

RADiO COMMunication

July 1981

The IARU Region 1 Conference — Brighton, 1981

Full report in this issue



Delegates to the conference assembled on Brighton seafront

Journal of the Radio Society of Great Britain





your one-stop shopping centre for complete equipment from 'Trio' and 'Philips', accessories from 'Jaybeam' and 'Microwave Modules', components, kits and the 'Video Genie' Microcomputer system

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70cm SYNTHESIZED TRANSCIVER PHILIPS TYPE FM321

Catronics are proud to announce the availability of the world's first 70cm 40 channel FM mobile transceiver in the UK. Especially made to our own specification by Philips—Europe's largest manufacturer of Radiotelephone equipment.

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- ★ Full 40 channel coverage RBO to SU39
- ★ Direct LED display of channel number
- ★ Electronic channel change up or down from front panel
- ★ Remote Control channel change on microphone
- ★ 3 position squelch control for ease of operation
- ★ "Nominated Repeater Position" may be preprogrammed to your local Repeater channel for instant access
- ★ Crystal controlled Toneburst operates in Repeater Mode
- ★ Receiver sensitivity 0.3µV for 12dB SINAD
- ★ Transmitter output power 5W minimum, gives typically 25W e.r.p. with Jaybeam U5 mobile antenna
- ★ Supplied complete with mobile bracket, microphone with P.T.T. and channel change, operating manual etc.

The Philips FM321—We want you to have the best even better value now at £197 + VAT = £226.50.

New RTTY Terminal Unit/Program for Computers

Fabulous new program now available to send and receive RTTY. Complete with Receive Terminal Unit and Transmit AFSK on PCB assy. Suitable for Video Genie and TRS80 computers: CT600 special introductory price £109.20

THINK JAYBEAM—THINK CATRONICS

We generally have the full range of 'Jaybeam' aerials in stock as follows:

FOR 2m Band:		FOR 70cms Band:			
C5/2M	5dB colinear	£44.25	D8/70cm Double 8 yagi	£20.70	
5Y/2M	5 ele yagi	£11.25	PBM18/70cm 18 ele Parabeam	£25.30	
8Y/2M	8 ele yagi	£14.45	MBM48/70cm 48 ele Multibeam	£28.75	
10Y/2M	10 ele yagi	£31.05	MBM88/70cm 88 ele Multibeam	£39.30	
PBM10/2M	10 ele Parabeam	£36.80	12XY/70cm Cross 12 ele yagi	£42.30	
PBM14/2M	14 ele Parabeam	£44.85	8XY/70cm Cross 8 ele yagi	£34.15	
5XY/2M	Cross 5 ele yagi	£22.75	C8/70cm 8dB colinear	£50.00	
8XY/2M	Cross 8 ele yagi	£28.40	X6/2M/X12/70cm Dual Band	£38.50	
10XY/2M	Cross 10 ele yagi	£37.70	FOR 23cms Band:		
Q4/2M	4 ele quad	£23.65	D15/1296	Double 15 yagi	£34.00
Q6/2M	6 ele quad	£31.35	PHASING HARNESSSES:		
D5/2M	Double 5 yagi	£20.10	PMH/2C	2m circular	£7.45
D8/2M	Double 8 yagi	£27.10	PMH/2M	2m stacking	£9.85
UGP/2M	Unipole	£10.10	PMH/70	70cms stacking	£8.50
HO/2M	Mobile 'halo'	£4.50	MASTS and ROTATORS, etc:		
HM/2M	'Halo' + mast	£5.40	SPM	16' portable mast	£15.10
TAS	1/2 wave whip	£15.25	PME	4' extension	£2.53
X6/2M/X12/70cm	Dual Band	£38.50	SVMK	Vertical mount	£7.20
LR1/2M	4½dB vertical	£24.15	9502	Rotator	£55.75
			9523	Align bear	£11.70
			KR400	H. Duty Rotator	£105.80

ALL PRICES INCLUDE VAT, but please ADD CARRIAGE as follows: Harnesses, halos, and UGPs—£1.00. Other aerials and masts—UK Mainland, £4.00.

COMPONENTS FOR RADCOM (AND OTHER) PROJECTS

G3PLX RTTY VIDEO DISPLAY (April 1977 Rad Com)

Kit (excluding modulator and keyboard), £107.00.
Set of printed circuit boards, £34.10; 2513, £8.00; AY5-1013, £5.35; 2102-1, £1.57; SN74188, £2.40 each or ready programmed £6.60 per pair; 7MHz xtal, £2.90.
Also available: Cabinet to match CT100 T.U., £12.50.
Flashing cursor kit, £7.90.

Diode Matrix kit, £16.30.

NOTE regarding PROM program: The PCBs and programmed PROMs supplied by us make use of a slightly different program sequence resulting in different pin connections to those published in the 'Rad Com' article. Whilst constructors buying PROMs and PCBs from us will have no difficulty, those producing their own PCBs or having PROMs programmed elsewhere should note this important difference. A detailed modification sheet is available with the PCBs.

MULTIMODE 1600 TRANSCIVER

(Oct/Nov 1977 Rad Com)

Special price for component kit, £275.10.

Receive only kit also available, £243.30.

PCB, £16.45; 8545kHz xtal, £2.90; 400ns delay line, £2.27; MD108, £8.95; RS 12V Relay, £3.80; Toroid 75p; Minikit 3 IRs and Csl, £24.05.

40 WATT 2M PA KIT

For boosting power output of '10-15 Watt' FM mobile rigs. Auto Transmit/Receive switching. Requires 12-16V d.c. supply. Complete with cabinet and full instructions.

Kit £28.85 + £1.25 post. Also ready-built at £38.85.

10 WATT 2M PA KIT

A 10 watt output version of our famous 40 watt 2M PA kit is available, for boosting the output of 1-2 watt FM transmitters.

Kit £21.75 inc VAT + £1.25 post. Also ready-built at £31.75.

G3TDZ FM TRANSCIVER (March 1978 Rad Com)

PCBs: Audio, £2.40; RX, £5.90; TX, £5.75; xtal Osc, £1.60.

KITS: Receiver (less 455kHz coil), £39.10; Transmitter, £31.95.

G3ZVC SSB TRANSCIVER (Sept 1974 Rad Com)

PCB £5.35; Toroid, 85p; MD108 Ring Mixer, £8.95; OC1246 AX Filter, £29.65.

SPECIAL PRICE FOR COMPONENT KIT, £99.95.

Also available—but not included in kits: Reprint of article, 15p plus SAE, Min. 50p; coaxial connectors—PCB mount socket, £1.37 and plug, £2.32.

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. Secured delivery arranged. All prices include VAT.



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EXPORT SALES WELCOME—PAY BY CREDIT CARD OR BANKERS CHEQUE



JULY 1981

VOLUME 57 No 7



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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.

Radio Communication is published by The Radio Society of Great Britain as its official journal on the first Friday of each month and is sent free and post paid to all members of the Society



26,007 copies per
issue average
circulation in 1980

Closing date for contributions
unless otherwise notified:
five weeks before publication date

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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.)

TS830S £726.00 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 £547.00 inc VAT
TS-130S £450.00 inc VAT
Carriage £4.50.



PS-30

SP-120

TS-130S

VFO-120

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TRIO *pacesetter in amateur radio*

TS-530S *building on proven success*

The all new TS530S is firmly based on the reputation of the TS520 series and incorporates many of the features of the superb TS830S. Included are the three new bands and, of course, the rig has both digital and analogue frequency readout. Also available for the TS530 is a complete range of matching station accessories, the SP230 speaker, the VFO240 and, of course, the AT230 antenna tuning unit.

TS530S features:

- Single conversion receiver and transmitter using 8.83MHz IF.
- LSB, USB and CW on 160-10 metres including the new 10, 18 and 24MHz bands.
- Built-in digital display with six digits and also analogue dial.
- IF shift (passband tuning).

- RIT (Receiver Incremental Tuning) and XIT (Transmitter Incremental Tuning).
- Built-in speech processor.
- Narrow and wide filter switching.
- Noise blanker threshold level control.
- Also retained are the rugged reliable 6146B PA valves and the easy to use controls.

Optional Accessories:

- SP230 external speaker with selectable audio filters.
- VFO240 external matching VFO.
- AT230 antenna tuner/SWR and power meter/antenna switch, 160 to 10 metres bands.

TS-530S £561.00
carriage £4.50



NEW

TR-9500 *70cm FM, SSB and CW multimode mobile*



The TR9500, a 70cm multimode mobile giving SSB, FM and CW operation in a compact rig based on the phenomenally successful 2 metre 9000. Combining the convenience of FM with the "DX ability" of SSB on the 70cm band this is the rig all discerning VHF and UHF amateurs have been waiting for. Used alongside your existing 2 metre equipment a new spectrum of contacts becomes available. Repeaters, satellite working, simplex and with the addition of your 2 metre rig Duplex communications are at your fingertips.

Of course the matching accessories, SP120 speaker, BO-9 system base and PS20 power supply, are all available to enable you to build a base station system second to none.

The TR9500 features:

- FM, USB, ESB and CW.
- Similar in size to the TR9000.
- Two digital VFOs.
- Multiple scan facilities for various modes.
- Six memories, five for simplex or repeater shift—and the sixth memory for a non-standard offset.

- Digital frequency display.
- Covers 430 to 440MHz.
- Up/down microphone for manual band scan.
- RIT (Receiver Incremental Tuning) for SSB and CW.
- RF gain control.
- Mobile mounting bracket.
- Led indicators for on air and busy.

Optional Accessories:

- PS20 fixed station power supply.
- SP120 fixed station external speaker.
- BO9 system base—with power switch, send/receive switch, memory back up power supply and headphone jack.

TR-9500 £472.00
carriage £4.50

NEW



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Ward Electronics
Soho House,
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Leeds LE2 3AG
0532 452657

TRIO

As the appointed distributors for Trio, we recommend that you purchase your Trio equipment from an approved stockist (list above). Any stockist *not* on the 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.

TRIO

R-1000 "Hear there and everywhere"



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 240V AC.

RECEIVER WITH DC KIT FITTED £299 inc VAT.
SP-100 MATCHING EXT SPEAKER £26.45 inc VAT.
CARRIAGE BY SECURICOR £4.50.



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



MF-083 8-Channel

Marine Scanner + FM Broadcast
£85.10 inc VAT carriage £1.50

Lowe Electronics Open Day

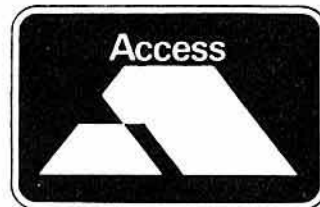
The Directors and Staff of Lowe Electronics have great pleasure in inviting you to our first open day to be held on Saturday the 15th August, here at Matlock. All the members of staff will be in attendance including back room boys and girls. You will have the opportunity to meet them and find out how we tick. There will be conducted tours of the building by G3PCY and G8GPY. The RSGB Practical Wireless and the girls from CLUB 24, the LOWE CARD people will be in attendance. We hope you will join us in making it a successful day.



THE WAY TO HAVE TOMORROW'S EQUIPMENT TODAY

WRITE FOR FULL DETAILS TODAY

ALSO WE NOW



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LOWE ELECTRONICS

CHESTERFIELD ROAD MATLOCK DE4 5LE

Have you thought about selling or trading in your QSL cards?
Not so daft as it seems, since our collectomaniac Director - John Wilson - is willing to buy or trade in QSL cards. They must be postally used, in other words have stamps on, and been sent to you from abroad. Particular interests are cards from former African colonies and places like Ascension, St Helena and so on.
If you are interested, why not contact John Wilson at Matlock. It's an easy way to turn waste paper into money.



LOWE SRX 30D

..... a familiar name, but a whole new receiver



A familiar name, but a whole new receiver behind it. Building on all the excellent features of the SRX-30, including the drift cancelling system covering 500kHz to 30MHz; the selectable sidebands and AM; the easy to use tuning system; we now introduce the all new SRX30D which incorporates the suggestions made by our customers. Outstanding new features are:

- Extended coverage 200kHz-30MHz
 - Digital readout in large green display units which give true unambiguous frequency information—even when you switch sidebands or use the clarifier.
 - All new frequency synthesis using Plessey SL6 1641 double balanced modulator ICs for a new high standard of performance.
 - All new audio system which produces outstandingly good quality on the built in speaker, and is capable of driving external hi-fi speaker units for even better sound.
 - All new IF filters with optimum bandwidth for mode in use. Automatic filter selection from mode switch.
- There is so much that is impressive about the SRX30D that you have to see it and handle it to really appreciate the performance. We predict that the SRX30D will be a landmark in low cost, high performance SWL receivers. Just consider how much you should pay for a receiver covering 200kHz-30MHz with accurate digital readout; high performance USB/LSB/AM with switched filters; drift cancelling frequency synthesis; built in mains supply and built in speaker; high quality construction and advanced design—and so much more. Then look at our price for the SRX30D and you will be even more impressed.

£195.00 inc VAT Securicor carriage £4.50

Accessories for the short-wave listener

		Inc VAT	Carr
HF5	80-10m HF vertical. No radials required when on ground post.	48.50	4.50
EIS	Small egg insulator. Glazed ceramic 40cm long.	.30	.25
EIL	Large egg insulator. Glazed ceramic 50cm long.	.45	.36
SIL	Ribbed strain insulator for dipole end or centre, 70cm long.	.35	.36
MIZUHO			
KX2	Top quality 500kHz-30MHz aerial tuner. Perfect match for R1000.	29.90	1.50
AX1	Aerial switching system. Handles 6 aerials & 6 receivers.	27.03	1.00
APM1	Audio peak and notch filter. Variable bandwidth active filters.	33.00	1.00
SR1	Mini rack for above the system.	14.09	1.50
MP1	Rack mount for APM1.	5.20	1.00

TRIO

pacesetter in amateur radio



Trio 8400 the new way to 70cm FM mobile, a fully synthesized 430 440MHz 10 watt output, mobile transceiver with memories, 2 separate VFO's all in a truly amazing compact package. Complete with up/down frequency shift microphone and car mounting bracket the TR8400 is the way to go... 70cm is on the move.

TR-8400 70cm FM mobile

£329 inc VAT. Securicor carriage £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.

TR-9000 2 Metre Multimode

£372 inc VAT. Carriage by Securicor £4.50



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 development for repeater shift, priority, and scan. The TR-7800 by Trio, the only FM mobile.

TR-7800 The Ultimate 2 Metre Mobile FM rig

£275 inc VAT. Carriage by Securicor £4.50

LOWE ELECTRONICS Ltd

CHESTERFIELD ROAD MATLOCK DE4 5LE TEL 0629 2430/2817



DAIWA *Distributed in the UK by Lowe Electronics Limited.*



The Daiwa infrared mike system comprising of a control box, sensor and infrared mike enables you to dispense with the hand mike and cable when operating in your car or shack. By using an infrared beam audio is transmitted from the mike to the sensor and then to the control box which activates the transmitter. To transmit, press the locking switch on the mike and talk. To receive, release the switch and your rig immediately returns to receive. When you have finished your contact return the mike to its slot in the control box and the mike nicad battery is maintained at full charge. For those of you who like fresh air and drive with all the windows open there is a matching wind shield available at an additional 75p. So there we are, the latest in technology to bring safely to your mobile operation, the Daiwa infrared mike.

the **DAIWA** Infrared mike £45 inc VAT carr. £1.00

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.

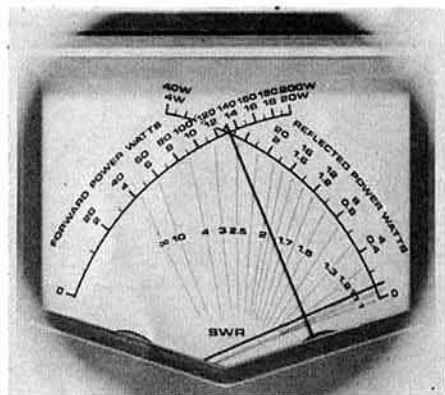
The CNA1001A incorporates a sensitive reflected power detector which monitors SWR all the time. At the first push of the operate button, a motor driven gearbox drives the load and match variable capacitors through their entire range in overlapping small increments seeking a correct match. When matching is achieved, the motor drive stops and that's that. The CNA1001A needs only a small sniff 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 CNA 1001A Automatic Antenna tuner £129.50
inc VAT high power model £190 inc VAT



the **DAIWA** cross needle 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

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.

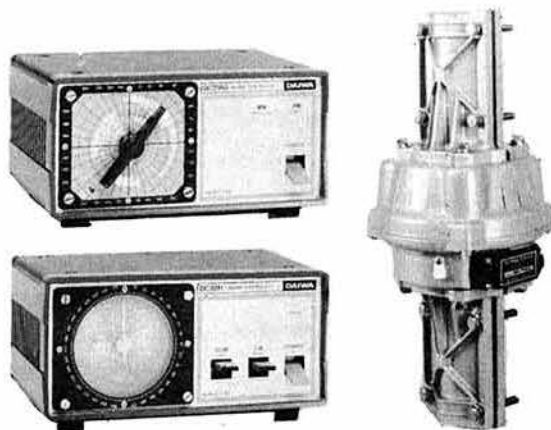
Each rotary system is supplied complete with rotator unit, control unit, and upper and lower mast clamps.

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.

the **DAIWA** rotator systems

DR7500X £98 inc VAT DR7600X £135 inc VAT
DR7500R £108 inc VAT DR7600R £144.90 inc VAT



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enjoy the flavour of homebrew equipment . . .

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 the RF and mixer boards are ready built and aligned so no test equipment is required. All the cabinet work has been carried out so all you have to do is assemble the IF strip, xtal oscillator, and fit them to the completed chassis. Great idea and it brings back the flavour of home brew with the added advantage that the rig will work when you've finished it. For more info, just ask us or come along and see it. It's a great little rig.

NETT inc. VAT CARR.

SS015S	80-10m solid state SSB/CW/FM transceiver. Semi kit form	225.00	258.75	4.50
SE-NB	Noise blanker kit	6.75	7.76	50
SE-FMtx	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	500 Hz CW filter	13.50	22.43	58
Optional band crystals		3.00	3.45	25

THE SHIMIZU SS105S 80-10 metres ssb/cw transceiver

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THE AR240A

2 metre hand held synthesized
144-146MHz 1½ watt transceiver
AR240A £158 inc VAT

THE AR22

a 2 metre FM pocket synthesizer
141-149 MHz receiver
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THE AR740A

the 70cm hand held version of
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Price to be announced

AERIALS *only a small section of our vast range, ring for full details*

THE NEW BUTTERNUT RANGE

the HF5V III 5 band vertical £65.00 inc VAT
the TRB160 160 loading coil for above £25 inc VAT
the 2MCV 2 metre colinear £22.00 inc VAT

THE HOKUSHIN RANGE

the 2E 2 metre 5/8 whip £8.50 inc VAT
the 2NE 2 metre 7/8 whip £13.00 inc VAT
the 430E 70cm 5/8 over 5/8 £11.50 inc VAT

FREQUENCY COUNTER *Model HFC 55*

The HFC55 is a sensibly priced, easy to use digital frequency meter covering 10kHz-55MHz in a single range. The bright 5 digit display gives a direct reading of frequency when the built in telescopic aerial is placed near a source of RF. The HFC operates from internal dry batteries and is housed in a strong metal case to withstand regular and continuous use.

HFC 55 Frequency Counter £36.50 inc. VAT. Carriage £1.50

POWER SUPPLY UNITS

the PP1305 4 amp 13.8 volts d.c. £18.40 inc. VAT.
the PP137 7 amp 13.8 volts d.c. £32.00 inc. VAT.
the PP1310 10 amp 13.8 volts d.c. £49.50 inc. VAT.
Carriage £2



NOTE PRICES AS OF THE 1st JUNE 1981

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MULTI 750E PLUS EXPANDER

144-146MHz & 430-440MHz

SPECIFICATION

Frequency range:	144-146 (or 148) MHz 430-440MHz
Frequency steps:	5kHz & 100Hz
Operating modes:	FM/USB/LSB/CW
Supply requirements:	11-15 volts DC (13.8V nominal)
Power consumption:	3 amps on transmit
RF output:	10 Watts or 1 Watt
Sensitivity SSB/CW:	-8dBμ at 10dB S/N
FM:	-4dBμ at 20dB N.Q
Audio output:	More than 1.2 watts α 10% THD
Size (each unit):	163W × 73H × 260D in mm

Note: all interconnecting leads are provided.

SPECIAL SUMMER PRICE ON M750E £289 inc vat*. HURRY!

*Expander 430 has been increased to £179

It's been a long time coming but with the Japanese home market amateur radio population of 770,000 it's been hard work to satisfy the demand! But now the European version of the expander is at last on its way and by the time you read this we hope to be well through the backlog of orders. For those owners of the Multi 750E, the EXPANDER unit is an absolute must and for those considering a base or mobile unit that covers all modes on both 2m and 70cms then surely the combination at £468 must be outstanding value at today's prices.

Let's consider what the combination provides. Firstly, you have the luxury of doing on 70cms what you have been able to do on 2 metres with your 750E. That means USB/LSB/CW/FM with full digital readout down to 100Hz with full signal strength and RF output metering. Secondly, band switching is done at

the press of a button. Aerial selection is carried out automatically so there are no cables to change when going from one band to another. In fact, it's even possible to transmit on one band and receive on another—sorry, no "listen through" though! The correct repeater shift is automatically taken care of inside the M750E and because a very low level of drive is employed, there is no leakage on 2 metres when operating on 70cms. Full coverage of 430-440MHz is possible with the EXPANDER at either 10W or 1W output and, of course, the dual VFO system can be used on both 2 metres and 70cms.

In short, if you're a VHF/UHF man then the M750E and EXPANDER unit will provide a complete and comprehensive station for either fixed or mobile use. Also coming shortly will be the matching AC power supply PS750.

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2 METRE FM
MOBILE TRANSCEIVER
IS NOW EVEN CHEAPER!**

£189

inc VAT

EASY ORDER FORM ON PAGE 595

The Multi 700EX now a firm favourite with amateurs throughout the world—it embodies all the essential features of a completely self contained FM station. Its punchy 25 watt signal beats all the old 10 watt transceivers hands down. The large digital display gives clear and precise frequency readout, controlled by a "click stop" frequency selector knob that provides steps of 25kHz with an additional 12½kHz selector.

Priority scanning provides for the scanning of pre-programmed channels plus the mains dial channel. Repeater operation is taken care of by means of a 600kHz down shift selector and automatic tone-burst switch. For listening on the input frequency of the repeater, instant reverse repeater operation is available at the touch of a button. Local contacts are taken care of by a continuously variable power control that enables power to be reduced right down to 1 watt.

**"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.

NEW

**GLOBAL TV FILTER
HP4A**

We are pleased to announce the introduction of the new GLOBAL HP4A TV filter. Even more effective than earlier models, its double action filters both inner and outer coax conductors. Ideal for both VHF and HF operators, it is now so effective it should solve most cases of interference caused by RF down the TV aerial lead. Keep one handy!



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

**WELZ PROFESSIONAL
COAX SWITCHES**



Now at last we've found a true coaxial switch rated at DC-450MHz at 1Kw. Unlike other units the coaxial cavity is perfectly preserved with a small gold plated changeover finger. The insertion loss is an amazing 0.1dB and the isolation an equally amazing 70dB. Made by one of Japan's laboratory equipment manufacturers, this unit is the perfect answer to coax switching at VHF/UHF.
Model CH-20A £13.95 (SO239 sockets)
Model CH-20N £23.95 ("N" sockets)

**STILL THE MOST SENSITIVE MONITOR
ON THE MARKET TM56B £89 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.



**2m FM 25 Watts AZDEN PCS 3000
£219 inc VAT**

Here's a really super action packed FM mobile transceiver. Particularly ideal for the operator with very little room to accommodate the standard size of transceiver. The detachable head unit may be mounted remote from the main transceiver (optional cable kit necessary) so it can be tucked away in the smallest of spaces. Apart from this novel practical feature, there is a host of technical features. A microcomputer control panel takes care of frequency control, 8 memories, band and segment scanning, all selected by touchpad controls with back illumination. Full coverage of 144 to 146MHz is available on 25kHz or 12½kHz steps, a bar LED signal and RF meter gives positive readout as does the large LED frequency display. Other features include high/low power switching, repeater shift, tone burst, tone entry indicator, ni-cad memory back-up and much more. Why not send today for the full colour brochure?

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PRICE LIST—JULY 1981

Carriage charge
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TRIO	160-10m transceiver 9 bands	£639.52 (5.00)	YM37	500ohm manual mic FT707/107	6.15 (.75)	MMDP1	Frequency counter probe	11.50 (.65)
VFO230	Digital VFO with memories	194.45 (6.00)	FT707S	160-10m 8 band transceiver	454.00 (n.c.)	MMA28	10m preamplifier	14.95 (.65)
AT6320	All-band ATU power meter	106.72 (2.25)	FP707	160-10m 8 band transceiver	529.00 (n.c.)	MMA144V	2m RF switched preamp	34.90 (.65)
SP230	External speaker unit	33.14 (1.50)	FC707	230v AC to 12v DC for FT707	109.25 (2.50)	MMA1296	23cm preamplifier	29.90 (.65)
DS2	Optional dc pack for TS830S	39.90 (1.50)	FV707DM	160-10m atu	80.50 (1.50)	MMF144	2m filter	9.90 (.65)
DFC230	Dig frequency remote controller	163.13 (1.50)	MR7	External digital vfo for FT707	186.30 (n.c.)	MMF432	70cm filter	9.90 (.65)
YK88C	500Hz CW filter	28.75 (1.00)	MMB2	Metal rack for FT707	14.95 (1.50)	MMV1296	70cm-23cm varactor tripler	34.50 (.65)
YK88CN	270Hz CW filter	28.75 (1.00)	FL2100Z	Mobile mounting bracket FT707	16.00 (1.50)	MM5384	384MHz frequency source	27.60 (.65)
TS530SE	160-10m trans 200W pep digital	505.00 (4.50)	FRB707		21.85 (1.00)	MMR15/10	15db attenuator, BNC terms	9.90 (.65)
DG5	Digital readout	103.50 (1.50)	FT225RD	160-10m 1200 watt linear 9 band	385.00 (n.c.)			
SP520	Speaker	17.25 (1.50)	YH55	with digital readout	565.00 (n.c.)	JAYBEAM ANTENNAS		
VFO520S	External VFO	98.90 (4.50)	FF501	80hm headphones	9.95 (1.25)	TB3	HF 3 element Tribander Beam	167.90 (4.50)
YG3395C	CW filter 8 pole	37.95 (.50)	QTR24D	Low pass filter	19.95 (.75)	VR3	HF Vertical Tribander	42.50 (3.00)
DK520	DG5 to older TS520	10.35 (.75)	FP12	24 hour quartz clock	25.70 (1.50)	4metre Antennas		
SM220	Station monitor scope	197.80 (4.50)	F4	230v AC 12 amp DC p/supply	78.20 (2.50)	4Y4M	4 element yagi	20.70 (3.00)
BS8	Pan display TS820/180/830	48.30 (.50)	FSF1	230v AC 4 amp DC p/supply	41.40 (2.50)	PMH2/4M	2 way phasing harness	12.20 (1.00)
BS5	As above for TS520	48.30 (.50)	FRG7		9.60 (1.00)	2 metre Antennas		
R820	Amateur band receiver	690.00 (4.50)	SRG7	-5-30MHz communications Rx	189.00 (n.c.)	DC1/WB	Wide band discone (100-470MHz)	41.40 (2.50)
YG455C	500Hz CW filter	58.65 (.50)	HRG7	Battery holder for FRG7	5.00 (1.00)	LR1/2M	Omnidirectional vertical	24.15 (2.50)
YG455CN	250Hz CW filter	60.95 (.50)	YC500J	Frequency counter	189.75 (n.c.)	C5/2M	5dB glass fibre colinear	44.30 (3.50)
YG88A	6kHz AM filter	34.50 (.50)	YC500S	Frequency counter	270.25 (n.c.)	5Y/2M	5 element yagi	11.25 (2.00)
TS180S	160-10m S/State transceiver	679.65 (4.50)	YC500E	Frequency counter	345.00 (n.c.)	8Y/2M	8 element yagi	14.50 (2.50)
VFO180	External VFO	96.60 (1.50)	FRG7700	1581 version of FRG7000	309.00 (n.c.)	10Y/2M	10 element "long yagi"	31.00 (3.50)
SP180	External speaker unit	36.80 (1.50)	FRG7700	MEM As above with freq mem	390.00 (n.c.)	PBM10/2M	10 element Parabeam	36.80 (3.50)
AT180	Matching 200W antenna tuner	95.45 (4.50)	FT207R	144-146MHz synthesised h/h	199.00 (n.c.)	PBM14/2M	14 element Parabeam	44.85 (4.50)
YK88C	500Hz CW filter	28.75 (.50)	NC1A	Ni-cad 230v AC charger	18.98 (1.50)	5XY/2M	Crossed 5 element yagi	22.75 (3.00)
YK88S	Second SSB filter option	26.45 (.50)	NC1B	Ni-cad 230v AC fast charger	39.68 (1.50)	8XY/2M	Crossed 8 element yagi	28.40 (3.50)
PS30	AC power supply for TS180S	85.10 (4.50)	NC9	Ni-cad 230v AC charger	7.48 (.75)	10XY/2M	Crossed 10 element yagi	37.70 (4.00)
TS130S	8 band 200W pep	491.05 (4.50)	NBP9	Spare ni-cad battery pack	16.88 (.75)	X6/2M/X12	70cm Dual band crossed yagi	38.50 (4.50)
TS130V	8 band 20W pep	404.34 (4.50)	FLC2	Heavy duty case	20.70 (.75)	PMH/2C	2 way phasing harness	7.50 (.75)
DFC230	Dig frequency remote controller	163.13 (1.50)	PSU	12v PSU	16.88 (1.00)	Q4/2M	4 element quad yagi	23.70 (2.50)
TS120S	10-10m 200W pep mobile trans	399.00 (4.50)	FBA1	Ni-cad pack charging adaptor	2.59 (.35)	Q6/2M	6 element quad yagi	31.40 (4.50)
TS120V	10-10m 20W pep mobile trans	347.30 (4.50)	FT225R	144-146MHz Base station	520.00 (n.c.)	D5/2M	Double 5 slot-fed yagi	20.15 (2.50)
TL120	200W pep linear for TS120V	128.80 (4.50)	MEMT225	Memory option module	92.00 (n.c.)	D8/2M	Double 8 slot-fed yagi	27.15 (4.00)
MB100	Mobile mount for TS120/130	17.25 (1.00)	DI225	Digital readout for FT225R	57.50 (1.00)	SVMK/2M	Kit for vertical polarisation	7.25 (1.50)
YK88C	500Hz CW filter	28.75 (.50)	FT480R	2 metre 10W FM transceiver	359.00 (n.c.)	UGP/2M	ground plane	10.15 (1.50)
YK88S	2nd SSB filter option	26.45 (.50)	FT720R	2m/4m/70cm control head	57.50 (1.00)	HO/2M	Mobile "halo" head only	4.50 (1.50)
VFO120	External VFO	89.70 (4.50)	S72	Switching box	120.00 (n.c.)	HM/2M	Mobile "halo" with 24" mast	5.40 (1.75)
SP120	Base station external speaker	25.30 (1.25)	E72S	2m of connecting cable	56.00 (n.c.)	PMH2/2M	2 way phasing harness	9.90 (1.00)
SP40	New mobile speaker unit	26.89 (1.50)	E72L	4m of connecting cable	23.00 (1.00)	PMH4/2M	4 way phasing harness	23.00 (1.75)
AT130	100W antenna tuner	72.89 (1.50)	720RV	2m of connecting cable	28.00 (1.00)	70cm Antennas		
PS20	AC power supply TS120/130V	44.85 (4.50)	720RVH	10W 2m module	133.00 (n.c.)	C8/70cm	8dB glass fibre colinear	50.00 (3.50)
PS30	AC power supply TS120/130S	85.10 (4.50)	720RVH	25W 2m module	143.00 (n.c.)	D8/70cm	Double 8 slot-fed yagi	20.70 (2.50)
MA5	5 band mobile aerial system	74.75 (4.50)	720RU	10W 70cm module	156.00 (n.c.)	PBM18/70cm	18 element Parabeam	25.30 (2.50)
TL922	160-10 metre 2KW linear	595.70 (4.50)	MMB3	Mobile mounting bracket	5.00 (1.50)	MBM48/70cm	48 element Multibeam	28.75 (3.50)
MC50S	dual impedance desk microphone	24.15 (1.50)	NEW	FT290 All-mode	229	MBM88/70cm	88 element Multibeam	39.30 (4.50)
MC35S	Fist microphone 50K impedance	13.80 (1.00)	FDK VHF/UHF EQUIPMENT			8XY/70cm	Crossed 8 element yagi	34.15 (3.50)
MC30S	Fist microphone 50ohm imp.	13.80 (1.00)	M700EX	2m FM 25 watt trcvr. 12v DC	189.00 (n.c.)	12XY/70cm	Crossed 12 element yagi	42.32 (4.50)
LF30A	HF lowpass filter, 1kW	18.40 (1.00)	M750E	2m FM/10W trcvr 12v DC	289.00 (n.c.)	PMH2/70cm	2 way phasing harness	8.50 (1.00)
RD300	1kW oil filled dummy load	48.30 (1.50)	Expander	70cm transverter	169.00 (n.c.)	PMH4/70cm	4 way phasing harness	18.00 (1.50)
TS770E	2m/70cm all mode transceiver	730.25 (4.50)	PS750	230v A.C. power supply	69.00 (2.50)	23cm Antennas		
SP70	External speaker unit	18.40 (1.00)	Palm II	2m FM 6 channel portable	89.00 (n.c.)	D15/1296	Double 15 slot-fed yagi	34.00 (1.50)
TR9000	2m synthesised multimode	345.00 (4.50)	Palm IV	70cm FM 6 channel portable	149.00 (n.c.)	PMH2/23cm	2 way phasing harness	25.40 (1.00)
TR9500	70cm all mode	t. b. a.	TB1	1750Hz tone burst	10.00 (n.c.)	Matching Transformer		
BO9	Base plinth for TR9000	32.20 (4.50)	Multi 3000	2m FM/10 watt base station	399.00 (n.c.)	MT75/50	Impedance transformer 75/50Ω	3.60 (.50)
TR7800	2m FM synthesised mobile	268.00 (4.50)	TM56B	2m FM monitor 230v/12v DC	89.90 (n.c.)	Chimney Lashing Kit		
TR2300	2m FM synthesised portable	166.75 (4.50)	FDM40SP	Speaker/mic for Palmizer	11.00 (1.50)	DL	Double lashing chimney kit	8.25 (2.00)
VB2300	10W amplifier for TR2300	49.45 (1.50)	CC2	Leather case for Palm II/IV	5.75 (.50)	Wall Brackets		
MB2	Mobile mount TR2300/VB2300	17.25 (1.00)	BC2	230v AC battery charger	4.50 (.50)	W6	6" wall bracket (1½" masts)	2.65 (1.00)
RA1	Rubber flexible antenna	6.90 (.50)	SC2	Leather case for Palmizer	9.75 (.50)	W21	21" wall stand-off bracket	10.35 (3.00)
PS1200	AC power unit and charger	25.50 (1.50)	BB2	"AA" size external battery case	5.00 (.50)	W24HD	24" wall stand-off bracket,	14.70 (4.50)
TR2400	2m FM synthesised handheld	198.95 (4.50)	BT2	Ni-cad battery pack	12.00 (.50)	Masts (Aluminium)		
ST1	Base stand and quick charger	43.70 (1.50)	Xtals for Palm II and Palm IV		3.00 (.15)	SPM	16" x 1" Portable Mast	15.15 (3.00)
BC5	12V quick-charger	17.25 (1.50)	Xtals for TM56B		2.50 (.15)	PME	4" extension for double arrays	2.50 (2.00)
SC3	Soft carrying case.	11.50 (.50)	MICROWAVE MODULES			A4	4" 6" x 1½" straight	3.80 (1.50)
LH1	Hard leather holster	18.50 (1.50)	MMT28/144	10m linear transverter	99.00 (1.75)	A5	5" x 1" straight	2.30 (1.50)
PB24	Spare battery pack/charger lead	14.26 (1.50)	MMT144/28	2m linear transverter	99.00 (1.75)	A9	9" x 1½" straight	6.50 (2.50)
TR3200	70cm FM portable transceiver	164.45 (4.50)	MML144/42S	2m 25W linear amplifier	59.00 (1.75)	A10	10" x 2" straight	12.55 (2.60)
PL1	Spare power/charge lead	1.30 (.15)	MML144/40	2m 40W linear amplifier	77.00 (1.75)	A12	12" x 2" straight	14.95 (5.20)
R1000	Gen. Coverage Receiver	285.20 (4.50)	MML144/100P	2m 100W linear amplifier	142.60 (2.75)	A14	14" x 2" straight	17.40 (3.00)
YAESU			MML432/28	70cm linear transverter	115.00 (1.75)	Accessories		
FT101Z	160-10m 9 band transceiver FM	529.00 (n.c.)	MML432/70	4m linear transverter	184.00 (1.75)	CP1	Cross-over plate 2" x 2"	3.35 (1.50)
FT101ZD	as above but with digital FM	599.00 (n.c.)	MML1296/144	4m linear transverter	184.00 (2.25)	JBL59/15	1½" jointing sleeve for 2" masts	6.60 (1.50)
DIG101Z	Digital kit	86.25 (n.c.)	MML144/25	2m 25W linear amplifier	59.00 (1.75)	JL29	u/v clamp 1½" boom to 1" -2" mast	1.60 (.75)
DCT101Z	12v DC adaptor	34.50 (1.00)	MML144/40	2m 40W linear amplifier	77.00 (1.75)	JL30	u/v clamp 1" boom to 1" -2" mast	1.60 (.75)
FV101Z	Remote VFO for FT101Z/ZD	121.00 (n.c.)	MML144/100P	2m 100W linear amplifier	142.60 (2.75)	JL53	u/v clamp 1" boom to 1" -2" mast	1.45 (.75)
FT107M	160-10m band transceiver	690.00 (n.c.)	MML432/20	70cm 20W linear amplifier	77.00 (1.75)	JL58	Guy wire clamp: non-rotating	1.50 (.75)
FV107	Remote VFO for FT107	92.00 (n.c.)	MML432/50	70cm 50W linear amplifier	119.00 (2.75)	JL63	u/v clamp 1" -1½" boom to 1" -2" mast	1.40 (.75)
FC107	160-10m atu, aerial switch, p/meter	102.00 (1.50)	MML432/100	70cm 100W linear amplifier	228.65 (2.75)	JL64	Die-cast clamp 1" boom to 1" mast	1.20 (.75)
PI07E	230v AC power supply for FT107	106.95 (2.50)	MML2000	RTTY to TV converter	169.00 (1.75)	JL65	Die-cast clamp 1" boom to 1" -2" mast	1.30 (.75)
FT107	As above but fitting internally	97.75 (2.50)	MMC28/144	10m converter	27.90 (.65)	JBL73	HD u/v clamp 1½" boom to 1" -2" mast	2.10 (1.00)
FTV107	Transverter main frame	110.40 (n.c.)	MMC70/28	6m converter	27.90 (.65)	MBP	Mast base plate for 2" mast	3.60 (1.50)
FTV107(2)	Transverter main frame	207.00 (n.c.)	MMC70/28L	4m converter	27.90 (.65)	STANDARD VHF/UHF		
144V107V901	2 metre transverter	101.20 (n.c.)	MMC144/28L	2m converter	27.90 (.65)	C800	2 metre portable scanner receiver	79.00 (n.c.)
50V107V901	6 metre transverter	69.00 (n.c.)	MMC432/28-S	70cm converter	34.90 (.65)	C8800	2 metre FM mobile transceiver	251.00 (n.c.)
430V107V901	70cms transverter	175.95 (n.c.)	MMC432/144-S	70cm converter	39.60 (.65)	C7800	70cm FM mobile transceiver	297.00 (n.c.)
SP107P	External speaker in cabinet	57.50 (2.50)	MMC435/51	70cm ATV converter	27.90 (.65)	G-WHIP MOBILE ANTENNA RANGE		
SP107	External speaker in cabinet	27.60 (2.00)	MMC435/600	70cm ATV converter	34.90 (.65)	Tribander Helical for 10/15/20 metres		
DMST107	12 channel memory	88.15 (n.c.)	MMC1296/28	23cm converter, 10m output	32.20 (.65)	LF40m Coil for above		6.55 (.50)
CWV	CW filter for FT107	23.00 (.50)	MMK1296/144	23cm converter, 2m output	59.80 (1.75)	LF80m Coil for above		6.55 (.50)
AM	AM filter for FT107	23.00 (.50)	MMD050/500	500MHz digital freq meter	69.00 (.65)	LF160m Coil for above		6.55 (.50)
YM34	500ohm desk mic FT707/FT107	18.80 (1.50)	MMD600P	500MHz prescaler	23.00 (.65)	LF telescopic resonator whip		3.35 (.75)
YM35	500ohm up/down mic FT707/107	12.65 (.75)						
YM36	500ohm noise cancelling FT707/107	11.90 (.75)						

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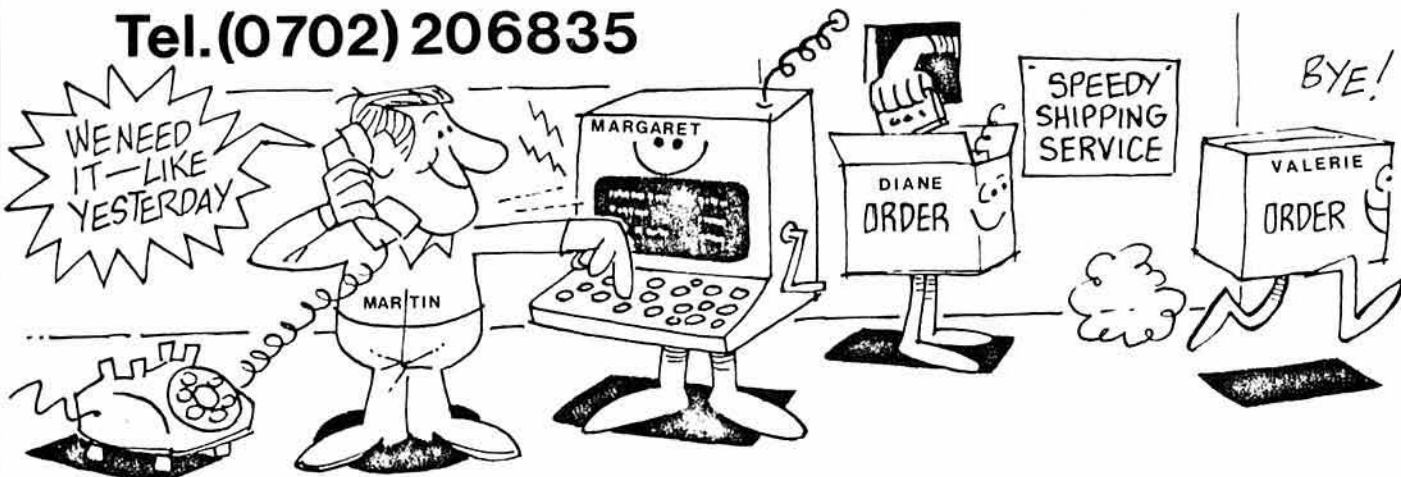
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Base mount single hole fixing + 3m cable	4.50(.50)	70cm Auto switching pre-amplifier	24.73(.35)	3-30MHz Broad band dipole	29.00(1.00)
AERIAL ROTATORS (complete with control boxes)		2m pre-amplifier	14.95(.35)	Mosley RD5 all-band dipole	40.00(1.00)
CDE AR40 (5 core cable)	59.80(1.50)	70cm pre-amplifier	17.73(.35)	AIR BAND PORTABLE MONITORS	
Channellmaster 9502 (3 core)	42.00(2.00)	2-40MHz pre-amplifier auto switching	18.66(.35)	(see also VHF/UHF Monitors)	
Sky King SU2000 (3 core)	36.00(2.00)	2-40MHz pre-amplifier	11.73(.35)	SHARP FX213 tuneable receiver	13.50(.75)
Sky King SU4000 (6 core)	75.00(2.50)	PA3 miniature 2m pre-amplifier	8.00(.35)	INGERSOLL MW/FM/Airband monitor	12.95(.75)
KR 400RC (5 core) complete	£99.00(2.00)	PA70 miniature 70cm pre-amplifier	10.00(.35)	RS17 Tuneable + 3 Xtal controlled chan's	49.50(.75)
CDE alignment bearing	7.75(1.00)	Z Match Aerial tun unit 1-8-30MHz 500W	47.15(1.50)	MISC STATION ITEMS	
Channellmaster alignment	11.75(1.00)	EZITUNE Aerial tuning aid	30.48(.75)	SEIF 13-8V 4 amp AC power supply	22.95(2.00)
HF ANTENNAS (various manufacturers)		IAMBIC Keyer	34.50(.75)	PS125 6 amp AC power supply	28.00(2.00)
Mini-Products HQ-1 20/15/10m 2 el	96.50(2.50)	2 METRE PORTABLES		EK121 Katsumi Electronic Keyer	29.00(1.00)
Mini-Products C4 20/15/10m vert dipole	48.50(2.00)	SB2M 2m SSB portable	94.00(n.c.)	EKM12 Matching side tone monitor	10.95(1.00)
Mosley TD3JR 20/15/10m wire dipole	34.50(1.50)	AR245 2m FM synthesized handheld, 5W	178.00(1.50)	CW2A general purpose morse oscillator	6.95(.65)
Mosley "Mini-Beam" 20/15/10m 2 el. 600W	99.00(2.00)	AR245 carrying case	4.10(.50)	Telegraph CW key (manual)	10.50(.75)
Mosley "Mini-Beam" 20/15/10m 2 el. 2kW	129.00(2.00)	AR245 optional helical	4.10(.50)	YW3 Twin SWR/Pwr/Field strength meter	11.95(.50)
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Mosley TA33 20/15/10m 3 element	133.40(2.50)	VHF/UHF MONITORS		FX1 d/I station w/meter 700kHz-250MHz	28.00(1.00)
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Hy-Gain 14AVQ 40-10m vertical	60.00(2.00)	Sound Air M161 16 channel FM monitor	59.00(n.c.)	12BY7A driver valves	2.75(.50)
Hy-Gain 18AVT/WB 80-10m vertical	87.00(2.50)	MF083 Marine or Amateur + 3 FM broad.	85.00(n.c.)	6146B/S2001A P.A. valves	8.70(.50)
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Radial Kit for HFS	28.00(2.00)	SX200 VHF/UHF. New stock just arrived!	240.00(n.c.)	PL259 plugs	.63(n.c.)
Sagant EL40X 80-40 Balun fed dipole (79')	36.00(1.50)	SR9 Tuneable 144-148 or 156-162MHz	46.00(n.c.)	PL259 reducers	.17(n.c.)
Jaybeam TB3 HF 3 element Tribander	167.90(4.50)	AR22 2m FM pocket synthesized handheld	83.00(n.c.)	SO239 chassis sockets	.60(.10)
Jaybeam VR3 HF Vertical Triband	42.50(3.00)	AR22 flexible antenna	3.00(n.c.)	PL259 joiners	.85(.10)
Western DX5V 5-band	89.00(3.00)	MOBILE AERIALS		N. Plugs. Silver plated UR67	2.00(n.c.)
DENTRON		ASP201 2m 1/2 wave with base	3.50(1.25)	N. Plugs. Silver plated UR43	2.00(n.c.)
MLA2500B 6 band 160-10m 2kW linear	695.00(n.c.)	ASP2009 2 5/8th wave with base	9.25(2.00)	4 pin mic plugs	.85(.10)
Clipperton-L 6 band 160-10m 2kW linear	459.00(n.c.)	ASP3009 2m 5/8th wave with base	9.75(2.00)	3 pin mic plugs	.85(.10)
DTR-1200L 5 band 80-10m 1-2kW linear	t.b.a.(n.c.)	ASP462 70cm co-linear with base	8.25(1.25)	6 pin mic plugs (FDK 750)	1.00(.10)
GLA-1000B 5 band 80-10m 1kW linear	295.00(n.c.)	Magnetic base adaptor	8.50(.75)	3 pin chassis socket	.85(.10)
DTR-3KA 1-8-30MHz ATU/2kW	t.b.a.(n.c.)	ASP677 2m 5/8th wave	14.95(2.00)	4 pin chassis socket	.85(.10)
MT-3000A 1-8-30MHz ATU/3kW	275.00(n.c.)	ASP667 70cm co-linear	17.95(1.25)	BNC plugs (bayonet)	.90(.05)
AT-1K 1-8-30MHz ATU/1kW	99.00(n.c.)	ASPM125 27MHz 1/2 wave	18.50(2.00)	Pen Coil Ni-cads (HP7 size)	1.20(.05)
HF200A 80-10m transceiver 100W AC PSU	399.00(n.c.)	Magnetic base adaptor	8.50(.75)	Cigar lighter plugs	.55(.10)
Spare set of D50A tubes	25.00(n.c.)	ASP 'no hole' boot mount adaptor	3.75(.50)	UR67 cable 50ft per metre	.69(.10)
All band Doubler 1-8-30MHz + 470ft feeder	22.50(2.00)	2NE 2m 7/8th mobile whip	13.00(2.00)	UR43 cable 50ft per metre	.23(.05)
ADONIS MICROPHONES		RG4M Base for above aerial	3.50(.75)	5 core rotator cable per metre	.30(.05)
AM202G Mobile safety mic	20.95(n.c.)	GSS Heavy duty gutter/boot mount	3.15(.50)	BL40X balun 50ft	11.25(.35)
AM202S Mobile safety mic	20.95(n.c.)	MBS Magnetic mount with 5m coax	7.95(1.00)	3 core rotator cable. Per metre	.22(.05)
AM202H Mobile safety mic	29.00(n.c.)	10SE 28MHz whip 1-72m long	11.50(1.25)	Ferrite rings 1 1/2" diameter	.35(.05)
AM502G Base station compressor mic	39.00(n.c.)	15SE 21MHz whip 1-72m long	11.50(1.25)	Mosley aerial insulators	.30(.05)
AM802G Base station compressor mic	59.00(n.c.)	20SE 14MHz whip 1-72m long	13.80(1.25)	KX2 SWL aerial tuner 0-5-30MHz	29.90(1.50)
SEM		WELZ PROFESSIONAL POWER/SWR METERS		APM1 Audio Peak and notch filter	33.00(1.00)
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2m power amplifier/pre-amplifier 16/50W	66.70(1.50)	SP300 1-8-500MHz 20W-200W-1kW	69.95(n.c.)	Drake TV3300 LP Low Pass Filter	18.40(1.20)
2m power amplifier/pre-amplifier 16/100W	126.50(1.50)	SP400 130-500MHz 5W-20W-150W	49.95(n.c.)	Shure 444D high impedance desk mic	27.50(1.50)
2m converter	23.00(.35)	SHORT WAVE LISTENER AERIALS		Shure 201 high impedance hand mic	12.50(1.00)
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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.

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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.

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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.



Probably the Best 2M Multimode Base Station

Facilities include: FM, USB, LSB and CW. Built in scanner and memories. Bright green digital readout. Mains and 12 volt.

IC 251E

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Covering all bands from 80m – 10m including the new ones.* 13.8V DC operation. 100 watts RF output (40W on AM).* TWIN VFO with in band duplex available.*

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IC-730

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IC-202S

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 200k Hz band positions allows operation anywhere in 2m. (Supplied with 144-144.2 and 144.2-144.4). * Top of the band Oscar xtls 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. The 70cm twin of the 202S having very similar features, covering the frequency range of 432-435.2 MHz.

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IC-720A

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



IC-451 UHF Base Station

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- * Additional selectable shift for European DX
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- * Full power control on SSB/CW/FM
- * Superb receiver performance using MOSFETS
- * Multipurpose scanning
- * Covers 430-440 MHz
- * Xtal controlled Toneburst
- * Cool running power supply



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* All solid state. * All bands 1.8 MHz to 30 MHz. * Full 500W RF output. * Switches bands automatically with 720A. * Protection against mismatching, overheating, overcurrent, overdriving and the P.A. units unbalancing.
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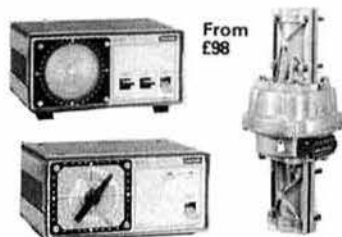
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STABILISED POWER SUPPLIES

Model 125 10-15V 5A £28.00
Model 1210/1 10A 13-5V £65.00
Model 156S 4-15V 6A Twin Meter £40.00
Model 1210S 4-20V 10A Twin Meter £88.00
Maximum ratings quoted.

STATION ACCESSORIES (inc post)

SWR 25 Twin meter £12.80
2-way Antenna switch (V2) £6.50
3-way Antenna switch (V3) £10.80
4-way Antenna switch (V4) £11.00
2-way Antenna switch (VHF) £11.00
DL50 50 watt dummy load 50ohm £7.00
Oscarblock SWR200B SWR/Power £41.00
FX1 Station Wavemeter £29.00
Welz SP200 swr/power £49.95
Daiwa CN620A £54.00
Full range of aluminium tubing, wall clamps, brackets "V" bolts for the caller.

TRANSCIEVERS AND RECEIVERS

SRX30 Solid State Receiver £158.00
Sky Ace aircraft band hand held receiver £49.00
SRX30D Digital Receiver £195.00
Argonaut 515 Transceiver £276.00

R512 Aircraft Band Scanning Receiver £138.00
Digital Flight Scan Airband Receiver £215.00
SR9 2m FM Receiver £46.00
Bearcat 220FB Scanning Receiver £258.75
Standard C8800 FM Transceiver £252.00
AR22 2m Handheld Receiver £85.00
SX200 Scanning Receiver £239.00

HY-GAIN

12AVQ 10-15-20m Vertical Antenna £43.13
14VQ/WB 10-15-20-40m Vertical £60.38
18AVT5WB 10-15-20-40-80m Vertical £87.40

VARIOUS ANTENNA

HF5 vertical 10-through 80m £41.40
Discone 5 Antenna 50-480MHz £36.80
C4X 10-15-20m Vertical £46.00
HQ-1 Minibeam Tribander £96.76
Hustler 5 band vertical £86.00

Complete range of JAYBEAM HF AND VHF-UHF Antennas, send 15p for catalogue and price list.

G-WHIP. Mobile Antenna Range

Tribander Helical 10-15-20m £23.00
LF Coils for above £6.56
LF Telescopic for coils £3.00
Standard Basemount £4.20
MultiMobile 10-15-20m £26.45
Coils for above £6.56
Extendard £10.93
Flexwhip 10m £16.00
Coils for above £6.56

FDK

Multi 700EX Transceiver £190.00
Multi 750 Transceiver £290.00
Palm 2 Portable Transceiver £89.00

Radio Shack Ltd for Amateur Radio

R. L. DRAKE PRODUCTS

Model	Description	inc. VAT	Carr.
TR-7/DR-7	Transceiver/Gen. Cov. Receiver Digital	£1035.00	5.00
PS-7	Power Supply 120/240v for TR-7	207.00	5.00
PS-75	Sideband Duty P.S.U. for TR-7 120/240v	138.00	5.00
RV-7	Remote V.F.O. for TR-7	132.25	2.00
MS-7	Matching Speaker for TR-7 and R-7	29.90	2.00
R-7/DR-7	Digital Receiver 0-30MHz	989.00	5.00
SL-300	CW Filter for TR-7 and R-7 (300Hz)	39.10	0.50
SL-500	CW Filter for TR-7 and R-7 (500Hz)	39.10	0.50
SL-1800	SSD/RTTY Filter for TR-7/R-7 (1800Hz)	39.10	0.50
SL-4000	AM Filter for R-7 Receiver (4000Hz)	39.10	0.50
SL-6000	AM Filter for TR-7 and R-7 (6000Hz)	39.10	0.50
AUX-7	Range Prog. board and 1 Receive module	32.20	1.00
RRM-7	Range receive modules for Aux-7 (500Hz)	5.75	0.50
RTM-7	Range rcv. modules for Aux-7 (500Hz)	5.75	0.50
NB-7	Noise Blanker for TR-7	66.24	1.00
NB-7A	Noise Blanker for R-7 Receiver	66.24	1.00
FA-7	Fan for TR-7 and PS-7	20.70	2.00
MMK-7	Mobile mounting kit for TR-7	34.50	2.00
MN-7	ATU/RF Wattmeter. 160-10m (250w)	124.20	5.00
MN-2700	ATU/RF Wattmeter 160 10m (2kw)	207.00	5.00
WH-7	RF Wattmeter/VSWR Bridge (HF)	59.80	2.00
SP-75	Speech Processor	79.35	2.00
CW-75	Electronic Keyer	59.80	2.00
P-75	Phone patch	59.80	2.00
7804	Service Manual for TR-7	18.50	2.00
7805	Service manual for R-7	18.50	2.00
7037	TR-7 Service Kit	37.95	1.00
L-7E	Linear Amp 2kw 10 160m with tubes (2)	897.00	10.00
L-7E	Linear Amp 1kw 10 160m with tube (1)	69.00	2.00
TV-42LP	Low Pass Filter 100w	549.70	5.00
TV-3300LP	Low Pass Filter 2kw	10.35	1.00
7073	Hand Microphone for TR-7	18.40	1.50
7077	Desk Microphone for TR-7	18.40	1.50
DL-300	Dummy Load 330w	29.90	2.00
DL-1000	Dummy Load 1000w	20.70	1.00
CS-7	Remote control ant. switch 5 way (7 line)	37.95	2.00
B-1000	Balance for MN-7 and MN-2700 4:1	115.00	5.00
Manuals	Spare Operating Manuals	20.70	1.00
Interface	R-7/TR-7 connecting cable	6.00	1.00
AK-75	Multiband Antenna	20.70	1.00
AA-75	Antenna Insulator Kit	23.00	2.00
HS-75	Headset	2.30	0.50
COMMERCIAL SPECIFICATION RECEIVERS AND TRANSCEIVERS			
R4245	Commercial Specification Receiver	2129.00	5.00
TR4310	Commercial Specification Transceiver	2294.25	5.00
RR-3	Marine Specification Receiver	1380.00	5.00
TRM	Marine Transceiver MF and HF	1265.00	5.00
MRT55C	VHF 55 Channel	549.70	5.00
Cabinet	5" for RR-3, R4245 and TR4310	158.70	5.00
MN4438	General coverage tuner	239.20	5.00
ENDS OF LINES (Whilst stocks last)			
SPR-4	Programmable Receiver	345.00	5.00
DC-PC	DC Power Cord for SPR-4	3.45	1.00
XTAL	Accessory Range Crystals	6.44	0.50
FL-500	500Hz CW Filter for R-4C	39.10	0.50
FL-4000	4000Hz AM Filter for R-4C	39.10	0.50
FL-6000	6000Hz AM Filter for R-4C	39.10	0.50
MS-4	Matching speaker for 4 line	29.90	2.00
AC-4	DSU for TR-4/T-4X Series	50.00	5.00
DC-4	AC/DC PSU for TR-4	84.50	5.00
FF-1	Fixed Frequency Control for TR-4	27.60	1.00
34-PNB	Noise Blanker for TR-4C	69.00	1.00
RV-4C	Remote VFO for TR-4C	92.00	5.00
CW-MOD	500Hz CW Mod for TR-4(C)	52.90	2.00
RCS-4	5 Way Coax Remote Antenna Switch	84.50	2.00
WV-4	VHF Wattmeter 100/1000W 20/200MHz	59.80	2.00
AA-10	2m Linear 1:10 Watts	39.95	1.00
1525-EM	Encoder Microphone	34.50	1.00
PS-3	6Amp 13.6 VDC Power Supply	69.00	5.00
SD-AUTO	SD-240/120 Auto Transformer	19.95	3.00

TRIO EQUIPMENT

MC50	Deluxe dual impedance desk microphone	24.15	1.50
MC35S	First microphone 50k impedance	13.80	1.00
MC30S	First microphone 500ohm impedance	13.80	1.00
LF30A	HF lowpass filter. 1kW rating.	18.40	1.00
RD300	1kW oilfilled dummy load	48.30	1.50
TS770E	2m/70cm all mode dual band transceiver. European repeater shifts	730.25	5.00
SP70	External speaker unit for all TS700 series	18.40	1.00
TR9000	2m synthesised multimode mobile/fixed station transceiver	345.00	5.00
PS20	AC power supply for TR9000	44.85	5.00
BO9	Base plinth for TR9000	32.20	5.00
TR7800	2m FM synthesised mobile/fixed station 25W transceiver	268.00	5.00
SP40	Mobile speaker unit for TR7800, TR9000 and TR8400	26.89	1.50
RM76	Microprocessor control unit for TR7600/7625	60.95	1.50
TR2300	2m FM synthesised portable transceiver	166.75	5.00
VB2300	10W amplifier for TR2300	49.45	1.50
MB2	Mobile mount for TR2300 and VB2300	17.25	1.00
RA1	Rubber flexible antenna for TR2300 or TR2200GX	6.90	0.50
PS1200	AC power unit and charger for TR2300/3200/2200 (Non Trio item)	29.50	1.50
TR2400	2m FM synthesised handheld	198.95	5.00
SMC24	External mic/speaker for 2400	13.80	1.00
ST1	Base stand and quick charger	43.70	1.50
BC5	12V quick charger	17.25	1.50
SC3	Soft carrying case. Includes belt hook	11.50	0.50
LH1	Hard leather holster type case	18.50	0.50
PB24	Spare battery pack and charger lead	14.26	1.50
TR8400	70cm FM synthesised mobile transceiver. 430-440MHz	279.00	5.00
PS10	Base station power supply for TR8400	63.00	5.00
TR3200	70cm FM portable receiver. 3 channels fitted	164.45	5.00
PB10	Pack of 10 NiCad batteries for TR2300/3200/2200 series	10.35	0.50
PL1	Spare power/charge lead for TR2300/3200/2200 series	1.30	0.15
R1000	Synthesised 200kHz 30MHz receiver. Price includes dc kit fitted	285.20	5.00
SP100	External speaker unit - Matching aerial tuner. See KX2 in Mizuho section	26.45	1.50
HC10	Digital station world time clock	55.20	1.50
HS5	Deluxe headphones for all Trio equipment	21.85	0.75
HS4	Economy headphones	10.35	0.75
TS830S	160 10m transceiver with the new bands. Successor to the TS820	639.52	5.00
VFO230	Digital VFO with memories and digital readout	194.45	5.00
AT230	All band ATU and power meter. Matches TS830S	106.72	1.50
SP230	External speaker unit with switched filters	33.14	1.50
DS2	Optional dc pack for TS830S	39.90	1.50
DFC230	Digital frequency remote controller. Four memories, etc.	163.13	1.50
*NB	The DFC 230 will drive the TS830/130 or TS120 series rigs		
YK88C	500Hz CW filter	26.45	0.50
YK88CN	270Hz CW filter	28.75	0.50
SM220	Station monitor scope	197.80	4.50
BS8	Panoramic display for TS830/180/820 series	48.30	0.50
BS5	Scan board as above for TS520 series	48.30	0.50
R820	The ultimate amateur band receiver	690.00	5.00
YG455C	500Hz CW filter	58.65	0.50
YG455CN	250Hz CW filter	60.95	0.50
YG88A	6kHz AM filter	34.50	0.50
TS180S	160 10m solid state transceiver. Digital memory system. 200W pep	679.65	5.00
VFO180	External VFO	96.60	1.50
SP180	External speaker unit with high and low pass filters	36.80	1.50
AT180	Matching 200W antenna tuner and powerful meter	95.45	5.00
YK88C	500Hz CW filter	26.45	0.50
YK88S	Second SSB filter option	26.45	0.50
PS30	AC power supply for TS180S	85.10	5.00

TS130S	8 band 200W pep mobile transceiver	491.05	5.00
TS130V	8 band 20W pep mobile transceiver	404.34	5.00
DFC230	Digital frequency remote controller. Four memories etc	163.13	1.50
TS120V	80-10m 20W pep mobile transceiver	347.30	5.00
TL120	200W pep linear for TS120V	128.80	5.00
MB100	Mobile mount for TS120/130 series	17.25	1.00
YK88C	500Hz CW filter	26.45	0.50
YK88CN	270Hz CW filter	28.75	0.50
YK88SN	1-8kHz SSB filter	25.30	0.50
VFO120	External VFO	89.70	5.00
SP120	Base station external speaker unit	25.30	1.25
SP40	New mobile speaker unit	26.89	1.50
AT130	100W antenna tuner including new amateur bands	72.89	1.50
PS20	AC power supply for TS120/130V	44.85	5.00
PS30	AC power supply for TS120/130S	85.10	5.00
MA5	New Trio 5 band mobile aerial system. Absolutely complete. 160-10 metre 2kW linear. 3 500Z tubes included	74.75	5.00
TL922		595.75	5.00

TELEX COMMUNICATIONS INC.

HFC-91	Underchin headphones	6.21	1.00
HMC-2	Underchin headphones	9.20	1.00
HTC-2	Twin Receiver headphones	14.72	1.00
BOOM MICROPHONE HEADSETS			
CB-88	3-2 20 ohms with power microphone	41.40	2.00
CM-1320S	3-2 20 ohms Single Headphone Hi-impedance microphone	36.80	2.00
DUAL MUFF HEADPHONES			
C-610	Dual Receiver magnetic	6.90	2.00
SWL-610	Dual Receiver magnetic	8.28	2.00
C-1210	Dynamic, foam-padded	18.86	2.00
C-1320	3-2 20 ohms. Telex's Best	26.22	2.00
MICROPHONES (battery powered)			
PROCOM 1	High Output	11.96	2.00
PROCOM 11	Variable gain	17.95	2.00
CB-73R	Dynamic, noise cancelling	23.92	2.00
CB-73S	as above with 6-wire lead	25.30	2.00

MACROTRONICS

CM-800	HAM Interface for TRS-80	230.00	5.00
TM-800	Deluxe RTTY and morse for TRS-80	362.25	5.00
TM-650	Deluxe RTTY and morse for PET	328.91	5.00
RR-1	RTTY Riter Editor for TM-800	32.95	1.00
ESK	Electra Sketch (Editor and Animations Compiler)	9.90	1.00

VIBROPLEX

Presentation	Super de luxe Semi Automatic Bug Keys	89.70	2.00
Original	De Luxe Semi Automatic Bug Keys	59.80	2.00
Original	Standard Semi Automatic Bug Keys	46.00	2.00
Lightning	De luxe Semi Automatic Bug Keys	59.80	2.00
Lightning	Standard Semi Automatic Bug Keys	46.00	2.00
Champion	Semi Automatic Bug Keys	43.70	2.00
Vibro-Keyer	De luxe Paddle for Electronic Keyer	59.80	2.00
Vibro-Keyer	Standard Paddle for Electronic Keyer	46.00	2.00

ADVANCED ELECTRONIC APPLICATIONS

MM-1	Morsematic Special Keyer	124.20	2.00
MK-1	Keyer	49.45	1.00
ISO-144	2m Antenna	34.50	2.00

TEN-TEC EQUIPMENT

TRANSCEIVERS			
515	Argonaut, 5W. 3-5 30MHz	276.00	5.00
546	Omni-D, Digital, Series C. SSB/CW 1-8 30MHz	736.00	5.00
570E	Century/21, 70W. CS. 3-5 29MHz 240 volts	230.00	5.00
580	Delta, 200W. SSB/CW, 1-8 30MHz	469.20	5.00
POWER SUPPLIES			
210/E	115/230 VAC. 13VDC. 1A	27.60	2.00
280	117/230 VAC. 13-5VDC. 18A	92.00	5.00
LINEAR AMPLIFIER			
444	Hercules, 1kW with 115/230 VAC. Power Supply	920.00	10.00

ACCESSORIES

206A	Crystal Calibrator	18.86	2.00
208A	Notch/CW Filter for Model 515	29.90	2.00
212	Crystal, for Model 515, 29-0 29.5MHz	3.45	0.50
213	Crystal, for Model 515, 29-5 30.0MHz	3.45	0.50
215P	Microphone, ceramic with plug	18.40	2.00
215PC	Microphone, ceramic with plug and coil cord	21.85	2.00
217	500Hz 8 pole Ladder Filter for Models 545/546	36.80	1.00
218	1-8KHz 8 pole Ladder Filter for Models 545/546	36.80	1.00
219	250Hz 6 pole Ladder Filter for Models 545/546	34.50	1.00
228	Antenna Tuner	59.80	2.00
243	Remote VFO for Models 545/546	103.50	5.00
247	Antenna Tuner	43.70	2.00
273	Crystal, for Model 570, 28-5 29.0	3.45	0.50
276	Crystal Calibrator for Model 570	18.86	1.00
277	Antenna Tuner/SWR Bridge for Model 570	57.50	2.00
282	250Hz 6 pole Ladder Filter for Model 580	35.65	1.00
283	Remote VFO for Model 580	112.70	2.00
286	500Hz 6 pole Ladder Filter for Model 580	32.20	1.00
289	Noise Blanker for Model 580	29.90	1.00
1140	DC Circuit Breaker for Models 545/546 and 580	4.60	1.00
1150	Overvoltage Protector for Models 552/262 Series	9.20	1.00
1170	DC Circuit Breaker for Model 570	6.90	1.00
KEYERS			
645	Ultrasonic, Dual Paddle	55.20	2.00
670	Single-Paddle Keyer	23.00	2.00

ENDS OF LINES (whilst stocks last)

TRANSCEIVERS

544	Triton IV 200W, SSB/CW 3-5 30MHz with digital readout	399.85	5.00
545	Omni-A, Analog, Series B, SSB/CW, 1-8 30MHz	448.85	5.00

POWER SUPPLIES (when bought with Ten-Tec transceiver)			
252MO/E	115/230 VAC, 13VDC, 18A for Omni	79.35	5.00
262M/E	230 VAC, 13VDC, 18A, deluxe with VOX (Triton)	85.10	5.00

ACCESSORIES

212	29-0 29.5 Crystal for Models 540/544	3.45	0.50
213	29-5 30MHz Crystal for Models 540/544	3.45	0.50
240	160m Converter for Models 540/544	57.50	2.00
241	Crystal Oscillator for Models 540/544	23.00	1.00
249	Noise Blanker for Models 540/544	18.40	1.00
AC-4	SWR Meter Lower Power	6.90	1.00
KR-5A	Single-paddle keyer, 6 14VDC	25.30	2.00
KR-50	Ultrasonic, dual paddle, 117 VAC/6 VDC	57.50	2.00

J BEAM ANTENNAS

4 metre Antennas			
4Y/4M	4 element folded dipole yagi with 1 1/2" boom	20.70	
PMH2/4M	2 way phasing harness for two 4m yagis	12.19	
2 metre Antennas			
DC1/WB	Wide band discone (100 470MHz)	41.40	
LR1/2M	Omnidirectional vertical gain colinear	24.15	
C5/2M	5dB glass fibre colinear, omnidirectional	44.27	
5Y/2M	5 element golded dipole yagi with 1" boom	11.27	
8Y/2M	8 element folded dipole yagi with 1" boom	14.49	
10Y/2M	10 element folded dipole 'long yagi' with 1 1/2" boom and trombone support	31.05	
PBM10/2M	10 element Parabeam with 1 1/2" boom and trombone support boom	36.80	
PBM14/2M	14 element Parabeam with 1 1/2" boom and 45° braces	44.85	
5XY/2M	Crossed 5 element yagi with 1 1/2" boom	22.77	

8XY/2M	Crossed 8 element yagi with 1 1/2" boom	28.40	
10XY/2M	Crossed 10 element yagi with 1 1/2" boom	37.72	
X6/2M/X12/70cm	Dual band crossed yagi	38.52	
PMH/2C	2 way phasing harness for circular polarisation	7.47	
Q4/2M	4 element quad yagi	23.69	
Q6/2M	6 element quad yagi	31.40	
D5/2M	Double 5 slot-fed yagi with 1" booms	20.12	
D8/2M	Double 8 slot-fed yagi with 1" booms	27.14	
SVMK/2M	Mounting kit for vertical polarisation for 2 slot-fed yagis	7.24	
UGP/2M	Unipole and ground plane	10.12	
HO/2M	Mobile 'halo' head only	4.55	
HM/2M	Mobile 'halo' with 24" mast	5.40	
PMH2/2M	2 way phasing harness for two 2m aerials	9.89	
PMH4/2M	4 way phasing harness for four 2m aerials	23.11	
70cm Antennas			
C8/70cm	8dB glass fibre colinear, omnidirectional	50.02	
D8/70cm	Double 8 slot-fed yagi with 1" booms	20.70	
PBM18/70cm	18 element Parabeam yagi with 1 1/2" boom	25.30	
MBM48/70cm	48 element Multibeam yagi with trombone mounting	28.75	
MBM88/70cm	88 element Multibeam yagi with trombone mounting	39.33	
8XY/70cm	Crossed 8 element yagi complete with phasing harness and 'N' type connector	34.15	
12XY/70cm	Crossed 12 element yagi complete with phasing harness and 'N' type connector	42.32	
PMH2/70cm	2 way phasing harness for two 70cm yagis	8.51	
PMH4/70cm	4 way phasing harness for four 70cm yagis	18.05	
23cm Antennas			
D15/1296	Double 15 slot-fed yagi with 'N' type connector	34.04	
PMH2/23cm	2 way phasing harness for two 23cm antennas	25.41	
Mobile Antennas			
TAS 2M	5/8 wave glass fibre whip with 4 metres of coaxial cable	15.29	
U5	70cm Colinear 5-6dB with 4 metres of coaxial cable	17.25	

Carriage on all the above Antennas—£5.00

HY-GAIN ANTENNAS

18HT	6 80m Vertical Tower	258.75	
12AVQ	10 20m Trapped Vertical	48.50	
14AVQ/WB	10 40m Trapped Vertical	60.37	
18AVT/WB	10 80m Trapped Vertical	87.40	
18V	10 80m Vertical	31.97	
TH6DXX	6 element beam for 10/15/20	235.75	
TH3MK3	3 element beam for 10/15/20	180.55	
TH3JR	3 element beam for 10/15/20	130.52	
TH2MK3	2 element beam for 10/15/20	126.21	
HY-QUAD	2 element quad for k0/15/20	194.35	
DB 10 15A	10 and 15m beam	132.25	
205A	5 element 20m beam	235.75	
204BA	4 element 20m beam	178.25	
203BA	3 element 20m beam	135.12	
155BA	5 element 15m beam	135.12	
153BA	3 element 15m beam	72.16	
103BA	3 element 10m beam	58.65	
105BA	5 element 10m beam	105.80	
402BA	2 element 40m beam	181.70	
511	Heavy duty spring	11.84	
499	Flush body mount	11.84	
417	De luxe spring	9.02	
492	Miniature spring	4.60	
LA-1	Lightning arrestor	23.34	
LA-2	In-Line Lightning arrestor	3.80	
BN-86	Ferrite balun	15.52	
TELREX	TB5EM 5 element beam for 10/15/20	368.00	
AR-20XL		39.67	
AR-22XL		49.45	
AR-30		47.15	
AR-40		54.62	
CD-45		113.85	
HAM-4		166.75	
BT-1	(Big Talk)	91.42	
T2-X	(Tail Twister)	228.85	

CDE ROTATORS

BENCHER PRODUCTS

BY-1	Keyer Paddle (Black base)	28.75
BY-2	Keyer Paddle (Chrome base)	37.95
BY-3	Keyer Paddle (Gold plated)	92.00
ZA-1A	Balun 3-5 30MHz for dipoles	12.65
ZA-2A	Balun 14 30MHz for beam antennas	13.80

HUSTLER ANTENNAS

AMATEUR ANTENNAS WITH MOUNTS		
4-BTV	4-Band Trap Vertical 10 40m	66.70
5-BTV	5-Band Trap Vertical 10 80m	86.25
BBLM-144A	5/8 Wave 2m Magnetic, 17' coax	28.75
BBLT-144A	5/8 Wave 2m Trunk lip and coax	26.45
CGT-144	2m Colinear, Trunk lip and coax	29.90
G6-144B	6db 2m Base Colinear	59.80
G7-144	7db 2m Base Colinear	89.99
HT-144	"Hustleoff" 2m 5/8 wave mobile	19.99
SFM	5/8 Wave 2m Magnetic and coax	22.99
SFS-144	5/8 Wave 2m Speedy Mount	15.99

MONITOR ANTENNAS

DCX	40 700MHz Receiving	13.80
DCL	Discone as above with 50' coax	20.70
UHT-1	140 500MHz Unit Gain and 15' coax	6.50

ACCESSORIES

BM-1	Bumper Mount	11.95
C-29	Stainless Steel Spring	7.95
C-32	Chrome Ball Mount	5.50
HLM	Deluxe Trunk Lip Mount	11.95
MM-1	Universal Single Hole Mount	5.98
MM-3	Universal Single Hole Mount and coax	11.95
QD-1	Quick Disconnect Fitting	9.99
RSS-2	Resonator Impact Spring	4.95
SSM-1	Stainless Heavy Duty Ball and Spring	21.95
SSM-3	Stainless Heavy Duty Spring	10.95

RESONATORS AND MASTS

RM-10	10 metre Resonator	6.95
RM-10S	10 metre High Power Resonator	11.95
RM-15	15 metre Resonator	6.94
RM-15S	15 metre High Power Resonator	11.95
RM-20	20 metre Resonator	9.60
RM-20S	20 metre High Power Resonator	14.49
RM-40	40 metre Resonator	11.50
RM-40S	40 metre High Power Resonator	15.99
RM-80	80 metre Resonator	12.60
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MASTS

MO-1	Mast for Wing Mounting	14.95
MO-2	Mast for Bumper Mounting	14.95
SF-2	2m 5/8 Antenna fits Hustler Mounts	8.50

CARRIAGE EXTRA. PLEASE CHECK FOR DETAILS.

COLLINS EQUIPMENT

KWM-380	Amateur HF Transceiver	1,794.00	10.00
KWM-380 OPTIONS			
AC-3801	Noise Blanker	120.75	5.00
AC-3802	Speech Processor		
AC-3803	Control Interface	82.80	2.00
AC-3810	CW Filter, 500Hz	59.80	1.00
AC-3811	CW Filter, 250Hz	59.80	1.00
AC-3812	RTTY Filter, 1-7kHz	59.80	1.00
AC-3813	AM Filter, 6-0kHz	36.80	1.00
KWM-380 ACCESSORIES			
AC-2801	Rack Mount	82.80	2.00
AC-2808	Blower Kit	120.75	2.00
AC-2821	DC Standby Power Cable	33.35	2.00
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NTN	Service Manual	20.00	2.00



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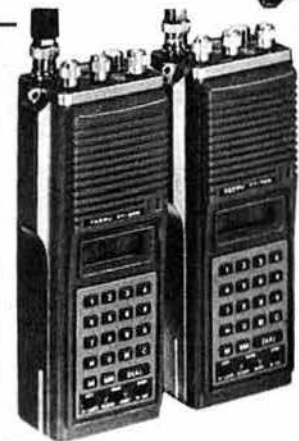
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Icom's superb new HF rig with general coverage receive 100kc-30MHz plus transmit facility across its entire range for commercial purposes

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PCS-3000

Azden's pace-setting new 2m mobile giving 25w out, with 25kc or 12.5kc shift and 8 memories . . .

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FRG-7700

Yaesu's latest receiver with FM right across the band now offers yet more optional extras. Memory facility . . . Aerial tuning unit . . . and no less than four converters.

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| A. 118-130MHz, | 130-140MHz, | 140-150MHz |
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| C. 140-150MHz, | 150-160MHz, | 160-170MHz |
| D. 118-130MHz, | 140-150MHz, | 70- 80MHz |

Basic receiver **£299** inc. VAT and **FREE** Heliscan aerial worth **£15**



YAESU's LATEST . . .

the new all-mode 2m portable FT-290

So many features ★ 10 memories ★ Memory scan ★ 2 VFOs ★ Band scan ★ Clarifier ★ FM/LSB/USB/CW ★ LCD readout ★ Real S-meter ★ Priority channel ★ 2.5w out

£229



FRT-7700

Designed by Yaesu to match the FRG-7700, but also compatible with many other popular receivers such as the FRG-7, R-1000 and DX-300, this ATU lets you peak up on the signals you want and attenuate those you don't. Great performance and value at just **£33.75**



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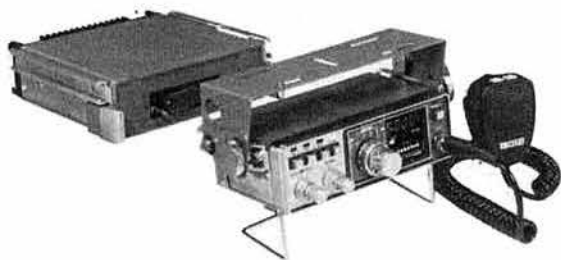
Yaesu's own warranty does not extend outside Japan. Repairs are the responsibility of the UK dealer selling the set. SMC's two-year guarantee is backed, as UK distributors, by daily contact with the factory and many tens of thousands of pounds of spares and test equipment. Avoid hawkers offering sets without serial numbers, without spares, service or advise back-up.

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- * 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.7 status LEDs
- * 1W of audio to internal/external speaker
- * 3-3 (4-3) D x 6" W x 2 (2-2) H
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- 720RVH 25W, 2M deck.....£143.00 inc.
- * 144-146MHz (144-148MHz possible)
- * 12!KHz synthesizer steps
- * ±600kHz repeater offset
- * 0-3µV for 20dB quieting
- * Rx 0-5A, Tx RV 3-5A, RVH 6-5A
- * 5-8 (6-5) D x 6" W x 2 (2-2) D
- 720RU 70cm, deck.....£156.00 inc.
- * 430-434MHz
- * 25kHz synthesizer steps
- * 1-6MHz repeater shift
- * 0-5µV for 20dB quieting
- * Rx 0-5A, Tx 4-5A
- * 5-8 (6-5) D x 6" W x 2 (2-2) D
- E72S Extension cable 200cms.....£23.00 inc.
- E72L Extension cable 400cms.....£28.00 inc.
- S72 Switching box.....£56.00 inc.
- * Permits control head with two decks
- * Single button change of band
- * Auto change of synthesizer steps
- * Auto change of repeater split

FT720RV 10W 2 metre

£253 inc. VAT @ 15% & SECURICOR



CPU2500RS

- * Covers 144 to 146 or 148MHz
- * 25/3 watt or 10/1 watt models (S)
- * CPU controlled digital synthesiser
- * 10kHz (+5kHz up) synthesised steps
- * Optional 25kHz steps in S1 version
- * 6 digit readout + memory channel number
- * Main tuning by optically coupled encoder
- * Up/down tuning/scanning from microphone
- * Scanning for empty or occupied channels
- * Band scanning up or down the band
- * Four normal memory channels
- * Further memory for 'odd' split
- * Can scan memory channels only
- * ±600kHz plus any split (to 4MHz)
- * Sub audio tone squelch option
- * Manual (EU) and Auto (UK) tone burst
- * High or low (1/10) power switch
- * Low noise mosfet RF stage
- * LED's for: 'on Air' and 'Busy channel'
- * VSWR and reverse polarity protection
- * Punch in frequency on keyboard mic (K)
- * 0-5A Rx, 2-5A LTx, 6 A HTx (25)
- * 13-6V DC±10%
- * Case: 7" W, 2 1/2" H, 10 1/2" D
- * Sensitivity: 1-3µV for 20dB (2:1SF)
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- * AF output: 1-5W into 8 ohms
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- CPU2500NS 10W, standard mic.....£235.00 inc.
- CPU2500RK 25W, keyboard mic.....£260.00 inc.
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- WMT2500 workshop manual.....£5.00 inc.

CPU2500RS 10W 2 metre

£235 inc. VAT 15% & SECURICOR



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- * Input 30W (PEP A3J and A1/F3).
- * GaAs Fet RF for incredible sensitivity.
- * NMOS four bit micro control.
- * Bandwidth 2.2kHz and 14kHz @ -6dB.
- * "Dial set" clears unwanted non-integral steps.
- * Very bright blue display to 100Hz.
- * Display indicates Tx and Rx (inc RIT).
- * Manual tone switch on microphone.
- * String LED displays for S and PO.
- * Digital receiver independent tune (± 10 kHz).
- * Advanced effective noise blanker.
- * FM: 100kHz, 25kHz, 1kHz, steps.
- * SSB: 1,000, 100, 10Hz steps.
- * Repeater access by use of dual VFO's.
- * Four easy write in memory channels.
- * Memory scanning with slot display.
- * Up/down tuning from microphone.
- * Priority channel on any memory slot.
- * Satellite mode allows tuning on Tx.
- * Scanning for busy or clear channels.
- * Size (case): 10"D, 2.3"H, 6.9"W.
- * LED's on air, clear, hi/low, FM mod.
- * FP80 mains PSU + SC1 console available.

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FT290R

- * 144-146MHz (144-148 possible)
- * Multimode USB, LSB, FM, CW
- * 2.5W PEP, 2.5W RMS, 300mW out
- * LED's; "ON AIR", "BUSY". MC meter; S, PO
- * Integral telescopic antenna
- * Bandwidth 2.4kHz and 14kHz @ 6dB
- * Optically coupled main tuning
- * LCD Frequency display with backlight
- * Readout to 100Hz
- * Digital Clarifier
- * 10 channels of memory!!
- * Memory with "5 year cell" backup
- * FM: 25kHz to 12.5kHz steps
- * SSB: 1kHz to 100Hz steps
- * Any TX RX split with dual VFO's
- * + 600kHz repeater split
- * Mobile mounting bracket available
- * Matching 10W linear Amplifier
- * Up/down tuning from microphone
- * AF output 1W @ 10% THD
- * Tone burst on 175kHz
- * 58(H) x 150(W) x 195(D) (1.3kg)
- * RX, .70mA, TX; 800mA (FM maximum)
- * External supply 8-5 15-2V DC
- * 8 C Size Ni cads or Dry cells

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FT225RD

- * 144-148MHz inclusive Coverage.
- * Multimode USB-LSB-FM-AM-CW.
- * AC mains or 12V dc working.
- * Smooth Dual speed VFO.
- * Digital readout to 100Hz. Analogue 1kHz.
- * 22 Fix Channels (2 x 11) (2MHz).
- * Memory Option for split/simplex.
- * "S"/centre zero/P output meter.
- * 20dB attenuator/switchable AGC.
- * Xtal tone burst/FM power cont.
- * Effective noiseblanker/ALC socket.
- * Lights/readout brightness.
- * Semi Break in CW with side tone.
- * Clarifier on Rx or Rx & Tx.
- * Clarifier works on VFO, xtal & mem.
- * Norm/Rev and Aux repeater
- * Relay make-break-common sockets.
- * Plug in board construction.
- * 11.8" D x 11.1" W x 4.8" H (case).
- * Weight 20lb (9kg).
- * LED's for: MEM, Burst, NB & Attn.
- * LED's for: RPT, CLAR, VFO, MEM, On Air.
- * 25W + PEP A3J, 25W + F3.
- * Highly sensitive and selective.
- * Conservatively rated PA for low IMD.

£565 INC.

VAT @ 15%
& SECURICOR



FT480R

- * 144-146MHz (143.5-148.5 MHz possible).
- * USB-LSB-CW-FM (A3J, A1, F3).
- * 30W PEP A3J, 10/1W out A1 F3.
- * Bandpass filter no tune design
- * Excellent dynamic range sensitivity.
- * Bandwidth 2.4kHz and 14kHz at -6dB.
- * Semi break in with side tone.
- * Very bright blue 100Hz digital display.
- * Display shows Tx and Rx freq (inc RIT).
- * String LED display for "S" and PO.
- * Digital receiver offset tuning.
- * Advanced effective noise blanker.
- * FM: 25, 12.5, 1kHz steps.
- * SSB: 1,000, 100, 10Hz steps.
- * Any TX RX split with dual VFO's.
- * +600kHz standard repeater split.
- * Four easy write-in memory channels.
- * Memory scanning with slot location display.
- * Up/down tuning/scanning from mic.
- * Priority channel on any memory slot.
- * Satellite mode allows tuning on Tx.
- * Scanning for busy or clear channels.
- * Size (Case): 8.3" D, 2.3" H, 6.9" W.
- * LED's; "On Air" Clar, Hi/Low, FM mod.
- * Matching FP80 Mains PSU available.

£359 INC.

VAT @ 15%
& SECURICOR

NEW



FT101ZDFM

- ★ 160-10 metres including new allocations.
- ★ Variable IF bandwidth 2.4kHz down to 300Hz.
- ★ 8 pole filters for razor edge selectivity.
- ★ Selectable CW fixed bandwidth CW-W and CW-N*.
- ★ Semi-break in with sidetone for excellent CW.
- ★ Digital plus analogue frequency displays.
- ★ 6146B PA's with 6dB of negative feedback.
- ★ 180W PIP and -31dB 3rd order intermod.
- ★ RF speech processor fitted—adjustable level.
- ★ VOX built-in and is adjustable from the front panel.
- ★ Wide dynamic range for big signal handling.
- ★ High usable sensitivity, for those weak ones.
- ★ Superb noise blanker—adjustable threshold.
- ★ Attenuator; 0-10-20dB, front panel switch.
- ★ AGC: slow-fast-off, front panel switchable.
- ★ Clarifier (RIT) switchable on TX, RX or both.
- ★ Low level transverter drive output facility.
- ★ Universal power supply 110-234V ac and 12V dc*.
- ★ Incredible range of matching accessories. 4 models.

FT101ZAM	£515.00 inc	SP901	£28.75 inc
FT101ZFM	£529.00 inc	FV101Z	£121.90 inc
FT101ZDM	£585.00 inc	* FV101DM	£225.00 inc
FT101ZDFM	£599.00 inc	FV901DM	£223.45 inc
FL2100Z	£385.25 inc	WMT101Z	£12.00

*Option **£599 inc.** VAT @ 15% & SECURICOR



FT107M

- ★ 160-10 metres (including 10, 18, and 24MHz).
- ★ USB-LSB-CWW-FSK-AM multi-mode.
- ★ Full broad band "no tune" power amplifier.
- ★ 240W PIP. 75 per cent power output at 3:1 VSWR.
- ★ 12 memory channels with clarifier on memory.*
- ★ Digital Memory Shift gives offset from memory.*
- ★ Up/down scanning control from the microphone.*
- ★ Variable IF bandwidth—16 poles of selectivity.
- ★ Bandwidths: 6kHz*, 2.4kHz-300Hz, 600Hz-300Hz.*
- ★ Selectable CW "fixed" widths CW-W and CW-N.*
- ★ Tunable Audio Peak (AFP) and Notch filter.
- ★ Diode ring mixer for very high Rx dynamic range.
- ★ Noise blanker—front panel adjustable threshold.
- ★ AGC: slow-fast-off switchable from the front panel.
- ★ Attenuator 0-20dB, plus RF gain on front panel.
- ★ RF speech processor fitted—front panel adjustable.
- ★ Digital (100Hz) plus analogue frequency displays.
- ★ Meter Reads: Vcc, Ic, ALC, Compression and SWR.
- ★ Semi-break in with side tone. Vox built in.
- ★ Choice of built-in or separate power supply units.

FT107M	£690.00 inc	FC107	£102.35 inc
FT107MDMS	£775.00 inc	FP107	£97.75 inc
FV107	£92.00 inc	FP107E	£106.95 inc
FTV107	£110.40 inc	Filters	£23.00 inc
SP107	£27.60 inc	WMT107	£12.00

*Option **£690 inc.** VAT @ 15% & SECURICOR



FT902DM

- ★ 160-10 metres including new allocations.
- ★ Variable IF bandwidth 2.4kHz down to 300Hz.
- ★ Audio Peak and independent notch controls.
- ★ AM, FSK, USB, LSB, CW, FM, (TX and RX).
- ★ Semi-break in, inbuilt Curtis IC Keyer.
- ★ Digital plus analogue frequency displays.
- ★ 6146B's with negative feedback.
- ★ VOX built-in and adjustable.
- ★ Instant write in memory channel.
- ★ Tune up button (10sec, of full power).
- ★ Curtis Keyer—lambic, single or straight.
- ★ Switchable AGC and RF attenuator.
- ★ Optional 350 or 600Hz CW, 6kHz, AM filters.
- ★ Clarifier (RIT) switchable on TX, RX or both.
- ★ Audio Peak and tunable notch filter.
- ★ Plug in modular, computer style constructor.
- ★ Fully adjustable RF Speech processor.
- ★ Ergonomically designed with necessary LEDs.
- ★ Incredible range of matching accessories.
- ★ Universal power supply 110-234V ac and 12V dc.

FT902DM	£799.00 inc	YR901	£369.00 inc
FT902DE	£713.00 inc	YVM1	£142.60 inc
FT902D	£724.50 inc	YK901	£115.00 inc
YO901P	£302.45 inc	FTV901 (2)	£263.35 inc
FC902	£126.50 inc	WMT901	£12.00

*Option **£799 inc.** VAT @ 15% & SECURICOR



FT707

- ★ 80-10 metres (including 10, 18 and 24MHz bands).
- ★ USB-LSB-CWW-CWN-AM (Tx and Rx operation).
- ★ 100W PEP, 50% power output at 3:1 VSWR.
- ★ Full "broad band" no tune output stage.
- ★ Excellent Rx dynamic range, power transistor buffers.
- ★ Rx Schottky diode ring mixer module.
- ★ Local oscillator with ultra-low noise floor.
- ★ Variable IF bandwidth—16 crystal poles.
- ★ Bandwidths 3kHz*, 2.4kHz-300Hz, 600-350Hz*.
- ★ AGC: slow-fast switchable from the front panel.
- ★ VOX built-in and adjustable from the front panel.
- ★ Semi-break in with side tone for excellent CW.
- ★ Digital (100Hz) plus analogue frequency display.
- ★ LED Level meter reads: S, PO and ALC.
- ★ Convenient concentric AF/FR gain controls.
- ★ Indicators for: calibrator, fix, int/ext VFO.
- ★ Receiver offset tuning (RIT-clarifier) control.
- ★ Advanced noise-blanker with local loop AGC.
- ★ 25kHz crystal calibrator feature.
- ★ Internal, xtal or external VFO control.

FT707	£529.00 inc	*FTV707	£82.00 inc.
FT707S	£455.00 inc	70TV	£80.50 inc
FP707	£109.25 inc	144TV	£101.20 inc
FC707	£80.50 inc	430TV	£175.95 inc
FV707DM	£186.30 inc	WMT707	£10.00

*Option **£529 inc.** VAT @ 15% & SECURICOR

- ★ 430-440MHz (440-450 option)
- ★ 25kHz synthesizer steps
- ★ 4 bit CPU chip for frequency control
- ★ Keyboard entry of frequencies/splits
- ★ LCD digital display with backlight
- ★ Ten channels of memory
- ★ Memory back up 5-year lifetime cell
- ★ Up/down manual tuning
- ★ Manual or auto scan busy/clear channels
- ★ Priority channel with search back feature
- ★ Memory scanning feature
- ★ Scan between any two desired frequencies
- ★ Auto scan restart
- ★ Any split + or - programmable
- ★ Quick change Nicad pack
- ★ 1,750Hz tone burst
- ★ ± 7.6 MHz EU split standard
- ★ Built in condenser microphone
- ★ 500mW AF to int/ext speaker
- ★ External speaker/mic available
- ★ 1W or 100mW RF output
- ★ Rx: 20mA squelch, 15mA (max AF)
- ★ Tx: 500mA at 1W RF
- ★ 0.4 μ V for 12dB SINAD
- ★ Double conversion 46.255MHz and 455kHz
- ★ Keyboard offers 16 tone DTMF
- ★ 168(H) \times 61(W) \times 49(D)mm.
- ★ c/w Nicad pack, helical.



FT708R

YM24A External speaker Mic.	£16.85 inc
PA3 12V DC Adaptor.	£12.25 inc
NC7 Standard charger.	£24.55 inc
NC8 Quick/Standard/DC PSU.	£41.40 inc
NC9C Compact charger.	£7.65 inc
FNB2 Battery Pack.	£16.10 inc
FBA2 Battery Sleeve.	£2.70 inc
MMB10 Mobile mount.	£5.75 inc
FL7019 Linear, 10W	TBA
FTS32 Tone squelch	TBA
FTS32AE Tone encoder	TBA

FT708R 1W, 70cms

£199 inc. VAT @ 15% & POSTAGE

FT404R is a 2 $\frac{1}{2}$ W, 6-channel, 70cm handheld. Similar in size to the FT207 and compatible with most of its accessories. Supplied c/w Nicad pack, helical, and carrying case.

FT404R, 2 $\frac{1}{2}$ W, 70cm

£179 inc. VAT @ 15% & POSTAGE

- ★ 144-148MHz (144-148 possible)
- ★ 12.5kHz synthesizer steps
- ★ 4 bit CPU chip for freq. control
- ★ Keyboard entry of frequencies
- ★ Keyboard lockout safety features
- ★ Digital display to hundreds of Hertz
- ★ Display auto shutdown times
- ★ Four Channels of memory
- ★ Memory back up disable
- ★ Up/down manual tuning
- ★ Bandscan for busy or clear channels
- ★ Memory scanning feature
- ★ ± 600 kHz split built in
- ★ Any split + or - programmable
- ★ Easy change Nicad packs
- ★ BNC antenna connector
- ★ "On Air" and "Channel Busy" LEDs
- ★ Built in condenser microphone
- ★ 200mW AF to internal/external speaker
- ★ External speaker/mic available
- ★ 2.5/0.2W of RF output
- ★ Rx: 35mA squelch, 150mA full vol.
- ★ Tx: 250mA low, 800mA high
- ★ 0.3 μ V for 20dB quieting
- ★ Double conversion 10.7MHz and 455kHz
- ★ Two tone encoder built in
- ★ 1.7 (2.2)" D \times 2.5 (2.7)" W \times 6.7 (7.2)" H
- ★ C/w Nicad pack, helical and case



FT207R

FL2010 Booster, 10W output.	£59.75 inc
YM24A External speaker Mic	£16.85 inc
PA2 12V DC adaptor.	£13.40 inc
MMB 10 Mobile Bracket	£5.75 inc
NC9C Mini Charger.	£7.65 inc
NC1A Mains Charger	£19.15 inc
NC2/3 Mains quick charger/eliminator	£39.50 inc
NC3 Charger/eliminator/12V adaptor	£42.55 inc
NBP9 Nicad pack (spare)	£16.85 inc
FLC2 Heavy Duty leather case.	£20.70 inc
WMT207R Workshop Manual.	£4.00 inc

FT207R 2 $\frac{1}{2}$ W, 2 metre

£175 inc. VAT @ 15% & POSTAGE

FT202R is a 1W, 6-channel, 2 metre handheld. Similar in size to the FT207R. Large range of accessories available. Supplied c/w 3 channels, helical and carrying case.

FT202R, 1W, 2 metre

£109 inc. VAT @ 15% & POSTAGE



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

A	G3ZUL	Brian	Stourbridge	(03843) 5917
G	GI3KDR	John	Bangor	(0247) 55162
E	GM8GEC	Jack	Edinburgh	(031665) 2420
N	GI3WVY	Mervyn	Tandragee	(0762) 840656
T	GW3TMP	Howarth	Pontybodkin	(035287) 846/324
S	GW8EBB	Peter	Swansea	(0792) 872525
	GJICD	Geoff	Jersey	(0534) 26788
	G4EQS	Simon	Redcar	(0642) 480808

LEEDS
S.M.C. (Leeds)
Colin Thomas, G3PSM
257 Otley Road,
Leeds 16, Yorkshire.
Leeds (0532) 782326
9-5.30 Monday-Saturday

CHESTERFIELD
S.M.C. (Jack Tweedy) LTD
Roger Baines, G3YBO
102 High Street,
New Whittington, Chesterfield.
Chesterfield (0246) 453340
9-5 Tuesday-Saturday

WOODHALL SPA
S.M.C. (Jack Tweedy) LTD
Jack Tweedy, G3ZY
150 Horncastle Road,
Woodhall Spa, Lincolnshire.
Woodhall Spa (0526) 52793
9-5 Tuesday-Saturday

ASCOT

These are a complete range of mobile antenna accessories developed and manufactured in the UK.

They are extremely rugged, designed to withstand extremes of weather using: fine stainless steel whips, A100 nylon bases, chrome plated brass ferrules, heat treated silver plated beryllium copper contacts and polished stainless steel shock springs.

From the list below, choose the base (1, 2, 3) choose the whip (long or short) and the cable assembly required (cable or magnetic). Then add an accessory if required.

340	Base, Stand 1/4λ 60-550MHz	£2.00	£0.35
310	Base, Swivel 1/4λ 60-550MHz	£3.65	£0.35
344	Base, Sprung 1/4λ 60-120MHz	£5.55	£0.45
440	Base, Stand 5/8λ 145MHz	£2.35	£0.35
330	Base, Swivel 5/8λ 145MHz	£4.35	£0.35
341	Base, Sprung 5/8λ 145MHz	£6.35	£0.45
350	Base, Fine tune 1/2λ 45MHz	£6.35	£0.45
351	Base, Sprung 1/2λ 145MHz	£7.00	£0.55
057	Whip, tapered SS 127cms	£1.70	£0.85
056	Whip, parallel SS 63cms	£0.65	£0.65
085	Mount cable 5/8 & 1/4λ	£2.65	£0.55
085LR	Mount cable 5/8 & 1/4λ	£3.35	£0.55
092	Mount Mag. 5/8 & 1/4λ	£9.35	£0.75
084	Mount cable 1/2λ	£4.35	£0.55
088	Mount cowl 1/2λ	£5.00	£0.35
091	Mount Magnetic 1/2λ	£9.35	£0.75
089	Gutter clip adaptor	£4.35	£0.55
093	Boot lip adaptor	£3.30	£0.45

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

Kenpro

KR500

Elevation Rotator (180°),
Up to 50kg of Load.
1 1/2in 2 1/2in mast
1 1/2in 1 1/2in boom.



RC6W 6-core control cable per metre ToS
KR500 (post and packing free)

KR250

Twist and switch controller.
Rotator 200kg/m. Brake 600kg.
1in-1 1/2in masts.



RC6W 6 way rotor cable per metre ToS
KR250 (post and packing free) £39

KR400RC

360° round tube meter. Max:
load 200kg.
Rot. 400kg/m, brake 1500kg/m.
1 1/2in-2 1/2in masts.
Lower casting option.



RC5W 5-way rotor cable per metre 26p
KR400RC (post and packing free) £79

KR600RC

360° round tube meter.
Max: load 200kg.
Rot. 600kg/m, brake 400kg/m.
1 1/2in-2 1/2in masts.
Lower casting optional.



RC6W 6 way rotor cable per metre 00p
KR600RC (post and packing free) £115

NB: PRICES EXCLUDE VAT (15%)

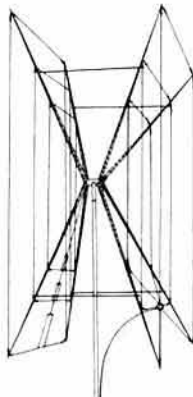
hy-gain

The TH3jnr is a 3 element triband (10-15-20m) beam whose compact design (longest element 24-2ft, boom 12ft turning radius 14-3ft) makes it ideal where space is the limiting factor. Separate and matched air dielectric Hy-Q traps are used for each band giving a 52ohm fed with a 1.5:1 VSWR at resonance, 8dB Av gain, 25dB F.B. ratio and a power handling of 600W P.E.P. By using a 1 1/2in boom the antenna presents only 3-4sq ft of surface area (equals 87lb of load at 80mph). The mast to boom the antenna presents only 3-4sq ft of surface the hardware is Iridite treated to mil specs.

12AVQ	Vertical 10-20m inc.	£37.50	£1.50
14AVQ/WB	Vertical 10-40m inc.	£52.50	£1.50
18AVT/WB	Vertical 10-80m inc.	£76.00	£1.50
14RMQ	Roof mounting Kit	£19.50	£1.50
18V	Vertical 10-80m inc.	£27.80	£1.50
18HT	"HY Tower" 10-80m	£225.00	£10.90
103BA	3 Ele Yagi 10m	£51.00	£1.50
105BA	3 Ele Yagi 10m	£92.00	£2.75
153BA	3 Ele Yagi 15m	£62.75	£2.05
155BA	5 Ele Yagi 15m	£117.50	£4.15
203BA	3 Ele Yagi 20m	£117.50	£3.45
204BA	4 Ele Yagi 20m	£155.00	£5.10
205BA	5 Ele Yagi 20m	£205.00	£6.60
402BA	2 Ele Yagi 40m	£158.00	£4.55
DB10/15A	3 Ele Yagi 10-15m	£115.00	£3.40
TH3JNR	3 Ele Yagi 10-15-20m	£113.50	£2.15
TH2MK3	2 Ele Yagi 10-15-20m	£109.75	£2.25
TH3MK3	3 Ele Yagi 10-15-20m	£157.00	£4.05
TH5DXX	"Thunderbird" 5 Ele	£178.30	£4.70
TH6DXX	"Thunderbird" 6 Ele	£205.00	£5.90
HYQUAD	2 Ele Quad 10-15-20m	£169.00	£4.25
18TD	Dipole Tape 10-80m	£56.00	£2.00
BN86	Balun 1:1-3 30MHz	£13.50	£1.00
LA1	Lightning Arrestor	£39.50	£0.65

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

Gem Quad



GEM QUAD

A light strong, boomless, quad antenna covering 10-15-20m. The centre spider is aluminium and the spreader arms (13-6ft and 2-2lb) are of a glass fibre tri-dielectric construction. (Thin rods forming a triangle with tape criss-crossing for light, rigid, low wind resistance structure.)

GO2E 18ft x 18ft x 9-5ft
8dB Gain
GO3E As 2 ele plus 6-5ft
Boom
GO4E As 2 ele plus 13ft
Boom

GO2E	3 Ele Antenna	£124.00	£3.75
GO2E	3 Ele Antenna	£187.00	£6.45
GO4E	4 Ele Antenna	£249.00	£7.05
GQCK1	Conversion Kit 1 Ele	£63.00	£2.90
GQCK2	Conversion Kit 2 Ele	£125.00	£4.70
GQSPIDER	Centre piece (spare)	£26.25	£1.25
GQSPREADER	Spreader Arm (spare)	£9.85	£1.50

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

J-BEAM

As well as 2m antennas featured here, the range covers 4m through 23cms. All models offer good 50ohm matches and bandwidths by incorporating such innovations as the inverse balun. Technical details are quoted in accordance with ICE (ICE13B + 138A) and I.E.E.E. (RV481 RE252 Jan 65) recommendations. (See for catalogue.)

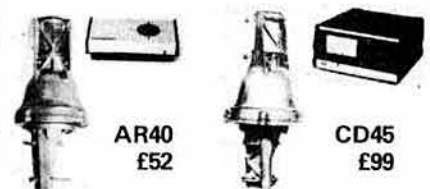
The 8XY/2m is basically two 8 element yagis mounted at right angles on a common 9ft boom. It is suitable for horizontal, vertical or circular (with PMH/2c) polarisation. 9-5dB gain in each plane. 47° horizontal beamwidth, 10lb weight, 64lb wind load at 100mph an elegant answer to a single antenna installation.

JAYBEAM 2 METRE

HO/2M	Halo, head only	£3.95	£0.55
HM/2M	Halo, with 24in mast	£4.70	£0.65
UGP/2M	Ground plane	£8.80	£1.50
C5/2M	Colinear omni vert	£38.50	£1.50
LR1/2M	Colinear	£21.00	£1.50
5Y/2M	Yagi 5 ele	£3.80	£0.50
8Y/2M	Yagi 8 ele	£12.60	£1.50
10Y/2M	Long Yagi 10 ele	£27.00	£1.50
14Y/2M	Long Yagi 14 ele	£31.30	£1.50
D5/2M	Yagi, 5 over 5 slot	£17.50	£1.50
D8/2M	Yagi, 8 over 8 slot	£23.60	£1.50
PBM10/2M	10 ele parabeam	£32.00	£1.50
PBM14/2M	14 ele parabeam	£39.00	£1.50
Q4/2M	Quad, 4 ele	£20.60	£1.50
Q6/2M	Quad, 6 ele	£27.30	£1.50
5XY/2M	Yagi, 5 ele cross	£19.80	£1.50
8XY/2M	Yagi, 8 ele cross	£24.70	£1.50
10XY/2M	Yagi, 10 ele cross	£32.80	£1.50
PMH2/C	Harness, Cir. Polar	£6.50	£0.45
PMH2/2M	Harness, 2 way	£8.60	£0.75
PMH2/2ML	Harness, 2 way long	£9.60	£1.00
PMH4/2M	Harness, 4 way	£20.10	£1.50

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

CDE



AR40
£52

CD45
£99

Accurate, silent self-calibrating control box. Dial up desired beam heading, push knob; motor rotates to that position and then switches off.

Large illuminated meter gives read out of antenna heading at all times. Armature brake. Low voltage meter. Handles antennas to 8 1/2sq ft.



HAM IV
£145

T2X
£199

Large illuminated meter gives read out of antenna heading at all times. Wedge solenoid brake mechanism. Handles antennas to 15sq ft.

Large illuminated meter gives read out of antenna heading at all times. Wedge solenoid brake mechanism. Handles antennas to 30sq ft.

NB: PRICES EXCLUDE VAT (15%)
CARRIAGE INCLUDED (Road or Post)



SOUTH MIDLANDS COMMUNICATIONS LIMITED

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.

The range encompasses towers between 25 and 120ft in 10, 20 or 40ft sections mounted on ground post, base plate, wall, fixed base or high speed trailer.

STANDARD		HEAVY DUTY	
Post mounting		Post Mounting	
13M20P25 25'	£252	16M20P40 40'	£514
13M20P40 40'	£345	16M20P60 60'	£584
13M20P60 60'	£422	16M20P80 80'	£880
13M20P80 80'	£805	16M20P100 100'	£1,061
Fixed Base		Fixed Base	
13M20FB25 25'	£188	16M20FB40 40'	£404
13M20FB40 40'	£280	16M20FB60 60'	£478
13M20FB60 60'	£357	16M20FB80 80'	£752
13M20FB80 80'	£739	16M20FB100 100'	£920
Socket Types		Socket Types	
13M20SP25 25'	£293	16M20SP40 40'	£558
13M20SP40 40'	£386	16M20SP60 60'	£640
13M20SP60 60'	£464	16M20SP80 80'	£937
13M20SP80 80'	£847	16M20SP100 100'	£1,118
Base plate		Base plate	
13M20BP25 25'	£295	16M20BP40 40'	£524
13M20BP40 40'	£389	16M20BP60 60'	£606
13M20BP60 60'	£464	16M20BP80 80'	£902
13M20BP80 80'	£847	16M20BP100 100'	£1,083
Wall Mounting		Wall Mounting	
13M20W25 25'	£203	16M20W40 40'	£412
13M20W40 40'	£296	16M20W60 60'	£483
13M20W60 60'	£373	Mobile Type	
Mobile Type		Mobile Type	
13M20M25 25'	£1,356	16M20M40 40'	£1,723
13M20M40 40'	£1,484	16M20M60 60'	£1,823
13M20M60 60'	£1,576	16M20M80 80'	£2,241
13M20M80 80'	£1,998	16M20M100 100'	£2,316
*T Series Towers (20' sections)			
13M20T85 85'	£1,135	13M20T120 120'	£1,550

Towers are supplied complete to brochure specifications. Check details of luffing gear, head unit, winches and bolts against your requirements. (Standard items will be credited in full at order time).

*New reinforced head unit with provision for KS065 rotary bearing (£15.35 extra) is now available.

'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	£307
10M10W30 Wall mount (LG1013W extra)	£295
10M10B30 Base Plate (HD Bolts extra)	£325
10M10FB30 Fixed base (HD Bolts extra)	£285

NB: PRICES EXCLUDE VAT AT (15%)

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. This is a flat frequency response, peak envelope power and R.M.S. in-line wattmeter with many novel features. Most notable being the 'power independent' SWR scale—no forward power calibration knob, just direct reading SWR.

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

FS500 £53



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 x 4 x 5 1/2"

FS600 £39



PEAK READING LEVEL RESPONSE
FS601M 1-8-30MHz 20 & 200W
FS601MH 1-8-30MHz 200 & 2kW
FS602M 50-150MHz 20 & 200W
FS603M 430-440MHz 5 & 20W
Power $\pm 10\%$ FSD. SWR 1:1-3:1
Size: 6 1/2 x 2 1/2 x 4 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 x 4 x 5 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 1/2 x 2 1/2 x 4 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 x 2 1/2 x 1 1/2"
coupler 3 1/2 x 2 1/2 x 1 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 x 3 x 3 1/2" 'On the Air' LED

FS700M £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 1/2 x 2 1/2 x 4 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 x 2 1/2 x 2 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 x 2 1/2 x 2 1/2" 'On the Air' LED

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



SMC-HS

OMNIDIRECTIONAL VERTICAL HF, VHF, UHF ANTENNAS

HF TRAPPED VERTICAL

The SMCHF5V covers five bands, 10 to 80 metres. Only 15ft 9in high, about 1 1/2in diameter and weighing 6 1/2lb but with PEP handling (within the 1-5:1 VSWR bandwidth) of 500W on 10-20m and 200W on 40 and 80m. It is suitable for ground mounting on a good earth stake (with or without radials) or in an elevated position with resonant wire radials or the SMCHF5R trapped radial kit.

The SMCHF5R consists of five solid rods (between 6 1/2ft and 7 1/2ft) sloping downwards at 45° to the antenna. It is the perfect answer to restricted locations. Power; 150W PEP, weight 4lbs.

SMCHF5V £35.00 SMCHF5R £26.00
(Carriage on either or both together £1.50)

2 METRE COLINEAR

144MHz, 6-5dB gain and low angle of radiation from two 1/2λ phased sections to a maximum height of 3-1 metres. Three 48cm radials project from the bottom chrome-plated brass boss. A good 50ohm match offers better than 1-5:1 VSWR at resonance for 100W PEP plus performance over 4MHz of operational bandwidth. Excellent weatherproof design with a SO239M connector recessed 30cm up the detachable 3-2cm OD support tube. Supplied complete with mounting plate and U bolts to take 1 1/2in mast. Weight 1-5kg.

SMCGP144W (P&P £1.50) £21.70

70CMS COLINEAR

432MHz, 6-8dB gain and ultra low angle of radiation from three 1/2λ phased sections to a maximum height of 1-7 metres. Three 17cm radials project from the bottom chrome-plated brass boss. A good 50 ohm match offers better than 1-5:1 VSWR at resonance for 100W PEP plus performance over 10MHz of operational bandwidth. Excellent weatherproof design with a SO239M connector recessed 23cm up the detachable 3-2cm OD support tube. Supplied complete with two extruded mast clamps and U bolts capable of taking masts up to 2 1/2in. Weight 1-1kg. Projected area 0-034 square metres.

SMCGP432X (P&P £1.00) £24.35

VHF/UHF DISCONES

The SMCGDX1 is a vertically polarized, 3dB gain, 500W PEP, 50ohm, broad-band antenna. It is constructed of eight horizontal rods (each 40cm) radiating from a central boss, thus forming the disc, and eight rods (each 90cm) radiating from the boss but sloping downward at 45° to form the cone. This configuration produces a 1-5:1 VSWR over the range 80 to 480MHz.

The SMCGDX2 is a development of the GDX1 with every other disc rod extended by 72cm and every other cone rod extended by 1-3m. This reduces the lower frequency limit to 50MHz.

The SMCVHFL is a skeleton discone with three off 8in cone and three off 24in disc elements suitable for listening anywhere between 65 and 520MHz.

All models have an inbuilt SO239M coax connector, (in the GDX versions it is recessed into an extension of the support mast—which doubles as the coaxial feed) and are supplied with mounting hardware to 1 1/2in mast.

SMCGDX1 (P&P £1.50) £36.00
SMCGDX2 (P&P £1.50) £41.70
SMCVHFL (P&P £1.50) £14.65

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

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

SUGIYAMA F850



An all band (160 to 2m including 4m) all mode transceiver, with a specification to suit the most discerning operator. VOX and speech processor as standard. 10 watts output SSB/CW/FM — 5 watts AM Mains or Battery, large LED frequency display.

LIST PRICE:

Fitted 2.4 KHz filter £799.00 inc VAT

Fitted ALL filters £899.00 inc VAT

432 MHz Transverter (ordered with F850) £100.00 inc VAT

Zycomm Z5800 Hand Portable



A no nonsense synthesised rig, free of gimmicks yet offering high power and good sensitivity. Covers 144-148 MHz with channels in 5 KHz spacing selected by decade switches. Slide switches control simplex or repeater and high or low power operation. Low power level is adjustable by internal preset. Maximum power (5 watts nominal) may exceed 7.5 watts from internal NiCd battery pack. Antenna has BNC connector.

PRICES: Z5800 £175.00 inc VAT

Desk Charger £19.00 inc VAT

Remote Mic/Speaker £18.00 inc VAT

INCLUSIVE PRICE: £199.00 inc VAT

FM88 2M TRANSCEIVER



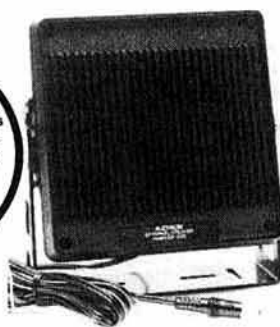
Full range of amateur and commercial antennas and Home Office approved two way radio equipment available.

SAE for details.

We are convinced that the FM88 is one of the most reliable 2 metre rigs being offered today. The construction has to be seen to be believed, and all the frills which normally lower reliability have been omitted.

If you are considering buying a new 2 metre transceiver, you owe it to yourself to consider a unit which has proven itself with thousands of hours of reliable "on the Air" operation in the USA. 25 Watts output. 143-149 mHz in 5KHz steps.

INTRODUCTORY PRICE £178.00 inc VAT



AZDEN AS006 COMMUNICATIONS SPEAKER

Adds punch to any rig — rated up to 6 watts. Supplied with moulded jack plug and mounting bracket.

Price £11.50 inc VAT

Ci-110 Mk2 POWER AMP

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: 2.5lbs.

Price — £99.00 inc VAT



Please address all Amateur Equipment correspondence for the attention of Lou Glover (G4GKJ)

Zycomm

Electronics Ltd.

G3ZYC G8CNB G3NJK G3ZYD G4GKJ G8ZYC

47/51 Pentrich Rd., Ripley, Derby DE5 3DS

Tel Ripley (0773) 44281 Telex 377466

Agents: Clem Tabor (G3UGR), Banksia, Queen Camel, Yeovil, Somerset 0935-850463 (Evenings & Weekends only)
Alan Kenyon (GW4DOO), 24 Connaught Street, Port Talbot, Glamorgan 0639-887963
Peter Clark (G4IUV), 91 Farmer Road, Leyton, London E10 5DJ 01-539 3385
Bob Finch (G4DDM), REF Electronics, Church Road, Pen, HighWycombe 049 481-4483
Ted Bowen (G4JKQ), Coalville Communications, 6 Ashby Road, Coalville, Leicestershire 0530-38779 (Day) 0530-60396 (Evenings)

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Region 1—W. R. Parkinson, G3FNM

Region 2—D. S. Smith, G4DAX

Region 3—(To be elected)

Region 4—M. Shallow, G3S2J

Region 5—(To be appointed)

Region 6—F. S. G. Rose, G2DRT

Region 7—(To be appointed)

Region 8—(To be elected)

Region 9—W. J. Colclough, G3XC

Region 10—(To be appointed)

Region 11—B. H. Green, GW8AAA

Region 12—F. Hall, GM8BZX

Region 13—(To be appointed)

Region 14—(To be appointed)

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Region 16—(To be appointed)

Region 17—H. G. Cunningham, G8FG

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HONORARY OFFICERS

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Post vacant

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Video tape and film library co-ordinator

J. Anthony, G3KQF

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

RSGB QSL BUREAU

QSL cards for distribution should be sent to:

Mr E. G. Allen, G3DRN, QSL Bureau manager,
30 Bodnant Gardens, London SW20 0UD

RADIO SOCIETY OF GREAT BRITAIN

(Limited by guarantee)

Registered office: 35 Doughty Street, London WC1N 2AE

Telephone 01-837 8688. Telex 25280 (RSGBHQ G)

Founded 1913. Incorporated 1926.

Member society, International Amateur Radio Union

PATRON: HRH The Prince Philip, Duke of Edinburgh, KG

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.

GENERAL MANAGER AND SECRETARY

D. A. Evans, G3OUF

EDITOR

A. W. Hutchinson

ANNUAL SUBSCRIPTION RATES

UK corporate: £12.50, including VAT

Overseas: £12.50

Associates under 18: £5

Family member: £5

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)

Associated societies: £12.50 (including Rad Com); £7.50 (excluding Rad Com).

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)			
N from Carlisle	G4LAA	(Vacancy)	0930
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	G4LAA	(Vacancy)	1030
SE from Lincoln	G8OFQ	G3NRO	1030
SW from London	G3FZL/G3VAG	G3IIR	1030
S from Aberdeen	GM8GHV/GM8MBP		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/G3VGO	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/G4KYY	1000
Londonderry	G12DHB	G14AHD	1000H
London	G3FZL/G3VAG	G3IIR	1000
Birmingham	G3PWJ	G3BA	1000
Lincolnshire	G8OFQ	G3NRO	1000
Tyneside	G4FUT	G3WNR	1000
Glasgow	GM4HCO	GM4CXM/GM3VTB	1000
Elgin	GM4ILS	(Vacancy)	1000
Southampton	G8LVC	G8ADM	1030
E Sussex coast	G8SC	G3ZFE	1030
Bristol	G4CJZ	G3ZWY/G8NNU	1030
Manchester	G3LEQ	G3JWK	1030
Dumfries	GM8TKA	GM3MSG	1100
Brighton and coast	G3ZYY/G8GEZ	G4JGJ/AM	1100
Jersey	GJ8KNV	GJ4ICD	1100H
Gwynedd	GW4KEV	GW8TTM	1100

H = horizontal polarization

QTC

Amateur radio news

New Council members

Council has co-opted two new members to fill the vacancies for zonal Council members, arising from the resignation of Messrs D. J. Andrews and W. F. McGonigle, until the election of the 1982 Council. They are Mr W. J. McClintock, G3VPK, for Zone C, and Mr I. J. Kyle, G18AYZ, for Zone F.

Reciprocal licensing

The Home Office advises that the terms of the reciprocal agreement between South Africa and the UK have been slightly amended. The agreement allowed the granting of reciprocal licences to amateurs who had passed the RAE in each country, and not to those who had obtained their licences by exemption.

The South African administration have now agreed to issue South African amateur radio station licences to British amateurs who have held a licence obtained by exemption continuously since 1958, when the RAE was introduced. The UK will reciprocate by granting British licences to South African radio amateurs who obtained their licences prior to 1963, when the South African amateur operator's certificate was introduced, and have held their licences continuously since then.

HF Committee

The chairman of this committee is now John Kay, G3AAE. The details in the list of RSGB committees published in the April 1981 issue of *Rad Com* should be amended accordingly.

QSL Bureau

G4HAA-G4HZZ series. The sub-manager for this series, Mrs J. Brakespear, has changed her address to The Chequers Store, East Church Road, Minster, Isle of Sheppey.

G4MAA-G4MZZ series. The sub-manager for this new series is Mrs G. Thomas, G4JYL, 36 Chelwood Crescent, Leeds LS8 2AQ.

G4AAA-G4AZZ series. The sub-manager for this series, Mr C. Johnson, reports that many members are not keeping up-to-date with the postage rate. He has saes carrying postage as low as 3½p and 7p, and that cards are accumulating. Because of limited space, he may have to destroy unclaimed cards unless adequately prepaid saes are received.

GW6 and GW8 series. An additional sub-manager has been appointed to handle the GW6 and GW8 callsign series. He is Mr John Lewis, GW8ZL, 14 Carreg-y-Gad, Llanfairpwllgwyngyll, Anglesey. Mr. J. Reid, GW3ANU, will continue to handle the GW2, GW3, GW4 and GW5 callsign series.

Stolen equipment

On 5 May from a car in Poole, Dorset: Trio TR9000, serial number 0110413; Radiomobile 409 stereo cassette/radio, serial number 7873. Any information to Poole police, tel 0202 22099, or to G8HQA.

On 11 May from a car in Perry Barr: Yaesu FT224, having callsign G3VHA scratched on chassis in several places. Any information to G3VHA, QTHR.

On 28 May from a car at Carnforth, Lancs: Icom IC255E, serial number 10202130; Hoxin 144MHz 7A/8 antenna plus gutter mount. Any information to G8XYW.

From the bring and buy stall at the Southend RC Rally on 26 April: Trio TR2200 fm 144MHz transceiver, serial number 750139. Information to Gary Beale, Waltham Cross 38101 or Southend police.

On 8 June 1981 from a car in East Barnet: Beltek Type W5400, serial number 030257, 144MHz fm transceiver. Any information to Mr J. G. Assenheim, G4BOK, QTHR.

"QTI"

This is the name of a tape magazine for visually handicapped licensed amateurs and swls which has recently been introduced. It provides three hours of technical material and news items from many sources.

"QTI" may be obtained by sending two C90 cassettes (Maxel UD preferred) in an "Articles for the blind" postal pouch to Mr J. F. Feeley, 79 Narrow Lane, North Anston, Sheffield S31 7BJ. No charge is made, and each edition is posted on the first Tuesday of the month.

Alresford Wireless Club

This club was formed just over a year ago, and although it has increased its membership it would like to welcome more members to its meetings. The club meets on the last Wednesday of each month at 8pm, and further details can be obtained from Mr R. L. Farley, 37 Nursery Road, Alresford, Hants SO24 9JW; tel Alresford 3816.

UK Horizontal FM Group

This group held its first meeting on 10 May 1981 at the QTH of Arthur Dorsett, G8YLH, Dogmersfield Park, Dogmersfield, Hants. The well-attended meeting commenced at 2pm and closed at 7.45pm, and a full and very comprehensive constitution was formed after a two-and-a-half-hour debate. The following members of the committee were chosen: Paul Hancock, G8UAV, chairman; Arthur Dorsett, G8YLH, secretary; Rod Walker, G8WJF, treasurer; Mitch Tribe, G8PMT, contest officer; and Paul Pasquet, G8PVH, contest member.

Plans were put forward for a contest (date to be fixed), and a rally and a field day (date to be fixed). It is hoped that the rally will be attended by a large number of disabled people who may be encouraged to become amateurs. Arthur Dorsett will be donating two trophies annually; one for swl or vhfl with the best dx in the year from a member of the UKHFMG, and the other for the best dx contact from a newly-licensed amateur receiving his callsign within the year the contact is made. The group will also be issuing trophies and certificates for contests and other events. Reports from swl and vhfl are always welcomed, and QSL cards will be sent to all listeners sending in a report.

The group has a regular net on Mondays, Wednesdays and Fridays commencing at 1930bst; the "CQ" call being put out on 144.670MHz.

The aim of the group is to encourage dx working on horizontal polarization in the all-mode sections of the amateur radio bands. It is hoped to contact French, Belgian and Dutch amateurs, especially those holding Dutch novice licences who are restricted to 10W, are horizontally polarized, and are very keen to work the UK.

The group is applying to the RSGB for affiliation, and radio amateurs who like the idea of horizontal fm with its scope and potential are asked for their support. Reports and all correspondence should be sent to the group secretary (please enclose an sae where applicable). The membership fee is £1, cheques and postal orders should be made payable to the UK Horizontal FM Group.

Radio Amateur

Old Timers'

Association

Originally called the British Old Timers' Association, formed in May 1949 with over 160 members, the association was re-formed in October 1958, and now has over 500 members.

Originally the membership was narrowly open only to transmitting members who held a licence continuously for 25 years. It is, however, now thought that this does not do justice to the work of the amateur as a whole, and at the RAOTA AGM held at Brighton on 26 April 1981, it was decided that the constitution should be changed to include all amateurs who could produce proof that they had been involved in the hobby for a period of 25 years, a QSL card would do this for a receiving amateur, or a recommendation from another member who would vouch for this fact. This brings the association into line with other world-wide bodies.

The association is affiliated to the RSGB and to the Australian Old Timers' Association (RAOTC). The association's callsign is G2OT, and a net is held on 3.5MHz on Thursdays at 11am. The station's QSL card will be available through the usual channels or direct via G2UV (sae please).

The president is G2DX, the vice-president G6CJ, and committee members G2UV, G2CVV and G5RV. Membership forms can be obtained from the secretary, Miss May Gadsden, 19 Drummond House, Font Hills, Long Lane, London N2 8LF. Tel 01-349 3935.



RSGB NATIONAL MOBILE RALLY

Woburn Abbey, Bedfordshire
(Coach Park Site)

Sunday 2 August 1981
From 10am

- Large trade exhibition
- Bring and buy stand
- Raynet stand

- RSGB bookstall and enquiries stand
- Grand raffle
- BARTG stand

(All under cover)

Bring-and-buy this year will be charged at **£1 per table per hour**, which will enable members to sell direct. Tables will be offered on a first-come first-served basis.

The RSGB makes no charge for entrance to the rally but all visitors must pay for entrance to Woburn Park, in which the rally takes place at **£1.50 per car**. All the normal Woburn attractions will be available at small extra charges. Various bars and cafés are available nearby.

HOW TO GET THERE

Via the M1—Leave the M1 from north or south at intersection 13, **not 12 as signposted**. Turn left off motorway and follow signposts through Husborne Crawley to Woburn Abbey.

From the south via the A5—Turn right at Hockliffe and follow the A50 to Woburn.

From the north via the A5—Turn left at A418, five miles south of Fenny Stratford, and follow to Woburn.

From other directions make for the points indicated above and proceed as indicated.

Avoid routes signposted to "The Wild Animal Kingdom" or "Game Reserve". The rally takes place in Woburn Park and correct routes are signposted to "Woburn Park" or "The Abbey". Also watch for RSGB signs.

Usual talk-in facilities will be in operation by Dunstable Downs RC on 1.8, 70, 144 and 432MHz.

All enquiries regarding this event should be made to Mr N. Miller, G3MVB, "Avon", Gardiners Lane North, Crays Hill, Billericay, Essex.

Dunstable Downs RC df hunt

The Dunstable Downs RC is to hold a df hunt during the RSGB National Mobile Rally at Woburn on 2 August. The contestants will take part on foot, and the "fox" station will be located somewhere in the grounds of Woburn Park. Check-in: 2.30pm at talk-in (DDRC) caravan. Start of transmission: 3pm on 1,910kHz.

G8QS-again!

Reg Leven, of York, recently had his old callsign, G8QS, reissued to him after passing the test. He was a founder member of the Bury RC and obtained his licence in 1937 in his father's name—he was too young to have his own!

The Radio Amateur Invalid & Blind Club

The aim of the RAIBC is to enable blind and disabled swl and licensed amateurs to pool their knowledge and experience and, with the assistance of representatives and supporters, enjoy the hobby of amateur radio.

At the AGM held at the end of May at Alexandra Palace, the secretary reported that during the past year 12 hf or vhf transceivers and 14 receivers had been added to the considerable number already on loan to members. A total of 154 new members had joined, bringing the total membership up to nearly 700.

The treasurer reported that £3,178 had been spent on aid to members, ie purchase and repair of equipment, and recording of the RAE course on cassette.

The chairman gave thanks to the many representatives, clubs and supporters who had given their services, time and experience; and he expressed a wish that more individuals and clubs would offer their help in the future.

Any enquiries or offers of help should be made to the hon secretary: Mrs Frances Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton, Surrey KT6 4TE.



UoSAT stickers

AMSAT-UK will be selling stickers, as illustrated full size here, at mobile rallies etc, and direct to members at 25p plus sae or stamp for three. Proceeds go towards the launch of the University of Surrey amateur radio satellite later this year.

Mail orders to AMSAT-UK, 94 Herongate Road, Wanstead Park, London E12 5EQ.



BARTG CONVENTION 1981

Harpenden Public Hall
Harpenden, Herts

11am to 5pm, Saturday 18 July 1981

The venue is conveniently located for road and rail travellers and has good car parking facilities

Trade stands
Bookstalls

Bring and buy
Refreshment and luncheon facilities

LECTURE PROGRAMME

It is hoped that the lectures this year will be suitable both for beginners and for more experienced amateurs. Likely topics will include AmTOR and RTTY repeaters

A raffle will be held

Members and non-members of BARTG and their families will be most welcome

The IARU Region 1 Conference

by JOHN MORRIS, G4ANB, and ROY F. STEVENS, G2BVN

THE TWELFTH TRIENNIAL CONFERENCE of the Region 1 Division of the IARU was held between 27 April and 1 May 1981 at the Hotel Metropole, Brighton. Previous conferences were held in Paris (1950), Lausanne (1953), Stresa (1956), Bad Godesburg (1958), Folkestone (1960), Malmö (1963), Opatija (1966), Brussels (1969), Scheveningen (1972), Warsaw (1975) and Miskolc-Tapolca (1978).

Thirty-eight of the 51 member societies of the division were represented by delegates or by proxy. Those participating were:

ARA — Algeria	NRRL — Norway
ARAB — Bahrain	OVSU — Austria
ARI — Italy	PZK — Poland
ARM — Monaco	RJARS — Jordan
BARS — Botswana	RKDDR — German DR
BFRA — Bulgaria	RL — Luxembourg
CARS — Cyprus	RSF — USSR
CRCC — Czechoslovakia	RSGB — United Kingdom
DARC — FR of Germany	RSTG — The Gambia
EDR — Denmark	SARL — South Africa
FRA — Faeroe Islands	SLARS — Sierra Leone
GARS — Ghana	SRAL — Finland
IARC — Israel	SRJ — Yugoslavia
IRA — Iceland	SSA — Sweden
IRTS — Ireland	UBA — Belgium
LRAA — Liberia	URA — Andorra
MARL — Malta	URE — Spain
MRASZ — Hungary	USKA — Switzerland
NARS — Nigeria	VERON — The Netherlands

Also present were Messrs N. B. Eaton, VE3CJ, president of the IARU; R. L. Baldwin, WIRU, secretary of the IARU; H. J. Dannals, W2HD, president of the ARRL, P. Seidemann, YV5BPG, secretary Region 2; and D. Rankin, 9V1RH, secretary Region 3. Other participants included Mr M. Fujioka, JMIUXU, from JARL, and Messrs E. Robinson, F8RU, and H. Robig, HB9QC, of the IARC (ITU). Several Region 1 organizations were also represented, these included: International Beacon Project (G3DME), IARUMS (G3PSM), AMSAT-UK (G2UK and G3AAJ), BARTG (G3PLX) and Raynet (G3BPT).

The delegates arrived on Saturday and Sunday for the opening on Monday morning. Many of them availed themselves of the facilities of GB11ARU which was active on all bands from the hotel. The station was staffed by members of a number of Sussex radio clubs, the activity being co-ordinated by G4GNX and G3ZYE.

OPENING MEETING

The chairman of the Executive Committee, PA0LOU, welcomed guests and delegates; the former included: Mr A. E. Corben, (Home Office); Commander I. Anderson-Mochrie, RN, (RNARS); Lt Col D. A. Barry, G3ONU, (RSARS); Ft Lt David Rycroft, (RAFARS); Mayor of Brighton, Councillor John Leach; Mayor of Hove, Councillor Dr E. C. Colin-Jones; Mr Ryan, G5BV; and Mr A. O. Milne, G2MI.

PA0LOU then introduced Lord Wallace of Coslany, who said that he welcomed the opportunity to speak as he was a past-president of the RSGB, and he particularly wished to draw attention to the close co-operation that existed between the Society and the Home Office. He reminded everyone that he had expressed in the House of Lords the amateur expertise that had prevailed at WARC 1979 in Geneva, and he wished to associate in this context the president of the IARU, Noel Eaton. He emphasized the non-political aspect of amateur radio and mentioned many personalities who held amateur licences—referring in particular to the support to the service given by King Hussein of Jordan. He said that amateur radio produced a bond of friendship throughout the world, and he bid everyone present a sincere welcome and he wished the assembled company every success.

Saying that it was his privilege and honour, PA0LOU then introduced the Rt Hon Timothy Raison, MP, Minister of State for Home Affairs.

The Minister began by saying it was a privilege to be invited to open this conference of the Region 1 Division of the International Amateur Radio Union. He went on to say:

"One reason for this—a personal one merely—is that my ministerial responsibilities for radio regulation have recently involved me heavily in the question of citizens band, with all the attendant problems of providing an outlet for cb enthusiasts while seeking to protect the interests of established services. You may picture for yourselves the relief of stepping back into an environment of wholly responsible enthusiasm. Much more seriously, however, this is an important occasion, and we in this country are honoured to be the hosts of this conference. I believe that the last time the Region 1 Conference of the IARU came to Britain was 21 years ago, and then also it took place in a coastal resort. I hope that Brighton will once again prove its invigorating powers, as it regularly does to annual conferences of our major political parties.

"The last Region 1 conference was of course heavily preoccupied with the impending World Administrative Radio Conference of 1979: in the English language, conveniently referred to as the WARC. That now is an event which the amateur service can look back on with considerable satisfaction. In the first place, there were the undoubted achievements. Against a background of greatly increased demand for radio frequencies, the amateur service not only largely retained its existing allocations but succeeded in obtaining significant additional allocations, particularly in the high frequencies at 10, 18 and 24MHz, as well as having the amateur satellite service added to a number of bands. That would be a cause for satisfaction in itself, and the success reflects on the worldwide respect in which the amateur service is held. However, the way in which it was achieved is also important. In no small part it was due to the fact that the international amateur radio community was able to speak to national administrations with a concerted voice, reflecting the united views of amateurs throughout the world. This in turn was accomplished, of course, by the practice of meticulous preparation. I know that in many countries there were series of conferences held by national societies of amateurs, and the outcome was based on carefully-prepared and soundly-based arguments which took account of the realities of existing usage and other needs as well as that of your own service. The quality of amateur participation in the 1979 WARC, both in the IARU team and through the delegations of national administrations, speaks for itself in the outcome. Certainly in our United Kingdom preparations for the conference, the Radio Society of Great Britain gave us every possible support, and their assistance was greatly appreciated and highly valued. The interface between governments and non-governmental bodies is not always constructive or comfortable, but in the United Kingdom we are fortunate in having always found it possible to consult our radio amateur friends and to reach amicable solutions. A responsible, constructive and positive approach to each other's problems is the best, as well as the only, viable way of resolving problems between radio amateurs and national administrations. I feel confident that we can look forward to continuing in that spirit.

"Rather than attempt to compete with any of your conference proceedings, I will say only a few words about the new allocations achieved at the WARC of 1979. The availability of the new allocations at 18 and 24MHz is subject to the satisfactory transfer of residual fixed service assignments. Many of those fixed, point-to-point services are of great importance, particularly to developing countries. Accordingly an enormous amount of effort—and money—is being invested in a worldwide operation to ensure a smooth and, we hope, fairly speedy transfer of these services. Certainly we hope that transfer can be completed earlier than the deadline of 1 July 1989. As far as the amateur satellite allocations are concerned, there is of course no such delay, and I note with interest that the next in the series of Orbiting Satellites Carrying Amateur Radio (OSCAR) will be operating in the new 1,260–1,270MHz allocation.

"The programme for your conference, and the extensive and thorough preparation which has already gone into it, show the same approach which proved its value in 1979. For events move on, and already attention is shifting to the consequences of the 1979 WARC. The calendar for the coming years is now occupied with an unprecedentedly heavy programme of service-specialized administrative radio conferences, some of which involve amateur interests. For example, next year there is to be a WARC for mobile telecommunications. Amateur interest in this is rather limited, but there is an extremely complicated problem of planning to accommodate certain mobile services in order to clear the band at 1,810–1,850kHz so that this, at least, can eventually become as near as possible a worldwide amateur band.

"In 1983 and 1984 there is to be a conference on high frequency broadcasting, the outcome of which might have implications for the amateur service; our aim will be to ensure that there is no adverse impact. Again in 1984 and 1985 there is to be another conference, this time to deal with the extremely complicated and sensitive problem of space services using the geostationary satellite orbit. I do not know yet whether the amateur satellite service has designs on that orbit; but whether it has or not, we shall in the UK be alive to any impact on amateur activities, and if there are likely to be any, you can be sure that we shall look yet again to the RSGB to help us and, in so doing, help their own members.

"Mr chairman, I hope you will forgive me if I have, from time to time, spoken in rather too insular a fashion of the administration and the amateurs of the United



The chairman of the Executive Committee, Mr L. van de Nadort, PA0LOU, welcoming guests and delegates. L to r: Basil O'Brien, G2AMV, RSGB President; Lord Wallace of Coslany, former RSGB President; PA0LOU; and Noel Eaton, VE3CJ, president of IARU

Kingdom. It is natural to do so, but I rest these comments on a recognition of the truly international nature of amateur radio activity. The history of the IARU itself is sufficient evidence of that. Formed even before the ITU acquired its present name, the IARU has for over 50 years made a profound contribution to the development of radiocommunications through research and scientific study. It is in its own right an impressive international community. Gathered here today are something like 140 delegates and observers from about 35 countries, together with a substantial number of other visitors. In its 30 years of existence, the Region 1 Division of the IARU has grown threefold in its national representation, with an individual membership of over 120,000 radio amateurs, all of whom contribute to the high reputation of the amateur service for its responsibility and—to use a justified contradiction in terms—its “professionalism”. I wish this conference every success in its deliberations, and look forward confidently to the continued success and prestige of the amateur service in all its work. With that said, Mr chairman, may I sincerely thank the conference, through you, for the honour of being able to make these opening remarks.”

The reply to Lord Wallace's speech of welcome was given by Mr N. B. Eaton, VE3CJ, president of the IARU. Mr Eaton said it was an honour to be asked to reply. He congratulated the organizers of the conference on their most excellent arrangements, and said that all amateurs were grateful for the co-operation that had existed between them and the British administration both before and during WARC 79. He said that there were many papers on various subjects—but that of great interest was the question of restructuring the IARU, and he concluded by wishing the conference every success.

The chairman then introduced Mr Basil O'Brien, G2AMV, President of the Radio Society of Great Britain. Mr O'Brien said that as President of the host society he wished success to all delegates, and he hoped that all would find the arrangements made for them to be satisfactory and comfortable. He hoped that the new bands would soon be available, bearing in

mind that there were now in excess of 1.5 million radio amateurs. He concluded by saying that he hoped “nation would speak peace unto nation”.

The meeting then considered the election of Committee C (Credentials and Finance). Mr J. Wolff, LX1JW, was elected unopposed as chairman and Messrs S. Barlaug, LA4ND, M. Danon, YU1AU; J. C. Laib, HB9TL; P. Lessig, DK3LP; E. David, ON5IA; and H. Keto, OH2TW, were elected to serve on the committee.

The Election Committee was the next item considered. Mr Rene Vanmuysen, ON4VY was elected chairman, and Messrs P. Huis, PA0AD, and R. J. Hughes, G3GVV, were elected to the committee.

The chairman said that it was with great pleasure that he had to announce that the 50th member of Region 1 was Andorra. To mark the occasion a certificate was presented to the two Andorran representatives, and this was greeted with an ovation.

WORK OF THE CONFERENCE

The first call for papers for the conference was made in June 1980. Between then and the despatch of documents to delegates in February 1981, 144 papers were prepared for distribution by the Region 1 secretariat. In addition a further 33 papers were prepared during the period of the conference and this accounted for a further 20,000 sheets of paper.

The papers for consideration had previously been grouped in the agendas of the three committees. Committee A and B each met on 27, 28 and 29 April, and Committee C met on the evening of 27 April. The final plenary meeting which considered the recommendations of the three committees was held on the final day of the conference, Friday 1 May.

Working groups were set up from Committee A; these included (a) HF Working Group, (b) Amateur Radio Direction Finding Working Group, (c) EMC Working Group, and (d) Working Group for Promoting Amateur Radio in Developing Countries. The convenors of these groups were G3MXJ, SP5HS, SP9ZD and YU7NQM respectively.

Committee A

This committee, Administrative and Operational, dealt broadly with all operating matters on frequencies below 30MHz, and with general administrative questions. The committee considered more than 40 agenda items supported by papers originated by member societies. The chairman of the committee was PA0LOU, supported by G2BVN as secretary and Mrs Heather Allin assuming the task of minutes secretary. Eric Godsmark, G5CO, had been asked to attend as an adviser to the Executive Committee, and was present at all meetings of Committee A. RSGB delegates engaged in the work of this committee were G3GVV, G3FKM, G3HCT and G3MXJ.

A summary of the major decisions reached by Committee A, as amended by the Final Plenary, follows. For convenience these items appear in the order in which they were dealt with on the agenda and their position does not indicate their relative importance.



The Rt Hon Timothy Raison, MP, Minister of State for Home Affairs, in conversation with Lord Wallace, PA0LOU and VE3CJ

Table 1. Number of licensed amateurs in Region 1 societies

Society	1981	Society	1981	Society	1981
ARA (7X)	72	IRA (TF)	91	ROARS (A4)	(n/a)
ARAB (A9)	19	IRTS (EI)	339	RSF (UA)	10,000
ARAI (TU)	(n/a)	LRAA (EL)	33	RSGB (G)	16,500
ARI (I)	7206	MARL (9H)	45	RSK (5Z4)	29
ARM (3A)	30	MARS (3B)	(n/a)	RSTG (C5)	23
ARRSM (9A)	8	MRASZ (HA)	1,635	RSZ (9J)	13
BARS (A2)	24	NARS (5N)	92	RSZ (ZE)	(n/a)
BFRA (LZ)	930	NRRL (LA)	2,923	SARL (ZS)	1,800
CARS (5B)	152	OVSU (OE)	2,621	SLARS (9L)	8
CRCC (OK)	2,294	PZK (SP)	4,950	SRAL (OH)	3,420
DARC (DL)	36,618	RAAG (SV)	335	SRJ (YU)	3,190
EDR (OZ)	4,032	RAL (OD)	(n/a)	SSA (SM)	4,883
FRA (OY)	60	REF (F)	5,327	UBA (ON)	2,138
FRR (YO)	1,386	REP (CT)	(n/a)	URA (C31)	36
GARS (9G)	70	RJARS (JY)	84	URE (EA)	8,510
GARS (ZB)	11	RKDDR (Y2)	1,755	USKA (HB)	2,461
IARC (4X4)	371	RL (LX)	245	VERON (PA)	5,900

(n/a = no answer)

Table 2. Schedule of IBP (28MHz) beacons

Frequency (kHz)	Call sign	Location	Notes
28,175	VE3TEN	Ottawa	New frequency allocated (see below.)
28,200	—	—	Common frequency
28,202-5	ZS5VHF	Durban	
28,205	DL0IGI	Mt Predigtstul	Transmits on 28-2kHz H - H + 5 and H + 30 - H + 35
28,207-5	W4ESY	Englewood, Fla	Temporarily non-operational
28,210	3B8MS	Mauritius	
28,215	GB3SX	Crowborough	
28,217-5	VE2TEN	Chicoutini	
28,220	5B4CY	Zyri	
28,222-2	HG2BHA	Tapolca	
23,225	VE8AA	Lake Contwoyto	
28,230	ZL2MHF	Upper Hutt	
28,235	VP9BA	Southampton	
28,237-5	LA5TEN	Oslo	
28,240	OA4CK	Lima	
28,245	A9XC	Hamala	
28,247-5	EA2HB	San Sebastian	Irregular hours
28,252-5	VE7TEN	—	Reserved
28,257-5	DK0TE	Konstanz	
28,260	VK5WI	Adelaide	
28,262-5	VK2WI	Sydney	
28,265	VK	—	Reserved
28,270	VK	—	Reserved
28,270	ZS6PW	Pretoria	TEP Experimental station. Not IBP
28,275	VE3TEN	—	Reserved
28,277-5	DF0AAB	Lutjenberg	
28,280	YV5AYV	Caracas	EU, W & VK in 24hr sequence
28,282-5	W9	—	Reserved
28,285	VP8ADE	Queen Adelaide Is	
28,287-5	W8OMV	Tuckasegee NC	
28,290	V56HK	Cape D'Aquiler	
28,295	VU2BCN	Bangalore	Not yet operational
28,315	ZS6DN	—	TEP Experimental station. Not IBP
28,888	W6IRT	N.Hollywood, Cal	10-X. Not IBP
28,894	WD9GOE	Freeburg, Ill	Not IBP
28,302-5	ZS1STB	—	Not IBP

International Beacon Project

This activity was endorsed, and G3DME was thanked for the work he had undertaken on this project. An up-to-date list is given in Table 2.

ITU conferences and the CCIR

The necessity to participate in future conferences which might affect the amateur service was agreed. Possible meetings are scheduled for the next 10 years. It was essential that all societies should keep in close touch with their administrations regarding these matters. Participation by the amateur service in the work of the CCIR was also essential and could have considerable benefit to our activities. A small international working group was set up to review papers intended for submission to CCIR study groups.

EMC

The importance of this working group was stressed, and it was agreed that Region 1 would take part in the European EMC symposium 1982, presenting suitable papers from the amateur service.

IARUMS

After a discussion in which it was agreed that removal of intruders rather than creation of paperwork was the object of the IARUMS the following recommendations were agreed:

1. The offer made by the RSGB to provide data processing facilities available for the IARU Monitoring System be accepted.
2. The Region 1 co-ordinating office officially assumes the status of IARU Monitoring System headquarters in order to co-ordinate the data received from all three regions.
3. IARU Region 1 formally endorses the principles and work of the IARU Monitoring System and agrees to support this work by such financial assistance as may be, from time to time, required and agreed by the executive committee.

G3PSM was thanked for the work he had carried out as IARUMS co-ordinator.

28MHz intruders

This growing problem was noted and a recommendation from VERON was accepted stressing the need for greater efforts to remove illegal stations operating in this band.

Restructuring of the IARU

After an introduction by the president of the IARU, there was a long discussion concerning the nature of the changes that might be needed. Twelve out of 38 delegations present felt that no changes were needed. Papers before the conference were to be studied by the Executive Committee and converted into final proposals for circulation.

Region 1 common licence

The offer of the Italian society to act as co-ordinator in the extension of reciprocal licensing and harmonization of regulations was accepted. The recent work of CEPT in this matter should be studied and action taken with administrations.

RTTY

Two recommendations were agreed:

1. Speeds of 50, 75 and 100 bauds should be encouraged by IARU.
2. All IARU members adopt CCIR 476-1 in both modes A and B as an alternative advanced method of communication between amateur rtty stations, and that each IARU member seeks to obtain permission from its licensing authority for the general use of this method of transmission on all bands where rtty using CCITT alphabet No 2 is currently permitted.

Indoor radio telegraphy championships

The offer of the Radio Sport Federation of the USSR to act as host society for the first championship in 1983 was accepted with thanks.

Emergency communications

A working group under the chairmanship of the late G3BPT produced a report on the various conference papers submitted under this heading. *Inter alia*, it was agreed:

- (i) that emergency networks should be formed in those countries where they do not exist and by those who wished to do so;
- (ii) that IARU Region 1 societies should request permission from their authorities to use amateur frequencies in the case of internal emergencies and international emergencies, in accordance with Resolution BN/640, and that a common procedure be used (possibly based on the UK Raynet manual).

12VIE was accepted as IARU Region 1 emergency traffic co-ordinator.

Promotion of amateur radio in developing countries

It was agreed that in the post-WARC period this was a worthwhile activity. Finances would be required and:

- the Executive Committee was authorized to raise the annual contribution by 0.20 Sw Frs per licensed member for the use of PADC during the period 1981-4.

HF matters

The numerous conference papers were considered by a sub-committee with G3MXJ as convener. The conference accepted a recommendation that a permanent hf working group should be set up and that it would normally meet once a year, except in those years when there is a Region 1 conference. G3FKM was invited to serve as convener of the working group.

Additions to the Region 1 band plan covering the three new WARC bands were considered and the proposals are set out in Table 2. In addition it was agreed:

- (i) that the transmitter power on 10MHz should not exceed 250W mean output power;
- (ii) that no contest should be organized on the 10MHz band;
- (iii) that credit for awards or diplomas will be accepted for contacts made on the 10MHz band; and
- (iv) that ssb may be used on the 10MHz band during emergencies involving the immediate safety of life and property and only by stations actually involved in the handling of emergency traffic.

Standardized log and summary sheets were adopted. Some changes were made to the Region 1 HF Field Day (telephony) rules. Previous recommendations concerning contest-free segments were endorsed. It was agreed that there are too many contests and their dates are badly co-ordinated. Several other matters, including the planning of the new 1.8MHz band, were referred to the new HF Working Group.

Table 3. Band plan proposals for the new WARC bands

Band	
10,100-10,140kHz (1)	CW only
10,140-10,150kHz	CW and rtty
18,068-18,100kHz (2)	CW only
18,100-18,110kHz	CW and rtty
18,110-18,168kHz	CW and phone
24,890-24,920kHz (2)	CW only
24,920-24,930kHz	CW and rtty
24,930-24,990kHz	CW and phone

Notes (1). 10MHz available after 1 January 1982.
(2). 18 and 24MHz date of availability not yet known.



Committee A in session

Committee B

This committee, VHF/UHF/SHF, considered matters affecting frequencies above 30MHz, under the expert chairmanship of C. van Dijk, PA0 QC.

The programme of the conference indicates that Committee B met for only 15 hours. In fact one of the first decisions of the committee was to throw this timetable away and start half an hour earlier each morning, and it was rare for any session to finish on time. Working groups were spawned to discuss meteor scatter calling procedures and the formation of a satellite co-ordinating group, and meetings of these lasted well into the night. Less formal discussions occupied most of the meal-times, occasionally starting before breakfast. So busy was the schedule that for many delegates sleep became a secondary consideration to getting through the work.

Throughout these meetings the RSGB was ably represented by G3WSN and G3VEH, with G3RPE supplying microwave expertise, and G2UK and G3AAJ present on behalf of AMSAT. The committee discussed just about every aspect of amateur radio above 30MHz, including band plans, repeaters, contests, satellites, technical standards—the list, if not endless, is certainly long.

The subject which occupied more time than any other was band planning, especially in light of the successful outcome for the amateur and amateur satellite services of WARC 1979. The only major objective not attained by Region 1 amateurs at WARC was a band at 50MHz, but there are good indications that some administrations are willing to listen sympathetically to requests for national allocations. In the Netherlands, for example, a few amateurs have been issued with temporary permits for cw operation on 53.875, 53.925 and 53.975MHz, while in the UK the GB3SIX beacon transmits on 50.02MHz outside television hours. Liberian amateurs are already allowed to use 50MHz, and a few EL stations have made WAC on this band.

National societies, including the RSGB, will continue to pursue these possibilities vigorously and will exchange information on their successes and failures.

Band plans

The band plans have been subjected to a few clarifications and minor alterations, but the basic outlines remain largely unchanged. During meetings of Committee B care was taken to distinguish between the actual band plans, which specify segments for cw, beacons, repeaters etc, and recommendations for usage, such as calling frequencies. The purpose of the band plans is to separate incompatible modes of communication, such as ssb and cw, which inevitably come into conflict when they meet. Rather than an additional set of unnecessary restrictions, the band plans should be viewed as a way of letting all of the many aspects of amateur radio at vhf/uhf live together peacefully. It is important that we all follow them, lest chaos take over, much to the detriment of everybody's enjoyment of the hobby.

Calling frequencies, for the specialist as well as the popular modes, are designed to act as meeting places for those with similar interests. To allow

them to fulfil this role they should be used intelligently. Once contact has been established on 144.05MHz, 144.3MHz, S20, or wherever, a working frequency should be agreed and moved to as quickly as possible, leaving the calling frequency clear for others. Equally, the frequencies recommended for specialist interests should be avoided by other modes, so that rtty, sstv, fax, data and so on do not have to spread over the rest of the band.

Perhaps the strongest argument for respecting the band plans is that they demonstrate to the licensing authorities that we, as amateurs, are capable of regulating our own use of the spectrum in an internationally agreed manner without the necessity of more stringent controls being imposed from outside.

Having discussed what the plans are *for*, the committee then considered what they should *be*. The 144MHz beacon sub-band had previously been specified only loosely as "centred on 144.9MHz", and a more precise definition was needed. Accordingly, the exclusive 144MHz beacon sub-band is now defined as 144.845–144.990MHz. It seems likely that a similar clarification will be made for 432MHz at the next conference. Despite their empty appearance to the casual ear, the beacon bands are full of weak and transient signals which can be obliterated over a wide area even by low-power working. They should therefore be regarded as strictly out of bounds for transmitting.

It was agreed at the 1978 IARU Region 1 Conference in Hungary that 145.8–146MHz should be allocated to amateur satellite use for the succeeding three years. The unfortunate demise of one Ariane launch vehicle set the plans of the amateur satellite service back considerably, so the same resolution has been re-adopted for the coming three years. It is expected that future satellites will use higher frequencies, where greater bandwidths will be available.

Another space activity which is growing in popularity is moonbounce. The following frequencies within the exclusive cw sections of the bands are recommended for cw eme: 144.000–144.015MHz; 432.000–432.015MHz; 1.296.000–1.296.015MHz. A proposal for ssb eme to be allowed at these frequencies was rejected, the argument being that if the reflected signals are strong enough to permit communication by voice, they should also be strong enough to allow a frequency outside the cw-only segments to be agreed.

Fast-scan amateur tv in the relatively confined space of 434–440MHz may in the future find itself in conflict with the satellite allocation, 435–438MHz. In view of this it is recommended that tv should move to the wide open spaces of the higher bands during the coming years. This should be regarded as a long-term aim, and tv has not been removed from the 432MHz band plan. It is to be hoped that users of two of the most technically advanced parts of amateur radio, tv and satellites, will be able to co-ordinate their operation should any conflict arise.

The present 1.3GHz band plan is only provisional, never having been formally adopted by IARU Region 1. A sub-committee, which will include a representative from RSGB, has been formed to draft a band plan for consideration at the next conference. The current provisional band plan, the WARC space allocation, and the RSGB experimental repeater work will be taken into account.

Repeaters

The committee reconfirmed that the main aim of repeater systems is to aid mobile operation, and that this should be reflected in antenna siting and ERP of repeaters.

12.5kHz channel spacing for fm on 144MHz will not be adopted, but societies may adopt a 12.5kHz "channel frequency offset" if they deem it necessary. The difference between these is that a true 12.5kHz system requires smaller transmitter deviation and narrower receive filters than are currently in use, whereas a 12.5kHz offset implies the use of the current modulation standard on frequencies halfway between the normal fm channels. With this system there would inevitably be problems with what may be termed "adjacent half-channel interference", although this would be less severe than the co-channel interference between two units operating on exactly the same frequency under the same circumstances. Use of this offset is optional, and given the inherent problems there are no plans for its adoption in the UK.

The limited space available in the 144MHz band means that no more fm repeater channels will be allocated. The committee recommended that if more space is needed for repeaters, consideration should be given to the use of higher bands. This position has been recognized by the RSGB for some years, and an extensive 432MHz repeater network is available. In this context it is interesting to note that West Germany has had no new 144MHz fm repeaters for the last five years.

The proposal for an experimental demodulating-modulating ssb repeater on 144MHz, GB3SF, has been debated at some length in the pages of *Rad Com*. To gauge international reaction to the idea, the RSGB presented the proposal to the committee for comment. The result was endorsement for an experiment, strictly limited in duration and coverage, to provide information on which future discussions can be based. The future of this proposal will now have to be considered by the Repeater Working Group and VHF Committee of the RSGB, and of course by the Home Office if an application for a licence is made.

Contests

Normal UK licence conditions, unlike those of most of the countries in Region 1, forbid the use of a single callsign on more than one band simultaneously. The rules of the IARU uhf/shf multiband contest held over the first weekend in October each year specify that only one callsign should be used, and this conflict has deterred many UK groups from entering the IARU events. At the request of RSGB a footnote has now been added to the rules, and multiband entries from UK groups using one callsign on each band and working from a single location will in future be accepted for the "all other stations" section of the contests. Each such entry will show which single callsign should be used in the final results tabulation.

From 1982 IARU Region 1 vhf/uhf/shf contests will start at 1400gmt on the Saturday and end at 1400gmt on the Sunday. This change has been made in response to a request from Yugoslavia, where the 1600gmt finish and the earlier sunset caused by the easterly location means that stations have to be dismantled and brought down from mountain-top sites in the dark. The earlier timing will not apply to this year's contests. The RSGB VHF Contests Committee will decide whether to adopt the new start and finish times for RSGB events.

Locator systems

The proposal by Sweden and the UK to abandon the QRA in favour of a new locator system (*Rad Com* November 1980) was narrowly defeated. The opinion expressed by many countries was that the present system is far from satisfactory, but that no change should be made until Regions 2 and 3 have had time to discuss thoroughly what is to them a new subject. It was agreed that Region 1 will vigorously pursue consultations with Regions 2 and 3 to reach a consensus on this matter. Therefore the current QTH locator system will remain in use at least for the next three years.

Satellite Co-ordinating Group

Following a proposal submitted by AMSAT-UK via RSGB an "IARU Region 1 Satellite Co-ordinating Group" has been set up. The role of this group will be to co-ordinate amateur satellite activity in Region 1, in particular the exchange of technical information; to liaise closely with Regions 2 and 3; to promote amateur satellite activity; and to consider, as a high priority, the funding of future satellites.

Meteor scatter

Many solutions have been proposed to the problem of spreading ms calling over a range of frequencies to reduce congestion, especially around 144-100MHz, during periods of high activity. The various ideas, such as choosing a frequency according to location or including frequency codes in "CQ" calls were carefully analysed and discussed at some length by a working group during the conference. It emerged that there was no ideal solution, but for the next three years a system whereby the calling

frequency is chosen according to the last letter of the callsign will be tried for random or non-sked operation.

The system is based on two reference frequencies; 144.100MHz for cw and 144.400MHz for ssb. A station whose callsign ends in the letter "A" will call "CQ" 1kHz above the appropriate reference frequency; if the callsign ends in "B" the call will be made 2kHz above the reference frequency, and so on. For example, to call "CQ" on ms, using cw, G3SEK would use 144.111MHz, 11kHz above the cw reference frequency, as the last letter of his callsign is "K", the 11th letter of the alphabet. Similarly, to call "CQ" for an ssb ms contact, SM7FJE would use 144.405MHz, 5kHz above the ssb reference frequency, as "E" is the fifth letter of the alphabet. Suffixes such as "/P" or "/A" are ignored when determining the calling frequency from the callsign. A reply to a "CQ" call should always be made on the same frequency as that on which the call is received.

This system should result in a frequency spread of 26kHz for each mode. The spread will be random, avoiding the concentration of activity on specific frequencies which has so often occurred when the choice of frequency has been left to personal preference. In addition, by knowing the callsign of a station which is thought to be active, the frequency on which that station will be calling "CQ" can be determined. Minimum local QRM should occur, as stations located near to each other will usually be on different frequencies. The use of split transmit/receive frequencies is also avoided.

Other meteor scatter procedures and conventions remain essentially unchanged, although improving technical standards mean that use of shorter periods, 1min on cw and 15s on ssb, is being encouraged.

Data transmission

144.675 and 432.675MHz are recommended for data transmission calling, with working down to 144.650 and 432.650MHz.

The growing use of computers and large-scale integrated circuitry by amateurs has brought with it a growing interest in data communication. For international communication it is vital that a standard format for this work should be agreed. In many ways the exact format chosen as standard is not important. What is important is that there should be a standard.

This subject will be discussed over the next few years until a consensus emerges which can be discussed at the next conference.

VHF/microwave dividing line

The dividing line between vhf/uhf and microwaves was confirmed as 1GHz. This decision was based on the argument that operation above this frequency was still highly experimental, a view which was supported by most countries which took part in the discussion.

Microwaves

The practice started at the last conference of having a special session of Committee B devoted exclusively to microwaves was followed once more. For the duration of this session G3RPE chaired the meeting. The wide frequency allocations available in the microwave bands brought relief from the conflicts between differing interests which were occasionally seen in discussions of the lower bands, and agreement was reached quickly on most topics. The RSGB was again seen to be leading the way in many aspects of microwave work.

In line with the practice established at the last conference, it was agreed that microwave bands should be specified in terms of frequency rather than wavelength. The preferred designations of new bands allocated at WARC are 47, 76, 120, 142 and 241GHz. The recommendation that initial operation should centre on harmonics of 1.152MHz has been extended, where possible, to the new bands. Specifically, the recommended centre frequencies are 24.192, 76.033, 145.152 and 248.832GHz.

The RSGB presented some of the excellent results obtained by UK amateurs using narrow-band modes on 10GHz, but was slightly chagrined by the revelation that two stations in the Netherlands and two in West Germany are already active on 24GHz ssb. It was agreed that the nominal working frequency for 10GHz narrow-band operation should be 10.368.150MHz and that the preferred operating frequency for 24GHz wide-band equipment should be 24.125GHz.

For work at frequencies above 1GHz, transmitted signals should have right-hand circular polarization, except on 2-3GHz where the standard is left-hand circular. It may be noted that reflection from the moon causes a reversal in polarization, so that received signals will be left-hand circular, with again the opposite on 2-3GHz. The reason for 2-3GHz being the odd man out is as that advantage can be taken of the 2,276MHz beacon left on the moon during the Apollo programme. This beacon has already proved useful for testing antennas and 2-3GHz receiving systems, but unfortunately it transmits right-hand circularly polarized signals, and so the proposed standard was reversed for 2-3GHz.

One bad piece of news came from West Germany, whose delegation reported that they were no longer allowed to use frequencies in the

Table 4. 2-3GHz band plan proposed by DARC

Frequency (MHz)	Use
2,300-2,320	(Not allocated in Federal Republic of Germany)
2,320-0 2,320-150	CW
2,320-0 2,320-010	EME
2,320-05	CW calling frequency
2,320-150 2,320-500	SSB
2,320-200	SSB calling frequency
2,320-35 2,320-40	Linear translator input
2,320-5	SSTV calling frequency
2,320-6	RTTY calling frequency
2,320-7	FAX calling frequency
2,320-8 2,321-0	Beacons
2,321-15 2,321-40	FM simplex
2,321-4 2,321-5	FM repeater input
2,400-2,450	Space

2-3GHz band below 2,320MHz. As this excludes the recognized narrow-band section, 2,304-2,306MHz, a segment for narrow-band operation was provisionally established from 2,320 to 2,322MHz. DARC, the West German national society, has produced a provisional band plan for 2-3GHz which will be discussed at future meetings (Table 4).

Microwave contests were one of the last items discussed in this special session. A calendar of the many events organized by various groups is being compiled to act as a guide in the co-ordination of future contest activity.

Committee C

The terms of reference of this committee concern Credentials and Finance, and it met under the chairmanship of LX1JW on the evening of Monday 27 April. No formal recommendations were made by the committee, although it was agreed that in future the presentation of Region 1 accounts should incorporate additional explanation of the major items.

Consideration of the 1982 budget was deferred in view of conference decisions which could materially affect this matter. The budget will be considered by the Executive Committee in October 1981.

Election of Executive Committee

During the final plenary meeting, ON4VY, the chairman of the Election Committee, announced the results of the secret ballot which were as follows:

Office	Name	Callsign	Votes
Chairman	L. van de Nadort	PA0LOU	Unopposed*
Vice-chairman	W. Nietyksza	SP5FM	Unopposed
Treasurer	S. R. Barlaug	LA4ND	20*
	J. C. Laib	HB9TL	17
Secretary	R. F. Stevens	G2BVN	Unopposed*
Members	H. Walcott-Benjamin	EL2BA	25*
	J. Rottger	DJ3KR	25*
	M. Bendani	7X4MD	14
	R. Spadini (Miss)	11RYS	13
	A. Tigerstedt	OH5NW	12
	A. Gschwindt	HA5WH	8
	M. Mandrino	YU7NQM	15*

* Elected

1984 conference

Invitations had been received from the societies of Italy, Liberia and Norway. A ballot was conducted with the following result:

Italy	15	votes
Liberia	14	"
Norway	8	"

GB1IARU

The conference station was active on all bands, hf and vhf, and accumulated a total of more than 5,000 QSOs. The station was popular with delegates, and the heat-sinks rarely had time to cool. The operation was made possible by the co-operation of a number of distributors who made the latest equipment available to the members of a number of Sussex clubs who erected antennas, installed equipment and supervised the operation, and not least by the local Post Office RI and the hotel staff who provided excellent co-operation.

The clubs involved in the operation include: the Brighton and District Radio Society, Crawley Amateur Radio Club, Hastings Electronics and Radio Club, Mid-Sussex Amateur Radio Society, Southdown Amateur Radio Society, Sussex Repeater Group, and the Worthing and District Amateur Radio Club.

The onerous task of dealing with the QSLs is being handled by G3LQI, to whom our sincere thanks are due.

IN MEMORIAM

During the conference week, delegates were shocked by the deaths of two delegates: A. H. ("Ton") Kokec, PA0KOK, and Peter Balestrini, G3BPT.

PA0KOK had attended several IARU conferences and had been active as a host when meetings had been held in his home city of The Hague.

G3BPT had not previously attended a Region 1 conference, but his expertise in the field of emergency communication and the activity of his working group had made a very favourable impression on delegates.

To the families of these two radio amateurs we extend our sincere sympathy and condolences.

POSTSCRIPT

The end product of many meetings such as the recent conference is a mountain of paper. Interesting as this may be it is not enough. Discussions and recommendations must be converted into action by the various national societies. If this is not done then the conference activity will have little value. In the RSGB context the conference output will form agenda items for many future meetings of RSGB committees.

It is recorded with pleasure that many delegates expressed the view that the Brighton conference had been the most successful for many years. Certainly the atmosphere of cordiality and co-operation that existed throughout the week can only lead to a better understanding of amateur radio problems and to solutions acceptable to all.

GB1IARU, and all that

TWELVE Sussex radio societies began meeting in mid-1980 to plan the social activities which form an essential part of a successful conference. Meetings continued throughout the year and by the time the conference opened they were well prepared.

The main responsibility of the local committee concerned the organization of a conference station which was allocated the unique callsign GB1IARU. Despite what one often hears about retailers and their all-consuming interest in matters financial, the response from the trade for the free loan of equipment was quite overwhelming. GB1IARU ran 13 stations simultaneously, the vast majority comprising borrowed equipment. When one remembers that the station was closed to members of the public, and was in no sense a trade exhibition, the response was most gratifying. There were even a number of rigs as spares in case of breakdowns!

The station occupied two rooms and consisted of:
70MHz. FT101E plus Magnum 4 transverter and five-element beam at 70m.

144MHz ssb/cw. Trio TS700S plus 100W Microwave Modules linear and an eight-element Tonna at 70m.

144MHz fm. FT221R 15W and a colinear at 70m.

432MHz ssb/cw. Multi 750E and 88-element beam at 70m.

432MHz fm. Philips FM321 10W and colinear at 70m.



Alan Baker, G4GNX, station supervisor, activating the 70MHz station



Frank Harrop, G3DVL, operating the 7MHz station

1.3GHz. Homebrew gear from the Sussex repeater group.

1.8MHz. Drake TR7 and a dipole at 80m.

3.5MHz. TS820S 200W p.e.p. and inverted-V at 80m.

7MHz. TS130S 200W p.e.p. and inverted-V at 80m.

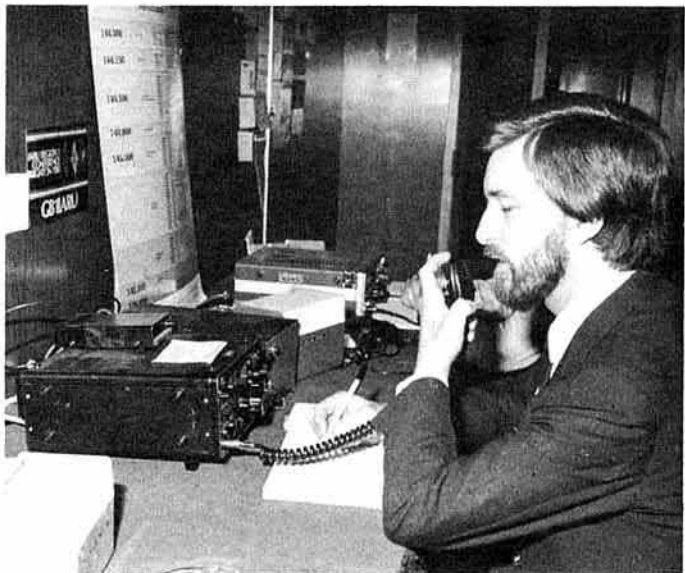
14MHz. Icom IC720A plus 2KL linear 100W barefoot, 350W p.e.p. with linear, three-element Western Electronics beam at 70m.

21MHz. TS830S 200W p.e.p. and three-element Moseley Mustang beam at 70m.

28MHz. FT101E plus YC601 digital display 200W p.e.p. and $\lambda/4$ vertical with 14 radials at 70m.

RTTY (mainly 14 and 144MHz). Software Catronics keyboard, CT100 terminal unit, CD300 vdu controller, Sony monitor, FT707 and Datong filter FL2.

At no time were there less than three stations in use, and in the peak hours approaching midnight up to 10 of the stations operated simultaneously. 650 man-hours were contributed by Sussex amateurs in operating and supervising the station, and special mention must be made in the case of Alan, G4GNX, and Len, G8GEZ, who managed to maintain an almost continuous presence for the six days of operation, in addition to the preparation and clearing up. In all, almost 5,000 QSOs were achieved, this at a time when hf conditions were truly appalling. On the opening day of the conference it proved virtually impossible to operate on anything other than the vhf bands for much of the day, and, although conditions steadily improved during the week, overseas delegates from Region 3 were only rarely able to keep skeds with VK and JA. Stan, G3LQI, is handling the QSL operation.



The 144MHz station



Len Wooller, G8GEZ, station supervisor, operating the station, watched by Robin Bellerby, G3ZYE

The Metropole Hotel proved extremely co-operative, allowing us to use the entire roof area for the erection of antennas. Something of a record was achieved over the Easter weekend, when 650 television sets were simultaneously out of action, the problem eventually being traced to an unscreened antenna feeder leading to the main distribution amplifier in the hotel. When the station was finally dismantled the hotel management commented that it was the first time for many years that their television sets had been free of police and taxis breaking through, and that the little residual interference caused at peak operating times by the amateur station had been of a quite acceptable level.



The antenna-rigging party on the roof of the Hotel Metropole: G4IIL, G4KWU, Henry Frankham and Neville Cannan. Photo: G3LFZ

Those involved in the technical side of the station learned a great deal about the siting of antennas and practical measures which can be adopted to prevent mutual interference, and by the time the conference opened it was possible to operate on any band without causing interference on the others, even the rtty station being immune from interference.

The social programme went extremely well and has resulted in a number of Sussex clubs informally "twinning" with clubs overseas, and the entire venture was voted, by visitors and Sussex amateurs alike, as being extremely successful.

The Sussex radio societies would like to record their thanks to all who supplied equipment for the station, in particular: Bredhurst Electronics, Catronics Limited, Datong Electronics, Lowe Electronics, South Midlands Communication Ltd, Radio Shack, Thanet Electronics, Western Electronics and Lee Electronics.

G3ZYE

An easy method for determining grey-line bearings

by G. P. STANCEY, BSc, G3MCK*

It is well known that enhanced conditions for working dx often occur at sunrise and sunset. This is particularly true when the station being worked is also experiencing sunrise or sunset. The objective of this article is not to consider the propagation phenomena involved but to describe a simple method for amateurs to determine who else in the world, apart from themselves, is experiencing dawn or dusk.

First, it is essential to understand what is a great circle path. This is any path which encircles a sphere and is equal to the circumference of the sphere. If we assume that the earth is spherical, examples of great circle paths are the equator, meridians of longitude, and any path of equal circumference to the equator that encircles the earth. Parallels of latitude, except the equator, are not great circle paths.

Fig 1 shows that the line which separates day from night is clearly a great circle path. This particular great circle is called the grey-line. Hence an amateur who wishes to exploit grey-line propagation can express the problem as follows:

- (1) For any day, when will my sunrise/sunset occur?
- (2) What will the bearing be of the grey-line and who will lie on that bearing?

The first problem can be solved in various ways:

- (1) Diaries frequently give this information.
- (2) Many daily newspapers give it.
- (3) Navigation tables.
- (4) Calculation.

The first method, which may only give weekly information, is sufficiently accurate for amateur purposes; it can be used to predict at what time of the year the dx operator could use this method to work a particular part of the world. The second method will enable daily assessments to be made. The third method is not applicable for the majority of radio amateurs; and the fourth is probably best left to astronomers, navigators, mathematicians, and similar ilk.

We can find our own sunrise and sunset times by methods (1) or (2). The next stage is to find the location of another place in the world which is experiencing sunrise or sunset at our sunrise or sunset. If we limit our choice of locations to places which lie on the equator, their longitude west of us is given by the following equations

$$\text{Longitude west} = (\text{Sunrise time} - 6) \times 15$$

$$\text{Longitude west} = (\text{Sunset time} + 6) \times 15$$

Example: When local sunrise is 0630gmt.

$$\text{Longitude west} = 15 (6.5 - 6) = 7.5^\circ$$

Therefore at 7.5°W of us on the equator they are experiencing sunrise. Similarly they are experiencing sunset at 187.5°W (or 172.5°E) of us.

Note that the calculated longitude is the number of degrees west (or east) of us and may need correcting for locations in other countries. For example, if we lived in Brussels which is 4° east, then the point on the equator would be $7.5 - 4 = 3.5^\circ$ west in terms of true longitude. Only for people living on or near the Greenwich meridian is no correction necessary.

We now have three points on the dawn/dusk great circle path, and to find the bearing of the grey-line it is only necessary to know the bearing of one of the two equatorial points from us. This can easily be accomplished by taking a great circle map which is centred on our location, marking either point on the equator, and laying a straight edge through this point and the centre. The straight edge will follow the dawn/dusk line, and the bearing can be read off the edge of the map. Perhaps of more significance one can see at a glance which places are on the grey-line and which places are in darkness or light. Caution—the method requires access to a great

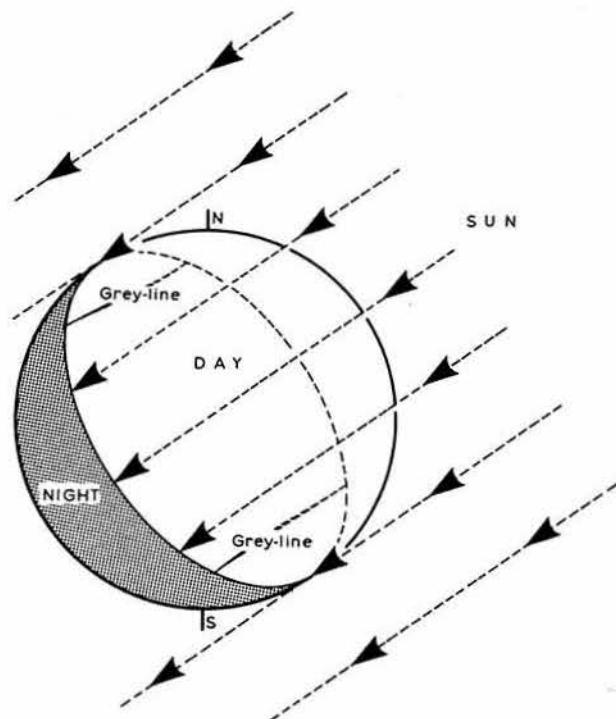


Fig 1. Formation of grey-line path by the sun's rays

circle map which is centred on or about one's location. For UK amateurs the RSGB Great Circle DX Map based on London will be satisfactory. The location of the second point was chosen to be on the equator to simplify the equation for determining sunrise and sunset times. In the UK the equator is sufficiently far away from the centre of the great circle to give reasonable accuracy with either the sunrise or sunset point. In other parts of the world this may not be true and the point on the equator furthest from the centre should be used.

Appendix

The following worked examples are intended to give the user confidence in his own ability to use this method and also to demonstrate how to handle apparently "funny" results. All examples are based on London.

Example 1. Local sunrise is 0630gmt.

Equatorial sunrise is at: Longitude west = $15 (6.5 - 6) = 7.5^\circ\text{W}$.

Lay off on great circle map to give grey-line bearing of $10-190^\circ$.

Alternative method is to find the equatorial sunset longitude:

$$\text{Longitude west} = 15 (6.5 + 6) = 187.5^\circ\text{W (or } 172.5^\circ\text{E)}.$$

Laying off on great circle map gives the same bearing.

Example 2. Local sunset is 1700gmt.

Equatorial sunset is at: Longitude west = $15 (17 + 6) = 345^\circ\text{W (or } 15^\circ\text{E)}.$

Grey-line bearing is $341^\circ/161^\circ$.

Example 3. Local sunset is 2000gmt.

Equatorial sunset is at: Longitude west = $15 (20 + 6) = 390^\circ\text{W (ie } 30^\circ\text{W)}.$

Grey-line bearing is $37^\circ/217^\circ$.

Anyone unhappy with getting longitudes of greater than 360° should remember that they can always use the sunrise point:

Equatorial sunrise is at: Longitude west = $15 (20 - 6) = 210^\circ\text{W (or } 150^\circ\text{E)}.$

Example 4. Local sunrise is 0430gmt.

Equatorial sunrise is at: Longitude west = $15 (4.5 - 6) = -22.5^\circ\text{W (ie } 22.5^\circ\text{E)}.$

Grey-line bearing is $158^\circ/338^\circ$.

As before, the other equatorial dawn/dusk point (ie sunset) can be used.

Equatorial sunset is at: Longitude west = $15 (4.5 + 6) = 157.5^\circ\text{W}.$

Grey-line bearing is $158^\circ/338^\circ$. □

* 14 Cherry Orchard, Staines TW18 2DF.

The RX80 Mk2

A 3.0-4.0MHz ssb/cw

receiver and tunable i.f. for

a complete hf receiver

(Part 6)

by A. L. BAILEY, G3WPO*

THE CV2 144MHz CONVERTER MODULE

Although the RX80 is primarily intended as an hf bands receiver, the provision of vhf receiving capabilities extends its versatility, and with the addition of the FM80 i.f. module, to be described in the next part of this series, reception of all primary communications modes on 144MHz is possible. The converter is of the same physical dimensions as the CV80 hf converter, and is used in conjunction with the 28 and 29MHz converters to cover 144-146MHz in two 1MHz bands. Thus the CV2 can also be used with any receiver having a 28-30MHz tunable i.f..

The CV2 features low-noise vhf mosfet input and mixer stages, and uses a 116MHz crystal to avoid the need for an oscillator multiplier chain. All inductors are prewound, and screened, giving a stable converter, with ease of construction and alignment the prime object. As with all the other modules in the receiver, the pcb and all components are obtainable from one source.

Circuit description

A conventional dual-gate mosfet input/mixer was used for the design, as experience has shown this to be a more than adequate combination for all but the most critical of applications, and the wide availability of protected dual-gate mosfets has removed the constructional problems once associated with these devices. The rf amplifier, TR1, is a vhf device configured as a classic mosfet amplifier, with signals coupled into L1 via a one-turn link.

After amplification, signals at 144MHz are passed through the inductively coupled bandpass filter, L2/L3 to gate 1 of a further dual-gate mosfet TR2, acting as a mixer. Output at the i.f. of 28-30MHz is from transformer T1, with R8 increasing the bandwidth.

Having the local oscillator crystal running at the desired injection frequency is always beneficial in terms of reduced unwanted mixer products, so a 116MHz third-overtone crystal is used in a conventional Colpitts oscillator circuit, using a vhf transistor type BF273, TR4. L6 is tuned to the crystal frequency. As the output of the oscillator is insufficient to drive the mixer directly, a common base amplifier, TR3, gives the required injection level, via a further inductively-coupled coil pair, L4,5. Both these coils and those of the input and output of the rf amplifier are fully screened for reasons of stability and to minimize unwanted signal pick-up.

Construction

To retain the stability of the original converter, the pcb foil pattern (Fig 43) should be followed, using any of the methods given in Part 1 of this series. Alternatively the pcb can be purchased ready screened and drilled together with all the other components.

It is important that all lead lengths are kept to a minimum—this means that transistor bases should be within 3mm of the pcb upper surface, and capacitors as close to the pcb as possible. Resistors, the coils and their screening cans mount flat against the pcb upper surface.

1. Insert and solder the five 0.1in dia connection pins. These are marked with ● on Fig 45. Insert from the foil side of the pcb and push home with a hard object before soldering.
2. Insert and solder all fixed resistors. All have 10mm lead spacing which can be achieved by gentle bending of the leads at right angles to the body.
3. Insert and solder all capacitors.
4. Insert and solder TRs 1-4, ensuring correct orientation, either by case tab, or flat on the case outline, with ferrite beads on the drain and gate to leads of TR1.
5. Insert and solder L1-L5, with the short shoulder on each in the position indicated by the hatched side on the layout. Using a short piece of insulated wire, wind a one-turn link anticlockwise around L1 starting at the hole marked "z", with the other end in the hole "y".
6. Insert and solder L6.
7. Preset the tops of all cores level with the tops of the formers.
8. Insert and solder the three screening cans. Solder all six lugs.
9. Insert and solder the crystal with the base resting against the pcb.
10. Before proceeding any further, double check the positioning of all components and look for solder bridges etc.

Alignment

1. Following Fig 45, attach the earth lead, i.f. output connection to the RX80 or other receiver, a suitable antenna, and the +12V lead, preferably with a milliammeter in series.
2. Apply power—current consumption should be approximately 15mA.
3. Either using a signal generator or a signal in the 144MHz band (most people will have a repeater within range between 145.6 and 145.775MHz) peak all tuned circuits using the correct hex trimming tool to avoid damaging the cores. L6 is the oscillator coil and can be used to get the crystal close to its nominal frequency. If the rf amplifier tends to take off near resonance, damp L2, on the underside of the pcb, with the highest value resistor which stops this (2-7kΩ is an average value).

There should be no problem in finding a signal, as the converter should be virtually aligned with the cores preset as indicated, and an increase in noise level should be apparent, if all is functioning correctly, at the tunable

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

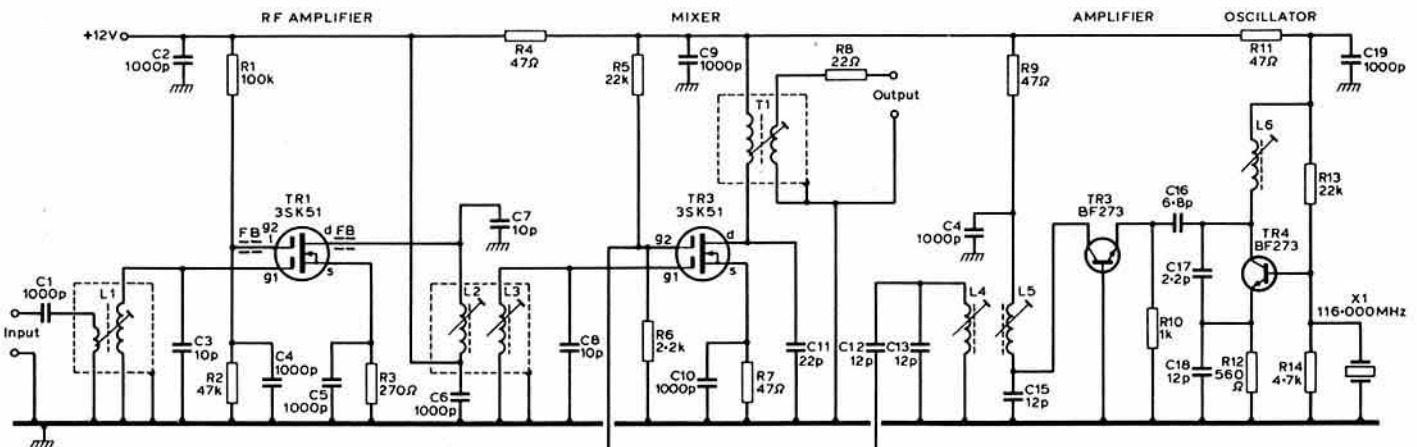


Fig 42. CV2 144MHz converter circuit diagram

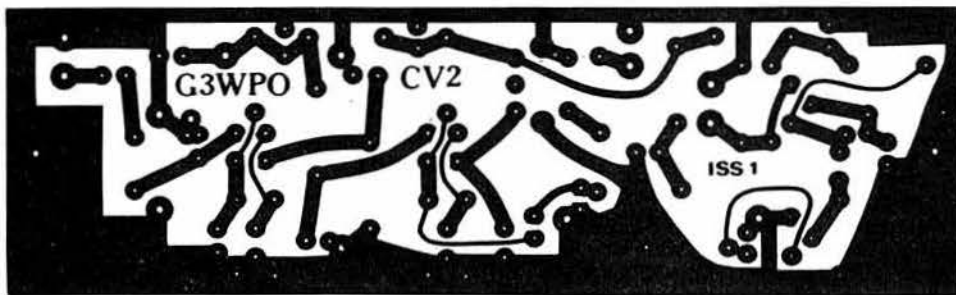
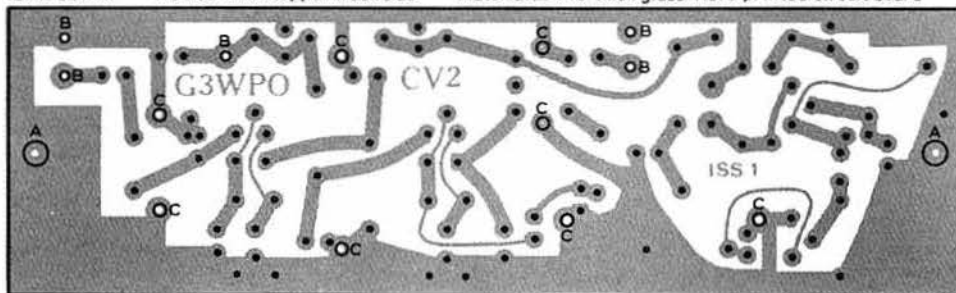


Fig 43. CV2 pcb

127 x 38mm Viewed from copper track side Material 1/16" thick glass-fibre printed circuit board



Holes shown are 0.85mm dia 2 holes 'A'...3mm dia 5 holes 'B'...1mm dia 8 holes 'C'...1.8mm dia

Fig 44. CV2 pcb drilling diagram

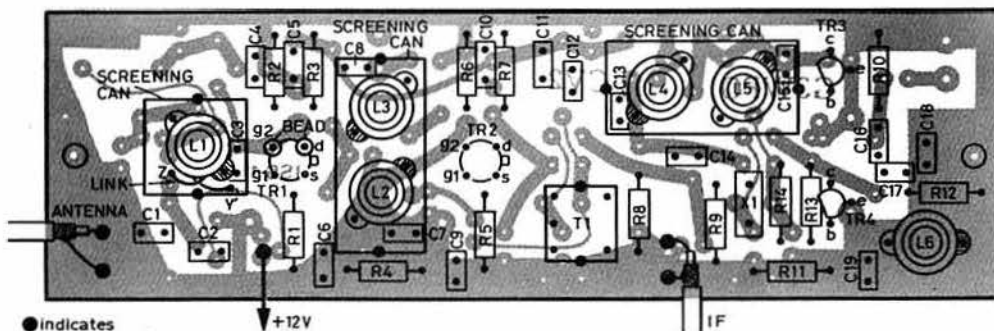


Fig 45. CV2 converter component layout

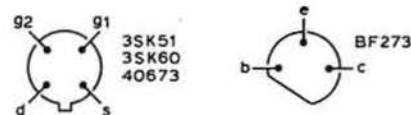


Fig 46. CV2 component pin-outs

CV2 components list

R1	100kΩ
R2	47kΩ
R3	270Ω
R4,7,9,11	47Ω
R5,13	22kΩ
R6	2.2kΩ
R8	22Ω
R10	1kΩ
R12	560Ω
R14	4-7kΩ
All resistors are 0.25W 5% carbon film.	
C1,2,4,5,6,9, 10,14,19	1,000pF
C3,7,8	10pF
C11	22pF
C12,13,15,18	12pF
C16	6.8pF
C17	2.2pF
All capacitors are disc ceramic.	
TR1,2	3SK51/3SK60/40673
TR3,4	BF273
L1,2,3	Toko 301KN-0300 (orange)
L4,5,6	Toko 301KN-0400 (yellow)
T1	Toko KANK3335R (pink core)
X1	116.000MHz third overtone HC-18/U

Also required

One	S18 single screening can (Ambit)
Two	S18 dual screening cans (Ambit)
One	S18 trim tool
Five	0.1in dia pcb connection pins
Two	FX1115 ferrite beads or equivalents

All of the above components together with a drilled, screened pcb are obtainable from Ambit International. Please accompany all enquiries with a stamped-addressed envelope.

i.f.. Use of a gdo/wavemeter can check that the oscillator is working if no signals are received, otherwise check again for short circuits and components incorrectly placed. Anyone possessing an automatic noise alignment device can put it to good use to extract the best possible noise figure from the converter.

The finished converter can be mounted in the RX80 cabinet above the 28 or 29MHz converter, with the usual screening plate in between. It will be

necessary to remove the paralleled antenna connection from the two hf converters and then to take these two inputs to the 144MHz switch on the front panel. Fig 47 shows the extra wiring required to accommodate the converter, selection of 144MHz being by depressing both the 144MHz button and the 28 or 29MHz button, depending on the range required. Operation of the 28 and 29MHz converters is as normal without the 144MHz converter selected.

TO BE CONTINUED

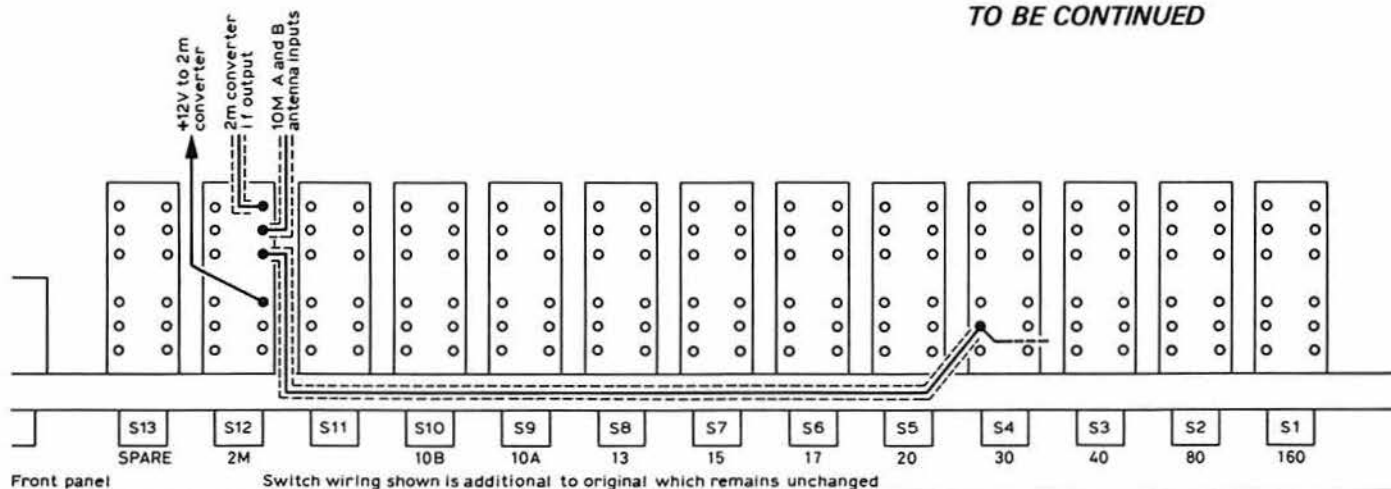


Fig 47. Additional wiring to switchbank for 144MHz converter

TECHNICAL TOPICS

Pat Hawker, G3VA

"Thanks old man for a most enjoyable queso. It's been my pleasure talking to you. 73 and see you further down the log." Winston Smith smiled happily as he pulled the big switch. It was a real joy working the bands these days!

The improvement, of course, had come about since the general adoption in 1984 of the very successful Triaesu "SS" units—those fabulous pre-programmed microprocessor-based "synthesized speech" units that could readily be connected to any transceiver. How he enjoyed working them—so polite, such good courteous "operators", such stunningly attractive female voices with just a slight Japanese accent, so pleased with everything you told them about your rig. Geisha-trained, so to speak.

Whoever said that you can divide the world into blind ignorant fools and those who agree with you certainly knew his stuff. Even that abrasive old-timer across town had now installed an SS101 which started each over with the highly satisfying remark: "Solid copy dear old man. I do so agree with all your comments and may I say that you're one of the nicest signals I've ever heard on the band". Now all you had to do was to make sure you called him only when he was not in the shack himself. It was, mused Winston, rather like that super new video cassette recorder that automatically records all the tv programmes you don't want to see, and replays them when you're out.

He must be sure to send off one of the brand-new £1,000 notes to the SS-DXpedition Fund. Even such a small contribution would ensure his call sign was programmed into the special priority list to which Triaesu units installed in all dxpeditions would respond and then automatically print out a QSL card.

There was, thought Winston, just one tiny cloud on the horizon. He had come back to Victory Mansions early and found his Super SS150 talking away to GB3ZZ's microcomputer, and in the moment before his presence had been detected on the interactive tellyscreen he had heard "them" discussing the possibility that in future the Radio Amateurs' National Lottery computer should be programmed so that licences would be issued only to SS-equipped stations and any human operation made a serious breach of the regulations.

"Are we," he pondered, "storing up a load of trouble for ourselves?"
(With apologies to George Orwell and GB3CE)

The story of the ground-plane

The recent work by Les Moxon, G6XN, on the use of counterpoise-type vertical antennas (TT March) suggested that large earth mats of buried radials etc may not be necessary for effective operation of vertical antennas. But,

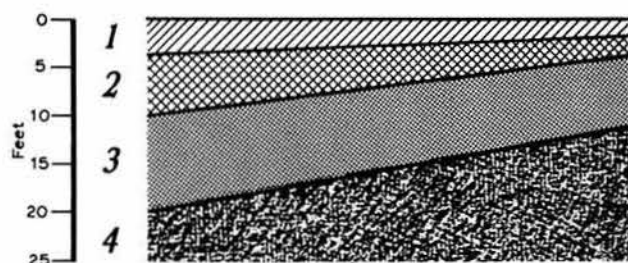


Fig 2. Typical section of earth's crust showing geological strata with several layers of different electrical conductivity. (1) Alluvial soil having relatively good conductivity (about 20×10^{-14} emu). (2) Sandy soil (about 4×10^{-14} emu). (3) Chalk (about 10×10^{-14} emu). (4) Young rock (1×10^{-14} emu). Sea water has conductivity of about 4×10^{-11} emu (ie $4,000 \times 10^{-14}$ emu). In practice effective conductivity depends upon depth of penetration of the earth currents and is thus a function of frequency (as frequency is raised more current will be concentrated in the uppermost layers). (From "The ground beneath us", G3HRH, 1966)

of course, very many of the vertically-polarized antenna systems currently used by amateurs do not use any buried radials: instead they use the artificial ground-plane technique with the antenna mounted well above earth so that the signals are not absorbed so much by surrounding trees and houses.

Conventional wisdom (eg *The ARRL Antenna Handbook*) claims that: "Instead of being actually grounded, a $\lambda/4$ antenna can work against a simulated ground . . . formed from wires $\lambda/4$ long radiating from the base of the antenna . . . However, with only one radial the directive pattern would be that of a $\lambda/2$ antenna bent into a right angle at the centre . . . this would result in equal components of horizontal and vertical polarization and a non-uniform pattern in the horizontal plane. This can be overcome by using a disk with a $\lambda/4$ radius. The effect of the disk can be simulated, with simpler construction, by using at least four straight radials equally spaced around the circle" (my italics).

The implication is that, as with buried radials for a monopole, the more ground-plane (insulated) radials the better, and that such an antenna cannot be expected to function efficiently, with an omnidirectional radiation pattern, with only two or three radials.

In a comprehensive article "The ground beneath us" (*RSGB Bulletin* June 1966, pp375-85), R. C. Hills, G3HRH, also considers that four radials represent an inefficient minimum. He wrote: "What then of the ground-plane? Let no one be deceived that the conventional four radials take care of the Brewster effect! The radial system of the normal elevated ground-plane does little more than provide a convenient connection for the unbalanced side of the feeder. It is electrically very transparent and the ground below the radials is well illuminated by the vertical radiator, so the presence of a good earth system is just as important as if the antenna were fed against ground." Here again the casual reader would assume that the use of four or more radials plus an extensive earth system buried in ground of good electrical conductivity was advisable to obtain optimum results.

But one needs to be careful what one reads into this. Certainly the effectiveness of any vertical antenna in providing low-angle radiation depends

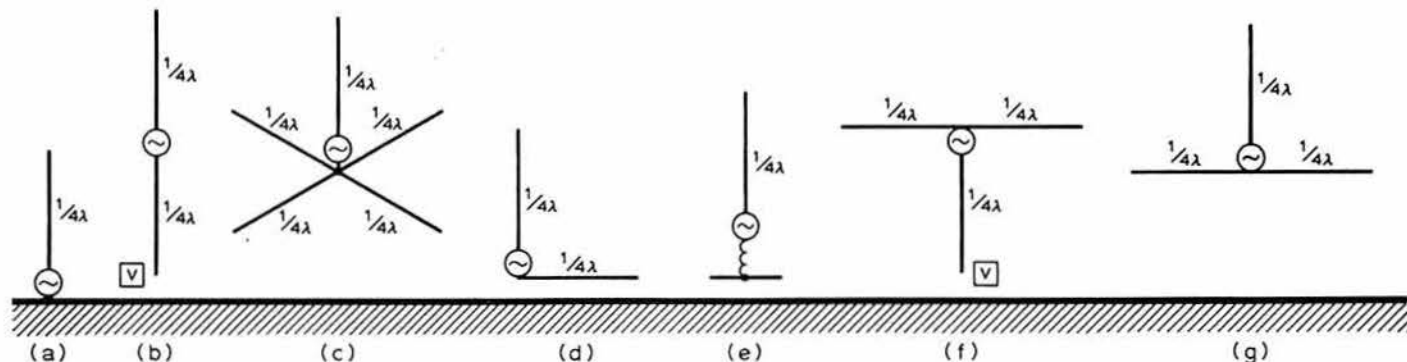


Fig 1. The family of verticals. (a) Standard monopole (unipole) antenna fed against earth. Any significant resistance in the earth connection will dissipate a substantial amount of the transmitter power so that good earthing systems (stakes, radials, mats etc) are most important. (b) The $\lambda/2$ vertical dipole requires no direct earth connection but has both high and low angle lobes of radiation. As for all vertical antennas the earth conductivity is important because of the large induced currents. Without very extensive earth mats only limited improvement is likely from any buried radials etc. The antenna can be voltage-fed at V with the current feed-point short-circuited. (c) Conventional four radial ground plane (radials usually slope downwards to facilitate impedance matching). The artificial earth formed by the four radials does not prevent large currents being induced in the real earth. (d) The "bent" dipole (ie single-radial ground plane) results in mixed polarization and is unlikely to provide true omnidirectional horizontal radiation pattern. Nevertheless it can form an effective general purpose antenna, particularly if the earth conductivity is good. (e) G6XN's inductively loaded counterpoise form of monopole/dipole as described in March 77. In practice the "coil" can be in the form of distributed inductance. (f) G3VA's 1970 "inverted ground plane" or " $\lambda/4$ T" raises the current maximum in cluttered sites. It can be voltage-fed at V if the current feed-point is short circuited. (g) The "original" two radial ground plane as developed by Dr George Brown of RCA (additional radials added later to meet customers' wishes!)

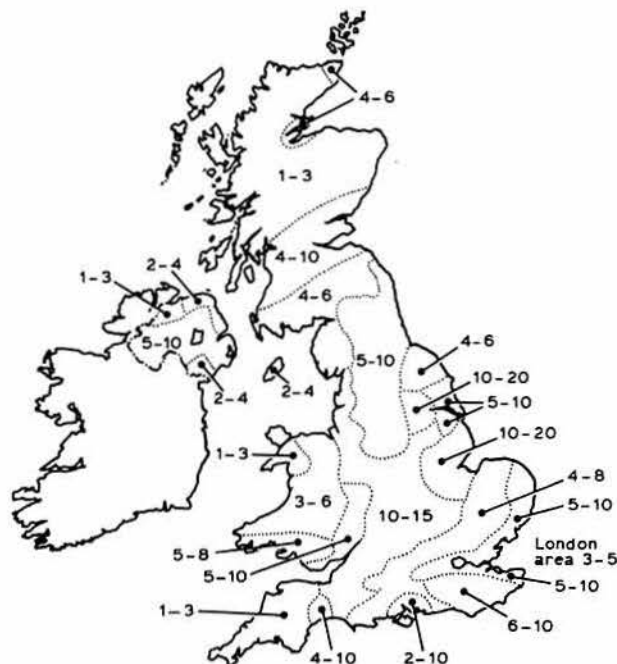


Fig 3. A rough ground conductivity map of the UK. Figures quoted are for 1.5MHz but the same general pattern can be assumed at higher frequencies. Conductivity is moderate to good in central and south-east England; poor to moderate in the west and north-west; and very variable in Scotland and Northern Ireland. Urban areas will tend to be poorer than farmland and rural areas. (G3HRH, 1966)

to a very marked extent upon earth conductivity; but an earth system that really meets this requirement cannot use a normal buried earth system, since it should extend many wavelengths around the antenna in all directions. The efficiency at low angles of either a vertical monopole or a ground-plane (gp) antenna increases enormously when, for example, you can use the sea for this purpose. John Roscoe, G4QK, recalls what happens when one *does* have a good earth: "One remembers tales 24 years ago of a gp on the flight deck of an aircraft carrier; or 12 years ago, when warships were larger than they are now, the 500W of illicit naval rf applied to a 50ft vertical, with impressive results. My office is on a site where some attention has been given to earthing, as there are over 1,500MW of electricity sculling around: a 7ft (indoor) vertical loaded against the ring-main earth gets out unexpectedly well."

So, one would not wish in any way to disparage the importance of earth conductivity, but what about that minimum of four radials for an elevated gp antenna? As G3HRH pointed out, their *prime* job is to provide a convenient connection for the feeder by bringing the antenna to resonance (just like the G6XN counterpoise). So why *four*? As noted by ARRL, one would result in radiation of a horizontally-polarized component and would not provide an omnidirectional pattern (although it can provide quite an effective general purpose antenna). So what about *two* spaced 180°? In other words an inverted-T with three $\lambda/4$ sections. Some years ago (TT July 1970, and all subsequent editions of ART) I described an "inverted ground-plane" antenna which was in the form of the classic "T" antenna except that the dimensions were all $\lambda/4$. I had taken the idea from the old "bobtail" antenna. Certainly my "inverted ground-plane" worked quite effectively from a poor site, and the system has since been further developed by several other amateurs, including K7GCO who implemented my suggestion that one could use this system as the basis for an antenna which could be switched to form a dipole with horizontal polarization as an immediately-available alternative to the vertical polarization of the "T" antenna.

In the beginning

Now the man who, more than any other, was responsible for the development of the ground-plane antenna (not to mention also the vertical monopole arrays from which were developed both the close-spaced Yagi and the W8JK driven array) was the redoubtable Dr George Brown of RCA. Recently, it was my great pleasure to meet Dr Brown, now retired, and his wife Elizabeth, on one of their frequent visits to the UK. In the course of conversation I happened to mention that of all his many antenna developments it was for the ground-plane that he was perhaps most widely known to radio amateurs. He then related an interesting little anecdote

which (if I understood it correctly) has an important bearing on the question of how many radials are really necessary.

He told me that the (elevated) ground-plane antenna was first devised in the 'thirties to meet an early requirement for police communications (American police mobiles then used to work around 30 to 45MHz). Its success was immediately evident when, at the first demonstration, the transmissions reached well beyond their anticipated service area. Now the important point was that the original design had only *two* radials; however, when it came to marketing the design the sales engineers reported that they could not persuade potential users that a two-radial antenna, with the two radials looking like a half-wave dipole, could possibly have an omnidirectional radiation pattern. On the classic principle that the customer is always right, George Brown and his colleagues simply added two more radials—and everybody was satisfied.

In other words, all that is required for a ground-plane antenna to function effectively is that the bulk of the "horizontal" radiation from the radials cancels out: and this happens with two radials. Now, of course, this anecdote does not *prove* that four may not be better than two; but at least it is an indication that an antenna using two radials or a G6XN-type counterpoise serves the purpose that the inventor had in mind! This is very different from the question of buried earth systems for monopoles where the lowest possible earth resistance is undoubtedly advisable to minimize the power losses.

More thoughts on verticals

Vertically-polarized antennas close, or reasonably close, to ground put one in mind of that nursery rhyme little girl who, when she was good, was very very good, but when she was bad she was horrid. The reason for this is primarily the very significant differences that are encountered at different sites, both in terms of earth conductivity and/or absorption and screening by any surrounding trees and man-made structures. It should also be appreciated that different systems, particularly different earthing arrangements (real or artificial) result in considerable differences in feed-point impedances: Phil Horwood, G3FRB, has carried out a valuable series of measurements on feed-point impedances, and it is hoped that his report will be published soon in *Rad Com*.

There is, of course, a fundamental difference between vertically- and horizontally-polarized antennas close to ground: they differ in the effects of the reversal of electric charges in the "image" antenna. Vertically-polarized waves are reflected with no change in phase: horizontally-polarized waves have their phase shifted 180° on reflection. This results in profound differences in the radiation patterns of the two types of antennas and the total radiated power.

Many amateurs still tend to visualize the vertical radiation pattern of a vertical antenna in the form in which it is usually presented in the various handbooks: that is to say, maximum radiation towards the horizon. In reality this is only (nearly) achieved over salt water. As earth conductivity decreases, not only does the total radiated power fall, but it virtually vanishes at low angles: see Fig 4. This effect occurs pretty well regardless

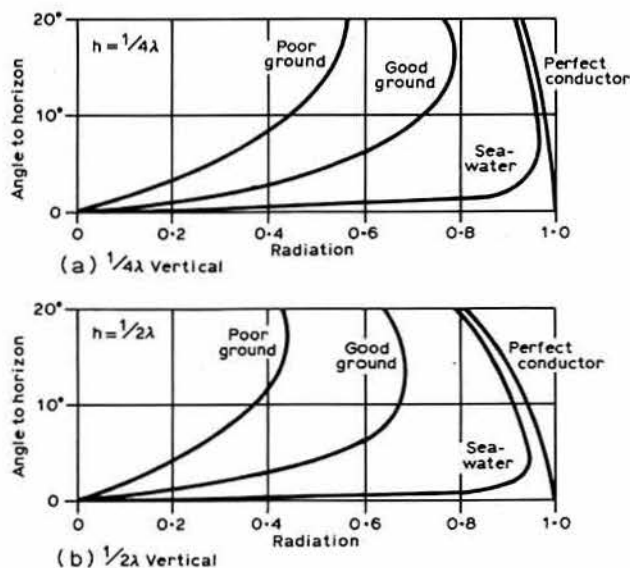


Fig 4. How the low-angle radiation of a vertical antenna differs from the theoretical vrp diagrams when a "real" earth is substituted for an "ideal" earth. Only with salt water do the vrp characteristics approach those of the theoretical text book patterns. (a) $\lambda/4$ vertical. (b) $\lambda/2$ vertical dipole

of which type of vertical antenna is being used, and is only moderately affected by man-made buried radials unless these are in the form of a truly massive earth mat. What many buried radials do, of course, is to reduce power losses in antennas fed against earth (ie, as in Fig 1 (a)). Earth conductivity depends primarily on location and "the ground beneath us" as described in great detail in G3HRH's 1966 paper; it also depends on frequency so that figures quoted for mf propagation have to be treated with some caution at hf although they provide a valuable guide.

There is another tantalizing question: to what extent is the vertical radiation pattern of a vertical antenna the same on transmit and receive? It is very difficult to find any clear indication of this in the text books. Yet it has certainly been my observation, when working medium-distance (say, East European) stations on hf that the signal reports I receive from stations which themselves have very strong incoming signals tend to be significantly lower from stations using vertically-polarized antennas, than from those (like myself) using fairly low horizontally-polarized antennas. The verticals appear to discriminate well *against* high-angle incoming signals but often radiate well at those same high angles. In other words, "real" earths appear to blur the nulls in the vrp on transmit more than on receive, just as, even over a poor earth, a vertical receiving antenna may perform well at low angles.

One of a number of interesting comments on the notes on G6XN's work in the March *TT* has come from Peter Pitts, G3GYE/A4XGC/VP8JP, who has always been far from satisfied with the treatment of vertical antennas in the text books which seem to concentrate on 120-buried-radial-type systems for broadcasting. He raises several points which I hope are partially answered in these notes. He is firmly in favour of the use of verticals mounted at least a few feet above ground to allow the use of sloping (insulated) resonant radials to avoid the power losses of antennas fed directly against poor earths and to provide a good match to 50Ω cable. His experiences also seem to bear out the view that the number of radials can be reduced with remarkably little effect on signal strengths. In tests from Oman to Cornwall using a 12AVQ vertical with sloping radials, he successively rolled up all the radials except one, with no adverse effect on the signals received in Cornwall.

Russian d-c receivers

Boris Stepanov, UA3AX, of the Russian magazine *Radio*, was one of the delegates at the Brighton IARU Region 1 Conference, and he has very kindly passed along two examples of publications produced for Russian amateurs. One was his own operators' guide (1974) which includes a great deal of information on international prefixes, the Russian system of identifying location by means of the first letter in the call sign after the number, translations of all the common abbreviations and operating codes etc.

The other was an 80-page booklet (48 drawings) devoted entirely to direct-conversion receiver principles and practice, including several designs reprinted from *Radio* based on the anti-parallel diode harmonic mixer that has been spot-lighted a number of times in *TT*. UW3AX has pointed out that there were a couple of errors in the circuit diagram of the harmonic mixer 1.8MHz d-c receiver as reproduced in *TT* (February 1981, p144, Fig 11). In the mixer section, both C6 and C7 are shown as 0.05μF. This value is correct for C6, but C7 should be 0.5μF. In the af filter the capacitor shown between the junction L6/C15 and chassis is wrongly labelled as C15 0.1μF and should have been C14 0.05μF. This design is one of those included in the book; another is a vhf 144-146MHz receiver using the basic anti-parallel diode mixer (unbalanced) with the oscillator

tuning 72-73MHz. The Russian Cyrillic text is pretty obscure to me, and I will not attempt to reproduce any constructional details: however, the first stages of the receiver may well be of interest to anyone attempting to build a d-c receiver for 70 or 144MHz, see Fig 5. Unfortunately, in this simple form, it is unlikely to be suitable for either fm or (because of oscillator stability) ssb, though, with care, the half-frequency oscillator could be made stable enough for cw; the Russian text also contains a suggestion that for ssb it would be possible to use a vxo. Direct-conversion at vhf remains an interesting challenge, provided that one remembers the point made by Chris Bartram, G4DGU, in *TT* February 1981, p142: appreciable predemodulator gain is needed to overcome the amplitude and phase noise of the oscillator.

Improving the 1.3GHz prescaler

In the May *TT*, LA8AK drew attention to the availability of a low-cost prescaler based on the SDA2001 consumer-type ic that can extend the range of a frequency counter to at least 1.3GHz. He pointed out, however, that the 64:1 division ratio of this ic means that one cannot directly use the calibration of the display. This problem can be overcome by using a conversion table, but LA8AK also made the alternative suggestion that correct readings could be obtained by changing the timebase crystal in the counter.

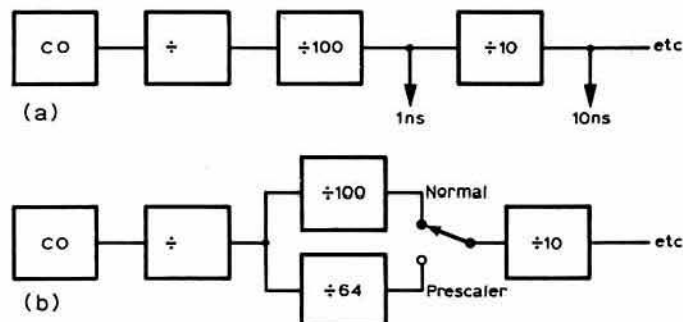


Fig 6. How a frequency counter can be modified for use up to 1.3GHz with a low-cost 64:1 prescaler as described in May *TT* but without requiring a change of timebase crystal. (a) Typical counter timebase chain. (b) Inclusion of an additional divide-by-64 device when using the prescaler but retaining correct "display" on lower frequencies (G3HWR)

Heath Rees, G3HWR, considers that there is a better solution. He writes: "Don't change the crystal; the one in the counter will most likely be nicely settled down ('aged') and a replacement crystal would need to be on an odd frequency that would be difficult to check. It would be better to modify the divider chain in the counter timebase as indicated in Fig 6. The counter is virtually certain to include either a divide-by-100 stage or two divide-by-10 stages. Simply re-wire as shown, adding a divide-by-64 ic. The counter will then provide a 'correct' display when used with or without the prescaler."

Interference filters and the elcb

Also arising from the May *TT*, but this time referring to G3KWJ's notes on earth-leakage circuit-breakers, G3HWR points out that there can be a problem when mains-interference filters are fitted to equipment to be protected

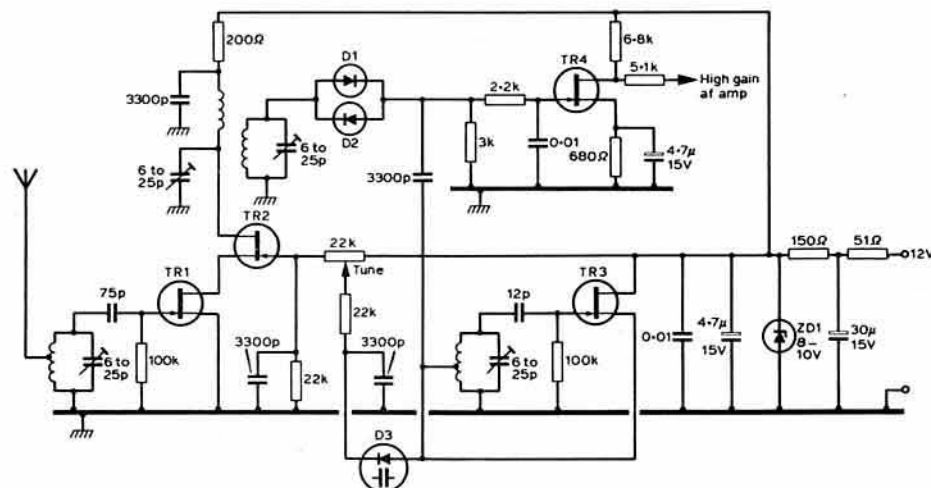


Fig 5. First stages of a Russian 144-146MHz direct-conversion receiver with harmonic detector (D1-D3). The oscillator tunes 72-73MHz using an electronic tuning diode

by an elcb. Fig 7 (a) shows a standard form of mains filter. With any filter of this general form, an unbalanced current due to the finite capacitive reactance flows in the earth lead (E) due to the disparity in the potentials on line (L) and neutral (N). With 0.1 μ F capacitors this can amount to roughly 7.5mA per capacitor, and such leakage currents may be sufficient to affect a sensitive elcb. G3HWR suggests that this problem can be overcome, with other advantages, by using a filter arrangement such as that shown in Fig 7(b). The heavy current in the line load now returns via neutral. This has the secondary advantage that, if a capacitor breaks down, the chassis of the equipment does not become "live". Also the operator does not experience any "tingle" when touching the case.

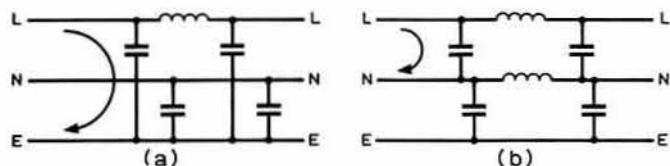


Fig 7. (a) Unbalanced currents with typical mains filter can present problems when a sensitive earth leakage circuit breaker is used. (b) Modified filter configuration overcomes this problem (G3HWR)

G3HWR adds: "Incidentally, an elcb provides protection against shock even if the shack earth is poor, which will often be the case where a local earth is used primarily to reduce mains-borne interference. Many earth connections represent a resistance of quite a few ohms and do not provide adequate protection against a serious live-to-earth fault, since the resistance can be sufficiently high for it to take several seconds for a conventional fuse to blow, even on earths formed from several earthing spikes."

DIY petrol-electric generator

The essence of amateur radio construction has traditionally been that of producing for next to nothing something which would be quite costly to buy commercially. So hats off to FIAPF (*Radio-REF* April 1981) in putting together for his local club "à prix RRP" a 250W (12V) petrol-electric generator. This comprises a 25-year-old "Mobylette" cycle engine; a salvaged car dynamo; a two-litre fuel tank made from an empty oil container; a driving belt salvaged from an old washing machine; and a rigid support fashioned from a fixture formerly used to carry the radio equipment on a police motorcycle!

Since there is no fuel pump, the bottom of the fuel tank has to be mounted higher than the top of the carburettor. If it is necessary to use an engine which turns in the opposite sense to the dynamo, then either the driving belt has to be crossed or the dynamo suitably modified. A 12V battery is used for starting the engine together with some tidy finger work on the decompressor. Clearly no two diy generators are likely to be the same, but FIAPF certainly shows that ingenuity can be made to pay large dividends.

Meteor scatter traffic in bursts

For quite a number of years some amateurs have been using the short-lived meteor trails in order to bounce vhf signals over distances up to about 1,200 miles so as to make fleeting contacts—but one doubts whether many of them have seriously thought of this mode as capable of supporting a steady stream of "traffic". Yet a lot of the early work was aimed at providing a reliable link for operational messages; for example the "Janet project" of the Canadian Defence Research Board (G. W. L. Davis *et al*, *Proc IRE*, Vol 45, No 12, December 1957). As noted by L. P. Learney of Redifon in *Radio & Television Engineers' Reference Book* (Hawker & Pannett, 3rd edn 1960): "The highly ionized trail left by a meteor entering the earth's upper atmosphere persists for a period amounting, in many cases, to several seconds. This trail can be used for two-way communication by the use of specially oriented transmitting and receiving antennas. Communication is intermittent, but the effect is so marked, even with meteors too small to be visible, and the number of such meteors is so vast, that practical use can be made of it with special equipment."

"The intelligence to be transmitted is recorded on magnetic tape at normal speeds, stored as long as necessary and then transmitted in intermittent high speed bursts. The mechanism is triggered off by the reception from the distant position of a monitor signal on a slightly different frequency, indicating the temporary existence of a transmission path. Use of a transmission rate of 600wpm enables a mean rate of 60wpm to be maintained."

"A carrier power of 100W at about 50MHz has been successfully used over a distance of 600 miles, using five-element Yagi arrays. The system has a high degree of privacy, and is immune to normal ionospheric disturbances."

Such equipment was available by about 1958-9 for specialized applications, initially in the military communications field. Today, by the exploitation of more modern techniques such as Amtor rtty, it would be by no means impossible for amateurs to set up traffic-capable links, rather than depending solely on the longer-lasting trails of the main meteor-shower periods to make brief contacts consisting of little more than token reports.

John Douglas, ON8AM/G4DVG, noticed a report that the American firm Telecom Inc has recently set up a demonstration meteor-burst communications link between Vienna, Virginia, and Watts Bar, Tennessee, a distance of about 700km. The firm is marketing a system based on 1kW transmitters and five-element Yagi antennas, using frequencies within the 30 to 50MHz range. A company spokesman is quoted as saying: "The technology has always been there but never exploited". Most trails at 90-110km above the earth have useful lifetimes of only about 0.2s but the link is available 24h/day due to the "billions" of bursts that are possible each day. The data during these brief periods is sent at 4,800 bits/s and ranges of up to 2000km are claimed. The system is said to be "perfect for remote sensors, especially weather-gathering drones". The disadvantage, it is admitted, is that delays up to several minutes can occur while the computer-controlled terminal is looking for usable trails. The major advantage is claimed to be "low price" relative to other comparable systems such as satellites.

Shortly after compiling the above notes, I received a letter from Mike Strange, G8HHO, enclosing a clipping from *Microwave Systems News* (MSN), March 1981, reporting further on the Telecom meteor-burst system. The commercially-developed terminal is in the form of an enclosed rack, the cabinet being 62in (157.5cm) high, 23in (58.5cm) wide and 26in (66cm) deep. The interface features 110-9,600 bits/s data rate, with a buffer capacity of 2,400 characters.

This article also reveals that NATO have been using meteor-burst equipment ("Comet") for over 12 years, presumably based on the Project Janet work. The US Department of Agriculture has a "Snoonet" meteorological meteor-burst system that collects data on snow, rain etc from remote sensors, and it is possible that it was for this system that the Telecom equipment was initially developed (although that is purely a guess). G8HHO comments: "I was amazed to read of this mode being used for specialized professional communications."

With the aid of reasonable antennas and full legal power transmitters it would seem quite feasible for amateurs to exploit such systems on vhf or uhf bands now that the technology for Amtor has been developed to its present stage. After all, even the domestic tv set is served by teletext systems (Ceefax and Oracle) in which information at an average rate of 50,000wpm is transmitted in 50 μ s "bursts" 200 times/s at almost 7Mbit/s. Generally speaking, I have never been convinced of the value to amateur radio of really high speed data transmission, but ms "burst" transmission would appear capable of yielding a traffic capacity roughly equivalent to a normal rtty channel, to provide a unique form of reliable vhf communication over a range of about 1,000 miles. An interesting challenge that deserves to be accepted by some enterprising group of amateurs!

Efficient stripline power amplifiers

A number of designs for 144 and 432MHz high-power amplifiers using $\lambda/4$ anode lines have been described, including the popular "W2GN stripline kilowatt" for 144MHz using two 4CX250B valves (*Ham Radio* October 1977) and also a coaxial line 432MHz amplifier in the *RSGB VHF/UHF Manual* (3rd edn). Jan Martin Noeding, LA8AK, points out that in such amplifiers the anode-line decoupling capacitor is a crucially important component, and that in the original designs the value tends to be too low for optimum efficiency.

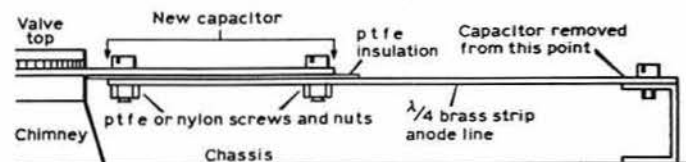


Fig 8. Modification to the W2GN "stripline kilowatt" power amplifier (adaptable to other amplifiers using $\lambda/4$ lines) to improve efficiency

Work by Karl Weiner, DL8KH (*UHF-Unterlage, Gesamtausgabe-Starrhilfe für den UKW-amateur*), LA6VM, LA1TN and himself has shown that it is quite possible to increase efficiency of amplifiers using $\lambda/4$ lines (although not those with $\lambda/2$ lines where there is no equivalent decoupling). The modified arrangement, as shown in Fig 8, moves the capacitor to the "hot end" of the line and offers the additional advantage that the tuning and output links "see" only earth potential.

The modified VK2ABQ antenna

Les Moxon, G6XN, mentions that for the modified VK2ABQ array (77 May 1980) even the spacings quoted there, though much greater than used originally by VK2ABQ, are on the low side. He has since found that about 20-24in (50-61cm) seems to be about right for 14MHz, but the interactions between elements for different bands can take subtle forms (eg affecting the coupling). He considers it best, if possible, to use relays to disable any element that has an observable effect on the current flowing in elements for other bands.

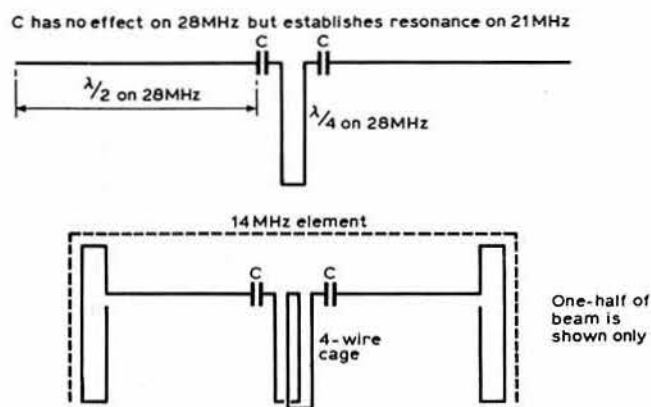


Fig 9. Use of combined 21/28MHz elements in G6XN's modified VK2ABQ three-band beam antenna

However, G6XN finds that he can get away with using two-band elements for 28/21MHz based on a 28MHz collinear pair, concertinaed to fit the space formed by the 14MHz elements, roughly as shown in Fig 9. Very tight coupling (*à la* VK2ABQ) is needed between these elements. In his experimental arrangement, G6XN uses two 600Ω open-wire feeders with passive switching between the 28/21 and 14MHz elements.

Those coaxial connectors

The recent notes on soldering PL259 plugs to coaxial cable have indicated that this whole subject of rf connectors is still, for many of us, shrouded in some mystery. In *rf design* (September/October 1980), Allen Nemetz, of Amphenol, provides "A designer's guide to rf connector selection" that sheds a good deal of light on these useful, if at times infuriating, plugs and sockets. RF connectors have spawned a very large family since they were first developed in the 'thirties and forties for radar. While some of the article is concerned specifically with Amphenol devices, much of it is of general interest; as the following brief notes may indicate.

Currently there are three main categories of interest: those for use with standard cable, such as the "uhf" type including the PL259 plug and SO239 socket; the BNC miniature connectors; and the subminiature types (not in wide use by amateurs) such as the SMA series. However, there are quite a number of other varieties, including precision components used in some professional equipment.

The "uhf" series date from the earliest days as the first true coaxial connectors; even today the PL259 plugs are the most widely used coaxial connectors, with the cb industry having given them a fresh lease of life. The PL259 plug is designed for RG8-type cable, but two adaptors allow it to be used on RG58-type and RG59-type cables. Since soldering the centre contact of the PL259 is recognized by the industry as being by no means simple, Amphenol have adopted a "field crimp concept" to eliminate any need for soldering. These devices have a peak voltage rating of 500V and are recognized as not being weatherproof. It should be appreciated that these connectors were originally designed before there was any recognized requirement to maintain the impedance accurately through the connection; they are "nominally" 50Ω but perform satisfactorily on both 50 and 70Ω cables up to 500MHz with low vswr. It should be appreciated that it is not until a small impedance variation approaches one-fiftieth of a wavelength that the signal begins to "see" the discontinuity.

The N series of connectors are credited to Paul Neill at Bell Laboratories during the second world war. Unlike the "uhf" series these have screw threads. The early N-series connectors were also suitable for use only up to about 500MHz, but major improvements were introduced later, and modern N-series connectors are suitable for use up to 11GHz with constant 50Ω impedance. These connectors are quite widely used in professional communications equipment. An N-series connector can be used with 70Ω cables at frequencies below about 300MHz.

A C-series connector (the "C" came from Carl Concelman) is a constant 50Ω unit basically similar to the N series but with a bayonet lock and able to handle more power.

The most popular connector for "miniature" cables is the BNC series (the BNC is said to stand for Bayonet-Neill-Concelman). These can be used with such cables as RG58/U, RG59/U and RG62/U. They are currently made in forms suitable for several cable affixment styles such as crimp, clamp and solder. Modern BNC connectors can be used up to about 4GHz, although early ones were meant for use only up to about 300MHz. The TNC series is a threaded version of the BNC.

Of the other types, SMA are semi-precision subminiature connectors made in several versions, for use from dc to 18GHz; they are less costly than the true "precision" types, some of which are now capable of resonance-free performance up to 34GHz. Because cost rises pretty sharply for such characteristics, it will usually be found wise not to over-specify requirements. It will also be seen from these notes that important variations exist within the same "family" depending on when they were manufactured and whether they are meant to be soldered or crimped to the cable.

Antenna direction indicator

An antenna direction indicator with an array of 16 light-emitting diodes to form a mimic diagram appears in *Radio ZS* (December 1980, p9): Fig 10. The indicator functions by connecting either the mast or the antenna motor shaft to a multi-turn potentiometer so that the voltage at the slider of the potentiometer is proportional to the directional position of the

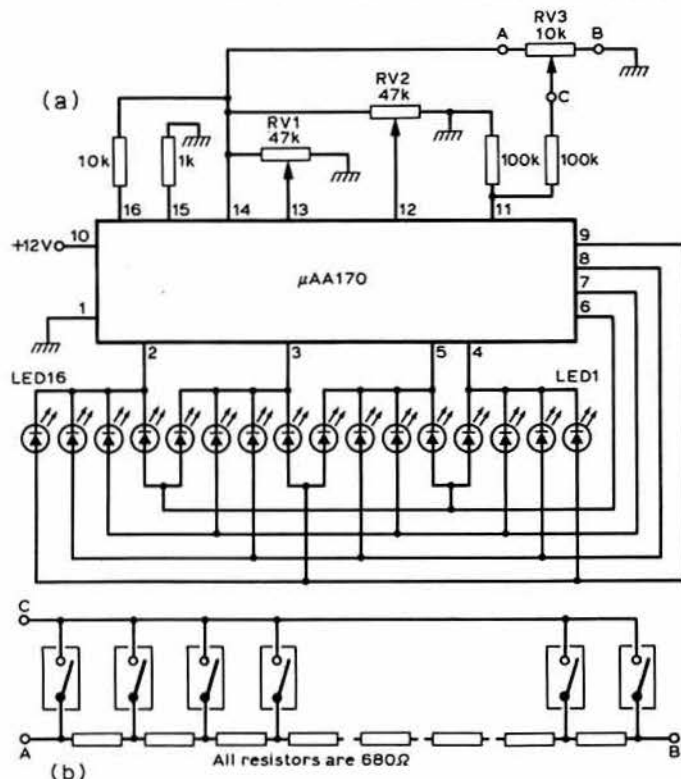


Fig 10. (a) Antenna direction indicator using 1-to-10-turn potentiometer coupled to mast or motor shaft. (b) Alternative sensor using reed switches with a magnet fastened to the mast

antenna. This voltage drives the l.e.d. array using a UAA170 ic, with additional potentiometers to control the settings of the first and last l.e.d. With a 10-turn potentiometer it may be convenient to attach this to the motor shaft (before the reduction gear) rather than to the mast itself. Set the potentiometer mid-travel and connect it to the motor. Turn the antenna until it points south (mast shadow at noon) with the first l.e.d. arranged to be the south-pointing diode; adjust the appropriate potentiometer until this lights up. Then turn the antenna through 180° and adjust the other potentiometer until the ninth l.e.d. lights to indicate north; all lamps should then be correct. The power supply for the UAA170 does not need to be stabilized since this ic has an internal reference voltage output, pin 14. As an alternative to the geared potentiometer it is possible to use reed switches with a magnet attached to the pole, as suggested some years ago by G3YCI and G3KGA (*ART*) and as indicated in Fig 10(b).

SWL NEWS



Bob Treacher, BRS32525*

SWL contest

The rules of the Cray Valley RS 11th SWL Contest appear in "Contest news" in this issue. The multi-operator section is particularly suitable for clubs and groups which perhaps find it difficult to cater for their listener members; they could, perhaps, organize a station with decent antenna systems for their swls to use. This year the society has publicised the event further afield and hopes that this will promote activity in the USA, Australia and Japan to give the contest a really worldwide flavour. Anyone interested should contact G4DFI.

Your scribe hopes to receive the results of the White Rose LF Contest, held earlier this year, in the near future.

144MHz activity

With the onset of summer, vhf conditions should soon be worth reporting. Stations at greater distances can be heard because of sporadic-E and tropospheric conditions and the swl can provide an important service in reporting the extent of the openings and the sort of distances which could have been worked. Judging from comments in the past, we have some listeners with extremely good receiving set-ups on vhf, and some excellent locations which favour vhf reception. Your scribe would like to receive reports from readers about any good dx openings which might occur during the next few months. Please do not forget to give the QTH locator as it is this which signifies how good the dx actually is. For those interested in vhf awards, an scribe to G5UM will produce details of the Society's swl vhf award programme.

The best dx opening to report this time occurred in mid-April, when several listeners reported LA6HL on 144MHz ssb at around 1900.

DX news

The traditional "quiet" period of the dx year, with the bands showing typical summer conditions, is now with us. Dxpeditors in June should, hopefully, have included a trip to ZM7 by VK9NS, VK2BKD and VK2BJL, one to Descheo Is by KP2A, WB8ZJW *et al*, and also trips to SV5 by SV1JG, and C31VF by F6EXV, which may have provided a new country or two for swls' logbooks.

It seems that everyone heard ON5NT using the call TYA11, which was wrongly issued to N4HX, because the authorities thought he was to set up a commercial radio station—whoops! Another one mentioned by several reporters is M1IPA, aired by a group of French amateurs around the middle of May. YLIP, also mentioned, seems to be on Franz-Josef Land (UK1) and is manned, if that is the right word, by a yl expedition! Our own GB11ARU falls into the category of an exotic callsign being the only one so far issued with a GB1 prefix and a four-letter suffix, and the QSL card, via G3LQI, is well worth having.

Most reporters mention various other snippets of good dx during May. Harold Moss, BRS18529, picked out JT0YFU on 21MHz, 8J3ITU on 14MHz, and ZD8RH on 7MHz. It seems that the operator ZD8RH is a reasonably-close neighbour of Harold's when he is in G-land. For those waiting for a QSL card from VP8AHS on Adelaide Is, Harold warns of a long delay. He will not be in a position to answer QSL card requests until he returns home to the Falkland Is at the end of the year, and the cards should be despatched by April 1982. He quips, "who says the bureau takes a long time?"

Derek Casson, BRS41992, reports that he has already beaten his 1980 score on 3·5MHz and feels his best dx so far is 5V7HL and PA0WAY/A6. Basil Woodcock, BRS44266, was looking forward to his trip to W/VE, but this time he reported 5U7BE and 9M2FR as his best dx. Brian Wainwright, BRS44703, is progressing well in this year's countries table and provides a good list of stations heard recently, including KH3AB, ZK1AR, TL8CN and XT2AZ.

Brad Bradbury, BRS1066, reports his latest QSL additions—CE0AE, FH8CO, HH2VP, J87BN, TG4NX, VE7AAZ/4U and YB3MD—and they all made pleasant additions to Brad's confirmations list.

1981 hf countries table

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS14585	168	158	159	103	110	11	709	ssb/cw
A8808	166	148	140	105	95	34	688	ssb/cw
BRS48909	158	176	183	71	55	18	661	ssb
BRS8841	133	145	186	95	82	5	646	ssb/cw
RS42604	128	144	121	115	111	15	634	ssb
BRS1066	125	133	139	81	61	33	572	ssb/cw
BRS44703	121	101	107	89	79	0	497	ssb
ARS42503	91	104	120	28	38	0	381	ssb
BRS40705	95	85	92	31	24	1	327	ssb
BRS18529	48	45	84	60	66	20	323	ssb
BRS44266	113	50	105	27	9	10	314	ssb
BRS41992	48	44	101	55	47	15	310	ssb
BRS35509	48	54	83	38	25	1	249	ssb
ARS41349	44	73	51	25	34	2	229	ssb
RS44218	75	42	58	21	16	0	212	ssb/cw
AS191	56	33	60	26	29	3	207	ssb/cw

John Ralph, BRS44000, seems to have a soft spot for callsigns starting with "V". In his report, he lists QSL cards from VK0AS, VP8ZR, VR6TC and VU2KT, and mentions logging VP8AGX, VP8DQ, VP8QI, VP8ZR and VQ9AA. Can anyone beat that in a month?

Robert Small, BRS8841, has been benefitting from an 18AVT vertical put up by his father, G3ALL. Comparing this with his dipoles, Robert reports signals three S-points better on 7 and 3·5MHz; on 14MHz, signals were similar to those from the dipole; while on 28 and 21MHz, signals from the vertical were weaker. They are both awaiting the autumn conditions on 3·5MHz to really put the vertical through its paces. Kingman Reef was the pick of the month for Robert, AD0S/KH5K being logged on 14MHz. On 21MHz, 3B8AE/3B9, 9U5JM and A7XE were the best of the bunch. In May, 21MHz was at its best during late afternoon and early evening, with stations from AP2, VS6, YB0, DU, 9V1 and VU2 being copied at good strength. In the May issue, G4CYW mentioned QSL returns; Robert says he has a return of 40 per cent via the bureau and 60 per cent, direct. It will be interesting to see how others compare.

Mark Rogers, RS46276, has a new 150ft long wire at 30ft to replace his 66ft wire. He has noticed a remarkable difference on 1·8MHz and has now heard 50 countries on the band on his KW202. His thoughts have now turned to constructing a beam for 14 and 28MHz (May 81 *Rad Com*, p427), which will obviously improve his dx capabilities on those bands.

Paul Crankshaw, BRS48909, reports his disappointment of the month as not even hearing the Palmyra/Kingman Reef expedition being worked, let alone actually hearing AD0S/KH5 and KH5K himself. Also, in the same category, not hearing KC61N (Eastern Carolines) on 21MHz—who, it seems, had been appearing regularly on Wednesdays and Sundays on 21,230kHz at 1500—and the continued getaways of VK2AGT/LH. However, every cloud has a silver lining—so they say—and Paul does report T32AB on 14MHz for a new one. Also noted and of interest, were A22PH, a yl operator, on 28MHz; 6T1YP, FR7AI/G, JDIALZ and 7P8BJ on 21MHz; and A35UW (via ZL2UW), FK8DV/M and AH8A on 14MHz.

Michel Delvaux, ARS42503, rang your scribe while this piece was on the production line. He reports having some fresh QSL cards printed, which he hopes will improve his success rate, and he commented on poor daytime conditions (there was much in the way of disturbed conditions during early May, in particular). However, from a fairly ordinary month he picked JS, TL8 and TR8, all on 21MHz, as his best catches of the month.

Newcomers

A welcome to Arthur Jenkinson, BRS41932, who uses an FRDX400 with an 140ft long wire at 40ft. He is a member of Raynet and the RAIBC. Jonathan Kempster, RS45205, uses a FRG7 when he is at home, but most of his time is spent /A in Ipswich, so his listening time is much curtailed. However, he mentions 5Z4RT, YC2BJS and OH3JR/O/0, among others as his best hf band dx. Dave Farrow, RS46751, has been interested in radio for some 11 years, but has only recently discovered the amateur bands via the broadcast bands. He has three receivers, and long wires to cover all bands. The majority of his listening is done on 14MHz especially during early morning hours around 0430. He has logged C6ANU, J73CB, KV4AB, TI2AV and XQ3VA (Chile) at around this time of day.

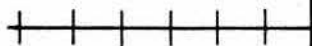
Nigel Fairbairn, RS44218, has a TS515 and has logged many interesting and exotic callsigns. Perhaps his best to date was HZ1UN being operated by a Saudi-Arabian prince. He is now anxiously awaiting a QSL card through his manager, I8YCP. Nigel planned to take the RAE, along with his father, on his birthday in May; they have been receiving tuition from G8YDC.

Finale

Next deadline is Tuesday 14 July. Do not forget to update those all-time scores; and remember that the late copy date this time is 22 July. ☐

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4 - 2 - 70



John Morris, G4ANB*

Aurora

It appears that the massive auroral event on 12 and 13 April reported in last month's 4-2-70 has produced better radio results than was at first thought. G8TFI in Middlesex heard many stations, mainly in the UK, and worked GI4GVS (XO21b) and GM8DMZ (XP48e) at 1710gmt on 12 April.

For GM4ILS in Elgin the event started at about midday with contacts with DK1KO, GM4IPM and GM8MBP. There were no further contacts until 2250gmt, when the DL0PR beacon (EO54c) became audible, followed by SK4MPI (HU46d). The event grew steadily into the small hours of the morning, and among the dx worked by GM4ILS were UR1QA (NI36a), OH3MF (MU13j), OK1MG (GK73a), UP2BFR (LP19b), SP2AOZ (IO44f), UR1R1, and SM0SAX (J151b). In total GM4ILS made over 80 contacts, all on cw. The visual effect was also remarkable, spreading from horizon to horizon, with a curtain of light directly overhead.

Although the event was very disappointing for many operators, unconfirmed reports indicate that distances well in excess of 2,000km were worked by Russian and Continental stations at about 0700gmt on 13 April.

The Space Environment Centre at Boulder in Colorado has requested information on the effects of this event on general hf band operating as well as auroral activity on the vhf and uhf bands. Any unusual phenomena during or just after the event would also be of interest. The Propagation Studies Committee would appreciate a special effort due to the unusual nature of this period, and anyone with any information is requested to send details to G2FKZ or to telephone him on 01-856 6816.

GM4IHJ in Fife noted several minor events during the second half of April. DL0PR was audible between 1607 and 2039gmt on 20 April and from 1750 to 1948 on 26 April.

Tropo

Many vhf/uhf operators refer to localized short-lived tropospheric lifts as "ducts". Whether this is strictly accurate may be open to some doubt, but Peter Burden, G3UBX, believes that the opening of 15 April could well fall into this category. When G3UBX arrived at his Wolverhampton home for the holiday weekend he was pleased to find 432MHz open, and worked 18 Continental stations, 12 of which were in DL and CL locator squares. The remainder were in adjacent squares, with the exception of DG4BB (EN76e).

For Chris Easton, G8TFI, in Middlesex, the good conditions started on 14 April, with OZ5BZ (EP17h) and OZ2OE (EP10f) on 432MHz, and OZ1CTC (EP06j) on 144MHz worked between 2035 and 2104gmt. The following day brought a very nice piece of 144MHz dx in the form of LA6HL in the rare locator CS09g at 1938gmt. Very weak cw signals from LA6HL were also heard on 432MHz, but there was no response to G8TFI's ssb call. During the evening very strong 432MHz signals from DF3XU (FN square) were audible for over an hour. The equipment used by G8TFI on 144MHz consists of an FT225RD with Mutek board, and a homebrew 4CX250B linear feeding 200W to a 14-element at 10m agl. The 432MHz line-up is a Belcom LS707 with a gasfet preamp and homebrew linear giving 200W to an 88-element at 12m agl.

Steve Cottis, G4KMH (ZN03h), stayed on 144MHz on 15 April to work numerous Dutch and West German stations in CL, CM, DL, DM and EN locator squares. The best dx was DF7VX (EL24c) at 2250gmt.

Both G4KMH and G8TFI found 144MHz open on a north-south path on 16 April. Among the highlights for G4KMH were LA1EKO (BQ37g) in the Eko Fisk oilfield, GM4FNE (ZU26g) and GM4LER/M in the Shetlands. All but one of the contacts were made using 80W of ssb to a

12-element ZL Special. The exception was GM4LER/M who was on fm using a 7λ/8 whip.

The good conditions gave Dave Coomber, G8UYZ, in Leeds, a welcome opportunity to use his newly-acquired TS700 and homemade seven-element ZL Special. On 14 April PD0IFC (CL03j) and PD0JAQ (CM72f) were worked, both using horizontally-polarized fm. G8UYZ described the speed with which one of these stations sent a QSL as almost breathtaking. Unfortunately, returning the favour is a bit more difficult, as G8UYZ cannot read the handwriting on the card! (There is a lesson to be learnt here for those who send cards direct for dx contacts.) The following two days brought several contacts with France and the Low Countries, as well as some UK dx. The contest on 2 and 3 May proved to be a happy hunting ground, with many new squares and counties waiting to be worked.

It is worth noting that G8UYZ's contacts were all made using 10W and a moderately-sized antenna. This demonstrates that although high power and massive antenna arrays are useful for working dx, they are by no means essential. Patience and good operating techniques are worth at least 10dB, on transmit as well as receive, and the lessons an operator is forced to learn while running low power will stand him in good stead whatever equipment he uses.

144MHz eme

"Hoppy" Hopkins, G5CSZ, who is well known to regular readers of 4-2-70 as an enthusiastic 144MHz eme operator, has now left his Yorkshire QTH and returned to Texas and to the callsign W4FAY. During 1979 and 1980 G5CSZ worked 55 stations by eme on 144MHz, including 26 states and all 10 call areas of the USA. Including tropo and auroral contacts, 20 countries were worked during the two years. Some of the highlights were W6PO in California on 29 July 1979, N7NW in Washington on 9 September 1979, and JA6DR on 18 May 1980.

W4FAY hopes to be operational on 144MHz eme from Texas by the end of the summer. The equipment will include a Dexcel 3501 preamp, 8877 pa, and 160-element colinear. Between his amateur radio activities W4FAY is working on the Space Shuttle project at the Johnson Space Centre as a data flow engineer for the orbiter down-link telemetry data. Readers will no doubt be envious when they hear that Hoppy returned to Houston in time to participate in the first orbital test flight of the shuttle.

The callsign G5CSZ has not been permanently retired as W4FAY is hoping to make another trip to the UK in about five years' time. Until then he will be participating in the 144MHz eme net held on 143.45MHz each Saturday and Sunday at 1700-1800gmt and will be looking for contacts with his UK friends both there and off the moon.

Chris Bartram, G4DGU, in north Devon recently set up a 144MHz receiving system to listen for signals reflected off the moon. Using a single 16-element Yagi and an FT221R fitted with the Mutek board, G4DGU copied very good signals from GW4CQT, W7FN in Washington, and K1WHS in Maine. It is hardly surprising that G4DGU was able to copy K1WHS, considering the size of the antenna array used by that station — 24 14-element Yagis. In fact K1WHS has also been heard recently by fellow scribe G3WDG and his wife G4KGC, both of whom positively identified signals from K1WHS using only a three-element quad, and with 10m of UR67 coaxial between the antenna and 2dB nf preamp!

432MHz activity

A recent letter from G3UBX contained the following comment, suggestion and observation: "Complaints are sometimes voiced by distant operators that they never hear anything on 432MHz and nobody ever beams in their direction."

"There is a simple answer to this problem and that is to organize schedules with well equipped, more centrally located stations. A frequency reasonably far away from the calling frequency should be selected and a transmission schedule arranged. For example, one station will start transmitting first and will then send/listen on a 5min on/5min off basis for an hour. Do not expect immediate success or signals consistently above noise."

"Also of note is the consistent signal from GM4IGS (XP37c) operating from near sea level in Troon at a distance of 370km (from G3UBX). This result gives a very good indication of what can be achieved on the band under normal conditions."

Repeater news

The repeater scene has been unusually quiet during the month under review, with just two new units having been reported. These are GB3SS (R0, 16km south-east of Elgin), which was due to come on the air on 27

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May, and GB3WG (RB6, Port Talbot), which came into service on 3 May.

GB3WG is intended as a fill-in unit for the Neath and Swansea valleys, and the Port Talbot area. As with most repeaters, GB3WG came on the air thanks to the contributions, large and small, of many workers. The organizers of the project have made special mention of the cavity-building activities of GW8VBG. Located at Baglan, near Port Talbot, GB3WG uses a heavily-modified Pye Westminster running 4W output. Separate full wave antennas are used for transmit and receive, according to the G3VEH formula, and optimum spacing between them gives a measured isolation of 62dB. The cavities follow the RWG specification and the whole system is controlled by the G3RKL logic unit. The call sign is sent every 4min, in high deviation when the repeater is not in use, and low deviation when it is. There is no time out.

The freak snowstorms over the weekend 25-26 April meant that the Leicester Repeater Group had to make special efforts to maintain service by GB3CF (R0, Leicester) and GB3LE (RB4, Leicester). The repeater site lost all mains power early on the Sunday, but despite very bad weather conditions the stand-by batteries were maintained and a float generator provided to ensure continuity of service. The group has thanked users of the repeaters for restricting their traffic to essential messages during this critical period when members of the Leicestershire County Raynet Team were at stand-by, ready to assist with emergency communications during the subsequent flooding in the Soar and Wreake valleys.

GB3WL (R1, west London) is now operational again. The RWG has received a proposal for a vhf repeater in central Wales, and has provisionally allocated Ch R3. A special one-off proposal for a new 145MHz repeater, GB3VA, to be located at Brill, between Oxford and Aylesbury, has been submitted to the Home Office. If and when a licence is issued for this unit, GB3WH (R4, Abingdon) will move to a site near Swindon and change to Ch R2, leaving R4 for GB3VA.

Plans are now well advanced for the production of maps of the RSGB vhf and uhf repeater networks. The maps will be published in the form of a card, with the 145MHz network shown on one side and 433MHz on the other. Those who have seen proof versions of the maps say that the final result should be far superior to that produced by a certain rival publication.

Expedition plans

Telford & DARS will be going portable again this summer with operation from Barra in the Western Isles planned for the period 29 July to 5 August. The call signs GM4AUY/P, GM3UKV/P and GM3ZME/P will be used for ssb and cw operation on 70.225 and 144.325MHz. Sites permitting, operation will be from WQ locator square for the first three days, and from WR square for the rest of the trip. 7.050MHz±QRM will be used for co-ordination and talkback, as well as daytime contacts. Skeds will be welcomed and may be arranged by sending an sae to G3UKV, QTHR, or by telephoning him on 0952 55416.

G8MFJ and G8JVM are rumoured to be planning a high-power vhf/uhf expedition to the Republic of Ireland between 2 and 10 September. They hope to be operational on 144 and 432MHz, as well as some of the microwave bands, using sites in WL, VL and UL locator squares. Details of the call signs and frequencies to be used are not known at the time of writing.

Propagation warnings on beacons

Mike Warrington, G4EMW, read with particular interest the item in May's 4-2-70 describing the possible use of beacons to carry propagation warnings, as he and several others are involved in the production of an auroral warning beacon, GB3MLY, which will operate on uhf in place of the old 432.91MHz unit, GB3EM, at Emley Moor in Yorkshire.

The intended hardware for GB3MLY may be subject to several changes before the project is completed, but the present plan is to use two microprocessors. The transmitter will be controlled by a 6808-based system, which will be programmed to key the beacon and monitor power levels and swr. A 6809-based system will be the more important of the two computers, and will be used for gathering and assembling the information to be transmitted. It will have a high-speed link with the 6808 system.

The source of data will be a vhf receiver listening for signals from the SABRE auroral radar which will be operational from Wick in Scotland later in the year. This radar is a joint project of the Ionospheric Physics Group at the University of Leicester and the Max Planck Institut für Aeronomie, Germany. The receiver will be controlled by the 6809 system, which will also log on cassette tape the times of auroral openings, their duration and strength, and other related data.

A two-processor system has been chosen to allow the beacon to remain

operational, without propagation information, while program development takes place with the 6809 system. This is important in view of the experimental nature of the project and the likelihood of extra features being added at a later date.

The propagation information will probably consist of a simple morse message of only two or three letters transmitted occasionally after the beacon call sign to give a brief indication of conditions, with a more extensive report sent in either rtty or ASCII at 5min intervals. The current feeling is that rtty will be used, as ASCII would only be of interest to those with computers, which could also be programmed to copy the rtty.

A project of this nature would be greatly assisted by having a data link to the beacon for adding extra information. This could either be a radio link, or a telephone with an auto-answer modem. Each of these has several advantages and disadvantages. A radio link would be open to interference, but could be implemented cheaply and easily as most of the necessary hardware would already exist. A telephone system is perhaps the best solution, but this would incur an annual rental bill of about £100.

It is hoped that GB3MLY will come on the air without the auroral information during the next few months, and that an initial form of the complete system will be operational before the end of 1981. Both G4EMW and G4ANB would be very interested to receive any comments and ideas on this and related projects.

Synthesized speech on repeaters

May's *Rad Com* carried a fascinating article by G3WRT describing the ingenious adaption of a "Speak & Spell" teaching toy to give announcements in synthesized speech on uhf repeater GB3CE (RB14, Colne Estuary). Besides being technically interesting this experiment raises the question of whether such features on repeaters are desirable. The Repeater Working Group and VHF Committee of the RSGB recently discussed this topic in the light of the results from GB3CE, and came to the same old conclusion—the simpler the better. As G3WRT's article indicates, the use of machine-generated speech on repeaters is not thought to be particularly useful, especially on the busy machines on 145MHz.

A few moments thought about the basic purpose of repeaters reveals the reasoning behind this conclusion. Voice relays on vhf and uhf are designed and licensed to aid communication by mobile stations. For a repeater to perform this function most effectively the machine itself should be unobtrusive, allowing contacts to proceed in a natural manner and with as few distractions for operators as possible. A "K" or "T" tone at the end of each over is vital to indicate that the input is clear, and the licensing authorities rightly insist on the transmission of some form of identification. Warnings of signal faults, such as over-deviation or frequency error, can also be useful, but beyond this any additional complexity is probably superfluous, adding little or nothing to communication efficiency.

There may be some deep psychological reason why call sign announcements in speech are more distracting than those in cw. The simplest explanation is that somebody listening to a repeater is expecting to hear the voice of another operator, and the sudden presence of artificial speech can completely confuse that marvellous filter network between the ears which will quite happily reject morse code in the same circumstances.

Whatever the reason, this seems to be a case of technology finally having caught up with, and even overtaken, operating practice. Current vhf/uhf phone repeaters perform the task for which they were intended quietly, simply, and given a little co-operation between users, efficiently.

Any group considering the introduction of a novel operating feature on a repeater should first contact, via the RSGB, the RWG, who will be able to offer comments on its desirability and advice about the licence conditions.

Midlands VHF Convention

Details of the programme of the Midlands VHF Convention 1981, which has been arranged for 10 October, are now available. The venue is to be Wolverhampton Polytechnic, and the convention will open at 11am. Attractions will include a vhf/uhf noise figure measuring competition, trade and special interest group stalls featuring items of particular interest to vhf and uhf operators, raffles, film shows, exhibitions, and a series of specialist talks. The single lecture stream will include: "VHF sporadic-E propagation: theory and practice", by Prof M. Harrison, G3USF; "The principle and operation of the Plessey Groundsat common channel repeater", by Mr C. K. Richardson, G3NAE, of Plessey; and "The design and construction of high performance vhf receivers", by Mr C. Bartram, G4DGU, of Mutek, and Dr I. White, G3SEK.

Snacks and refreshments will be available on the convention premises at lunchtime, and during the evening a buffet supper will be served and a licensed bar will be open.

Tickets are now available, at £1 for the convention only, and £3 for the buffet only, from G3UBX, QTHR. In order to preserve a pleasant atmosphere in which vhf enthusiasts can meet each other attendance will be strictly limited and advance purchase of tickets is therefore very strongly recommended.

G4ANB definitely intends to participate in this new event, especially in the light of the promise by the organizers that they will "do their best to ensure that the bar is fully stocked with draught beers".

Awards

Shortage of space in last month's 4-2-70 meant that the awards news had to be held over, and so this month there is a double helping. Starting with the 4-2-70 Squares series, the first 70MHz 6+25 sticker to be issued has gone to Pat Moore, G3IKR. This is only the second 70MHz Squares Award to be issued, the first also having gone to G3IKR for working four countries and 20 squares. Who will be the first operator to keep him company in this category?

The absence of the well-known callsign G3BW from the lists of 144MHz Squares Award winners may have puzzled those who know Bill Hodgson of Whitehaven as a dedicated vhf dx operator. The answer was made plain to the vhf awards manager when a packet arrived containing more than enough cards to put G3BW straight into the 144MHz 20+100 category at No 6. In fact the package contained QSLs for no less than 24 countries and 104 squares, including such exotica as Hungary, Poland and Finland. This sort of success can only be achieved by using all of the available propagation modes. Analysis of the G3BW claim showed that 31 of the confirmations were for auroral contacts and no less than 41 for ms exchanges. The same message was implicit in the claim by GW4EAI for 144MHz 20+100 sticker No 7, which included cards for three contacts made by aurora, 16 by sporadic-E, 11 by ms, and the remaining 70 by tropo.

In the lower categories of 144MHz Squares Awards, 15+60 stickers have recently gone to G3XDY, G4JZF and G8VR, while the basic 10+40 Award has been claimed by G8LZM, G4EUE and the station of the Wakefield Club, G3WRS/P. 432MHz Squares certificates for working six countries and 30 counties have gone to G3PBV, G3XDY and G8LZM.

Within days of the announcement of the new, higher categories of squares awards (May 4-2-70) the first claim for the 432MHz 15 countries plus 70 squares sticker was submitted by Mike Lee, G3VYF, of Essex. In an accompanying letter G3VYF commented that the new categories are too low, as he knows of several UK operators who are well beyond the 150 squares ceiling on 144MHz already. The answer to this is that the squares awards series will almost certainly be extended even further as soon as the new top categories are claimed. The nature of the awards means that they can be extended indefinitely—at least up to the limit of the 32,400 2° by 1° areas which cover the whole surface of the earth! While welcoming the new 70, 80 and 100 squares categories on 432MHz G3VYF also asked: "Why no 90? Restricted propagation modes on this band (some aurora, possible ms in major showers) make it difficult to work anything new after about 90 or so squares. To push this up to 100+ suggests extreme optimism." This is a valid point—do any other readers have comments?

Moving on to the Four Metres and Down Awards, a claim by Denis Jones, G3UVR, for 70MHz Senior No 46 represented virtually a history of the band. Among the cards for nine countries and 66 counties (only six plus 60 are required) were such fleeting rarities as GB2GC on Alderney and ZB2BO. All of the contacts were made before 1970, 27 by cw and the rest by a.m., with not a single ssb entry. The cards came to light when G3UVR began to dig into his archives after house moves and a long period of inactivity.

On 144MHz Bryn Llewellyn, G4DEZ, took less than two years to collect the cards for FMD Senior No 163. Standard awards on this band have gone to GM8TSI and GW8TVX.

Sue Firth, G8SFI, of York is near to being the first woman operator to achieve the Supreme Award. During April she took 432MHz Senior No 74, along with a 1,296MHz Standard, leaving just the 144MHz Senior required for the gold leaf certificate. 432MHz Standards have gone to G8PWX and GM8TSI/P. The latter claim was notable in that 17 of the 20 counties on the claim form were worked during the April 432MHz contest this year, less than a month before the claim was submitted.

Apologies to Steve Cottis, G4KMH (ex-G8TFR), whose callsign was misprinted in previous awards news. G4KMH holds 144MHz FMD Standard No 562 and 10+40 Squares award No 34.

New members interested in the various vhf/uhf awards offered by the RSGB are advised to borrow a copy of the December 1980 *Rad Com*, in which details are printed on p1305. Alternatively, an sae to the VHF Awards Manager, G5UM, 27 Ingarsby Lane, Houghton-on-the-Hill, Leicester, will bring copies of the rules and claim forms.

MS award proposal

Ken Willis, G8VR, has proposed the introduction of an award for successful meteor scatter operation, and has offered several suggestions as to how it could be organized. The basic award could be given for making ms contacts with stations in 10 different countries. This would not be quite as easy as it might appear at first sight, as the restriction to ms implies that the contacts would be beyond normal tropo range, effectively ruling out most contacts between the various countries in the UK, and from the UK to the nearer parts of Europe.

An alternative would be to base an ms award on locator squares, perhaps by offering specially endorsed certificates in the 4-2-70 Squares series of awards. Do readers have any comments on the idea of an ms award, or suggestions about how it should be implemented?

International VHF-FM Guide

The 1981 edition of *The International VHF-FM Guide* is compiled and produced by Julian Baldwin, G3UHK, and Kris Partridge, G8AUU. It is available from J. Baldwin, G3UHK, 41 Castle Drive, Maidenhead, Berks SL6 6DB, price £1 plus 25p p & p for the 64pp "Overseas edition"; £1.50 plus 25p p & p for the 112pp "Domestic edition".

The original edition of this guide has been extensively revised and updated to produce the new 1981 version. The 64-page (of which 12 are devoted to advertising) overseas edition is intended for use by stations outside the UK and Republic of Ireland. Comprehensive lists, with maps, are given of the repeater networks in most of the larger western European countries, including the UK, as well as a few other English-speaking parts of the world. Less detailed coverage is given to many other countries. Along with channels, callsigns and map references, the repeater lists show, where known, the QTH locator, antenna height, power output, time out, access method, and any unusual features of each machine listed. As well as repeater information full details of reciprocal licensing requirements and application addresses are given for most of the countries covered.

The domestic edition contains all of the above plus a 48-page supplement giving a full page to each operational UK 145MHz fm repeater. Each entry includes a coverage map and operational details.

The guide is obviously a labour of love and has been very carefully researched. The level of detail is impressive, and this is probably the most comprehensive compilation of European repeater data available to the amateur.

The need for such a volume must be questioned, especially when the nature of repeater networks is considered, and the guide will be of little practical use in the shacks of most fixed stations. Anybody who does a lot of mobile operation, however, should find the guide useful and the low price makes it a worthwhile investment for those contemplating a trip abroad. The reciprocal licensing details alone are useful in this respect.

The well-produced volume also raises a few questions. How, for example, do the two Norwegian repeaters which run off solar and wind power manage during calm nights? Why did the builders of one UK uhf machine decide on the curious time out period of 4min 28sec? Why does one Swedish unit demand a 5sec-long access tone? These questions are not answered in the guide, but a stroll through its pages can provide a fascinating evening's entertainment for the inveterate browser.

Scatter

The new all-solid-state 70MHz beacon for Gibraltar has been completed and at the last report was being tested by G3VPF. The unit now needs to be transported to The Rock. Is there any reader, perhaps planning a holiday trip to Gibraltar, who can help with this?

Graeme Caselton, BRS44984, recently received a QSL card from a Dutch station showing details of the "Baronie DX Group Award". To claim the award UK stations must work five members of the group. BRS44984 is willing to send out copies of the details of the award in exchange for an sae or two ircs sent to him at 19 Cowden Road, Orpington, Kent.

It is a common phenomenon in repeater groups that most of the work is done by just a few members. This situation may be less extreme in some groups than others, but it is interesting to note that the latest edition of one repeater group's newsletter is headlined "Special Apathy Issue".

In a letter redolent with the aroma of burning cakes G8PTH has speculated on King Alfred's reaction to the news that Wantage, the present location of G4ANB, has been moved from Berkshire to Oxfordshire. Well, whatever the post-mortem rotational state of that monarch, the powers that be have made their decree, and so all news for the September issue should reach G4ANB, in Oxfordshire, by 11 July (late news by 21 July), and for October by 22 August (late news by 2 September) please. □

MICROWAVES

Charles Suckling, G3WDC*

An elliptical to rectangular waveguide transition

G3ZEZ has sent details of an elliptical to rectangular waveguide transition for 10GHz. He has used it to convert from elliptical corrugated "heliwave" type waveguide to WG16. Construction details are shown in Fig 1. A short length of copper waveguide was annealed, and the corners of one end were hammered carefully around a piece of round steel bar. With care it was possible to modify the rectangular section to the elliptical shape of the corrugated waveguide. A flange was made to fit the modified WG16, and a mating flange fitted to the corrugated waveguide. The flanges were then bolted together after careful alignment. Two such transitions are in use on the G3ZEZ 10GHz antenna system, and measurements indicate that the losses in them are very low.

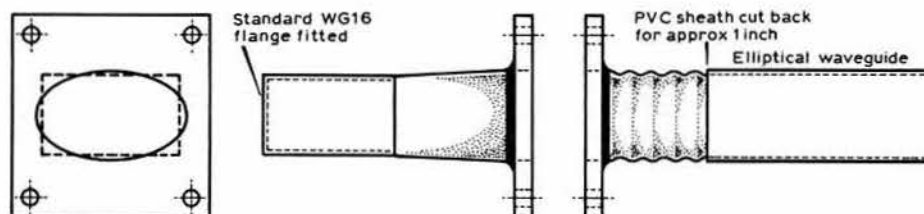


Fig 1. An elliptical to rectangular waveguide transition for 10GHz

Microwave beacon updates

Following a recent circular to all microwave beaconkeepers, the following list of currently-active UK microwave beacons has been compiled.

Call sign	Frequency MHz	QTH locator	NGR	Beaconkeeper
GB3BPO	1,296.83	AM77j	TM251 448	G4FSG
GB3AND	1,296.87	ZL63b	SU379 467	GBADM
GB3DUN	1,296.89	ZL08e	TL044 210	G3ZFP
GB3IOW	1,296.90	ZK34a	SZ494 772	G8IDZ
GB3CLE	1,296.91	YM48h	SO593 866	G3UQH
GB3EDN	1,296.99	YP05g	NT268 706	GM8BJF
GB3NEV	2,304.01	ZL63b	SU379 467	GBADM
GB3LDN	2,304.05	AL41a	TQ435 767	GBAYN
GB3UOS	3,456	ZN42c	SK278 929	GBAGN
GB3IOW	10,100	ZK34a	SZ494 772	G8IDZ
GB3ALD	10,120	YJ30a	CI865 798	G3JHM
GB3LEX	10,400	ZM24d	SK485 108	G8CAC
GB3XGH	10,400	YN57d	SJ567 721	G3PFR

Recent 1.3GHz awards

Within less than a year G3XDY has progressed from his initial 10 squares award on 1.3GHz to 25 squares. An analysis of this latest claim by vhf awards manager G5UM showed that 22 of these were for ssb QSOs and three for cw, reflecting the state of the art on 1.3GHz today. In addition, G3XDY holds a 1.3GHz squares award for portable operation. It is worth restating that separate certificates can be claimed for operation from different sites.

Another recent award for 1.3GHz went to G8BFX for 30 squares confirmed. Among his claim were QSLs from HB, SM and OK!

10GHz cumulative contests

Cold windy weather in April and heavy rain in May undoubtedly reduced participation somewhat in the first two activity periods of the 1981 10GHz Cumulative Contest. Nevertheless quite a large number of contacts were made; serial numbers of 10 or greater were being exchanged by some stations towards the end of both days. This year has seen a startling increase in narrowband activity—some 60-70 per cent of stations active had some sort of narrowband capability. Many new non-optical paths have been worked as a result.

Despite the growth of narrowband activity, most stations are also still equipped for wideband, so there are still plenty of opportunities for contacts for wideband-only stations. Indeed, at least one one-way QSO was made in May between a narrowband-only station and a wideband station, so there never need be complete incompatibility between the modes.

In fact complete compatibility is possible with some modification to both the narrowband and the wideband equipment. First, the use of a Gunn oscillator capable of tuning up to 10,368MHz will ensure that the wideband station can at least receive the narrowband station. Provided that tone modulation of the receiver Gunn oscillator is possible, A1 keying by the narrowband station will be perfectly receivable.

Of course, if the narrowband station can make provision for wideband fm of the crystal oscillator, then a one-way F3 QSO can be made. Unfortunately some Gunn oscillator designs do not seem able to operate reliably at both the common wideband working area of 10,050-10,100MHz and at 10,368MHz. One design which can be thoroughly recommended for tuning reliably over 10-10.5GHz is the G8APP pte screw tuned, iris-coupled oscillator described in *Rad Com* June 1978.

Compatibility in the reverse direction is somewhat more difficult to achieve, because Gunn oscillators are generally not sufficiently stable to be followed on a narrowband receiver. One solution would be to use a tunable 140-150MHz, 250kHz bandwidth, fm receiver (some commercial broadcast receivers cover this range) in conjunction with the transverter, and to follow the incoming signal on the tunable receiver. Again, of course, the wideband station would have to be able to tune to 10,368MHz.

Unfortunately it would not be possible for the wideband station to transmit on the image frequency of the narrowband station (10,080MHz with 144MHz i.f.) as has been suggested, since the transverter will usually have a high degree of selectivity before the mixer, which would reject a signal on 10,080MHz by perhaps as much as 60-70dB!

To summarize, wideband and narrowband compatibility could be improved if all wideband stations were able to receive and transmit on 10,368MHz if required, and if narrowband stations had the capability for transmitting and receiving wideband fm.

Historical note

G3KSU has drawn the writer's attention to the fact that the first microwave QSO across the Channel (albeit a professional one) took place just over 50 years ago, on 31 March 1931. The experiment was conducted by engineers from ITT laboratories in Britain and France on a frequency of 1.67GHz. Unfortunately no details of the equipment used are available, although it is known that 3m dishes were employed at both ends of the Dover-Calais path.

High power from Holland on 3.4GHz

G3ZEZ reports that PA0JME is now active on 3.4GHz using 10W rf output from a twt. During a recent lift PA0JME was heard at 59 by G3ZEZ; unfortunately the 300-400mW at G3ZEZ was insufficient to be copied in the reverse direction. G3ZEZ notes that PA0JME is also active on 1.3 and 2.3GHz.

Amateur Radio Awards (2nd edn)

This book, now revised and updated, contains details of most of the popular hf awards from all parts of the world together with details of several swl and vhf certificates.

Country, prefix and zone lists, and maps, are given where appropriate, and many photographs of certificates are included to whet the award hunter's appetite.

80 pages; paperback; 246 by 184mm; 1980

*46 Windsor Close, Towcester, Northants.

THE MONTH ON THE AIR

John Allaway, G3FKM*

The new amateur bands

Next year we will have a new hf band, and in a few more years a further two new bands. Are we going to have eight-band DXCC, WAZ, WAS, etc? Surely expeditions cannot be expected to work all eight bands on both cw and ssb and then give out as many as 16 QSL cards to the more active dxers? The new band structure will result in there usually being two or more bands open at any one time in any particular country. The individual contest operator is going to find it quite difficult to monitor all bands for new multipliers. Looking to the future we can expect further parts of the hf spectrum to be allocated to amateurs. In short it appears that hf operating techniques must change and the concept of band endorsements/entries be revised.

Even with the present bands modern equipment has made working DXCC relatively easy, and doing well in contests more a matter of endurance than superior equipment—after all, isn't everyone 599? The new bands will enable more real communication as opposed to report swapping, and more room for propagation experimentation.

For example, in the past, changing bands was quite a complicated affair requiring several controls on both receiver and transmitter to be adjusted. Modern solid-state transceivers allow virtually instantaneous band changing when coupled with a multiband antenna which enables continuous switching of bands to optimize the propagation path between two stations. Eventually this might be controlled automatically by microprocessors.

The allocation of new closely-spaced bands opens up exciting possibilities, and it is not too early to consider how operating practices may change during the next decades.

(Thanks to Dr M. Eccles, GM3PPE, of the Royal Observatory, Edinburgh, for this contribution.)

IRTS has asked for attention to be drawn to the fact that some QSL managers are sending cards to a bureau in Eire other than the official one, and that they should be sent to IRTS, PO Box 462, Dublin 9, Eire.

The Society's hon hf awards manager, G3KDB, has some irls for disposal. They cost 18p each and applicants should apply (with return postage) to P. Miles, PO Box 73, Lichfield, Staffs, WS13 6UJ.

Expeditions

From 10 to 20 July a group of six amateurs from the Netherlands calling itself the Monaco Expedition Group will be on the air from Monaco on hf, vhf and uhf using an FT101, TH3Jr and long wire; IC211 plus 10-el Yagi; and FT780R plus 22-el Yagi respectively. Callsign/s are not known at the time of writing, but the QSL manager will be PA3ARM. Those taking part will be PA0SIM, PA2WLE, PA3AKP, PE1AMC, PE1AUX and PE1CUG, and frequencies to watch are 3,505, 7,005, 14,005, 21,005 and 28,005kHz (cw), and 3,790, 7,065, 14,141, 21,312 and 28,582kHz (ssb).

ZL1AMO is expected to be on Lord Howe Is for one week this month, and if so he will be on all bands 3.5 to 28MHz, mostly operating on cw.

According to *DX News Sheet*, Gus Browning, W4BPD, has bought a boat and is making plans for a five-year round-the-world expedition. Gus will be remembered for his previous exploits in many parts of the globe and for his operating skill.

A group of Finnish amateurs together with W6BIP hopes to visit Market Reef from 6 to 14 July. They will be on all bands 1.8 to 28MHz. There is a rumour that the island is to be taken over by the military and that no further amateur activity will take place after this.

Between 10 and 18 July, TI2VVR and TI2FAG will visit Cocos Is and become TI9VVR and TI9FAG. They will be on all bands on cw and ssb and will use the beam left on the island by a previous visitor.

WB3IQE will be in Forest County, Pa, on 1, 2 August as WB3IQE/3 using cw only with battery power. QSL to RD 1 Box 297, Brockway, Pa, 15824, USA, with one irl, or via the bureau.

Overseas news

I2YAE, who acts as QSL manager for 600DX, has circulated copies of his correspondence concerning this recent operation from Somalia and the DXCC decision to grant credit with contacts on and after 28 July 1980. It seems that Joe De Gasperin, I2YDX, was given permission to take equipment to Somalia in March 1980 by Somali Military HQ. He arrived in

June with his SB102, SB220, Osler 200, and 14AVQ which were all properly cleared with customs. He was given "definitive" verbal permission to operate on hf and vhf for an indefinite period, from Kismaayo. He began his activity properly on 20 July and, by chance, he had to go to Mogadiscio on 26 July—on that day he availed himself of the chance to get a written permit to forestall any possible problems. This was written in Somali and Arabic and he also later obtained an English translation dated 25 August. Neither document gives a starting or finishing date for the permission. Unfortunately the 3,000 or so contacts made between 20 and 28 July were almost entirely with Europe and Japan, and I2YAE feels very strongly that these should not be excluded. To mark his unhappiness he says that "Starting from 10 January 1981 I hold all the W and K QSLs in order to avoid misunderstandings. Surely I will confirm the QSOs with the USA only when the situation is cleared up." Joe should be back in Somalia now and active in the 14,180 14,190kHz area.

Peter Taylor, H44PT, has discovered that he is not the only "H44PT"! He has started to receive QSLs for alleged lf and hf QSOs which he has not made, one of which was reported in *Hani Radio*. He wishes it to be made known that he is very active on 432, 144, 50 52 and 28MHz on both cw and ssb. If his call is heard on 21 or 14MHz he asks those hearing it to be suspicious—and if it is heard on 7, 3.5, or 1.8MHz to be very suspicious. On 50MHz he is now up to 42 countries and needs only Europe for WAC—his most recent QSOs on that band have been with KH5K, XE, VS5 and ZD8—ZD8TC being worked via a "skewed" path with his beam at 270° instead of the expected 200°. This was 11,199 miles by great circle.

DX news

600DX has confirmed that 601TI, a radio avionics engineer, has been granted permission to operate during his own absence from Somalia. More operations are planned later this year and in 1982.

J11VLV reports that 8Q7s BH, BI, BJ, BK, NN and UT operated from the Maldives from 26 to 30 April and made some 3,200 QSOs. QSLs for all these calls should be sent via JH4RUG (see "QTH Corner").

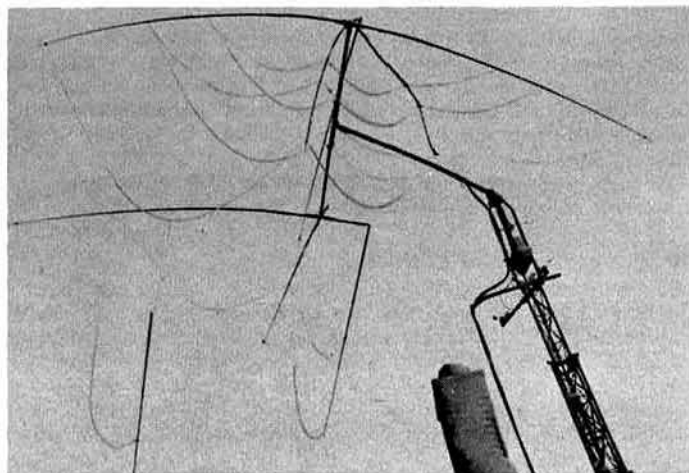
AO2HAM was a very successful expedition by EA2s AFZ, OS, JX, OP, JG and EA5BRA to Cantabrico Is; they made 12,800 QSOs in 78 hours. It was a trial-run for other expeditions to more exotic places in the future.

Doug Blythe, G3KCT (formerly VS7DB), left for Kiribati on 19 May. He has the callsign T30DB, and has taken his FT101ZD (Mk3) and three-element beam with him, and will initially set up on 14, 21 and 28MHz. He will, of course, be especially looking for UK contacts. Doug's QSL manager will be G8LGB (see "QTH Corner").

DX press reports that ZL3PA/C on Chatham Is is active and worked on 14MHz ssb.

HF0POL is a Polish scientific expedition located on King George Is in the S Shetlands. The station operates usually on cw in the bottom 5kHz of the 7-28MHz bands, and asks for QSLs via SP5EKZ. At the time of writing, YL0B and YL1P were active from Franz Josef Land and working on 14MHz—they were part of an expedition which was believed to be moving to Dickson Is. From the South Pole, KC4AAA is often active on 14,323kHz in the early morning.

According to *QRZ DX*, JT1103 is QSL manager for JT1s AO, KAA, KAF, KAI, BE, BF, BG, BK and BM. He says that irls are not valid in Mongolia. He may be reached as N. Khosbayer, Box 74, Ulan Bator 28, Mongolia. JT60UB was a station using a special prefix to celebrate the 60th anniversary of Mongolia's independence.



G3HCT's antenna following the gale and snow on 26 April

*10 Knightlow Road, Birmingham B17 8QB.

9N1MM is often on 14,220 or 14,280kHz after 1200 and has a schedule with W3WGS at 2400 on Mondays on 14,235kHz.

J5HTL is Hillar Loo, resident in Guinea-Bissau, and will be on 14, 21 and 28MHz ssb only for about one year.

The fourth meeting of the Clipperton DX Club will take place at Le Raincy, near Paris, on 19 September. For more details of what promises to be a very interesting gathering contact F9IE, 28 rue de Savigny, Bat A, F-91300 Morsang-sur-Orge, France.

Intruder Watch

The Society's Intruder Watch reports that, in response to representations recently made to the Home Office, the radiation of third-harmonic energy from a BBC World Service transmitter in the 28MHz amateur band has now ceased. Improved third-harmonic rejection measures initially reduced the strength by 30dB, more recently a change of transmitter programming removed the trouble which, for several months, had affected the 28MHz band in large areas of Kent, Surrey and E Sussex.

Intruder Watch also reports that the rough ac-modulated "creeper" type signals which continue to affect dx working, particularly on 14MHz, do not—as many suspected—come from UK sources. One group of "creepers" has been found to originate from SW Europe, while others arrive from directions in the sector 45-75°. More recently similar "pollutants" have been noted on 21MHz, and coincidental checking in Europe and the Antipodes confirms that these—as well as the 14MHz variety—constitute a worldwide problem. Due to the transient nature of these signals—they have no "fingerprints" or call signs—tracing is difficult. The UK administration and overseas organizations will continue to pursue the problem.

The USSR high-power pulse signals ("woodpecker") continue to interfere with the amateur service, although the medium-to-high muf appears to have attracted this intruder to parts of the spectrum outside the amateur dx segments. However, reports from Region 3 state that the interference continues to seriously affect the amateur service in Australia and New Zealand, and steps have been taken to alert those administrations to the intrusion.

During the past few weeks another type of pulse transmission has appeared; this has a higher pulse repetition frequency, so far is mostly confined to 21 and 28MHz, and is reported from Region 3. The characteristic "phutt-phutt" gave our VK friends leave to dub this as "the motor-bike"! This is not a true pulse signal but a steady carrier swept accurately over 25, 50 or 100kHz at 25prf. It is believed to serve the same purpose as the "woodpecker" but its precise origin is not known. Intruder watchers have also reported this type of transmission in the 14MHz band, but it is believed to be frequency-agile following the muf. Its activity will be reported to the administration when sufficient evidence is obtained.

(Thanks to Stan Cook, G5XB, RSGB honorary Intruder Watch organizer, for this report.)

Egypt

A letter has been received from M. S. Reda, SU1CR, commenting on the previous reference to operation by VE7AAZ from Sinai. The information had been copied from another news source, and the reference to Syria should of course have been to Egypt. SU1CR points out that no portable operation is allowed in Egypt, and that therefore VE7AAZ/SU would seem to be unauthorized—this should mean that any contacts should not be valid for DXCC or other awards. He says that activity by UN force members is not recognized as legal amateur operation in Egypt, and that the permission to carry third-party traffic granted to some stations in the area was particularly unfortunate, as the nation granting it is a full signatory to all ITU treaties and conventions.

28MHz

During the peak of Cycle 21 we have all been enjoying extremely easy world-wide propagation on 28MHz, and a great deal of attention has been paid to the band. However, this happy state will, sadly, all too soon fade away and long distance propagation will once more become quite rare. The proximity of the 27MHz cb band presents a threat to our amateur allocation, and in fact some intruders are already active in the area around 28MHz from the ranks of the, at present illegal, cb equipment operators. Jeff Harris, G3LWM, points out that it is up to us to protect our own interests by using the band as much as possible—both now and later. This will mean more monitoring and an easier detection of intruders. He and others have been using the band for many years for local working when there is no long-distance propagation, and they have a great deal of information on its use for such a purpose. They hope to form an organization (as exists already in the USA) and if sufficient interest is shown may produce a news-sheet. Jeff points out that a local group meets on Tuesdays at

QTH CORNER

CN29FIC
D4CBC

F8BYH }
F8BYI }
FG0DDV/FS }
J5HTL }
J6KJ }
KP2A/D }
M11PA }
T30DB }
VP2ED }
VP8AEI }
VP8AEN }
VP8HZ }
VP8NX }
ZF2AB }
3B8AE/3B9 }
601TI }
8P6OL }
8Q7BH }

PO Box 299, Rabat, Morocco.
(Operated by KA1CY) D. C. Fisk, 8 Grove St, Wayland, Mass, 01778, USA.

via F3KH, L. Bomberault, La Billardiere, 18410 Argent-Sur-Sauldre, France.
D. Beckwith W2QM, 151 Whitney Av, Pompton Lakes, NJ, 07442, USA.
via SM3CX5, J. Svensson, Berghemsv 11, 86021 Sundsbruk, Sweden.
via CT4KJ, Av Bento de Freitas 439E, 4480 Vila do Conde, Portugal.
via AF2C, J. B. Muskar, RFD 2, Putnam Valley, NY, 10579, USA.
via F6CXJ, P. Marge, 139 R Maurice Arnoux, 92120 Montrouge, France.
via G8LGB, J. Stephens, 26 Netherhall Way, Cambridge, CB1 4NY.
via AD8J (new QTH) 3905 Monet Ct S, Allison Park, Pa, 15101, USA.

via GM3ITN, L. Hamilton, Halls Land, Hardgate, Clydebank, Glasgow.

PO Box 697, Grand Cayman, W Indies.
PO Box 18, Rodriguez Is, Indian Ocean.
via I0SSW, S. Sugoni, Via Villa Bonelli 22, Roma 00149, Italy.
via VE3AMJ, PO Box 993, Alliston, Ont, L0M 1A0, Canada.
via JH4RUG, H. Taguchi, Naka 966 Yakage Cho, Oda-Gun, Okayama 714-12, Japan.

2100 on 28,600kHz in the Chelmsford area, and that in the Harlow, Hoddesdon and Bishop's Stortford area 29,600kHz is monitored and much used on fm.

As in the USA, the availability of comparatively cheap cb equipment could mean that it will be possible to convert this for 28MHz fm use—and perhaps when cb on fm becomes legal there will be an abundance of a.m. equipment available for conversion!

Any interested amateur or listener is invited to contact Jeff Harris, The Oaks, Cricketfield Lane, Bishop's Stortford, Herts, so that the degree of interest can be estimated.

Top band

More news from VK6HD, who is continuing his tests on 1-8MHz throughout the southern winter season. He feels that contact with Europe is possible in the June to August period, as this is the best time for such contacts on 3-5MHz. Sunrise times in VK6 will be as follows: 1 June, 2309; 11 June, 2314; 21 June, 2317; 1 July, 2319; 11 July, 2317; 21 July, 2313; 1 August, 2307; 11 August, 2258; 21 August, 2247; 1 September, 2235; 11 September, 2222; 21 September, 2208; 1 October, 2157; 11 October, 2144; 21 October, 2131; 1 November, 2120; 11 November, 2112; and 21 November, 2106. Depending on conditions, Mike will be on 1,801, 1,802, or 1,807kHz 15min before sunrise, and will listen between 1,820 and 1,852kHz. If conditions are poor he will be near 3,505kHz, or on 7MHz. He promises to continue his efforts until all who need VK are satisfied.

The Ozone Club

Bert Whitley, G2BY, has kindly drawn attention to the formation of this organization which is open to those who are still active on the air and who owned spark transmitting equipment back in the early 'twenties when it was legal! It is being organized by Ralph Hasslinger, W2CVF (ex-2CVF), 28 Warren Pl, Glen Rock, NJ, 07452, USA, and there are no fees to be paid. Bert says that by early May there were over 160 members but that he was the only one outside the USA, and that he is quite convinced that there are a number of other UK stations who would qualify. The club runs a net which meets on Mondays at 1700 on 21,435kHz, and on Tuesdays on 21,050kHz at 2030.

Contests

European DX Contest

0000 8 August to 2400 9 August (cw).
0000 12 September to 2400 13 September (phone).
0000 14 November to 2400 15 November (rtty).

3-5 to 28MHz. Single-operator multi-band and multi-operator single-transmitter categories. Single-operator entrants may only operate for 36h, and the 12h off the air may be taken in up to three periods. Europeans work non-Europeans and exchange RS/T plus serial number (from 001). Each QSO counts one point. Additional points may be acquired by the passing of QTCs, the sending or receiving of each of which counts one point. A QTC is a report of a confirmed QSO that has taken place earlier in the contest and later sent back to a European station, and it contains time, call sign and QSO number of the station being reported: eg "1300/DA1AA/134" means that at 1300 DA1AA was worked and gave number 134. A QSO may only be reported once and not back to the originating station. A maximum of 10 QTCs may be passed at any one time, but further contacts may be made to pass more. It is advisable to keep a list of QTCs received, indicating from whom they were received. The multiplier is the number of ARRL DXCC countries worked on each band added together, and for this purpose call areas in JA, PY, VE, VO,

HF propagation study

		Band predictions for July 1981				
		28MHz	21MHz	14MHz	7MHz	3.5MHz
UTC		000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802
EUROPE						
Moscow		1	22	43455445787	65211111357	32
Malta		111111331		74565556898	886211112368	+53
Gibraltar			11	52145444776	886422122468	+4
Iceland				1	11	11353
ASIA						
Osaka			111	1221		3
Hong Kong			1122113552	3	1	12687
Bangkok			11	1	1223224663	51
Singapore			11	121	11223224674	51
New Delhi			11	111	11223224664	74
Tehran			1111	122	21243335775	974
Colombo			1111	111	323334335674	84
Bahrain			1211112331		435433446786	974
Cyprus			1	121	313544445775	987544445789
Aden			1	1222323432	645433446888	9851
OCEANIA						
Suva (s)				11	2421	2551
Suva (l)			21	1	4445	85
Wellington (s)				1	21	114421
Wellington (l)			21	2	6545	47
Sydney (s)				1	23221	2
Sydney (l)			1	53231	6	32363
Perth			1111		31345431	631121
Honolulu					11	2321
AFRICA						
Seychelles			1	1222323322	635434446777	9851
Mauritius			1	12223234543	4	5544456888
Nairobi			2	1222444533	755644556888	9972
Salisbury			2	1222455643	833744556888	9975
Capetown				12245661	65455661	41
Lagos			2	121455743	754653446898	99862
Ascension Is			1	21234541	651	64446897
Dakar			21	121243542	764564344887	99863
Las Palmas			1	11	42134354664	997765456699
S AMERICA						
South Shetland			24451		45686	1585
Falkland Is			243442	3	2456887	942111
Rio de Janeiro			21	1132431	76414444787	998521
Buenos Aires			11	1132331	7534	4355687
Lima			1	1	64123232356	997631
Bogota			1	111	63123232246	897531
N AMERICA						
Barbados			1	1	64123232356	997631
Jamaica			11	11	52	112121135
Bermuda			11	52	11211245	886531
New York			31	111	124	775321
Mexico			31	11	123	574421
Montreal			31	1	124	774321
Denver			1	1	4543	1
Los Angeles			1	1	24331	1
Vancouver			1	1	23331	1
Fairbanks			1	1	112321	1111

VK, W/K, ZL, ZS, UA9 and UA0 each count as a country. In working out the final score the country total on 3.5MHz may be multiplied by four, on 7MHz by three, and on 14, 21 and 28MHz by two. Logs should reach WAEDC-Committee, Postbox 1328, D-895 Kaufbeuren, Fed Rep of Germany, no later than 15 September, 15 October or 15 December respectively. DARC log sheets and summary forms are available from this address in exchange for a large sae and some ircs. The multiplier for non-European entrants is the number of European countries worked, which means as per the DXCC list plus GM (Shetland), Sicily, Bear Is, and UN1 (Karelia).

AGCW-DL QRP Summer Contest

1500 18 July to 1500 19 July.

1-8 to 28MHz. CW only. Five classes: single-operator 3.5W or less input; single-operator 10W or less input; multi-operator 10W or less input; QRO stations over 10W input; and listeners. Multi-operators may operate 24h, but others must take a 9h break. Exchange RST, QSO number and power input, and add "X" if crystal controlled. QSOs with own country count one point, with own continent two points, and with elsewhere three points. Points are doubled if station is crystal controlled (they may have only three crystals for each band). Multiplier is one for each DXCC country and each DX QSO (outside own continent). Final score is total points on each band multiplied by multipliers on that band and all band totals added together. Note that call areas in JA, PY, VE, VK, W and ZS count as multipliers. Send log before 14 August to DK9FN, Spessartstrasse 80, D-6543 Seligshstadt, Fed Rep of Germany.

The 1981 IARU Radiosport Championship

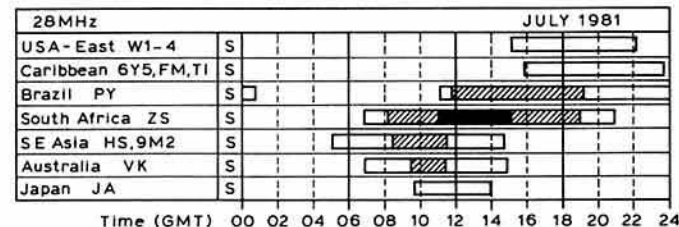
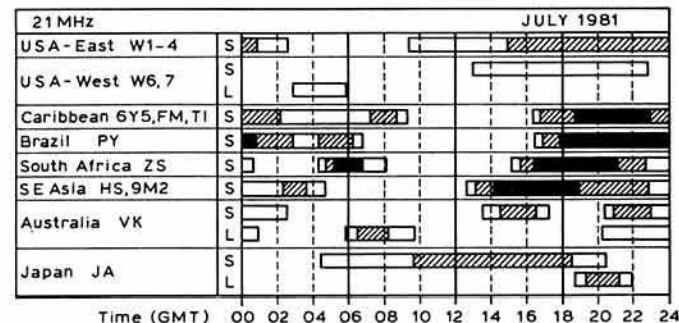
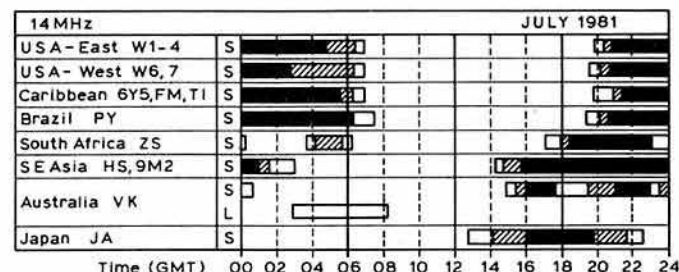
0000 11 July to 2400 12 July.

1-8 to 144MHz. Categories are (a) single-operator, phone only, cw only, or mixed (may only operate for 36h) and (b) multi-operator single-transmitter mixed modes (must remain on a band at least 10min at a time). QSOs with other stations in entrant's own ITU zone count one point, with other stations in the same continent but in a different ITU zone three

Propagation predictions

It has not been possible to include textual predictions this month.

The provisional sunspot number for April 1981 from the Sunspot Index Data Centre was 156.2. Daily numbers varied between 212 and 72. The predicted smoothed numbers for August, September and October are 127, 125 and 123 respectively.



S...Short path L...Long path 1-5 days 6-20 days
 Openings on more than 20 days in the month

points, and with others five points. Exchanges consist of RS/T plus ITU zone (UK is 27) and the same station may be worked only once per band. Total score is total QSO points multiplied by the sum of ITU zones worked on each band. Logs should list time, band, callsign, complete exchanges and multipliers, and off-the-air times clearly indicated. "Dupe" sheets are required from those who have made more than 500 QSOs. Specimen log forms are available from G3FKM, but the official summary sheet should be obtained from IARU HQ, Box AAA, Newington, Ct, 06111, USA. Entries should be posted no later than 12 August 1981 to the same address.

Awards

There seems to be some confusion concerning check-points for hf awards, and this is causing applications to be addressed to the wrong person. Please note that applications for all RSGB hf awards and certification requests for all other hf awards other than those issued by *CQ Magazine* should be sent to the Society's honorary hf awards manager, G3KDB. Only matters relating to *CQ Magazine* certificates should be sent to G3FKM.

The Royal Wedding Award

Sponsored by the Bromsgrove & District ARC and offered to amateurs and listeners worldwide. A contact with GB2WED must be made between 0001 and 2359 on 29 July 1981, and at least two members of the club contacted during 1981 (or a single QSO with any other special Bromsgrove station using a GB prefix during the year will be accepted). No contacts via repeaters may be claimed. Send applications consisting of log details and £1, US\$3, or five ircs to J. K. Harvey, G4IVJ, 38 Bodenham Rd, Birmingham B31 5DS. A list of members and answers to any queries may also be obtained by sending an sae to this address.

Around the bands

G8KG, before commencing his report, remarks that: "We must hope that 'continued high solar activity' is not getting boring!" He then goes on to say: "The recent spell of high solar activity continued into May, with the 27-day average solar flux remaining near or above the 200 mark for the past 90 days. With a few more days of data to come in, it looks as if the period from March to May will be the fourth in the cycle to have a three-month mean solar flux above 210sfu—the other three being September-December 1979 and April-June and October-December 1980.

"The smoothed monthly solar flux (ie the 12-month running average) shows how very flat the peak of the cycle has been. From November 1979 to November 1980 this index has always been between 195 and 200sfu, with the highest values early and late in the period—ie the curve is slightly 'double-humped'. During the same period the smoothed sunspot numbers have declined slowly from 165 to 150, while there are recent signs that the mean level of geomagnetic activity is still rising—as might be expected at this stage of the cycle."

The following kindly supplied information from which the loggings below were noted: G2HKU, G5JL, G3s AAE, GHY, GIQ, GVV, IGW, GM3ITN, G3KSH, GM3LYY, G3NWG, GM3PPE, GM3YOR, G3YRM, G4s AXD, BDQ, CHX, EHQ, EON, ETN, G4JVG/SMO, GW4KGR, G4s LDS, LRS, G8WQS, and RS1066.

Stations listed in italics were using cw.
 1-8MHz. 0000 EA8AK, EA9EU. 2200 EL2FY, EZ5WAB, ZD8TC. 2300 OE1ETA.
 3-5MHz. 0000 EA80Z, W5JMM/SU. 0100 TY9ER, ZP5LX. 0400 PY, TYA11, ZS6BPL. 0500 VP2MKV (QSL to K6STI). 2200 A7XE, M1IPA, WB8CSH/SV9, 524YV, 7X4AH. 2300 PY3CDL, ZP5PT.
 7MHz. 0000 OD5MR, 6W8/DJ6SI. 0100 F88YH. 0400 TYA11. 0500 VK, VK9NS, W7KA/VP2A (QSL to N6NK). 0600 FY7BF, W6-W7, ZL. 1400 M1IPA. 1900 ZS. 2000 OH3HZ/OJQ, VK3, ZD8TC, 4S7US. 2100 UA0. 2200 A7XE, D4C8C, KP4KK/DU2,

J5AG, VK6RZ, VP2MKV, 4K1A, 524YV, 7X4AN, 9X5AB. 2300 C5, CE, CP, FY, JY5MM, OA, TL8RC, UA0AG, VK6HD, VP8QG, ZD8RH.

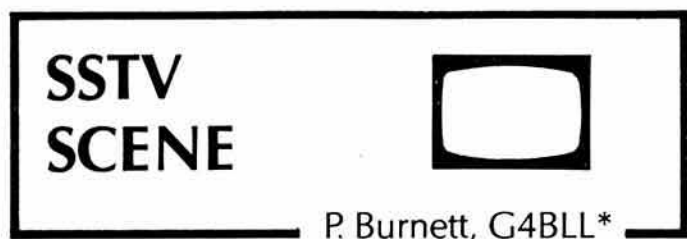
14MHz. 0400 FR7BX. 0500 F08FN, ZL. 0600 CE0AE. 0700 C31PQ (QSL to F6BSA), FK8DJ, F00KU, KH3AB, VR6TC, W6-W7. 0800 F08GM F08HD (BP 89, Papete), VK9NS, VR6TC. 1600 VK9YA. 1700 FH8CI, TL8CN, 3B8AS, 601TI. 1800 EP2JP, FR7CE, VS5PM, 600DX. 1900 3B8AE/3B9, 8J3ITU. 2000 AP2MQ, EK1P (QSL to UP2BBM), VK9YA (QSL to VK5QX), VQ9PF, ZD7AL. 2100 C31VK, VS5TX, 7X2FK (2W). 2200 CN29FIC, JT0YFU, TYA11, YL1P. 2300 JT1KAA, VP8AGY, 9V1UY.

21MHz. 0000 VK2NAQ. 0600 ZK1AR. 0700 F08EW, JA, KH3AB, KH6IJ, VK, ZK2BGD, ZL. 0800 CT2DE, JT1BH, JT0WA (QSL to OK1DWA), VK, W6-W7. 0900 JA, VK, ZK1AR, ZL. 1100 DU1CK, VP2EEK, 6T1YP. 1200 C5ACA, 600DX. 1300 A51PN, H44RW. 1400 F1S3J/ST2, TA2TAT, TL8CR, YB3MD (QSL to JH8RTP). 1500 DU6FER, FY7YE, VK5BW, VS5PP. 1600 K6OX (Edwards AFB). 1700 JA, S79WHW, XZ5A, ZD7HH, 4S7MY. 1800 D4C8C, J5HTL, S83H, VQ9PF, VU2BBJ, 3B8AE/3B9. 1900 KH6KU, YC6HS, ZS3MS. 2000 H44ST, J26CL, JT0YFU, JY9RC, SU1CR, VP8s AIC, QI, QP, XZ5A. 2100 S79RD, V66PAT/M (motorcycle mobile—6W), W6. 2200 C5ACD (QSL to K4YT), ZF2AB, J88AQ, 9X5MB, W6-W7, W0. 2300 G4IHS/AP1(78P), CE, LU, PY, VP2VJ, ZP.

28MHz. 0800 DA1WA/HB0, JA, VK. 0900 H44RW, HL1EY, TU2CV, YJ8NPS, ZL. 1000 FK8CL, FW8SC, H44VW, G3ZRK/SU. 1100 D4C8C, FR0FLO, HM1SX, P29NDX, VS6CT, XT2AZ, ZL3ACT. 1200 EL2AV (QSL to N6FL), KG6JJH, P29GC, LA1RR/ST0, TL8CN (QSL to W5RU), 1300 A51PN, KAI1J (Ogasawara), TYA11, VU2IT, 9J2BO. 1400 A9XF, 3B8AE/3B9. 1500 FH8OM, FR0FLO, SU1ER, VP1ME, ZC4DY, 6T1YP, 9V1UH. 1600 A22BX, HH2PW, HS1BV, 9M2CW, 9X5AB. 1700 DU6GEN, J6LSF, M1IPA, S79WHW, VP5RFS, VS5PP, 9V1TL. 1800 YC, VU. 1900 KH6SB, KP4AMS, VP8QG. 2000 CE, HC, LU, PY, YV, ZP.

Thanks are expressed to all who have written, and to the authors of the following for items extracted: *DX News Sheet* (Geoff Watts), *Long Skip* (VE3BMV), *QRZ DX* (K5FUV), *DXpress* (PA0TO), *CQ Magazine* (W1WY), *DX NL* (DL3RK), *Lynx DX Bulletin* (EA1QF) and *EA2JG* the *DX Bulletin* (KITN), and *The Long Island DX Bulletin* (W4UL/W21YX).

Please send everything for the September issue to reach G3FKM no later than 23 July and for October by 4 September. □



A very encouraging response has been received for information on the Robot 400 pcb and the first batch has now been distributed. This should herald a significant increase in sstv activity over the next few months. A second batch of pcbs is due for delivery and should be available by the time this column appears. As reported last time, your sstv reviewer is organizing the distribution, and requests for information should be sent with an sae or irc to the address given below. He is now also in a position to supply the memory plane complete with sockets; these are ex-equipment but guaranteed.

A letter from Lawrence Woolf, GJ3RAX, informed *SSTV Scene* that three scan-converters are already in use in Jersey—a "real" Robot 400, a home-built copy and a DL2RZ unit, all on 144MHz. GJ3RAX hopes to put Jersey on the map for sstv on the hf bands. John Outen, of Grays, Essex, while writing for information on the Robot 400 pcb, commented that he previously ran sstv with a 70A monitor and an 80A camera, and regrets selling the equipment as there is now a high level of activity on the bands. A number of enquiries for the Robot 400 pcb have been received from technical colleges and other educational establishments. As one writer commented, "the construction of a scan converter makes an ideal radio club project".

Computer angles

Jeff Maynard, G4EJA, another 400 pcb enquirer, said that he is using an Apple computer, although not for sstv or other amateur related projects at this stage. He has written to G4HNG (see *SSTV Scene* March 1981) with help in programming the ITT2020 for sstv display. Jeff would also like to hear from anyone using a microcomputer with high resolution graphics to display facsimile pictures such as weather maps.

Gordon Sharpley, G3LEE, states that he is still playing around with bandwidth compression ideas (related to "moving" sstv) and alternative forms of sstv to provide more noise immunity. He has also converted the input/output sstv program as compiled by Grant Dixon, G8CGK, for Nascom 2.

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

On the subject of computers and full sstv capability, G4HNG wrote to Macrotronics Inc, in the USA (this firm manufactures rty gear for the Apple computer) enquiring about their researches into sstv. They replied that they are working on an sstv package but they are not sure when or if one will be available. G4HNG commented that he thinks full sstv capability for these types of computer is still in the future—no other firm he wrote to had anything to offer. He went on to say that the present availability of software would not justify the purchase of an Apple type computer exclusively for sstv. Someone already owning one would find the program quite interesting, and it is certainly useful for caption generation. With the ever-reducing cost of computers G4HNG thinks that with external plug-in circuitry using more sophisticated a/d logic and audio filtering, this type of microcomputer could play a significant part in future sstv operation at a reasonable price.

Commercial sstv

The winter edition of the *British Telecom Journal* carried an article by Dr N. D. Kenyon (head of Video Systems Laboratory) entitled "Slow-scan tv goes on trial". The article deals with some of the considerations and limitations of the commercial use of sstv as an alternative to standard fast-scan tv, where special cables, microwave links or satellites are required. The more general utilization of sstv in commercial applications is good news for amateur sstv as there should be a "spin-off", eg the availability of specifically-designed hardware which will simplify the design of a scan-converter.

More on the Robot 400

The Robot 400 circuit diagram, suffixed with a D, now includes additional circuitry to provide 8s lockout and rounding off of the sstv signal output, called a "sine" circuit. Both features are used only in commercial applications of the 400 and may therefore be ignored for amateur use. The following components should also be omitted for amateur use: R138, R139, R140, R141, R142, R143 and C208; these provide on-board adjustment of width, brightness and contrast where front panel controls are not required. T2 may also be omitted if a suitable transformer cannot be located. The 1Ω surge resistors R315 and R318 can be deleted provided heavy-duty bridge rectifiers, eg 10A (available quite cheaply on the amateur market at the moment), and a mains transformer with sufficient reserve capacity are employed.

While on the subject of power supply requirements, it is advisable to provide +5V at 3A, -5V, +12V and -12V at 1A. This should ensure sufficient capacity to cater for modifications such as additional memory boards. LS series ics should also be used where applicable to keep the current consumption down to a minimum. A modification attributable to G3OQD is to increase the value of C26 to 10μF and reduce C34 to 0.01μF or omit altogether; this provides an enhancement of picture quality. □

YOUR OPINION

PLANNING PERMISSION AND TVI

The Editor

Radio Communication

Sir—Upon sending in a normal planning application (including RSGB information) to erect a radio mast to the local planning authority some time ago, I found great opposition, due mainly to—unknown to me—local tv.

Despite sending RSGB interference information with the application, and carefully advising a polite but numerous sub-committee from the planning authority visiting my QTH, I was finally refused permission on the following grounds: "The planning authority is of the opinion that the erection and use of this radio mast would be detrimental to the residential amenities by virtue of the interference caused to the electrical, radio and tv appliances of the residents of these dwellings, occasioned by the use of this radio mast".

It never fails to amaze me how some local authorities try to sweep a problem under the carpet instead of investigating it in its true context.

Finding oneself in the predicament of living in council property, where the local council insists that you erect an antenna no higher than 3m above ground, whether permission is granted or not, and who listen and respond to only one side of the story, plus locals who compile a petition to stop any antennas being erected on fears of further tv, is perhaps a common story. But living under those circumstances in a very small village community, as I do, can bring pressure to bear on a radio amateur and his family to relinquish the hobby in despair.

I found, however, that with relentless determination, knowing I was right, plus the valuable help and advice from the RSGB and the Post Office interference department, I won my appeal. This stated, of course, that interference, if any, does not relate directly to the mast but to the operation of the radio—clearly not a matter for the Town & Country Planning Act.

I hope that others in a similar situation will benefit from this information. My thanks to the RSGB.

Don Ayris, G4GZA

THE MEANING OF "QSL"

The Editor

Radio Communication

Sir—I am the vhf representative on the Bournemouth Radio Society Committee and as such have organized and taken part in many vhf contests over the past few years. I consider that several amateurs taking part in these events do not fully understand the use of the term "QSL" in the correct context. In the international Q-code it means "Can you acknowledge receipt?" or "I am acknowledging receipt".

In vhf contests it is often used by the sending station, after he has given the relevant contest information, to ask the receiving station "Have you received my information correctly?". The receiving station then starts his over with either "QSL" to confirm receipt of the details or asks for the details again. It does not mean "I would like a QSL card".

Following every contest we usually get several dozen QSL cards, most of which are from fairly local stations with strong signals. While we will always reply to all QSL cards received, we feel that the amount of time and expense incurred by ourselves and the RSGB in handling unnecessary QSL cards, caused possibly by the misunderstanding of "QSL", could be better utilized in other projects. If one really wants a QSL card from another station in a contest, we suggest one asks for it as "QSL card".

Martin J. Linda, G4GTH

CB

The Editor

Radio Communication

Sir—Various letters in *Rad Com* bemoan the advent of cb in the UK on 27MHz. While I have a certain sympathy for Class B licence holders I can only say that they have the option of becoming a Class A licence holder by taking the morse test.

In fact the advent of cb in the UK means that a large amount of both equipment and accessories is now available which with a small amount of ingenuity can be made to operate on the 28MHz band. Maybe when cb becomes legal on 27MHz fm, there will be a large

number of the present illegal operators who will wish to dispose of their sets. What an opportunity for the amateurs! I am aware that the Home Office have stated that "sets may be converted" but note that "provided that they then conform in all respects with the authorized technical standards". It is unlikely that any of the existing a.m. cb sets would be able to meet the new specification when purely modified for fm. In any case, with projected retail prices of £60 for cb fm sets it will not be worthwhile to try and convert existing a.m. equipment.

The best way we, as radio amateurs, can protect our interests on 28MHz is to use the band as much as possible. In the area Bishop's Stortford, Harlow, Hoddesdon and Chelmsford there is a growing use of 28MHz for local working, and we would like to hear from any radio amateurs (Class A and B and swls) who are interested in increasing activity on the band. Perhaps those who are interested could write to me so that we can estimate the initial interest. Collectively there is a fund of knowledge available, and we hope to form some form of association with a newsletter and various other activities.

At this time 29-60MHz fm is widely used, and certainly in the Harlow area monitored on a regular basis. On Tuesdays at 2100gmt a net takes place on 28-60MHz ssb centred on Chelmsford.

I would not agree with G4ADD's suggestion to use 28-28.02MHz for a.m., as that of course is in the cw part of the band. The band is nearly 2MHz wide, and if a spot for a.m. is required it can be located somewhere else if needed. Nevertheless I feel that G4ADD could easily be convinced to use fm!

If we use the band on a more regular basis we will be able to monitor the band on a regular basis and more easily spot and discourage the intruders.

J. D. Harris, G3LWM

The Oaks, Cricketfield Lane,
Bishop's Stortford, Herts.

VHF/UHF CONTESTS

The Editor

Radio Communication

Sir—Complaints about hf band operation being spoilt by contests weekend after weekend have been a regular feature of letters to the editor for many years. Unfortunately the rot seems to be spreading to vhf/uhf, with contests of some sort on 15 weekends this year, not counting the cumulatives and non-RSGB events. It is refreshing to note that some attempt is being made to reduce this congestion by organizing two major vhf/uhf contests on the same weekend (2-3 May).

As anyone who talks to vhf/uhf contest operators will realise, multiband contests, while they seem to be popular in Europe, are extremely unpopular with UK operators. The VHF Contests Committee has a thankless task, which is compounded by the tendency of contest operators to moan vociferously in the pub and club and not take matters further.

A few suggestions to the VHF Contests Committee and vhf/uhf contest operators for simplifying the vhf/uhf contest programme should be worth a public airing to gauge reaction. A suggested programme would consist of five contests (no more) comprising VHF NFD and one 24-hour open contest for each of the 70, 144, 432 and 1,296MHz and higher bands. Each single band could have as many sub-sections such as eight-hour, fixed station, QRP, cw etc, as was felt appropriate.

In spite of some fairly obvious objections I think this simplified programme has sufficient advantages to warrant serious consideration. In view of the current widespread discontent with the vhf/uhf contest programme, it would be very useful for as many operators as possible to express their views publicly.

Peter Burden, G3UBX

STOLEN AMATEUR RADIO EQUIPMENT

The Editor

Radio Communication

Sir—I have recently been involved in tracking down a pirate operator and was able to obtain make, model and serial number of the equipment being used. Checking with the dealer who handles this particular make did not reveal the name or call sign of the purchaser.

Having put in a fair amount of effort, including telephone calls, letters, telex, and personal visit by the RSGB regional representative to HQ I am still no nearer finding the rightful owner.

The problem seems to be that there is no central record for "lost and found" amateur equipment. It has also become apparent that the various police authorities do not have facilities to trace owners of stolen equipment which has been "found" by them.

I am therefore proposing to set up a central register for "lost and found" amateur equipment, which hopefully will help remedy the present unsatisfactory situation.

If amateurs who have had equipment stolen would send me details of make, model, serial number and where the equipment was stolen, I will attempt to match this up with any information about equipment which has been found, and its location.

It will be necessary for as many amateurs as possible to visit their local police headquarters, to tell them about this register, point out that it's for amateur radio equipment *only*, and give them a note of the more common manufacturers' names: eg Trio, Kenwood, Icom, Yaesu, KDK, FDK, Microwave Modules, Standard, Lunar etc and ask the police to forward to me the make, serial number and location of any equipment bearing any of these makers' names.

Hopefully, radio amateurs should benefit from this, and if anyone has ideas which could help, I trust they can be passed on.

Michael Mansfield, G8RXU
26 Dovecot Lane,
Beeston, Nottingham.

EQUIPMENT COSTS

The Editor

Radio Communication

Sir—I write concerning the two letters in *Rad Com* regarding the prices charged by retailers, particularly for Japanese equipment.

I think we must admit that in the present economic situation we must be approaching the condition of a "buyers' market". The remedy could be in our own hands. Ask for a discount, particularly for cash, as I would expect on any item costing several hundred pounds, and if no offer is forthcoming leave the equipment on the retailer's shelf. In other words, a buyers' strike.

I think a number of importers and retailers have had it their own way too long and their "killing" gone on long enough—to be honest I couldn't really care less if a few of them went broke as a result of not lowering their prices.

E. W. Elliott, G3BYX

(Several other letters on this topic have had to be held over—Ed)

OBITUARIES

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

Mr B. Coulson, G4BRI

Brian Coulson died on 8 March, aged 49. He was a supporter of the Verulam Club for many years, and was active on top band and 144MHz. He had just begun operating on the hf bands.

Mr W. A. Fisher, G2ATF

Mr Fisher died on 7 April. He had been a member of the RSGB for many years.

Mr R. C. Fishlock, G3DI

Mr Fishlock died on 23 January, aged 73. He began operating before the second world war, although he had not operated for some years.

Gp Capt E. C. Passmore, CBE, CEng, FIEE

G4IZ/VQSEP/S79EC
Eric Passmore, whose death was briefly reported in the April issue, died in the Seychelles on 18 February aged 71. He had a long and distinguished career in communications, principally with the RAF (which he joined in 1929) the Fleet Air Arm, Indian Air Force and Nato.

After his retirement in 1964 he settled in the Seychelles where he helped to establish Radio Seychelles, of which he became manager and chief engineer until 1976. As an amateur he was keen and active on 14, 21 and 28MHz.

Mr R. C. Warne, G8AW

Ronnie Warne died on 6 May, aged 76. He was a well-known Cornish amateur working both local and dx. He was a founder member of the West Cornwall Radio Club, now the Cornish Radio Amateurs Club, and served for many years in the Royal and Merchant Navies as an operator.

Also:

Mr W. W. Humphries, G3IGK;

Mr F. P. Major, RS43121;

Mr E. Reed, G6US, in March;

Mr Z. L. Williams, G3PXW, on 19 February; and

Mr L. Wilson, G3LHY, in March.

RSGB SLOW MORSE PRACTICE TRANSMISSIONS

Alterations and additions to this list should be sent to the organizer, Mr M. A. C. MacBrayne, G3KGU, 25 Purleu Way, Theydon Bois, Essex.

Clock time	Callsign	MHz	Mode	Town	Notes	Clock time	Callsign	MHz	Mode	Town	Notes
Mondays						Thursdays					
1100	G4IRI	3-550	A1/A3J	Bolton, Lancs		1100	G4IRI	3-550	A1/A3J	Bolton, Lancs	
1830	G3GNS	1-910 3-550 144-250	A1	Locking, Avon	[14]	1830	G3GNS	1-910 3-550 144-250	A1	Locking, Avon	[14]
1930	G4BFJ	144-625	F2/F3	Banstead, Surrey		1900	G4BNA	3-590	A1	Swindon, Wilts	
1930	G4DKK	144-100	A1/A3J	Tooting, SW London		1900	G3BLS	145-375	F2	Osney, Oxford	[1]
2000	G3SXX	145-250	F2/F3	Newtownards, Co Down		1900	G3ZRZ	1-975	A1/A3J	Blackpool, Lancs	
2000	G3LZV	145-250	F2/F3	Manchester	[3]	1900	G4RS	3-565	A1/A3J	Catterick, N Yorks	[1]
2000	G4IRI	3-550	A1/A3J	Bolton, Lancs		1930	G3ZYY	145-550	F2/F3	Saltash, Cornwall	[5]
2030	G3ASR	1-875 144-175	A1/A3J (lsb)	Harrow, Middlesex	[1][13]	1930	G3ASR	1-875 144-175	A1/A3J (lsb)	Harrow, Middx	[1][12][13]
2030	G2FKO	145-525	F2	Bideford, Devon		1930	G4BFJ	144-625	F2/F3	Banstead, Surrey	[16]
2100	G3LQI	144-250	A1/A3J	Lancing, Sussex	[15]	2000	G2ACZ	1-808	A1	Mablethorpe, Lincs	
Tuesdays						2000	G3LZV	145-250	F2/F3	Manchester	[3]
1200	G3GNS	1-910 3-550 144-250	A1	Locking, Avon	[14]	2000	G4IRI	3-550	A1/A3J	Bolton, Lancs	
1830	G4CWN	144-100	A1/A3J	Stoke-on-Trent, Staffs		2000	G4ELV	144-250	A1	Arrochar, Strathclyde	
1900	G3ZRZ	1-975	A1/A3	Blackpool, Lancs		2030	G2FKO	145-525	F2	Bideford, Devon	
1900	G4RS	3-565 145-525	A1/A3J F2/F3	Catterick, N Yorks	[1]	2100	G3LQI	144-250	A1/A3J	Lancing, Sussex	[15]
1930	G3ZYY	145-550	F2/F3	Saltash, Cornwall	[5]	2100	G4EWK	144-850	F2	Burton-on-Trent, Staffs	[7]
1930	G4BFJ	144-625	F2/F3	Banstead, Surrey		Fridays					
2000	G3VHE	145-350	F2	Swindon, Wilts	[1]	1830	G4CRI	3-525	A1	Helston, Cornwall	
2000	G4ELV	144-250	A1	Arrochar, Strathclyde		1830	G4ILW	145-450	F2/F3	Gateshead, TGW	[1]
2000	G4FEX	145-250	F2/F3	Horsley Woodhouse, Derbyshire	[1]	1830	G3GNS	1-910 3-550 144-250	A1	Locking, Avon	[14]
2030	G3IRM	1-975	A1/A3	Bury St Edmunds, Suffolk		1930	G4BFJ	144-625	F2/F3	Banstead, Surrey	
2030	G4FFC	144-390	A1/A3J	Pertenhall, Beds	[6]	2000	G3WQK	144-775	F2	Haslemere, Surrey	
2030	G3OHM/A	144-180	A1/A3J	Birmingham		2030	G2FKO	145-525	F2	Bideford, Devon	
2030	G3KGU	1-915	A1/A3	Theydon Bois, Essex		2200	G3AWL	144-110	A1/A3J	Easington, Co Durham	[8]
2030	G2FKO	145-525	F2	Bideford, Devon		Saturdays					
2100	G4EWK	144-850	F2	Burton-on-Trent, Staffs	[7]	1100	G3LZV	145-250	F2/F3	Manchester	[3]
2200	G3AWL	144-110	A1/A3J	Easington, Co Durham	[8]	1200	G3GNS	1-910 3-550 144-250	A1	Locking, Avon	[14]
Wednesdays						2000	G3LZV	145-250	F2/F3	Manchester	[3]
1830	G3WNR	145-450	F2/F3	South Shields, T & W	[1]	2000	G4JBB	145-425	F2	Birmingham	[11]
1830	G3GNS	1-910 3-550 144-250	A1	Locking, Avon	[14]	2000	G4FEX	145-250	F2/F3	Horsley Woodhouse, Derbyshire	[1]
1900	G3WWSU	145-250	F2	Barry, S Glam	[1][10]	2030	G2FKO	145-525	F2	Bideford, Devon	
1900	G2ABC	145-250	F2/F3	Truro, Cornwall		Sundays					
1900	G3JULY	1-960	A1/A3J	Culgaith, Cumbria	[1]	0930	G3WNR	145-450	F2/F3	South Shields, T & W	[1]
1930	G4EXD	145-475	F2/F3	Saltash, Cornwall	[5]	1015	G3CGD	1-875	A1/A3J	Cheltenham, Glos	
1930	G3ZYY	145-550	F2/F3	Banstead, Surrey		1030	G3OHM/A	144-180	A1/A3J	Birmingham	
1930	G4DKK	144-625	F2/F3	Tooting, SW London		1100	G2FXA	1-910	A1/A3/A3J	Stockton-on-Tees	
2000	G3SWP	144-180	A2/A3J	Doncaster, South Yorks	[1]	1100	G3XJJ	3-535	A1/A3J	Northampton	
2000	G3LZV	145-250	F2/F3	Manchester	[3]	1100	G4BFJ	144-625	F2/F3	Banstead, Surrey	
2000	G3MZAS	145-550	F2/F3	Prestwick, Ayrshire	[3]	1100	G4DKK	144-625	F2/F3	Tooting, SW London	
2030	G2FKO	145-525	F2	Bideford, Devon		1130	G3BLS	145-375	F2	Osney, Oxford	[1]
2100	G3HVI	144-750	F2/F3	Stoke-on-Trent, Staffs	[1]	1200	G3HVI	144-750	F2/F3	Stoke-on-Trent, Staffs	[1]
Notes						1200	G3GNS	1-910 3-550 144-250	A1	Locking, Avon	[14]
[1] Omnidirectional	[7] To SW	[12] First and third Thursdays				1400	G3LZV	145-250	F2/F3	Manchester	[3]
[2] Horizontal to SW	[8] To S	in each month				1800	G3WNR	145-450	F2/F3	South Shields, T & W	[1]
[3] Vertical to S	[9] Slant polarized to	[13] Horizontal				1900	G3WWSU	145-250	F2	Barry, S Glam	[1][10]
[4] Vertical	WNW	[14] Reports to RAFARS Locking				1930	G3LDW	144-160	A1/A3J	Halesowen	[1]
[5] Vertical to E	[10] To NE	[15] Horizontal to E and W				2000	G3LZV	145-250	F2/F3	Manchester	[3]
[6] Horizontal to S	[11] To NNE	[16] Starting speed 12wpm				2000	G4JBB	145-425	F2	Birmingham	[11]

Special event stations

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

GB4PCF, 4 July

This station will operate at Potton Church Fete, Potton, near Sandy, Beds. It will be active on 3-5 28MHz and 144MHz. Special QSL cards will be available. Details from Dave Thompson, G3OXG.

GB2DTS, 11-12 July

Barking R&ES will operate this station at Dagenham Town Show, on 28, 21, 14 and 144MHz. There will be a display of pre-war radio and televisions, and a working cctv display. Details from A. Sammons, G8LZN.

GB2RW, 29 July

The station, in Rayleigh, Essex, will commemorate the royal wedding. It will operate on 70-8, 14-28, 21-28, and 28-58 and 144MHz approximately, depending on QRM. QSLs via Bureau or G4KIH, please enclose postage for return of special QSL cards. Details from G4KIH, tel Rayleigh 747851.

GAWED, 29 July

Another station to celebrate Prince Charles' wedding. Special QSL cards available, plus an award for those who also work two Bromsgrove & DARS members during

1981. Rules and membership list from Awards Manager, J. Harvey, G4IVJ, QTHR on receipt of sae or irc. QSL to G3VGG.

GB2STH, 30 July-1 August

The St Helens & DARS will operate this station from the St Helens Show at Sherdley Park, Marshalls Cross Road, St Helens, Merseyside. Operation will be on hf and vhf/uhf. Special QSL cards are expected to be available. Details from P. Gaskell, G8PQD, tel St Helens 25472.

GB2FAA, 1 August

The station will be operated at the International Air Day, Royal Naval Air Station, Yeovilton, Yeovil, Somerset, by Yeovil ARS for the RNARS. It will be at the Royal Naval Communications Stand, Hangar 8. Details from G3NOF, QTHR, tel Yeovil (0935) 24956 or G4DEP, QTHR, tel Langport 50629.

GB2MSS, 15 August

The Mid-Somerset Show will include this station, at Shepton Mallet, operated by Yeovil ARS. Details from G3NOF, QTHR, tel Yeovil (0935) 24956.

GB2IYD/GB8IYD, 1-3 August

This station will be part of the International Weekend on the Air at St Loyes College for the Disabled, Exeter, operated by Exeter ARS from 0900-2000 on all amateur frequencies from 3-5 28MHz, vhf and uhf. Special QSL cards via the bureau. Details from G. Draper, 19 Sunnymead, Copplestone, Nr Crediton, Devon.

CONTEST NEWS

Duplicate contacts in hf contests

During the past year the HF Contests Committee has become increasingly concerned by the number of duplicate contacts appearing in logs, for which points have been claimed. The committee has always felt that the production of an accurate log is an integral part of any contest operation. It has therefore decided that with immediate effect, unmarked duplicate contacts will be penalized at 10 times the number of points claimed. Logs containing in excess of five unmarked duplicate contacts will be automatically disqualified. Duplicate contacts should be included in logs, marked as such and without any claim for points.

D. J. Andrews, G3MXJ
chairman

IARU Region 1 VHF/UHF/SHF Contest rules

1. Eligible entrants. All licensed radio amateurs in Region 1 can participate in the contests. Multiple-operator entries will be accepted, provided only one call sign is used during the contest. The contestants must operate within the letter and spirit of the contest and at no greater power than permitted in the ordinary licences of their country. Stations operating under special high power licences do so *hors concours* and cannot be placed in the contest proper.

2. Contest sections. The contest will comprise two sections:

VHF contest:

1. Single-operator station, operated by owner of the licence (no club stations).
2. All other stations.

UHF/SHF contest:

The contest will comprise two sections, for 432MHz and for every higher band. All participating stations must operate from the same location throughout the event.

3. Dates of contests.

VHF contest:

The contest will take place during 5 and 6 September 1981.

UHF/SHF contest:

The contest will take place during the weekend of 3 and 4 October 1981.

4. Duration of contests. The contests will commence at 1600gmt on the Saturday and will end at 1600gmt on the Sunday.

5. Contacts. Each station can be worked only once on each band, whether it is fixed, portable or mobile. If a station is worked again during the same contest, only one contact will count for points, but any duplicate contact should be logged without claim for points and clearly marked as duplicate. Contacts made via active repeaters or translators do not count for points. Any telephony contact made with stations generating in the cw (A1) sub-band shall not count for points.

6. Type of emission. Contacts may be made on A1, A3a, A3j or F3. F2 may be used above 1GHz. Only one transmitter or transceiver may be used on each band at any time.

7. Contest exchanges. Code numbers exchanged during each contact shall consist of the RS or RST report, followed by a serial number commencing at 001 for the first contact on each band, and increasing by one for each successive contact on this band; this must immediately be followed by the QTH locator of the sending station (eg 59003 GX24j or 579023 HG46e).

8. Scoring. Points will be scored on the basis of one point per kilometre. The final claimed score must be shown on the first sheet.

9. Entries. Entries should be sent to the VHF Contests Committee, c/o the adjudicator for the RSGB contest on the same date.

10. Awards. The winner of each section will receive a certificate. The entrants compete for the following challenge trophies:

VHF contest:

a) The IARU Region 1 VHF Trophy, for the winner of Section 1. b) The PZK Trophy, for the winner of Section 2.

UHF/SHF contest:

a) The Vittoria Alata Cup 1, for the winner of the 432MHz Fixed Section. b) The Vittoria Alata Cup 2, for the winner in the 432MHz Portable/Mobile Section.

Overall winner: An overall winner of the IARU Region 1 UHF/SHF Contest will be declared. For this competition, the scores of the entrants will be combined, using the following multipliers:

432MHz	x 1
1,296MHz	x 5
2,400MHz	x 10
Higher bands	x 20

The entrant scoring highest will be awarded an IARU Region 1 medal. The 1981 organizing society is the German national society, DARC.

First and second in the single-operator sections were, on 1,296MHz, G3JXN and G3VHK, and on 432MHz, G3YTE and G4CQR. BRS15822 and BRS32525 lead the listener sections. Certificates go to all these entrants.

G5HD

432MHz SINGLE-OPERATOR SECTION									
Posn	Call sign	Points	QSOs	QTH	Power	Best dx	Km		
1	G3YTE	742	98	A113	200	DJ9DL	459		
2	G4CQR	593	93	ZL49	100	GM4IGS	540		
3	G3UBX	590	108	YM40	400	GM4IGS	371		
4	G3VHK	548	100	ZL49	100	GM4IGS	548		
5	G6GN	405	63	YL48	30	PA0CRA	505		
6	GW8AAP/P	403	59	YN65	10	G5MW/A	320		
7	G3MOT	344	64	YL20	10	DF1JC	620		
8	G8GXE	334	76	ZL48	50	F1C8H	302		
9	G4GZ/P	333	41	YO55	100	G5MW/A	418		
10	G8EDG/P	286	58	YM49	8	GJ4JWA	361		
11	G4ERO	257	39	ZK11	10	G4IGZ/P	402		
12	G4GFX	255	49	YM79	10	ON5FF	440		
13	G8FT	232	54	YM50	35	G4ANT	232		
14	G8AWN/A	196	32	ZN02	120	G5MW/A	330		
15	G3XWZ/P	196	56	ZN62	10	G3VHK	230		
16	G8FMK	170	38	ZL26	40	G8SFI	235		
17	G5UM	150	42	ZM35	10	G8PWX	247		
18	G8IEM	134	28	ZK05	20	GW4LP/P	278		
19	G8KEN	115	15	AL77	10	GW4LP/P	368		
20	G8LXY	80	32	ZL09	50	PA0FRE	321		
21	G8XBH	72	30	ZL50	10	GW4LP/P	278		
22	G5DF	33	8	ZO51	10	G4ANT	300		

432MHz LISTENERS SECTION									
Posn	Station	Points	QSOs	QTH	Best dx	Km			
1	BRS32525	140	50	AL41	GW8AAP/P	290			
2	BRS28198	131	25	AK04	G4KAL/P	350			
3	BRS15822	125	31	ZL40	PA0CRA	337			

432MHz MULTI-OPERATOR SECTION									
Posn	Call sign	Points	QSOs	QTH	Power	Best dx	Km		
1	G4BPO/P	1,789	192	AM67	400	DJ30S	587		
2	G4JUG/P	1,782	209	ZL53	400	DB18P	637		
3	GW4LP/P	1,507	173	YN75	400	DJ9DL	729		
4	G4ANT	1,354	140	AM27	200	DJ30S	607		
5	G4HWA/P	877	139	ZL15	100	DF1JC	560		
6	G5MW/A	823	104	AL53	200	DJ9DL	455		
7	G8ZHP	681	105	ZM29	150	DF1JC	526		
8	G4KOL/P	594	102	YN29	100	G4ERO	324		
9	GW3UCB/P	567	85	YN75	50	PA0CIS	536		
10	G8MTS/P	536	46	YP46	100	G3VHK	481		
11	G8VWA/P	488	108	ZL26	200	DC9DL	548		
12	G6YB/P	458	68	YL57	400	PA0FRE	495		
13	G3UHF/P	452	85	ZN61	10	G8IDZ	284		
14	G8IEM	389	61	YN38	16	G5MW/P	332		
15	GW6GW/P	388	70	YL06	100	G8MTS/P	395		
16	GW3NYY/P	363	54	YL23	45	G4ANT	349		
17	G3EFX/P	354	92	ZL26	35	G8PWX	372		
18	G3VZD/P	275	58	ZL06	8	PA0CRA	393		
19	G6BSE/P	242	42	AM64	10	DF1JC	448		
20	G8OHM	212	48	ZM41	30	G4ANT	222		

1,296MHz MULTI-OPERATOR SECTION									
Posn	Call sign	Points	QSOs	QTH	Power	Best dx	Km		
1	GW4LP/P	11,058	60	YN75j	130	G3SPJ/P	354		
2	G4BPO/P	11,016	61	AM67	200	DF3EE	412		
3	G4ALE/P	10,121	75	ZL60	300	DK2UO	484		
4	G3NNG/P	7,602	52	ZL33	30	PA0EZ	466		
5	G4HWA/P	5,179	44	ZL15	80	PA0EZ	430		
6	G4ANT	4,717	28	AM27	60	GW4LP/P	303		
7	G3UHF/P	2,568	20	ZN61	2	G4ALE/P	252		
8	G5MA/A	2,531	22	AL53	50	PA0EZ	332		
9	G8GXE	1,500	23	ZL48	8	GW4LP/P	246		
10	G6BSE/P	953	10	AM64	2	GW4LP/P	270		

1,296MHz SINGLE-OPERATOR SECTION									
Posn	Call sign	Points	QSOs	QTH	Power	Best dx	Km		
1	G3JXN	6,211	55	ZL39	100	DK2UO	490		
2	G3VHK	5,565	56	ZL49	65	PA0EZ	380		
3	G3SPJ/P	5,020	32	AK14	25	PA0EZ	350		
4	G4KIY	4,989	38	ZM40	10	DK2UO	498		
5	G8DKK	2,806	28	ZL08	25	PA0EZ	384		
6	G8GDX	2,520	24	ZM41	30	G4BPO/P	219		
7	G4GFX	2,091	15	YM79	1	G4ANT	259		
8	G8FT	1,906	22	YM50	20	G4BPO/P	223		
9	G3TQF	1,873	20	ZM24	40	G4BPO/P	176		
10	G8FMK	1,870	20	ZL26	20	GW4LP/P	210		
11	G4FZL	1,848	14	ZM25	10	G4BPO/P	178		
12	G4BYY	1,483	12	YM79	1	G3SPJ/P	247		
13	G2RD	1,280	20	ZL60	70	GW4LP/P	278		
14	G8HMI	1,065	13	ZL56	1-4	GW4LP/P	238		
15	G8IEM	945	10	ZK05	4	G4KIY	193		
16	G3WFM	836	16	ZL30	20	G4BYY	142		
17	GW8AAP/P	723	7	YN65	1	G3NNG/P	218		
18	G8DIU	111	6	ZL60	10	G3WFM	38		

1,296MHz LISTENERS SECTION									
Posn	Station	Points	QSOs	QTH	Best dx	Km			
1	BRS15822	288	7	ZL40	G8FWZ	177			

144MHz Trophy and SWL Contest rules

1600-1600gmt, 5-6 September 1981

The following general rules, published in the January 1981 issue of *Radio Communication*, will apply: 1, 2, 3, 4f, 5a, 6a, 7a, 9, 10a, 11a, 12b, 13-24.

All entries and checklogs to: VHF Contests Committee, c/o Mr W. McClintock, G3VPK, Maple Leaf, Great Braxted, Witham, Essex CM8 3EJ.

As this contest is timed to coincide with the IARU Region 1 VHF Contest, QTH locators only need be sent, as per rule 11b. Stations wishing to enter both contests should score their logs in accordance with rules 7a and 7b.

The Mitchell Milling Trophy will be awarded to the leading multi-operator station; the Thorogood Trophy to the leading single-operator station, and the GM4HAM Trophy to the leading Scottish station.

432 and 1,296MHz Trophy Contests results

These events attracted a good entry despite poor conditions and indifferent weather. A number of contestants commented favourably with "Excellent contest; just the right duration and timing" being typical.

Poor-signal complaints were made against one entrant from stations sited 25 and 70km distant. A warning letter is on its way.

The VHF Contests Committee Cup goes to GW4LP/P, the Parallel Lines Contest Group, and the runners-up certificate to G4BPO/P.

The 432MHz section winners, G4BPO/P, the Martlesham Group, receive the Council Cup and G4JUG/P the certificate.

144MHz CW Contest April 1981 results

This contest was held under very poor conditions enlivened by an aurora only discovered by a few—notably DK3UZ, who had five high scoring contacts as a result, the best of which was OH5LK. A number of QSOs were lost due to very deep QSB, which also caused some logging inaccuracy. However, the contest was well liked by entrants, several of whom were entering a contest for the first time. A disappointment is that many stations who were active during the contest did not enter. On the other hand a number of Continental stations were active, and one of these, DK3UZ, an RSGB member, entered the contest.

A certificate goes to the winner, G4CVI. OH5LK is thanked for a check log. G4ERT is also thanked for his check log which contained sufficient information to be classed as an entry.

G3FZL

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	G4CVI	477	71	ZL59f	GM4CXM	581
2	G3XDY	413	40	AM76c	DK3UZ	620
3	G4AHN	352	50	ZL56c	DL20M	580
4	G4IJJ	340	56	ZL18b	DF7VX	608
5	G6GN	327	43	YL48h	DJ4AX	670
6	GM4CXM	320	27	XP09g	G3FPK	575
7	DK3UZ	312	16	EN20c	OH5LK	1,277
8	G3EMU	276	22	AL56e	DK8ZB	563
9	GW3NYY	269	31	XL40b	G3SSS/PA	560
10	G3VIP	237	27	ZN40j	DK3UZ	664
11	G4IBZ	189	37	YK09j	G3DSS	270
12	G3JFY	175	30	ZL73e	DJ4AX	608
13	G3BPM	138	31	ZL48d	PA3BCE	426
14	G3FIJ	132	22	AL05e	G3BWV	421
15	G4KLN	126	27	ZN23a	G3DSS	314
16	G4AYM/P	109	25	YL19c	G8JO	357
17	G3TGL	88	22	ZM41f	G3TIR	190
18	G4JKW	88	20	ZN33j	GM4CXM	320
19	G4HSS	76	18	YN57j	GM4CXM	310
20	G4ERT	59	17	ZM24c	G4CVI	167
21	G4KGC	55	13	ZM65d	G3JYP	273
22	G4AGQ	39	19	AL05e	G3FIJ	140

Ropoco 1 1981 results

Entrants in this contest appear to find its format a welcome relief from the more usual serial number type of event. The need for greater accuracy in exchanging information provides a good opportunity for improving cw operating ability. With the fairly small number of logs and the relatively low number of contacts, it was possible to make a full cross-check of all logs for accuracy. With two points deducted for each mistake in information received (except where there is a callsign error, when both sides of the contact lose all points) entrants may draw their own conclusions on their cw proficiency! There can be little criticism on this score of the station who successfully extracted a postcode from a Belgian station!

Comments—"Most enjoyable"—from most entrants;

"Good cw exercise though Sunday mornings bad for local QRN on 80m";

"Any trace of hum on signal was due to operation from disused sewage farm!";

"Is 6min to receive one's own postcode back in distorted form a record?"

G3MXJ

Posn	Callsign	Points	Posn	Callsign	Points
1	G4BWP	478	14	GM30XC	286
2	G3YCP	426	15	G2PT	274
3	G4DRS	422	16	G4KGG	274
4	G3KKQ	400	17	G3AWR	268
5	G6UQ/A	400	18	G4GBG	256
6	G4BUO	386	19	G3EUE	230
7	G3SJE	384	20	G4CZB	218
8	G3UFY	370	21	G3QXQ	212
9	G3YMC	366	22	G2FNK	160
10	G3NKS	306	23	G3ZNH	150
11	G3WRR/P	300	24	G4JMY	146
12	G3JKB	296	25	G4CSB	92
	GW3S8	296			

DF Qualifying Event Burton-on-Trent results

Fourteen teams stood in 3in of snow and attempted to take bearings on the hidden stations as a blizzard swirled round them at the start of this year's Burton-on-Trent df event.

Station A, G3RBP/P, located 6 miles NW of the start at Hilton old gravel pit, used an electric fence wire as an antenna, and was easily accessible to those able to walk on water. Eric Mollart was therefore first to arrive at 1445.

The B station was not quite at its intended site, as the landmarks placed when the antenna was erected had disappeared under the snow. G3NFC/P was operated in semi-arctic conditions from near Coleorton by Alan Hitchcock and was first choice of nine teams, Ian Butson leading the field at 1426.

Ian won the contest at 1514, and along with Mike Hawkins qualifies, subject to confirmation, for the National Final.

Posn	Team	Club	Station A	Station B
1	I. Butson	Colchester	1514	1426
2	M. Hawkins	Chelmsford	1540	1453
3	T. Gage	Mid Thames	1540	1454
4	R. Shepherd	Mid Thames	1541	1441
5	T. Gleeson	South Manchester	1542	1433
6	G. Whenham	Coventry	1542	1437
7	C. Plummer	Mid Thames	1543	1437
8	C. Merry	Dartford Heath	1545	1431
9	D. Newman	Rugby	1550	1453
10	E. Mollart	Mid Thames	1445	1616
11	R. Vickers	Slade	1517	1623
12	J. Warburton	South Manchester	1446	1630
13	D. Yorke	South Manchester	1508	
14	M. Ellis	South Manchester	1509	

Contests calendar

1 July	Canada (Rules in June issue)
4-5 July	VHF NFD & SWL (Rules in March issue)
11-12 July	IARU Radiosport Championship (Rules in July issue)
12 July	DF Qualifying Event Salisbury (Rules in June issue)
18-19 July	AGCW-DL QRP Summer (Rules in July issue)
19 July	3-5MHz Field Day (Rules in June issue)
26 July	DF Qualifying Event South Manchester (Rules in July issue)
2 August	144MHz QRP & SWL
8-9 August	European DX (CW) (Rules in July issue)
9 August	DF Qualifying Event Oxford (Rules in July issue)
11-12 August	Meteor Scatter
16 August	70MHz Trophy & SWL (Rules in June issue)
22-23 August	All Asian DX (CW) (Rules in June issue)
23 August	DF Qualifying Event Slade (Rules in July issue)
30 August	Ropoco 2
5-6 September	SSB FD (Rules in May issue)
* 5-6 September	144MHz Trophy & SWL (Rules in July issue)
	IARU VHF (144MHz) (Rules in July issue)
12-13 September	International ATV (Rules in July issue)
12-13 September	European DX (Phone) (Rules in July issue)
20 September	DF National Final Mid-Thames
26 September	AGCW—DL uhf/vhf/cw (144MHz) (Rules in June issue)
* 3-4 October	RSGB UHF/SHF
	IARU UHF/SHF (Rules in July issue)
October/November	432MHz Cumulatives
	1,296MHz Cumulatives
11 October	21/28MHz (Phone) (Rules in May issue)
18 October	21MHz (CW) (Rules in May issue)
25 October	70MHz Fixed
* 8 November	144MHz (CW)
14-15 November	Second 1-8MHz
15-16 November	European DX (RTTY) (Rules in July issue)
November-December	BATC Cumulative (Rules in July issue)
6 December	144MHz Fixed
20 March 1982	AGCW—DF uhf/vhf cw (432MHz) (Rules in June issue)

* IARU co-ordinated date

DF Qualifying Event South Manchester

Date: 26 July 1981.

Map: OS Sheet 109, 1:50,000, series, Manchester.

Assembly: 1300bst for start at 1320bst.

Location: Lay-by on A57, ½ mile south of junction with M63, ngr 748 972.

Competitors requiring tea should notify Mr. D. Holland, 32 Woodville Drive, Sale, Cheshire M33 1NF, tel 061-973 1837, not later than 19 July 1981.

DF Qualifying Event Oxford

Date: 9 August 1981.

Map: OS Sheet 164, 1:50,000, series, Oxford.

Assembly: 1300bst for start at 1320bst.

Location: College Farm, Pinchgate, Bletchington, ngr 522 173. Please approach from west.

Competitors requiring tea should notify Mr. R. Pearce—Boby, College Farm, Pinchgate, Bletchington, Oxford, tel 0869 50767, not later than 2 August 1981.

DF Qualifying Event Slade

Date: 23 August 1981.

Map: OS Sheet 138, 1:50,000 series, Kidderminster & Wyre Forest.

Assembly: 1300bst for start at 1320bst.

Location: Hartlebury Common, ngr 820 705.

Competitors requiring tea should notify Mr. Mr. J. Drakely, 186 Conway Road, Fordbridge, Birmingham B37 5LD, tel 021-770 3474, not later than 10 August 1981.

1981 International ATV Contest rules

12-13 September 1981, 1800gmt Saturday to 1200gmt Sunday

SECTION A: TRANSMIT/RECEIVE STATIONS

Scoring. Logs have to be entered per band operated: (a) two-way QSO on 432MHz—2 points/km; (b) two-way QSO on 1-3GHz—8 points/km; (c) two-way QSO on 10GHz—16 points/km.

Multi-op-stations may only use one call.

Crossband-QSOs must be entered in the log for the transmit band. QSOs via repeaters do not count.

Exchanges. The following data is to be exchanged:

1. Code-group, which consists of four digits, individually chosen by each entrant, ie 1865 or 9732. The code group must be exchanged in video only.

2. Call, QTH locator, report, serial number starting at 001. This data is to be exchanged via video and, if necessary, via phone.

Should one of the stations fail in receiving the picture of the other, the scores of both stations are to be halved.

144-75, 144-80 and 144-17MHz are well-known atv calling channels in Europe. Please QSY from these frequencies as soon as a QSO is established.

SECTION B: RECEIVE-ONLY STATIONS

For swls the same rules are applied.

Entrants of section B may not "give" points to stations working in section A:

Logs. Must include postal address, locator, and station details and be mailed not later than 30 September to G. Shirville, G3VZV, 18 Church End, Milton Bryan, Milton Keynes, Buckinghamshire MK17 9HR.

BATC Autumn Cumulative Contest 1981 rules

Dates. 7, 15 and 23 November, and 1 and 9 December.

Time. 2000 to 2300gmt each day.

Scoring. Logs have to be entered per band operated—a maximum of three sessions will count for points—if you operate on more please enclose details for checking purposes. (a) two-way QSO on 432MHz 2 points/km; (b) two-way QSO on 1-3GHz 8 points/km; (c) two-way QSO on 10GHz 16 points/km. Multi-op-stations may only use one callsign—only one location may be used during the contest. Crossband QSOs must be entered in the log for the transmit band.

Exchanges. The following data is to be exchanged:

1. Code-group, which consists of four digits, individually chosen by each entrant, ie 1865 or 9732. The code group must be exchanged in video only.
2. Call, QTH locator, report, serial number starting at 001 each session, this data to be exchanged via video or phone.

Should one of the stations fall in receiving the picture of the other, the scores of both stations are to be halved.

144.75, 144.80 and 144.17MHz are well-known ATV calling channels. Please QSY from these frequencies as soon as a QSO is established.

Contacts. The same station may only be contacted once per band on each night. Logs. Must include postal address, locator, and station details and be mailed not later than 31 December 1981 to: G. Shirville, G3VZV, 18 Church End, Milton Bryan, Milton Keynes, Buckinghamshire MK17 9HR.

Region 1 RSGB VHF Contest rules

0900 to 1700gmt, Sunday 13 September 1981.

Organized by and for members in NW England and Isle of Man.

Bands: Any three from 70, 144, 432, 1,296MHz.

Section 1. Multi-operator, fixed or /P. Separate call on each band, simultaneous operation. No QSOs within operator's own group count.

Section 2. Single-operator, fixed or /P. One to three bands from four.

Section 3. Operators in other regions are invited to enter logs, scoring only Region 1 QSOs.

The following general rules published in the January 1981 issue of *Radio Communication* will apply: 2, 3, 5a, 6a, 10a, 11a, 13, 20.

Scoring: A-70, 144, 432MHz as Rule 7a, 1,296MHz 1pt per 5km, plus B, C, D.

B—Multiply 70MHz score by three, and 432MHz score by four. C—according to antenna height asl, multiply band totals as below: 0-200ft by 2; 200-400ft by 1.8; 400-600ft by 1.6; 600-800ft by 1.4; 800-1,000ft by 1.2; 1,000-1,200ft by 1.1. Over 1,200 by 1. D—add 10pt bonus for each Region 1 contact.

Awards. Section 1, The G3SMM Trophy; Section 2, The G2CIP Trophy. Both are held for the year. Certificates to band leaders and best log in Section 3.

Entries to G2CUZ, 34 Sandbrook Road, Ainsdale, Southport PR8 3JE, within 15 days of the contest please.

Cray Valley RS 11th SWL Contest rules

1. 1800gmt on 12 September to 1800gmt on 13 September. Up to 18h logging may be done during this period and the rest period must be clearly shown. Multi-operator stations may log during the entire contest.

2. The contest is open to anyone in the world and there will be two sections (phone and cw) each with two categories (single-operator and multi-operator). The second category is open to two or more listeners or to clubs and more than one receiver can be used.

3. The 1-8, 3-5, 7, 14, 21 and 28MHz bands may be used.

4. The practice of logging a series of contacts made by one station is deprecated.

5. Scores should be compiled as follows: one point for each station heard multiplied by the number of different countries heard on each band. A list of countries heard must be furnished and a separate log must be submitted for each band. Illegible logs will not be accepted.

6. The call areas of the USA, Canada and Australia will each count as a separate country, ie W1 0 VO1, VO2, VE1 8, VY1 and VK1 8. All other countries will be determined by the official RSGB Countries List.

7. No CQ or QRZ or similar call will be allowed to count for points.

8. Log sheets are available from Owen Cross, G4DFI, 28 Garden Avenue, Bexleyheath, Kent DA7 4LF, who must be sent a large sae. It is desirable that entrants use official log sheets but entries on home-made log sheets will be accepted if the following information is given: date, time, band, station heard, station being worked, report at swls QTH. Points may be claimed only for stations actually heard and the callsign must be shown in full.

If points are claimed for both sides of a QSO, the callsign of each must appear in the station heard column.

9. Entries should be sent to the contest manager, G4DFI, at the above address, to arrive not later than 2 November 1981.

10. Certificates of merit will be awarded at the discretion of the board of the Cray Valley RS and its decision will be final.

White Rose RS 1st LF Bands Contest results

Four countries were represented in the contest: England, Belgium, Japan and the USA. Much activity was noted on the 3-5MHz and 1-8MHz bands, the latter being created by the annual CQWW HF/LF contest. Conditions were about average for the time of year and some good dx was noted on all bands. 3-5MHz carried most of the traffic with a total of 74 countries audible in western Europe. This total represented a possible maximum of 88 multipliers in the 18h available. Best dx recorded on 3-5MHz were EL7A, Y11BGD, OA4AWD, HT1KD, KL7Y and J3AAE. Not much activity was noted on 7MHz for the first part of the contest and it was left to the VEs to bring in a few extra multipliers. Even so a total of 60 countries were noted in the European logs received and this in return could have accounted for a maximum of 75 multipliers. Best dx noted in the 7MHz logs were UJ8XCW, TR8DX, ZD7BW and VE7IG. Those who monitored 1-8MHz in the cw section found a transmitting contest in full swing at the same time. What a pity more entrants did not monitor this band as activity from North America would have increased their scores considerably. A check log received from CM31GW showed 77 W/Ve stations being worked by that station.

Paul Tittensor, the winner, listened throughout the 18h on a Drake R4B. He used a 40m long wire at 28ft and a 40m inverted Vee at 32ft. Paul had a total of 125 multipliers and 1,238 scoring points in his entry. The cw section winner was Ron Thomas with 34,875 points. Ron was one of the new entrants who misunderstood the points system. The final score was calculated on the total points scored on all three bands multiplied by the total number of countries heard on three bands. Ron will see he earned himself another 22,000 points!

Presentation of the logs was very good and although the majority of entrants will see their scores adjusted it is to their credit in most cases. The committee thanks all who took part in this contest and to G31GW, G4FKS and BRS25429 for submitting check logs. These were much appreciated.

Comments:

"The start of the contest was a bit early in the UK. Suggest finishing an hour later as Ws can still be heard on 7MHz at 1000gmt"—Paul Tittensor.

"It is good to have another swl contest in the calendar"—Bob Treacher.

"I suggest the contest could be run from 1200 Saturday to 1200 Sunday with competitors choosing their own period of 12 consecutive hours"—Arthur Miller.

"Thank you for the opportunity to take part in your first swl contest and please convey my appreciation to your members"—John Goodrick.

"I enjoyed the contest. Looking forward to the next one"—Reg Akhurst.

"We are both Sea Cadets in York and spent the duration of the contest in the Unit Headquarters working independently and without any help whatsoever"—Julian Meek and Nigel Birkinshaw.

"Last took part in a swl contest about 14 years ago. Don't expect to finish in top half as I prefer to go to bed at night"—George Elliott.

"I listened 95 per cent of my time on 1.8 and 3.5MHz and the rest of time on WAB nets"—John Raynes.

PHONE SECTION

Posn	Station	Points	Posn	Station	Points
1	P. Tittensor, A8808	154,750	9	J. Meek	7,359
2	B. Treacher, BRS32525	94,416	10	G. Yarnall	5,920
3	A. Miller, G5218	94,016	11	R. Jeffery, BRS44997	4,727
4	N. Hembrey, BRS28198	28,105	12	M. Jeffery, BRS45172	4,396
5	R. Akhurst, BRS25209	26,792	13	T. Sugihara, JA44665/1	4,344
6	C. Addison, WDX2CA	23,980	14	N. Birkinshaw	1,342
7	A. Darby	22,491	15	Y. Kurosaki, JA92197	1,200
8	G. Simpson, ARS42439	12,887			

CW SECTION

Posn	Station	Points	Posn	Station	Points
1	R. Thomas, BRS15822	34,875	4	Yerganian Jean-Jacques, ONL383	15,876
2	D. Poppi, BRS29909	24,258	5	J. M. Raynes, BRS45019	12,040
3	J. Goodrick, BRS44395	24,092	6	G. S. Elliott	6,424

Mobile rallies calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

5 July—RAIBC Picnic, The Fairground, Broadlands Estate, Romsey, Hants. Talk-in on 144MHz. Organized by Southampton RSGB Group. Details from sec F. E. Wooley, 9 Rannoch Court, Adelaide Road, Surbiton, Surrey KT6 4TE.

12 July—Worcester & District Mobile Rally, formerly Upton Rally. New venue: Droitwich High School, Droitwich, Worcs, three miles from M5, junction 5. All the usual attractions, strawberries (weather permitting), lots of parking space, room for all the family. Trade and bring and buy bigger than ever. Details from Tony Blissett, G8NSL, tel Worcester 620507, or club sec Mike Tittensor, G4EKG, tel Evesham 41105.

19 July—Sussex Mobile Rally, Brighton Raceground, Racehill, Brighton, Sussex, 10.30am. 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.

26 July—Anglian Mobile Rally, Stanway School, Colchester, Essex. Open 10am-5pm. Talk-in on 144MHz. Further details from G3YAJ, tel 0206 39 3938.

26 July—Scarborough ARS Mobile Rally, The Spa Ocean Room, The Sea Front. Open 10.45am. Talk-in on S22 and GB3NY (R80). Refreshments, licensed bar, bring and buy, raffle etc. Free admission. Help available for RAIBC members wishing to attend if contacted in advance. Details from Margaret Crofts, G4JAO, 43 Broadlands Drive, East Ayton, Scarborough, N. Yorks YO13 9ET, tel 0723 862638.

2 August—RSGB National Mobile Rally, Woburn Abbey.

9 August—Derby & District ARS Mobile Rally. Lower Bemrose School, Littleover, Derby, site as previous years. All usual attractions. Details from hon sec Jenny Shadlow, 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.

30 August—Torbay ARS Mobile Rally, ITT Social Centre, Brixham Road, Paignton. Details from G2CWR, tel Paignton 558714.

6 September—Vange ARS Mobile Rally, Nicholas School, Basildon, Essex. 10am-5pm. 144MHz talk-in station, callsign GB4VMR. Many attractions including trade stands, bring and buy, raffle, and refreshments. Details from Albert Smith, G4FMK, QTHR, tel 03743 3805.

13 September—Telford Mobile Rally, Telford New Town Centre Malls, Shropshire. All usual attractions plus some unique to this rally. Full catering and licensed premises on site. Over 50 trade stands. Further details from G8DIR, tel Shrewsbury 64273; G8UGL, tel Telford 584173; or G3UKV, tel Telford 55416, all QTHR.

13 September—Pembroke RSGB Group GW20P Bucket and Spade Party at The Regency Hall, Saundersfoot, Dyfed. Talk-in on RB4, RB6, S22 and R7. Starts 1100bst. Details from GW3XJQ.

20 September—Bromsgrove Mobile Picnic, organized by Bromsgrove & DARS, at Avoncroft College, Bromsgrove, just off the A38. Talk-in on 144MHz ssb, S22 and 432MHz fm. A true picnic, no trade stands. There will be a flea market, raffles etc plus low-price admission to the Avoncroft Open Air Museum of Buildings. Refreshments available. Details from E. Cotton, G8XAB, tel 0905 773181.

20 September—Peterborough Mobile Rally. New venue: Wirrina 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—Harlow Mobile Rally. The new venue is Harlow Sports Centre; details to follow. Further information from Phil Dunbar, G8FRG, QTHR, tel 0279 39851, ext 251, office, 32486, home.

Looking ahead

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

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.

29-31 October—Amateur Radio Retailers Association Tenth National Amateur Radio Exhibition, Donington Park, Castle Donington, Derbyshire. Please note change of venue.

CLUB NEWS

The following is the latest information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue, plus basic unchanged information on other affiliated organizations which was last published in the January issue. Unchanged details will be published again in January 1982.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the September issue should reach them by 8 July and for the October issue by 20 August.

Club programmes are given in order of date, subject time and place of the meeting. All call signs 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.

COMPOSITION OF RSGB REGIONS

- Region 1** Cheshire, Cumbria, Greater Manchester, Isle of Man, Lancashire, Merseyside.
- Region 2** All that part of Humberside north of River Humber, North Yorkshire, South Yorkshire, West Yorkshire.
- Region 3** Hereford and Worcester, Shropshire, Staffordshire, Warwickshire, West Midlands.
- Region 4** Derbyshire, all that part of Humberside south of River Humber, Leicestershire, Lincolnshire, Nottinghamshire.
- Region 5** Bedfordshire, Cambridgeshire, Northamptonshire.
- Region 6** Berkshire, Buckinghamshire, Oxfordshire.
- Region 7** Greater London south of River Thames, Surrey including that part of London north of the Thames administered by Surrey.
- Region 8** Kent, East Sussex, West Sussex.
- Region 9** Cornwall, Devon.
- Region 10** Dyfed, Gwent, Mid Glamorgan, Powys, South Glamorgan, West Glamorgan.
- Region 11** Clwyd, Gwynedd.
- Region 12** Grampian, Highland, Island Authorities, Tayside.
- Region 13** Borders, Fife, Lothian.
- Region 14** Central, Dumfries and Galloway, Strathclyde.
- Region 15** Northern Ireland.
- Region 16** Essex, Norfolk, Suffolk.
- Region 17** Isle of Wight, Channel Islands, Dorset, Hampshire, Wiltshire.
- Region 18** Cleveland, Durham, Northumberland, Tyne & Wear.
- Region 19** Greater London north of River Thames, Hertfordshire.
- Region 20** Avon, Gloucester, Somerset.

REGION 1—RR W. R. Parkinson, G3FNM, 141 Norris Road, Sale, Cheshire M33 3JR.
Ainsdale (AARC)—7 and 21 July. Ainsdale Scout HQ. Full particulars from G2CUZ.
Barnoldswick (Rolls Royce ARC) 1 July (Talk by H. Leeming, G3LLL). Rolls Royce Sports & Social Club, Barnoldswick. Sec Leslie G. Logan, G4ILG.
Blackburn (East Lancs ARC)—First Thursday in each month. Shadworth Centre, Blackburn. All enquiries to sec G8TJG.
Blackpool (B&DARS)—First Monday in each month. Details from G5ND, tel Blackpool 64508.
Bolton (B&DARS)—First, third and fourth Wednesdays in each month, 8pm. Horwich Leisure Centre, Horwich, Nr Bolton. Sec Alan Hartley, G8PRH, tel Bolton 46023.
Bolton (BTCARC)—no details available.
Bolton (Edbro RC)—Details from sec, c/o Edbro Ltd, Lever Street, Bolton.
Bury (BRS)—Main meeting second Tuesday in each



The opening of the new premises of Thornton Cleveleys ARS. L to r: Fred Redhead, G4FXG, Chairman of TCARS; Basil O'Brien, G2AMV, President of RSGB; Mark Denny, G6DN, President of TCARS and Eileen O'Brien, G3WIO.
 Photo: Lancashire Evening Gazette.

month, 7.30pm. Mosses Community Centre, Cecil Street, Bury. 21 July (Surplus equipment sale). Informal meetings on other Tuesdays for cw practice, "natter and noggin" sessions, constructional projects etc. Details from publicity officer C. Marcroft, G4JAG, tel Ramsbottom 2168.

Carlisle (C&DRS)—Mondays, 7.30pm. Currock House, Lediard Avenue, Carlisle. Details from G8DVD.
Chester (C&DRS)—Tuesdays (except first in the month), 7.30pm. YMCA, Chester. Sec P. Holland, G3TZO.

Douglas (IoMARS)—Mondays, fortnightly. Keppel Hotel, Creg ny Baa, Nr Onchan. Sec C. Matthewman, G4FWQ, tel Douglas 22295.

Eccles (E&DRS)—Tuesdays, 8.30pm. White Swan, Worsley Road, Swinton. Sec C. Harrison, G8KRG, tel 061-797 0031.

Leyland (LHARG)—Second Tuesday in each month. Rose & Crown, Ulmes Walton, Leyland. Sec: Arthur Jolly, G4JCO, 30 Crawford Avenue, Chorley.

Liverpool (L&DARS)—Tuesdays, 8.30pm. Conservative Association Rooms, Church Road, Wavertree, Liverpool. Details of programme etc from R. Simmons, G3PNS.

Liverpool (North Liverpool RS)—Details from R. Porter, G3VXX, tel 051-928 1610.

Liverpool (UoLARS)—This society is mounting a expedition to Galloway, South West Scotland from 10 to 20 July. Site 20km ESE of Stranraer, ORA X028h, ngr: 248 522—Sheet 82 in OS "Landranger" series. Activity: 1-8 to 432MHz. Meetings in term times at lunchtime in Reilly Building. Sec Peter K. James, GW6AJK c/o UoL, 2 Redford Street North, Liverpool 7.

Macclesfield—Second Tuesday in each month, 7.45pm. Please contact Mrs Mary Roberts, 15 Park Brook Road, Macclesfield, for details of venue etc, tel Macclesfield 24383.

Manchester (M&DRS)—Wednesdays, 7.30pm. Newton Heath Community Centre, 203 Droylsden Road, Newton Heath, Manchester. Sec G8OWY.

Manchester (MUARS)—In term time Wednesday afternoons and most lunchtimes, Club Shack, Union Buildings, top floor. G3VUM active on hf, rtty etc. For details please contact sec c/o Radio Society, University Union, Oxford Road, Manchester 13.

Manchester (South Manchester RC)—3 July (Preparation for VHF NFD), 10 July (Mystery lecture), 17 July (HF activity night), 24 July ("FETS biasing and applications", by D. Bolton, G8UQC), 31 July ("Experiments on uhf", by C. McKenzie, G8LOQ), 8pm. Norris Road Community Centre, Norris Road, Sale. Informal meetings, same venue, Mondays, 8pm. Following AGM in May new chairman is Chris Ward, G4HON. Sec D. Holland, G3WFT, tel 061-973 1837.

Manchester (UoMISTRS)—Meetings during term time—Wednesday afternoons in shack, L Floor, Main Building. Thursdays, 9pm, Union Bar (UMIST). Callsigns G3CXX/G8FOT, active on 1-8 to 432MHz. Details from sec, c/o Radio Society, UMIST Union, Box 88, Sackville Street, Manchester M60 1QD.

North West Repeater Group—Details from G3RXH.
Ormskirk (OARC)—Tuesdays, 8.30pm. "Over 60's"

Hut, Liverpool Road, Ormskirk. Details from G4HDU, tel Aughton Green 423062 or G4IGX, tel Ormskirk 75546.

Penrith (Eden Valley)—Third Thursday in each month. Two Lions Hotel, Great Dockray, Penrith. Details from G4HYJ.

Preston (PARS)—Alternate Thursdays. St Mary Magdalene Church Hall, Farrington Lane, Ribbleson Lane, Preston. Sec G. Earnshaw, G3ZXC.

St Helens (StH&DARC)—Thursdays, 7.45pm. Conservative Association Rooms, Boundary Road, St Helens. Please enquire of sec Paul Gaskell, G8PQD, tel St Helens 25472 for details of July programme.

Salford (Dial House RS)—Wednesdays, 5.30-9.30pm. Dial House, 21 Chapel Street, Salford. Details from sec, c/o M43 at above address.

Stockport (SRS)—Second, third and fourth Wednesdays in each month, 8pm. Blossoms Hotel, Buxton Road, Stockport. Club net on 3.692kHz, 11am, Sundays. SRS International, 28-430MHz, 10am, Sundays. Details from sec G3FYE.

Thornton Cleveleys (TCARS)—Mondays, 6 July ("Exchange teaching in the USA", by G4FXG), 13 July ("Electronics air navigation", by G3VKM), 27 July ("Radio brains trust", by G8JV), 7.30pm. Thornton Cleveleys Sports Centre, Victoria Road, Cleveleys. Slow cw transmissions 1-975MHz, Tuesdays and Wednesdays, 7pm. RAE course available. Enquiries to A. Parr, G3IWP. Membership over 100.

UK FM Group (Western)—First Thursday in each month, 8pm. Grappenhall Community Centre, Grappenhall, Warrington. Sec G3LEO, tel Knutsford 4040.

Warrington (W&DARS)—Tuesdays, 7.45pm. Grappenhall Community Centre, Grappenhall, Warrington. Sec R. Staples, G3MMD, tel Lynn 3533.

Wigan (Douglas Valley ARS)—First and third Thursdays in each month. Shevington Conservative Club, Shevington, Wigan. Details from G3LRB, OTHR.

Winsford (Mid Cheshire ARC)—Wednesdays, 7.30pm. The club meets in new premises in Winsford. For details please contact sec Rob Linton, G8XNZ, Birch Cottage, Heyrose Lane, Over Tabley, Near Knutsford, tel Pickmere 3601, or listen on club net, S8 (145-200), 1830h Tuesdays, talk-in on S8. The club's association with ICL has now ended.

Wirral (WARS)—1 July (Talk by G3EGX), 15 July (Treasure hunt by radio), 7.45pm. Sports & Recreational Centre, Grange Road West, Cloughton, Birkenhead. Sec Garry O'Keeffe Wilson, G8VPF, tel 051-677 1531.

Wirral (W&DARS)—Wednesdays, fortnightly, 8pm. Sports Concourse, West Kirby, Wirral. 8 July (Eileen Medley Challenge Cup of hunt). Publicity secretary J. Mills, G8NOY.

Apart from twice a year, when all clubs are listed, only updated information/programmes can be published lack of such details has resulted in the somewhat truncated entry from Region 1 over recent months. If material reaches me by the deadline date I will incorporate it into the region's entry. **RR1.**

REGION 2—RR D. S. Smith, G4DAX, Red Roof, Goathland, Whitby, North Yorks YO22 5AN. Tel 094 786 333.

Barnsley (B&DARC)—Second and fourth Mondays in each month. The Grey Horse, Kensington Road, Barnsley. Sec G4JKW, tel Barnsley 382955. This is a new club and now that they have a venue a full programme will follow. Application for RSGB affiliation has been made.

Barnsley (UK FM Group Northern) 5 July, 2 August, 7.30pm. The Royal Hotel, Church Street, Barnsley. Sec G8PLJ.

Bradford (UoBARS)—Thursdays, 7.30pm. N10, Main Building, University of Bradford. Sec G8GOV. Net frequency 145-275.

Denby Dale (DD&DARS)—Second and fourth Wednesdays in each month, 7.30pm. Pie Hall, Denby Dale. Sec J. Clegg, G3FQH.

Doncaster (DMIoHEARC)—Details from sec Robert Lane, G4AWU. Club call, G3UER.

Goole (G&DARS)—Mondays, 7.30pm. The Grammar School, Boothferry Road, Goole, term time only. Out of term at the Chamber of Commerce Building, Boothferry Road, Goole. Details from chairman G3VBI.

Halifax (Northern Heights ARS) 8 July (Visit to West Yorkshire Fire Brigade HQ at Birkenshaw), 7.45pm. Bradshaw Tavern, Bradshaw, Nr Halifax.

Harrogate Repeater Group (HRG)—Work continues on the repeater and the completed logic is a beautiful job. Three members of the engineering team visited the proposed site on 13 May and were received very hospitably by the site owner's staff. Chairman G4ATZ.

Hornsea (HARS)—Wednesdays, 8pm. The Mill, Mill House, Attic Road, Hornsea. Sec Mrs J. Heathershaw, G4CHH.

Hull (H&DARS)—Fridays, 8pm. RAE classes, 9pm, Fridays. Kingston Community Centre, Fountain Road,



Members of Wakefield & DARS see G3WWF put theory into practice after his talk on rtty (G3WRS marks PY1)

Hull. Sec Mrs H. Cunliffe, 12 Pearson Avenue, Hull, tel 0482 44355.

Hull (HUR&ES)—1.15pm, Room 313B, University Union Building, Cottingham Road. Details from G8RPZ.

Hull (World Association of Christian Radio Amateurs & Listeners)—This very active worldwide organization does not have many meetings but has a number of nets and activity days. The UK Sunday Net is at 0830 on 3-775kHz. All amateurs are most welcome to call in. Details from HQ sec L. Colley, G3AGX.

Leeds (White Rose RS)—8pm, Moorfoot Rugby Football Club, Moss Valley, Alwoodly, Leeds 17. Sec G8UYZ. Club net 8pm, Thursdays on 3-750MHz. The AGM was held on 6 May. New officers are: G4IDJ (Dave), chairman; G4JYL (Gwen), treasurer; G8UYZ (Dave), sec. A new constitution was adopted and many suggestions for a full year were made.

Leeds (L&DARS)—Mondays, 8pm. Old Hall Golf Club, Woodhall Lane, Calverly, Leeds. Sec G8NVP. A Christmas rally has been planned for Sunday 13 December. Details from Chris, G8NVP.

Mexborough (M&DARS)—Fridays, 7pm. Harrop Hall, Dolcliffe Road, Mexborough. Sec G3ZHI, tel Rotherham 814911.

Otley (OR&ES)—Tuesdays, 8pm. Back of Court House Street, Otley. Sec Jack Annakin. Contact G8DFZ for details.

Pontefract (P&DARS)—Details from sec G4ISU, tel 72784. 9 July ("Video cassette recorders", by G3VTD), 23 July (Club electronic keyer project, by G4AAQ), 6 August (Junk sale, everything must go!) The cw practice organized by G4KMW will be on alternate Thursdays to club nights.

Scarborough (SARS)—Mondays, 7.30pm. Scarborough Cricket Club, North Marine Road, Scarborough. Sec G4JQA, tel Scarborough 862638. 13 July (Preparatory talk for df hunt), 20 July (Rally preparation), 26 July (Rally), 27 July (Rally wash-up), 3 August (DF hunt). The club's new 60ft mobile tower should ensure immediate contest success—or hernias for those trying to move it!

Sheffield (SARS)—Third Monday in each month, 8pm. Sheaf House Hotel, Bramell Lane, Sheffield. Sec G4APV.

Sheffield (British Steel ARS)—Wednesdays, 7.30pm. Tinsley Sports & Social Club, Bawtry Road, Sheffield. Details from G3XSI, tel Sheffield 51417.

Wakefield (W&DARS)—8pm. Holmfild House, Denby Dale Road, Wakefield. Sec G4BLT, tel Wakefield 255515.

Wharfedale Repeater Group—2 July (AGM). Details from G3KKP. QTHR.

York (YARS)—Fridays, except third in the month, 7.30pm. United Services Club, Micklegate, York. Sec Keith Cass, G3WVO. Look out for GB3GYS from The Great Yorkshire Show at Harrogate on 14, 15 and 16 July.

Representatives from a number of clubs within Region 2 attended the half-yearly regional meeting at the White Rose RS HQ on 25 April. Subjects discussed included a portable display stand for Zone A, the cost of ARRL books, cb standards, a "Euro licence", an information package on local clubs for new RSGB members, a British novice licence, cw operation on 144MHz, Raynet, and interference on 144MHz. The three-hour meeting gave everyone a present opportunity to air their feelings, and the regional representative had the chance to gather opinions from the major groups in the region. Many thanks to White Rose RS for its hospitality. Was your club represented?

REGION 3—RR to be elected

Atherstone (AARC)—9 July ("The use of microcomputers in amateur radio", by Haydn Bate, G8AMD), 7.30pm. The Tudor Centre, Coleshill Road, Atherstone. Sec G8SYE, tel Atherstone (08277) 5995.

Birmingham (Midland ARS)—21 July, 8pm. 294a Broad Street, Birmingham B1 2DS. Sec G8BHE, tel 021-422 9787.

Birmingham (Slade RS)—First Friday in each month, 7.45pm. The Kingsbury Road Community Centre, 75 Kingsbury Road, Erdington, Birmingham B24 8QH. Sec G4GFG, tel 021-770 3474.

Birmingham (South Birmingham RS)—Thursdays (HF night on the air), Fridays (Construction and Morse classes), 7.30pm. 5 August (Natternight), 8pm. Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Sec G4GZI, tel 021-427 7104.

Birmingham UoBARS—Lunchtimes and Fridays during term, 7.30pm. Tuesdays (RAE classes), 7.30pm. Club room, second floor Students' Union (above shop). Sec G4LCM (QTHR as G8VNC).

Bromsgrove (B&DARC)—10 July (Night on the air—G3VGG/A), 8pm. Avoncroft Art Centre, Bromsgrove. Club net Wednesdays, 144-850MHz, 8pm. The club will be operating a special event station in Sanders Park on 29 July to mark the occasion of the royal wedding, using the call sign GB2WED. Special QSL cards will be issued and an award arranged—details from G4IVJ. Sec G4HFP, tel Stourport (02993) 3818.

Burton-on-Trent (B on T&DARS)—Wednesdays, 8pm. Stapenhill Institute, Main Street, Stapenhill, Burton-on-Trent. Sec G3ACR.

Cannock Chase (CCARS)—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 (CARS)—Fridays, 8pm. Baden Powell House, 121 St Nicholas Street, Radford, Coventry. Sec G8SEQ, tel Coventry (0203) 598186.

Coventry (CTCARS)—Mondays, 7pm. Winfray Annex of the college. Sec G8ISJ. All visitors welcome.

Coventry (University of Warwick ARS)—Wednesdays during term, 7pm. Cryfield Farm, University of Warwick. Talk-in on S20, or contact G4BXI or

G4DCW, Hurst Flat 40, Cryfield Village, University of Warwick.

Dudley (DARC)—Second and fourth Tuesdays in each month, 7.45pm. Central Library, Dudley. Sec Norman Rock, 28 Conway Close, High Acres, Kingswinford, Brierley Hill DY6 8PT.

Hereford (HARS)—First and third Friday in each month, 8pm. Civil Defence HQ, Gaol Street, Hereford. Sec G4CNY, tel Hereford (0432) 3237.

Kidderminster (K&DARC)—Mondays (Informal), 9.30pm. Bellman's Cross, Shatterford. 21 July (Surplus sale), 4 August (Informal discussion), 8pm. Aggborough Community Centre, Hoo Road, Kidderminster. Sec G4ILQ, tel Kidderminster (0562) 4930.

Lichfield (Chad RC)—Alternate Wednesdays, 8pm. The Naval Club, Burton Old Road, Lichfield. Sec G4ESK.

Lichfield (LARS)—First Monday and third Tuesday in each month, 8pm. "Swan" (bar), Lichfield. Sec G3NLY, tel Burntwood (05436) 71447.

Malvern Hills (MHRAC)—On 14 July the regular Morse class will be followed by a talk on hf propagation by Nick Hamilton, G8TXG at 7.30pm. The Foresters' Arms, Wilton Road, Barnards Green, Malvern. Sec G4BVV, 9 Wyche Road, Malvern, tel Malvern (06845) 62900.

Mid-Warwickshire (MWARS)—First and third Mondays in each month, 8pm. 61 Emscote Road, Warwick. Sec G8RZR, tel Warwick (0926) 496453.

Redditch (RRC)—Second and fourth Thursdays in each month, 8pm. WRVS Centre, Ludlow Road, Redditch. Sec G3EVT, tel Alcester (0789) 762041.

Rugby (RATS)—Wednesdays, 7.30pm. Cricket pavilion entrance to B Building, Rugby Radio Station, A5 trunk road, Hillmorton, Rugby. Sec G4ECO.

Shrewsbury (Salop ARS)—Thursdays, 8pm. Albert Hotel, Smithfield Road, Shrewsbury. Sec G3VWH, tel Shrewsbury (0743) 51833.

Solihull (SARS)—21 July ("Survival on 2m", by Robert Maskill, G4JDL), 7.30pm. The Manor House, High Street, Solihull. Club nets (G3GEL), Fridays, 9.30pm on 1.960kHz and (G8ZLJ), Sundays, 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.

Stoke-on-Trent (North Staffs ARS)—First and third Mondays in each month (Lectures, etc), other Mondays (Natterights, Raynet and club station, G4BEM), 7.30pm. Harold Clowes Community Centre, off Dawlish Road, Bentilee, Stoke-on-Trent. Sec G8FGR, 61 Westacre, Bucknall, Stoke-on-Trent ST1 6AF.

Stoke-on-Trent (S-on-TARS)—Thursdays, 7.30pm. 2a Racecourse Road, Oakhill, Stoke-on-Trent. Sec G4IMV, tel Newcastle (0782) 613207.

Stourbridge (StARS)—20 July (Visit to AirCall control room, Birmingham). Regular meetings are held on the third Monday in each month, 7.45pm. Library, Longlands School, Brook Street, Stourbridge. Sec G8JTL, tel Lye (038482) 4019.

Stratford-upon-Avon (S-upon-A&DARC)—No regular meetings but occasional events. Help always given to new amateurs and swls. Chairman/sec G3OOQ, tel Stratford (0789) 5973.

Sutton Coldfield (SCRS)—13 July (Discussion of members' ideas for future club activities), 27 July (Light-hearted evening in anticipation of the holiday period), 7.30pm. Central Library, Sutton Coldfield. Sec G8TUR, tel 021-353 2061. Club net Mondays, except on meeting nights, 145-2MHz, 8pm.

Tamworth (TARS)—Second and fourth Mondays in

The Membership & Representation Committee invited local regional representatives to attend a meeting in Hereford. Front, l to r: John Bazley, G3HCT; David Evans, G3OUF, RSGB general manager; Jack Anthony, G3KQF, chairman; Basil O'Brien, G2AMV, President. Rear, l to r: Ian Kyle, G18AYZ (Region 15); Les Hawkward, G5HD; Brian Goddard, G4FRG (Region 20); Henry Pinchin, G3VPE (Region 3); Bob Barrett, GW8HEZ; John Allaway, G3FKM; Dain Evans, G3RPE; Martin Shardlow, G3SZJ (Region 4); Willy McClintock, G3VPK.



each month, 7.30pm. White Lion, Lichfield Street, Tamworth. Other Mondays (informal), club shack. Sec G4FZN, tel Tamworth (0827) 69708. Club net Wednesdays, 145-375MHz, 9pm.

Telford (T&DARS)—Wednesdays, 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G8UGL, tel Telford (0952) 584173.

Walsall (W&DARS)—Alternate Wednesdays, 8pm. Forest Community Centre, Forest School, Hawbush Road, Leamore, Walsall. Sec G4GKC, tel Walsall (0922) 31675.

Willenhall (W&DARS)—Alternate Wednesdays, 8pm. Three Crowns, Stafford Street, Willenhall. Sec G4FAQ, tel Wolverhampton (0902) 730300.

Wolverhampton (WARS)—13 July (Natternight), 20 July (to be announced on GB2RS), 27 July (Committee meeting—members welcome to attend), 3 August ("Power supplies", by John Cook, G8EDG), 8pm. Wolverhampton Chamber of Commerce & Industry, 93 Tettenhall Road, Wolverhampton WV3 9PE. Sec G8EDG, tel Wolverhampton (0902) 763617.

Worcester (W&DARS)—The meeting on 3 August will include two films. There will also be a talk on amateur radio in Canada by Keith Ballinger, VE2AQU, previously G8BBP, a former local member of the club, 8pm. "Old Pheasant", New Street, Worcester. Sec G4EKG, tel Evesham (0386) 41105.



Bob Ward, G8LGA, operating the talk-in at the Maidstone Rally. Photo: Kent Messenger

REGION 4—RR M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel Derby (0332) 556875.

Bolsover (BARS)—8 July ("Prisoner of war radios", by Tom Douglas, G3BA), Duckmanton Hotel, Bolsover, 7.30pm. Wednesdays, 8pm. Angel Hotel, Bolsover. Sec Alan Turford, G8HPQ, tel Chesterfield 824972.

Derby (D&DARS)—Wednesdays, 1 July (Bring and buy sale), 7.30pm. Morse classes, Tuesdays and Thursdays, 7pm. Historic radio section every third Friday, 119 Green Lane, Derby. Sec Jenny Shardlow, G4EYM, tel Derby (0332) 556875.

Derby (Nunsfield House ARG)—3 July (VHF Field Day preparations), 4-5 July (VHF Field Day at Weaver Hills near Ashbourne), 10 July (Contest logging), 17 July ("The secret listeners" and "World at their fingertips", videocassette films), 24 July (Direction finding run in the Alvaston area), 31 July (A lecture by Peter Neal, G3WUF), 7.45pm. Nunsfield House, Boulton Lane, Alvaston, Derby. Sec Ian Cage, G4CTZ, tel Derby (0332) 71875 or 799452.

Grimsby (GARS)—2 July (Starting on 10GHz), 16 July (Guest speaker from Lowe Electronics), 30 July (Visit to RAF Binbrook), 7.30pm. New Alexandra Social Club, Cleethorpes. Sec Trevor Matthews, G3RGC, tel Grimsby 884060.

Hinckley (HARAES)—The club has ceased meeting for summer vacation, next meetings start in September at Room H8G, John Cleveland College, Butt Lane, Hinckley. Sec Norman Geary, G8STX, tel Hinckley 632778. **Ibstock (IARS)**—7 July (DF hunt), 21 July (Bring a guest evening), 7.30pm. Hastings Arms, Ibstock. Sec Steve Haywood, G8UZO, tel Ibstock 62158.

Leicester (LRS)—Mondays, 7.30pm, Sundays, 10.30am. Club House, Gilroes Estate Cottage, off Groby Road, Leicester. Sec Paul Elliott, G8XGD, 21 Unitt Road, Quorn, Loughborough, Leics.

Leicester (LPARS)—For information contact G3ORY, at Leicester Polytechnic, The Newark, Leicester.

Leicester Repeater Group—For information contact Geoff Dover, G4AFJ.

Lincoln (LSWC)—Second and fourth Wednesdays in each month, 8 July ("RTTY using a vdu", by G3VRD), RAE and Morse classes first and third Wednesdays, 7.30pm. City Engineers Sports and Social Club, Waterside South, Lincoln. Sec Mike Wells, G4JES, tel Lincoln 721277.

Loughborough (LFARC)—Fridays, 8pm. Brush Sports and Social Club, Fennel Street, Loughborough. Sec Brian Goodall, G8BUB, tel Shephed 3558.

Louth (L&DARS)—14 July (Open evening), the society has been issued with the callsign G4LRS. Eastgate Union Church, Eastgate, Louth. Sec Ron Padbury, G4GAB.

Mansfield (MARS)—3 July, 7.30pm. New Inn, Westgate, Mansfield. Sec John Coates, G4GYU, tel Mansfield 27257.

Matlock (Derwent Valley ARS)—6 July (DF hunt). Chatsworth House, Matlock Training College, Chesterfield Road, Matlock. Sec Jim Geeson, G4IDI, tel Bakewell 3784.

Melton Mowbray (MMARS)—Summer vacation until September, third Friday in each month, 7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray. Sec Richard Winters, G3NVK, tel Melton Mowbray 3369.

Nottingham (ARCON)—2 July (Forum), 9 July ("Crystals and ferrites in rf circuits", by G8JYP), 16

July (Preparation for Selston Carnival), 23 July (TBA), 30 July (Foxhunt), 15 July (Raynet meeting), 7.30pm. The Sherwood Community Association, Woodthorpe House, Mansfield Road, Sherwood, Nottingham. Sec Mike Shaw, G4EKW.

Nottingham (Trent Poly RS)—Mondays, 7pm. Ninth Floor, Newton Building. Sec P. M. Bond, G8TIS, via Students Union.

Nottingham (NURC)—Sec C. Coleman, G4HCW.

Scunthorpe (SARC)—Tuesdays, 7 July (QRP working), 14 July (HF band computer control), 21 July ("Receiver design", by G3PDL), 28 July ("HF, cw working", by G3TMC), 7.30pm. Thursdays, Morse classes, 7.30pm. Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe. Sec Joe Sheardown, G8TIY, tel Scunthorpe 732438.

Spalding (S&DARC)—First Friday in each month. Pinchbeck Teachers Centre, Pinchbeck, Spalding. Further information from Dennis Hoult, G4OO, tel Risegate (077586) 382.

Wigston (WRC)—Fridays, 7.30pm. United Reform Church, Wigston, Leicester. Sec Steve Parker, G8TLC, tel Leicester 61541; daytime.

REGION 5—RR to be appointed

Following information is latest received.

Bedford (B&DARC)—First Wednesday in each month. Other Wednesdays (Informal), 8pm. Club shack, Ravensden, Bedford. Sec G8PZZ/G4JTJ, tel 0234 47818.

Cambridge (C&DARC)—Fridays, 7.30pm. Coleridge Community College, Radegund Road, Cambridge. For information contact sec G8JKV, tel Swavesey 31120.

Cambridge (CUWS)—Mondays. St. John's College bar. Details from Chris Budd, G8OPB, St John's College.

Corby (CARG)—Fridays, 7.30pm. Hightrees Scout Centre, The Nook, Corby. Sec G8MLA.

Dunstable (DDRC)—Fridays, 8pm. Chews House, 77 High Street South, Dunstable. Sec G8ASP.

Leighton Buzzard (LLRC)—This recently-formed club is now becoming well established and meets on Mondays, 7.30pm. Vandyke Community College, Vandyke Road, Leighton Buzzard. Visitors and prospective members are advised to contact John Hart, G8GIK, tel Wing (029 668) 590.

Luton (Kent Process Controls ARC)—A club recently reformed and retitled. It was previously "The George Kent ARES". The club call is G4KPC. Membership is open to all Kent Process Control employees and to all employees of the Brown Boveri Kent Group worldwide. Further information may be obtained from John Allen, G3DOT, tel Luton (0582) 508515.

March (M&DRAS)—Tuesdays, 7.30pm, 2 Grays Lane. Sec G8GNE.

Northampton (NRC)—Thursdays, 8pm. Kingsthorpe Community Centre, Thornton Park, Kingsthorpe, Northampton. Details from sec I. P. A. Scott-Iversen, 35 Milverton Crescent, Abington Park, Northampton.

Peterborough (GPARC)—Fourth Thursday in each month, 7.30pm. Southfields Junior School, Stanground, Peterborough. Sec G4FDF.

Peterborough (PR&ES)—For details contact G3EEL. **St Neots (SN&DARC)**—Recently formed club. Alternate Mondays, 7.30pm. Ernulf Community School, Eynesbury, St Neots. Details from Paul Herrod, G8TOI, tel St Neots 74642.

Shefford (S&DARS)—Thursdays, 8pm. Church Hall. Sec G4DAQ.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 7EA. Tel Penn (049481) 4240.

Aylesbury Vale (AVRS)—For details of new club's meetings, contact G8BQH.

Burnham Beeches (BBRC)—First Thursday in each month, 8.15pm. St John Ambulance, Serena HQ. Contact Mrs J. Britton, Windsor 61723, office hours 57721.

Chesham (C&DRC)—New club. Contact G8PUC, tel 02405 5625 for details.

High Wycombe (Chiltern ARC)—29 July (Royal Convivial Night), 26 August ("Amateur tv", by G8LES), 8pm. John Hawkins Ltd Canteen, Victoria Street. Contact sec P. B. Shears, G4LLM, tel High Wycombe 24095.

Maidenhead (M&DARS)—21 July (Evening foxhunt on 144MHz), 6 August (Talk: "Noise", by Roger Hemmings, G3VCT). Sec J. Patrick, G3TWG, tel Bourne End (06285) 25275.

Oxford (O&DARS)—Please contact Stuart Wilkins, G3HJM, for meeting details.

Oxford (OURS)—Contact G4KGA, Oriel College for meeting details.

Reading (RARC)—7 July ("Locator systems", by John Morris, G4ANB), 4 August ("SWR, facts and fallacies", by Peter Chadwick, G3RZP), 18 August (SSB FD and 144MHz Trophy discussion). Details from sec Chris Young, G4CCC.

Vale of the White Horse (VWHARS)—7 July (AGM, all members please attend). Contact G4FLX, tel Wallingford 37482, or G3SEK, tel Didcot 812584.

REGION 7—RR to be appointed

Following information is latest received.

Addiscombe (AARC)—Tuesdays, 9.15pm. Prince of Denmark, 152 Portland Road, South Norwood. Sec G3SJJ, tel 01-656 9054.

Ashford (Echelford ARS)—Second Monday and last Thursday in each month, 7.30 for 8pm. The Hall, St Martin's Court, Kingston Crescent, Ashford, Middx. Sec G8LEL, tel Byfleet 46847.

Bexley Heath (North Kent RS)—Second and fourth Thursdays in each month, 8pm. St Mary's Institute, 2 North Cray Road, Bexley. Sec Dr C. P. Conduit, G4KCC, 49 Baldwyns Park, Bexley DA5 2BE.

Brixton (Ferdale RS)—Wednesdays, 6.30pm. Brixton College, Ferdale Road, London SW4. Sec G4GTO, tel 01-660 2532.

Coulston (CATS)—Sec A. R. Bartle, G6HC, tel 01-684 0610.

Cray Valley (CVRS)—First and third Thursdays in each month, 7.30 for 8pm. Christchurch Centre, High Street, Eltham, London SE9. For details of Morse classes run by the club contact sec, G4FUG.

Croydon (Surrey Radio Contact Club)—First and third Wednesdays in each month, 7.30pm. TS Terra Nova, 34 The Waldrons, Croydon. Sec G4FFY, tel 01-642 9871.

Crystal Palace (CP&DRS)—Third Saturday in each month, 8pm. Emmanuel Church Hall, Barry Road, London SE22. First Tuesday in each month (Open house), members' QTHs. Sec G3FZL.

Guildford (G&DRS)—Second and fourth Fridays in each month, 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec G4BHQ, tel Guildford 76375.

Guildford (U of Surrey E&ARS)—Informal meetings, lunchtimes during term. Lower Bar, Union House, G8AHK is active on vhf, and G3IGQ on hf. Skeds and QSOs always welcome. Sec G8MIO, tel Guildford 71281.

Kingston (K&DARS)—Second Wednesday in each month, 8.15pm. For details contact Sec R. Pellatt, RS41392, tel 01-399 8113.

New Cross (Clifton ARS)—Fridays, 8pm. 225 New Cross Road, London SE14. Details from R. A. Hinton, 42 Sutcliffe Road, Welling.

Redhill (Reigate ATS)—Third Tuesday in each month, 8pm. Constitutional Centre, Warwick Road, Redhill. First Tuesday in each month. Marquis of Granby, Hooley Lane, Redhill. Sec G3XSZ.

Sutton & Cheam (S&CRS)—For meeting details contact sec G. W. Brind, G4CMU, tel Burgh Heath 54497.

Thames Ditton (Thames Valley ARTS)—Giggs Hill Green Library, Giggs Hill Road, Thames Ditton. Sec G3ZNV.

Tolworth (Decca ARG)—First Thursday in each month, 8pm. Decca Sports and Social Club, Kingston Road, Tolworth. Sec G3NFV, tel Leatherhead 72587.

Wimbledon (W&DRS)—Second and last Fridays in each month, 8pm. St John Ambulance HQ, 124 Kingston Road, Wimbledon. Sec J. W. Todd, tel 01-540 9031.

REGION 8—RR to be elected

Following information is latest received.

Brighton (B&DRS)—Details of events from J. Trimmer, G4JDM, 7 Dale Crescent, Patcham, Brighton.

Burgess Hill (Mid-Sussex ARS)—Alternate Thursdays, 7.30pm. Marie Place Further Education Centre, Leylands Road, Burgess Hill. Details from the sec, Jack Brooker, G3JMB, tel Hassocks 4965.

Canterbury (East Kent RS)—Further details of event from G8PFE, QTHR.

Chichester (C&DARC)—Details from sec S. Talbot, G8FCX.

Crawley (C&DARC)—Further information from D. L. Hill, G4IQM, tel 0293 882641.

Dartford (DHDRC)—Details of club events given on club net, 1930kHz Sundays at 10.30am and Tuesday evening net, 145-325 (S13). Please check with G4FYV for start details before every hunt. Further information from sec Alan Burchmore, G4BWW.

Dover (South East Kent YMCA ARC)—Details from G8KEN.

Eastbourne (Southdown ARS)—First Monday in each month. Details from R. Jeffries, G8KQN, 84 Mill Road, Hailsham, Sussex BN27 2HU; or pro G3LFZ.

Gravesend (IGRS)—Mondays, 7.30pm. Windmill Tavern, Shrubbery Road, Gravesend. Details from F. Donovan, G4ALD, 4 Rembrandt Drive, Northfleet, Kent DA11 8NG.

Hastings (HE&RC)—Fridays, 479 Bexhill Road, St Leonards-on-Sea, Sussex. Third Wednesday in each month, 7.30pm. West Hill Community Centre, Croft Road, Hastings. Details of events from G4FET.

Horsham (HARC)—First Thursday in each month. Parish Rooms, The Causeway, Horsham. Details of future events from A. C. Wadsworth, G3NPF.

Kent Repeater Group—The group is responsible for GB3KR (Dover) and the proposed GB3KN (Mid-Kent), and for 432MHz repeaters GB3CK (Charing), GB3EK (Margate), GB3NK (Wrotham), and GB3SK (Folkestone). Information leaflet and membership details from G3XDV.

Maidstone (MYMCAARS)—Details from Graham Edy, G4AXD.

Medway (MARTS)—Details from sec G4EVY.

New Cross (Clifton ARS)—After 33 years at 225 New Cross Road, the society has returned to Clifton Rise, from which its name was taken. The new venue is an upstairs room in the New Cross Inn, about 300yd east of the old HQ. Fridays, 24 July (UHF/ssb talk and demonstration by G8APV and G8DIU), 8pm. Details from Reg Hinton, 42 Sutcliffe Road, Welling, Kent, tel 301 1864.

Sussex Repeater Group—Information from G4EFO. Treasurer G4GNX, 38 Elphick Road, Newhaven.

Tunbridge Wells (West Kent ARS)—First and third Fridays in each month. Adult Education Centre, Monson Road, Tunbridge Wells, Tuesdays following Fridays (Informal) at Drill Hall, Victoria Road. Details from Brian Castle, G4DYF, tel 0732 56708.

Worthing (W&DARC)—Tuesdays, 8pm. Adult Education Centre, Union Place, Worthing. Details from G8MSQ.

REGION 9—RR W. J. Colclough, G3XC, Highview.

Indian Queens, St Columb, Cornwall TR9 6LL.

Camborne (Cornish RAC)—2 July (Natter night), 6 August ("Avionics", by John, G8DPV), 7.30pm. SWEB Clubroom, Pool, Camborne. Computer section meets on second Monday in each month, same place. 10 August ("Sord—micros in business", by Mr L. Jones). Cornish net weekends, 3-714MHz and on Sundays, 3-692MHz at 11am. 144MHz ssb net Sundays at 10.30am on 144-275MHz. Contact pro Ron, G2ABC. Tel Truro 78393.

Exeter (EARS)—13 July ("Maritime communications", by Vic, G4KEE), 7.30pm. Community Centre, St Davids Hill, Exeter. Informal meetings on first, third and fourth Mondays at The Scout Hall, Emmanuel Road, Exeter. Contact Geoff Draper, 1 Carlyon Close, Heavitree, Exeter EX1 3AZ.

Exeter (EUARS)—Sundays during term-time, 2.30pm. Room 225, Applied Science Building, North Park Road, Exeter. Contact Miss Ann Bellchambers, G8ZPJ, Devonshire House, Stocker Road, Exeter EX4 4PZ.

Exmoor (ERC)—Second and fourth Thursdays in each month, 7.30pm. "Loughrigg", East Street, South Molton. Contact Mrs Pat Jemison, "Homedale", Brayford, Nr Barnstaple EX32 7QJ, tel Brayford 327.

Exmouth (EARC)—Alternate Wednesdays, 7.30pm. Rolle College, Exmouth. Contact Mrs J. Nicholson, G8KRR, 35 Hollymount Close, Symonds Farm, Exmouth, tel Exmouth 77263.

Newquay (N&DARS)—Alternate Wednesdays, 7.30pm. Treviglas School, Newquay. Contact Bob, G4LDA, 29 Greenhill Road, Eglosayle, Wadebridge PL27 6AY. Tel Wadebridge 3649.

North Devon (NDRC)—8 July ("Basic on computers", by G8PCX), 7.45pm. Even months at Community College, Abbotsham Road, Bideford, odd months at Community College, Pilton, Barnstaple. Contact George, G4CG, tel Barnstaple 3683.

Plymouth (PRC)—13 July ("Steam trains", by John, G8PSC), 27 July (Foxhunt), 7.30pm. Tamar Secondary School, Paradise Road, Stoke, Plymouth. Contact Trisha Day, G4KYY, c/o G3ZYY, tel Saltash 5913.

Plymouth (PPARS)—During term time listening facilities available on 3-5 28MHz and on 144 and 432MHz for 12h every day. Contact Jeff Key, G8VTW, ARS, Plymouth Polytechnic Students Union, Drakes Circus, Plymouth.

Saltash (S&DARC)—First and third Fridays, 7.30pm, Toc-H Hall, Burraton, Saltash. 18 July (Visit to Goonhilly Satellite Station—Saturday morning). Contact Eddie Hayden, G8VVF, tel Tavistock 832838.

Torbay (TARS)—Every Friday with special meeting on last Saturday in each month, 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay. Torbay net Monday, Wednesday and Friday at 10.30am on 3-756MHz and on Saturdays at 10am. Contact pro Les Mays, G2CVR, tel Paignton 558714.

Treveryn (English China Clay RC)—Alternate Mondays, 7pm. Club net on meeting nights on S22. Contact Jack Redfearn, G8HSZ, tel St Austell 3647.

REGION 10—RR P. A. Jones, GW4HAT, 68 Pastoral Way, Tycoc, Swansea SA2 9LY.

Blackwood (BARS)—Fridays, 7pm. Oakdale Community Centre, Oakdale, Blackwood, Gwent. Further details from Norman Davies, GW8UCQ, tel Blackwood 227550.

Bridgend (B&DARC)—Second Wednesday in each month, 7.30pm. NCB Social Club, Tondy, Bridgend. The club has now been issued with the callsign GW4LNP and will be operational with its new hf rig. At press time it is hoped to operate GB2BBS from The Bridgend Blind School with some blind operators in attendance, the exact dates not confirmed. It is hoped to run in the near future a radio picnic and a df hunt. Details can be obtained from the new club sec Peter Lynn, GW8WCI.

Cardiff (CRSGBG)—13 July (To be arranged), 7.30pm. The Pantmawr Inn, Pantmawr Estate, Cardiff. Further details from sec Joe Brooke, GW3GHC.

Merthyr (Hoover ARS)—There has recently been interest in reforming the club after a very "lean" period. Previous members and other interested parties are urged to contact Alan Brown, GW3RNC, 1 Bryony Close, Twyny Rodyn, to enable local discussions to take place.

Pembroke (PRSGBG)—31 July (Open forum), 7.30pm. The Defensible Barracks, Pembroke Dock. Advance notice: The forthcoming "Bucket & Spade" party will be on Sunday 13 September at The Regency Hall, Saundersfoot. Talk in on S20, GB3WW, R7, and GB3SP, RB4. Further details from Martin Shelley, GW3XJQ at his new QTH, 2 Denning Avenue, Manorbier, Tenby.

Port Talbot (British Steel Corporation ARS)—Thursdays, 7.30pm. BSC Sports & Social Club, Margam, Port Talbot. Further information from Reg Bray, GW4ESV, 56 Greenwood Road, Baglan, Port Talbot.

Powys (PARC)—Thursdays, 7.30pm. The Cricket Pavilion, Montgomery. Club callsign, GW4HVN. Further details Mike Smith, GW4DWX, tel Welshpool 2068.

Rhondda (RARS)—Every other Thursday, 7.20pm. New venue National Union of Mineworkers Club, Tonymandy. Further details from Cyril Parry, GW3PHH, tel Porth 676655.

If your club is not mentioned above it means that your secretary has failed to reply to my letter. Thanks to all club secretaries who have written/phoned. At long last I am getting correct information, now—how about some news? Only confirmed, correct information will be acceptable in future. *RR10*.

REGION 11—RR B. H. Green, GW8AAA, 1 Clwyd Court, Tan-y-bryn Road, Rhos-on-Sea, Colwyn Bay, Clwyd.

Following information is latest received.

Bangor (UCNWAR)—Meetings on irregular Thursdays during term. Club active 1-8 1,296MHz, all vhf contests and major hf contests. 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!

Conway Valley (CVARC)—Second Thursday in each month, 7.45pm. The Quarries, Llandulas, Colwyn Bay.

Dolgellau (Meirion ARS)—First Thursday in each month, Ship Hotel, Dolgellau. 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.

Towyn (T&DARC)—Details from sec GW8SYX, tel 0654 710402.

REGION 12—RR F. Hall, GM8BZX, 45 Priory Cottages, Lunanhead, Forfar, Angus DD8 3NR. Tel 0307 67565.

Following information is latest received.

Aberdeen (ARS)—Fridays, 7.30pm. Mail for the club should not be addressed to the club premises but to the secretary 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. Further details of club activities from sec Nick Stewart, GM8YRT, 23 Clive Road, Dundee.

Elgin (Moray Firth RS)—First Wednesday in each month at external venues. Other Wednesdays within Elgin Technical College. Due to a small membership the arrangements may be varied. For full details contact GM4IZN or GM3KHH.

Inverordon (Easter Ross RC)—No updated information received.

Kirkwall—Members now meet on a few occasions each year. For details of meeting places and dates etc, contact GM3BU, tel Kirkwall 3232.

Perth (P&DARG)—Every Tuesday, 8 11pm in new clubroom within Perth City Sports & Social Club, Leonard Street, Perth. The club is located within licensed premises and it has been reported that the meetings are no longer "dry"! Chairman, GM8JCR; secretary/treasurer, GM8RYZ, 75 Viewlands Road West, Perth.

Shetland (Lerwick RC)—Wednesdays, 7pm. Islesburgh House Community Centre. Members also use the club premises at other times. The club station GM3ZET is active on hf and vhf bands and on Wednesdays, Fridays and Sundays is active on the "Shetland Net" at 2000hr clocktime, on 3,775kHz, when all amateurs with an interest in Shetland are invited to join in. The club is also preparing new equipment to reactivate the Lerwick beacon, GB3LER, and it is hoped that the beacon will be operational once more early in 1981. Sec, GM4BBL.

REGION 13—RR to be appointed

Following information is latest received.

Berwick-upon-Tweed (B&DARS)—First and third Fridays in each month, 7.30pm. Avenue Hotel, 122 Marygate, Berwick-upon-Tweed. Details from sec GM8IIQ.

Borders Repeater Group—The group administers the two 144MHz repeater projects, GB3BT (Berwick-upon-Tweed), and GB3SB (Scottish Borders). Meetings are held in Kelso as and when necessary. Details, GM4CXP, tel St Boswells 2795, or G3HDT, tel Berwick-upon-Tweed 88260.

Dalgety Bay (Marconi Space & Defence Systems ARC)—Open to employees and ex-employees of the company. Tuesdays, 7.30pm. MSDS Social Club, Hillend Industrial Estate, Dalgety Bay. Fife. Details from GM3YND, tel Dalgety Bay 822678.

Dunfermline (DARS)—Second Wednesday in each month, 7.30pm. CCTV Studio, Pittencrieff School, Maitland Street, Dunfermline. Details from GM3CIG.

Edinburgh (E&DARC)—Tuesdays, 7.30pm. City Observatory, Calton Hill, Edinburgh. Details from GM3RFQ.

Edinburgh (Ferranti Recreation Club AR Section)—Membership is restricted to company personnel. Details from GM8JKG, tel 031-441 5684. Visits by other clubs by prior arrangement.

Edinburgh (GB3ED Repeater Group)—Details, GM3GBX, tel 031-447 2611.

Edinburgh (Heriot Watt UARC)—Wednesdays, 2.30pm. Mountbatten Buildings, 31 35 Grassmarket, Edinburgh. Details, GM4JFS, tel 031-339 1104.

Edinburgh (Leith Nautical College ARC)—First and third Thursdays in each month, 7.30pm. Leith Nautical College, 24 Milton Road East, Edinburgh 15.

Edinburgh (Lothians RS)—Details from GM8BZF, tel 031-447 5527.

Glenrothes (G&DARC)—Wednesdays and third Sunday in each month. Details from GM3YBQ.

St Andrews (UoStARS&S)—Details from Physics Department, North Haugh, St Andrews.

REGION 14—RR to be appointed

Following information is latest received.

Ayr (AARG)—Two Sundays in each month, normally second and fourth, 7.30pm. Community Centre, Wellington Square, Ayr. Details from sec, GM3THI.

Dumfries (D&GREC)—First and third Monday in each

month, 7.30pm. Cargenhall Hotel, Dumfries. Details from sec GM4JAP.

Falkirk (Stirlingshire ARG)—Details from sec, GM4DGT.

Glasgow (West of Scotland ARS)—Fridays, 7.30pm. 22 Robertson Street, Glasgow. Details from sec, GM4JDU.

Greenock (G&DARC)—Third Friday in each month (informal meeting every Tuesday and Friday), 7.30pm. 22 Inverkip Street, Greenock. Details from sec, GM3XNJ.

Helensburgh (HARC)—First and third Wednesday in each month, 7.30pm. Clyde Street School, Helensburgh. Details from GM4FEO.

Kilmarnock (K&LARC)—First and third Tuesday in each month, 7.30pm. The Buchanan Centre, Riccarton, Kilmarnock. Details from sec GM3ZRT.

Motherwell (Mid-Lanark ARS)—Fridays, 7.30pm. Wragghall Hall Community Centre, Jerviston Street, Motherwell. Details from sec, GM4FKD.

Stevenson (Ardeer RCARC)—Thursdays, 7.30pm. Ardeer Recreation Club. Details from sec, GM8BOM.

Stranraer (SARC)—Fourth Thursday in each month, 7.30pm. Stranraer Community Centre, Lewis Street. Details from sec, GM8RUG.

REGION 15—RR J. T. Barnes, G13USS, 95 Crawfordburn Road, Bangor, Co Down, Northern Ireland BT19 1BI.

Following information is latest received.

Ballyclare (East Antrim ARC)—Second Tuesday in each month, 7.30pm for 8pm. Carnall Orange Hall, Carnall Road, Mossley. Sec G14JXM.

Ballymena (BRC)—Thursdays (Natter night), Wednesdays (Morse and RAE classes), 8pm. 70 Nursery Road, Gracehill. Details of future events will be on G82RS. Sec G14HCN.

Bangor (B&DARS)—First Friday in month, 8pm. Sands Hotel, 12 Seaciff Road, Bangor, Co. Down. Secretary G18RNE.

Belfast (BRSGBG)—Third Wednesday in each month, 8pm. 90 Belmont Road, Belfast. Attendances now top 60. Sec G13USS.

Belfast (CoBYMRC)—Tuesdays, 7pm; Saturdays, 2.30pm. 12 Wellington Place, Belfast. Sec Paul McTaggart, 14 Thirlmere Gardens, Belfast BT15 5EF.

Belfast (Queen's UoBRC)—Tuesdays during term, 7pm. Morse and RAE tuition available. 37 Fitzwilliam Street, Belfast.

Coleraine (C&DARS)—Fridays, 8pm. QTH of Secretary, G18RPI.

Coleraine (NWARS)—Second Tuesday in each month, 8pm. BRC Rooms, Whitehall Buildings, New Row, Coleraine. Secretary G18RME.

Jordanstown (Ulster College ARC)—G14FZU. Enquiries to Students Union, Block 11, NI Polytechnic, Jordanstown.

Lisburn (Lagan Valley ARS)—Rathvarna Teachers Centre, Pond Park Road, Lisburn. Secretary G18SXN, QTHR.

Londonderry (North West Ireland ARS)—First Monday in each month. Templemore School, Londonderry. Sec G12DHB.

Magherafelt (MARS)—First Tuesday in each month. Morse class every Wednesday. 12 Garden Street, Magherafelt, Co. Derry. Secretary, G18JNP.

Mid-Ulster (MURSGBG)—First Sunday in each month, 3pm. G14BAC's QTH. For details contact G14RJW.

North Ulster (NURSGBG)—Details from area representative, G14HVI, QTHR.

Omagh (West Ulster ARS)—Second Monday in each month. McAleer's, Campsie, Omagh. Sec G18TST, tel Omagh 46837.

REGION 16—RR to be appointed

Braintree (B&DARS)—First and third Mondays in each month, 7.30pm. Braintree Community Centre, Victoria Street, Braintree. Details from Alan Heritage, G4EOG.

Bury St Edmunds (BS&ERS)—Third Tuesday in each month, 7.30pm. Red Cross Headquarters, Mustow House, Eastgate Street, Bury St Edmunds. Details from John Munro, 29 Angel Hill, Bury St Edmunds.

Chelmsford (CARS)—7 July ("Integrated circuits for radio communication"), 4 August ("10GHz"), by M. Donithorne, G8MKX, 7.30pm. Marconi College, Arbour Lane. Details from Andrew Mead, G4KQE, tel Silver End 83094. The club is also holding a top band df hunt on 17 July, starting at 7.30pm at Tiptree Heath, ngr 884148. OS map sheet 168 will be required. Details from Dick Brooks, G3WHR, tel Maldon 55707.

Colchester (CRA)—2 July ("Aerials for small gardens"), 7.30pm. Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 70189. The club is also holding top band df hunts on 3

and 31 July, starting at 7.30pm at Fordham Heath, ngr 945264. OS map sheet 168 will be required. Details from Ian Butson G4HCK, tel Colchester 860724.

Felixstowe (FARC)—Tuesdays, informal, 8pm. Felixstowe Ferry Golf Club. Details from John Hobin, G3XIX.

Great Yarmouth (GYRS)—Last Thursday in each month, 7.30pm. 67 Southdown Road, Great Yarmouth. Details from Tony Besford, G3NHU.

Harlow (H&DRS)—Tuesdays, 8pm. Mark Hall Barn, First Avenue, Harlow. Further details from hon sec A. C. Keeble, G4HPU.

Harwich (H&DRS)—Thursdays, 7.30pm. Harwich Adult Education Centre. Details from sec Tony Free, G4EYE.

Haverhill (H&DRS)—Fridays, 7.30pm. Steeple Bumpstead, Haverhill. Details from Chris Kitchener, G8IMI, tel Haverhill 2852, evenings.

Ipswich (IRC)—1 July (Final planning for VHF Field Day), 8 July ("Tackling tv") by Phillip Hubert, G3YWM, 8pm. Club Room, Rose and Crown Public House, Norwich Road. Details from Jack Tootill, G4IFF, tel Ipswich 44047.

Loughton (L&DARS)—Fridays, fortnightly, 8pm. Loughton Hall, Rectory Lane, Loughton. Details from Barry Capon, G8UBH, 180 High Road, Loughton.

Lowestoft (L&DARC)—Fridays, 7.30pm. North Suffolk Teachers' Centre, Lovewell Road, Lowestoft. Details from Paul Godfrey, G8JBD.

Martlesham (MRS)—First Wednesday in each month, 7.30pm. British Telecom Research Laboratories, Martlesham Heath, Ipswich. Visitors always welcome but must first contact Simon Garrett, G4EVN, at the above address.

Norwich (Norfolk ARC)—Wednesdays, 7.45pm. Crome Community Centre, Telegraph Lane East, Norwich. Details from Andrew Kiddle, G4HVC.

Southend (S&DRS)—Fridays, fortnightly, 8pm. Church Hall, Sir Walter Raleigh Drive, Rayleigh, Essex. Contact sec G3YOA.

Stowmarket (S&DARS)—First Monday in each month, 7.30pm. Red Cross Hall, Stowmarket railway station. Details from Jim Lowe, G8SCB, 22 Bluebell Grove, Needham Market.

Thurrock (TARC)—First and third Tuesdays in each month, 8pm. Grays Park Hall, Orsett Road, Grays. Morse tuition available. Details from sec G3KMD. Club net on 144MHz S21/22, on second and fourth Tuesdays in each month, 8pm.

Vange (VARS)—2 July (Junk sale for rally), 9 July (Receiver talk by G4FD), 16 July (Top band df hunt), 23 July (Formulation of club programme), 30 July (Antenna talk by G3IOI), 6 August (Junk sale), 8pm. Barstable Tennants' Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Road, Basildon.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 876018.

Basingstoke (BARC)—Third Wednesday in each month, 7.30pm. Chineham House, Popley, Basingstoke. Sec John Davis, G8NHL.

Basingstoke (UK FM Group Southern)—First Wednesday in each month, 7.30pm. Chineham House, Popley, Basingstoke. Chairman Mike Payne, G3ZRM, tel Aldershot 26108.

Bournemouth (BRS)—First and third Fridays in each month, 8pm. Coachhouse Motel, Ferndown. Sec Glenn Lloyd, G8GTB, tel Poole (0202) 769317.

Chippenham (C&DARC)—Tuesdays, 7.30pm. Sheldon School, Hardenhuish Lane, Chippenham. Sec P. J. Tuck.

Fareham (F&DARC)—1 July (Propagation and antennas), 15 July (Natter night on the air, club calls G3VEF and G8KGI), 7.30pm. Room 9, Porchester Community Centre. Sec G4IGT, tel Fareham (0329) 234904.

Fareham (HMS Collingwood ARS)—Wednesdays, 7.30pm. Details from sec G8OWJ, tel Fareham (0329) 234139.

Farnborough (F&DRC)—Second and fourth Wednesdays in each month, 7.30pm. Railway Enthusiasts Club, Access Road, off Hawley Lane (near M3 bridge). Sec Ivor Ireland, G4BJQ, tel Farnborough (0252) 43036.

Guernsey (GARS)—Tuesdays and Fridays, 8pm. 'The Lodge', La Corbinerie, Oberlands, St Martins. Sec G8UOV, PO Box 100, St Peter Port, Guernsey.

Hordean (H&DARC)—9 July (Demonstration and talk by Messrs Wood & Douglas), 7.30pm. Merchiston Hall, Hordean. Sec G4CHO, tel Hordean (0705) 597188.

Jersey (JAEC)—Second Wednesday in each month, 7.30pm. The Quennevais Communication Centre, St Brelade, Jersey. Sec Mrs M. Smith, tel 0534 23249.

Jersey (JARS)—Sundays, 10.30am, Fridays, 8pm. Le Hocq Tower, St Clement, Jersey. Sec R. H. Ford, tel 0534 31131.

Poole (PARS)—At the AGM held on 1 May the following officers, among others, were elected: chairman, G4JYI; sec G8ZCG, tel Broadstone (0202) 693986. Last Friday in each month, 7.30pm. Poole Technical College.

Portsmouth Hill Repeater Group—Sec G8GNB, tel Titchfield (03294) 41456.

Portsmouth (Marconi E&ARS)—RR17 has no details of when this club meets but a site has been allocated by the company, as has a quantity of test equipment. The club callsign is G4JMR, and the sec is G3FWE.

Portsmouth (P&DRS)—Thursdays, 7.30pm. Portsmouth Community Centre, Malins Road, Buckland, Portsmouth. Sec G3JZV.

Salisbury (SR&ES)—Tuesdays, 7.30pm. Salisbury Activity Centre, Wilton Road. Sec G2FIX.

Southampton (SUARC)—Tuesday evenings, also informal meetings every lunchtime in the Club Room, Old Union Building. Sec A. C. Talbot, The Radio Club, JCR Post, The University, Southampton.

Southampton (SR&GBG)—Wednesdays, 7.30pm. Toc-H House, Little Oak Road, Bassett, Southampton. For future events contact G4COM, tel Southampton (0703) 693017.

South Dorset (SDRS)—First and third Tuesdays in each month, 7.30pm. Civilian Canteen, Army Bridging Camp, Wyke Regis, Weymouth. Sec G3ZGP, tel Weymouth (0305) 812893.

Swindon (S&DARC)—Alternate Wednesdays, 7.45pm. Clubroom, Oasis Leisure Centre. Sec G8OQY.

Winchester (WARC)—Third Saturday in each month, 8pm. The Scout Log Cabin, Stockbridge Road, Winchester. Sec G3MCL.

REGION 18—RR W. A. Ricalton, G4ADD, 4 South Road, Longhorsley, Morpeth, Northumberland. Tel Longhorsley 259.

Following information is latest received.

Durham (DURES)—During term. Physics Dept, Science Site, Durham University. Sec Miss Elizabeth Dean, 26 Almsford Avenue, Harrogate.

Easington (EAR&EC)—Tuesdays and Thursdays, 7.30pm. Easington Village Workmen's Club. RAE and Morse tuition if required (the club has a good pass record). Details from sec G4GXJ. All welcome.

Great Lumley (GLAR&EC)—Alternate Wednesdays, 7.30pm. Great Lumley Community Centre. Sec G8HPW.

Hartlepool (HRC)—Mondays, 7.30pm. Methodist Church Hall, Grange Road. Sec G3NWU.

Middlesbrough (Post Office ARC)—All amateurs welcome, but first contact sec G8CDP.

Middlesbrough (Teesside Repeater Group)—Last Tuesday in each month, 7.30pm. 196 Marton Road, Middlesbrough, Cleveland. All amateurs and swls invited but first contact sec G8MBK.

Morpeth (Northumbria RC)—Thursdays. Old telephone exchange, Ellington. Sec G4GWB.

Newcastle upon Tyne (Tyne & Wear Repeater Group)—Arts Common Room, Claremont Tower Block, Newcastle University. Sec G4DOB, tel Newcastle 744444.

South Shields (SS&DRS)—Fridays, 7.30pm. Trinity House. Old and new members welcome. Sec G8BQF, 67 Lauderdale Avenue.

Tyneside (TRS)—Mondays, 7.30pm. The Community Centre, Vine Street, Wallsend. Activity and interest in most bands. Club callsign, G3ZQM. Sec G4ILW.

REGION 19—R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Tel 01-989 6741.

Barking (BRES)—11-12 July Dagenham Town Show. BRES will again be actively engaged in this annual event. For details of this and all club activities, contact Alan Sammons, G8IZN, tel 01-594 2471.

Central London (Post Office HQ ARG)—For Post Office members only. For details contact J. A. Clarke, Room 134, Cardinal House, Farringdon Road, London EC1M 3ND.

Cheshunt (CDRC)—1 July (Junk sale), 8 July (144MHz portable on Broxbourne Common), 15 July (Natternight/cw), 22 July ("Computers for the radio amateur", by G8KHI), 29 July (Natter night/cw), 5 August (144MHz portable on Broxbourne Common), 8pm. The Church Room, Church Lane, Wormsley, Herts. Enquiries to Jim Sleight, G3OJI, tel Ware 4316.

Chingford (Silverthorn RC)—7.30pm. Friday Hill House, Simmonds Lane, Chingford, E4. Sec G4AJA, tel 01-529 2282.

Chiswick (ABCARC)—21 July ("ATUs", a discussion). The Committee Room, Chiswick Town Hall, High Road, London W4. Sec W. G. Dyer, G3GEH, tel 01-992 3778 for details.

(Continued on page 653)

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: 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

FRG7 rx, £130. TR2300, £135. AT5 160m tx, a.m., cw, £30. EK121 electronic keyer, £20. Datong Morse tutor, £35. IC22A, 2m, 12 channels, £100. 2m fm pa, 40W, £25. MM432/28 converter, £20. Datong FL1, £40. S. James atu Mk2, £15. G4JAX, QTHR. Tel 0703 842000. **Must be sold:** TW Electronics 10 2m linear transverter, QQVO340 pa valves, cost £70 last year, full instructions and circuit diagram included, Emsac 2m converter, output on 10m, cost £30. For more see other advert. Tel Knowle 78218, anytime.

R216 rx and psu, 19-156MHz, £70. QQVO26 and QQVO310 valves. Joystick vfo, Heathkit Q-mult, Codar preamp, no reasonable offer refused. Bill Wynn, G4EUQ, 263 Oak Close, Middle Wallop, Hants SO20 8NN.

Sell/exchange QST from 30s, CQ from 40s. **Wanted:** CQ January-June 1945, May 1975 October 1979, *Bulletins* prior 1946, *SWM* prior 1945. Collins tx, rx, D104, T1131 or parts, ET4336, BC610. Baker, Bontnewydd, Aberystwyth, Dyfed. Tel 097-421 608.

Cossor dual beam oscilloscope model 1035, £15 ono. Pye Cambridge AM108, 2m, single channel, £15 ono. Tel Ashbourne (0335) 43702.

Icom IC215, boxed as new, channels R3-7, S8-9, S20-22, £85. Pye Pocketfone (uhf) rx type PF1R, tx type PF1T, manuals, needs attention, £15. S. Green, G4DSK, 17 Mountbatten Close, Kewstoke, Weston-super-Mare, Avon BS22 9LR.

FT101B with 350Hz filter, £310 ono. FT221R, £310 ono. AR240A, £130 ono. All good cond, original boxes, manuals. Need the lot! G4CEN, 26 Ripstone Gardens, Highfield, Southampton SO2 3RE. Tel 0703 559881, evenings.

Contest winning hf location (good for vhf too). Three-bed semi in quiet country location, gas central heating, good decorative order and repair, in large garden with lawns, fruit trees, shed, greenhouse, Versatower, TH6DXX, fields to rear etc. Tamed neighbours. 15min pleasant walk to station. Fast, frequent trains to Fenchurch Street (27min). For further details Tel Basildon 412435.

Yaesu FT301 tx/rx, power supply, FV301 vfo, YO301 monitorscope, FC301 atu, comp station, £600 ono. Icom IC22E with case, HM9, BP3, leads etc, £135 ono. TenTec Argonaut 515 with psu, calibrator, £225 ono. Tel 01-567 8771, after 6pm.

2m colinear antenna, ex-Lowe, cost £28 one year ago, accept £15. Buyer collects or pays carriage. Tel (Staffs) 05432 23608.

TY2125 power triodes, pair, unused, in orig but soiled packing, £25 each. Coil coaxial 75Ω airspaced (in od blue sheath, £10 ono. Buyer collects or post at cost. G3UIB, QTHR. Tel Medway (0634) 367915.

KW Viceroy, Hallicrafters SX117, ATM vdu, displays "V" on rty tune, KSR 28 teleprinter, Gelo 54/216 ham bands rx, CR09 oscilloscope, semi-auto bug key,

190m 2.5mm t+e cable, sstv, monitor, offers or w.h.y? Bill Ball, G8XCF. Tel Blackpool (0253) 404459, 8pm.

TS830S, cw filter, mic etc, only few hours use, bareaveform forces sale, offers over £200. AT180 atu, £75. AR40 rotator and cables, £30. Western DX33, £80. 13-8V at 4A metered psu, £20. All items as new. G4AAQ, QTHR. Tel Pontefract 71071, after 6pm.

UHF Westminster on SU20, £65. 145MHz tx/rx, S16, S20-22, R1, R3-7, toneburst, 10W, £65. Base station on 70-26 a.m., 30W, £30. LG300 Mk2 hf tx, 813 pa, needs psu, £15. Burgoyne wireless with 78rpm player, £15. VHF a.m. rx, low band, £10. Over 300 valves ex-equip, boxed, unused, £25. G3XVL. Tel Chesham 4883.

Yaesu FT224 vhf/fm tx/rx, mobile or fixed station, comp with mounting hardware, fitted eight channels, FP2 mains psu, manuals, £105. Collins aircraft 360 channel vhf tx/rx type 6181A, 118-00 135-95MHz, 6W, £95. G3KCT. Tel 0763 44550.

Icom IC260E, brand new, sealed in orig packing, £300. Icom IC251E, virtually unused, £400. Catronics rty demod and vdu unit with modulator, virtually unused, £185. GW4ACO, QTHR. Tel 0492 55240.

TR2200GX, nicads, charger, case, S15 23, R0, R3, R5, auto toneburst, £110. G8AHE, QTHR. Tel 021-458 2406.

TR2200G, nicads, charger, etc, S20 21, R4 7, orig cond, £100 ono. Liner 2, 28MHz output/input, £100 ono. G8FMM, 13 North Street, Caversham, Reading. Tel 0734 479748.

FRG7, exc cond, used little, fine tune, no mods, £140 ono. Tel Lancaster 37152, evenings.

Secondary gear: Ham M, comp 95ft cable, £100. Trio TS900, £400. Trio TS700G, £305. Trio TR7500, £170. Whole package less 15 per cent. Carriage by arrangement. Could possibly deliver West Midlands. Full details see please. GM4AGS, QTHR. Tel 0382 543113.

FT101 top band, fan, cw filter, manual, mains lead, no mic, vgc, £250. G4AYP, 62 London Road, Andover. Tel 0264 66527.

FT101E, used little, mint cond, £380. G4DRF, Woodall Spa, Lincs. Tel 0526 52965.

Going abroad: TS500, psu, remote vfo, £150; FRDX400 rx, £100; Liner 2, £70; 2200G and homebrew amplifier, £75; Redifon atu, £20; absorption wavemeter, £20; SEM preamp autoswitch, £15; boom mic and switch, £10. G4AQH, QTHR. Tel 01-653 7623.

Hammerlund HX50 all valve tx, clean unmodified top band to 30MHz, and xtal outputs, cw, ssb, a.m., heavy duty multi-tapped auto transformer, hp and lf filters, £40 value of new spare valves, dummy loads, D104 astatic xtal mic on desk stand, operating and service manual, detailed circuit diagram, £75. Cash and carry only hence low price. G6RF, QTHR. Tel Liskeard (Cornwall) 45459.

Trio TS510 and PS510, £180. Trio TR7010 2m ssb, £85. Heathkit DX40U with VF1U vfo, £40. Cossor 1035 db

scope, wkg ok, £10. All above with manuals. G4JNG, QTHR. Tel Bewdley (Worcs) 400295.

Datong FL1 audio filter, new, model mpw power unit, £50. Carriage at cost. G4GIZ, QTHR. Tel Earby (028284) 2776.

KW2000A ac psu, dc psu, spkr, cable, mic, £150 ono. G4ANP, QTHR. Tel 0709 893995.

TR9000 2m multimode, immac, orig packing, £275. HF5 vertical, 10 80m, cw radial kit, specially strengthened and waterproofed, £30. G3KAJ, QTHR. Tel Chorley 71343.

Trio TS520 cw filter, never used mobile, mint, orig packings, manual, £300. SEM Tranzmatch atu, 160 10m, used very little, £40. G4GLC, QTHR. Tel Loughborough (0509) 212583.

Philips vcr 1702, four months old, still eight months maker's guarantee, immac, two 3h tapes, £270. Will consider exchange for 2m synth rig to similar value. Tel 01-518 1562.

TS180S hf bands solid-state broadbanded tx/rx, optional ssb filter fitted, immac cond, £450. TR7500 2m fm tx/rx, with mobile mount, £150. G3XHX, QTHR. Tel Liskeard (0579) 43749.

KW2000B, comp with ac psu, handbook, Shure 444T mic, £175 ono. G4PLX vdu boards, keyboard, offers. Nascam 2, 16k ram, in case, £380 ono. **Wanted:** 61-into-4 sound mixer. Four track tape deck. G8PWT, QTHR. Tel Maidstone 50095, after 6pm.

Trio 9R59 communication rx, 0-55kHz 30MHz band-spread, all ham bands, £30. Exchange gdo or good absorption wavemeter. Tel Pett 2526, anytime.

Icom IC202E 2m ssb, nicads, orig packing, vgc, £100. Sagem electronic teleprinter, imperf, 45-5/50/75 baud, silent!! £35. A number of 4 400 valves, all good, some new, £10. Vidicons, lin, £2 each. 32ft mast, £15. G80GL, NOT QTHR. Tel Sacriston 711855.

Swan 350, good wkg order, new set of valves, modified for valve 144MHz transverter which is also included, as is mic, £250. Reynolds, 4 Pinewood Close, Shrewsbury SY1 3SF.

Trio R1000, orig packing, dc kit fitted, as new, £220 ono. SP100 separate spkr, £17 ono. SEM Z Match, £40 ono. D. Mathews. Tel 01-876 7868.

KW Viceroy Mk4, £60. 12AVO, £25. TA31Jr, £20. 2m lp filter, £5. Qud fm tuner, £15. 8HY 250mA choke, £2. 500V 250mA transformer, £3. 500V 400mA transformer, £4. 14yd UR1 70Ω coaxial, £8. G3GMY, QTHR. Tel 01-449 7203.

Trio TS520 in perfect cond, used little, £300. HF5 vertical antenna, 10 80m, 25m UR70 coaxial, SEM antenna noise bridge, £10. G3CYL, 16 Coxheath Road, Church Crookham, Hants. Tel 02514 7521.

Trio TS500/PS500 tx/rx, 80 10, 200W, p.e.p., manuals, boxes, £200. SEM 2m converter, new, £15. Xtal mic, desk stand, £5. G3OAZ, QTHR. Tel 0256 65126.

144MHz 640A linear, built-in power supplies, relays etc, £30. PR135A ssb rx, xtal controlled front end removed, £20. Pye Vanguard, all accessories, £20. 1000 0 1000 1A transformer, £10. Heathkit factory assembled rf/af sig gen, £10. G3OXV, QTHR. Tel Daventry 2265.

FRSDX400 rx, immac cond, £150 or exchange for 2m fm gear with cash adjustment. G3LLZ, QTHR. Tel Swindon 38069.

Drake TR7, three extra xtal filters, noise blanker, PS7 power supply, VF7 vfo, MS7 spkr, MN7 atu and power meter, desk mic, all as new, £1,325 ono. IC240, good cond, £130 ono. Nigel Clarke, G8PZR. Tel Harlow 414234.

QTH: detached bungalow, planning permission 60ft Versatower, three beds, lounge/four bed, lounge/diner, 17 by 12ft, int garage, sep wc, bathroom, large kitchen, good sized garden, open situation, 1.1 miles M61, £35,000. G4IAV. Tel 0942 (Lancs) 870954.

79 prewar valves, boxed, unused, 2,000 r/tv, ditto. SAE, G4AK, QTHR.

TS180S tx/rx, drc, memories, dual ssb filters, cw filter, matching vfo, comp with manuals, orig packing, exc cond, £550 ono. 12V psu to suit, £35. Marconi vtm high impedance rf/dc volt/ohmmeter, £10. G3UKS. Tel Burghfield Common 2672.

Drake SPR4 communications rx, noise blanker, calibrator, all 23 xtals fitted, 120/240V ac, 12 15V dc, cost over £500 new, a.m./cw/ssb/rty, £300. G4IAV. Tel 0942 (Lancs) 870954.

Yaesu CPU2500, tx/rx, remote keypad, operating manual, orig packing, exc cond, £240 ono. Buyer collects. G8XMP. Tel Scunthorpe (0724) 710303, after 6pm.

Pye Rangers, two a.m. hiband, one boot mount, fm ranger hiband, needs attention, £7 each or £20 all three. Suit experimenter, enthusiast, scavenger, etc. Pete Fox, G6ACB. Tel Riverside (Berks) 310.

National NCX5 tx, 80 10m, mech, digital readout, psu, hb, vgc, £180. Creed 78 tly, psu, no cover, £15. Avo coil winder, hb, 15. 200mV dpm psu, hb on pcb, £5. One gal tranf oil, £1. G4GAS, QTHR. Tel Swindon 750130.

Trio 2200GX, fully xtalld, 12 channels, R0 1, R3 6, S18 23, nicads, case, charger, 1/4 whip 5A/8 gutter mount, offers around £115. Tel Wolverhampton (0902) 764214.

Yaesu FR50B rx, mint cond, 10 80m plus 160m, 2m a.m./ssb, built-in spkr, manual, £100 ono. Buyer collects. GM4GIL, QTHR. Tel 0324 823263.

Trio 7500 2m tx/rx, manual, orig packing, 5A/8 whip, swr meter, mint cond, £165 ono. Eddystone 730, 0-5 30MHz, rec, manual, superb cond, £110 ono. Delivery possible most areas. G8PNW, QTHR. Tel 075-782 511.

FT101E, exc cond, all accessories, handbook, orig packing, £420 ono. FC301 antenna tuner, £75 ono. Prefer buyer collects. G3BPV, QTHR. Tel Burgess Hill 2501.

Europa 2m transverter with preamp, £65. Homebrew 4m transverter, £40. 2200GX, eight channel, comp, £90. MMC 144/14MHz converter, £12. RTTY 7E printer, ttu, moniscope, £60. VHF rx, a.m./fm, 30-260MHz, £35. G3LTN, QTHR. Tel Banbury 710623.

Eddystone EC10 Mk2 communication rx, Eddystone mains unit, exc, unmarked cond, limited use, manuals, buyer collects, cash sale, £120. New 6LQ6 valves, £5 for two. Advance mains stabilizer, £7. G3FK, QTHR. Tel 0202-873 175.

Europa solid-state 2m transverter, 10W output, good cond, £50 ono. Codar AT5 tx, with mains psu, £20. KW Vanguard Mk2 80-10m, £28. GM3WIJ, QTHR. Tel 0224 37019.

TRS80 pocket computer with cassette interface, mint, £85. Jaybeam slot, 8/8, £10. Sinclair PDM3, £20. Casio FX2300, £15. 48in dia parabolic dish, £15. *Wanted:* Trio LH1. Datong FL2. Jaybeam X6/2M/X12/70. KX2 or AT1000 atu. G8IYK, 120 Birmingham Road, Redditch, Worcs. Tel 64885.

Communication rx, Sanyo RP8880 double conversion, 1MHz, 100kHz, 10kHz, xtal markers, tuned hf amplifier, fm, lw, mv, six sw channels, 1-6 30MHz bfo, integral spkr, two telescopic, one directional antenna, battery, 12V dc mains operation, £185. G4GQN, QTHR. Tel 09284 441.

FT200/FP200, full 10m coverage, exc cond, £220 ono. G4GBM, QTHR. Tel Staines 53549.

Trio TS520 cw filter, 12V dc, no mods, vgc, £300 ono. Heathkit HW8 QRP tx/rx, vgc, £70. Katsumi electronic keyer, one month old, EK150, £45. All plus p&p. G4GFK, QTHR. Tel 021-476 8202, after 5pm any day.

Creed 7E page printer with perforator, auto tx, power supply, 7B for spares, incl paper, handbooks, etc, £30 ono. *Wanted:* TZ40 equiv DA41 valves. Stone, G3JFC, QTHR. Tel Crayford 524489.

FT901DM, FC901, perfect cond, £580. FRG7700M, perfect, £300. Himound paddle MK701, £12. Himound squeeze MK705, £16. G3DKO, QTHR. Tel 01-801 2449.

Generator, 800W, 230V ac Asperi petrol engine, 2X13A sockets for supply take off, will part-exchange for Honda E300 or similar or just sell, £75. G4EPN, QTHR. Tel Sapcote 3404.

Ground post only for Strumech, GEC tv boards, latest ics, £4. Xtal calibrator, £1. 0 500V 250mA stab power supply, £8. 0 99-99sec digital timer, £3. 100 untested ics, £1. Beer barrel for cavity, £4. Multicore cable. Tel Tony, 01-452 6724, evenings.

70cm Multi U11, fitted RB0 14, comp, £180 ono. FT221 2m multimode, fitted 11 xtals, immac, £290 ono. Heath fet vom test meter, £15 ono. G3VGH, QTHR. Tel York 769245.

Tower 60ft telescopic post mount, ready to collect, needs cables, £150 ono. Trio 2200GX nicads, charger, helical, fitted 12 channels, three spares, orig box, £110 ono. *Wanted:* 2m multimode hf linear. Tel Dave, 051-227 1919, office, 051-428 1845, home.

Yaesu FT202R, six channel handie, nicads, NC1 charger, new, unused, £90. Yaesu desk mic, modified to 5000, £10. Nagasawa TWS120N uhf two-way coaxial switch, gold-plated "N" connectors, new, unused, £10. Postage extra. Tel 0747 840138.

Two Army rx tx No 18 sets Mk3 with key mic, head phones, collectors items, offers. One BCC rx, 140 150MHz no xtals, £8. G8KVU, QTHR. Tel 0203 597411.

Two Pye Cambridge AM10Ds, both six channel, fm, transmit and receive, fitted toneburst, 10 channels available, G3QOD homebrew tx/rx, 160 10m, requires aligning, Class D wavemeter, with manual, 19 set variometer, QOV0320A valve, offers. G4DEN, QTHR. Tel Newton-le-Willows 6099.

Wilson System 40, 10-el tribander, unused, 10, 15 and 20m, 26ft boom, bargain at £200. Jaybeam 14 el Parabeam, used, £15. Cushcraft 20-el 2m dx array, £25. G4GI, QTHR. Tel 0622 720366.

FT101E for quick sale, immac, £310 ono. G3BHT, QTHR. Sutton Coldfield. Tel 021-308 4764.

Trio 9R59DS communication rx, mint cond, 10 160m, choice of spkr, manual, £65. Hunting, 22 Northgate, Oakham, Leics. Tel 2685.

Reward offered for recovery of Sommerkamp TS240FM stolen from Belle Vue area of Manchester.

This equipment was possibly re-sold at NRSA Convention at Belle Vue, Manchester. Serial number located inside equipment is 800080. G8HXE or G8ZZM, QTHR. Tel 0204 384903.

Yaesu FTV250 2m transverter, unused, manual, £130. Four new boxed TT21 pa valves, ideal for linear amplifier, £16. Pye a.m. Vanguard, low band, unmodified, exc cond, tested, £30. G3WIF, QTHR. Tel Bristol (0272) 293738.

IC260E, £275. Going hf. G4LGB. Tel Norwich 897694. **TS520S** with cw filter, as new, boxed, £380. SB200, mind cond, £280. Mustang Mk2 Yagi, exc cond, £70. Tower, 25ft aluminium, incl rotator, exc cond, £70. Carriage extra on all items. G3RCU, NOT QTHR. Tel Christchurch 484211, daytime, 475048, evening.

Shack sale: 27MHz double beam scope, £30; Homebrew ssb tx/rx, £20; 100 xtals, £10; pcbs, 100, £1; Taylor valve tester, £8; ssb filters with carrier xtals, £10; swr meter, relays, switches, meters, valves, components. G3PEV, QTHR. Tel Roxwell 374. **Icom 255E**, superb cond, one year old, orig packing, handbook, circuits, etc, no mods, £190, plus carr. G3JKV. Tel Dorking (0306) 884359.

Fujica TS605 slr, exc cond, £45 or swap for comm rx equiv value. RS43115. Tel East Kilbride 32068. **Heathkit OS2** scope with manual, £7. Joystick with atu, £5. TTC semi-automatic bug, £3. All wkg. Requiring work or breaking down for parts: Dekatron counter with 2x GC10B; R209 rx modified for external psu; Heathkit multimeter; offers. Homebrew 80m ssb tx/rx; Heathkit 3,393-6MHz filter, separate vfo, separate linear with fan, £15. HF bands phasing ssb tx/rx, needs oscillator pack, hf bands linear Q74250 pa, linear psu, enormous transformer, 160m converter, £45. G3YZO, QTHR. Tel Cambridge 48072.

HRO MX, miniature rf valves, nine gc coils, five b/spectrum, 697 psu, £35. Spare dial assembly, £3. Spare 697 psu, £5. BC221AK, internal modulator, integral official rec psu, orig charts, spare valves, £25. Codar AT5 tx, h/b mains/battery psu, £15. Philips four-track three-speed reel recorder, QTY 600/1, 200ft tapes, £20. All good cond. Buyers collect or arrange carriage. G3HIS, QTHR Somerset. Tel 082-347 6400.

Wood & Douglas 2m rx board, professionally aligned, £25. Texan hifi amplifier, 20+20W, £15. *Wanted:* Radio Communication, January 1972 issue - can you help? G3ZOH, QTHR. Tel Farnborough (Kent) 58413, evenings.

Morse code keyboard, Wireless World design, full buffered memory, ptt control circuit, built-in tone oscillator, £100. GM3WIL, QTHR. Tel 0292 79217.

Trio TS520, perfect, immac cond, fitted cw filter, comp with manual, £325. Trio VFO520 ext vfo, mint cond, £75. G4GFU, QTHR. Tel Maidstone 70725.

Eddystone 750 gen cov rx, spare valves, matched spkr, £75 ono. MMC 144/4 6 converter, £15. Buyer collects. Tel Camberley (Stroud, Glos) (045 387) 2547. **TR7010** 2m ssb, comp with mobile mount, hardly used, £110. G4EBG, QTHR. Tel Rotherham 524634.

FT200/FP200, full 10m coverage, £180. BC348 built-in psu, £35. Many other items. Returning to VK. G4CLP/VK6WA, QTHR. Tel Reading 412583.

FT207R, 144 148, spkr/mic, charger, 1/4 whip, helical, dc-dc adaptor, 10 months guarantee, case, etc, £180. Pye uhf Cambridge, U10B, RB6, RB11, SU20, 4W fm, £50. MCC 432/144 converter, new Dec 1980, £22. G8TEE, QTHR. Tel Tony, Reading (0734) 340532.

Scope GPOS15, single beam, handbook, probe, £25. 10GM doppler radar CL8920, £8.50. WG16 bends, £2. FLDX, FRDX400, mic, books, spares, cases, fb cond, £260. G3KPW, QTHR. Tel 0474 62051, evenings.

Trio TS700G 2m multimode 240V/12V, exc cond, £280. NDI HC1400 2m fm, synthesized 30W rf, digital display, 12V dc, £150. Pye Cambridge 2m six channels modified fm, fitted R3 6, S20 21, £55. Redifon GR415, hf ssb tx/rx, 100W p.e.p., 12V dc quick-heat pa, manuals, £60. Redifon TT11 rttv rx tu, £15. SSM Europa transverter, £45. High band Pye base tx, suitable linear conversion, £15. Old Pye RTC, £5 or free with tx. Prefer buyers inspect/collect. G8XRY, 341 Walsall Road, West Bromwich, W Mids. Tel 021-588 4801.

Drake TR4C tx/rx, as new, ac psu, £240. G3YFW, QTHR. Tel 01-586 8678, evenings.

Datong D70 morse tutor, new, 12 weeks use, with p&p, £38. Tel Leeds (0532) 678422.

Ideal for antenna measurements: Wayne Kerr admittance bridge B801B with source S161 and detector R161, 5 100MHz, to 1MHz with external sig gen and rx, £150. Stiles, Pentre Isaf, Bryneglwyys, Corwen, Clwyd LL21 9NA.

Two HROs, manual, £20 each. PSU, £15. Various coil packs, £2 each. All in wkg order, new valves, 6D6, 6C6, 6B7, offers. Prefer buyer inspects and collects. Tel Bath 330588, evenings.

Atlas 215X, comp with mains console, mic, as new, £360. Two 4 400A valves, as new, £30 each. Two Eimac 4CX350A valves, new, unused, £35 each. G5UG, QTHR. Tel Peel, Isle of Man 2845.

2200GX with VFO30G, in orig packing, handbooks, accessories, nicads, charger, xtalld S20 22, R0, reverse R0, R1 7, £110. No split. G8XS0. Tel Lincoln 33094.

FT707 solid-state 200W input eight-band WARC "Wayfarer", save £135 on list price, comp with FT707 psu, spkr, FT707 antenna tuner, swr power meter, dummy load, YM36 mic, all perfect, boxed, air tested only, £595. G3GGL, QTHR. Tel Bewdley (0299) 403372.

Hygain 402BA 40m two-el beam, used once, £150 ono, or part exchange w.h.y? G4CNY, QTHR. Tel 0432 3237.

HW101, fitted cw filter HP23A power unit, handbooks, looks almost new, £160 ono. Trio 7200G fitted xtals R5 7, S20 22, £80 ono. GW3ENN, QTHR. Tel 0222 701830.

Circuit diagram for the Bearcat BC220 rx, modification available for a.m. if required, 75p incl. S. Scanton, G8HQY, 5 Chestnut Avenue, Kettering, Northants.

FTDX400, SP400, 560W p.e.p., mini cond, manual, mic, spare valves, orig packing, £220. Prefer buyer inspects. G3JMH, QTHR. Tel 0494 34984.

FT101EE, fitted with 350Hz cw filter, incl mic, leads, manual, exc cond, tx facility used little, £350. 590V, 0-6A continuous, mains transformer, ideal for sweep-tube linear, £15. Buyer collects. G3ZLS, QTHR.

Trio 2200G, three ss, six rptr channels, auto t/b, accessories, no nicads, sent orig carton, £85. Brand new Heath power transformer for SB/HW series, £18 plus half carriage or collect Somerset this item. ASP667 mobile colinear, brand new, cartonned, £12. Tel Blagdon Hill (082 342) 578.

FRG101DD and spkr, £400. FRG7700M, £300. Datong audio filter FL2, £60. Mizuho FX1 absorption meter, £18. AT1000 atu, £20. Sony ICF2001, £110. All in mint cond, carriage free. No offers please. Cameron, "Coombe Cottage", Pitchcombe, Stroud, Glos. Tel Stroud 3081, evenings.

Muirhead facsimile machine D900, easily modified for Meteor pictures or Bracknell weather charts, cct diag and mod info available. G8NFU, QTHR. Tel Erith 37033.

FT101Z, fan, S901 spkr, immac, £400. Trio R1000, as new, £240. G4BXR, QTHR. Tel 0908 566266.

Microwave Modules 2m 100W linear amplifier, Lunar low-noise preamp, incl leads etc, offers around £80. Buyer collects or carriage at cost. G8RWG, QTHR. Tel Camberley (0276) 32195.

Four-track tape recorder, mains, £10. Ex-WD attenuator unit, silver-plated coils, suit h/brew linear, £15. Meters, 4in square, 0 60mA ac, 250 0-25uA dc, £3 each. Old WD scope, rough, heavy, free if collected. Mains psu, valved, various outputs, £5. G3YHG, QTHR.

Trio R1000, exc rx, as new, £225 ono. Datong FL2, first class filter unit, mains power unit, as new, £65 ono. All units under one year old. Tel 061-962 7577.

FRG7, new February 1980, vgc, used very little, handbook, £150. G4KRT NOT QTHR. Tel 021-458 7878.

Trio TS520 with manual, orig packing, SP520 spkr, £310. Heathkit SB200 linear amplifier, spare valves, manual, £200. KW107 tuning unit, £60. TH3 junior beam, £90. Trio TS770 vhf/uhf multimode tx/rx, immac, orig packing, £535. G4EYA. Tel 01-777 9908 evenings.

FRG7, eight months old, perfect cond, manual, packing, now using hf rig and awaiting G4, £160. Mike Prince, Tel Aldershot 316729, after 6.30pm.

2m wavemeter/signal strength meter, £16. VMOS top band tx, £25. HF bands wavemeter, 3 30MHz, £17. G4JJJ, QTHR. Tel Luton 25729.

BX1 tower, 60ft, motors, £150. Buyer assists removal and arranges carriage, quad thrown in. Large 3hp motor for use 2kW generator, £5. Stewart Turner pump type A6, 3hp motor, new, never used, £100 ono. Teleguipment scope S42, £10 ono. VVV desk computer, £5. Bench pillar drill, in chuk taper, three-speed, £20 ono. HRO dials, HRO drives, new, offers.

CRTS Cintel CV1587, VCR112, VCR138, eight-base, offers. 1in by 1,800ft video tapes, two off, 9in empty spool, offers. G3EFK. Tel Downland 51212.

FT220R, fitted S20 22, R1, R4 5, spkr/mic, power adaptor, £89. KW2000B mains psu, £190. IC255E, £185. R. Lathwell, 4 Canterbury Road, Ramsgate, Kent. Tel 0843 52723, evenings only.

DX200, 60m rx, mint cond, one month old, orig packing, instruction book, etc. £135 ono. Reason for sale - need cash for hf tx/rx. Tel Dursley (0453) 860426, evenings.

National NC101X (1937) rx of historical interest, £45 or offer. Antenna tuning unit for 52 set, contains large roller coaster with counter, £10. G3VW, QTHR. Tel 01-205 1443.

Icom IC215, good cond, 13 channels fitted, £105 ono. Exchange for IC202. G3ZJF, QTHR. Tel Windsor 68364.

TS120V, 1h use, property of late G4BRI, £320 ono. Technalogs tv pattern generator, £35 ono. G4JKS, QTHR. Tel St Albans 59318.

Microwaves Modules MMT432/144R transverter, 1hp

£130. Yaesu FT2FB fm 144MHz tx/rx, xtalled eight simplex channels, R0, R6 7, rev R0, £90. Both ono. GBLXY, 126 Putteridge Road, Luton, Beds LU2 8HQ. **Trio HS5** deluxe headphones, unused, in maker's pack, £13.50. Carriage paid. G2BY, QTHR. Tel Ventnor 852150.

IC701, **IC701PS**, desk mic, as new, orig box, £650. IC202 incl internal charger, nicads, modular 15V pa/preamp, orig box, £160. Delivery paid. Neil Onions, GM8HUT, Flat 9, Suinborghus, Virkie, Shetland. Tel 0905 60751.

Yaesu FT7 tx/rx, 80-10m, ssb/cw, 20W p.e.p., cond like new, all comp, in orig packing, never used mobile, this super QRP rig has given me DXCC, WAS, WAZ, etc, and without tvil £245 ono. Tel 01-578 4484, after 6 pm.

1-10-75GHz, four tunable converters, £35 each. 2-2kW rf amp, TS130 0-3 12GHz, £65. R444 vhf a.m./fm rx, £45. CV88A/URA8A frequency shift converter, £35. **Wanted:** HRO and vhf rx. Manual for R1283/GRC. Wright, 249 Sandy Lane, Hindley, Wigan. Tel 55948.

KW200B, power supply, 1/spkr, 160-10m, 2 x 6146s in final, manual, exc cond, some spares, £230. Will pay half of Securicor "A" charges on 250 mile journey. **Wanted:** KW Atlanta or FTD401, exchange possible. G2BTY. Tel 0872 863198.

IC202S, 2m usb/lb tx/rx, xtalled for 144-0 144-4, 145-8 146-0 (Oscar), £130. G8RVP. Tel Bradford (0274) 570567.

Trio TS700G 2m multimode, xtalled R3 4, R6 7, 144-300, matching vox unit, auto toneburst, exc cond, boxed, £260. G3PY, QTHR. Tel Glossop 61062.

FRG7, exc cond, digital readout, ssb/a.m. filters, £120. **Trio 2400**, charger base, case, used little, £160. **Oskorblick SWR200B**, used little, £30. G3LEH. Tel 01-850 5594.

VHF QTH: Three-bedroom semi, ideal first-time buyer, £18,250. G3PWJ, QTHR. Tel Kingswinford 277778. **Hygain TH3 Mk3** tribander beam, £89. Ham 2 rotator, £69. About 40m eight-way cable, £10. Prefer collect or carriage extra. G2KF, QTHR. Tel 072-681 2337.

Quad (valved) preamp/control unit, vhf tuner/stereo decoder, a.m. tuner, power amps, handbooks, £150 ono. **Truvox PD86** reel-to-reel tape unit, three heads, £35 ono. **Sanyo cassette recorder M2220**, £20. **Lafayette HA600** gen cov rx with handbook, £35. **HC1400** mobile 2m tx/rx, 5W/25W 144/148MHz pll memories, £140. All ono. 100W linear, 2m, 18dB preamp, £80. G8VEI, QTHR. Tel Cambridge 207640.

FT207R 2m fm synthesized hand portable, vgc, nicads, charger, case, £170 ono. **Microwave Modules 70cm** converter (28MHz i.f.), DJ62Z 144MHz transmit converter, needs some attention, offers. **Wanted:** Waveguide 16 and flanges. Nigel Houlit, G4CIK NOT QTHR. Tel Wokingham (0734) 781580.

TR2300 incl nicads, rubber duck, charger, six months old, £120 or exchange IC2E. G3RRG, QTHR. Tel 061-442 8534.

Atlas 210X mobile tx/rx, 80 10m, 12V, mint, £275. Noise blanker board, £20. Both £290. **MM transverter 432/144**, £85. Xtals for transverting 70cm for TR7200, quartz 16, RB0 14, £3.50 each. Last two items £100. G4DGM, 106 Goldthorn Hill, Wolverhampton.

Racal RA17L rx, vgc, comp with handbook, £175. Series precision multimeter, 20KΩ pv, £10. Various bits and pieces. Requirements to 5 Ida Road, West Bromwich, West Midlands. Tel 021-553 0409.

TS820S digital tx/rx 15h use, as new, handbook, packing, £500. **Trio TR7500** with PS6 psu, £200. **Racal RA17L**, ssb, atu, diversity units, all immac, £300. **KW Vanguard** tx, £30. Tel 021-553 0409.

Icom IC22A 10W mobile, fitted all repeaters, 10 channels, incl mobile mounting bracket, £100. G3XGE, QTHR. Tel 061-865 3191.

Tangerine Microtan 65, built, wkg, graphics option, Tanex min config kit, X-bug eprom, all manuals, requires ASCII or hex keyboard and tv, £110. **GW8IAM**, QTHR. Tel 0222 843555, after 8pm.

Trio 2300 2m fm handheld, nine months old, fitted reverse repeater, nicads, helical rubber antenna, exc cond, £115. **Microwave Modules 144/25 25W 2m** linear pa/preamp, £35. 71/8 mobile whip, £8. G4LDF. Tel 01-428 3266 (NW London).

Drake R4A MS4, extra xtals, G8KW trap dipole, Joymatch, Joystick, exc cond, £170 or best offer, will separate. Chris Lee, 315 High Road, Chadwell Heath, Essex. Tel 01-597 7740, 734 5491, work.

Sentinel 2m 50W linear and preamp, brand new, £50. **Jaybeam** 2m six-el quad, £12. G3YED, QTHR. Tel Stratford-upon-Avon (0789) 297845.

Honda 1-5kW petrol generator, reconditioned and in good wkg cond, £200. G3JKS, QTHR. Tel St Albans 59318.

Microwave Modules MM2000, rty to tv converter, special unit with additional 100 baud rty and 110 baud data ASCII, absolutely mint, only 4 5h use; genuine reason for selling reluctantly, £150. G3HBT, QTHR. Tel Larkhall 883306, after 6pm.

Heathkit SB101 with cw filter, SB600 spkr, HP23 psu, manuals, new 6146s fitted, 18W p.e.p., 170W cw 80-10m, £125. Buyer collect. G2DUG, QTHR. Tel Winchcombe 602159.

Tx/rx Pye hf rt, six channels, 100W p.e.p., ssb 130, 110/240V, 12/14V psu, handbook, as new, £90. **Lafayette comm rx HA700** 0-15/30MHz cw/a.m./ssb, suit beginner, £15. Five new Pye-TMC linesman's telephones, 704 (modern field telephones), £20 each. G8PF, QTHR. Tel 0425 617576.

FT101E, one of the best around, fan, mic, speech processor, dust cover, used very little, orig packing, no more time wasters or cb boys please! Paul Smith, G3WPB, QTHR. Tel Bournemouth (0202) 644546.

KW Valiant tx, 25W, a.m./cw, psu, £20. G5HJ, QTHR. Tel Cambridge 872220.

Trio TS700S digital 2m multimode, external vfo, circuit, mic, workshop manual, £325. **Magnum** 2 2m transverter, circuit, some spare valves, suits FT101B and E, £45. 1in vidicon Thomson-CSF commercial grade type TH9828, £10. **Poulter**, G3WHK, QTHR. Tel 01-330 5795, after 6pm.

FDK Multi 700E, good clean cond, no mods, £150 ono. **Microwave Modules** 2m converter, 116MHz output, 28-30MHz i.f., only 1h use, £18 ono. Buyer collect or carriage extra. G4DKB, QTHR. Tel Billerica (02774) 53561, after 6pm.

TS820S digital, dc supply, Sherwood cw filter, £500 ono. **Multi 700E**, £145. **KLM160** 15/160W, £135. **Heathkit SB301/401**, dual cw filters, full QSK, £300 ono. **Wanted:** sections of Western Electronics Alumast. G5CMX. Tel Bill, 049-481 3956.

Yaesu YR901 cw/rty reader, hardly used, a beautiful instrument, cost £425, a bargain at £300. **Yaesu Y901P** multiscopes, used little, £190. **Technic** 524AD twin beam oscilloscope, incl two type 121 wide-band preamp units, £100. **Regency** digital flight scan aircraft band, superb, cost new £248, sell at £140. **Sony HP511A** radiogram and pair 10in sprks/cabinets, exc cond, £90. **Ex-Ministry** Micovac model 22B test meter, superb instrument, £30. Tel Bulls Green (Welwyn, Herts) 219.

Mizuho SB2M 2m ssb/cw tx/rx, £70. G8CXQ, QTHR. Tel 0926 313669.

Mizuho SB2M, one year old, incl nicads, £80 ono. **Uniden 2030**, R0, 1, 3, 4-7, S19-22, R6R, £75 ono. **TR2400**, one year old, exc, £150 ono. **Magnum** 2 transverter, straight plug-in to FT101/200, £55 ono. **Boot** mount six-channel Cambridge 2m fm, S20-22, £25 ono. **GM4JPG**, QTHR. Tel lain, 031-665 4281.

Yaesu FRG7000 rx, 13 months old, used little, orig packing, £200. **G8XWR**, Tel Nottingham (06073) 3953.

QRO linear 4 x 4CX250B, offers. 70cm 48-el multibeam, brand new, £25. 4 x 4CX250B bases, integral chimney, tuned grid, three 1/4 2m anode lines, TR9000, 40-el broadband coilover, £400. **KW Viceroy**, £50. Three-way coaxial switch, £5. Coaxial bits and pieces. G8OFQ. Tel Lincoln 26399.

QTH: 1,200ft asl, Queensbury, Nr Bradford, W Yorks, semi-bungalow, four bedrooms, sunlounge, garage, carport, 30ft tower, 15min to M62 JN25, exc take-off. **G4CMV** NOT QTHR. Tel Pudsey (0532) 566392, anytime.

Siemens Hellschreiber tx/rx, type GL, £20. **Plessey** telegraph sig gen solid-state, 40-240 bauds, inbuilt coder for "Quick brown fox etc" in five and eight level format, £75. **Delivered** G and GW at petrol cost. Details from G5XB, QTHR. Tel 073-525 2195.

FT75B, 10-80m, 100W, ac psu, vfo, unused 12AVQ (10 15 20) vertical ant, £160 ono. **Wanted:** HQ1 mini-beam, good cond. Dr Jaggarao, Royal Sussex County Hospital, Brighton. Tel 0273 606611, after 8pm.

IC202S, as new, £140. 20W pa ME202-25 for 202/215, £20. **Mobile** mount, power supply, helical whip for 202/215, £15. **Comp outfit**, £165. **G8ROC**, QTHR. Tel 0272 877789.

Trio TR7200G, £110. **Trio JR310**, 80-10m rx 2-4kHz filter, £60. **Eddystone 730/4**, rx, £60. **Yaesu FT202R**, nicads, charger, never used, £95. **G8KSC**, QTHR. Tel Dave, Stoke-on-Trent 517552, after 6pm.

Property of the late G2FWA: Heathkit models SB102 with SB600 and HP23, £180. **HW8 QRP** tx/rx, £50. **SB610** monitorscope, £30. **HW7**, needs attention, £20. **HW12A**, £35. **HW32A**, £15. **Homebrew** in Heathkit matching cabinets for use with SB102 series, separate vfo, £10. **160m** transverter, £15. **Desk mic**, £8. **Philips** 70cm tx/rx FM321, nearly new, £150. **Pye** 70cm tx/rx, £10. All units sold as is. Buyer collects. Price asked reflects cond. **G3FXA**, QTHR. Tel 0242-35727.

Shack rearranging? 2m multimodes: **Yaesu FT221RD**: hi-lo power, end of transmission "T", £310. **Icom IC245E**, £270. **FDK Multi U11**, 70cm, SU0, 8, 16, 20, RB2, 6, 10, 14, £170. **Yaesu FT101EE**, spare pas, £385. **FT7 28-29MHz** on 10m, £240. **FRG7**, £120. **Frequency** counters, YC355D, mains, 12V, 10Hz-200MHz, £85. **VHF** Communications design 10Hz-500MHz, £45. **Jaybeam PMH2C**, circular phasing harness for 144MHz X-Y antennas, £3. **Teleguipment** D54R, dualbeam oscilloscope, 10MHz bw, £295.

FT101B incl cw filter, £325. Interested? G4ITF, QTHR. Tel Cosham (0705) 386184.

Pye Westminster W15 fm, 2m, R3-7, S0, S20-23, mic, £80 ono. **G6AUW**. Tel Weymouth 786930.

Nicads, brand new unused Varta nicad packs, 12V at 1-2AH, size 41 by 1 1/2 by 1 1/2in, sale price incl postage, £18.50. New 32 number auto telephone dialer, only £55. **G4BBR**, QTHR. Tel 0242 27588.

AR88, in good cond, **RSGB Bulletins** July 1947 to present day, 1947 to 1953, bound, offers please. Will assist with delivery. Hague, 75 Woodland Drive, Anlaby, Hull, North Humberston HU10 7HN. Tel 0482 657439.

Telegraph distortion measuring sets, TDMS5, TDMS6, wkg order, manuals, £30 each. **Solartron** stabilized psu, variable 200/500V, 400 mA, £20. **Carriage** extra. **G8IXG**, QTHR. Tel Reading 53046.

Electronic Developments 70cm linear 40W op with blower, £35. **BFR91** 70cm preamp, £15. **GM8BDX**, QTHR. Tel 03612 2425.

Memory keyer, 1024 bits, integral stabilized power supply, compatible to FT101 etc, competition prize winner, see further details and photo, £45. **G3RB**, QTHR. Tel Whitley Bay 530504.

KW202, rx, matching spkr, handbook, exc cond, £140. **Tel Sittingbourne** (Kent) (0795) 73401, evenings and weekends.

KW2000 incl mains psu, instruction book, £120. **Yaesu FT75B** 100W p.e.p. mobile, £190. Both tx/rxs in exc cond, prefer buyers collect. **GM3ACL**, QTHR. Tel 041-952 2866, evenings.

Eddystone 730/4 gen cov rx, 480kHz-30MHz, £100. **KW** p.e.p. meter, 300W, integral two tone oscillator, £15. **144MHz** converter, 4-6MHz i.f., integral psu, £10. **G3WEX**, QTHR. Tel 021-354 4265.

IC2E, spk/mic, case, charger, mobile power pack, as new, £140. **TR7500**, all usual extras, vgc, £170. Both boxed. **G6AVN**. Tel 0422 588556, after 6pm.

Stop! look over here: **KP202** 2m fm handheld, S0, S16, S20, S22, S32, R6-7, good cond, in orig box, manual, case, nicads, base charger, helical, carrying strap, £95. **G4HLB**, QTHR. Tel Boston (0205) 61455.

FT221R, 2m multimode, exc cond, orig packing, £290. **Yaesu YH55** headphones, £7. **Datong** auto speech processor, just checked by Datong, £55. **Microwave Modules** digital frequency meter, 500MHz, £42. **G8BWR**, QTHR. Tel 0926 498388.

FT101E, **Mizuho** 2m ssb/cw, **HW7** QRP tx/rxs, **HR1680** rx, **FL2100B** linear, unused **Gotham** triband quad, **Joystick** system A, unused **Vibroplex** original key, swr, multimeters, details, prices, see please. **Marvin Wallis**, G5CRD, "Quernmore", Lowbeech, Hailsham, East Sussex BN27 4JL.

Microwave Modules transverters, **MMT1296/144**, £140. **MMT432/28**, £65. **MMT144/28**, £50. **Converters** **MMC435/600**, £23. **MMC70/28LO**, £20. **MMC1296/28**, lo output, £25. **MMA144V** preamp, £25. **G4EEE** 70FMO5R untouched rx kit, £30. **Pye U50A** 432MHz 4CX250B amplifier, £55. **Buyer** collects. **Remainder** plus carriage. **G4FRE**, QTHR.

Shack clearance: **Lafayette HA350** rx with spare valves; **HW100** with **Heathkit** mobile power supply, manuals, ok on rx, nil drive to pa, tested, boxed, and stored, offers please. **G3OML**, QTHR. Tel 01-540 2713.

TR2200G tx/rx, seven channels, S20-22, R0, RRO, S0, S24, R3, R7, nicads, case, charger, manual, orig packing, power supply, charger, £100. **Wanted:** IC2E or similar 2m handheld, **G6ASC**, QTHR. Tel 021-705 1253. **8MHz** and **45MHz** xtals for 2m, many other frequencies, £1.25 each. **SAE** for list. **Miniature** 807 valves types **5B254M** and **5B255M**, £1.50 each. **5B257M**, £1 each. **8748** micro-P, offers? **28MHz** tx, 6146 pa similar **DX40**, £20. **G3NGK**. Tel 01-462 2178, evenings.

FT101ZD incl fan, spkr, £460. **FL2100B** linear, £260. Both units in mint cond, **Heathkit** power meter, **HM102**, £30. **Yaesu** spkr **SP101**, £10. **Two** Toshiba **6JS6C** valves, £10. **Buyers** collect. **G3MSL**, QTHR. Tel Fleet 21446, after 7pm to arrange demonstration.

CRF160 13 band gen cov rx, unmarked, orig packing, fm, a.m., SW1, SW2-10 mw, lw, bfo, prefer buyer inspect/collect. **Carriage** extra, £90 ono. **G4LHY**, QTHR. Tel Falmouth (0326) 311802.

Autoscan/manual 2m fm rx, pocket-sized, S20, R0-8, xtals, new, unwanted gift, comp with rechargeable battery, carrying case, antenna, earpiece, orig packing, exc rx, £45. **G3VPH**, QTHR. Tel Droitwich (0905) 773089.

Icom IC2E, in good cond, case, psu/charger, £145. **G8VLZ**, QTHR. Tel 0752 43588.

TR2400, all accessories, vgc, £180. **Parkair** 1700 air-band monitor, £280. **Daiva** SR9 marine rx, £40. **Antec** 5/8 2m gp, £5. **Bantex** 5/8 2m mobile, £5. **BC639A** for spares. **Lockwood**, **G3XLL**, QTHR. Tel Mellis 596.

Heavy duty 32ft tower, £135. **Various** **G3ZVC** tx/rx, modules from £25. **Wanted:** **Microwave** components, waveguide, switches, circulators etc. **Wavemeters** in the range 1-10GHz. **G8EQL**, QTHR. Tel 0823 74572.

Going rty? **Toroids:** 88mH, £1.20. 44mH, £0.60 (includes free mounting kits). **Useful** tuning capacitors: 2

per cent polystyrene: 0.042µF, 0.034µF, 0.031µF, £0.15 each. (1.275Hz needs approx 0.177µF and 1.445Hz needs 0.171µF). Comp discriminator/detector board, ready tuned, £10. New LM709CH (T05 can type), £0.29. Computer grade 25,000µF/60V electrolytics, £3.50. All ex-GPO except where stated, but as new. Under £2, please add 50p p&p. G8RBY, QTHR.

Shack clearance: B40D rx with official manual, £40 ono. Buyer collects KW E-Zee Match, as new, £30. KV vswr bridge, £5. D104 mic with G-stand, £20. US Navy 24h radio room clock, chronometer accuracy, eight-day movement, £55. Collins F455FA21 mechanical filters, £25 each. Brand-new Dowkey coaxial relays, rated 1kW to 1GHz, SO239 connectors, 115V ac coil, £15 each. Maintenance manual for six-band FT101Z/ZD, £5. Valves new, boxed UK/USA manufacture, sets of seven for S840C/S840A, £5 per set, 7360 (two only), £5.50 each. 6HS6, £1.50. 6AU6A, 6BF5, 6DC6, 6UBA, 5749, £1 each. Postage extra on all the above. G4EEY, QTHR. Tel Yateley 876860, evenings.

Six-element cubical quad, only three week's use, £25. Battery charger for Sommerkamp TS802, cost about £26, any reasonable offer accepted. GW4KYM. Tel 0873 6767.

Drake TR7, PS7, RV7, MS7, FA7, NB7, SP75 etc, all filters, manual, as new, boxed, cost near £1,700, sell at £1,100. Drake R4C, blanks etc, etc, £295. Yaeu FL2100B linear, as new, £250. Taylor, 5 Luther Road, Winton, Bournemouth. Tel 510400.

WANTED

Suitcase tx/rxs: B2 (type 3 Mk2), B2 minor (type A Mk3), Mk119, Mk122, Mk128, Mk217, BP5 or T5, AR11 and A3. Any American suitcase sets. Incomplete or damaged items welcome. RA117, mint, and VS62. Taylor, G3UCT, 27 Glen Road, Fleet, Hants. Tel 02514-6998.

R1000 or NRD515. Tel 0602 622763, evenings.

Mosley Elan antenna in good cond. G4ESF, QTHR. Tel 0872 862601.

American Majestic wireless rx, 1930s model, any cond. Kolster Brandes radio/wire recorder, 1949, (or similar). Pye transformerless television, 1946. Any plastic cabinet Philips radios. Any wkg amateur homebrew equipment for disposal? Roberts, 26 Beech Avenue, Brentwood CM13 2DX.

B2 suitcase set or any other wartime suitcase/spy

type radio. Any cond or incomplete welcome. G8VDZ, QTHR. Tel 01-949 2317.

Racal rx accessories and Racal books. MA350B synthesiser, MA1210 Racalator, MA168 diversity switch, comparator, oscillator, converter, preselector. John Porep, G5DVB, Larchmont, Ladygate Lane, Ruislip, Middx HA4 7QR.

VHF high band FM Pye Europas, 25W or 5W. FM paging units. Tel Liss (Hants) 2262.

KW2000B or E,fb cond with mic and power unit. G3STT, QTHR. Tel Southport (0704) 29137, evenings. Gen for construction of large frame antenna tuned for 200kHz to receive BBC4 in south Spain. Millar, Los Arcos, 10, La Nuncia, Alicante, Spain EX 5H3AP.

Circuit diagram for telemetry rx type X11610 R1392D, loan for copy or buy. G4GRH, QTHR.

Datong Morse tutor and obsolete *Call Book* by new member retired abroad but arriving UK mid-July. Birth, c/o Myerscough, Beech Road, Greenbank, Northwich, Cheshire.

Good portable gen cov rx for keen youth hostelling and camping family of three. One father, two sons. Mersereau, Chief Electrician, Crucible Theatre, Sheffield. Tel 0742 760621.

Licensed students for foremost contest winning university radio society, see past "Club News" for more details. Large heavy duty tents and generators (diesel). Skeds anytime 160 40m. Details from GW3OCB, Room 216, SEES, Dean Street, Bangor, Gwynedd, N. Wales.

Teleprinter Handbook. Buy or borrow (all expenses paid). G4BVC, 61 The Fairway, Oadby, Leicester. Tel 708585.

G-Line KW2000. Micro key KW E-Zee Match. G3FTA. Tel Hastings 423828.

Circuit diagrams or manuals for Hartley 13A oscilloscope and Marconi TF801A rf sig gen. Purchase or loan for photocopy. Will gratefully refund any costs. G8BAZ, QTHR. Tel 0305 821715, after 6.30pm.

FT200/FP200 or similar hf tx/rx, 80-10. G3MCA, QTHR. Tel Orpington (0689) 56497.

QRO linear, urgently. Heath SB220, NEC or Drake or similar amp, amateur or commercial, distance no object, will collect. Jenkins, G8RHJ, 76 Hillfield Avenue, Hornsey, London N8. Tel 01-446 5509.

T1154 and accessories by British Vintage Wireless Society member for reconstruction of operational wartime station. Other RAF second world war equipment. Anyone interested in a vintage wireless net? G3XSJ NOT QTHR. Tel Bristol 685280.

CW tx or tx/rx, QRP, compact, ac power supply, all in

good cond. G3YFI, Rosehurst, Margaret Avenue, Bardsey, Nr Leeds. Tel 0937 72502.

Heathkit power supply for SB101, cond immaterial. Write price and cond. *For sale:* Joystick antenna, mint. or exchange w.h.y? G3KCC, QTHR.

Sectional mast, ex-Army or similar for /P, wkg, guy lines and pegs not necessarily required. GM4BAF, QTHR. Tel 041-332 7751.

Original or photostat of HRO-MX manual or circuit diagram. Askey, 4 Keswick House, Lowth Road, London SE5 9NL.

KW E-Zee Match or similar atu. Decent straight Morse key. Small metalwork lathe, ie 2in or 3in throw, Myford? etc or w.h.y? G4LSA, 23 Barn Common, Woodseaves, Stafford. Tel Woodseaves 388.

KW109 atu, must be in first class cond. G4JZR, Tel 051-677 0632.

G2DAF Mk2 rx in good order. G2DAF Mk2/3 tx, well-constructed but unfinished items considered with or without interest. Interested in Anglian tx/rx. Please send details, price. G3YCP, QTHR Somerset.

HF linear solid-state 100W o/p, any make considered. 13-8V, 20A reg power unit. Both must be in good wkg cond and within reasonable travelling distance of London. Tel 01-357 2627, day, or 01-578 4484, evenings.

Microwave Modules 4m converter MMC70/28. Xtals for G2DAF ssb tx, 6-25, 7, 8, 9, 11-5, 11-75MHz, HC6/U type. KW Vanguard tx, one requiring attention considered, but must be in good cond. G3GLW, QTHR. Tel Southampton 462382.

Valve linear amplifier with good efficiency on 28MHz, and pen-recorder, either single or multi-channel. G4GLT, QTHR. Tel Coalville 35835.

IC202S ssb 144MHz tx without accessories. J. Tye, G4BYV, Inter-Nos, Swanton Morely 8142, Dereham NR20 4NU.

S32A scope circuit or manual, purchase or loan. All expenses refunded. Have own copying facility available. G8RLR, QTHR.

ITT Starphone F5 base station, preferably unmodified, in good cond. Starphone five-channel oscillator boards, tx and rx. G8CXV, QTHR. Tel 0602 384956, evenings.

HW101 with psu. G4HMB, QTHR. Tel Margaret, 0632 748343.

Ex-RAF bubble sextant, prefer good cond but any will do. G3ORH, QTHR. Tel Maidstone 44021 evenings.

Signal One CX7 or similar tx/rx. G4CIN, QTHR. Tel Bilston 403416.

Datong Morse tutor D70. Tel Howard, Leeds 68690, after 6pm.

CLUB NEWS

(Continued from page 649)

Ealing (E&DARS)—Tuesdays, 8pm. Northfields Community Centre, Northfields Road, London W13. Hon sec. E. Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston-upon-Thames.

Edgware (E&DRS)—4-5 July (Field Day), 9 July (Film show), 23 July (Informal natter night), 13 August (No meeting). Meetings held at Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Hon Sec G4HMD, tel 01-952 6462, club net on 1-875MHz, Mondays at 2200 local.

Harrow Weald (RSH)—Fridays, 8pm. Harrow Arts Centre, High Road, Harrow Weald. Sec G4AUF, tel 01-868 5002.

Havering (HDRS)—Wednesdays, 8pm. Fairkytes Arts Centre, Billet Lane, Hornchurch. Further details from sec A. Negus, tel Upminster 24059.

Holloway (Grafton RS)—The Five Bells, Eastend Road, Finchley, Second and fourth Friday in each month, 8pm. Sec G8SYD, tel John, 01-959 8785.

St Albans (Verulam ARC)—28 July (UHF propagation), 25 August (Bring and buy sale), 7.30 for 7.45pm. Formal meetings at Charles Morris Hall, Tyttenhanger Green, Nr St Albans. Informal meetings second Tuesday in each month, RAFA HQ, Victoria Street, St Albans. Details from Hilary, G4JKS, publicity sec, 115 Marshalswick Lane, St Albans, Herts.

Shelburne (SRC)—Thursdays, 7pm. Shelburne Youth Centre, Hornsey Road, London N7. RAE courses available. Hon sec T. C. Clark, G4BZW, tel 01-249 1843. Sec would be pleased to hear from any prospective members. The club has a 2000E transceiver, and G5RV antenna for licensed members to use.

Southgate (SRC)—Second Thursday in each month, 7.45pm. The Scout Hut, Wilson Street, Winchmore Hill Green, N21. Contact sec John Fitch, G8EWG, tel 440 7353.

South West Herts UHF Group—The building of GB3BH (1-3GHz/beacon/repeater) is progressing, and the group's 10GHz beacon, GB3SWH, is now

operational. Reports are requested from as many amateurs as possible to evaluate GB3SWH's catchment area. Talks can be arranged for interested groups. Contact sec G8BBE.

Stevenage (S&DARS)—This club has a new sec, Stephen Clarke, G8LXY. 8pm. Staff canteen, BA Plant B, Gunnels Wood Road, Stevenage. Details from G8KMV, tel 0438 54689.

Wanstead (ELRSGBG)—Third Sunday in each month, 3pm. Wanstead House, The Green, Wanstead E11 (200yd south of Wanstead Tube Station). All welcome. All details from Rod Holmes, G3PKQ, tel 01-558 2928, or G3AMF, tel 01-969 9224.

Watford (WRC)—This is a new club. Steering committee sec C. R. Tredwell, G8CHW, 15 Whippendell Road, Watford WD1 7LY. Wednesdays, 8-11pm. Watford Radio Club, Small Hall, Christ Church, St Albans Road, Watford.

West Drayton (LT District Line ARC)—Thursdays, 6pm. DLAA Sports Ground, Park Place, Gunnersbury Avenue W3 (Bar). This club requires the attendance of former members, who lost interest, to enable the club to survive. It would also like the assistance of local amateurs who could give talks on any radio topic. Hon sec R. Ball, G8JEB, tel 01-422 0414. Club net 144-250 ssb, 2000-2100 local.

UKFM Group—Next meeting 11 August. The Winning Post Pub, Epsom Race Course, Epsom, a social event, beer and skittles? Details from new social sec G8KVP, tel 01-531 0866.

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park, Portishead, Bristol BS20 8NQ. Following information is latest received.

Bridgwater (HPSSARS)—Second Monday in each month, 7.30pm. YMCA, Nr St John Ambulance Hall. Further details from G4ETN.

Bristol (BARC)—Tuesdays, 7.30pm. The University Settlement, Barton Hill, Bristol 5. RAE classes, etc. Sec G8GFZ.

Bristol (BRSGBG)—7.15pm. Queens Building, Bristol University. Sec G8GLQ.

Bristol (North Bristol ARC)—Fridays, 7.30pm. c/o Self Help Enterprise, Braemar Crescent (off Braemar

Avenue), Northville, Bristol. Please note new secretary, Ted Bidmeade, G4EUV, tel Bristol 691685.

Bristol (Shirehampton ARC)—Fridays, 7pm. Twyford House, Shirehampton. RAE and Morse classes. Lectures, films and df hunts planned. HF and vhf station, G4AHG, active. Sec G4GTD.

Bristol (UoBAR&CS)—Sec L. Mather, G8OKI, c/o 36 University Close, Parys Lane, Bristol.

Brunel Technical College RS—welcomes licensed students to operate club station, G4FNB. Student swls welcome. Details from Students Union, c/o Brunel Technical College, Cabot House, Ashley Down Road, Bristol BS7 9BU.

Cheltenham (CARA)—7.30pm. The Old Bakery. Chester Walk, Clarence Street, Cheltenham. Sec G4ILI.

Cheltenham (Smiths Industries RS)—Third Wednesday in each month, 7.30pm. Club House, Newlands, Bishops Cleeve, Cheltenham GL52 4SF. Sec Roger Hawkins, G8UJJ, c/o 101 Tobysfield Road, Bishops Cleeve, Cheltenham, Glos, tel 0242 67 2175.

Gloucester (GARS)—Thursdays, 7.30pm. First Thursday in each month (Society business followed by a talk). Other Thursdays, informal chat, operating club station, G4AYM, Morse practice. Various events planned. Chequers Bridge Centre, Painswick Road, Gloucester. Hon sec, G3MA.

Mendip Repeater Group—GB3WR, GB3UB and GB3VS (70cm proposed)—RB13, location Glastonbury). Subscriptions to hon treasurer, G8NNU. Information from hon sec, G8GMZ.

North Avon Repeater Group—Provisionally GB3AA (1-3GHz) at Alveston, Avon. Group meets on ad hoc basis. Information from G8NNU.

Taunton (TARS)—Fridays, 7.30pm. The Basement, The Mount, Taunton. Details from hon sec, G8TJF.

Weston-super-Mare (WsMARS)—Third Monday in each month, 7.30pm. Rugby Club, off Drove Road, Weston-super-Mare. Sec, G8IGB.

Yate (Y&DARC)—First Friday in each month, 8pm. G3RQN QTH. Further details from G8LGC.

Yeovil (Y&DARC)—Thursday, 7.30pm. Building 101, Houndstone Camp, Yeovil. New RAE class starts in May. Sec G3NOF, tel Yeovil (0935) 24956.

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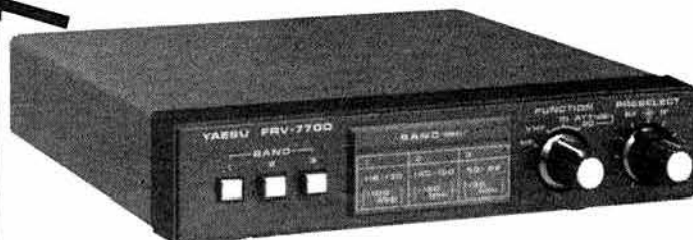
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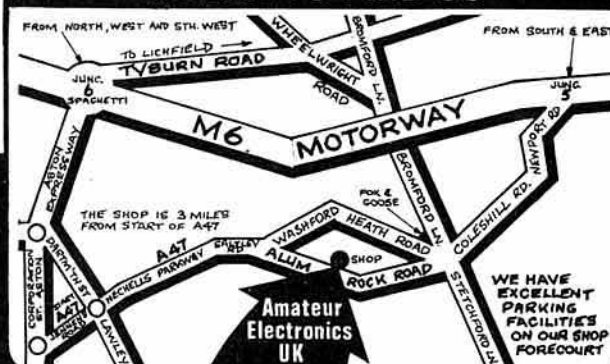


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EAST ANGLIA—AMATEUR ELECTRONICS UK—EAST ANGLIA, DR T. THIRST (TIM) G4CTT, NORWICH 06925 865
NORTH EAST—NORTH EAST AMATEUR RADIO, DARLINGTON 0325 56969
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New Products

FT101 front-end board

This board is the first half of a two board set intended to do for the FT101 (not ZDs) what our highly successful FT221/225 board has done for that transceiver. The first board (FT101GTA) replaces PB-1181 and puts a properly terminated schottky diode ring mixer into the receiver signal path with other refinements such as an improved bandpass filter at the second (tunable) if. The second board (FT101GTB) which we expect to have available by September replaces PB1180 using a high-level ring mixer feeding an additional 3180kHz crystal filter. FT101GTA — £29.83

144MHz switched preamp

We've never been particularly sold on the idea of rf switched preamps, however the demand for a good reliable design is rather high and so we've succumbed! Essentially we've taken our very successful 144MHz Ina design and grafted-on a reasonably sophisticated 2-relay changeover circuit which may be operated either by incident rf or by hard switching line. In the 'switched' mode the power handling capability is in excess of 100W, whilst by using properly sequenced 'hard switching' this can be doubled. An environmental enclosure to IP65 is available for masthead mounting.

Unboxed — £18.27 Boxed — £24.85 Environmental cased — £31.39

144MHz halo antenna

In the days of am, the 'horrible 'alo' was the standard 2m mobile antenna. The growth of vertically polarised fm (and probably the negative aesthetics of the commercially available design) caused it to fall from favour. The availability of mobile multimode boxes has led to an increase in ssb mobile activity which we suspect is proving rather disappointing to those people using vertical whips. Our halo is an optimum 2m ssb mobile antenna which mounts on the gutter of most cars using a cast aluminium clamp. It may be easily detached for parking etc and is well made from materials such as stainless steel and quality alloy and will handle (at least), legal limited motoring and 200W pep of rf — £31.00.

Other products

FT221/225GT Front-end board

With numbers of this board around, we suspect that it probably doesn't need too much advertising. Suffice to say that three out of four certificate winners in the 144MHz fixed contest were using this design! — £3.87

1-3GHz Ina

Very high performance and a very low price from a properly engineered microstripline design. Unboxed — £26.13 Boxed — £35.40

1-3GHz receive converter

This was our very first product: we still make it although we haven't advertised it very widely of late. It offers 8dB ssb noise figure with a highly stable local oscillator chain using 5ppm crystal. We only sell it as a board as it is intended for use with our other system components: — £22.00

The 'Moonbeam' — 15 element 4-2λ NBS yagi.

1 — £16.50; 2 — £32.00; 4 — £63.00; 8 — £116.00. Carriage £3.00 per antenna

144MHz preamp Boxed — £17.72 Unboxed — £10.79.

Kungsimport Antenna Combiners

Prices and other details listed in previous ads. We now have Ben's dish feeds available at £30.00 for both the 1-3 and 2-3GHz versions: they really are well made in brass and are fitted with an integral 'N' connector.

TVI filter

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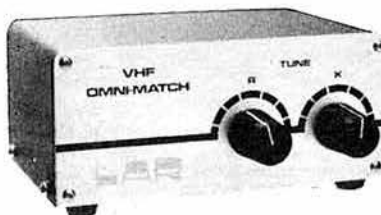
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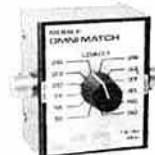
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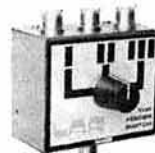
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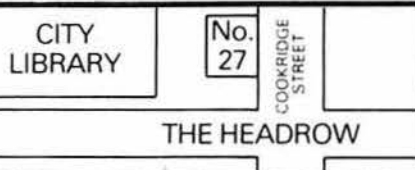
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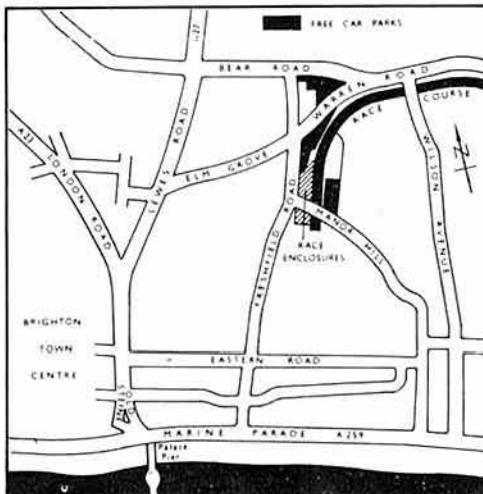
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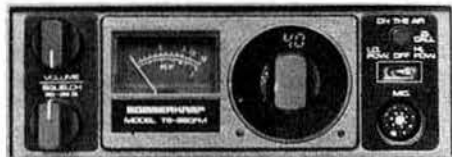
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4X013	15+15	4.00	8X025	45+45	5.55
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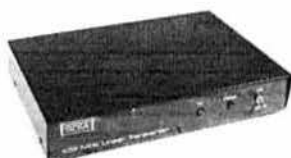
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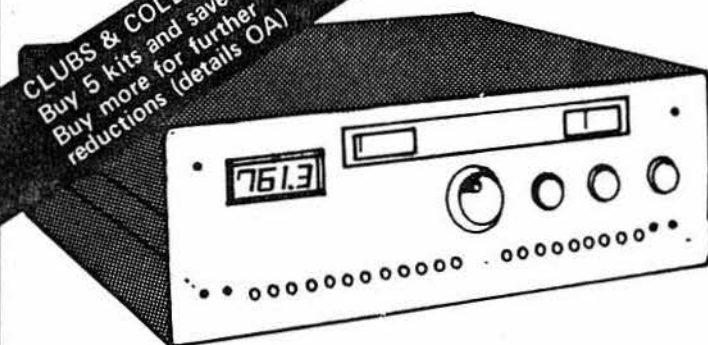
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6B7	£1.40	6EA8	£1.80	6HF5	£3.80	12AU7	£1.45	7360	£9.20
6BL8	£1.60	6E88	£2.75	6HF8	£2.30	12AV6	£1.35	8950	£6.90

Ask for quote for other types. (P&P 20p each, free over £15)

CONNS 50ΩN Series	50ΩBNC Series	PL259/SO239 Series
Plug for UR67—£1.00;	Plug for UR76—£0.63;	PL259 special, UR67—£1.15
Plug for UR76—£0.97;	4-hole socket—£0.50;	PL259 special, UR76—£0.98
Skt. for UR67—£0.83;	SO239 4-hole socket—£0.40	
4-hole socket—£0.97;	(All connectors 30p/order, free over £15)	

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The C58's small size makes it truly a portable and when used with the CM8 mounting cradle it has all the features, and more, of a mobile multi-mode transceiver.

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The lcd display has been purpose-made for Standard and it not only displays the frequency down to 100Hz but also supplies scanning and memory details. The main advantage with the lcd display is the low power consumption which is a must for portable equipment. For night use the display can be illuminated.

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The C58 has five memories that can be user-programmed from the front panel controls; these memories not only retain the frequency but also the mode at the time of programming. When the memories are scanned the scanner will look only at those channels that have been entered in the correct mode; ie: if out of five channels three have been entered in the FM mode and two in the SSB mode, then on scan with the mode switch in the FM position the three FM channels will be scanned (this is displayed on the lcd). When the mode switch is in the SSB position only the two SSB channels will be scanned. This type of intelligent scanning can be found only in the Standard range at the present time.

RELIABILITY

As with all Standard equipment the reliability is assured by their excellent quality control and years of experience in the professional communications market. We can endorse this by the lack of Standard equipment we find in our service laboratory.

ACCESSORIES

The accessories for the C58 are the same as those for the C78 (with the exception of the power booster), which allows interchangeability between the units.



FEATURES

- ★ Liquid Crystal Display
- ★ 100Hz/1kHz/5kHz & 25/12.5kHz
- ★ Five programmable memories
- ★ Rit Control
- ★ Repeater & rev. repeater off set
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ACCESSORIES FOR BOTH

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C78

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A144/11	11-element 13dB Yagi 144MHz	(b)	£27.85
214B	14-element 15dB long Yagi 144MHz	(c)	£49.50
A3219	19-element "Boomer" 16-5dB long Yagi 144MHz	(a)	£62.00
ARX2	Ringo Ranger 6dB Vertical 144MHz	(a)	£24.75
AR10	Ringo vertical 10 metres	(b)	£22.00
A10/3	3-element Yagi 7-6dB 10 metres	(b)	£52.00
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NEW PRODUCTS

As announced last month, we have introduced a number of new products for the radio amateur market. Full details of these are available in our new revised specification sheets. We also now have a full 'spare parts' list. All data will be sent on receipt on a large SAE. The main new projects available are:

70SY25B 70cms Synthesiser

This long-awaited kit will make your 70FM05TR one of the most-versatile rigs available for 70cms. The kit consists of two pcb's which are designed to fit the same-size standard diecast as the 2M synthesiser. The logic board uses a special synthesiser integrated circuit to give 25kHz step simplex coverage of channel '00' to '99' ie 433.000 to 435.475MHz. In addition you have repeater and reverse repeater splits up to channel '19'. The lower section of the band (432–433MHz) is also covered in 25kHz steps. The board has an automatic crystal-controlled toneburst, out of lock inhibit and voltage stabiliser. Channel selection is in bcd for thumbwheels, MPU's and is of course fully compatible with the PROSCAN and DISP1/2. Interfacing is simple for customers already owning a W&D transceiver while new constructors will be offered dedicated new transmit hardware and the standard receiver. Prices and further details are now available, please ring.

144PA4/S RF Switched 2M Pre-Amplifier.

Such has been the popularity of the 144PA3 that we have brought out an r.f. switched version for those people who just couldn't squeeze it into their commercial equipment. The board has one or two extra refinements and is very attractively priced. Again please ring for details.

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), diecast 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 and 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 rally 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. London stockist is Amateur Radio Exchange in Ealing.

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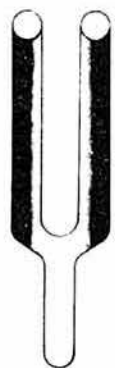
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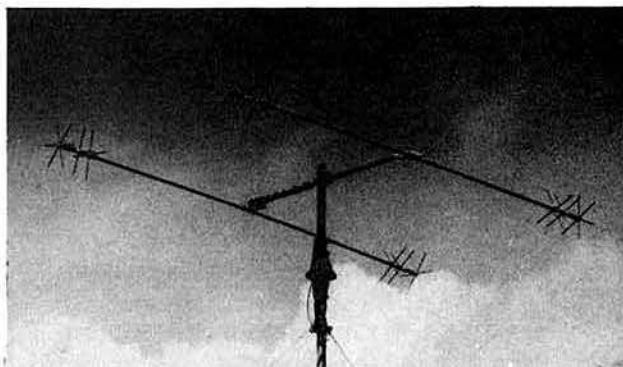
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Price: £77.50 + £2.50 p&p in UK
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Turning radius	7 feet	Input impedance	50 ohms
Operating frequencies	10m, 15m, 20m	Wind resistance	80 mph
Forward gain (ref D pole = 1:00)	3.6 dB	Weight	14 lbs
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SAE for details. Coax UR43, UR67 and 5 core available



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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).

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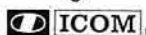


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By 'high class' receiver we mean one with the kind of top-notch selectivity, sensitivity and high dynamic range that you are used to getting with good quality amateur band equipment. After that anything less will be a disappointment - and less is what you will get if you move down to low price general coverage receivers. Model PC1 sounds simple. It converts incoming signals in 1 MHz segments from 0 to 30 MHz up to the band 144-145 MHz so they can be received on a 2-metre rig (or even a VHF scanner!).

For example to receive on 6.350 MHz you simply set the main receiver to 144.350 MHz with Model PC1 set to '06 MHz'.

The trick is in doing the conversion in such a way that the noise threshold and overload levels of the main receiver are not spoiled and so that spurious responses to unwanted signals are minimised.

Instead of the obvious Schottky mixer we use a specially developed high level parametric mixer. This combines a +10 dBm intercept point with extremely low noise plus gain instead of loss. Instead of a broadband input we use a bank of six bandpass filters automatically selected by diode switches working at high current. A frequency synthesiser based on CMOS LSI generates all thirty local oscillator frequencies with excellent sideband noise levels.

Throughout the design we worked hard to ensure that our converter is always better than your 2-metre rig. Only then can you be sure that you will get the same performance right from 60 kHz to 30 MHz as you get on the 2-metre band.

If you already own a 2-metre all-mode transceiver Model PC1 offers an unbeatable cost-effective route to high performance general coverage reception. It will also add 60 kHz to 30 MHz coverage to VHF scanning receivers, in effect turning it into short wave scanners as well.

THE SAME FOR 28-29 MHz RECEIVERS

By adding our high performance 2-metre down-converter Model DC144/28 between Model PC1 and your 28-29 MHz receiver you extend its total coverage in exactly the same way as described above. Simply tune 28-29 MHz on the main receiver and select any 1 MHz band from 0 to 30 MHz on Model PC1.

Model DC144/28 also makes a fine 2 metre converter. It features a high intercept point thanks to its balanced Schottky diode mixer. Converters using dual gate MOSFETs as mixer have insufficient dynamic range to match the superlative performance of Model PC1. But although we designed Model DC144/28 primarily for use with PC1 this same high dynamic range can be a great help for serious 2-metre DX work.

Model DC144/28

using dual gate MOSFETs as mixer have insufficient dynamic range to match the superlative performance of Model PC1. But although we designed Model DC144/28 primarily for use with PC1 this same high dynamic range can be a great help for serious 2-metre DX work.

NEW PRODUCT

KEYBOARD MORSE SENDER

MODEL MK NOW AVAILABLE

SEE SEPARATE ADVERTISEMENT

D

DATONG ELECTRONICS LIMITED

A QUART IN A PINT POT!

Big is beautiful - sums up the traditional attitude to antennas, and indeed still applies to transmitting antennas. But for reception only, the Datong line of Active Antennas has turned this conventional wisdom upside down. Now small is beautiful. What other antenna has an overall length of only 2 metres, and yet behaves like a full size dipole from 30 MHz to 200 kHz? With the Datong Active Antennas you can even have a vertical dipole for top band. Try that with a normal dipole! Put your finger on the gate of a FET wideband amplifier connected to a receiver and you can test the principle. The FET matches the high impedance antenna element (you) to the low impedance receiver input. But, and it's a big one, you will hear lots of stations which are not really there. These are generated by the challenge with active antennas is to build an amplifier which contains extremely high linearity with high input impedance, low noise and high dynamic range. This in itself is no easy task but Datong do even more. We include differential inputs so that we can use a balanced dipole configuration. Compared with surge whip antennas, balanced dipoles pick up less local interference and do not need a ground plane. Full details are given in our AD270/AD370 data sheet but briefly these antennas are ideal for general coverage DX reception. They give equivalent signal-to-noise ratios to much larger conventional antennas, but are only 2 metres long. (Indoor version is 3 metres overall).

They also have a flat response from 200 kHz to well over 30 MHz. No external antenna tuner is required. Model AD270 is for indoor use while Model AD370 is engineered for outdoor use. The circuits are identical. Remember, like in the FET example above, it's easy to make a lively active antenna. But if you want one that doesn't fill the bands with phantom signals there is no substitute for the careful and thorough design which is our speciality. If you have acres of ground then go ahead and erect large conventional receiving antennas and use tuner units and attenuators to stop your receiver overloading. If on the other hand you want similar results unobtrusively and without the hassle our active antennas are unbeatable.

Model AD370

They also have a flat response from 200 kHz to well over 30 MHz. No external antenna tuner is required. Model AD270 is for indoor use while Model AD370 is engineered for outdoor use. The circuits are identical. Remember, like in the FET example above, it's easy to make a lively active antenna. But if you want one that doesn't fill the bands with phantom signals there is no substitute for the careful and thorough design which is our speciality. If you have acres of ground then go ahead and erect large conventional receiving antennas and use tuner units and attenuators to stop your receiver overloading. If on the other hand you want similar results unobtrusively and without the hassle our active antennas are unbeatable.

WHAT IS AN AUDIO FILTER?

Why buy a Datong audio filter when you can get other audio filters at lower prices? To answer this you first need to remember that the title 'audio filter' can mean anything even down to a couple of 741's and a handful of parts. Only by comparing like with like can you make an informed decision. This means comparing features, performance and quality.

If you send for our free data sheets and compare our products with the competition you will see that reality there is virtually no competition at our chosen standard of performance. What other audio filter can tune into heterodyne interference like tune-up whistles and notch them out automatically like our model FL1? Yet Model FL1 is also such a good CW filter that it is used by professional traffic handlers as well as thousands of amateurs.

Model FL1

What other audio filter has passband edges sharper than SSB crystal filters and yet which can be tuned at will from 200 to 3500 Hz? To pull off this trick our Model FL2 uses no less than 32 op amps plus state-of-the-art pulse width modulation techniques. Two 5-pole elliptic filters and a 2-pole peak or notch filter in one box all independently tuneable add up to

a lot more filtering capability for SSB, RTTY, CW than you will find in any other audio filter that we know of.

To answer our question then an 'audio filter' can be almost anything. On the other hand, the phrase 'Datong Audio Filter' is a lot more precise. It stands for state-of-the-art filtering backed by extra capacity, extra thorough design and extra quality. If you need confirmation ask a user!

Model FL2

a lot more filtering capability for SSB, RTTY, CW than you will find in any other audio filter that we know of. To answer our question then an 'audio filter' can be almost anything. On the other hand, the phrase 'Datong Audio Filter' is a lot more precise. It stands for state-of-the-art filtering backed by extra capacity, extra thorough design and extra quality. If you need confirmation ask a user!

MODEL ASP: THE 'INTELLIGENT' RF CLIPPER

Model ASP modulates your speech signal direct from the microphone and makes it more effective at modulating your transmitter. The effect is as if the transmitter peak power were to increase by between two and three times. Unlike other speech processors Model ASP automatically senses your voice level and reacts accordingly to always maintain the degree of true if clipping selected (in decibels) by the panel push-buttons. Novel circuitry avoids 'hang-ups' by discriminating against noise spikes and non-speech inputs. We use the same principle of clipping in two other units. Models D75 and RF C/M. Both of these need manual adjustment of the system level to control the amount of clipping, but otherwise give the same benefits. The technique has been proven by thousands of satisfied users of 'Datong Clippers'. If in doubt why not ask one?

MODEL D70: THE GO-ANYWHERE MORSE CODE TRAINER

Since its introduction in 1979 the success of our Morse Tutor has surprised even us. Its effectiveness at speeding people through the Morse examination is legendary and we are constantly being told success stories by satisfied users. (The unconfirmed record so far seems to be three weeks to pass the exam starting from scratch!) Generating 60 hours of random

morse code from a low cost 9 volt battery. Model D70 gives you freedom to practice anywhere to suit your timetable and lifestyle. You learn the code with the characters at normal speed but with an extra delay between each one. As you improve you reduce the DELAY control unit with a fully reduced, you find you are reading code at the chosen speed and with correct spacing. You then book your test!

VERY LOW FREQUENCY CONVERTER MODEL VLF

If your communications receiver gives poor results below 500 kHz Model VLF is the answer. It also adds MW and LW coverage to amateur bands only receivers for news, time checks etc.

Connected in series with the antenna Model VLF allows you to tune the 0 to 500 kHz range (and above at reduced sensitivity) using the ten metre band (28-30 MHz) on your normal receiver.

Model VLF

Products not shown in this advertisement

- Model Date 1 Transistor Tester
- Model Date 2 Transistor Tester
- R.F. Speech Processor Model D75
- Model RFC/M, R.F. Speech Processor PCB Module
- Model MPU, Mains Power Unit
- Accessory Leads

INGENIEURBÜRO ULRICH HANSEN

VHF & UHF PREAMPLIFIERS: A new range from Ulrich Hansen of West Germany
A range of high quality in-line preamplifiers for 2 metres or 70 cms. featuring ultra-low noise figures and state-of-the-art design. The range includes R.F. switching capability from 60 watts P.E.P. to 500 watts P.E.P. and choice of silicon low noise devices or the latest gallium arsenide MESFETs for the best possible noise figure. Indoor or mast mounted options are also included. Full details free on request. These units represent a cost-effective way of improving your DX receiving capability.

PRICES: All prices include delivery in U.K. basic prices in £ are shown with VAT - inclusive prices in brackets.

FL1	59.00 (67.85)	VLF	22.00 (25.30)	AD270	33.00 (37.95)	MPU	6.00 (6.90)
FL2	78.00 (89.70)	D70	43.00 (49.45)	AD370	45.00 (51.75)	DC144/28	31.00 (35.65)
PC1	105.00 (120.75)	D75	49.00 (56.35)	AD270 + MPU	37.00 (42.55)	DC144/28 Module	25.00 (28.75)
ASP	69.00 (79.35)	RFC/M	23.00 (26.45)	AD370 + MPU	49.00 (56.35)	Keyboard Morse Sender	140.00 (161.00)

DATONG ELECTRONICS LIMITED
Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Tel: (0532) 552461

THE LOWEST PRICES FOR PRIME CMOS/TTL/74C IN THE UK

TBA1200	1.00	SL1610P	1.60	HA11223	2.15	4000 series	4060 0.95	4566 1.59	7448 0.56	74125 0.40	74190 0.55	7405 1.14	7496 1.20	74190 0.60	74C CMOS	BF194	18p
L200	1.95	SL1611P	1.60	HA11225	1.45	4000 0.13	4063 1.15	4568 2.18	7450 0.14	74126 0.40	74191 0.55	7408 0.14	74107 0.25	74191 0.60		BF195	18p
U237B	1.28	SL1612P	1.60	HA12002	1.45	4001 0.13	4066 0.38	4569 1.95	7451 0.14	74127 0.40	74192 0.55	7409 0.14	74108 0.25	74192 0.60		BF224	22p
U247B	1.28	SL1613P	1.60	HA12017	0.80	4002 0.14	4067 0.40	4570 1.95	7452 0.14	74128 0.40	74193 0.55	7410 0.13	74112 0.25	74193 0.60		BF241	18p
U257B	1.28	SL1620P	2.17	HA12042	1.95	4007 0.19	4068 0.18	4572 0.30	7453 0.14	74129 0.40	74194 0.55	7411 0.14	74113 0.25	74194 0.60		BF274	18p
LM301H	0.67	SL1621P	2.17	HA12411	1.20	4008 0.70	4069 0.18	4573 0.30	7454 0.14	74130 0.40	74195 0.55	7412 0.15	74114 0.25	74195 0.60		BF440	21p
LM301N	0.30	SL1624C	2.26	LF12741	0.33	4009 0.30	4070 0.25	4574 0.49	7455 0.14	74131 0.40	74196 0.55	7413 0.15	74115 0.25	74196 0.60		BF441	21p
LM308B	0.65	SL1625P	2.17	SN7660N	0.80	4010 0.30	4071 0.22	4585 1.00	7456 0.14	74132 0.40	74197 0.55	7414 0.14	74116 0.25	74197 0.60		BF462	49p
LM324	0.64	SL1626P	2.44			4011 0.24	4072 0.22	4702 4.50	7457 0.14	74133 0.40	74198 0.55	7415 0.14	74117 0.25	74198 0.60		BF499	18p
LM339N	0.66	SL1630P	1.62			4012 0.20	4073 0.22	4703 4.48	7458 0.14	74134 0.40	74199 0.55	7416 0.14	74118 0.25	74199 0.60		BF499	18p
LM348N	1.86	SL1640P	1.89			4013 0.38	4074 0.25	4704 4.24	7459 0.14	74135 0.40	74200 0.55	7417 0.14	74119 0.25	74200 0.60		BF499	18p
LF353N	0.76	SL1641P	1.89			4015 0.70	4077 0.23	4706 4.50	7460 0.14	74136 0.40	74201 0.55	7418 0.14	74120 0.25	74201 0.60		BF499	18p
LM374N	3.75	SL1642P	3.05			4016 0.65	4078 0.25	4720 4.00	7461 0.14	74137 0.40	74202 0.55	7419 0.14	74121 0.25	74202 0.60		BF499	18p
LM380N-14	1.00	ULN2283B	1.00			4017 0.65	4082 0.25	4724 0.95	7462 0.14	74138 0.40	74203 0.55	7420 0.14	74122 0.25	74203 0.60		BF499	18p
LM380N-18	1.00	CA3080E	0.70	11C900D	14.00	4019 0.38	4093 0.45	4725 2.24	7463 0.14	74139 0.40	74204 0.55	7421 0.14	74123 0.25	74204 0.60		BF499	18p
LM381N	1.81	CA3089E	1.84	LM1232	19.00	4020 0.68	4099 0.99	4725 2.24	7464 0.14	74140 0.40	74205 0.55	7422 0.14	74124 0.25	74205 0.60		BF499	18p
2N4198C	1.80	CA3090AQ	3.35	LM1242	19.00	4021 0.75	4175 1.15	4725 2.24	7465 0.14	74141 0.40	74206 0.55	7423 0.14	74125 0.25	74206 0.60		BF499	18p
NE544N	1.80	CA3123E	1.40	MSL2318	3.84	4022 0.68	4502 0.90	4725 2.24	7466 0.14	74142 0.40	74207 0.55	7424 0.14	74126 0.25	74207 0.60		BF499	18p
NE555N	0.30	CA3130E	0.80	MSM5523	11.30	4023 0.19	4503 0.55	4725 2.24	7467 0.14	74143 0.40	74208 0.55	7425 0.14	74127 0.25	74208 0.60		BF499	18p
NE556	0.50	CA3130T	0.90	MSM5524	11.30	4024 0.45	4506 0.75	4725 2.24	7468 0.14	74144 0.40	74209 0.55	7426 0.14	74128 0.25	74209 0.60		BF499	18p
NE560N	3.50	CA3140E	0.46	MSM5525	7.85	4025 0.18	4507 0.45	4725 2.24	7469 0.14	74145 0.40	74210 0.55	7427 0.14	74129 0.25	74210 0.60		BF499	18p
NE562N	4.05	CA3189E	2.20	MSM5526	7.85	4026 1.05	4508 0.99	4725 2.24	7470 0.14	74146 0.40	74211 0.55	7428 0.14	74130 0.25	74211 0.60		BF499	18p
NE564N	4.29	CA3240	1.27	MSM5527	9.75	4027 0.60	4510 0.70	4725 2.24	7471 0.14	74147 0.40	74212 0.55	7429 0.14	74131 0.25	74212 0.60		BF499	18p
NE565N	1.60	MC3357P	2.85	MSM5527	9.75	4028 0.65	4511 0.85	4725 2.24	7472 0.14	74148 0.40	74213 0.55	7430 0.13	74132 0.25	74213 0.60		BF499	18p
NE566N	1.60	LM3900N	0.60	MSL2312	3.94	4029 0.35	4512 0.70	4725 2.24	7473 0.14	74149 0.40	74214 0.55	7431 0.13	74133 0.25	74214 0.60		BF499	18p
NE570N	3.85	LM3909N	0.68	SP8629	3.85	4030 0.35	4513 0.70	4725 2.24	7474 0.14	74150 0.40	74215 0.55	7432 0.13	74134 0.25	74215 0.60		BF499	18p
SL6241N	3.28	LM3914N	0.80	SP8647	4.00	4031 0.65	4514 2.20	4725 2.24	7475 0.14	74151 0.40	74216 0.55	7433 0.13	74135 0.25	74216 0.60		BF499	18p
TBA651	1.81	LM3915N	0.80	95H90CP	7.80	4032 0.68	4515 2.20	4725 2.24	7476 0.14	74152 0.40	74217 0.55	7434 0.13	74136 0.25	74217 0.60		BF499	18p
UA709HC	0.64	KB4400	0.80	HD10551	2.45	4033 0.93	4516 2.80	4725 2.24	7477 0.14	74153 0.40	74218 0.55	7435 0.13	74137 0.25	74218 0.60		BF499	18p
UA709PC	0.66	KB4406	0.60	HD44015	4.45	4034 0.68	4517 2.36	4725 2.24	7478 0.14	74154 0.40	74219 0.55	7436 0.13	74138 0.25	74219 0.60		BF499	18p
UA710HC	0.45	KB4412	1.95	HD12009	6.00	4035 0.65	4518 2.36	4725 2.24	7479 0.14	74155 0.40	74220 0.55	7437 0.13	74139 0.25	74220 0.60		BF499	18p
UA710PC	0.66	KB4413	1.95	HD44752	8.00	4036 0.65	4519 2.36	4725 2.24	7480 0.14	74156 0.40	74221 0.55	7438 0.13	74140 0.25	74221 0.60		BF499	18p
UA7141C	0.66	KB4417	1.09	MC145115	12.45	4037 0.69	4520 0.80	4725 2.24	7481 0.14	74157 0.40	74222 0.55	7439 0.13	74141 0.25	74222 0.60		BF499	18p
UA7141CN	0.27	KB4420B	1.80	MC145156	8.75	4038 0.30	4521 0.95	4725 2.24	7482 0.14	74158 0.40	74223 0.55	7440 0.13	74142 0.25	74223 0.60		BF499	18p
UA7147CN	0.70	TD4442A	2.65			4039 0.30	4522 0.95	4725 2.24	7483 0.14	74159 0.40	74224 0.55	7441 0.13	74143 0.25	74224 0.60		BF499	18p
UA748CN	0.46	KB4423	2.30	MISC		4040 0.30	4523 0.95	4725 2.24	7484 0.14	74160 0.40	74225 0.55	7442 0.13	74144 0.25	74225 0.60		BF499	18p
UA753	2.44	KB4424	1.65	ICM7106CP	9.55	4041 0.30	4524 0.95	4725 2.24	7485 0.14	74161 0.40	74226 0.55	7443 0.13	74145 0.25	74226 0.60		BF499	18p
UA758	2.35	KB4431	1.95	ICM7107CP	9.55	4042 0.30	4525 0.95	4725 2.24	7486 0.14	74162 0.40	74227 0.55	7444 0.13	74146 0.25	74227 0.60		BF499	18p
TBA820M	0.78	KB4432	1.95	ICM7126P	19.50	4043 0.30	4526 0.95	4725 2.24	7487 0.14	74163 0.40	74228 0.55	7445 0.13	74147 0.25	74228 0.60		BF499	18p
TC940E	1.90	KB4433	1.95	ICM7555	0.94	4044 0.30	4527 0.95	4725 2.24	7488 0.14	74164 0.40	74229 0.55	7446 0.13	74148 0.25	74229 0.60		BF499	18p
TD4102B	2.11	KB4436	2.53			4045 0.30	4528 0.95	4725 2.24	7489 0.14	74165 0.40	74230 0.55	7447 0.13	74149 0.25	74230 0.60		BF499	18p
TD4102N	2.11	KB4437	1.75			4046 0.30	4529 0.95	4725 2.24	7490 0.14	74166 0.40	74231 0.55	7448 0.13	74150 0.25	74231 0.60		BF499	18p
TD4105A	1.45	KB4438	2.22	32.768kHz	2.70	4047 0.30	4530 0.95	4725 2.24	7491 0.14	74167 0.40	74232 0.55	7449 0.13	74151 0.25	74232 0.60		BF499	18p
TD4106A	1.95	KB4441	1.35	100kHz	3.85	4048 0.30	4531 0.95	4725 2.24	7492 0.14	74168 0.40	74233 0.55	7450 0.13	74152 0.25	74233 0.60		BF499	18p
TD4107A	2.69	KB4445	1.25	455kHz	5.00	4049 0.30	4532 0.95	4725 2.24	7493 0.14	74169 0.40	74234 0.55	7451 0.13	74153 0.25	74234 0.60		BF499	18p
TD4107A	5.04	KB4446	2.75	1.000MHz	2.95	4050 0.30	4533 0.95	4725 2.24	7494 0.14	74170 0.40	74235 0.55	7452 0.13	74154 0.25	74235 0.60		BF499	18p
TD4108A	1.95	KB4448	1.65	3.2768	2.70	4051 0.30	4534 0.95	4725 2.24	7495 0.14	74171 0.40	74236 0.55	7453 0.13	74155 0.25	74236 0.60		BF499	18p
TD4109A	3.05	NE5044N	2.26	4.000	2.00	4052 0.30	4535 0.95	4725 2.24	7496 0.14	74172 0.40	74237 0.55	7454 0.13	74156 0.25	74237 0.60		BF499	18p
HA1137	1.00	NE5532N	2.26	14.1934	2.00	4053 0.30	4536 0.95	4725 2.24	7497 0.14	74173 0.40	74238 0.55	7455 0.13	74157 0.25	74238 0.60		BF499	18p
HA1197	1.00	SD6000	3.75	4.096	2.00	4054 0.30	4537 0.95	4725 2.24	7498 0.14	74174 0.40	74239 0.55	7456 0.13	74158 0.25	74239 0.60		BF499	18p
HA1220	1.40	SL6270	2.03	4.032	2.00	4055 0.30	4538 0.95	4725 2.24	7499 0.14	74175 0.40	74240 0.55	7457 0.13	74159 0.25	74240 0.60		BF499	18p
LM1303	0.99	SL6310	2.03	4.333619	2.00	4056 0.30	4539 0.95	4725 2.24	7500 0.14	74176 0.40	74241 0.55	7458 0.13	74160 0.25	74241 0.60		BF499	18p
LM1307	1.55	SL6640	2.75	5.000	2.00	4057 0.30	4540 0.95	4725 2.24	7501 0.14	74177 0.40	74242 0.55	7459 0.13	74161 0.25	74242 0.60		BF499	18p
LM1310P	1.90	SL6440	POA	5.5536	2.00	4058 0.30	4541 0.95	4725 2.24	7502 0.14	74178 0.40	74243 0.55	7460 0.13	74162 0.25	74243 0.60		BF499	18p
MC1330	1.20	SL6690	3.20	7.000	2.00	4059 0.30	4542 0.95	4725 2.24	7503 0.14	74179 0.40	74244 0.55	7461 0.13	74163 0.25	74244 0.60		BF499	18p
MC1350	1.20	SL6700	2.35	7.68	2.00	4060 0.30	4543 0.95	4725 2.24	7504 0.14	74180 0.40	74245 0.55	7462 0.13	74164 0.25	74245 0.60		BF499	18p
HA1370	1.90	ICL8038CC	4.50	8.000	2.00	4061 0.30	4544 0.95	4725 2.24	7505 0.14	74181 0.40	74246 0.55	7463 0.13	74165 0.25	74246 0.60		BF499	18p
HA1388	2.75	MSL9362															

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IC720A 200W £795.00
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IC730 See panel, below left



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BC3 Base Charger £34.00
DC1 12V adaptor £7.50
WM9 Mic/speaker £9.00
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FT290 2m Portable multimode POA
FT207R 2m POA
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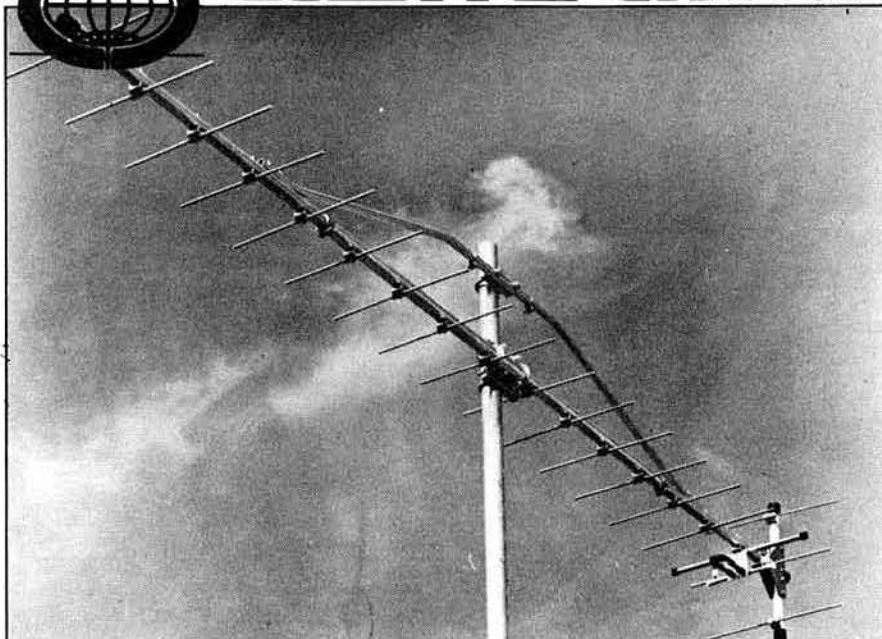
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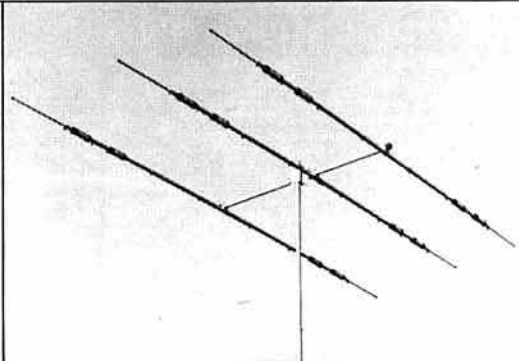
Power dividers are available separately.

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

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Feed Point impedance	50 ohms
Boom (ft-in)	14' x 1.63" x 150"
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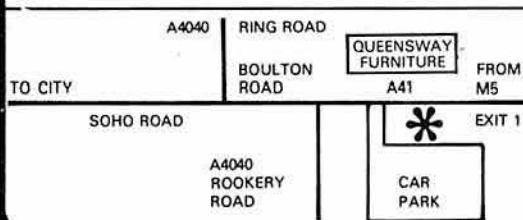
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145-350/S14	e	e	e	e	e	e	e	e	e	e	e
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145-425/S17	e	e	e	e	e	e	e	e	e	e	e
145-450/S18	a	e	a	e	e	b	b	b	a	a	e
145-475/S19	a	e	a	e	e	b	b	b	a	a	e
145-500/S20	a	c	a	c	c	b	b	b	a	a	c
145-525/S21	a	c	a	c	c	b	b	b	a	a	c
145-550/S22	a	c	a	c	c	b	b	b	a	a	c
145-575/S23	a	c	a	c	c	b	b	b	a	a	c
145-600/R0R	a	c	a	c	c	b	b	b	a	a	c
145-625/R1R	e	e	e	e	e	b	b	b	e	e	e
145-650/R2R	e	e	e	e	e	b	b	b	e	e	e
145-675/R3R	e	e	e	e	e	b	b	b	e	e	e
145-700/R4R	e	e	e	e	e	b	b	b	e	e	e
145-725/R5R	e	e	e	e	e	b	b	b	e	e	e
145-750/R6R	e	e	e	e	e	b	b	b	e	e	e
145-775/R7R	e	e	e	e	e	b	b	b	e	e	e
145-800/R8R	a	c	a	c	c	b	b	b	a	a	c
145-950/S38	a	e	e	e	e	e	e	e	e	e	e

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AVAILABILITY: (a), (b) and (c) stock items normally available by return (we have over 5000 items in stock). (e) 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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FT480

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Ease of use

No preselectors! Up conversion with a 48MHz first IF and professional grade crystal filter, plus dual PLL system provides automatic selection of the input bandpass filter direct from the band selector of memory.

The VFO has both a pleasing bright, but dimmable digital readout and a back illuminated analogue scale. It is tuned by a comfortable 1½" knob with a fast tune finger tip recess through a zero backlash slow motion drive. The front panel is remarkably uncluttered, clearly labelled and the controls are in logical positions. The illuminated meter is calibrated in both conventional 'S' units (0 9 +20, +40, +60dB) and in SIMPO 1-5 for broadcast station reporting.

Memory (option)

12 frequencies *anywhere* within the tuning range may be stored by simply touching the M button. On recall there is no preselector adjustment and no range switch adjustment. The memory is tunable by ±1kHz and is kept alive year long by 3 'AA' dry cells. The memory may be used for storing; the frequencies of a particular broadcast network (and with a convertor), common marine channels, 2m FM channels (switch between the VFO and memory for repeater input/output) etc.

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On the panel a SO239 coax socket provides a 50 ohm input (2-30MHz) for resonant antennas and convertors. In parallel, and in addition, are posts, for Earth, and for 500 ohm antenna input (up to 2MHz).

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This new 144MHz solid state linear amplifier, MML144/100 S, is intended for use with any existing 144MHz equipment having an output power of 10-15 watts. When used in conjunction with such a drive source this linear amplifier will provide an output power of 100 watts.

Several front panel mounted switches controlling the internal switching circuitry, allow the unit to be left in circuit at all times. The linear power amplifier and the ultra low-noise receive preamplifier, which are incorporated into the unit, can both be independently switched in and out of circuit. In this way all four operational combinations are possible.

By means of an internal RF vox circuit the linear will automatically switch onto transmit, when 144MHz drive is applied to the input socket. It is possible to override this facility by the connection of an earth to pin one of the five pin DIN power socket, located on the rear panel. This connection is compatible with all current transceiver PTT lines. The RF vox circuit is suitable for both SSB and FM modes.

The inclusion of the latest state of the art power transistor (rated at 145W dissipation) guarantees highly reliable and ultra-linear performance, thus making the unit ideal for all modes of operation (SSB, FM, AM, CW and SSTV).

The amplifier utilises recently developed matching techniques, which allow safe operation even when improperly subjected simultaneously to 50% overdrive and a supply voltage of 15V. The PA transistor is thermally tracked against temperature variation and operational temperature rise.

The receive preamplifier uses one of the latest dual-gate MOSFETs (3SK88) in a noise-matched configuration. This technique together with careful optimisation of overall gain makes the preamplifier ideal for use ahead of any popular 2 metre transceiver. The sensitivity of most current 2 metre transceivers is such that a preamplifier gain of 12dB is sufficient to ensure an excellent overall system noise figure. A preamplifier with gain in excess of this figure will prove unduly detrimental to the strong signal-handling performance of the transceiver.

All circuitry is constructed on high quality glass fibre printed circuit board and protection is included against reverse polarity. The unit is housed in a highly durable, extruded aluminium enclosure. RF input and output sockets are located on the rear panel together with the five pin DIN power socket. The unit is supplied with all necessary connectors.

FEATURES

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- * ULTRA-LOW NOISE RECEIVE PREAMP—FRONT PANEL SELECTABLE
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- * LED STATUS LIGHTS FOR POWER, TRANSMIT & PREAMP ON
- * SUPPLIED WITH ALL CONNECTORS

SPECIFICATION

Power output:	100 watts (within 0.5dB) typical
Power input:	10 watts nominal
Power requirements:	13.8 volts @ 12 amps for 100 watts output
Overall preamp power gain:	12dB
Overall preamp noise figure:	Better than 1.5dB
RF connectors:	50 ohm BNC
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