of Wight, PO3 3BW. Tel Ryde 62513.

Old pre-war QSL cards by collector and researcher. Help by supplying material which will enable the production of first definitive book and catalogues of QSL cards. Please send on approval to G3BDQ, "Whitefriars", Friar's Hill, Guestling, Hastings, East Sussex.

Manual for Mercury minimitter, any other useful data on same, photostats will do. Postage costs etc paid for. G8WUI. 40 Park Road, Stanford-le-Hope, Essex SS17 0LR. Tel John, Stanford-le-Hope 74301.

Hygain 18AVT/WB or Cushcraft ATV5, good 2m all-mode tx/rx, Trio TR9000, Yaesu FT480R. Tel Howard, Leeds (0532) 686960.



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1X012	12+12	1.25
1X013	15+15	1.00
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1X015	22+22	0.68
1X016	25+25	0.60
1X017	30+30	0.50

50VA 80mm dia. x 35mm
Weight 0.9 Kg **£5.19**
(+£1.10 p.p. + 0.94 VAT)

TYPE	SECONDARY RMS VOLTS	SECONDARY RMS CURRENT
2X010	6+6	4.16
2X011	9+9	2.77
2X012	12+12	2.08
2X013	15+15	1.66
2X014	18+18	1.38
2X015	22+22	1.13
2X016	25+25	1.00
2X017	30+30	0.83
2X028	110	0.45
2X029	220	0.22
2X030	240	0.20

80VA 90mm dia. x 30mm
Weight 1 Kg **£5.76**
(+£1.20 p.p. + £1.04 VAT)

TYPE	SECONDARY RMS VOLTS	SECONDARY RMS CURRENT
3X010	6+6	6.64
3X011	9+9	4.44
3X012	12+12	3.33
3X013	15+15	2.66
3X014	18+18	2.22
3X015	22+22	1.81
3X016	25+25	1.60
3X017	30+30	1.33
3X028	110	0.72
3X029	220	0.36
3X030	240	0.33

120VA 90mm dia. x 40mm
Weight 1.2 Kg **£6.72**
(+£1.30 p.p. + £1.20 VAT)

TYPE	SECONDARY RMS VOLTS	SECONDARY RMS CURRENT
4X011	9+9	6.66
4X012	12+12	5.00
4X013	15+15	4.00
4X014	18+18	3.33
4X015	22+22	2.72
4X016	25+25	2.40
4X017	30+30	2.00
4X028	110	1.09
4X029	220	0.54
4X030	240	0.50

160VA 110mm dia. x 40mm
Weight 1.8 Kg **£8.88**
(+£1.40 p.p. + £1.54 VAT)

TYPE	SECONDARY RMS VOLTS	SECONDARY RMS CURRENT
5X012	12+12	6.66
5X013	15+15	5.33
5X014	18+18	4.44
5X015	22+22	3.63
5X016	25+25	3.20
5X017	30+30	2.66
5X018	35+35	2.28
5X028	110	1.45
5X029	220	0.72
5X030	240	0.66

225VA 110mm dia. x 45mm
Weight 2.2 Kg **£10.59**
(+£1.50 p.p. + £1.81 VAT)

TYPE	SECONDARY RMS VOLTS	SECONDARY RMS CURRENT
6X014	18+18	6.25
6X015	22+22	5.11
6X016	25+25	4.50
6X017	30+30	3.75
6X018	35+35	3.21
6X026	40+40	2.81
6X028	110	2.04
6X029	220	1.02
6X030	240	0.93

300VA 110mm dia. x 50mm
Weight 2.6 Kg **£12.27**
(+£1.60 p.p. + £2.08 VAT)

TYPE	SECONDARY RMS VOLTS	SECONDARY RMS CURRENT
7X016	25+25	6.00
7X017	30+30	5.00
7X018	35+35	4.28
7X026	40+40	3.75
7X025	45+45	3.33
7X028	110	2.72
7X029	220	1.36
7X030	240	1.25

500VA 140mm dia. x 60mm
Weight 4 Kg **£16.35**
(+£2.70 p.p. + £2.71 VAT)

TYPE	SECONDARY RMS VOLTS	SECONDARY RMS CURRENT
8X017	30+30	8.33
8X018	35+35	7.14
8X026	40+40	6.25
8X025	45+45	5.55
8X033	50+50	5.00
8X028	110	4.54
8X029	220	2.27
8X030	240	2.08

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For 240V Primary (U.K.) insert 2 in place of "X" in type number.

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A division of I.L.P. ELECTRONICS LTD

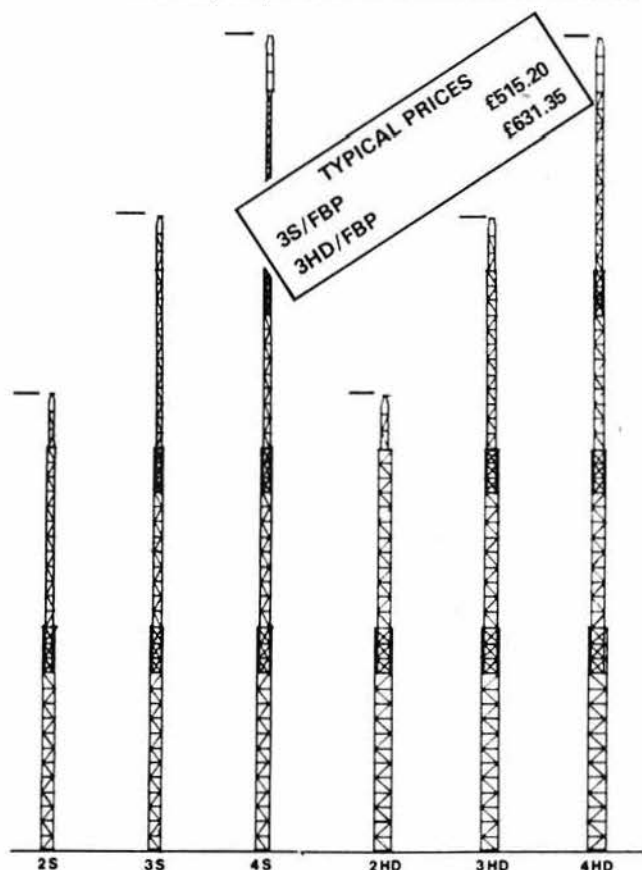
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- ★ Unique Framed Base Plate for mounting. Post or wall mounts also available on Standard Series.
- ★ All have reinforced head units.
- ★ Heavy duty towers have auto-braked winches.



A range of steel lattice telescopic, tilt-over towers offering high strength at moderate prices. Used extensively by commercial and professional bodies, the WESTOWER is designed to the latest British Standards by our own Chartered Engineers and manufactured in our own factory using modern electrically controlled welding techniques.

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FAIRFIELD ESTATE, LOUTH, Lincs LN11 0JH
Tel: Louth (0507) 604955 Telex: 56121 WEST G

Electronics (UK) Ltd



Western

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WRITE OR PHONE FOR DETAILS AND PRICES



NEW

TS-830S



The TS-830S is a high-performance, very affordable, HF SSB/CW transceiver with every conceivable operating feature built in for 160 through 10 metres (including the three new bands). The TS-830S combines a high dynamic range with variable bandwidth tuning, IF shift, and an IF notch filter, as well as very sharp filters in the 455kHz second IF.

TS-830S FEATURES

- ★ 160-10 metre coverage, including 3 New Bands
- ★ 220W PEP input (SSB); 180W dc input (CW)
- ★ Wide Receiver Dynamic Range
- ★ Variable Bandwidth Tuning (VBT)
- ★ IF Shift and IF Notch Filter
- ★ Built-in Digital Readout
- ★ 6146Bs in the PA, with RF negative feedback
- ★ PLL frequency control system for stability
- ★ RF Speech Processor; Noise Blanking and other desirable operating features
- ★ New compact size—only 333(W) x 333(D) x 133(H) mm

NEW

TS-130S



The TS-130S series is an incredibly compact, full-featured, all solid-state HF SSB/CW transceiver for both mobile and fixed operation. It covers 3-5 to 29.7MHz (including the three new amateur bands!) and is loaded with optimum operating features such as digital display, IF shift, speech processor, narrow/wide filter selection (for both SSB and CW modes), and optional (DFC-230) digital frequency controller.

TS-130S FEATURES

- ★ 80-10 metre coverage, including 3 New Bands
- ★ 200W PEP input (SSB), 160W dc input (CW) on 80-15m
- ★ 160W PEP input (SSB), 140W dc input (CW) on 12 and 10m
- ★ Built-in Speech Processor
- ★ CW Narrow/Wide filter selection (with optional filter)
- ★ SSB Narrow (1.8kHz) selection (with optional filter)
- ★ Automatic Sideband Selection according to Band
- ★ All solid-state; IF Shift; built-in Digital Readout
- ★ Compact package—ideal for /M or /P operation

NEW

YAESU FRG-7700

A HIGH-PERFORMANCE COMMUNICATIONS RECEIVER

The short-wave listener's dream is now a reality in the FRG-7700—an advanced all-mode communications receiver featuring significant advances in circuit design and operating convenience.



FRG-7700 FEATURES

- ★ Full General Coverage, 0-15 to 29.999MHz
- ★ All Modes, AM, SSB, CW, FM
- ★ Digital Frequency/Time Display
- ★ Twelve Memory Channels (option) with backup
- ★ LSI Clock/Timer, for unattended recording
- ★ Wide Dynamic Range
- ★ Many other Convenience Features

THE '9000 PACKAGE for VHF

TRIO TR-9000

+ BO-9 BASE

+ PS-20 POWER SUPPLY

LIST PRICE SEPARATELY £402.45

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+ FP-4 POWER UNIT

ADD £30 FOR FT-720RU (70CM)

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£305

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+ MC-35S MICROPHONE

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£499

THE '7625 PACKAGE (while stocks last)

TRIO TR-7625 (25W 2M)

+ RM-76 REMOTE UNIT

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£279

ALL PRICES INCLUDE VAT AT 15%

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Mays Hi Fi, Churchgate
Leicester (0533) 58662

muTek limited

rf technology from G4DGU

We've had quite a lot of approving feedback recently about our comments on specmanship. This has really been rather heartening, and we can only hope that our comments will sink-in in other places!

On another tack, after much prompting from several quarters, we are expecting to put a high performance front-end for the FT101 series transceivers (unfortunately not 'ZD's) into production in the near future. If you'd like advance data, drop us an SAE . . .

The "Moonbeam"

Some of you will have seen this at Leicester. Although this 432MHz long-yagi costs substantially less than anything else on the market, its performance isn't compromised. By passing the savings that we make by supplying the elements uncut along to you, we allow you to use the cash for something more useful like better feeder or even another antenna.

1—£16.50, 2—£32.00, 4—£63.00, 8—£116.00
Carriage—£1.50 per antenna

FT221/225GT front-end board

This board will transform the receive performance of most standard '221's and 225's. The 2dB noise figure and excellent dynamic range performance provide a receiver which will be very significantly more 'crunchproof' than most with receive sensitivity essentially limited by external noise. £53.87

1.3GHz low-noise amplifier

This preamplifier uses an NE64535 in a very carefully optimised teflon-glass microstripline design giving a *genuine* noise figure of less than 1.8dB (typically 1.65dB) quite reproducibly without tweaks! By adopting this approach, which requires a fairly sophisticated understanding of low noise amplifier design, we are able to keep our manufacturing costs, which directly influence our selling price, very low.

Our noise figure spec. is very much in line with the device-manufacturer's claims, when the inevitable losses in the input matching network are taken into account. Of course other people claim lower noise figures, although these don't stand-up to rudimentary analysis (unless they've developed some completely new technique—superconducting microstrip perhaps?)! We sleep more soundly by avoiding hi-fi style specmanship and sticking to good engineering practice.

Unboxed (with BNC or SMA connectors) £22.72 Boxed £30.81

144MHz preamplifier

Many of our comments regarding specmanship apply to this amplifier. We obtain nf's of less than 1.5dB (this equates with perhaps 1.1dB in black-box land . . .) with an associated gain of about 15dB. The pass band is flat to better than ± 0.5 dB over the 144-146MHz band with greater than 50dB rejection at ± 12.5 MHz.

Boxed £17.72 Unboxed £10.79

Microwave system components

We haven't really the space this month to list these goodies. We've held back in the production of new data, as several new items have been due for introduction and our move slowed this up rather. It should be available in the very near future.

Kungsimport Antenna Combiners

Prices and other details are listed in previous ads. We now have Ben's dish feeds available at £30 for both the 1.3 and 2.3GHz versions: they really are very well made in brass and are fitted with an integral 'N' connector.

TVI filter

This is a bandpass filter covering the 470-860MHz band, synthesised using microstripline techniques. Many people have found it very useful in dealing with TVI from both hf and vhf transmitters. £1.80

NEC rf and microwave semiconductors

A large selection available ex-stock. Prices are as before, with the exception of the 3SK88 which has now been reduced to £1.53

Data on request: SAE appreciated. CWO. Please add 50p p&p unless otherwise stated, and then VAT. Tnx!

muTek limited, Bradworthy, Holsworthy, N. Devon EX22 7TU
Telephone: Bradworthy (0409 24) 543

— 2 — 70 — 23 —

- High Throughput (1K SSB) Mast Head Preamps For 144 & 432MHz
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- GaAs Fet Preamps, NF @ 1296MHz 0.5dB
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- RF Power Measuring Device 20mW-60W-10-1500MHz
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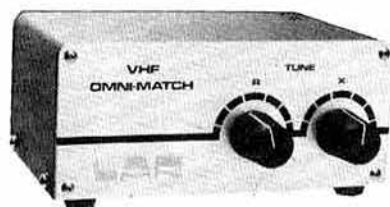
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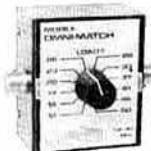
OMNI-MATCH

FOR MORE POWER - BIGGER SIGNALS

A recent survey* shows how reducing SWR can result in a significant increase in output power, particularly with today's equipment. To make this reality, we introduce the family of LAR Omni-match's . . . four models cover HF, VHF, Mobile and Linear use.



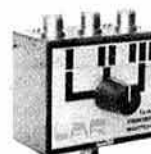
VHF Omni-Match. 144-174MHz. The ATU for the 2-metre man. Enables one antenna to cover the whole band. Ends laborious antenna pruning. Tunes out SWR at the operating position. Handles 750W. £34.90



Mobile Omni-match. 1.8-30MHz. 12-ratio impedance transformer matches lower impedance of mobile whips. Broadband, no tuning. Reduces SWR. Increases workable bandwidth. Handles 300W. £19.95



Linear Omni-match. 3-5-30MHz. Improves transceiver to linear amplifier matching. Increases drive for full output, whilst easing load on transceiver. Broadband. Switched impedances. Handles 300W. £19.95



. and for good measure

1kW Feeder Switch. A top quality switch with a generous power margin. Up to the minute styling. £16.95

HF Omni-match. 1.8-30MHz. Get full band coverage even with high-Q antennas. Optimise whole antenna feed system. Avoid power reduction SWR can bring. Includes new bands. *To the many people awaiting this model, we apologise. Difficulty with component availability frustrates us. Patience all, it is worth waiting for.*

OMNI-MATCH TIP NO 2—75ohm antenna on a 50ohm system (or vice versa)? No problem with a Linear Omni-match. Matches from 3.5-30MHz, with no bandswitching.

***FREE: 'The Plain Truth about SWR—does it matter?'**

MORE POWER TO YOU WITH AN OMNI-MATCH



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LAR



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THIS MONTH'S LAR SPECIAL— Trio CO1303G 5MHz monitor-scope with two-tone oscillator £140.00 inc VAT.

TRIO EQUIPMENT

		Price inc. VAT
NEW!	Trio 9000 multi-mode	£345.00
R1000	200kHz to 30MHz PLL Receiver with digital readout	285.00
R820	The ultimate matching receiver to the TS820	690.00
TS830S	160 10M transceiver with the new bands. Successor to the TS820	639.52
VFO230	Digital VFO with memories and digital readout	194.45
AT230	All band ATY and power meter. Matches TS830S	106.72
SP230	External speaker unit with switched filters	33.14
DFC230	Digital frequency remote controller. Four memories etc.	163.13
YK88C	500Hz CW Filter	26.45
YK88CN	270Hz CW Filter	28.75
SM220	Monitor scope	197.80
BS8	TS820 scan board for SM220	48.30
AT200	1.8 to 30MHz antenna tuner	82.80
TL922	HF linear amplifier 160-10m/2kW P.E.P.	595.70
TS20SE	1.8 30MHz SSB transceiver 200W P.E.P.	437.00
SP520	Matching speaker	17.25
DG5	Digital display/40MHz frequency counter	103.50
DK520	Conversion kit allows use of DG5 with TS520	10.35
YG3395C	CW filter	37.95
TS120V	80-10m mobile transceiver 20 W P.E.P.	347.30
TS130S	8 band 200W pep mobile transceiver	491.05
TS130V	8 band 20 W pep mobile transceiver	404.34
SP40	New mobile speaker unit	26.89
TL120	80-10m 200W P.E.P. linear	128.80
PS20	AC power supply for TS120V	44.85
MB100	Mobile mounting bracket	17.25
YK88C	CW filter	28.75
SP120	Matching speaker	25.30
VFO120	Remote VFO	89.70
TS120S	80-10m mobile transceiver 200W P.E.P.	432.40
PS30	AC PSU for TS120S, TA130 & TS180S	85.10
TS770E	2m 70cm all mode dual bander	730.25
SP70	Matching speaker	18.40
TR7600	2m synthesised mobile FM 10 Watt	220.00
TR7800	2m synthesised mobile FM 25 Watt	268.00
TR2300	2m FM portable transceiver	166.75
VB2300	10W booster	49.45
MB2	Mobile mount	17.25
RA1	Helical rubber antenna	6.90
TS180S	160 10m Solid State Transceiver. Digital memory system. 200W pep	679.65
VFO180	External VFO	96.60
SP180	Speaker	36.80
AT180	1.8-30MHz antenna tuner	95.45
PB10	Pack of 10 ni-cad batteries	10.35
TR2300	Spare power lead	1.30
LAR/PS1200	Power supply unit and ni-cad charger for TR2200GX/TR2300/TR3200 and ICOM portables. You can charge and operate at the same time	29.50

SRX30	0.5 to 30 MHz SWL Receiver	158.00
HS5	Communications headphones, tailored response	21.85
HS4	Communications headphones, tailored response	10.35
MC50	De luxe desk microphone dual impedance	24.15
MC35S	50K fist microphone (noise cancelling)	13.80
MC30S	500 ohm fist microphone (noise cancelling)	13.80
LF30A	HF low pass filter 1kW 90dB. Stop band rejection	18.40
LAR	1kW P.E.P. 3-way antenna switch	16.95

VHF AMATEUR RECEIVERS

SX200	Programmable Scanner 26-514MHz	239.00
SR9	Tuneable/crystal 2m FM receiver 144 146MHz	46.00
AMR217B	Scanner. The best mains/battery operated	120.75

HF MOBILE ANTENNAS

'G' whip tribander helical 20/15/10	24.72
'G' whip multimobile 20/15/10	28.75
L.F. coils for the above whips (specify whether tribander or multi-mobile)	6.56
Telescopic whips for the above	3.34
Base mounts for all 'G' whips	4.48

VHF/UHF 'J' BEAMS. All 'J' Beam products available

Famous Ringo Ranger 2m co-linear	27.60
Slim Jim 2m vertical	21.00
GDX2 VHF/UHF Discone Antenna 50-480MHz	39.50

ROTATORS

DR7500	Sky King SU2000	46.00
DR7600	Will take 3 element tribander	108.10
DR8600P	Will take a 2 element 40 metre beam	154.10
	As above but with preset or manual controller	204.70
	Channel Master 9502A	56.00
	Channel Master HD/9508	78.00

VHF MOBILE WHIPS A.S.P. (Telecoms Accessories)

All ASP mobile antennas and accessories available

NEW HF VERTICAL ANTENNA

HF5	80 10m vertical	48.50
HF5R	Operational radial kit for roof mounting	28.00

ICOM PRODUCTS

IC240	FM mobile synthesised transceiver 2m	169.00
IC215E	FM portable (LAR PS1200 available!) 2m	162.00
IC202S	SSB portable (LAR PS1200 available!) 2m	169.00
IC211E	All mode 2m transceiver	450.00
IC701	1.8 to 30MHz HF transceiver	899.00
IC255E	25 watt FM 2m mobile with memory and scanner	255.00
IC2E	2m FM hand portable	159.00
IC260E	2m all mode mobile	339.00
IC251E	All mode transceiver	479.00

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OFF THE PAGE - Simply choose the product and then complete the coupon and enclose cheque.

* Open Mon-Fri 9.15-6.30pm

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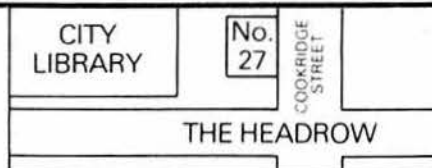
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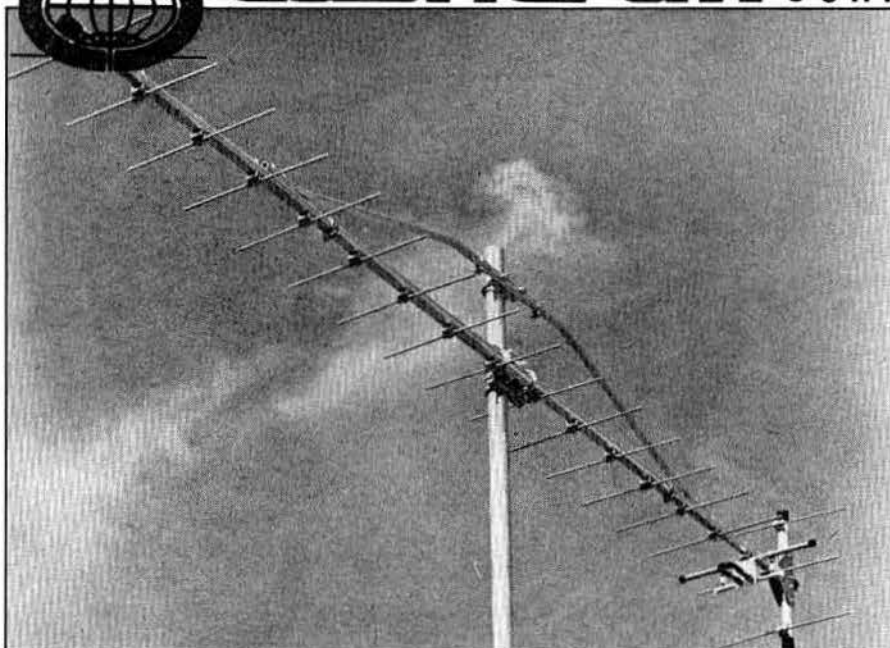
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RC22

RC22

cushcraft CORPORATION



Boomer

Boomers are your best antenna choice today. They offer the maximum gain available for their boom lengths. They feature carefully trimmed and spaced elements, T-match driven elements with 1:1 balun for perfect match. They have Trigon reflectors for excellent front to back ratio and cleaner patterns. Fasteners are all stainless steel and heavy gauge heat treated aluminium tubing is used for all models.

Whatever your choice of 2 metre activity, Boomers will fill your needs. For FM at the high end use the 214FB or 228FB. For CW/SSB on the low end use the 32-19 or 214B, in EME, DX or regular QSO's. Boomer will perform for you. Now 220 MHz has been added to complement the Boomer series. Models are available for the bands from 50 through 220 MHz.

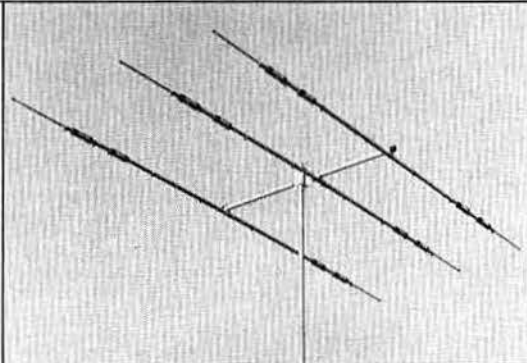
Power dividers are available separately.

Model No.	32-19
Frequency range (MHz)	144-146
Forward gain dBd	16.2
Front to back ratio dB	24
SWR (typical)	1.2:1
Impedance (ohm)	50
Weight (lb)	12
(kg)	5.44
Length (ft)	22
(m)	6.71
Turning radius (ft)	11
(mm)	3.35
Windload (ft ²)	3.5
(m ²)	.33

A3 3 Element 20/ 15/ 10 metres

Make friends of your neighbours with A3 compact dimensions low profile and small turn radius. Satisfy your budget with A3 economy pricing. You will also realise savings by using a lighter weight tower and rotator. This is one compact beam that has the strength and power of most larger antennas.

Forward Gain	8 dBd
Front to back Ratio (Avg)	25 dBd
VSWR	1.2:1 Typical
Bandwidth (Avg)	500 KHz
Power rating	2000 W PEP
Feed Point impedance	50 ohms
Boom (ft-in)	14' x 1.63" x 150"
(cm)	426.7 x 4.13-3.81
Weight (lb)	27
(kg)	2.19
Turning Radius (ft)	15.50
(m)	4.72



HF Verticals 10 to 80 metres

3 band
20-15-10 metres
Model ATV-3

5 band
80-40-20-15-10 metres
Model ATV-5

Efficient
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Fibreglass
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No tuning
required

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compression
clamps

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coverage

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sections

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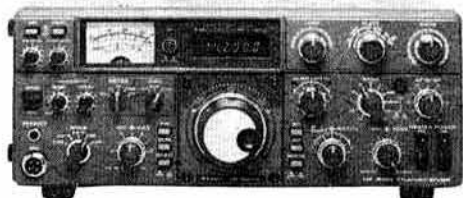


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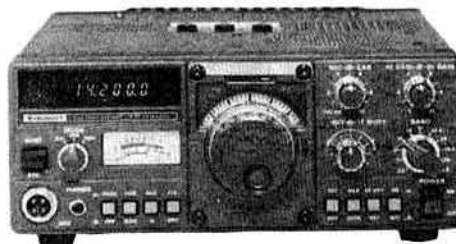


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70 MHz 40 WATT LINEAR AMPLIFIER



SPECIFICATION:
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20 WATTS OUT FOR 5 WATTS IN

THIS HIGH QUALITY LINEAR AMPLIFIER WITH COMBINED RECEIVE PREAMPLIFIER WILL PROVIDE 40 WATTS RF OUTPUT WHEN DRIVEN BY A 10 WATT TRANSMITTER, AND IS SUITABLE FOR ALL MODES. THE RECEIVE PREAMPLIFIER WILL GENERALLY IMPROVE RECEPTION, ESPECIALLY UNDER MARGINAL BAND CONDITIONS.

RECEIVE [GAIN: 15dB typical
PREAMP [N.F.: 2.0dB maximum
POWER REQUIREMENTS: 12.5 VOLTS @ 5 AMPS

THIS UNIT FEATURES RF VOX CHANGE-OVER, AND IS SUPPLIED COMPLETE WITH ALL CONNECTORS

MML70/100 ALSO AVAILABLE:
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MMT70/28

70MHz LINEAR TRANSVERTER



FEATURES INCLUDE:
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★ LINEAR, ALL-MODE OPERATION

SPECIFICATION:
FREQUENCY COVERAGE: 70-70.7MHz
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INPUT MODES: SSB, FM, AM and CW
INPUT DRIVE REQUIRED: 5-500mW (variable)
OUTPUT POWER: 10 WATTS CONTINUOUS
RATING
RECEIVE CONVERTER GAIN: 30 dB typical
RECEIVE CONVERTER N.F.: 2.0dB maximum
POWER REQUIREMENTS:
12.5 VOLTS @ 2.1 AMPS

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144MHz LINEAR TRANSVERTER



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INPUT FREQUENCY RANGE: 28-30MHz
INPUT MODES: SSB, FM, AM and CW
INPUT DRIVE REQUIRED: 5-500mW (variable)
OUTPUT POWER: 10 WATTS CONTINUOUS
RATING
RECEIVE CONVERTER GAIN: 30dB typical
RECEIVE CONVERTER N.F.: 2.5dB maximum
POWER REQUIREMENTS:
12.5 VOLTS @ 2.1 AMPS
FEATURES INCLUDE:
★ RUGGED PA TRANSISTOR
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Yaesu FT 101Z	£488	£190	£24.84	£488.08
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R2	4-0291	8-0583	12-0875	14-9944	18-1312	44-9833
R3	4-0298	8-0597	12-0895	14-9972	18-1343	44-9916
R4	4-0305	8-0611	12-0916	15-0000	18-1375	45-0000
R5	4-0312	8-0625	12-0937	15-0027	18-1406	45-0083
R6	4-0319	8-0638	12-0958	15-0055	18-1437	45-0166
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S8	—	—	12-1000	14-9444	18-1500	44-8333*
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S11	—	—	12-1062	14-9572	18-1593	44-8583*
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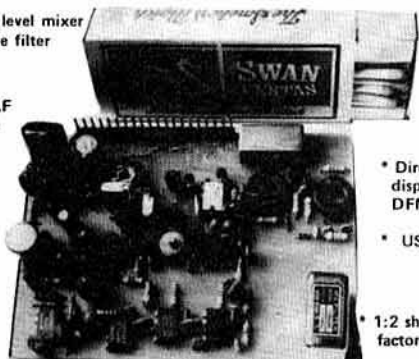
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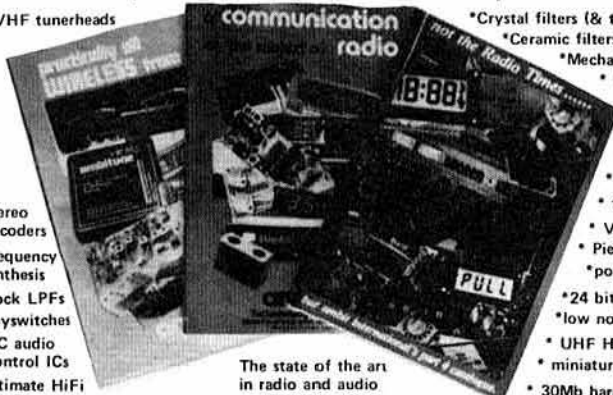
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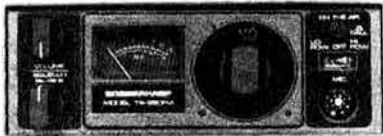
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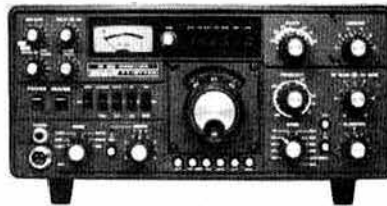
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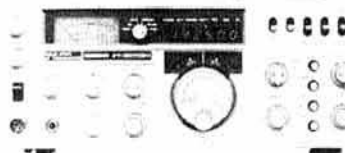
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70cms FM TCVR (0-5W) TX	70FM05T	25.95	17.80	2M Power Amps 1-5-10W	144FM10A	16.15	12.45
RX	70FM05R	47.25	38.50	144FM 10A with full c/o	144FM10B	28.90	22.90
70cms Multi-channel TX	70MC06T	18.10	11.30	2M Linear Amps 1-5W-10W	144LIN10A	23.35	17.66
RX	70MC06R	26.05	18.60	144LIN 10A with full c/o	144LIN10B	30.45	24.55
70cms FM Package (70FM05TR + MC)	70PAC	110.00	82.00	2M Pre-Amp (3SK88/BF981)	144PA3	7.50	6.25
70cms Power Amps 0-05-1W	70FM1	11.25	6.25	2M Pre-Amp (3N204)	144PA2	7.35	6.07
0-5-3W	70FM3	16.80	11.80	Toneburst	TB2	6.05	3.10
0-5-5W	70FM5	17.40	12.75	Piptone (12V PTT)	PT1	6.50	3.40
0-5-10W	70FM10	29.35	20.90	Piptone (Solid State PTT)	PT2	6.65	3.45
3-0-10W	70FM10/3	18.80	13.95	Piptone 'K' Generator	PTK1	7.85	5.60
70cms Pre-Amp (Bipolar)	70PA2	6.55	5.10	Regulator	REG1	5.95	3.70
70cms Pre-Amp (MOSFET)	70PA3	7.25	6.10	Solid State Relay (2M)	SSR1	4.85	3.16
70cms Pre-Amp/Power Amp	70PA/FM10	39.80	30.80	Solid State Relay (70cms)	SSR2	4.90	3.22
2M FM TCVR (1-5W) TX	144FM2T	30.25	21.15	Microphone Pre-Amp	MPA1	5.15	2.50
RX	144FM2R	49.80	40.70	Noise Filter	SLF1	5.10	3.90
2M Synth TX	SY2T	23.10	17.25	Reflectorometer	SWR1	5.60	4.55
2M Synthesiser Mk II	144SY25B	69.70	50.95	CW Filter (Audio)	CWF1	5.85	4.25
2M FM Package (RX + TX + Synth)	144PAC	135.00	102.00	Filters (144, 433, 384MHz)	BP1	4.85	2.85
2M Synth Mk I Adaptor	SY25PB	10.50	8.25	Pin Switches (144, 433MHz)	PS1	6.20	5.10
2M Synth Mk II 70cms Adaptor	SY25S70	5.95	3.65	TVI Filter	70FI6P	3.95	3.05
2M Synth Scanner	PROSCAN1	20.10	14.75	Microwave Drive Source	MD05T	28.35	19.25
2M Synth Display (2 pcbs)	DISP1/2	20.15	15.80	Microwave Driver PA 10W	MD10PA	29.35	20.90

Above is a brief listing of the current product range as full kits. These cannot be split and sold in component parts. We do have, however, many components that are hard to get for the average amateur which include 23cms pre-amp boards and devices (NE64535), diode boxes, chip resistors (51Ω and 100Ω), PTFE trimmers, Mullard thick film amplifiers (OM335, OM361) etc. A large SAE (A4 size) will bring you the latest lists and new projects. The range is constantly expanding and it is worth giving a call if you have a simple query on TADLEY (07356) 5324 or BASINGSTOKE (0256) 24611 during evenings and weekends. The above prices include VAT at

the current rate. Please include 60p on your total order for post and packing. The kits include all pcb components except crystals unless stated otherwise. Suitable boxes and external hardware is not supplied in the kit but some suitable stock is held. Any kit purchased from the range will be gladly serviced but a £2.50 cover charge would be appreciated on larger items. All items in kit form are usually ex-stock either with us or our ally agent J. Birkett of Lincoln. Assembled items unless stock will be 10-14 days from receipt of order, and will be tested and aligned to specification.

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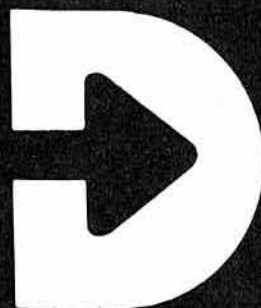
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Model ASP



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Models AD270, AD370

Model D75 RF Speech Processor

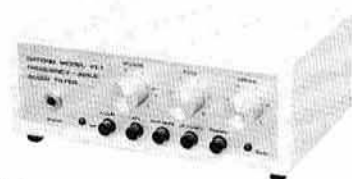
Model D75 uses the same method of r.f. clipping as in Model ASP but features manual adjustment of input level rather than the automatic system used in Model ASP.



Like all our r.f. clippers the unit helps your speech signals stand out from the next under DX conditions. Many users consider the use of our r.f. clippers more effective than a linear.

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Products not shown in this advertisement

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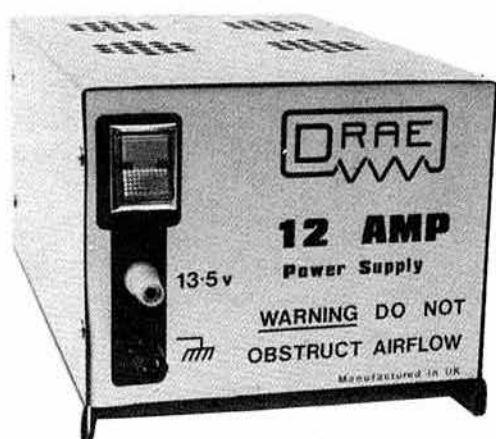
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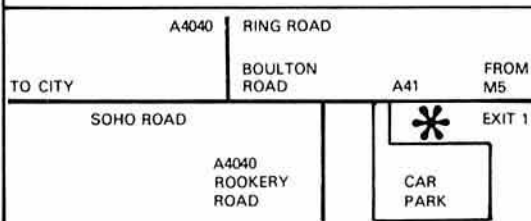
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FT272ZD Similar to FT1012D but includes cw filter, 12V converter, cooling fan and microphone — extras worth at least £95. £589.

FT901DM including such extras as AM and CW crystal filters, electronic keyer, inbuilt AC and DC power supplies, microphone, frequency memory and cooling fan, £795.

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*1-5 to 2-599MHz (fund) HC6/U	£4.93
*2-6 to 2-999MHz (fund) HC6/U	£4.48
*3-4 to 3-999MHz (fund) HC18 & 25/U	£6.21
*4-0 to 5-999MHz (fund) HC18 & 25/U	£4.93
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*Delivery Normally 5/6 weeks (express available) — all other frequencies 7/8 weeks.

Holders — Low frequencies HC13/U or HC6/U dependent on frequency.

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We can supply crystals to most commercial and MIL specifications, with an express service for that urgent order. Also for commercial use, eg TV or computer crystals, etc, we can supply at very competitive prices. Please send S.A.E. for details or telephone between 4.30-7pm and ask for Mr Norcliffe.

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144-4 (433-2)	b	e	b	e	e	b	e	e	e	e	e
144-480	e	e	e	e	e	e	e	e	e	e	e
144-800	c	e	e	e	e	c	c	c	c	c	c
144-850	a	c	a	c	c	b	b	a	a	a	c
145-000/ROT	a	c	a	e	e	b	b	a	a	a	c
145-025/R1T	a	c	a	e	e	b	b	a	a	a	c
145-055/R2T	a	c	a	e	e	b	b	a	a	a	c
145-075/R3T	a	c	a	e	e	b	b	a	a	a	c
145-100/R4T	a	c	a	e	e	b	b	a	a	a	c
145-125/R5T	a	c	a	e	e	b	b	a	a	a	c
145-150/R6T	a	c	a	e	e	b	b	a	a	a	c
145-175/R7T	a	c	a	e	e	b	b	a	a	a	c
145-200/R8T	a	c	a	e	e	b	b	a	a	a	c
145-300/S12	e	e	e	e	e	e	e	e	e	e	e
145-350/S14	e	e	e	e	e	e	e	e	e	e	e
145-400/S16	e	e	e	e	e	e	e	e	e	e	e
145-425/S17	e	e	e	e	e	e	e	e	e	e	e
145-450/S18	a	e	a	e	e	b	b	a	a	a	c
145-475/S19	a	e	a	e	e	b	b	a	a	a	c
145-500/S20	a	c	a	c	c	b	b	a	a	a	c
145-525/S21	a	c	a	c	c	b	b	a	a	a	c
145-550/S22	a	c	a	c	c	b	b	a	a	a	c
145-575/S23	a	c	a	c	c	b	b	a	a	a	c
145-600/R0R	a	c	a	c	c	b	b	a	a	a	c
145-625/R1R	e	e	e	e	e	e	e	e	e	e	e
145-650/R2R	e	e	e	e	e	e	e	e	e	e	e
145-675/R3R	e	e	e	e	e	e	e	e	e	e	e
145-700/R4R	e	e	e	e	e	e	e	e	e	e	e
145-725/R5R	e	e	e	e	e	e	e	e	e	e	e
145-750/R6R	e	e	e	e	e	e	e	e	e	e	e
145-775/R7R	e	e	e	e	e	e	e	e	e	e	e
145-800/R8R	a	c	a	c	c	b	b	a	a	a	c
145-950/S38	a	e	e	c	e	e	e	e	e	e	e

PRICES: (a) £1.95, (b) £2.32, (c) £2.50, and (e) £4.48.

AVAILABILITY: (a), (b) and (c) stock items normally available by return (we have over 5000 items in stock), (d) 4/6 weeks normally but it is quite possible we could supply from stock. N.B. Frequencies as listed above but in alternative holders and/or non stock loadings are available as per code (e).

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Due to the much higher multiplication involved (three times that on 2m) all our stock 70cm crystals are to much higher tolerances than our standard range.

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A Solid State, all modes unit covering 1.7 to 38 MHz. Typical power output 130 watts for 215 watts DC input and 4-7 watts drive (15 watts SSB). RF sensing VOX circuit. Switchable receive pre-amp. Supply requirements: 13.8V at 20A, Negative Earth. Size: 5" w x 7" l x 3" h. Weight: 2.5 lbs.

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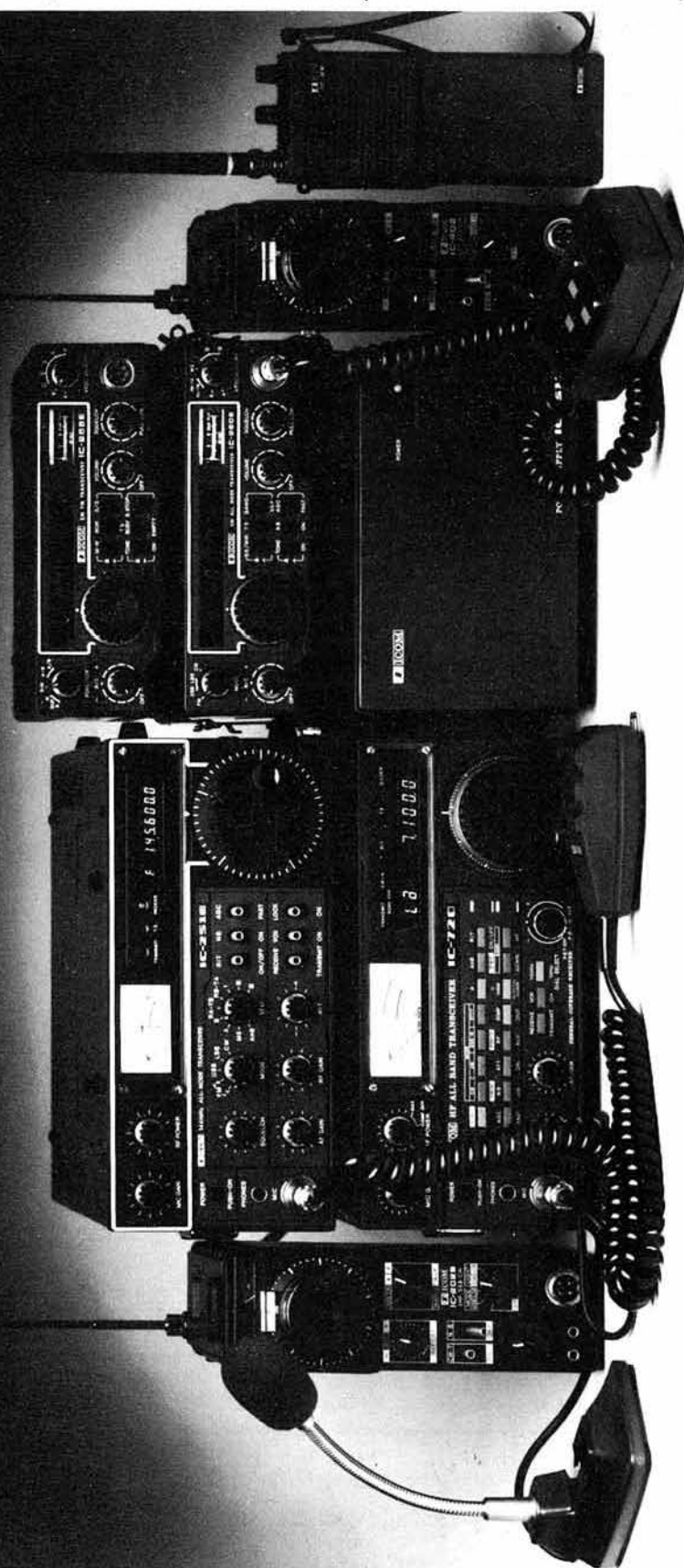
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