

journal of the Radio Society of Great Britain

# AMATEUR RADIO INTERNATIONAL

## TOP RIGHT

RSGB President Dain Evans, G3RPE, and former RSGB president John Allaway, G3FKM, welcomed Noel Eaton, VE3CJ, president of IARU, and Vic Clarke, W4KFC, president of IARU Region 2, when they called at RSGB HQ on their way to a meeting in Geneva in preparation for WARC 79. Left to right: G3FKM, G3RPE, VE3CJ and W4KFC

# LOWER RIGHT

The DARC annual exhibition and meeting at Friedrichshafen, "Ham Radio 78", took place during the first weekend in July. Over 10,000 visitors attended, including Dr Dain Evans, G3RPE, as President of RSGB. Eleven other societies were also represented. The photograph shows Phillip Lessig, DK3LP, president of DARC, (r) describing some of the amateur equipment on show to the Lord Mayor of Friedrichshafen, Dr Hertzog

# BELOW

Dr John Allaway, G3FKM, with a group of YU DX Club members whom he met at the meeting of the Savez Radio-amatera Jugoslavije in Bor in July, reported in last month's issue. Left to right YU2DX, G3FKM, YU1PCF, YU3EY and YU3DM







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- \*TTL and ECL i.c.s used to give good reliability.
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Price: £177.12 (incl. VAT). (Add £3.00 for Securicor Delivery).



250MHz version still available Model DFM5-£148.50. Ovened oscillator version of both models-extra £43.50

# RTTY TERMINAL UNIT

Featuring a unique digitally controlled 'Autopoint' circuit which is a superior replacement for the 'Antispace' and 'Autostart' facilities found on some other terminal units. The terminal will ignore most CW and phone signals but will respond to a correct RTTY signal.

Tuning correctly into an RTTY signal is made simple with a single 'correctly tuned' LED plus an additional 'Mark frequency' indicator.

The FSK demodulator circuit utilises a special 'state-of-the-art' system to give excellent performance and stability at low cost. The demodulator is set to decode signals within 75Hz of nominal frequency i.e. 1200-1350Hz for space and 1370-1520Hz for mark, when in narrow shift position

The teleprinter interface unit incorporates electronic 'de-bounce' circuitry to eliminate spurious switching from the Keyboard. The loop supply is protected by a separate fuse and is suitable for driving all single current and double current magnets known to be available.

Units are as follows:

CT100. Receive only RTTY Terminal Unit housed in attractively styled metal cabinet approx 9" × 7" × 2\frac{1}{2}" with integral mains power supply. Input sockets for AFSK and TTL. Output sockets for TTL drive to VDU. £71.00

CT101. As above but with addition of hi-stability AFSK oscillator for transmission purposes. Output socket from oscillator suitable for driving high or low impedance microphone circuits. £79.00

CT102. Receive only version with addition of teleprinter interface unit. Input socket for Keyboard or tape reader. Output socket for Printer Magnet. £80.00

CT103. Combined unit for reception and transmission with teleprinter interface. £88.00

Add carriage: £1.50 post or £3.00 Securicor.

MAKE CHEQUES ETC PAYABLE TO CATRONICS LTD AT ADDRESS BELOW

# COMPONENTS FOR

# RADCOM PROJECTS \_K BUYING GR

# MULTIMODE 1600 TRANSCEIVER

(Oct/Nov 1977 Rad Com) Special price for complete kit, £220.00. Receive only kit also available, £195.00. PCB, £13.55; QC1246AX, £31.50; Less carrier xtals, 27.50; 8545kHz xtal, £3.00; 400ns delay line, £1.70; MD108, £6.65; RS12V Relay, 2.25; Toroid 30p Minikit 3 (R's and C's), £23.45

# G3ZVC SSB TRANSCEIVER

PCB, £2.80. Toroid, 95p. MD108 Ring Mixer, £6.65. QC1246 AX Filter, £31.50 or YF-90F Filter, £22.50 (Not recommended for HF Band use in this project)

SPECIAL PRICE FOR COMPLETE KIT, £86.85 or £78.30

Also available-but not included in kits: Reprint of article (September 1974), 15p plus SAE, 25Ω Loudspeakers-2½", £3.10. Metal Cabinet, £2.00. Min. 50Ω coaxial connectors - PCB mount socket, 63p and plug. £1.17.

# ADD-ON KITS FOR ABOVE UNITS

12V to 6V Regulator/1W Audio Amplifier Kit to power the G3ZVC Board from + 12 volt supply and provide increased audio output. PCB size: 3.5" × 1.8". Price £6.90.

Components for HF Preselector Unit also available - write for details.

# G3PLX RTTY VIDEO DISPLAY

(April 1977 Rad Com)

Kit (excluding modulator, Keyboard and P.S.U.), £83.55. Set of printed circuit boards £15.20. 2513, £8.50; AY5-1013, £6.25; 2102-1, £2.85; SN74188, 3.40 each or ready programmed £8.20 per pair. 7MHz Xtal, £3.50.

Mini-kit 3 (all R's & C's) £4.80. Also available: Cabinet £2.40 or to match CT100 T.U. £6.95.

Flashing cursor kit £8.60.

Diode Matrix kit £13.20.

NOTE regarding PROM program: The PCB's and programmed PROMs supplied by us make use of a slightly different program sequence resulting in different pin con-nections 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.

# G3TDZ FM TRANSCEIVER

(March 1978 Rad Com)

Most parts available as follows:

PCB's: Audio, £2.00; Rx, £4.85; Tx, £2.55; 9MHz Osc, 95p. Filter CFR455E/F, £14.10; Heat Clips, 30p; 35pF Ceramic Trimmers, 40p; BA102, 29p; 2N918, 40p; 40673, 67p; 2N3866, 86p; BLY33/40290, £1.60; BC303, 30p; TBA120/SN6660 IC, 85p; DIL741 IC, 43p; LM 3900, KITS available as follows: Receiver (less 10-245 Xtal & 455kHz coil), £43.35; Transmitter, £25.65.

All prices include VAT but please add minimum of 30p for post and packing. New enlarged Data-Catalogue now available at 45p + large 181p S.A.E.

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**EDITOR** 

A. W. Hutchinson

Assistant editor

Mrs M. J. Collins

Draughtsman

D. E. Cole

Secretary

Mrs J. D. Brown

Contributions (including Members' Ads) and all correspondence concerning the content of Radio Communication should be addressed to:

The Editor, RSGB, 88 Broomfield Road, Chelmsford, Essex CM1 1SS

Tel 0245 84938

Office hours: 0830-1630

Correspondence concerning the distribution of the journal and all other Society matters should be addressed to:

RSGB Headquarters, 35 Doughty St, London WC1N 2AE

Tel 01-837 8688

Office hours: 0915-1715

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Tel 01-686 5839

Hours: 0915-1715

# **EDITORIAL PANEL**

J. P. Hawker, G3VA R. F. Stevens, G2BVN



# October 1978

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# THE IC-240 STILL VERY MUCH ALIVE & KICKING!

There seems to be some rumour around that the IC-240 has been discontinued because of the IC-280E. This is not the case. ICOM are still making this rig because it has become so popular. Many thousands of its type have been sold and many more will be sold. True, it does not have the digital display and hundreds of channels like some of its competitors—what it does have is an excellent name for reliability, quality of signal and receiver sensitivity which are truly envied by some of its digital cousins. It is still one of the easiest rigs to 'drive' while on the move—and the choice of ANY of 22 channels in the 2 Metre band really is plenty. Very few people ever use more than 10 and many only ever use 3 or 4 channels! Your IC-240 comes programmed for S20 to 24 inclusive and R0 to 9 and the dial is calibrated with the channel numbers. If you wish, you can alter these or add to them merely by adding diodes in a way clearly described in the handbook. At under £200 this represents real value for money (though if the Yen gets much stronger the price of this, along with most of the rest of the amateur gear on the market, will have to go up!)



AGENTS (PHONE FIRST—All evenings and weekends only, except Norfolk and Burnley)

London—Terry G8BAM (01-556 9366) Scotland—lan GM8DOX (0786 822 212) Norfolk—Ted G3FEW (05088 632)

Wales—Tony GW3FKO (0222 702982) Burnley—(0282 38481) Midlands—Tony G8AVH (021 329 2305)

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2	IC202E and IC-202S	The popular little SSB/CW portables which make the ideal rigs for portable or /A use when used barefoot with 3W out, or alternatively, as the signal from them is so clean, can be used as a prime mover for something bigger. The IC-202E runs USB and CW only, while the new IC-202S runs USB, LSB and CW, has sidetone on CW and an even better receiver.  IC202E Less VAT=£150.22 With VAT=£169 IC-202S Less VAT=£192 With VAT=£216
3	IC-402	ICOM's new portable in the same style case as the IC-202 which runs 3 watts of SSB on 70cml Again ideal as either a portable or as a prime mover for the base station. Continuous tuning of the second oscillator gives coverage over ranges 432·0 – 432·2 and 432·2 – 432·4 using a stable VXO circuit—see page 560 of July RADCOM for specs.  Less VAT = £256 With VAT = £288
4	IC-701	The ultimate in HF base station transceivers which is becoming very popular across the whole world. It uses a synthesizer to produce one of the nicest signals to be heard on HF. All solid state, with 200w DC input and complete with an electret desk mic. The ideal mobile rig—see our separate advert on page 812  Less VAT = £760 Inc VAT = £855
5	IC-701PS	Mains PSU for the IC-701 complete with extra forward facing matching speaker.  Less VAT = £128.00 Inc VAT = £144
6	IC-SM2	A superb quality electret desk mic with a built-in pre-amp. Can be powered without modification from all ICOM equipment having a 4 pin mic socket. Can also be used with other makes of equipment. £26 inc VAT
7	IC-211E	The fully synthesized 2 metre multimode which is now well known and very popular. Using the ICOM patent LSI chip, this rig, and its mobile partner the IC-245E can be interfaced with the microprocessor-controlled IC-RM3 to provide facilities just not possible with other rigs.  IC-211E Less VAT = £488 With VAT = £549 IC-245E Less VAT = £352 With VAT = £396
8	IC-RM3	The new and very popular remote controller for the IC-701, IC-211E and IC-245E. Using a microprocessor it provides facilities for scanning (the whole band or user selectable portions of it) and has 4 memories for frequency storage. Sorry about the waiting list, demand is greater than supply at the moment.  Less VAT = £88 With VAT = £99
9	IC-280E	The new mobile transceiver just introduced by ICOM for the man who wants the best. Gives full coverage of 2m in 25kHz steps with digital readout of frequency. Has all the qualities and virtues expected of ICOM equipment. The front panel can be removed and mounted elsewhere in the car using the special remote mounting kit which is available as an extra.  Less VAT = £249 With VAT = £279
		9

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# the systems approach!

Designed for the connoisseur, the ICOM IC-701 HF transceiver brings the latest digital technology to Amateur Radio. Study a few more of the vast list of features offered with the IC-701 ...

# TWO VFO'S BUILT-IN

The second VFO, which is an optional tack-on with most other transceivers, is an integral feature in every IC-701. Now you can work those Yanks on 40 and 80 metres!

# OPTICALLY COUPLED VFO

A VFO with no variable capacitors! Made under arrangement with Collins Radio, the IC-701 maximises digital readout with positively no time lag or backlash in display stability, even when using 100Hz steps. The IC-701's free wheeling dial is instantly co-ordinated with the high speed, computer controlled six digit readout using an optical chopper. There is absolutely NO mechanical connection between the smooth bearing mounted flywheel knob and the two dual-tracking VFOs. COMPUTER COMPATIBLE INTERFACE

External microprocessor control from a PIA interface is possible via the 24-pin accessory socket on the rear panel of the IC-701. The IC-701 can even be interconnected with the companion 2 metre IC-211 to track frequencies for Oscar work

# REMOTE CONTROL FACILITY

The IC-701 can be remotely controlled via the new optional RM-3 computerised remote controller. This unit includes scan, duplex, memory and tone functions plus a touch-tone pad with digital readout. You can select frequencies and automatically change bands with this CPU controlled accessory

## CONTINUOUS OPERATION

The IC-701 features continuous operation with a full 200w pep or 200w CW input on all bands and all modes. No need to worry about timing key-down operations as the IC-701 is designed to handle the maximum power continuously! If the heat sink starts to warm-up a built-in fan automatically switches on. If a temperature danger point should ever be reached the fan doubles its speed and the digital display flashes to tell you to quit transmitting!

## Just select the required band and frequency and start transmitting! ALL SOLID STATE

While the others are still fooling around with valves, ICOM have produced a

solid-state HF transceiver including protected transistors in the final CROSS MODULATION MINIMISED

Cross modulation — a fact of life with some rigs — is minimised with the double balanced Schottky diode mixer used for both transmit and receive. SMALL ENOUGH FOR MOBILE

The IC-701 is extremely compact with dimensions 111 by 241 by 311mm (HWL) and weighs only 7-3kg. No more need to struggle with heavy rigs impossible to mount under-dash!

## FILL METERING

The front panel meter includes swr, power, ALC, compression and collector voltage/current measurement.

## DESKTOP MICROPHONE AS STANDARD

A high-quality condenser electret desk microphone is included as standard equipment with your new ICOM IC-701.

VARIABLE POWER OUTPUT
In CW and RTTY modes power output can be continuously varied from zero to maximum 200 watts input. SSB output can easily be adjusted for novice use.

IDEAL FOR THE CW AND RTTY BUFF
The IC-701 includes narrow CW filter as standard plus semi-break-in and sidetone facilities. The IC-701 has switching to select either narrow or wide RTTY shift rates

# THANET TECHNICAL BACK-UP

Your new IC-701 from THANET comes complete with the THANET one year warranty plus technical and spares support. THANET staff have been factory briefed on the service and alignment procedures.

## PLUS-

- Separate front-end RF stages using dual gate MOSFETs for each
- Separate Moint-ein un ratges using dual gate Moore's band, providing optimum performance.
  Diode matrix to define band edge parameters.
  Operation on all bands 1-8 thru 30MHz including WWV.
  Modes include USB, LSB, CW, CW-N (narrow), RTTY.
- Unique ICOM bandpass tuning. VOX, Semibreak in CW, RIT, AGC, effective noise blanker.
- Built-in speech processor using advanced circuitry.
- All filters built-in.
- Automatic front panel light dimming to suit ambient light conditions.
- Separate VCOs for each band to reduce spurious and birdies.
- Receive triple conversion.

  Built-in DC power supply, external AC PSU with speaker.
- Full line of matching accessories to come. Internal speaker.

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\*

**SATURDAY 14th OCTOBER** 

**SUNDAY 15th OCTOBER** 



10.30am - 5.00pm

11.00am - 6.00pm

# LEADING LONDON STOCKISTS OF YAESU and ICOM EQUIPMENT

YAESU FO	OR FAST DEL	VERY			
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FT901D	£829.50	FT501	£495.00	FT223	£156.50
FT101E	£579.00	FRG-7	£210.00	FT224	£166.50
FL2100B	£349.50	FRG7000	£367.50	YC500E	£344.50
FT7	£357.50	FL101	£489.00	FT221R	£401.50
FT301D	£661.50	FR101D	£590.50	FT225R	£548.50

# ICOM IN STOCK

IC215	2m/12ch	£159.00
IC202	2m SSB	£169.00
IC240	10W mobile	£198.00
IC245E	10W FM/SSB	£396.00
IC211E	10W FM/SSB	£549.00

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  - \* Carriage extra to Devon/Cornwall, Scotland, N Ireland—see below

	TOV	VERS	S		
tower	Standard Po	st M	ountir	na	
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٠	42ft/12.75m				£361.80
٠	58ft/18.75m				£430.92
٠	75ft/22.75m				£500.04
	P P	tower Standard Po P 25ft/7.75m P 42ft/12.75m P 58ft/18.75m	tower Standard Post M P 25ft/7.75m P 42ft/12.75m P 58ft/18.75m	P 25ft/7.75m	TOWERS stower Standard Post Mounting P 25ft/7.75m P 42ft/12.75m P 58ft/18.75m P 75ft/22.75m

В		1	ROT	OF	RS					
Emoto	103LBX								£95	5.62
Emoto	502CX>	(				325			£145	5.12
Emoto	1102MX	Χ			المالية		_		£208	1.12
Emoto	1103MX	Х							£212	2.62
(NB 1	03LBX r	ot	reco	mn	nen	de	b	for	4-el	HF
beams	1									

ARITERIALA
ANTENNAS

Western DX-31 rotary dipole, 10/15/20m Western DX-32 2-element beam, 10/15/20m £67.50 Western DX-33 3-element beam, 10/15/20m £92.81 Western DX-34 4-element beam, 10/15/20m £121.50

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This comprises:

3m (10ft) 1 29/32" heavy duty aluminium masting

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# PLEASE NOTE:

Only equipment shown above qualifies for this offer. Orders must include tower, rotor, antenna and cable/mast package. Extra cable is available at list prices. Hire purchase is not available for this offer. Due to distances involved, carriage is extra for: 
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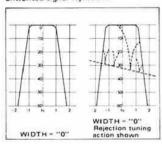
# **FT-901DM**

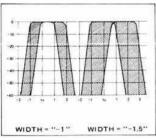
COMPETITION-GRADE HF TRANSCEIVER

# HIGHLIGHTS

The ham's dream—to have the best—is now reality. With the FT-901DM all-mode HF transceiver from YAESU. Designed to give you the competitive edge either at home or on a DX-pedition, the FT-901DM includes these advanced features:

Unique receiver filtering system including rejection tuning, variable IF bandwidth tuning, and audio peak frequency tuning for the ultimate in unwanted signal rejection.





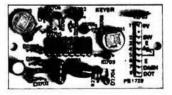
Digital frequency display with memory circuitry for transmit and receive. Ideal for QSY during net operation, multiplier hunting during contests, or daily schedules. Modern PLL frequency derivation for accurate, stable operation.



Offset tuning for either transmit or receive frequency allows precise zeroing in on that rare DX.



Built-in Curtis electronic keyer. That's one less box to pack along while traveling, and the 8043 chip provides excellent immunity from RF interference.



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MAIN AGENT



AGENT SWAN

# EURE E EARON

# source for YAESU MUSEN!

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As for the Yaesu Musen range. Well, there's simply nothing to compare and this year's Leicester Exhibition is your ideal opportunity to see all the latest models at close hand on Stand 22 where you'll be sure of a warm welcome from the crowd at Amateur Electronics - Looking forward to seeing you-Ken Perfect 3FIK.





Once again space does not permit anything approaching a description of Yaesu's ever growing range-therefore Yaesu's latest catalogue with our valuable credit voucher is a must-please see our offer below.

The FRG-7000 has opened new horizons for many a dedicated SWL and Licensed Op. And as for the FT-101E-suffice to say that it's the world's No. 1. H.F. Rig in numbers alone, which must say something!



# HOW TO REACH US (EASY PRIVATE PARKING ON OUR 70ft. FORECOURT)

FROM SOUTH AND EAST. We are located approximately two miles from Junction 5 of the M6 from which follow signposts to Birmingham. Within 3 miles turn right at Clock Garage and proceed towards city. After one mile look for traffic lights at Fox & Goose and immediately over the lights take minor left fork into Alum Rock Road. We are located one mile from this point.

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

Goose. Turn right and see preceding directions.

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

PLEASE NOTE: WE SHALL BE CLOSED AT ALUM ROCK FOR THE DURATION OF THE EXHIBITION-NOVEMBER 2, 3 & 4.

# SPECIAL VOUCHER OFFER <</p>

Here's a 10-1 winning offer if you'd like the latest Yaesu catalogue. Just send us 4 - 9p stamps (36p) and we'll send you Yaesu's latest fully illustrated brochure together with our Credit Voucher for £3.60 against your eventual purchase. A couple of stamps will bring you the latest Atlas or Swan leaflets or our current used equipment list

BRANCH: AMATEUR ELECTRONICS, UK-COASTAL, CLIFTONVILLE,

KENT, KEN McINNES, G3FTE, THANET (0843) 291297. 9 a.m.-10.30 p.m.

BRANCH: AMATEUR ELECTRONICS UK-SCOTLAND, 287 MAIN STREET. WISHAW, LANARKSHIRE, GORDON McCALLUM, GM3UCI.

TELEPHONE WISHAW 71382. (EVENINGS CARLUKE 70914)

WALES & WEST-ROSS CLARE, GW3NWS, CAERLEON, NEWPORT. AGENT:

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508-514 ALUM ROCK ROAD RMINGHAM 8 Telex 337045





# YAESU MUSEN

NO OTHER MANUFACTURER'S PRODUCTS CAN COMPARE WITH OUR RANGE. AVAILABLE FROM:—



The FT901DM Transceiver offers unparalleled receiver performance combined with state-of-the-art transmitter design. The receiver features rejection tuning, dual filter variable bandwidth tuning, and audio peak frequency tuning for maximum rejection of unwanted signals. The transmit side includes a built-in Curtis 8043 IC Keyer, RF speech processor, and a ten-second "TUNE" position timer which prevents damage to your finals due to excessive "key down" periods during tune up. Other advanced features include frequency memory for instant recall or split operation, an advanced noise blanker and offset tuning for either transmit or receive frequencies. Yaesu's up-to-date modular construction utilizing plug-in circuit boards minimizes service time. All modes (USB, LSB, CW, FSK, AM, and FM) and all bands (160-10 meters plus MSF receive) are provided.

A full list of matching accessories is becoming available to complement the FT901. In the illustration above (looking from left to right) we have: the FC901 Antenna Tuner/Power/SWR meter, the FT901DM External VFO, (with 40 memory channels, auto scanning and three speed manual electronic tuning, the FT901DM itself, the FTV901 transvertor (covering 4m, 2 and 70, with repeater shift etc. etc.) and the SP901P external speaker with phone patch (Normal speaker SP901 available). Not shown is the YO901 monitor scope, which in addition to AF, IF, and RF monitoring offers panoramic (spectrum analyser) facilities.

# FT901DM STAR FEATURES

Squelch on FM Variable width IF Power/IC/ALC meter Output Power Control Analogue Readout to 1kHz 12V DC Inverter in-built Semi Break-in with Side Tone Rejection Tuning Built-in Speaker 180W PIP 80W AM/FM RF Speech Processor 100-230V AC 50 or 60Hz Digital Readout to 100Hz PLL Frequency Generation 100-25kHz Crystal Calibrator

PASSRAND TUNING

# FT901DM CONSERVATIVE SPECIFICATIONS

FREQUENCY RANGE
160-10M (2MHz on 28)
CB (27-0-27-05) MSF RX
MODES
SSB (A3, USB & LSB), CW (A1),
FSK (F1), FM (F3), AM (A3h)
VOLTAGE REQUIREMENTS
100/110/117/200/220/234V 50/60Hz
13-5V DC (Negative Earth)
CURRENT REQUIREMENTS
AC 45W RX, 70W SRX; 320W TX
DC 1A RX, 5A SRX, 21A TX
SIZE
13-5" × 6" × 13-5"
WEIGHT

40lb ANTENNA IMPEDANCE 50-75 ohms 2-4kHz to 300Hz Cont.
BANDWIDTHS (with filters\*)
SSB 2-4kHz (1-7:SF)
CW\* 0-6kHz (2-1:SF)
AM\* 6-0kHz (2-1:SF)
FM 12kHz (2-1:SF)
FM 12kHz (2-1:SF)
FM 00DULATION IMMUNITY
80dB (20kHz off 20dB Sig. at 14MHz)
DENSENSITIZATION
90dB (20kHz off 20dB Sig. at 14MHz)
SENSITIVITY
0-25µV for 10d S/N
IMAGE RESPONSE
1-8-21MHz better than -60dB
28MHz better than -50dB
IF REJECTION
Better than -70dB

AGC Slow/Fast/Off Keyer IC built-in Variable Audio Peak RF Negative Feedback Advanced Noise Blanker Vox Front Panel Control AGC Side Noise Eliminator ±5kHz Clarifier (T, R, &/or TR)

THIRD ORDER DISTORTION
Better than -31dB
TRANSMITTER POWER
180W PIP A1, A3,
80W IN A3h, F3, F1
CARRIER SUPPRESSION
Better than -40dB
UNWANTED SIDEBAND
Better than -50dB (at 1kHz)
SPURIOUS OUTPUTS
Better than -40dB
STABILITY
300Hz Cold, 100Hz/3Hr (AWU)
NEGATIVE FEEDBACK
6dB at 14MHz
MICROPHONE IMPEDANCE
500-600 ohms

# YAESU MUSEN

SOUTH MIDLANDS COMMUNICATIONS LTD SM HOUSE, OSBORNE ROAD, TOTTON, SOUTHAMPTON, SO4 4DN

AND

AMATEUR ELECTRONICS UK 508-514 ALUM ROCK ROAD ALUM ROCK, BIRMINGHAM, 8





# **CPU2500R**

THE
ULTIMATE
IN FM
MOBILE
TODAY

The CPU2500RK is the ultimate in 2 meter FM transceiver design. Basically it is a 25 Watt transmitter, a highly sensitive receiver, and a 5kHz step digital synthesizer. This is only half the story. C.P.U. stands for Central Processing Unit and it is this micro-computer that governs the synthesizer functions. Plus and minus 600kHz repeater shifts are of course available and you can programme in any other split (up to 4MHz)! Four normal memory channels with back up facilities are provided as is an automatic, short UK burst, and a long manual European mainland repeater actuation tone system. Frequency control is possible either by rotating the main tuning knob (optically coupled as made famous in the FT227R), by using the up/down push buttons on the front panel, by using the up/down push buttons on the microphones or by tapping in the desired frequency(s) on the keyboard microphone. Should you wish to use the scanner it will stop on an occupied or the first vacant frequency, looking at the memory channels or across the band. The CPU2500R comes in four versions as detailed below:

CPU2500R Standard mic 25W/CPU2500RK Keyboard mic 25W/CPU2500RS Standard mic 10W/CPU2500RKS Keyboard mic 10W.

# **CPU2500R STAR FEATURES**

C.P.U. Controlled Tuning 5kHz Synthesized steps 5k digit frequency readout L.E.D. readout of memory channel Photo encoded knob tuning Push Button electronic tuning Scans up or down band Seeks empty or busy channels Four normal memory channels Additional memory for 'odd' split Can scan memory channels only ±600kHz plus any split (to 4MHz) Standard mic with scanner controls Keyboard microphone optional Sub audio tone squelch option Manual and Auto tone burst

10 or 25 Watt Tx options High or low (r<sub>5</sub>) power Low noise Mosfet, RF Lamps for 'On Air' Lamp for 'Busy Channel' Full VSWR Protection Reverse Power line protection A B.... miracle

# **CPU2500R CONSERVATIVE SPECIFICATIONS**

FREQUENCY RANGE
144 to 146 or 148MHz
FREQUENCY STEPS
5KHz
VOLTAGE REQUIREMENTS
13·6 volts ± 10%
CURRENT CONSUMPTION
0·5A RX, 6·0A H·2·5A LTX(25)
CASE SIZE
7"W×23"H×103"D

SENSITIVITY
0·3<sub>x</sub>V for 20dB OS
SELECTIVITY
12kHz - 6dB (2:1SF)
INTERMEDIATE FREQUENCY
10·7 and 455kHz
AUDIO OUTPUT
1·5W at 10% T.H.D.
A.F. OUTPUT IMPEDANCE
8 ohms

POWER OUTPUT 25/3 or 10/1 Watts SPURIOUS EMISSIONS Better than - 60dB MODE FM (F3) Variable Reactance DEVIATION 5kHz set (16kHz max.) TONE 1750Hz (Auto and Man.)

# COMPLETE RANGE ON SHOW

All our products will be on display at the
National Amateur Radio Exhibition, Granby Halls, Leicester between 2nd and 4th November.
Both our official distributors, SMC and AE,
will be there to demonstrate equipment and give advice



# South Midlands

HANTS-YORKS-DERBYS-LINCS-

# YOUR INVITATION TO THE SMC STAND AT LEICESTER '78

SEE SOME OF SMC's SELECTION FROM A HUNDRED MANUFACTURERS FROM TEN COUNTRIES

- 1 Gross Major Yaesu items
- 1 Doz. SWR/Power Meters
- 4 Doz. Versatowers
- 2/3 Doz. Frequency Counters
- 4 Doz. Crystal & Ceramic filters
- 1 Doz. Antenna Tuners
- 1 Doz. Morse Keys etc.

- 1 Doz. Rotators
- 4 Doz. HF Antennas
- 4 Doz. Valves
- 2 Doz. Microphones
- 6 Doz. VHF Antennas
- 1 Doz. Coax Cables

- Doz. Mast Tubular
- Doz. Coax plugs/Sockets
- 30 Doz. Crystal Frequencies
- 6 Doz. Riggings & Fittings
- 1 Doz. Insulators
- Doz. Antenna Wires Doz. Balun Transformers

Taken from stock of: 500 Transceivers, 500 Receivers, 1,000 Rotators, 50,000 Plugs, etc. etc.

# REMEMBER

SMC your only single stop source. Yaesu the choice of the Discerning. 2-Year Guarantee on Yaesu. "24 Hour" Free Securicor Service.



# TWO NEW TRANSCEIVERS FOR TWO - EX-STOCK YAESU CPU2500R 2 METRE SYNTHESIZED TRANSCEIVER

CPU2500R 25W out Standard mic £292.00 CPU2500RK 25W out Keyboard mic £308.00 CPU2500RS 10W Standard mic CPU2500RKS 10W Keyboard mic

£283.00 £298.00

Prices are exclusive of VAT (121%) but include 2-year guarantee and Free Securicor Delivery.

# YAESU FT202R 2 METRE HAND-HELD TRANSCEIVER

The FT202R multipurpose, six channel, hand-held, 2 meter FM transceiver, offers the highest level of performance in a compact easily portable unit, weighing less than a pound. The receiver is a double superhet: — mosfet, RF, FET, mixer, 2 stages of 10.7MHz ceramic filtering, integrated circuit, IF and Audio stages which produces half a watt of crisp audio. The transmitter provides over a watt of output to the top panel BNC socket, into which may be plugged, the supplied helical, a mobile whip, or the home station antenna. Dry cells or Nicads can be used and a charger is available, which not only recharges the batteries, but with a suitable DC source permits base station operation with external microphone (with ptt) and speaker.

- 1 Watt RF minimum.
- 6 channel capability.
- BNC Antenna socket.

VOLTAGE REQUIREMENTS

CURRENT CONSUMPTION

8 AA Ni Cad or Dry cells

**BATTERIES REQUIRED** 

9-6VDC±10% (Max. 12V)

30MA SRX, 200MA RX, 500MA TX.

- 61 (71)H×21 (21) W×2" D. 'S' and battery meter.
  - TX POWER OUTPUT 1 watt or more DEVIATION up to ±5kHz
  - SPURIOUS RADIATION 60dB or better
- Built in speaker & mic.
- Remote speaker, mic, socket. Impact resistant ABS case.

RX SENSITIVITY 0-3uV for 20dB quieting SELECTIVITY 11kHz @ - 6dB AUDIO OUTPUT 500W @ 10% T.H.D.

# THE FT202R: NO SMALL ACHIEVEMENT FOR £106.50 (+ 121/2 VAT P&P foc)

C/W 6 pairs of crystals £115 (+121/2% VAT. P&P foc)

Includes 3 (or 6) pairs of crystals Complete with Leatherette carry case Complete with dummy battery Includes semi auto tone burst

Complete with BNC helical whip Complete with long shoulder strap

# SOUTH MIDLANDS COMMUNICATIONS LIMITED.

OSBORNE ROAD, TOTTON SOUTHAMPTON, SO4 4DN Hours of business:

9-5.30; Monday-Saturday



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

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# Communications Ltd

# CLWYD-PERTH-ARMAGH-W.MIDLANDS











VHF BEAMS

VHF DISCONES

VHF LOG PERIODICS

MOSELY (10-15-20m. Beams) (Carr and packing \$2.50) VAT 121%

£64.00

£95.00

£12.75 £21.50

£124.00

GEM QUAD FIBREGLASS (Carriage £2-£9) VAT 12}%

CUSHCRAFT (Post and packing extra) VAT 121%

HF BEAMS

Mustang 2 ele. 1kW AM £95.00 Mustang 3 ele. 2kW P.I.P. £118.00

£21.50 £14.50

F249 00

£63.00

ARX40 Ringo Ranger 70cm ABW144 Big wheel 2m.

CK1Q 1 ele. Conv. kit

CQ4E 4 ele.

For fixed station antennas, (from top band to twenty three, from a dipole to a box of 352 elements) for Rotators (a choice of 15 models from Stolle and C.D.E.) and all accessories and fittings-coax, baluns, lightning arrestors, wall brackets, etc, SMC must be the natural choice. Good News is the reappearance of Hy Lain Stocks:-

TA32 Jnr. 2 ele. 200W

ARX2 Ringo ranger 2m.

TA33 etc.

AR2 Ringo 2m.

GO2E 2 ele. CO3E 3 ele.

uv	CAIN	UE E	DANCE	(Carriage extra) VAT 121%
п	UMIN	nr r	MINGE	(Carriage extra) VAI 124%

£20.60

BN86A 1:1 ferrite Balun	£13.50	TH2MK3 10-20m, 2 ele.	£109.75
103BA 10m, 3 ele.	£51.50	TH3JNR 10-20m 3 ele.	£113.50
153BA 15m, 3 ele.	£62.75	TH3MK3 10-20m 3 ele	£157.00
203BA 20m. 4 ele.	£117.50	417 Spring light duty	£8.20
402BA 40m, 2 ele.	£158.00	511 Spring heavy duty	£8.85
18V 10-80 load vertical	£27.80	LA1 Lightning arrestor	£21,35
12AVQ 10-20 trap, vertical	£37.50	DB1015A 10-15m, 3 ele.	£115.00
14AVQ 10-40 trap, vertical	£52.50	18AVT/WB 10-80m. Vert.	£76.00

SMC TRAPPED DIPOLES (Post 45p) VAT 121%

S500W P.E.P.14 SWG HPIK P.E.P.14 SWG

P500W P.E.P. Cu/Terylene braid c/w 75ft feeder, etc £25.00

£25.00



JAYBEAM (Carriage £1.13) VAT 121%



MOBILE HF MOUNTS

LIGHTNING ARRESTORS

MOBILE SPRINGS

If you are looking for mobile antennas - HF or VHF perhaps we can help - G-Whip or Tavasu, for 10-160M, Ascot, Bantex, SMC HS for 4, 2, or 70cms.

# RANTEY VHE WHIPS (Carriage 95a) VAT 121%

				**************************************	
B5	145MHz	£7.75	701	1 70MHz Stainless	£4.00
BGAfg.	1 2M fibreglass	£9.00	1000	Trunk Lip Mount	£5.50
BGAss.	J 2M S/steel	£8.50		Magnetic Base Mount	£9.10
B5U	432MHz	£5.00		Sta'd. b. unwanted deduct	£0.50
1441	1 145 S/steel	£3.80	UCL	Mid loaded	£8.00

## GWILD HE MORILE (Carriage 90s) VAT 12196

G-MILLI III MICE	LL ICan	age John Avi 153 10	
Tribander 10-20M (+LF)	£18.80	LF 40, 80, 160	£5.40
Multimobile 10/20 (+MM)	£27.60	MM40, 80, 160	£5.40
Flexiwhip 10M (+FF)	£13.00	FF15, 20, 40, 80, 160,	£5.40
Basemount 1" hole mount	£3.40	Telescopic	£2.40

# ON THE STAND-PRE-PRODUCTION-NEW-CURRENT-OBSOLESCENT AND S/H

This year we have concentrated our efforts on the Leicester show into three streams; Items that have not been seen by the general public before, and special obsolescent and secondhand equipment bargains interwoven with our massive normal range (many items introduced during the last year) On the stand the FT202R, the FT225R and RD, the FT227RX with Scanner, the FRG7000, the FT7, the FTV901M, the FC901, the 2015R and (touch wood) the YO901 and FTV901, and lots, lots more.

# IF YOU CANNOT LIAISE AT THE LEICESTER EXHIBITION:-

call in at Chesterfield, Leeds, Lincolnshire or Totton, or phone a S.M.C. Agent for an appointment to examine products from Vaesu and

'Alimasts'	Dentron	Hi Mound	KE	Maeden-Sound	S.M.C.	Telco
Ampere	Diawa	Hills	KLM	Metron	S.M.L.	'Telomasts'
Ascot	Electronic Devlps.	Honda	K.W. (Decca)	Mickey Mouse	Sanyo	'Telotowers'
Bantex	F.D.K.	Hy Gain	Katsumi	Mini Beams	Seiwa	Tempo
Barlow-Wadley	Fulton	I.C.E.	Ken	Mosley	Shure	Toshiba
Belcom	G-Whip	Icom	Kenpro	N.E.C.	Soar	Unadilla
Burns	Gem Quads	J.D.	Kuranishi	Nagasawa	Speciality Coms.	Varian
CDE	H.S.	J.R.C.	Kyokuto	Naigai	Stolle	'Versatower'
CIR	HZP	Jaybeam	Leader	Omega	T.T.E.	Wightraps
Center Rise	Hansen	Junker	Leson	R.S.G.B.	Tavsau	
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# FAILING THIS, SEND A LARGE SAE FOR YAESU CATALOGUE AND NEW 22 PAGE STOCK LIST ETC.



S.M.C. (Jack Tweedy) LTD Roger Baines, G3YBO 79 Chatsworth Road Chesterfield, Derbyshire Chesterfield (0246) 34982 9-5; Tuesday-Saturday

**NORTHERN (Leeds) BRANCH** Colin Thomas G3PSM 257 Otley Road, Leeds 16. Yorkshire. Leeds (0532) 782326 9-5: Mon-Wed & Fri-Sat.

S.M.C. (Jack Tweedy) LTD Jack Tweedy, G3ZY
Ham Shack, Roughton Lene,
Woodhall Spa, Lincolnshire
Woodhall Spa (0526) 52793
9-5: Tues-Sat (+appointments)





# **WATERS & STANTON**

TELEPHONE HOCKLEY (03 704) 6835 (2 LINES)



# **NEW MULTI-800D**

**25 WATTS!** 

2M FM Synthesised Transceiver



The Multi-800D covers all channels from 144-148MHz in 5kHz intervals and there is no guessing what frequency you are transmitting or receiving on. Many views have been voiced as to the good and bad points of digital displays, but let's face it, with digital readout there is only one display that is not ambiguous—readout of the true transmit and receive frequencies. The 800D overcomes all criticisms levelled at other models by giving true readout. Thus on S20 TX/RX indicates 145,500. Flip to the repeater mode and R7 reads receive 145,775 changing to 145-175 on transmit (makes sense doesn't itl). For reverse repeater operation simply flip the mode switch to reverse repeater and you are listening on the input channel with the display changing to 145-175. No cranking of dials with the 8000, electronic tuning takes care of that.

£289 including VAT. Remote Displays £19.95.

# **AUTUMN BARGAINS!**



Quartz-16

at £169 inc. VAT . . . You Can't Beat It



2m. FM Model

In Stock Now

FEATURES: 23 channels + 2 priority True "S" channel readout 12 watts output 10 channels fitted R3-R7, SO, S20+S21/22/23

Quick release mobile mount Mic and DC leads provided Automatic tone-burst fitted. S.A.F. for full details

# 70 cms FM! MULTI U-11 OF COURSE

23 Channels + Autoscan



FITTED 10CH's £259 inc. VAT.

# LISTEN IN ON THE ACTION! - - THE FUN & THRILLS

SIGNALS FROM DARKEST AFRICA TO THE NORTH POLE
OR KEEP IN TOUCH ON THE ROAD OR AT YOUR FIRESIDE WITH YOUR LOCAL AMATEURS
WE'VE GOT THE ANSWER BELOW:

# YAESU FRG7 SHORT WAVE RECEIVER



# GREAT VALUE — GREAT PERFORMANCE £210 inc. VAT delivered UK

Whether your interest is in amateur band listening or short wave broadcast monitoring, this receiver must be your first choice. Rarely does one find a low cost receiver that embodies the advantages of general coverage whilst retaining first class band-spread—but the FRG7 is the exception. None of the weaknesses manifest in similar models such as drift, cross modulation, image problems or poor calibration are evident in the FRG7. We have sold many of these receivers to customers throughout the U.K.—and all agree the FRG7 is a winner.

If you're thinking of buying one, why not give us a visit, telephone call or drop us a line. We'll be glad to give you any additional information you may require. And remember, we have our own fully trained service personnel to give you the back-up service that has made us one of the U.K.'s leading communications retail outlets.

# TM56B AMATEUR VHF MONITOR RECEIVER

230 volts AC

12 volts DC

10 Channels fitted

12 CHANNELS + 4 AUTOSCAN



## NEW STOCKS JUST ARRIVED

Tune into the existing World of Amateur Radio with this advanced monitor receiver. Listen to your local amateur radio stations both fixed and mobile direct or through your local repeaters. From the comfort of your fireside chair using the built-in 230 volt AC power supply, this receiver will open up the whole new World of VHF Amateur Radio for you. . . Alternatively the necessary hardware supplied enables you to power the TM56B from your car radio battery for true mobile operation.

GREAT VALUE

Little wonder that the first shipments of these beautifully engineered receivers were sold out within weeks of the advertisement appearing. We really are amazed at their superb performance at such a low price.

SOUND DESIGN

The design is well and truly tried and tested, and the circuitry is almost identical to the receiver section of the FDK mobile transceivers. Both sensitivity and selectivity leave nothing to be desired and the auto-scan enables the popular calling channels to be continually monitored for activity.

NO HIDDEN EXTRAS

The receiver is supplied complete with all leads, circuit diagram crystals for channels SO 20, 21, 22, 23, R3, 4, 5, 6, and 7 plus space for a further 6 channels making 16 in all. An additional matching desk top aerial is also available at £2.50

f104 including delivery and VAT.

Marine version £113.00

# ELECTRONICS FAST MAIL ORDER SERVICE



PRICE LIST 1ST OCT. 1978

**TELEX 897406** 

# FINAL OFFER

Microwave Modules 500MHz Counters £65 inc. p & p whilst stocks last.

FRG7 General coverage receiver 5-30MHz AC/DC FRG7D As above but digital readout F101D 160-2m. + broadcast Rx AC/DC FT101E transceiver 160-10m. AC/DC FT101E Extra-narrow CW filter F101D 150 1665.80 FT101E Extra-narrow CW filter F101D 150 160 160 160 160 160 160 160 160 160 16	YAESU COMMUNICATIONS EQUIPMENT (JAPAN)		
RG7D As above but digital readout R101D 160-2m. + broadcast RX AC/DC T101E transceiver 160-10m. AC/DC T101E Extra-narrow CW filter V101B Extra-narrow CW filter Sefo.00 P101M Extra Series T200 Transceiver Sefo.00 Extra Series T200 Transceiver P101M Digital 160-10m. transceiver 12v. DC P101M Digital 160-10m. transceiver 200W P101DM Digital 160-10m. transceiver V17B2 Amateur Radio World clock H55 Communication headphones P122SR 2m. All mode Sefo.00 Extra Sef	RG7 General coverage receiver 5-30MHz AC/DC	£210.00	
AC/DC FT101E transceiver 160-10m. AC/DC FT101E transceiver 160-10m. AC/DC FT101E Extand 50ve less processor FT101E Extra-narrow CW filter FV101B External vfo for FT101 FR Series FT200 Transceiver 80-10m. Series FT200 Transceiver 80-10m. Series FT200 Matching AC PSU for above FT227R 400 channel FM transceiver 1227R 400 channel FM transceiver 200W FT901D Digital 160-10m. transceiver 200W FT901DM Digital 160-10m. ATU as above, Rf indicator, 300 watts MCONITOR 160-10m. ATU as above, Rf indicator, 300 watts MCERE 0-200/02KW DC/PEP 160-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model A separate catalogue on Dentron is available priced 250—refundable.	RG7D As above but digital readout	£270.00	
AC/DC FT101E Exta-narrow CW filter FT101E Exta-narrow CW filter FT101E External vfo for FT101 SP101B External speaker for FT. FR Series FT200 Transceiver 80-10m. 260 watts FP200 Matching AC PSU for above FP101B External speaker for FT. FR Series FT200 Transceiver 80-10m. 260 watts FP200 Matching AC PSU for above FP101B Swatt dummy load FP101D Digital 160-10m. transceiver 12v. DC FP150 150 watt dummy load FP101D Digital 160-10m. transceiver 200W FP1901DM Digital 160-10m. transceiver 200W FP180 150 watt dummy load FP101DM Digital 160-10m. transceiver 200W FP180 150 watt dummy load FP1901DM Digital 160-10m. transceiver 200W FP180 150 watt dummy load FP1901DM Digital 160-10m. transceiver 200W FP1901DM Digital 160-10m. transceiver 200W FP180 150 watt dummy load FP1901DM Digital 160-10m. transceiver 200W FP180 150 watt dummy load FP1901DM Digital 160-10m. transceiver 2360.20 FP180 150 watt dummy load FP1901DM Digital 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU as above, R findicator, 300 watts N-2 180-10m. SWR/POWER METER 0-200/02KW DC/PEP 60-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model A separate catalogue on Dentron is available priced 25p—refund- able.	AC/DC	£590.60	
FT101E Extra-narrow CW filter PV101B External vfo for FT101 SP101B External vfo for FT101 SP101B External speaker for FT. FR Series FT220 Transceiver 80-10m. 260 watts P200 Matching AC PSU for above (70101 Monitor scope FT227R 400 channel FM transceiver 12v. DC FT9150 150 watt durmmy load FT901D Digital 160-10m. transceiver 200W FT9101DM Digital 160-10m. transceiver 200W FT901DM Digital 160-10m. E859.00 FT225R Dzm. All mode Glital FR07000 Gen. coverage rx	AC/DC		
SP101B External speaker for FT. FR Series FT200 Transceiver 80-10m. 260 watts P7200 Matching AC PSU for above (70101 Monitor scope FT227R 400 channel FM transceiver 12v. DC P7150 150 watt dummy load FT901D Digital 160-10m. transceiver 200W FT901DM Digital 160-10m. transceiver 200W FT7 80-10m. Mitary quality 200W FT7 80-10m. ATU 10ng 20	T101E Extra-narrow CW filter	£23.35	
## ## ## ## ## ## ## ## ## ## ## ## ##	SP101B External speaker for FT.		
## ## ## ## ## ## ## ## ## ## ## ## ##	watts	£394.90	
### ### ### ### ### ### ### ### ### ##	above		
P150 150 watt dummy load   F050 watt dummy load	T227R 400 channel FM trans-	1000000	
ceiver 200W	P150 150 watt dummy load		
ceiver 200W E77 80-10m. transceiver 2TR24 Amateur Radio clock 1785 Communication head- phones (70844 Desk microphone 17225R 2m. All mode 173602.00	ceiver 200W	£829.70	
17.24 Amateur Radio World clock	ceiver 200W		
### Communication head-phones ### Communication head-phone ### Commu	QTR24 Amateur Radio World		
VØB44 Desk microphone (P8.50 (	rH55 Communication head-	200000	
TT225RD 2m. All mode digital E602.00 E7867.90 Gen. coverage nc E867.90	/D844 Desk microphone /D846 Hand microphone	£8.50	
DENTRON RADIO COMPANY HF COUIPMENT (USA) WILA2500 160-10m. Mitiary quality amplifier 2kW pep continuous MT3000A 160-10m. ATU-SWR/ PEP-5-way selector 3 kW MT2000A 160-10m. ATU long wire, coax, balanced feed 3kW COUITOR 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU as above, Rf indicator, 300 watts W-2 160-10m. SWR/POWER METER 0-200/02KW DC/PEP 660-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model A separate catalogue on Dentron is available priced 25p—refund- able.	T225RD 2m. All mode digital	£602.00	
MLA2500 160-10m. Mitiary quality amplifier 2kW pep continuous (695.00 (n.c.) MT3000A 160-10m. ATU-SWR/PEP-5-way selector 3 kW MT2000A 160-10m. ATU long wire, coax, balanced feed 3kW (60-10AT 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU as above, Rf indicator, 300 watts M-2 160-10m. SWR/POWER METER 0-200/02kW DC/PEP (60-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model A separate catalogue on Dentron is available priced 25p—refundable.	DENTRON RADIO COMPANY I		
MT3000A 180-10m. ATU-SWR/ PEP-5-way selector 3 kW MT2000A 160-10m. ATU long wire, coax, balanced feed 3kW 60-10AT 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU as above, Rf indicator, 300 watts W-2 160-10m. SWR/POWER METER 0-200/02KW DC/PEP 160-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model A separate catalogue on Dentron is available priced 25p—refund-	MLA2500 160-10m. Mitiary quality	cese 00	(n a )
MT2000A 160-10m. ATU long wire, coax, balanced feed 3kW 6175.00 (n.c.) 60-10AT 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU as above, Rf indicator, 300 watts A-2 160-10m. SWR/POWER METER 0-200/02KW DC/PEP 610-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model A separate catalogue on Dentron is available priced 25p—refundable. (n.c.)	MT3000A 160-10m. ATU-SWR/	Passage Lan	120
160-10AT 160-10m. ATU long wire, coax, balanced feed 1kW MONITOR 160-10m. ATU as above, Rf indicator, 300 watts N-2 160-10m. SWR/POWER METER 0-200/02KW DC/PEP 660-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model A separate catalogue on Dentron is available priced 25p—refundable. (n.c.)	MT2000A 160-10m. ATU long	23.53	Contract of
MONTOR 160-10m. ATO as above, Rf indicator, 300 watts W-2 160-10m. SWR/POWER METER 0-200/02KW DC/PEP 160-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model t.b.a. t.b.a. a sparate catalogue on Dentron is available priced 25p—refundable.	60-10AT 160-10m. ATU long		
MCI COUNTER OF CONTROL	MONITOR 160-10m. ATU as above. Rf indicator, 300 watts		12
160-10m. Doublet. Tuned feeders DTR-1 HF transceiver—new 1978 model A separate catalogue on Dentron is available priced 25p—refund- able.	V-2 160-10m. SWR/POWER METER 0-200/02KW DC/PEP		
model t.b.a. a separate catalogue on Dentron is available priced 25p—refundable.	60-10m. Doublet. Tuned feeders DTR-1 HF transceiver - new 1978	£25.00	
AT ANTENNAC HIN & HOAL	model A separate catalogue on Dentron is available priced 25p—refund-	t.b.a.	
Mosely TA33 (balun) 10-15-20m. 3 el. £119.25 (£2.50) Mosely "Mini-Beam" coming	3 el.	£119.25	(£2.50)

Mosely TD3JR Wire dipole 10- 15-20m. 23 ft.   E25.87 (£1.00)   E25.87 (£1.00)   Mosely RD5 SWL Amateur band dipole 69ft   E27.00 (£1.00)   E25.87 (£1.00)   E	14/2M 4 way phasing harness four 2m. aerials f	16 22	
15-20m. 23 ft.   15-20m. 23 ft.   225.87 (£1.00)   15-20m. 23 ft.   27.00 (£1.00)   15-20m.   27.00 (£2.00)   15-20m.	I IOUI ZIII. OCIIOIS	10.33	(£1.00)
Mipole 69ft	m. Antennas 70cm. 8dB glass fibre		
SEM — We are stockists of the SEM range of equipment and can normally supply any item in the range from stock — phone for prices HQ-1 "Mini beam" 10-20m. £94.00 (£2.00) E41.50 (£2.00) E4	ollinear omnidirectional £	39.37	(£2.00)
SEM — We are stockists of the SEM range of equipment and can normally supply any item in the range from stock — phone for prices HQ-1 "Mini beam" 10-20m. £94.00 (£2.00) E41.50 (£2.00) E4	70cm. Double 8 slot-fed yagi ith }" booms f 418/70cm. 18 element Para-	15.46	(£1.50)
From stock	am yagi with 11 boom t	18.56	(£1.50)
C4 "Mini-vertical" 10-20m. £41.50 (£2.00)  ASP VHF/UHF MOBILE ANTENNAS (USA)  201 ½ wave standard 2m. £2.95 (£1.00) 677 ½th wave deluxe 2m. £14.95 (1.00) 872.009 ½th wave budget 2m. £7.95 (£1.00) 677 ½th wave deluxe 2m. £19.95 (£1.00) 677 ½th wave budget 2m. £7.95 (£1.00) 677 ½th wave deluxe 2m. £7.95 (£1.00) 677 ½th wave budget 2m. £7.95 (£1.00) 67 ½th wave budget 2m. £7.95 (£1.00) 677 ½th wave budget 2m. £7.95 (£1.00) 687 70cms dugget and antenan 2m. £7.95 (£1.00) 687 70cms dugget and antenan 2m. £7.95 (£1.00) 687 2M 4 element folded dipole yagi with 1½ boom and trombone support boom 2m. £7.90 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70 (£1.25) 67.70		21.66	
MSP VHF/UHF MOBILE ANTENNAS (USA)   201 \( \) wave standard 2m.   £2.95 (£1.00)   677 \( \) \( \) th wave budget 2m.   £7.95 (£1.00)   687 70cms. colinear de luxe   £7.771 (£1.00)   682 70cms. budget 3dB gain antenna   £6.75 (£1.00)   682 70cms. budget 3dB gain antenna   £6.75 (£1.00)   683 70cms. budget 3dB gain antenna   £6.75 (£1.00)   685 70cms. budget 3dB gain antenna   £6.75 (£1.00)   £6.70 (£1.25)   £6.70 (£1.25)   £7.70 (£1.25)   £7.70 (£1.25	M48/70cm, element Multi- eam yagi with trombone	21 62	(£2.00)
201 \( \) wave standard \( 2m\). \( \) \(\	ounting £ M88/70cm. 88 element Multi- eam yagi with trombone	21.02	(L2.00)
677 ith wave deluxe 2m. 2009 ith wave budget 3dB gain antenna "No-hole" Boot mount for all above E3.50 (£1.00) ith short 2009 ith short	ounting £	28.97	(£2.00)
2009 ith wave budget 2m. 667 70cms. colinear de luxe 462 70cms. budget 3dB gain antenna "No-hole" Boot mount for all above K220 Magnetic mount (677/667) +4m. cable K220A Magnetic mount (2009/ 467/2011 + 4m. cable K230A Magnetic mount (2009/ 467/2011 + 4m. cable K250A Magnetic mount (2009/ 467/2011 + 4m. cable K26.76 (£1.00) K27/2M 4 element folded dipole vagi with 1" boom SY/2M 5 element folded dipole vagi with 1" boom SY/2M 6 element folded dipole vagi with 1" boom And trombone support PBM14/2M 14 element Parabeam with 14" boom and trombone support boom PBM14/2M 14 element Parabeam with 14" boom and 45° braces SXY/2M Crossed 5 element yagi with 14" boom SXY/2M Crossed 5 element yag	/70cm. Crossed 8 element		
462 70cms. budget 3dB gain antenna antenna (£6.75 (£1.00) (£1.00) (£2.00) (£2.00) (£2.00) (£2.00) (£2.00) (£2.00) (£2.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£1.00) (£3.50 (£3.00) (£3.	igi complete with phasing		
above K220 Magnetic mount (677/667) +4m. cable K220A Magnetic mount (2009/ 467/201) + 4m. cable  JAYBEAM VHF/UHF ANTENNAS (UK) 4 METRE ANTENNAS 4 V/4M 4 element folded dipole yagi with 1½ boom PMH2/M 5 element folded dipole yagi with 1 boom 8 V/2M 5 element folded dipole yagi with 1½ boom 10 V/2M 10 element folded dipole yagi with 1½ boom 8 W/2M 8 element folded dipole yagi with 1½ boom 10 V/2M 10 element Parabeam with 1½ boom and trombone support boom PBM14/2M 14 element Parabeam with 1½ boom and trombone support boom 8 W/2M Crossed 5 element yagi with 1½ boom 10 XY/2M Crossed 5 element yagi with 1½ boom 10 XY/2M Crossed 5 element yagi with 1½ boom 10 XY/2M Crossed 10 element yagi with 1½ boom 10 XY/2M	Y/70cm. Crossed 12 element	24.13	(£2.00)
above K220 Magnetic mount (677/667) +4m. cable K220A Magnetic mount (2009/ 467/201) + 4m. cable  JAYBEAM VHF/UHF ANTENNAS (UK) 4 METRE ANTENNAS 4 V/4M 4 element folded dipole yagi with 1½ boom PMH2/M 5 element folded dipole yagi with 1 boom 8 V/2M 5 element folded dipole yagi with 1½ boom 10 V/2M 10 element folded dipole yagi with 1½ boom 8 W/2M 8 element folded dipole yagi with 1½ boom 10 V/2M 10 element Parabeam with 1½ boom and trombone support boom PBM14/2M 14 element Parabeam with 1½ boom and trombone support boom 8 W/2M Crossed 5 element yagi with 1½ boom 10 XY/2M Crossed 5 element yagi with 1½ boom 10 XY/2M Crossed 5 element yagi with 1½ boom 10 XY/2M Crossed 10 element yagi with 1½ boom 10 XY/2M	egi complete with phasing arness and "N" type connector £		100.001
+4m. cable K220A Magnetic mount (2009/ 467/201) + 4m. cable JAYBEAM VHF/UHF ANTENNAS (UK) 4 METRE ANTENNAS 4/Y4M 4 element folded dipole yagi with 1½ boom pomidirectional 5/2M 5 element folded dipole yagi with 1½ boom 8Y/2M 5 element folded dipole yagi with 1½ boom 8Y/2M 6 element folded dipole yagi with 1½ boom and trombone support PBM10/2M 10 element Parabeam with 1½ boom and 45° braces 5XY/2M Crossed 5 element yagi with 1½ boom 8XY/2M Crossed 5 element yagi with 1½ boom 10XY/2M Crossed 5 element yagi with 1½ boom 10XY/2M Crossed 6 element yagi with 1½ boom 10XY/2M Crossed 10 element yagi with 1½ boom 10XY/2M Crossed 10 element yagi with 1½ boom 10XY/2M 6 element quad yagi 06/2M 6 element	12/70cm. 2 way phasing har-		(£2.00)
467/201) + 4m. cable £8.50 (£1.00)  JAYBEAM VHF/UHF ANTENNAS (IK) 4 METRE ANTENNAS 4Y/4M 4 element folded dipole yagi with 11" boom 5Y/2M 5 element folded dipole yagi with 1" boom and trombone support PBM10/2M 10 element folded dipole yagi with 1" boom and trombone support boom and trombone support boom PBM14/2M 14 element Parabeam with 11" boom and 45" braces 5XY/2M Crossed 5 element yagi with 11" boom 10XY/2M Crossed 8 element yagi with 11" boom 10XY/2M Crossed 8 element yagi with 11" boom 500 (£1.50)  8XY/2M Crossed 8 element yagi with 11" boom 10XY/2M Crossed 8 element yagi with 11" boom 10XY/2M Crossed 8 element yagi with 11" boom 500 (£1.50)  8XY/2M Crossed 8 (£1.50)  8XY/2	14/70cm. 4 way phasing har-		(£1.00)
JAYBEAM VHF/UHF ANTENNAS (UK) 4 METRE ANTENNAS 4//4M 4 element folded dipole yagi with 1½ boom pornidirectional 5//2M 5 element folded dipole yagi with 1½ boom 8//2M 6 element folded dipole yagi with 1½ boom and trombone support PBM10/2M 10 element Parabeam with 1½ boom and trombone support boom PBM14/2M 14 element Parabeam with 1½ boom and 45º braces 5XY/2M Crossed 5 element yagi with 1½ boom 8XY/2M Crossed 5 element yagi with 1½ boom 10XY/2M Crossed 5 element yagi with 1½ boom 10XY/2M Crossed 6 element yagi with 1½ boom 10XY/2M Crossed 6 element yagi with 1½ boom 10XY/2M Crossed 10 element yagi with 1½ boom 10XY/2M Crossed 20 element yagi wi	ess for four 70 cm. yagis £ m ANTENNA	12.26	(£1.00)
Company   Comp	/1296 Double 15 slot-fed yagi		
yagi with 1½ boom PMH/2/M 2 way phasing harness for two 4m. yagis  2 METRE ANTENNAS C5/2M 5dB glass fibre colinear ormidirectional SY/2M 5 element folded dipole yagi with 1 boom 8Y/2M 8 element folded dipole 'long yagi' with 1½ boom and trombone support PBM10/2M 10 element Parabeam with 1½ boom and trombone support boom PBM14/2M 14 element Parabeam with 1½ boom and trombone support boom PSM14/2M 14 element Parabeam with 1½ boom and 45° braces SXY/2M Crossed 5 element yagi with 1½ boom 10XY/2M Crossed 5 element yagi with 1½ boom 10XY/2M Crossed 10 element yagi with 1½ boom PMH/2C 2 way phasing harness for circular polarisation 04/2M 4 element quad yagi 06/2M 6 element quad yagi 05/2M Double 5 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot- with 1½ booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-		22.78	(£1.00)
for two 4m. yagis  2 METRE ANTENNAS C5/2M 5dB glass fibre colinear omnidirectional 5Y/2M 5 element folded dipole yagi with 1" boom 8Y/2M 8 element folded dipole yagi with 1" boom and trombone support and trombone support boom PBM14/2M 14 element Parabeam with 1½" boom and trombone support boom PBM14/2M 14 element Parabeam with 1½" boom and 45° braces 5XY/2M Crossed 5 element yagi with 1½" boom 8XY/2M Crossed 5 element yagi with 1½" boom 10XY/2M Crossed 6 element yagi with 1½" boom 10XY/2M Crossed 10 element yagi with 1½" booms 105/2M 6 element quad yagi C6/2M 6 element quad yagi C6/2M 6 element quad yagi C7/2M 10 collet 8 slot-fed yagi with 1" booms 108/2M Double 5 slot-fed yagi with 1" booms 108/2M Double 8 slot-fed yagi with 108/2M Double 8 slot-fe	E/STOLLE JAYBEAM ROTATO A/GERMAN/JAPAN)	RS	
Z METRE ANTENNAS CS/2M 5dB glass fibre colinear omnidirectional SY/2M 5 element folded dipole yagi with 1" boom and trombone support boom PBM14/2M 10 element Parabeam with 1½" boom and trombone support boom PBM14/2M 14 element Parabeam with 1½" boom and trombone support boom PBM14/2M 14 element Parabeam with 1½" boom and trombone support boom PBM14/2M 16 element parabeam with 1½" boom and trombone support boom PBM14/2M 16 element parabeam with 1½" boom and trombone support boom PBM14/2M 16 element parabeam with 1½" boom SXY/2M Crossed 5 element yagi with 1½" boom 10XY/2M Crossed 10 element yagi with 1½" boom PMH/2C 2 way phasing harness for circular polarisation Q4/2M 4 element quad yagi E26.32 (E2.00) MM MM D6/2M 6 element quad yagi E26.32 (E2.00) MM MM E6.31 (E1.50) E1.50 (E1.50) E1.50 (E1.50) MM MM E1.50 (E1.50) MM MM E1.50 (E2.00) MM		53.43	(£1.50)
C5/2M 5dB glass fibre colinear omnidirectional 5Y/2M 5 element folded dipole yagi with 1" boom 8MY/2M 8 element folded dipole yagi with 1" boom and trombone support poom end trombone support boom PBM14/2M 14 element Parabeam with 14" boom and trombone support boom PBM14/2M 14 element Parabeam with 14" boom and trombone support boom PBM14/2M 14 element Parabeam with 14" boom and trombone support boom PBM14/2M Crossed 5 element yagi with 14" boom 10XY/2M Crossed 8 element yagi with 14" boom 10XY/2M Crossed 10 element yagi with 14" booms 10E/2M 6 element quad yagi E15.91 (E1.50) MM 15E/2M Double 8 slot-fed yagi with 1" booms 10E/2M Mounting kit for vertical polarisation for 2 slot-		106.87 48.95	(£1.50) (£1.50)
omnidirectional 57/2M 5 element folded dipole yagi with 1" boom 8Y/2M 8 element folded dipole yagi with 1" boom 10Y/2M 10 element folded dipole "long yagi" with 1‡" boom and trombone support PBM10/2M 10 element Parabeam with 1‡" boom and trombone support boom PBM14/2M 14 element Parabeam with 1‡" boom and 45" braces 5XY/2M Crossed 5 element yagi with 1‡" boom 10XY/2M Crossed 6 element yagi with 1‡" boom 10XY/2M Crossed 8 element yagi with 1‡" boom 10XY/2M Crossed 10 element yagi with 1‡" boom PMH/2C 2 way phasing harness for circular polarisation 04/2M 4 element quad yagi 06/2M 6 element quad yagi 06/2M 6 element quad yagi 08/2M 6 ele	LLE 2030 VHF rotator deluxe	.40.55	121.501
SY/2M 5 element folded dipole yagi with 1" boom and trombone support boom ewith 1½" boom and trombone support boom PBM14/2M 14 element Parabeam with 1½" boom and 45° braces SXY/2M Crossed 5 element yagi with 1½" boom and 45° braces SXY/2M Crossed 8 element yagi with 1½" boom PMH/2C 2 way phasing harness for circular polarisation Q4/2M 4 element quad yagi with 1½" booms pd 62/2M Cossed 10 element yagi with 1½" boom pm 64/2M 4 element quad yagi Q5/2M Double 5 slot-fed yagi with 1 booms pd 69/2M Double 8 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1 booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with	ontrol box £	54.00	(£1.50)
yagi with 1" boom 10Y/2M 10 element folded dipole "long yagi" with 14" boom and trombone support PBM10/2M 10 element Parabeam with 14" boom and trombone support boom PBM14/2M 14 element Parabeam with 14" boom and 45° braces SXY/2M Crossed 5 element yagi with 14" boom 10XY/2M Crossed 8 element yagi with 14" boom 10XY/2M Crossed 10 element yagi with 14" boom PMH/2C 2 way phasing harness for circular polarisation 04/2M 4 element quad yagi 06/2M 6 element quad yagi DB/2M Double 5 slot-fed yagi with 1" booms DB/2M Double 8 slot-fed yagi with 1" booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-	Channel master, Ideal VHF	11.25	(50p)
10Y/2M 10 element folded dipole "long yagi" with 1‡" boom and trombone support PBM10/2M 10 element Parabeam with 1‡" boom and trombone support boom PBM14/2M 14 element Parabeam with 1‡" boom and 45° braces SXY/2M Crossed 5 element yagi with 1‡" boom 10XY/2M Crossed 8 element yagi with 1‡" boom 10XY/2M Crossed 10 element yagi with 1‡" boom PMH/2C 2 way phasing harness for circular polarisation Q4/2M 4 element quad yagi Q6/2M 6 element quad yagi Q6/2M 6 element quad yagi Q6/2M 6 element quad yagi D5/2M Double 5 slot-fed yagi with 1" booms B8/2M Double 8 slot-fed yagi with 1" booms SVMK/2M Mounting kit for vertical polarisation for 2 slot- vertical polarisation for 2 slot-	rays (3 core cable) £ 00 ‡ ton de luxe rotator HF	45.00	(£1.50)
and trombone support PBM10/2M 10 element Parabeam with 1½" boom and trombone support boom PBM14/2M 14 element Parabeam with 1½" boom and 45" braces SXY/2M Crossed 5 element yagi with 1½" boom 10XY/2M Crossed 8 element yagi with 1½" boom PMH/2C 2 way phasing harness for circular polarisation 04/2M 4 element quad yagi 06/2M 6 element quad yagi 06/2M 6 element quad yagi D5/2M Double 5 slot-fed yagi with 1" booms D8/2M Double 8 slot-fed yagi with 1" booms SVMK/2M Mounting kit for vertical polarisation for 2 slot- vertical polarisation for 2 slot- vertical polarisation for 2 slot-	eams (6 core cable) £	95.00 £9.55	(£1.50) (£1.00)
support boom PBM14/2M 14 element Parabeam with 1½" boom and 45° braces SXY/2M Crossed 5 element yagi with 1½" boom 10XY/2M Crossed 10 element yagi with 1½" boom PMH/2C 2 way phasing harness for circular polarisation 04/2M 4 element quad yagi 06/2M 6 element quad yagi 06/2M 6 element quad yagi 06/2M 6 element quad yagi 07/2M 2 element quad yagi 08/2M 0 bouble 5 slot-fed yagi with 1" booms DB/2M Double 8 slot-fed yagi with 1" booms SVMK/2M Mounting kit for vertical polarisation for 2 slot- vertical polarisation for 2 slot-	R METERS (JAPAN) ple Meter SWR 3MHz-150		
PBM14/2M 14 element Parabeam with 1½" boom and 45° braces 5XY/2M Crossed 5 element yagi with 1½" boom 10XY/2M Crossed 8 element yagi with 1½" boom 10XY/2M Crossed 10 element yagi with 1½" boom 10XY/2M crossed 10 element yagi with 1½" boom 10XY/2M parabeam 10XY/	Hz I Meter SWR/Power 3MHz-	£9.50	(50p)
sxY/2M Crossed 5 element yagi with 1½" boom 10XY/2M Crossed 8 element yagi with 1½" boom 10XY/2M Crossed 10 element yagi with 1½" boom 10XY/2M Crossed 10 element yagi with 1½" booms 105/2M Double 5 slot-fed yagi with 1" booms 108/2M Double 8		11.95	(£50p)
BXY/2M Crossed 8 element yagi with 1½" boom 10XY/2M Crossed 10 element yagi with 1½" boom 14" booms 105/2M Double 5 slot-fed yagi with 1" booms 108/2M Double 8 slot-fed yagi with 1" booms 108/2M Mounting kit for vertical polarisation for 2 slot-fed 10XY/2M Mounting kit for vertical polarisation for 2 slot-fed	GAI (JAPAN) ) 500W PEP 230v linear (10w		
10XY/2M Crossed 10 element yagi with 14" booms  DB/2M Double 8 slot-fed yagi with 1" booms  DB/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1" booms  DB/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1" booms  DB/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1" booms  DB/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1" booms  DB/2M Mounting kit for vertical polarisation for 2 slot-fed yagi with 1" booms (£26.32 (£2.00) MM MI (£1.50)	rive) £4 .E. colour brochure	181.50	(£4.50)
with 14" boom PMH/2C 2 way phasing harness for circular polarisation Q4/2M 4 element quad yagi Q6/2M 6 element quad yagi D5/2M Double 5 slot-fed yagi with 1" booms B8/2M Double 8 slot-fed yagi with 1" booms SVMK/2M Mounting kit for vertical polarisation for 2 slot-	ROWAVE MODULES (UK)		
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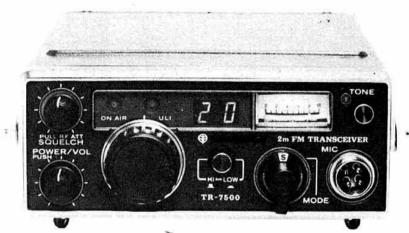
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# TRIO

# WHY SETTLE FOR ANYTHING LESS?



The TR7500 has now established itself as the 2 metre FM mobile rig chosen by the thinking radio amateur. Trio advance planning has provided the 7500 owner not only with the most sensible mobile transceiver of today but has catered for future developments such as 12½kHz channelling.

Whatever you now own, or may have been thinking of buying, it would be foolish to exist for anything less than the TG760.

foolish to settle for anything less than the TR7500.

PLL Synthesiser, no crystals to buy, ever, with the TR7500 since the operating frequencies are generated by a TRIO designed LSI phase locked synthesiser. This provides 80 FM channels at 25kHz spacing from 144-146MHz, all 10 repeater and reverse repeater channels. The channels are selected by a single knob and no programming is required from the user—just unpack the rig, connect 12 volts dc and you are on the air.

Why 25kHz channels? Because that's the IARU European band plan and there is no use being dazzled by the thought that there are other rigs which give you 800 5kHz channels—that's just silly, you end up tuning in five times as many steps as you need. Should you scan in 5kHz intervals, the situation is sillier since because of the required IF bandwidth for 25kHz spacing, the scanner usually stops on the next 5kHz step to the one you need – just try one out and see – but don't buy it!

Next point to ponder; IARU region 1 have just adopted 12½kHz channel spacing for 2 metre FM. Where does that leave the rig with 5kHz channel steps? Up ye creek without ye paddle, that's where, but the TR7500 will accommodate 121kHz channels with minor modifications - details are with every rig.

Trio care in advanced planning is not just hot air—they really think about pro-viding the right rig for the end user, rather than fobbing him off with the Japanese home market product.

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

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

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

Performance plus. A combination of multi section helical filtering at signal frequency, monolithic crystal filters at 10.7MHz, and sharp multi pole filters at 455kHz allows the TR7500 to keep on working under strong adjacent signal conditions when other rigs give up.

The transmitter generates a true FM signal at 10·7MHz which is translated directly to two metres in a fully balanced mixer system. This guarantees a superbly clean signal with no unwanted multiplier products, and an all new PA system with specially developed transistors, gives rugged reliable power in excess of 10 watts.

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

High/low band change is by push button, with S-meter illumination colour change to remind you of the band in use.

Another simple but typically TRIO thoughtful provision is the special channel knob with a deep moulded indent at S0. You can set this vertical by touch alone and can then count up the channels without even seeing the channel display. Great when mobile and you need your eyes on the road

Finally the TR7500 with all its potent performance is packaged in a case not much bigger than a TR2200GXI

# TR7500 £225 inc. VAT DON'T SETTLE FOR ANYTHING LESS

**BRANCHES:** 

AGENTS:

Communications House, 20 Wallington Square, Wallington, Surrey, SM6 8RG. Telephone: 01-669 6700—closed Saturday afternoons. 27 Cookridge Street, Leeds, Yorkshire, LE2 3AG. Telephone: 0532 452657. (He's hardly ever closed)
Ward Electronics, 362-364 Soho Road, Handsworth, Birmingham B21 9QL. Telephone: 021-554 0708—closed Mondays.
John—G3J34G, 16 Harvard Road, Ringmer, Lewes, Sussex. Telephone: Ringmer 812071 (evenings and weekends)
Sim—GM3SAN, 19 Ellismuir Road, Baillieston, Nr Glasgow. Telephone: 041-771 0364 (evenings and weekends)
Alan—GW3YSA, 35 Pen Y Waun, Efail Isaf, Nr Pontypridd, Glamorgan. Telephone: Newton Llantwit 3809 (evenings and weekends)

# TRIO

R2300

# 2 METRE SYNTHESIZER PORTABLE

Trio once again lead the field with the introduction of the new TR2300 2 metre FM portable. Following the established TR2200 line, the all new 2300 combines all the virtues of small size, ease of use and rugged go-anywhere construction but introduces for the first time, full band coverage in 25kHz steps from the same advanced synthesiser used in the TR7500. The synthesiser provides 80 FM channels from 144–146MHz together with 600kHz repeater shift, and a single auxilliary channel which can be crystal controlled to your favourite net frequency.

Automatic tone burst is provided for repeater operation and all in all, the TR2300 looks like being the new definitive 2 metre FM portable.

Although not so obvious from the photo, the TR2300 is actually smaller than the existing TR2200 and is a totally new design with an improved specification. The high sensitivity receiver section uses a combination of effective RF filters providing optimum cross modulation rejection across the entire band. An extra low profile speaker uses a samarium cobalt magnet to reduce equipment size whilst improving speaker efficiency and clarity of reproduction.

Switchable dial illumination is provided so as to ease dial readout in dimly lit situations.

Needless to say, in line with Trio advance planning, the TR2300 will allow for incorporation of the new IARU region 1 adoption of 12½kHz FM channels as this is gradually introduced.

Once again, Trio sensible design, attention to detail and care in providing equipment designed specifically for the user, rather than hand-me-down Japanese designs, is reflected in the TR2300—why settle for anything less!

Price—a shade over £200 including VAT.

LOWE ELECTRONICS LTD 119 CAVENDISH ROAD MATLOCK, DERBYSHIRE TEL: 0629 2430 or 2817 TELEX: 377482 LOWLEC G



SEE THE TRIO TR2300 AT LEICESTER '78 - NOVEMBER 2, 3 & 4.



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The new products mentioned below, together with our complete range, will be on show and available on our stand at the forthcoming Leicester show.

NEW PRODUCT \* MML 432/100 100 Watt 432MHz Linear Power Amplifier, equipped with RF Vox and sophisticated protection circuitry.

NEW PRODUCT MMC 432/28-S Dual Range Converter for satellite reception. Features an ultra low-noise first RF amplifier stage.



100 Watt 432MHz Linear Power Amplifier equipped with RF Vox and sophisticated protection circuitry. Power Gain: 10dB minimum. Power Output: 100 Watts RMS PRICE: £247.50 inc. VAT (£220+VAT)

MMC 432/28-S \*



\*

432-436MHz Dual Range Converter for satellite reception Typical Gain: 30dB. Noise Figure: 3·0dB IF's: 28-30, 144-146MHz PRICE: £29.90 inc. VAT (£26.58+VAT)

# MMT 432/28-S



432MHz Linear Transverter-now fitted with dual range coverage of 432-436MHz for oscar operation

FEATURES # 10 Watts RMS output power

- Frequency range selection by means of front panel mounted toggle switches
- 30dB receive converter gain
- 3-0dB receive converter noise figure
- Aerial changeover achieved by a pin diode switch 28-30MHz

IF: PRICE:

£133.88 inc. VAT (£119+VAT)

# MMT 432/144-R



432MHz Double Conversion Linear Transverter-now fitted with a 1-6MHz repeater shift

FEATURES # 10 Watts RMS output power for 10 Watts 144MHz input

10dB receive converter gain ☆ 3.0dB receive converter noise figure

A Repeater shift selected by means of front panel mounted toggle switches

Aerial changeover achieved by a pin diode switch

144-146MHz

PRICE: £169.88 inc. VAT (£151+VAT)

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

Telephone: 051-523 4011 Telex 628608 MICRO G



# MICROWAVE MODULES LIFO

# FOR THE WORLD!!

# MMD 050/500-f69

# DOWN IN PRICE!!



Due to substantial reductions in manufacturing costs, we have reduced the price of the MMD 050/500 from £85.32 to £69 inc. VAT. This represents a discount of almost 20% on the original price.

FEATURES: 6-digit display

Two ranges: 0-45-50MHz, 50-500MHz

Input sensitivity: better than 50mV RMS (0.45-50MHz)

better than 200mV RMS (50-500MHz)

# MMT 144/28



144MHz Linear Transverter

FEATURES # 10 Watts RMS output power

30dB receive converter gain

2.5dB receive converter noise figure

Aerial changeover achieved by a pin diode switch

28-30MHz

PRICE: £88.88 inc. VAT (£79+VAT)

MMC 144/28: 144MHz Receive Converter using protected

dual gate mosfet's

Typical gain: 30dB, Noise figure: 2-5dB IFs 12-14, 14-16, 18-20, 24-26, 28-30MHz

PRICE: £20.25 inc. VAT (£18 + VAT)

MMC 144/28LO: As above unit, but has an extra buffer

amplifier at 116MHz for use in transverters

Provides 5mW at 116MHz

28-30MHz

PRICE: £22.50 inc. VAT (£20 + VAT)

MMA 144: Low noise preamplifier with two inde-

pendent outputs

Typical gain: 18dB. Noise figure: 2-5dB

Also available for 136MHz
PRICE: £14.63 inc. VAT (£13 + VAT)

MMV 1296: 1296MHz Varactor tripler

Will accept up to 30 Watts of 432MHz drive

and achieves 60% efficiency PRICE: £33.75 inc. VAT (£30 + VAT)

MMD 500P: Divide by ten prescaler to give 500MHz capability when used with our MMD 050 or similar counter. Fully TTL compatible

Output level is 2.5V p.p.

Input sensitivity: better than 200mV Frequency range: 50-500MHz PRICE: £27 inc. VAT (£25 + VAT)

MMC 1296/28: 1296MHz receive converter utilizing a hybrid

ring mixer, with a matched pair of schottley diodes driving a mosfet i.f. amplifier. Typical

gain: 25dB. Noise figure: 8·5dB IFs: 28-30, 144-146MHz PRICE: £31.50 inc. VAT (£28+VAT)



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As space only permits a brief description of each of our products, please do not hesitate to contact us by post, telephone or telex for any further technical details, or to request detailed data sheets for any of the products listed below. We have experienced sales and technical staff who will be only too pleased to assist you with any queries you may have.

ALL MICROWAVE MODULES PRODUCTS ARE FULLY **GUARANTEED FOR 12 MONTHS** 

# STOP PRESS!! LINEAR AMPLIFIER

will be available very soon . . . designed on the same format as our MML 432/100, at a very

FURTHER DETAILS TO BE ANNOUNCED

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# RADIO SOCIETY OF GREAT BRITAIN

35 Doughty Street, London WC1N 2AE

Telephone 01-837 8688

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

**EDITOR** 

D. A. Evans, G30UF

Zone G:

A. W. Hutchinson

## ANNUAL SUBSCRIPTION RATES

UK corporate: £8, including VAT

Overseas: f8.

Students aged 18 to 21: £4.50. Associates under 18: £3. (Student applications should give the member's age at last renewal date and include evidence of student status)

Affiliated societies: £6.50 (including Radio Communication); £3.25 (excluding Radio Communication).

# COMPOSITION OF RSGB ZONES

Zone A: Regions 1, 2 and 18 Zone B: Regions 3, 4 and 5 Zone C: Regions 7, 8, 16 and 19 Zone D: Regions 6, 9, 17 and 20 Zone E: Regions 10 and 11 Zone F: Region 15

Regions 12, 13 and 14

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. Hereford and Worcester, Salop, Staffordshire, Warwickshire, West Region 3 Midlands. Derbyshire, all that part of Humberside south of River Humber, Leicestershire, Lincolnshire, Nottinghamshire. Region 4 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. Essex, Norfolk, Suffolk. Isle of Wight, Channel Islands, Dorset, Hampshire, Wiltshire. Region 16 Region 17 Cleveland, Durham, Northumberland, Tyne & Wear. Region 18 Region 19 Greater London north of River Thames, Hertfordshire. Region 20 Avon, Gloucester, Somerset.

# **CURRENT COMMENT**

# The Lambda Investment Co Ltd

For many present-day amateurs, the Lambda Investment Co Ltd is only a name that appears in the annual accounts. Its background goes back to 1961 when Council decided that a headquarters building fund be established with a view to obtaining permanent premises for the Society. In 1965 the Lambda Investment Co was formed and members were invited to lend money to the building fund. These loans were secured by the issue of debenture stock which totalled £19,025. The interest rate was fixed at six per cent. The debenture trust provided for £500 worth to be redeemed at the end of each year.

The result was that it was possible in 1968 for the Society to buy the headquarters building at 35 Doughty Street which, despite its limitations, has served the Society well. It has proved a good investment, with estimates of its current value being over £100,000. Savings to the Society of rent are estimated at £4,000 per year, a significant contribution to our current financial position. The Society should be grateful to the hundreds of loyal supporters, individuals and clubs, who made this possible, and who, effectively, have subsidized the Society over the years.

At 1 July 1978 the balance of stock still owing stood at £17,000, and, after having carefully reviewed the position, Council decided at its meeting on 22 July that it would redeem the entire debenture stock on 30 June 1979, or immediately upon the death of a holder. It also placed on record the debt the whole Society owes to the subscribers.

Dain Evans, G3RPE President



# Resignation of Mr A. Allan, GM3ZBE

Members will have noted in the notice calling for Council nominations in the September issue of *Radio Communication* that at the Council meeting held on 22 July the zonal manager for Zone G, Mr Alex Allan, GM3ZBE, tended his immediate resignation due to pressure of business. Council accepted his resignation with regret, and thanked him for his past services.

## Identity cards for members

Over the years amateurs have sometimes been embarrassed by police and other officials asking for an explanation of mobile or portable (particularly so-called "hand portable") activities. The legitimate activities of amateurs can very easily be confused with the illegal use of transmitting equipment by non-licensed persons.

In order to help safeguard their interests the Society intends to offer members a personal identity card which

# **RSGB PRESIDENT, 1979**

The Council of the RSGB has elected Mr John Bazley, G3HCT, to be President of the Society for 1979.

John Bazley has had two periods of service on Council: in 1971 and 1972, and since January 1977. He is currently RSGB executive vice-president; chairman of the Committee HF; a member of the Finance & Staff, Membership & Representation, Telecommunications Liaison and HF Contests committees, and a member of the IARU Working Group.

will be easy to carry. The card will state that its owner has demonstrated to the RSGB that he/she is the holder of a valid UK amateur transmitting licence issued by the Home Office. It will also include a photograph of the member, and a record of cards issued will be kept at HQ.

The Society plans to have the equipment available for issuing the cards at major events. Members wishing to obtain a card must be able to produce their UK licence. RSGB membership will be checked at the time of issue. The fee will be £1.50.

The first event at which these cards will be issued will be announced in *Radio Communication*.

# **WARC lectures**

Forthcoming lecture sessions dealing with WARC are planned for Sunday 22 October at 3pm, at the Grappenhall Community Centre, Bell House Lane, Grappenhall, Warrington, and at Solihull on 21 November. Further information on these meetings and requests for WARC lectures should be sent to the IARU Working Group Information Officer, John Bazley, G3HCT, OTHR.

# RSGB slow morse practice transmissions

Mr R. Holland, G3BPE, has been forced to withdraw from this service, as, due to a change of QTH, he can no longer use an outside antenna. However, he has kindly offered to provide personal tuition to any member who can get to his new address by 1930 on a Wednesday evening. He should be contacted in the first instance at 42 Elizabeth Court, St James Road, Gravesend, Kent.

This may be an appropriate opportunity to thank those operators who give up their leisure time to make regular slow morse transmissions, on behalf of the Society, for the benefit of fellow members. It is always an incentive to carry on making such transmissions if reports are received from the listeners.

Many parts of the country are not adequately covered by the existing transmissions, and the organizer would be pleased to hear from any member willing to send slow morse practice regularly. The most up-to-date slow morse practice transmission schedule is published elsewhere in this issue.

# 50th anniversary of the Norwegian society

On 12 August the Norwegian amateur radio society NRRL celebrated its 50th anniversary at a special meeting held in Oslo. Guests included the presidents of the Danish, Swedish and UK societies, and the vice-president of DARC, Josef Kaiser. Finland was

represented by OH1TV, and IARU by the secretary of Region 1, G2BVN. The programme included a useful update on the current WARC position, especially from the Scandinavian point of view. Of particular value was the opportunity to meet Mr X. Mortensen who will head the Norwegian delegation at WARC.

The Norwegians have a special award called the Golden Key which is given to those who have made an exceptional contribution to amateur radio. In a formal ceremony immediately after the Saturday evening banquet (which 300 attended compared with a membership of 3,000!), the award was presented to Roy Stevens, G2BVN, for his outstanding efforts on behalf of IARU. We join the Norwegians with our congratulations.

# VERON "Day for the amateur"

The Netherlands society VERON has organized its annual "Day for the amateur" and exhibition "AMRATO" to take place on Saturday 11 November 1978 in the congress centre "Het Turfschip" in Breda.

The event will feature lectures, a do-it-yourself contest, the presentation of a trophy to the "Radioham of the year" and a trade section.

the year", and a trade section.

Entrance is free of charge, and all foreign amateurs are very welcome. There are several camping areas open in and around Breda.

For more information contact: J. Hordijk, PA0AJE, Francklaan 5, Breda, Netherlands. Tel 076-653390.

# RAE courses, 1978-9

Details of the following courses were received too late for inclusion in the lists published in the August and September issues. Although courses will have already commenced it is often possible to join them a week or two late.

Aldridge. Aldridge School, Tynings Lane, Aldridge, Staffs. Commenced Tuesday 26 September, 7-9pm. For further details contact Mr Price, tel 021-554 5252 ext. 608.

London. Holloway Institute Annexe, Highgate Hill, London N19; in conjunction with Grafton RS. Mondays 7–10pm, commenced 18 September. Further details from course lecturer B. C. Bond, G3ZKE, tel 01-485-7065.

London (North). De Beauvoir ILEA Evening Institute, Tottenham Road, London N1. Enrolment from end of September through October.

(Primarily for students who have previously failed the RAE, but who do not wish to start all over again, including special coaching, theory and practical with laboratory facilities.)

Motherwell. Wrangholm Hall Community Centre, Jerviston Street, New Stevenson, Motherwell ML1 4UQ; Organized by Mid Lanark ARS. Commenced 8 September, 7pm.

Stockton-on-Tees. Stockton-Billingham Technical College, Oxbridge Avenue, Stockton-on-Tees, Cleveland TS18 4QA. Mondays 6.30-9pm. Further details from John Ross, G3WWG, tel 0642 552101.

Thurso. Thurso Technical College. Tuesdays 7pm, commenced September. Details from Dr C. V. Smith, GM4FZH, at the college, tel Thurso 3276.

Worthing. Worthing Technical College, Broadwater Road, Worthing. Full details via Ted Keeler, G4FPM, QTHR, or from head of engineering department at the college.

# Stolen equipment

Stolen from a car in Liverpool on 21/22 July was a Trio TS700 serial number 140351. Non-standard features were a pair of BNC sockets on the rear panel adjacent to the SO239 antenna socket, and a Lunar Electronics angle-linear preamplifier mounted internally.

Information to PC Leigh, Merseyside Police Auto Theft Squad, Copperns Hill Police Station, Liverpool; tel 051-707-6010 extn 3115. Crime number 9747.

# Who lost it at Derby?

At this year's Derby mobile rally, several items lost by visitors were recovered, but the one item not claimed may be of value—sentimental if not monetary. This is a dress ring, and if the loser would furnish a brief description of the ring to Mr J. Anthony, chairman of Derby & D ARS, 77 Brayfield Road, Littleover, Derby DE3 6GT, he would be pleased to return it.

# 1979 Belle Vue Exhibition

The Northern Radio Societies Association will hold a meeting of its affiliated societies at 8pm on Monday 23 October 1978 at the Mosses Youth & Community Centre, Cecil Street, Bury. Any group wishing to participate in the 1979 Belle Vue Exhibition is invited to send a representative to the meeting, which is the first of a series of open meetings to discuss and organize the exhibition.

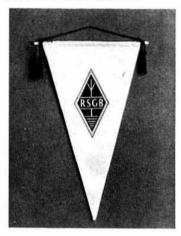
Further details from G4BVE, G8BCG or G3WFW.



RSGB President Dain Evans, G3RPE, and the general manager, David Evans, G3OUF, attended the Region 15 ORM in Belfast at the end of July, and are seen here with some of their hosts. Left to right: G13GXP, Council member; EI7CD, president of the Irish national society; G3OUF: G18AYZ, Region 15 representative; G3RPE; G13USS, area representative, Bangor; G13TLT; and G13HXV, QSL manager

# **RSGB** pennants

A limited number of these attractive pennants is now available from RSGB HQ. The Society "diamond" is printed in black, with outer lines in blue and red, on white satin-finish material measuring approximately 12½ by 7in. The tassels are in royal blue.



The price, including postage, packing and VAT is £2.35.

# Radio Amateurs' Examination

Members of the RSGB Education Committee will be available at 2pm on Saturday 4 November at the ARRA Exhibition, Granby Halls, Leicester, to meet RAE instructors and lecturers to discuss the new syllabus and the changeover to multiple choice questions next year. People who are instructing on RAE courses are invited to attend the meeting.

If there are specific queries about the examination it would be helpful if these could be sent beforehand to Mr D. M. Pratt, G3KEP, 11 Moorleigh Close, Kippax, Leeds LS25 7PB. These will not be answered by post but will be discussed in detail at the meeting.

# G3RJV honoured

The G QRP Club, an RSGB affiliated society, has honoured its secretary, the Rev G. C. Dobbs, G3RJV, by awarding him the G2NJ Trophy for his outstanding services to international QRP work in founding the club and initiating the club magazine SPRAT. Under the direction of G3RJV the club has grown to over 400 members, more than 20 per cent of whom live outside the UK, and it is now the premier QRP organization in the world. SPRAT. published four times a year, also reflects the international flavour of the club by publishing articles from European and American QRP enthusiasts.

Presented to the club by Mr Nick Carter, G2NJ, the trophy is awarded annually. Previous holders were G3NEO (outstanding QRP work on the hf and vhf bands) and, jointly, G3IGU and DJ1ZB (best technical contributions to SPRAT).

# Taking the RAE in December?

# The Radio Amateurs' Examination Manual (7th edn)

This is the standard study guide for all RAE candidates. Contents are: Becoming a radio amateur; Elementary electrical principles and calculations; Thermionic valves and their applications; Introduction to semiconductors; Power supplies; Receivers; Transmitters; Measurements; Propagation and aerials; Interference; Licence conditions; Tackling the Radio Amateurs' Examination; RAE papers set in December 1971-76.

87 pages

£1.60 incl p&p

# Radio Amateurs' Examination Questions and Answers

A collection of complete model answers to typical RAE questions. Invaluable for revision and the development of the correct approach to the examination. Contents are: Licensing conditions; Transmitter interference; Elementary electricity and magnetism; Elementary alternating current theory; Thermionic valves and semiconductors; Radio receivers; Low power transmitters; Propagation; Aerials; Measurements.

118 pages

£2.00 incl p&p

# A Guide to Amateur Radio (17th edn)

This popular book provides much useful background information for the RAE: not only basic theory and principles, but also down-to-earth practical guidance on many technical aspects of amateur radio. Contents are: This is amateur radio; Getting started; Communication receivers; Transmitters; The antenna; Amateur radio equipment; Workshop practice; The licence examinations; Operating an amateur station; The RSGB and the radio amateur; International amateur radio organizations.

120 pages

£1.71 incl p&p

All obtainable from RSGB Publications (Sales), 35 Doughty St, London WC1N 2AE

Note: The 7th edition of *The Radio Amateurs' Examination Manual* is not suitable as a study guide for the May 1979 examination. An 8th edition is in preparation which will cater for the new syllabus and format of that examination. Details and availability will be announced later.

Radio Amateurs' Examination Questions and Answers gives essay-type answers to old-syllabus questions and is, therefore, not directly applicable to the May 1979 examination. Nevertheless the material is up-to-date and the book should continue to prove a useful revision aid.

# **RSGB Region 1 lecture**

# "WARC 79"

by John Allaway, G3FKM and John Bazley, G3HCT

3pm 22 October 1978

Grappenhall Community Centre Bellhouse Lane, Grappenhall Warrington

Venue close to M6/M56 junction SE of Warrington Talk-in on 144MHz fm Further details from G3SMM, tel 061-973 6676

# Scrolling for the G3PLX video display unit

by B. W. COVERLEY, GW3OGG\*

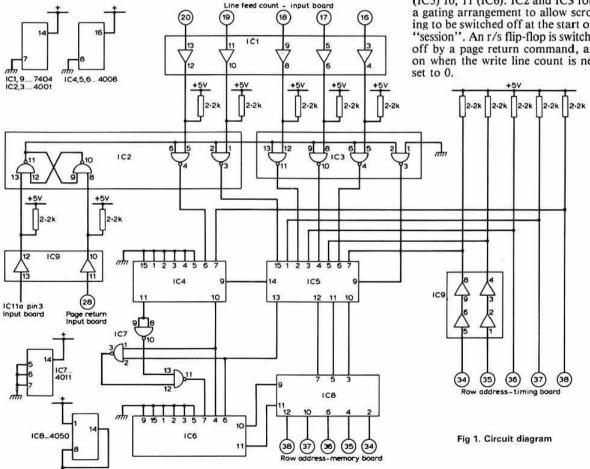
THIS article describes modifications to the G3PLX vdu [1] to provide scrolling of the display page. Scrolling gives the effect of the display page being shifted up one line each time a new line is needed-the old top line is lost and the new line is written at the bottom of the page. The modification is in two parts—the first achieves scrolling and the second clears the old line before the new line is written.

Scrolling unit

The current write line number is added to the read line addresses and this sum is presented to the memory board. Thus, if the write line number is 7, the revised read line sequence would be 7 added to the original sequence, ie 7+0=7, 7+1=8 and so on, so that the actual read sequence would now be lines 7, 8, 9 . . . 23, 0, . . . 6. This sum does not quite give the desired results since, if one is writing to line 7, one wants the read sequence to start at line 8 and end with line 7 at the bottom of the page. The correct addition is "write line count + read line count + 1". This is done using adders IC4 and IC5 (Fig 1), the constant "1" being provided at the carry-in at pin 9, IC5.

The output from this sum is available at pins 10, 11, 12, 13 (IC5) 10, 11 (IC4). The output is not immediately usable since it may exceed the value 23. All values higher than 23 require that 24 be "subtracted" from them-for example, if the count at the output of IC4, IC5 is 24, the required output is 0; if 25, the required output is 1; and so on up to a possible count of 47, where the required output is 23. This is done by an AND/OR combination in IC7, and presenting the output to a third adder, IC6. The final output is taken from pins 10, 11, 12,

(IC5) 10, 11 (IC6). IC2 and IC3 form a gating arrangement to allow scrolling to be switched off at the start of a "session". An r/s flip-flop is switched off by a page return command, and on when the write line count is next



Line feed count

<sup>\*49</sup> Withy Park, Bishopston, Swansea.

Choice of ics

No doubt a ttl adder such as the 7483 would be suitable, but this was ruled out on grounds of current consumption—perhaps in excess of 300mA for the adders alone. The author had no information on the existence or availability of "l" or "ls" adders, so a decision was made to use cmos devices. This meant putting up with the inconvenience of interfacing with existing ttl circuits but, with the considerable savings in power, it was thought to be well worth the trouble. Interfacing with ttl [2] is done using 7404s and resistor pull-ups at the input to the unit, and a cmos buffer (IC8) at the output. The total current consumption should not exceed 50mA.

Quite recently a low power ttl adder, 74LS83, has become available (eg Newbear Computing Store, at £1.05 each) and is an attractive alternative to the cmos adder. If the "start of session" facility allowing copy to start at the top of the page is required, use of the ttl LS series throughout will not reduce the ic count by much, although the pull-up resistors will be eliminated. However, if the "start of session" facility is not required it should be possible to build the basic scrolling unit with ICs 4, 5, 6 and 7 only in 74 LS series, with a considerable reduction in complexity.

# Constructional notes

No layout is suggested; the author used a piece of Veroboard with a compatible edge connector. The only real difficulty is finding spare pins on existing boards for the extra connections needed for the modifications. It should be noted that the cmos r/s flip-flop may not trigger on, due to the short reset pulse at pins 2, 3 IC13, input board. The action can be slowed by placing a capacitor from this point to ground; a 750pF capacitor in the prototype gave correct results. The cmos ics should be handled with care [3]; ic sockets are highly recommended. The existing read line address wires between the timing and memory boards need to be severed and routed through the new board.

Line blanking

This is done by holding the line count at the line to be blanked out and writing spaces to memory as the column addresses are changed by the read column address generator. The column addresses are traversed every 64µs, so that a line hold of some 200µs is ample to ensure that a complete line is blanked out. This timing is pro-

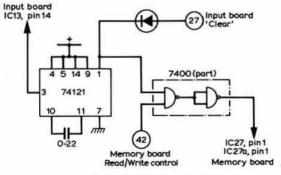


Fig 2. Line blanking circuit

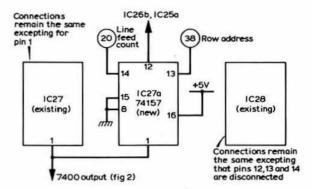


Fig 3. Modification to memory board

vided by the 74121 monostable multivibrator circuit (Fig 2) and is fired by a negative pulse at the line feed counter (pin 14, IC13, input board), ie it is fired by any event which causes the line feed counter to be incremented.

Output from the multivibrator is fed to the "clear" point on the input board, thus producing the required write enable and "clear" output from the uart. The multivibrator output is also fed to the multiplexers on the memory board to hold the current line address; this output is oned with the normal multiplexer switch input so that normal multiplex operation can take place at other times. Unfortunately, one multiplexer (IC28 on the memory board) is shared between line and column addresses so that a further multiplexer is required for this board. Fig 3 shows the modification required for the memory board. The small silicon diode in Fig 2 provides a simple or connection to the "clear" terminal to permit the screen clearing facility to be used as before.

## Additional notes

All the components were fitted on to the existing boards, there being sufficient room for the three extra ics required. Use of the line blanking facility does introduce a reversion to letter shift at the decoding rom at each new line, but in practice this has not interfered with copy to any great extent.

In order to avoid the need for a new 7400 package, constructors may be able to provide a spare gate if the bell or wru facility is not being used. Users of the Clare Pender KB5 keyboard may wish to note that the "debounce" TAPE circuits are usable for the auxiliary commands. For example, in operating the auxiliary line feed, a TAPE output may be fed to pin 13, IC9a, input board, direct, thus releasing the gates IC15a and d for the line blanking circuit. The "debounce" circuits need clock drive which can easily be provided by the timer (IC7, input board).

## References

[1] "The G3PLX Mk2 rtty video display unit". Radio Communications April 1977.

[2] "RCA application note ICAN 6602—Interfacing cmos with other logic families". RCA COS/MOS Databook.

[3] "RCA application note ICAN 6000—Handling considerations for mos integrated circuits". RCA COS/MOS Databook.

# A colinear antenna for repeaters

by J. A. ROLLASON, G3WCO\*

THE antenna to be described was designed for transmit and receive use at the uhf repeater GB3ER. It has now been in use since October 1976 and shows no signs of degradation or change in parameters.

The author is a firm believer in efficient antenna systems for all vhf/uhf projects and has attempted to make an antenna which has narrow vertical beamwidth, approximately 12°, while having an omni-directional horizontal pattern of radiation. The gain, over 10dB, with respect to a centre-fed dipole, enables the use of low-power battery-powered transmitters and, in conjunction with a good receiver preamplifier, lets the repeater sensitivity approach that of detecting rf noise from the sun.

During the summer of 1977 good signals were received from Holland, during an opening of 10-14 days duration, and mobiles in the north, midlands and Wales have worked each other through GB3ER. The low-angle radiation and ducting provided over-the-horizon QSOs, while other repeaters in the south-east with more conventional antenna systems have not produced anything near the same dx at the same time.

Construction (Fig 1)

There is nothing particularly difficult or new, mechanically, with the construction of the antenna. All the metal is alloy tube, the dipole insulators are standard tv type, and, if it is so wished, the crossover plates and U-bolts can be replaced by tv mast clamps. However, the antenna is large, so that, if thick-walled tubes are used with the more rugged crossover plates, the antenna rigger can climb up it instead of using a ladder. Also, repeaters tend to be on high lonely places; if the antenna can be used as a ladder it will also support a lot of ice without damage.

Having finished the mechanical assembly of the dipoles and support mast, check all distances are correct to, preferably, 2.5mm (1/10in) and tighten up all nuts and bolts. Lift the assembly up horizontally on a pair of chairs so that the wiring-up task will be eased. Ten dipoles were used at GB3ER but fewer, or more, may be fitted if desired.

Each dipole is to be fed in phase if the antenna is to have gain and a beam which is at right angles to the mast (ie does not squint). There are a number of exotic methods in power distribution, (eg cosine squared, which reduces side lobes), but it was decided that since an swr meter (Bird model 43) was the only uhf test equipment available, the method of distribution and splitting, while being practical, had to be very simple to set up and to remain so. Also,

350mm

Fig 1. Mechanical details

cost had to be kept to a minimum and the whole thing had to be waterproof.

The cable feeding the dipoles is UR43 or UR76, others may work but have not been tried. It is essential that the UR76 be of good quality and it must be assumed that each feeder is identical to all the others and the same length.

Measure the distance from the top dipole insulator to some mid-point on the pole where the matching unit will be mounted. Allowing a few centimetres extra, cut 10 identical lengths of cable. Lay these out on the floor side by side and, if time permits, allow a day or two for them to shrink before proceeding further; do not stretch them in any way. After waiting, check that they are all exactly the same length and attach them to the dipoles; always connect the inner of the coaxial to the upper half of each dipole. Complete each insulator with a smear of silicone grease before replacing the pill-box lid cover. Ensure that there is no possibility of the ingress of rain into either the coaxial or dipole insulator.

<sup>325</sup>mm 25mm 650mm 50mm dia Standard television antenna insulator with coaxial inner to top half. The coaxial cable is 12mm dia routed through the horizontal tube. Seal cap connections with silicone grease. 50mm 'U' bolt .... 25mm 'U' 100mm x 100mm x 5mm thick mild steel plate

<sup>\*19</sup> Braemar Avenue, Chelmsford, Essex.



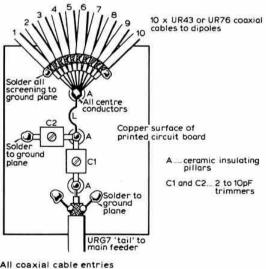
The author working on the antenna before erection

Matching unit (Figs 2, 3)

The matching unit is the heart of the design and should be carefully made; again, there must be no chance of rain

getting into it.

Strip back an identical length from each feeder and, after passing it through some form of gland on the diecast box, solder the inner to the top of the ceramic insulator, and the screen to the copper surface of the pcb



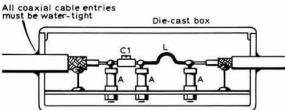


Fig 2. Matching unit layout. (Cable type described as URG7 should be UR67)

material. Next make an inductor from 16swg tinned or silver-plated copper wire. The wire is 25mm long and joins the two pillars which are 20mm apart; the wire should therefore be kinked as shown. Solder the two matching capacitors as shown and, finally, bring in the UR67 tail through another gland at the opposite end of the box. Keeping the inner as short as possible, solder this to the series capacitor. Fix the matching unit on to the support mast, "behind" the dipoles, and tape all the spare coaxial to the support mast in neat lines.

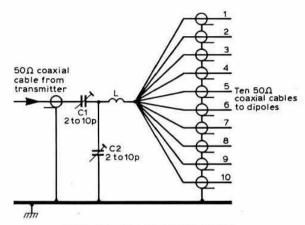


Fig 3. Matching unit circuit diagram

Setting up

Support the antenna horizontally, about 1.5m off the ground, with the dipoles pointing upwards. Connect the "throughline" (Bird model 43) between the main feeder and the UR67 tail, which could be kept to about 4m in length. Apply power to the antenna and adjust the shunt and series capacitors for zero reflected power and, of course, maximum forward power. Touching the dipoles by hand will have a slight effect on swr, but not a lot. Put the cover on the die-cast box and check that the swr is the same; if not, slightly misalign the capacitors so that the swr is correct with the lid on. The antenna system is now ready to erect. Without exotic test equipment and an antenna range there is little else that can be done to prove it works.

Mounting the antenna

At GB3ER the antenna pole was bolted to a socket which supported it, and three nylon guy ropes were attached to the top of the pole to prevent the system whipping in the wind and, hence, unwanted beam tilt. It is essential with a beamwidth of 12° to mount the antenna vertically. It was thought that the mounting pole would influence the horizontal polar diagram but in practice this does not seem to be so.

Acknowledgement

Many thanks to the Essex Repeater Group for their understanding and forbearance during the construction and erection of the antenna, which with the rest of the repeater installation was recorded for posterity on 8mm cine film by Dick Brock, G3WHR.

# EQUIPMENT REVIEW

# ICOM IC240 144MHz fm transceiver

by T. G. GILES, BSc, G4CDY\*



# Introduction

The enormous rise in popularity of 144MHz fm and the high cost of quartz crystals have led several manufacturers to introduce transceivers incorporating some form of frequency synthesizer. There is considerable discussion going on between fm enthusiasts about whether equipment should be marked in terms of true frequency or S and R channel numbers. The ICOM IC240 bypasses this dilemma by providing a 22-way switch, each position of which can be programmed to any 25kHz channel within the band. In practice, the unit comes preprogrammed by the manufacturer to all the common repeater and simplex channels which are arranged in a fairly logical order around the switch.

The transceiver is housed in a dark grey metal case approximately 24cm deep, 16cm wide and 6cm high.

The top and bottom panels are removable and made from pressed steel. The front and rear panels are part of the main chassis and are diecast in an aluminium alloy. The front panel carries the channel selector switch, volume control, squelch control, simplex/duplex switch, S/rf meter, microphone socket, and a call switch which is now redundant due to the inclusion of an automatic tone burst. The back panel has an SO239 antenna socket, a miniature jack socket for an external speaker, a power connector and a B9A accessory socket.

# Technical description

The receiver is a conventional double conversion superhet with 10.7MHz and 455kHz i.f.s. The rf amplifier and first mixer use dual-gate fets type 3SK40, and the second mixer is a junction fet type 2SK49. There is a five-section helical filter between the rf amplifier and the first mixer, and a bandpass crystal filter before the second mixer. The selectivity at 455kHz is provided by a

<sup>\*54</sup> The Mount, Coulsdon, Surrey.

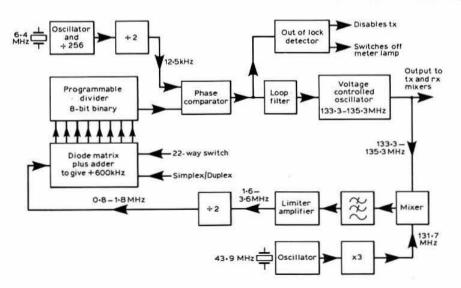


Fig 1. Simplified block diagram of synthesizer

# Measurements

Most of the measurements carried out on the IC240 were made to the CEPT mobile radio specification, and

Sensitivity

Fig 2 is a plot of the sensitivity for an input signal with 3kHz deviation and a 1kHz modulation frequency. The signal-to-noise ratio in full limiting is 46dB and the sensitivity for a 10dB s + n/n is better than 0.3V.

Spurious responses

The only significant spurious response in the receiver is the image, which is 65-5dB down. The worst response in-band (144-146MHz) is ±100kHz at 83dB down.

Adjacent channel selectivity

This test is a measure of how good the receiver is at rejecting strong signals on the adjacent channels; it is a function of both the i.f. selectivity and noise from the synthesizer. The test was done by setting up an on-tune signal with a 20dB s+n/n ratio and then progressively increasing the level of a modulated signal on the adjacent channel, ie  $\pm 25 \text{kHz}$  until the s+n/n ratio is degraded by 6dB. The IC240 under review gave an adjacent channel rejection of 76dB.

## Intermodulation

A 2-tone intermodulation test was carried out using signals at one and two channel separation. The level of these two signals was increased until the intermodulation product obtained had a  $10dB \, s + n/n$  ratio in the receiver. This occurred at a level of 76dB above a corresponding ontune signal.

Temperature drift

The complete transceiver was temperature cycled from  $-10^{\circ}$ C to  $+40^{\circ}$ C, and the drift in frequency is shown in Fig 3. The set was left for one hour at each measurement point to thermally stabilize. It was also

details of the measurement method can be found by reference to that document [1].

left off for one hour at  $\,-\,10^{o}\text{C}$  and then switched on, when a further drift of 100Hz was noticed.

Power output

The transmitter delivered 12W power output into a  $50\Omega$  load using a 13-8V supply, and 10-5W using a 12-5V supply. There was no variation in output power between channels.

Current consumption

Cult Gill Colladiliption		
Receiver	12-5V	0-4A
Transmitter	12.5V	2-2A
Receiver	13·8V	0-42A
Transmitter	13·8V	2-4A

Harmonics

2nd harmonic - 80dB 3rd harmonic - 92dB

## Deviation

As received, the peak deviation was set to 5.25kHz measured with an audio tone of 1kHz. This is rather high compared with the IARU recommendation of 2.5kHz.

Spurious outputs

No spurii were visible to a level of -74dB down on the carrier over the range between 10 and 500MHz.

Load stability

Operating from a 13-8V supply, the transmitter was stable into a 10:1 vswr, varied through all phases. Slight instabilities were obtained with a 50:1 vswr.

pair of ceramic filters, and a rather unusual feature is a ceramic discriminator. The squelch is a noise-operated type, and there is an active lowpass filter before the audio output ic.

The signal from the microphone is amplified, clipped and then lowpass filtered in a six-transistor circuit. There are adjustments for microphone gain, symmetry of clipping and deviation. The processed audio is passed to a varicap diode which directly modulates a 10.7MHz

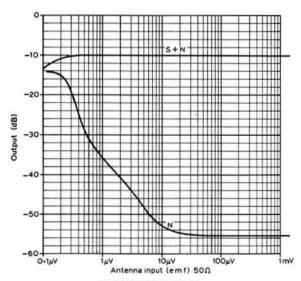


Fig 2. Sensitivity curve

crystal oscillator. This signal is then mixed with one at about 134·3MHz from the synthesizer, using a double balanced ic mixer. The output is filtered by a six-section bandpass filter to remove the unwanted components, and the filtered signal is then amplified by a dual-gate fet stage and three bipolar transistors. The output

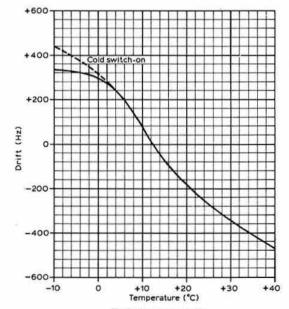
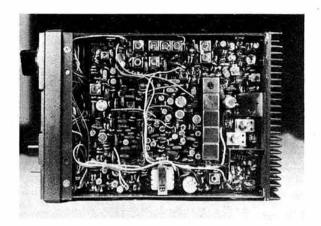
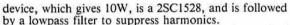


Fig 3. Frequency drift



Chassis, top view



As protection against non-existent or poorly matched antennas there is a directional coupler on the output which reduces the gain of the fet amplifier if there is a large amount of reflected power. The forward side of the coupler is used to drive the front panel meter to show output power. There is no antenna changeover relay. The transmitter is connected permanently to the antenna, and the receiver is protected by two series diodes which are only biased on in the receive condition.

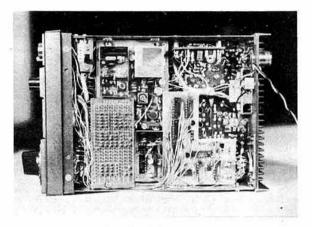
# Frequency synthesizer

The conversion frequencies for the transmitter and receiver are obtained from a mixer-loop type of digital frequency synthesizer. A simplified block diagram is shown in Fig 1. The transceiver requires a local oscillator between 133·3 and 135·3MHz, corresponding to 144 to 146MHz, and this is obtained from a junction fet in a Clapp type voltage-controlled oscillator. This same signal is mixed with one at 131·7MHz which is derived from a 43·9MHz crystal. The output of the mixer is lowpass filtered, amplified up to cmos logic level and divided by two in a D-type flip-flop. The output is then in the range 0·8 – 1·8MHz and goes into an 8-stage binary programmable divider.

The number used to control the programmable divider is obtained from a diode matrix which is addressed by the 22-way channel selector switch and the simplex/duplex switch. When the synthesizer is locked, the output from the programmable divider is at 12·5kHz. This is compared in the phase comparator with a 12·5kHz reference obtained from a 6·4MHz crystal and fixed divider. The phase comparator output is integrated in a passive lag-lead type of loop filter and then applied to the voltage controlled oscillator. An out-of-lock signal is generated and used to mute the transmitter; an indication of its operation is given by switching off the lamp which illuminates the meter.

When the loop is locked, the output frequency,  $f_{out}$  (add 10·7MHz to obtain signal frequency) is given by  $f_{out} = 131 \cdot 7 + N \times 0.025MHz$ ,

where N is obtained from the diode matrix and has the



Chassis, bottom view

range 64 to 144. Each position of the channel switch selects a maximum of seven diodes within the matrix, which gives an 8-bit word output corresponding to the number N in binary. When in the receive condition and duplex has been selected, 24 is added to the number coming from the matrix to give a 600kHz offset for listening to repeater outputs.

A rough calculation of the phase locked loop constants give a loop cut-off frequency of approximately 250Hz, and the loop is slightly overdamped.

The components used within the synthesizer are: normal bipolar and fet transistors, two bipolar ics, several standard range cmos devices, and two msi circuits—probably in cmos. It would seem likely that the two msi ics used for the phase comparator and programmable divider were either specially developed for this transceiver or for 27MHz citizen band use.

# Conclusions

The IC240 performed extremely well, both on the bench and in actual use on the band. The receiver performance as regards sensitivity and signal handling is quite outstanding and should lead to very few QSOs being lost due to noise or QRM. The 22-position channel switch was very easy to operate when mobile, and enabled one to QSY by counting the number of clicks without having to look away from the road. This could be simplified further if there was a stop at the end of rotation of the switch so that it could be used as a reference point from which to start counting. Reprogramming the synthesizer is easily carried out with the aid of the instructions in the manual or in the bottom of the transceiver. However, a small soldering iron is required, preferably a great deal smaller than the 40W maximum quoted in the manual.

Thanks are due to J. A. Garters, G8JLD, and P. J. Hart, G3SJX, for their help with the measurements and in compiling this review.

## Reference

[1] CEPT Recommendation T/R17, available as MPT1301 from HMSO.

# swl news

# Bob Treacher, BRS32525 \*

UNFORTUNATELY, the deadline for this feature has clashed with what some consider the biggest event of one's life—marriage. As a result, this piece is a little shorter and the tables have been held over until next time. It would be appreciated if all correspondence can now be sent to the new address given below.

## DX news

The past month should have provided many with what was probably the most wanted dxpedition for many years; that to the Saudi Neutral Zone 8Z4. The way in which the expedition handled the thousands who wanted a contact left much to be desired. Why expeditions have, of late, worked from a list is a little baffling, and why the expedition cannot transmit on, say, 14,195kHz and listen 5kHz to 10kHz up or down is also puzzling. Many, many more stations would be able to work them, and manners, general behaviour and etiquette would certainly be much better. Let us hope that the planned dx expedition to Desecheo Is is conducted properly and that everyone manages a new one.

## The mail

David Hawes, A9191, had recently returned from EA6 when he wrote; the difference in climate being like chalk and cheese. He had heard a good deal of dx traffic on both 21 and 14MHz but, expectedly, heard little on 28, 7 or 3.5MHz.

Andrew Glanville, BRS39950, wrote for the first time in a year. His dxing had to stop to enable study for "A" levels to be given priority. His receiver certainly seems to have enjoyed having the cobwebs blown away, as it has produced four all-time new countries for Andrew in the shape of CE0, D68, H44 and JD1. That much maligned band, 7MHz, provided CO2, PJ2, HP and VP2M, plus the more common PY, ZP, YV and LU stations that can be heard nearly every evening after 2300.

Neville Spry, BRS17567, had received his FO0 QSLs, plus cards from VR8O, ZL4LR/A and VK9YL, to take his tally to 317 out of 332 heard. He also had the pleasure of meeting H44EH, Wyn, who emanates from GW and spotted Neville's TH3 and called in.

Ian Marquis, A9140, provided a list of 7MHz dx heard during August: OE5CA/YK, YN2DX and VP8NX all being on ssb; and cw accounting for 5Z4CW, TU2HG, CX3AL and ZD7WT.

Keith Kerr, BRS35943, was finding more time to monitor the bands and had logged the majority of the expedition material which quite a few others mention. He is one of two reporters who mention the Cray Valley SWL Contest. Unfortunately there has been no event this year, but your scribe will see what he can arrange for next year.

Robert Small, A8841, reports "It's been a great month for dx". He missed the PW0 St Peter & Paul Rocks expedition, but scored with KA1NC (Minami Torishima) HZ1BS/8Z4 and 4U1UN—the "new country" which is actually the UN building in New York (on the lines of 4U1ITU). 5H3KS/5H1 on Zanzibar was also logged, but DXCC credit for that country lapsed early in the 'seventies. Also logged were CG6A—the special station at the Edmonton Commonwealth Games, and N6ADU/KH2 on Guam. Much Pacific dx is mentioned, plus some short skip EU dx on 28MHz.

In closing, I would mention first-timers Judith Pounder, BRS26120, Jonathan Naylor, ARS38529; and Jonathan Hallewell, A40076, who thanks G3NSW for all his help. Correspondence is acknowledged from BRSs 40154, 36883, 37620, 35454, 25429, 20185, 34740, 27421 and 39965.

# Finally

I hope to write a longer piece next time, if I have decorated the QTH. News, views and the table scores to your scribe by 23 October, and do not forget the new address.

# **BOOK REVIEWS**

Using satellites in the classroom by M. R. Davidoff, PhD, K2UBC

As its title indicates, this publication is intended for educators using Oscar satellites for practical teaching work. The book covers the theory and practice of communication satellites in a clear and concise way and would be an invaluable guide to educators.

The book is not being commercially distributed and copies are available only to educators and libraries who apply using their professional letterhead. To these users there is no charge for the book, which will be sent by surface mail. Requests for copies should be sent to:

Ms Julie Forbush, Editor, Air and Space, Smithsonian Air and Space Museum, Washington DC 20560,

Again, please note that copies of this book are not available to radio amateurs other than those engaged in a teaching programme.

Unilab Microwave Demonstration Notes. Obtainable from Unilab Ltd, Clarendon Road, Blackburn BB1 9TA. Price £1.50.

This 16-page booklet describes 25 experiments carried out with a simple 10-7GHz Gunn oscillator transmitter and diode detector, with ancillary equipment, which are available from Unilab Ltd.

The main purpose of the experiments is to demonstrate various "optical" characteristics of electromagnetic radiation. These include some fascinating polarization effects, radar, interference, diffraction, refraction, reflection from hardboard "half-silvered mirrors" and even of Bragg scattering from a "crystal" made up from "atoms" represented by aluminium 12mm dia spheres. It is, of course, the relatively long wavelength of the microwave radiation, some 50,000 times that of typical light, which allows the experiments to be scaled up by the same factor with most graphic results. And, naturally, one learns a lot about microwaves itself at the same time.

Mind you, with all these microwaves in the classroom, even at O-level, we amateurs will have to look to our laurels.

<sup>\*79</sup> Granby Road, Eltham, London SE9 1EH.

# technical topics

Pat Hawker, G3VA

THE report last month of National Field Day reinforced a feeling I have that amateurs could still learn useful lessons from simple forms of operational research. So many transistors knocked out by static; so many stations put off the air by wind and rain and by faulty petrol-electric generators; electronic bug keys that worked only on one band, and operators who have forgotten how to use mechanical keys. Have we really progressed so very much in operational terms during all the many years of NFD?

One of the most important conclusions ever to come out of wartime "operational research", when it was introduced in 1941, was to show that it would be far cheaper and more effective to make use of existing weapons properly, than ineffectively to misuse something new. That is a lesson that all communications people should sometimes deliberately forget, in the interests of technical progress. But equally, it should be remembered more often than sometimes now seems to be the case.

My opening item this month indicates that there may still be rewarding opportunities to improve the ruggedness and operational effectiveness, without increasing costs, even of such standard antenna systems as the cubical-quad. The quad, it might be pertinent to point out, was initially developed many years ago at HCJB to overcome the problem of static discharge from conventional elements at high altitudes. Another link with NFD 1978!

## The UA3IAR switch-rotatable quad

For many years a two-element rotatable quad has been high on the list of what most members of the hf dx fraternity would like to own. But the quad imposes problems that too often lead ultimately to disaster. A few years ago, commuting into Victoria station, I noticed that a new 14MHz quad had appeared above the rooftops in the Brixton area; but came the first real gale of winter and it was gone, never to reappear. I could not help reflecting on all the effort that had gone into the project and its short effective life.

In truth, many quads suffer from lack of mechanical robustness, represent quite a difficult constructional project even if a suitable "spider" is available, while during operation the time taken to swing a large beam around to a required direction is often a considerable disadvantage. A full-size quad, particularly for 14MHz, is undoubtedly difficult to put up and difficult to keep up, especially in an urban environment where roof-top mounting may be required. Yet listening on the bands shows that the stations using quads often appear to have an edge over the others.

In *Radio* (Moscow), No 6, 1978, pp18-19, L. Vsevolzhskii, UA3IAR, has come up with an ingenious,

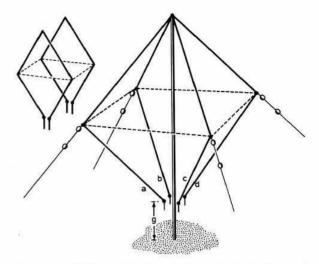


Fig 1. The UA3IAR switchable quad, showing its development from a conventional array. The four half-loops abcd are electrically joined at the top, and pairs of half-loops are used to form the full-wave loops which function either as radiator or, with the additional phasing extensions, as driven reflectors

though basically simple, arrangement that appears to overcome most of the usual problems in putting a quad on a rooftop. In effect, he has evolved a quad-type antenna that is *fixed*, requires no framework or self-supporting tubular elements, yet can be instantly switched (remotely) so that its main lobe is in any one of the four quadrants. Since the uni-directional beamwidth (to –3dB points) is roughly 90°, this means that such an array should provide an acceptable performance throughout the 360° with no turning delay (it may be recalled that bi-directional switching of hf arrays has been advocated by G6XN for this very reason). Indeed it would seem that the UA3IAR array combines much of the mechanical ruggedness and simplicity of a roof-mounted ground-plane antenna with a useful performance approaching that of a conventional full-size quad, although possibly of limited gain.

In providing notes on the UA3IAR design I am particularly indebted to Sid Dunn, who once again has provided me with a full translation of the Russian text from

which I am quoting extensively.

The array is, in effect, a two-element array with actively fed reflector. The array is formed from four half-loops which can be so selected that, at any one time, two half-loops form the radiator and the other two the reflector; four-position switching provides the fourbasic configurations of uni-directional beams. In each position, two half-loops form the radiator, while the other two form the reflector with its phasing section. Fig. 1 gives an indication of the general configuration and how this is comparable with a conventional two-element quad. The upper vertices of the separate loops are joined together, while the lower vertices form the feed points; the middle portions of the loops are in effect pulled a little outwards. All wires are held in place by guying rather than any framework, noting that the four wires at the top are electrically joined.

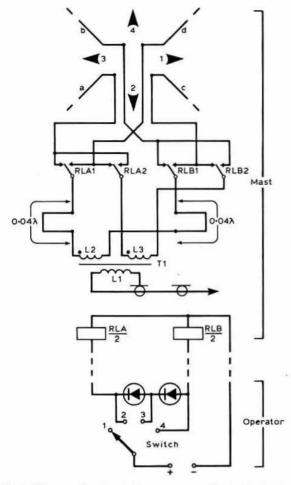


Fig 2. The control and switching system used by UA3IAR. The two 0.04½ extensions are used to provide an 0.08½ phasing section to convert the appropriate loop into a reflector. T1 is based on two ferrite ring cores with a Russian reference K32×16×8 but could be similar to the fairly substantial cores used to form transmitting baluns, though care should be taken that rf power loss in this component is not excessive. The "sense" of windings L2, L3 must be correct in order to provide the initial 180° phase difference between radiator and driven reflector. Control voltage and current steering silicon diodes as required by the relays. In the absence of any energizing voltage the beam will always be automatically set in Direction 1

The technique used by UA3IAR to switch his polar diagram is shown in Fig 2. To form a uni-directional radiation pattern it is necessary to provide a suitable phase difference between the currents flowing in the two loops, or rather more than 180°. The exact value of phase shift depends on the effective spacing between the loops, with an initial phase difference of 180° obtained by suitable connection to the appropriate windings of the ferrite-ring transformer T1.

Extra phasing elements are connected into the loop forming the reflector elements, with all switching provided by relays RLA and RLB. The switching sequence depends on the position of the selector switch S1, and this is best understood by considering just one example. In switch position 1, both relays are energized; winding L3 of T1 is connected directly to half-loops c and d through normally closed contacts RLA.2 and RLB.2. Winding L2 of T1 is connected to half loops a and b through the phasing extension elements. In this way, two full-loops (ab and cd) are formed, with ab acting as a reflector. In these circumstances the beam direction is that indicated by arrow 1. Arrows 2, 3 and 4 correspond to beam directions of the three other switch positions. Four hermetically-sealed relays connected in pairs are used by UA31AR. Their contacts are rated at comparatively low power provided that all antenna beam switching takes place with no rf power applied to the array.

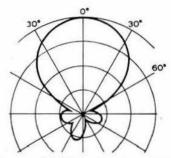


Fig 3. Polar diagram of UA3IAR array using optimized 0.53λ halfloops and a total phasing extension of 0.08λ (2×0.04λ)

T1 is described as based on two ferrite ring cores placed side by side, with windings made from 10 parallel strands of wire. Winding L1 has 10 turns; windings L2 and L3 have eight turns each. The antenna is fed with  $75\Omega$  coaxial cable, and it is stated that the swr does not exceed 1·4. Large toroidal cores similar to those used for baluns should prove suitable for the transformer.

The switching equipment is secured to the steel mast (20mm diameter steel tube) with the aid of four welded triangular steel plates. To these are also secured the insulators for bracing the half-loop wires. Special care was taken to see that wires joining corresponding circuits had equal and minimum lengths.

For 14.0 to 14.3MHz the mast is 9m high, with the point "g" 1.5m above the roof. The length of each half loop wire is 10.95m using copper wire of 2.5mm diameter; this wire is also used for the "extension" elements (total length 1m).

UA3IAR states that tests on 144-146MHz versions have shown that the optimum length of the half-loops is  $0.53\lambda$ , and the optimum total length of extension phasing elements is  $0.08\lambda$ . The polar diagram in one quadrant of an antenna of such dimensions is shown in Fig 3.

The system has been described here in some detail since it would seem to represent an extremely practical approach to the home-construction of a switched directional antenna array of good performance. Even if the full quadrant switching is not implemented it would seem possible to use such an arrangement of loops to provide fixed or reversible arrays based on a single support mast and no framework. For instance, the technique of using two (or even four) open-wire feeders

brought into the shack, in the G6XN approach, might be worth considering. The basic arrangement might also be applied to 7MHz, where a mast or tower exceeding about 18-20m high is available, or less if capacity-hat loading is used. Again, an automatically switched array might prove a useful arrangement for an hf or vhf beacon station providing a sequence of transmissions directed in the four quadrants. There is also scope for the development of multi-band systems.

As UA3IAR points out in the original article: "Time and time again amateurs have set themselves the task of creating antennas with switchable polar diagrams, but up to the present time such antennas have not gained wide acceptance." In this system, UA3IAR appears to have at last come up with a thoroughly practical way of avoiding the disadvantages of mechanically rotating beams, while preserving most of the basic merits of the long-established cubical-quad array. A 14MHz array of this type has been in operation at UA3IAR at Kalinin City since 1973 and has proved "highly reliable and convenient". However, UA3IAR makes no claims as to forward gain, and G6XN thinks this may be under 4dB.

Our thanks are thus very much due to UA3IAR for this novel idea, and to Sid Dunn for his translation.

3.5MHz four-valve "super" transceiver

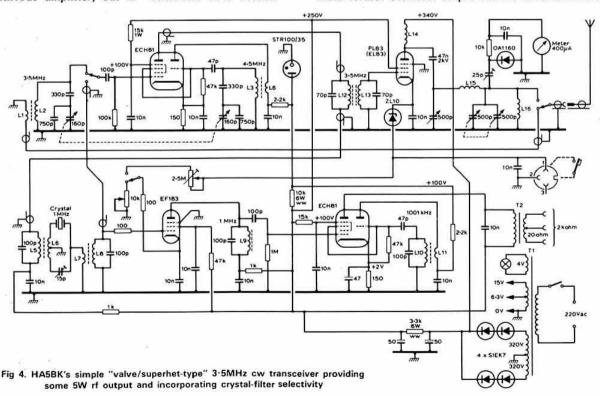
In the September issue of Radio Communication, M. T. Perkins, G3PNI, underlined the continuing attractions of using readily available valves to form low-cost 3.5MHz cw transceivers of effective performance. His receiver used the direct-conversion approach with rf cascode amplifier, but in "Reflecties door PAOSE"

(Electron, No 8, 1978) a roughly comparable unit designed by HA5BK, but based on a superhet receiver with crystal filter, is reproduced from the Hungarian journal Radio Technika: Fig 4. This uses an ECH81 as receiver mixer and transmitter heterodyne vfo; PL83 (or the 6.3V EL83 version) as transmitter power amplifier; EF183 as 1MHz high-gain i.f. amplifier; and a second ECH81 as product detector providing headphone output. A 100V, 35mA voltage regulator helps keep the vfo stable.

Although, apparently, the original Hungarian article provided full constructional details these were not given in *Electron*, but nevertheless it is felt that the circuit diagram provides useful guidance to anyone thinking along these lines for a 3·5MHz (or 1·8MHz) rig with an rf output of around 5W (9–10W dc input). Because of the adoption of the 1MHz i.f. it may be that the inductors will need to be home wound (although possibly broadcast medium-wave coils could be used). It is important to retain the bandpass filter between the het-vfo and pa in order to reduce unwanted mixer products.

G3EIW armchair/mobile electric bug

For a couple of years, Dick Halls, G3EIW, has been operating cw from his car. After trying a number of conventional forms of keys and keyers, but finding them all difficult to use without a work table, he finally adopted a novel form of electromechanical auto-dot, manual-dash "key for armchair sending". The system is unusual in that two relays are used in a form of mechanical multivibrator oscillator to provide the automatic dots;



as in the conventional mechanical bug key, the dashes are formed by holding over the keying paddle for the re-

quired length of time.

The side-acting keying paddle is mounted vertically in a box so that the top surface of the box provides a rest for the wrist. In his case the paddle and associated contacts are from a Post Office 16Hz vibrator, but other forms of construction could be used. The lever is towards the front of the box, projecting through the top face, and is operated by finger and thumb. G3EIW made his box 2in wide and 5in long; this allows it to be pushed between the two front seats of a car without any other positive fixing. Clearly, however, the method adopted for mounting the key will depend on individual circumstances and preferences, but aim so that the lever is where your hand naturally comes to rest when in a sitting posture, normally by your thigh.

Originally G3EIW intended to make his vibrator paddle part of a fully automatic electronic keyer, but soon discovered that it is difficult in a car to keep rf out of the electronics. The electromechanical system provides a workable alternative, producing a 1:1 mark/space ratio for dots: see Fig 5.

RLA actuates the transmitter, isolating the key from the keyed circuit. When the lever is pushed to the right, the two relays work together to form a continuous string of dots. The duration of dots and spaces is governed by the resistance of the relay coils and the values of C1, C2. Where two identical relays are used, the value of C1, C2 should be of similar value. G3EIW uses two small relays of the 160Ω solenoid type, and, in his case, 40μF capacitors are used. D1 isolates RLA from C1 when the paddle lever is held to the left to form a dash. The ganged potentiometer, RV1, RV2, provides a measure of speed control since they shunt the relay coils, increasing the dot rate with reducing resistance. However, G3EIW finds that, in practice, the speed control is only rarely used. The fixed resistors in series with the variable resistors are to limit the minimum value of the shunts, and should be roughly half the relay coil resistance. R1, R2 limit the charging current flowing into C1 and C2, and so help preserve the relay contacts; 10-20Ω should be satisfactory.

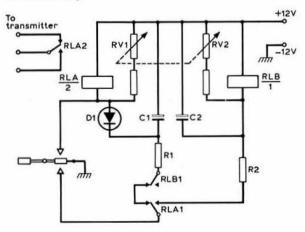


Fig 5. G3EIW's electromechanical bug key (auto dots, manual dashes) for armchair/mobile operation

#### Semiconductor round-up

Several continuing developments in the world of specialized semiconductors appear to hold out the promise of further useful devices for communications applications—although, as usual, the innovatory devices tend to be costly, at least for a time.

The development of rf power fets using verticalgroove channel structures (v-mos, Mospower, etc) is providing a means of providing semiconductor rf power amplification without tears. The absence of thermal runaway and the lower susceptibility to in-band and outof-band destructive parasitic oscillation can combine the advantages of valves and solid-state. According to an 8-page article in Electronics (22 June, 1978), devices capable of delivering up to 125W rf are in the pipe-line, and in the UK Siliconix has announced the VN84GA which can provide an output of 50W at 30MHz and 80W at lower frequencies. V-mos power fets have been developed which provide useful power output above 1GHz, and devices intended for military equipment in the 220-400MHz range providing 10-40W will soon be available. The lower power VMP-1 and VMP-4 devices were introduced in 1976 for use up to about 150MHz (TT July 1976).

QST (June 1978) provides information on 432 and 1,296MHz low-noise preamplifiers using GaAs (gallium arsenide) fets. Noise figures of 1dB at 432MHz and less than 3dB at 1,296MHz are stated to be combined with wide dynamic range and low susceptibility to burn-out. Such devices are still very costly, but the Microwave Semiconductor Corporation is providing licensed amateurs with devices at \$40 each.

The problem of access to detailed information on integrated circuits has been energetically tackled in the series of handbooks published by Plessey Semiconductors at £2 a time. Of the various titles, particular attention is drawn to Radio Communications Handbook by James M. Bryant, G4CLF, (surely, however, a title that, even with an extra "s", is likely to lead to confusion with the Society's two-volume handbook!). This provides almost 200 pages of information on the SL600 and SL1600 series of devices, including system design and applications. The various designs described in detail include receivers, transceivers, nbfm adapters, 144MHz amateur band synthesizer, etc. Recent material includes an SL1600 version of the well-known Plessey ssb transceiver design. The 144MHz synthesizer provides 25kHz steps, using the SP8622, SP8921 and SP8922, all of which are also used as the basis of a 27MHz cb synthesizer.

Other titles in this Plessey series include Consumer Integrated Circuit Databook (192 pages, 1976); Linear Integrated Circuit Databook (240 pages, 1977), which includes several versatile ic ranges in addition to the SL600/SL1600 devices; Digital Circuit Databook (1976), with emphasis on ecl and other high-speed devices; and a recent Radar Applications book (72 pages, 1978).

Incidentally, if one wants a transistor that will handle 400A, there are the new RCA "transcalent" devices in which a heat pipe is bonded directly to the silicon wafer to keep it cool. But prices and applications are not directed towards amateur radio.

# 4-2-70

# Graham Knight, GM8FFX\*

#### **Project Cameo**

At the time of writing, in early September, details are just coming in of Project Cameo which was due to be carried out over north-west Europe in late September or early October. It involves the release of a few kilogrammes of lithium vapour at an altitude near to 950km from the last stage of the Delta rocket used to launch Nasa's Nimbus G meteorological satellite. The lithium cloud, released into sunlight, will appear very bright to ground-based observers and will be blood red in colour due to the excitation of the Li resonance line at 670.8nm. The cloud will rapidly expand after release. following the satellite trajectory southward from a release point at about 25°E and 75°N. The cloud is expected to expand from a minute point in the north-east to a cloud covering most of the skyline about 5min later.

The cloud will act as a source of lithium ions which will be produced by photoionization due to sunlight. Although not visible, these ions can be accelerated within the ionosphere and magnetosphere and are expected to be observed by the European GEOS 11 satellite. The level of ionic intensity of the lithium cloud may produce artificial auroral conditions. With this in mind the Propagation Studies Committee has arranged for amateurs to monitor various beacon stations, and special vhf schedules are being kept between operators in Scotland and Northern Europe. The results of this interesting experiment will be detailed in next month's 4-2-70.

#### Transequatorial tests

The TESSA project (Transequatorial Tests To South Africa) continues to grow and a new beacon ZS6DN has been added to the existing Te chain. Following on from the recent successful transequatorial contacts on 144MHz between 5B4WR in Cyprus and ZE2JV in Rhodesia, a new beacon has been set up on the farm of Dave Larsen, ZS6DN, with the assistance of Dr Fred Anderson, ZS6PW. The beacon is on 144.130MHz and runs 150W input to a group of four 12-element widespaced beams. The antenna, which has a calculated gain of 19.5dB, fires due north from a 1,585m asl site near Pretoria. ZS6DN is on the air from 0600gmt to 0900gmt and from 1500gmt to 1830gmt.

Reports of reception of this new beacon should be sent to Doug Hutchinson, ZR6JH, PO Box 415, Silverton, South Africa 0127. Doug is acting as co-ordinator for the Pretoria Group and has kindly offered to keep 4-2-70 informed of future developments in the TESSA project. Interest in long-distance vhf reception in South Africa goes back a long way-ZS6PW successfully received television signals from the old Alexandra

Palace transmitter in 1939.

#### \*PO Box 49, Aberdeen AB9 8JA

#### Solar powered Norwegian repeater

During the recent lift in tropo conditions, Angelika Voss, GM5CCI, became the first UK station to work through the new Norwegian repeater LA6ER. Just two hours after it first came on the air Angelika was in OSO with LA1AO, one of the operators who put the repeater on the air on R5. LAIAO explained that the new repeater is solar powered and is running off batteries which are charged by solar panels which will supply sufficient power in all weather conditions. LA6ER is located at Eyersund in QTH locator square DS41c, and has been accessed from as far away as Hull when the band was open due to coastal ducting.

#### Expeditions

The Dutch Contest Group's three-week expedition to Andorra ended on 7 August. The operators, PA2AWU, PEOMOT, PEOEFR and PEIBBI, set up their vhf station on a mountain near Pas de la Casa close to the border with France and Spain. Although they were 2,650m asl some of the mountains on the horizon were even higher; despite this, some good tropospheric dx was worked, including a contact with Algeria. The most distant contact on meteor scatter was with Dave Price, GW4CQT, in South Wales. Dave received a 30s burst from the expedition, but they needed three bursts and 18 pings to get the necessary callsigns and reports from GW4CQT. Unfortunately final "rogers" were not ex-changed and the QSO was incomplete, as were other ms schedules with 9H1 and HB9. QSL cards for this expedition should be sent to RSGB member PE1BBI, PO Box 4044, Gronigen, Holland. The Dutch Group were surprised by the weather, and warn others planning expeditions to Andorra to be prepared for night frost and even melting snow.

Ian Harwood, G8LHT, and Bob Lane, G4AWU, both from Doncaster, have just completed their third trip to the QTH square ZR near Peterhead. Ian and Bob are surprised by the number of stations still needing this square but think this reflects the growing numbers of "OTH square hunters". The excellent sea take-off to the south and east helped GM8LHT/P to work G3FPK near Croydon on 144MHz on each of their three visits, and to work LA6HL on 432MHz using just 400mW of ssb. Newly-licensed stations who have yet to work ZR square need not despair, as G8LHT and G4AWU plan further expeditions next year.

#### Meteor scatter

The Perseids shower proved popular with the growing number of meteor scatter enthusiasts, and at times the frequencies around 144.1 and 144.2MHz were chock-ablock with stations. Listener Mike Allmark, in Leeds, recorded over an hour of the very fast high speed cw QSOs which he has slowed down to reveal 17 countries: SM, DM, ON, I, OH, DL, EA, YU, F, EA6, UR2, HG, IT9, OK, OZ and YO. The best of Mike's dx were EA6BW, UR2RDV and OK3KCM. Outstanding bursts were recorded from OE3OBL, F1JG, F6CJG, and a 60s burst on I4EAT. Mike now has 27 countries confirmed on 144MHz and hopes to get at least one more from the reports he sent after the Perseids shower.

Stephen Gregg, G8MJG, also from Leeds, did it the harder way on ssb and had a successful OSO with

OE5VHL which was completed in 90min with 13 bursts and 12 pings. G8MJG took 56min to work I1KTC in EF44g, and only 26min to work DC3CM with the assistance of three 16s bursts. On 13 August PE1AVU had a random contact with RA1ASA(PU) and UK2BAB(MO), and scheduled contacts were completed with SM3AXV(IX), SM3COL(IW) and YU3DBC(IG).

The above report refers to cw and ssb meteor scatter contacts, but a frequency modulation schedule between PEIAVU and GM8FFX took place on 12 August. This Ih schedule had surprisingly good results; callsigns and reports were exchanged but the contact was incomplete. PAOLSC also listened in to this contact and was surprised at the bursts of fm he received. Further schedules will be kept by PEIAVU and GM8FFX in future showers until a complete QSO is established by fm ms.

Probably the most interesting tests conducted during the Perseids were those between G4DGU and SM3AKW on 432MHz. So far no meteor scatter contacts have been made on 432MHz, but during the tests a 10s burst was received by G4DGU—believed to be the longest in captivity!

#### Sporadic-E reports

On the morning of 8 August Les Hutton, G8KMS, at Birmingham, noticed an Es opening which lasted for 15min from 1040gmt. Using 9W from a Liner 2 transceiver, G8KMS worked I2KSX/8 from locator square HY48h in southern Italy. Steve Richards, G8NXR, in Royston, Hertfordshire, was also on for this opening, and with 10W of ssb he worked I2KSX/8, IOAMU(GB43b), IODLP(GB03f), IWOAKA(GB13a). G8NXR also managed to tape the contacts and is ready to make the tape available to F8SH, the IARU Region 1 Es co-ordinator. Simon Baines, G8LKR, at Hitchin, Hertfordshire, managed to get his 8 August contacts into last month's 4-2-70 late news items. This time Simon heard further Es openings at 1700gmt on 15 August, when both YU1BXC and HG4KXG were copied at strengths of up to S7. The latest Es opening reported to 4-2-70 occurred at 1120gmt on 16 August, when G8LKR managed to exchange 5 and 9 reports with IT9ZWV/P who was 2,047km away in locator square HW13j.

#### VHF band plans

Minor errors occurred in the band plans published in the July issue of *Radio Communication*, pp 586-7, and the relative parts of the bands are reproduced below, duly amended, so that they may be pasted over the original versions.

	144MHz B	AND PLAN	
	— 144·000———	144·000-010 144·050	Moonbounce CW calling
CW only		144 - 100 - 110	Random cw m-s (5min)
		144 · 145 · 150	Random cw m-s (1min)*
	432MHz BA	AND PLAN	
	432-150-	432 · 125 · 175	Oscar 7B uplink
CW and SSB		432 · 200 432 · 300	SSB calling SSB calling
	432-500-	7,000,000	310.000
		432 · 600 ±	RTTY working (fsk)
All modes		432 - 600	RTTY calling
		432-700	FAX calling
	432·80		
Beacons only	432-99	Note: No cha below 433MF	

	REAL DX 1978	
70MHz ar	GM3JFG-G3OSS	760km
70MHz tropo	GM3SPJ/P-GJ3WMR	645km
144MHz tropo	GM8MBP-DF5GX/P	1,300km
144MHz ms	DK3UZ-9H1BT	2,021km
144MHz Es	GW4CQT-SV1DH	2,650km
144MHz ar	G3ZIG-UR2RQT	1,810km
144MHz eme	GW4CQT-W6PO	8,439km
432MHz tropo	VK6KZ-VK3ZBJ	2,460km
432MHz eme	G3LTF-JA6CZD	13,600km

#### Auroral reports

The following dates should be noted on the auroral warning calendar printed in last month's 4-2-70: 4, 27, 28, 29, 30, 31 August and 1 September. Warning of the aurora on 27 August came initially from Clive Penna. G3POI, who was working stations on the 14.340MHz vhf net when a UA3 station broke in to say there was an aurora in progress in northern Russia. This aurora first showed up on GB3LER, just 15min after this telephone call, at 1355gmt and continued until 1710gmt. It recurred again at 2155gmt and faded out in the early hours of Monday morning at 0130gmt, only to spring to life again on 70MHz at 0500gmt. G3JYP at Appleby heard the 70MHz beacons very strongly via the aurora at this early hour when there were few stations on the band. G3JYP eventually worked G3FDW, G3TAL, G3DAH and GI3RXV on 70MHz, and Angus McKenzie, G3OSS, could still hear 70MHz auroral signals at 0945gmt.

By 0600gmt on the same day the aurora was once again apparent on 144MHz, with Clive Morton, G4CMV, at Leeds, reporting very strong signals from both the Lerwick and Swedish beacons but very few signals on the band. Willie Low, GM8NSU, at Aberdeen, reports hearing GB3LER, SK4MPI, DL0PR, GB3NEE, GB3VHF and GB3CTC, all at good signal strengths, via the aurora at 0815gmt. GM8FFX has only been able to find one previous reference to such a late morning aurora in the last 30 years of vhf reports—further reports on this very unusual event would be welcomed by the RSGB Auroral Co-ordinator, Charlie Newton, G2FKZ, 61 Merriman Road, Blackheath, London SE3.

The excitement of the previous 24 hours had hardly died down when a large scale event started—this time at 1345gmt on the afternoon of the same day, 28 August. This phase lasted until 1810gmt and enabled stations all over Europe to participate in the event. During this period GM3JFG in Fortrose, Ross-shire, worked G3OSS on 70MHz to establish a new auroral record for this year, and went on to work GD2HDZ on both 70 and 144MHz. German visitors to Scotland GM5MJH, GM5MJI and GM5MJJ, operating from YR80j, stayed on ssb throughout this phase and worked 45 stations in nine countries, while the Oxford University Group, GM3OUR/P, at the Mull of Galloway, stuck to cw to work 65 stations in 14 countries in the same period. The aurora restarted at 2230gmt and continued until 0300gmt, with outstanding signals being monitored from LA8YB throughout this third phase.

Auroras recurred on each day during the period from 27 August until the early hours of 2 September. These six events in a row usually started with an afternoon phase and weaker evening and after midnight phases. It

is also interesting to note how the auroral signals move south as the aurora starts. The start of the event on 27 August could be heard by several Aberdeen stations in the early afternoon, but could not be heard by GM8NCM in Glenrothes, Fife. The start of other events during "aurora week" could be heard at both Aberdeen and at Glenrothes, yet at the same time signals from GB3LER were normal with G8LIC at Middlesbrough. In the early stages of auroras G8LIC often monitors Scottish stations working to Sweden and Norway for a few minutes before the aurora reaches Middlesbrough and he is then able to participate in the event. It has been found that a magnetic "A" index figure of 45 is the lowest level at which London stations can use the aurora on 144MHz. Auroras like the one on 27 August, a day on which the "A" index was 22, is limited to participation by northern stations only. The provisional "A" index figure for 28 August was 72 and allowed stations all over Europe to work each other. The geomagnetic data for the period shows that a sudden-commencement magnetic storm started at 0247, and this change on the magnetometers heralded the ensuing auroral events.

The latest details of solar, geomagnetic, and auroral activity are given each week in the RSGB News Bulletin Service.

#### FM in the beacon band

Many readers have written to agree with the remarks made by Angus McKenzie, G3OSS, about fm stations operating in the beacon band and on the rtty and sideband frequencies. Alan Turner, G3UFP, from Harpenden notices an increasing tendency for fm stations with synthesized rigs to turn the dial till they are free from other stations. G3UFP frequently hears fm between 144·90 and 145MHz and often around 144·350MHz. Listener Martin Chapple, from Leamington Spa in Warwickshire, also laments the number of fm stations who transmit on top of beacons, and comments on nets being established around 144·900MHz.

It is good to see that several of the repeater group newsletters have been advising their members to act responsibly and observe the band plan which was drawn up to assist all vhf operators.

#### Beacons

The 70.685MHz beacon in QTH locator AL71d has been beamed south for the autumn at the request of the Propagation Studies Committee to aid research into f2 propagation. Roland Whiting, 5B4WR, in Cyprus, has applied for permission to operate a special 70MHz beacon on the island. Well-known 50MHz enthusiast Gordon Pheasant, G4BPY, at Walsall, reports hearing the 50.498MHz signal from 5B4CY on a regular basis. Gordon has just completed a 5-element beam for 50MHz and has also been hearing ZB2VHF on 50.004MHz from Gibraltar.

The new 144.885MHz beacon OY6VHF on the Faeroe Islands is proving to be a most useful guide to conditions. GM8LHE and GM8AZS in Elgin, Morayshire, have been hearing the beacon on almost a daily basis, and OY6VHF has also been heard aurorally at Aberdeen by GM8NSU.

#### SMIRK and 50MHz

Mention was made of SWOT (SideWinders On Two) in June 4-2-70, but this month it is the turn of SMIRK. The Six Metre International Radio Klub is devoted to keeping 50MHz active and utilized by amateurs, and now boasts a membership of 2,630 members in 27 countries. The SMIRK bulletin contains a great deal of 50MHz international dx news; the latest issue mentions that 43 countries now have permits to operate on 50MHz. SMIRK member JH1USR worked 12 countries recently, including W, VK and ZL. Another member, KH6IAA has worked dozens of South American stations, including CE. LU and PY.

Many British amateurs are now equipped for 50MHz reception using Microwave Modules converters, and some are hoping for crossband contacts to either 28 or 70MHz. Gordon Pheasant, G4BPY, at Walsall, heard S9 plus signals from the new Cyprus beacon 5B4CY at both 0900 and 1720gmt on 4 June. G4BPY is trying to get someone in Cyprus to come on 70MHz for a crossband QSO. Brian Bower, G3COJ, also heard 5B4CY on 4 June, and again on 8 June at 0650gmt. The 5B4CY beacon came into service on 28 May from QTH locator QU14g; it runs 30W output to a 5-el Yagi beaming at Britain. The keying is A1 and the beacon is on 24 hours a day: reports should be sent to Roland Whiting, 5B4WR, at PO Box 1267 Limassol, Cyprus.

On 7 June at 1750gmt Brian Bower, G3COJ, heard a beacon on 50-030MHz signing ZB2VHF. This turns out to be a valve beacon with a QVO6-40 in the pa which ZB2BL puts on the air when he is at home. Apparently it gets very hot and ZB2BL does not dare to leave it on the air unattended. This beacon was heard in New England on the east coast of the USA for two hours from 1800gmt on 4 June.

#### Grapevine

Further auroras occurred on 9 and 10 September. GM4DSZ worked 11 countries, with good signals being heard from OZ9SW and GW4CQT. GM8DMZ and GM8NSU both report hearing OY6VHF via the aurora at 0030gmt on 10 September...GJ8ORH denies his newly arrived son is to be named Roger Roger...G8BHH/P worked EA3JM (BC44e) at a distance of 1,197km in the recent 144MHz Open Contest...GI5AJ, EI6AS and LA6HL all very much in demand in the recent auroras...DK1PZ/P, in far away QTH square FL33j, worked GM4CXP and G4FUT during a Monday night cw activity period on 4 September...Just in case you are making a trip to JY the repeater is on 147.700MHz...G3OSS full of praise for the latest additions to his antenna farm—an SMC log periodic and an F9FT Tonna 16 element...GM8DMZ has put up a heavy-duty model Versatower and is in the process of putting up four 8-over-8 slot-fed Yagi antennas...During the sporadic-E season CN8CC accessed two British repeaters, but no-one worked him thinking he was a pirate...G8OPR, G8MWV and G8BKF all report good dx in the auroras-full report next month.

Finally, thanks for the letters and telephone calls. Record your news item on the 4-2-70 answering machine by ringing 0224 780347, or post to PO Box 49, Aberdeen. CU at the Leicester exhibition.

# microwaves -

Charles Suckling, G3WDG \*

#### 10GHz troposcatter tests

During the June Microwave Contest, signals were received on 10GHz by G3JVL from G3OUR, over the very obstructed 110km path from Oxford to Hayling Island. G3JVL was using his usual receiver which incorporates a Plessey GaAs fet preamplifier (NF = 2.7dB), while members of the Oxford University RS (G4CNV, G3YGF and G3WDG) set up a 10W twt and 4ft dish on top of the engineering science building, some 100ft agl. The twt was driven by a 3mW crystal-controlled source, which consisted of a 6W semiconductor exciter at 384MHz, driving a 2C39A tripler to produce about 1W at 1,152MHz, which was multiplied to 10,368MHz using a BXY41E step recovery diode. The signal was received at G3JVL within seconds of switching on the transmitter, and peaked about 20dB over noise in a 2.5kHz bandwidth, but with considerable rapid fading indicating that the propagation was via troposcatter.

An attempt was made to cover the path in the opposite direction, using a cavity locked Gunn, as the local oscillator, and a narrow-band 30MHz i.f. The residual instability proved to be too serious, and G3JVL's signal

could not be detected.

On 15 August a successful test was carried out, following the construction by G3YGF of a proper narrow-band receiver. This employed a GaAs Schottky barrier diode as the mixer, mounted in a cavity between two filters—one on the local oscillator frequency (10,224MHz), and the other on the signal frequency (10,368MHz). This arrangement reduces the conversion loss of the mixer by preventing spurious mixing of the signal with the second harmonic of the local oscillator, generated in the mixer diode. This normally happens in simple mixers, and results in an unnecessarily high noise figure. Similar mixers are under construction by G4CNV and G3WDG, and it is hoped to publish the design in due course.

Using a 4ft dish feeding this receiver, the signal from G3JVL's 6W twt was received over the 110km highly obstructed path to Oxford at 22dB over noise in a 500Hz bandwidth. Judging by the results now obtained over this path, it should be possible to make two-way contacts with this equipment over obstructed paths several hundred kilometres in length on a regular basis.

#### More cross-Channel contacts on 10GHz

Following the contacts mentioned in *Microwaves* last month, it is a pleasure to report a number of other recent cross-Channel contacts. On 11 August G8BDJ and G8GKV, operating from Mill Hill, near Shoreham-by-Sea, worked F0AKD/P (G3JHM) located near Barfleur (ZJ24A). Signals over this 155km path were S9 + in both directions. A thick mist covered the sea, indicating

\*Physical Chemistry Laboratory, South Parks Road, Oxford OX1 3QZ.

the possibility of good super-refraction conditions. Two days later, this time operating from Chanctonbury Ring (ZK09F), G8BDJ and G8GKV contacted F0AKD again. The latter contact is particularly interesting as there was a considerable obstruction at the Sussex end of the path. On this occasion, both GB3IOW and GB3ALD were received at good strength by G8BDJ and G8GKV.

G8BDJ reports that F0AKD has also had recent contacts with F3LP and F1BQ, over a 98km obstructed path

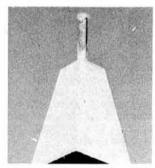
between Cherbourg and Le Havre.

#### Beacon news

The reappearance of the Alderney 10GHz beacon GB3ALD has led to some recent interesting observations of super-refraction propagation. On 28 July, G3JHM and G8BDJ, operating at 400ft asl on Mill Hill, 1km north of Shoreham-by-Sea, received the beacon 10dB above noise. Half an hour later, after moving the equipment down to the beach, the signal was somewhat stronger and, on setting up the tripod actually in the sea (!), the signal increased further to 20dB above noise. This would seem to indicate the existence of a very low-level duct. A day later G8DIC and G3JVL also received GB3ALD, both from G8DIC's home QTH and from the seafront at Hayling Island. An interesting observation was that the GB3IOW 10GHz beacon was much weaker than usual. Later in the evening the signal from GB3ALD decreased in strength while that of GB3IOW increased, corresponding with the onset of thunderstorms. G3JVL believes that the presence of the super-refraction duct, responsible for the strong signal from GB3ALD, was tending to screen GB3IOW, which is located approximately 800ft asl and, therefore, probably above the duct.

G8BDJ reports that he has previously heard GB3ALD from a number of sites in Sussex. The best dx so far is 195km, from White Hawk Camp near Brighton. This appears to be the longest distance over which any

10GHz beacon has been received.



A view of the GB3UOS antenna installation

Much has been said in the past few months concerning 1·3 and 10GHz beacons. Perhaps it is worth remembering that there is also a UK beacon on 3·4GHz, GB3UOS. This is located 10km NW of Sheffield, 400m asl, with a good take-off north through east to south. It runs 400mW output on 3,456·00MHz into a 10dB gain slotted waveguide antenna, which is shown in the photograph. Further details may be obtained from G8AGN.

# the month on the air

John Allaway, G3FKM\*

UNHAPPILY the writer receives several letters each month telling of instances where callsigns are being pirated. The matter has usually already been referred to the Home Office. However, it appears that another illegal and mean practice has appeared on the bands in the form of an amateur or amateurs who use the callsigns of others to cause deliberate interference—especially on the frequencies of rare dx stations. The callsign belonging to G3RCA has been used a great deal recently in this way, and at least three dx "pile-ups" have been interfered with by "G3RCA" calling "CQ DX" on the frequency on cw. In addition, his call is being pirated on 21MHz cw by "G3RCA/GC"—the inaccuracy of the callsign indicating that the culprit is stupid as well as being a law breaker!

Bernard Randell, G3ALE, is in Mexico and on the air as XE1RV. He has been there since 1966 but has received cards for contacts with "GW3ALE" in May 1978, allegedly on 21MHz ssb. The pirate called himself Bill.

G3VYZ has written to say that the callsign of the Tyneside ARS—G3ZQM—is being pirated on both 14 and 144MHz.

3.5MHz dxina

Now that the winter season is almost here, some minds will be turning to increased use of the lower frequency bands for dx work. Readers who have taken even a passing interest in 3.5MHz dx working will realize that this is a special part of the dx scene, and will also most likely have heard John Devoldere, ON4UN, on the band. John has already contacted nearly 300 countries on 3.5MHz, and has written a book, 80-metre DXing, which is a valuable source of information about antennas, receivers, propagation, special operating techniques, and other subjects of great value to those hoping to obtain the best results. Your scribe recommends it as being excellent value: it is available from RSGB (see price list on inside back cover).

Expeditions

G2DRT reports that Operation Drake, with four young people aboard, will leave Plymouth in October 1978 and return in October 1980. The venture is organized by the Scientific Exploration Society and it is planned to carry out exploration work on the world-wide trip. There will be an amateur radio station aboard, but the callsign is not yet known.

#### IARU Monitoring System

Listeners tuning in the vicinity of 14,140kHz between 0600 and 0645 on Fridays may hear GB2IW. This is the special callsign allocated by the Home Office to the station (currently operated by Stan Cook, G5XB) which exchanges information on intruders on our bands with organizers in other countries. G5XB is RSGB Intruder Watch organizer and keeps a schedule with stations in Australia, New Zealand and the USA at the time and on the frequency mentioned. He wishes readers to know that he is not allowed to make ordinary contacts using the special callsign, but would be happy to make these after he has finished and in this case using his normal callsign.

#### News from overseas

John Evans, A35JE, has kindly sent along the following information concerning the Radio Society of Tonga—"The RST was formed and christened at a meeting of local amateurs and listeners on 18 July 1978 in Nuku'alofa. Present on this historic occasion were A35s CR, DG, DE, RB, TV and WL, as well as A35JE. The national prefix is A3Z but A35 is allocated to amateurs to distinguish them from commercial stations in the kingdom. It is customary at present to issue licences with the operator's initials as a suffix. Interest in telecommunications was much increased when HM The King, son of the famous Queen Salote Tupou III, opened a new Cable and Wireless satellite station on 4 July. The station manager is Dennis Mattocks, a valued member of RST."



A photograph taken by the official photographer to the Tongan Royal Family showing Bill, A35WL, in his station. On the left is G3WET/A35JE who has been on UK government service in Tonga. Station equipment consists of an FT-301D transceiver and G5RV vertical, 14MHz wire beam, and 21MHz rigid beam antennas

KV4CI has written to say that he will stop answering QSLs, effective 31 December 1978. All contacts prior to that date will be acknowledged provided that the card is accompanied by one irc (for sea-mail) or two (for airmail). From 1 January 1979 onwards only 1.8MHz contacts will be QSLd—50 years as a ham and a faithful QSLer should be enough . . . Pat concluded by saying,

<sup>\*10</sup> Knightlow Road, Birmingham B17 8QB.



Dale Jones, GU5CIA (K5MM), operates this station from St Martin's, Guernsey

"Being a KV4 is becoming a nightmare as far as QSL

demands go-I just quit."

GU5CIA will be in Guernsey for two years and will be active mostly on 14MHz cw. He has a Drake 4-line, 18AVT, wire antennas for 1.8, 3.5 and 7MHz, and should have a four-element triband beam by now for 14, 21 and 28MHz. He activated GU5CIA on 21 May and had already completed a WAS by the end of July. Dale's home call is K5MM and he was second operator at

EP2SV for a couple of years.

In a letter to G2BVN, Majid Abdul Hameid, one of the operators of the Radio Club of Baghdad station Y11BGD, says that activity recommenced on 17 June following the change of location to Azamia Kasrah. He says that the club will be active on Mondays and Wednesdays from 1500 to 1800 on 14,210kHz, and on Fridays on 14,310kHz from 2000 to 0100 (especially for the USA). They have received equipment in the form of an FT101E and vfo from JA1BK, and an FTDX560 and vfo from a group of Finnish amateurs. In addition, 101J has supplied QSL cards. The club is particularly grateful to SRJ and YU1NZV for providing instruction in amateur radio.

#### DX news

I2FGP operated for about four weeks commencing mid-July as 601FG from Somalia. He was required to confine his transmissions to 14,205kHz and to use English only. He made 1,400 contacts, and it is believed that he will return shortly—other Italian amateurs also hope to

visit the country.

The DX Advisory Committee of ARRL has recommended that country status should be accorded to United Nations HQ in New York. Other recommendations (which will probably not be implemented in the immediate future) were that Bophuthatswana should also be recognized as well as the southernmost region of Bophuthatswana (which is separated from the rest of the country by more than 75 miles of another territory). It is looking into the possibility of denying in future any application for credit for an area which is a "demilitarized neutral, or buffer zone, or an embassy, consulate, or extraterritorial monument".

The UN HQ in New York has an amateur station, 4U1UN, already active within it. At the time of writing, the operator "Max" was trying to give as many contacts as possible by appearing on 14MHz on each weekday. In the coming months the station will probably be moved into a more suitable place, and it is hoped that the North California DX Foundation will be supplying a beam antenna. Operation has been around 14,240kHz, and regular future activity is promised. QSLs go to the address in "QTH Corner".

A51PN has been away from Bhutan for a period but may have returned by now. He has been heard in the Seanet group which meets daily at 1400 on 14,320kHz. QSLs should now be sent direct and not via W1JZ.

VE1MTA is said to be on Sable Is and has been heard on both 14 and 21MHz. The operators say that they will be there for a year. According to the *Call Book* the callsign is allocated to the Sable Island MOT ARC.

LUIDZ has said that a station is to be constructed on the South Sandwich Is and that the Groupo de Argentine ARC would be sponsoring amateur activity and dealing with QSL requests. Some sources believe that LU3ZY has operated from the islands this year.

D4CBS hopes to be in Sao Thome by now and should be there for three months. He will try to be on the air with an S9 call, and to operate on both cw and phone. However, a message from TR8LE says that S9RLB has been closed down by the local authorities so there is some doubt about anyone else being allowed to operate.

F5VU reports that Guy, FR7ZL, will be on Glorioso Is as FR7ZL/G from 2 November to 31 December.

Maurice, G3ZXD, will be in North Yemen from September, but unfortunately will be unlikely to be able to obtain operating permission. He will have to suspend dealing with requests for VP8PI QSLs during his absence.

QSL cards for contacts with stations in South Sudan (ST0) may be submitted for DXCC credit after 1 November 1978. Contacts must have been made since 7 May 1972.

Axel Tigerstedt, OH5NW, President of SRAL, confirms that the station which has been using the callsign OJ0BW is a pirate.

#### Welcome

The following overseas amateurs joined the Society recently; CT4MS, DF5TB, EA5PS, EI7CD, F1DRR, F5NK, H44EH, I1LGR, JA1MKH, K2XC, K4VA, PE1CNQ, VP8QJ, WA2GWI, WB2FTK, WB4JLT, W9NTP, ZS1RU and 3B8DZ.

**Dxpeditions** 

Full information on the autumn expedition to Navassa Is has now been received. Transport and landing permission has been arranged and the group should be on the island from 25 November until 2 December. The operation will consist of four stations operating simultaneously on 3·5 to 28MHz on both cw and ssb. The North California DX Foundation and Long Island DX Association are supporting the group, which consists of K2KA, W2PAU, W6OIG, N0TG, W0RJU and W0ZH. The callsign of the station will be N0TG/KP1 for ssb, and W0RJU/KP1 for cw operation. Likely transmitting

frequencies are: 3,505, 7,005, 14,030, 21,030 and 28,005kHz (on cw), and 3,795, 7,180, 14,205, 21,280 and 28,550kHz (on ssb). QSLs should go to N0TG (see "QTH corner").

The Quito RC, with K1MM, will visit the Galapagos Is during the CQ WW DX Contest. The callsign of the

expedition station will probably be HD8E.

Long Skip reports that a group of members of the Potomac Valley RC will visit Curação for the CQ WW DX Contest (Phone). They will operate on cw before and after the contest and will be on all bands 1.8 to 28MHz. The same source quotes a report from XEIJ that an expedition to Revilla Gigedo will take place either between 16 and 19 November or between the same dates in December. This group will also operate on all bands.

Unconfirmed reports say that a group of American amateurs from the fifth call area hopes to visit a rare location in the Pacific Ocean area in October—this

could possibly be Tuvalu, VR8.

A team consisting of ZL1s AJL, BKL, ADI, AMO, ZL2AH, ZL4NF and WA6YQW will be visiting Chatham Is between 27 October and 6 November. Their station will have the callsign ZL3HI/C, and the first weekend of their operation will be devoted to the CQ WW DX Contest. It will be an all-band action covering 1.8 to 144MHz, cw and ssb; it is also hoped to transmit some sstv. Special efforts will be made to work novice stations, and when these are being made others will not be contacted.

The expedition to Iceland and the Faeroe Is by G4DSE, G4DXC, GM3OLK, GM3YOR and GM8NCM was most successful. GM3YOR reports that 6,500 contacts were made—1,500 on cw and 1,000 on ssb from OY, and 2,500 on cw and 1,500 on ssb from TF. The group was privileged to use the clubroom of the Torshavn club in OY, and several locations were used in TF. All contacts will be QSLd via the bureau in due course.

Some W9s—including K9RA, WA9EYY and W9UCW, as well as K1PBW and HK0BKX—will visit Serrana Bank during January. The expedition hopes to stay there for four days.



Muhammed, YI1BGD (left) and Tom, YU2DX (centre) with your scribe during the SRJ meeting at Bor

Jacky, F6BBJ, is believed to be planning a visit to Abu Ail sometime during the next three months.

WB5WIT may be in Transkei late this month using

the callsign S8ABC.

According to W4OO, the West Palm Beach RC will be going to the Turks and Caicos Is for the weekend of the CQ WW DX Contest (Phone). The group will be there for about a week, but its VP5 call is not known at the time of writing.

#### Contests

Results of the 1977 CQ WW DX Contest (Phone) appeared in the August issue of CQ. Scores of British stations were as follows:

	Single-c	perator		
	Points			Points
(All band)	192,400	G3ZQW	(14MHz)	535,432
(All band)	179,564	G3KKJ	(14MHz)	147,056
(All band)	89,262	G3VOF	(14MHz)	82.080
(All band)	64,629	GW3SLA	(14MHz)	50,102
(All band)	25,740	<b>GM3XNJ</b>	(14MHz)	29,990
(All band)	21,746	<b>GW3MPB</b>	(14MHz)	21,024
(All band)	4.180	G2AJB	(14MHz)	11,340
(28MHz)	32,706	G3KTR	(7MHz)	8,550
(21MHz)	672,520	G4BDL	(7MHz)	5,809
(21MHz)	180,948	G4BXT	(3.5MHz)	28,073
(21MHz)	4.004	G3XWZ/A	(1-8MHz)	1.449
(14MHz)	668,506	G3YMC	(1·8MHz)	1,260
	(All band) (All band) (All band) (All band) (All band) (All band) (28MHz) (21MHz) (21MHz) (21MHz)	(All band) 192,400 (All band) 179,564 (All band) 89,262 (All band) 64,629 (All band) 25,740 (All band) 21,746 (All band) 4,180 (28MHz) 32,706 (21MHz) 672,520 (21MHz) 180,948 (21MHz) 4,004	(All band) 192,400 G3ZQW (All band) 179,564 G3KKJ (All band) 89,262 G3VOF (All band) 64,629 GW3SLA (All band) 25,740 GW3MPB (All band) 4,180 G2AJB (28MHz) 32,706 G3KTR (21MHz) 672,520 G4BDL (21MHz) 180,948 G4BXT (21MHz) 4,004 G3XWZ/A	Points   192,400   G3ZQW   (14MHz)   (All band)   179,564   G3KKJ   (14MHz)   (All band)   89,262   G3VOF   (14MHz)   (All band)   64,629   GW3SLA   (14MHz)   (All band)   25,740   GM3XNJ   (14MHz)   (All band)   21,746   GW3MPB   (14MHz)   (All band)   4,180   G2AJB   (14MHz)   (28MHz)   32,706   G3KTR   (7MHz)   (21MHz)   672,520   G4BDL   (7MHz)   (21MHz)   672,520   G4BDL   (3,5MHz)   (21MHz)   4,004   G3XWZ/A   (1,8MHz)   (21MHz)   4,004   G3XWZ/A   (1,8MHz)

	Multi-operator, si	ngle-transmitte	r
<b>G6UW</b>	1,912,292 points	G3KMI	835,780 points
G8JC	1,181,534 points	G3RCV	497,776 points
G3VPW	1,170,246 points		

Certificate winners are listed in bold type, Congratulations to G3MXJ who came world sixth on 21MHz.

Results of the 1978 PACC Contest have been received. UK scores were as follows G3EST (2,280 points), GM3KLA (2,132), G4AEM (1,105), G2HLU (660), G3UAS (408), GM4ELV (299), G3XFW (252) and GW3SLA (208). In the multi-operator section G3JRM scored 518 points, and in the listener section BRS15822 2,430 points and BRS34310 969. G4FDC submitted a check log. Stations listed in bold type are certificate winners.

#### Awards

The Norgessertifikatet-WALA

For contacts with LA/LB stations after 1 January 1950. Applicants outside the Scandinavian countries must produce evidence of contact with 20 different LA/LB stations on any band or mode. At least six of these must have been located north of the Arctic Circle (QTH must be clearly shown on the QSL). Minimum reports of RST 338 or RS 33 must be shown. Contacts with JW and JX count and are north of the Arctic Circle. Applications should consist of a list of QSLs certified by the awards manager of a national amateur radio society accompanied by 10 ircs and posted to: NRRL Award Manager, Hans E. Kinck, LA4YF, N-3800 Bo I Telemark, Norway. If application is made within one year of the NRRL 50th Anniversary Contest, contacts made during this competition may be used in place of QSL cards.

#### The Grand Prix Award

Issued by the Radio Club of Monza (a branch of ARI) to celebrate the Formula 1 Grand Prix. Requirements are contacts with 15 members of the club during the month of September (all the same year). Listeners may also apply.

Contact with the special station counts as with two members. Post applications (with 10 ircs) before 15 November to: PO Box 1, 20052 Monza, Italy.

#### Radio Club Argentino Award

Form these three words utilizing only the two letters after the digit with different prefixes, one of which must be LU (ie CT1RA-OK3DI-PY2OC-W8LU-LU3BA etc). Any band/mode. Starting date 1 January 1965. Send certified application to LUIDJU (see below).

#### The CEMARA Award

The Servicio de Radioficionados de la Armada (SARA) and the RCA issue this award to those who have confirmation of contact with at least 25 maritime mobile stations since 1 January 1960. Ten must have been with Argentinian ships (five from the Argentinian Navy). Send certified application plus 7 ircs to C. L. Hardy, LUIDJU, Awards Manager, R. Pena 406, 1828 Banfield, PCIA de Buenos Aires, Argentina.

#### The La Scala Award

For contacts between 1 September and 31 December with members of the Milan Radio Club. Each counts one point except with I2CUK, I2DMH and I2UCE (who are performers at La Scala) which count three. European applicants require 25 points. The same station may be worked on each band. Send a QSL plus list of contacts and 10 ircs to: Mario Ambrosi, I2MQP, Via Stradella 13 20129 Milano, Italy. Note that Milan stations will be found around 3,570, 3,670, 7,035, 7,070, 14,070, 14,270, 21,070, 21,320, 29,070 and 28,570kHz.

#### The SR Macedonia Award

Available to licensed amateurs and listeners who have confirmed contacts with at least 10 stations in eight different towns in Macedonia (YU5) since 1 January 1977. Applicants outside Europe need only five contacts with at least three towns. Send certified log extract and two ircs (for postage) to YU5 Award Manager, PO Box 14, 91001-Skopje, Yugoslavia.

#### Heraclea Lyncestis Award

For five points gained by contacting stations in Bitola since I January 1973. YU5s known to be active are CEF, XKB, RH, XDM, XDS, XBY, XIM, XKM, FAG, XAW and XGZ, Send certified list (plus eight ircs) to: Radio Club, PO Box 111, 97001 Bitola, Yugoslavia.

#### XIth Commonwealth Games DX Award

Fifty points must be earned in the following way: 10 for contacting the special Commonwealth Games station CG6A, two for a confirmed contact with a Commonwealth country (only one contact per country allowed), including Canada other than CG6, and one point for each contact with Edmonton stations using the CG6 prefix. At least 10 points must be gained by working non-Canadian stations. All contacts must be during 1978, and applicants should send a list of stations worked, date of contact, and points claimed (certified by a club official) plus five ircs to Commonwealth Certificate, PO Box 163, Edmonton, Alberta, Canada.

#### Bird of Paradise Award

For contacting a minimum of five P29 stations located in at least three different provinces of Papua New Guinea since 17 September 1975. A certified log entry plus 10 ircs should be sent to: Awards Committee, Box 204, Port Moresby, Papua, New Guinea.

#### OTH CORNER

	QIH CORNER
A2CPS	Peter Strauss, PO Box 35461, Northcliff, 2115,
	Republic of S Africa.
A4XGG	Box 3071, Seeb Airport, Muscat.
C21KM	(see H44KM)
H44KM	via WA6AHF, R. L. Hughes, 17494 Via Alamitos, San
	Lorenzo, Cal, 94580, USA.
KA1IW	via K8DYZ, J. B. Navarre, 6025 Freedom Lane, Flint, Mich. 48506, USA.
KA1NC	via K4JEX, N. M. Singletary, Box 475, Clarkton, NC.
KANG	28433. USA.
км6ВІ	after 1 July 1978 to W5RU, D. G. Thompson, Box 64,
KINIODI	Artesia, Miss, 39736, USA. NOTG, R. Rowe, 3237 Connecticut Drive, St Charles,
NOTG/KP1	NOTG, R. Rowe, 3237 Connecticut Drive, St Charles,
W0RJU/KP1	Missouri, 63301, USA.
KP4AM/Desecheo	via W6WX, N California DX Foundation, Box 717,
	Oakland, Cal. 94064, USA.
P29BL	(see 9M6SN)
PJ9KK	J. Kanoda, N4MM, Rte 1, Box 73-A, Boyce, Va.
	22620, USA.
STOYY	Dr S. Hutson, Box 5299, Little Rock, Ark, 72215.
	USA.
VE1MTA	Upper Air Stn. Sable Is, PO Box 40, Elmsdale, NS,
· cimira	BON 1MO, Canada.
VKOAS	via VK3ZAT c/o VK3 QSL bureau (after March 1979)
VP2EEK	via WA3HUP, Mary Crider, RFD 2 Box 5-A, York
VEZEEN	Haven, Pa. 17370, USA.
VP8QT	via G8IHT, S. B. Chambers, 7 Mowbray Rd.
Vraui	Northallerton, N Yorks, DL6 1QT.
ZL3HI/C	
ZL3HI/C	via N2CW, 207 West 5th St, Ship Bottom, NJ, 08008, USA.
3B8ZZ	via W2GHK, PO Box 7388, Newark, NJ, 07107, USA.
3D2CC	via VE6AKV, D. McKoen, 7612 23rd St S, Calgary,
30200	Alberta, T2C 0Y1, Canada.
4U1UN	ARC, UN Staff Recreation Council, Box 20, New York
	City, NY, 10017, USA.
5B4DT	now Tom Drake, G4GYC, 14 The Elms, Andover,
	Hants.
7	1101101

rian D. J. Brander, Carl-Kistnerstr. 19, D-7800 Freiburg Breisgau, W Germany. via JAZKLT, Y. Maruyama, 204 Gonaka, Shinozuka, Kozakai, Hoigun, Aichi 441-01, Japan. RSGB QSL Bureau, G3DRN, 30 Bodnant Gardens, London SW20 0UD

#### Diploma 100 EAs-CW

HZ1BS/8Z4

9M6SN

Issued to those who have confirmed contacts/reception reports with at least 100 Spanish stations—all made on cw. At least seven EA districts must be represented and at least three different bands covered. Contacts with the same station on different bands will be accepted provided that they were separated by at least three days. A list of QSLs (certified by a national society award manager) plus ircs for postage should be sent to URE, PO Box 220, Madrid, Spain. Note that confirmations should have been dated since 1 January 1969 and that the list of OSLs should indicate calls in alphabetical order and give complete OSO details.

#### The Espana Diploma

For confirmed contacts with 125 different Spanish stations since 1 January 1952. At least eight districts (with a minimum of three contacts with each) must be represented. The same station may not be worked on different bands for credit in the case of this diploma. Listeners may apply and require 60 stations on either 3.5 or 7MHz, 40 on 14MHz, 15 on 21MHz, and 10 on 28MHz. Apply as for Diploma 100 EAs-CW.

#### Band reports

G8KG has kindly supplied a progress report on Cycle 21. He says that the steep rise of solar activity in late 1977 and early 1978 has not been sustained, and, while the highest daily Zurich sunspot numbers (158) so far recorded for this cycle were on 22 and 23 June, the lightly-smoothed curve shows that mean activity levelled off in April/May and has since fallen somewhat. The provisional Zurich number for August was 56.7 (compared with 94.7 for April) and the three-month mean values centred on January to July are 61, 71, 86, 83, 89, 81 and 73 respectively. Smithy points out that subsidiary peaks or plateaux of this sort are by no means uncommon and that there is no suggestion that the peak of the cycle has passed. On past form it is probable that the downward trend will have begun to reverse by the time that this appears in print and will be followed by another steep rise taking the monthly numbers well past the 100 mark by the spring.

Many thanks to the following for supplying logs from which the following section has been compiled: G2AMV, G2HKT, G3KSH, GM3LYY, GM3OXX, G3RCA, G4EHQ, G4EZC, G4FMO and G4HJA, G8PQU, and BRSs 33915 39097.

Stations listed in italics were using cw.

3.5MHz. 0100 HK, PY, UHB.

7MHz, 0000 CX, VU, 0500 VE7, W6-W7, ZL, 8R1X, 0600 EA8EJ, 0700

VR3AK, ZL, 7X4AN. 2100 ZU7, 4K1A, 4K1GM. 2200 EP2IA. 2300 CO, CP, CX, HI, UB5MC/UF6.

14MHz. 0000 C6AEY (QSL to WB9HAK), VE1MTA. 0600 FB8YF, FO8FC, VK. 0700 A35JE, A35WR, CE0AE, F00AKV, FO0RS, OJOMA, VK0NL/VK0N VK9NI, VR3AK, ZK1CY (OSL to W6KNS), ZL4R/A, 5W1AU. 0800 C21KM, KH6, VK, VR1AY, ZL, 3D2CC. 1000 KA1NC. 1500 Y11BGD, 9V1NR. 1600 3B8ZZ. 1700 HS1ALP, WA4YVG/VQ9. 1800 KH6. 2000 G6ZY/CN, FK8CR, J28AL, KX6MP, HZ1BZ/8Z4. 2100 W3NZ/7 (Wyo), 4U1UN. 2200 FY0EOL. 2300 ST0YY.

21MHz. 0800 KH6AQ, 4D80UT (QSL to JA1UT). 1000 H44LW, P29RA, STORK. 1100 C21TA. 1200 P29NYL. 1300 H44ZZ. 1500 HP3XWB (QSL to DL1HH), VU2GOB, YV4OW/7. 1600 J28AP, 4S7EA, 5H3FW. 1700 CE9AT, S79NLB, S79WHW (S79 QSL bureau-Box 491, Mahe), 5R8AL, 9M8HG. 1800 VP2VJ (QSL to VE3MJ), 9M6MA. 1900 D68AD, FG7BA, SU1CR, 9V1SA. 2000 FG7TD, HK0QA, K7BA (Wyo).

28MHz. 0800 JA. 1000 VK6IV. 1700 J28AY (QSL to F6ETO). 1900 C5AAB. 2200 KZ5, W1, W2, W3, W4, W8.

# HF propagation study

dicted hale (MHz v 10) for October 1979

		Lieq		hpt			101 1			6t 13				
	GMT =	00	02	04	06	08	10	12	14	16	18	20	22	24
Aden	CONTRACTOR OF THE PARTY OF THE	215	201	185	368	446	455	418	418	406	296	234	214	215
Ascension		257	243	214	196	416	460	445	431	432	389	304	262	257
Bahrain		192	182	178	364	436	446	412	411	370	266	216	197	192
		167	147	155	332	404	435	426	407	335	246	190	172	167
Bangkok														
Barbados		220	201	192	157	174	348	421	413	407	403	323	252	220
Bermuda		206	182	172	147	159	317	399	395	398	388	313	239	206
Bogota		218	195	187	149	174	234	412	413	409	397	326	251	218
Buenos Aires		242	223	206	169	256	387	420	411	415	408	315	257	242
Cape Town		249	242	192	274	384	412	415	430	444	361	294	260	249
Colombo		178	172	176	366	432	444	411	412	281	260	208	188	178
								389	385	368	279	209		. 180
Cyprus		180	177	162	303	401	417							
Dakar		241	232	209	199	397	449	441	425	418	395	307	257	241
Denver		197	171	154	147	143	145	190	307	350	352	275	214	197
Fairbanks		186	163	153	152	167	167	167	177	210	247	237	197	186
Falklands		246	229	208	173	258	379	406	425	415	406	312	257	246
Gibraltar		136	134	124	116	253	294	286	274	272	238	180	150	136
Hong Kong *		158	133	153	293	370	426	359	275	227	220	187	168	158
		187	163	153	153	206	169	167	145	169	299	241	197	187
Honolulu														
Iceland.		130	112	105	107	177	244	277	265	262	242	174	135	130
Jamaica		206	181	172	149	178	214	403	398	399	389	315	239	206
Lagos		257	246	208	221	442	469	444	436	442	371	298	262	257
Las Palmas		205	197	180	159	337	401	398	383	378	350	268	223	205
Lima		229	210	197	161	216	232	423	416	409	406	322	255	229
Los Angeles		197	171	157	147	154	149	149	244	352	342	267	208	197
Malta		155	149	133	187	321	347	331	321	317	252	191	162	155
		224	210	187	364	401	406	407	394	397	309	255	230	224
Mauritius														
Mexico		201	174	154	147	177	161	230	378	375	370	296	223	201
Moscow		138	116	112	210	304	347	359	352	296	239	169	147	138
Nairobi		228	220	186	341	451	462	432	428	425	318	261	239	228
New Delhi		169	158	162	355	418	437	420	365	277	220	194	176	169
New York		201	174	159	149	149	232	324	380	383	370	298	225	201
Osaka		167	157	153	229	304	340	284	208	186	176	159	182	167
Perth		177	171	174	366	387	384	354	315	279	258	205	187	177
		247	229	208	173	262	418	423	384	359	380	314	257	247
Rio de Janeiro														
Salisbury		241	230	190	319	388	399	407	409	412	340	276	252	241
Seychettes		218	204	187	364	399	412	425	409	376	303	247	224	218
Singapore		169	158	162	355	418	437	420	412	340	251	194	176	169
Suva (s)		152	167	155	180	260	318	345	324	258	268	221	188	152
Suva (I)		258	249	208	215	318	275	242	234	216	272	299	272	258
Sydney (s)		158	133	153	293	370	324	305	289	267	223	187	168	158
Sydney III		229	210	199	162	267	233	211	199	172	195	272	252	229
										281	251			
Teheran		177	172	176	366	432	444	411	409			204	188	177
Vancouver		190	167	153	153	149	148	149	210	252	293	247	201	190
Wellington (s)		169	164	153	220	293	321	295	272	229	219	206	187	169
Wellington (t)		252	237	214	177	246	206	194	178	174	252	282	258	252
Bands recomm	ended ar	e tho	se be	twee	n hp	and	half	hpt.						

Many thanks to all who have sent in items, and to the authors of the following: Long Skip (VE1AL/3), the West Coast DX Bulletin (WA6AUD), DX'press (PAOTO), CQ Magazine (WIWY), the Ex-G Radio Club Magazine (W3HQO), and DX News Sheet (Geoff Watts).

Please send all items for December issue to reach G3FKM by 4 November and for January by 2 December.

# Propagation predictions

During October and November the daytime mufs reach their maximum, and during the present high solar activity they will be especially high. The 28MHz band will be open to all continents during October, North America and Japan will be heard during the latter half of the month, and on favourable days (days with above average mufs) western North America also. Chances of short-skip (over distances of 800 to 1,800km) will be very few this month and throughout the following winter months. This also holds true for 21MHz. Traffic with all continents will be possible on 21MHz, and even western north America will be heard. Chances of dx on 14MHz will be good in the evening. Traffic with Europe will also be possible in daytime.

Daytime distances will increase on 7 and 3.5MHZ, and 7MHz will not be interrupted by the dead zone. Chances of dx on 7MHz will increase as the season advances and the greater part of the path lies in darkness. The best dx on this band will be around midnight. The 3-5MHz band may be interrupted during the latter half of the night by the dead zone.

The provisional sunspot number for July 1978 from the Swiss Federal Observatory was 68-4, with daily numbers exceeding 100 between 8 and 16 July. Towards the end of the month solar activity dropped to a very low level. The predicted smoothed monthly numbers for November, December and January 1979 are: 103, 107 and 111 respectively.

14MHz					OCTOR	BER 197	8
USA-East W1-4	S	DI!			Numan.	inne	IIII
USA-West W6,7	s	1 :		1 1	TV/	min vins	
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Australia VK	s	1 1		1 1	TVIII	(2)	1
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Japan JA	s	11	U/A	1 P	dun.	<b>3</b>	

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Short path 11-5days

7/////// 6-20 days

Long path

Openings on more than 20 days in the month

# council proceedings

#### A brief report of the Council meeting held on 4 May 1978

Present: Dr D. S. Evans (President, in the chair), Mr D. H. Adams, Dr Council), D. A. Evans (general manager/secretary), A. W. Hutchinson (editor).

Apologies for absence were received from Lord Wallace, Messrs A. M. Allan, P. Balestrini, J. Bazley, P. F. D. Cornish, W. F. McGonigle, C. H. Parsons and C. J. Thomas.

Financial report

In the absence of the hon treasurer, the general manager read the report which Mr Cornish had prepared. The accounts to 31 December showed a healthy surplus and this trend was continuing.

Arrangements for the coming audit were discussed, and the affairs of the Lambda Investment Co Ltd were reviewed. Consideration was given to the ballot arising from the accounts presented at the 1977 AGM.

A legacy of £500 had been received from the estate of the late W. D. Clague, G2BSA, and, after discussion, Council referred its disposal to the Membership & Representation Committee.

General manager's report

The general manager reported that the meeting which the Society had been invited to co-sponsor with the IEE would not involve the Society in any financial commitment. Council agreed to participate in this jointmeeting.

HQ items reported dealt with the new telephone system, moving the packing section into the basement, and office space.

The general manager's weekly letter to Council, which was circulated to Council members and regional and area representatives, and was being well received, was discussed.

#### Review of committee business

Education

There had been no meeting of the committee since the last Council meeting.

Finance & Staff

The committee would be submitting a recommendation to Council that the Society gives full financial support to a member who might be invited to serve on the UK delegation to WARC 79. HF

There had been no meeting of the committee since the last Council meeting.

**HF Contests** 

The committee was concerned over a decision made last year to discontinue the engraving of Society cups and trophies. The SSB Field Day rules had been discussed and it was hoped to report progress on the harmonization of rules with other IARU Region 1 societies. IARU

Mr Andrews reported on the main topics discussed in Committee A (hf) of the IARU Region 1 Conference in Hungary, and the President reported on the vhf/microwave side of the conference.

Mr Stevens reported that 36 societies had been represented at the conference and that there were 130 delegates. The one-day session on WARC had gone well, and Mr Butler, the deputy secretary-general of ITU, had attended the conference.

Mr Stevens and others praised Mrs Allin, the general manager's secretary, who had worked very hard for the IARU conference team in Hungary; also, Mr Allin had spent his holiday there working for IARU. Interference

There had been no meeting of the committee since the last Council meeting.

Membership & Representation

Council agreed a recommendation of the committee to hold the next AGM, in London, on a Saturday as an experiment.

Council's attention was drawn to waived and reduced subscriptions; the estimated loss of income approached £3,000.

Microwave

A broad specification for experimental 10GHz repeaters was being formulated.

Mobile & Exhibition

No items for discussion.

Propagation Studies

Mr Stone drew attention to a minute mentioning rejection of an article for publication on the grounds of minority interest. Mr Hutchinson had no knowledge of this and said he would contact the committee about the minute.

Raynet

No items for discussion. Technical & Publications

No meetings had taken place since the last Council meeting.

Telecommunications Liaison

A special GT prefix for the Isle of Man during its millennium celebrations in 1979 had been obtained after considerable negotiation with the Home Office.

A Region 7 meeting which had discussed the GB3LO jamming problem had been unanimous that GB3LO should not be closed down because of the jamming. The Society did not know why prosecutions had not been made; the identity of the jammers had been established for a considerable time. Council agreed with the view that the responsibility for prevention of jamming lay with the Home Office. VHF Contests

There had been comment on the lack of detail in the VHF Contest Committee minutes, but steps were being taken to circulate more information in future.

Correspondence

Mr O'Brien tabled a letter from the Yeovil club which called for a competition to encourage scientific work. Mr Stevens suggested a reply be sent applauding the idea but saying that the Society simply did not have the resources to tackle the work at present.

Mr Scarr read a letter from the AERE Harwell club which wishes to change its status from that of an affiliated society to an RSGB group. The status of RSGB groups was referred to the Membership & Representation Committee.

# bituaries

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

Mr W. D. N. Berry, G3PLI

David Berry, who died suddenly on 5 August, was a very keen and active member of the Society, and had recently been appointed Raynet controller for West Yorks. He could be heard regularly on local nets and had more recently developed an interest in Oscar. David also took a leading part in organizing JOTA stations in the Bradford area, and had been preparing for the 21st anniversary event.

Mr G. H. Fox, G4GIW (ex G8FGP)

Graham Fox died on 5 August aged 24. He had been secretary and a previous chairman of Basingstoke ARC, and, with a ready appreciation of fundamentals, coached many members through the RAE. Initially very active on the vhf and uhf bands, he was preparing to take up hf operating with his recently acquired Class A licence.

Mr S. W. P. Henton, G5VU

Stan Henton died on 2 September after nearly 50 years as an amateur. He was active on most bands, chiefly on cw, and had been concerned with radar during the last war.

Mr F. R. Robathan, G2CNW

Frank Robathan died on 27 July. He received his transmitting licence immediately after the last war, and was much involved with cw and phone dx. His array of certificates included DXCC, WAZ, Empire DX, RCC, WBE, WAS, BERTHA, WAC (Phone), WAC (CW), TOPS CW Club and RSGB. He was also an active member of MARS, and was mainly responsible for the power generator and antennas on Field Days.

Frank was not only a very active operator but constructed much first class transmitting and receiving gear, finished to commercial standards. He will perhaps be best remembered for his generous help to others, particularly younger members who he helped obtain their G calls.

Mr G. Scriven, G4GWA

Gerry Scriven, who died suddenly on 21 July, took up amateur radio on his retirement two years ago, and became treasurer of Spalding ARS in January this year.

Mr P. A. Thorogood, G4KD Phil Thorogood, G4KD, who for many years was responsible for the RSGB exhibitions held at the Seymour and Horticultural Halls, died on 12 August. As a professional exhibition manager and manager of the ASEE Exhibition Company, his contacts in the electrical and radio industries enabled him to gain substantial support for the RSGB amateur radio exhibitions.

He was an enthusiastic supporter of the London VHF Group, which put on the first vhf conventions in London, and he was a founder member of the Edgware & D.RS. For many years he was regional representative for Region 7, and his services to amateur radio in general and the Society in particular will long be remembered.

#### Mr C. J. Waston, GW3CW

John Waston, who died on 11 August aged 67, was a keen cw operator. He was an ardent supporter of BERU, NFD and other cw contests, and he never used "commercial" equipment, being a keen home-constructor. He was treasurer of the Conway Valley ARC for many

#### Mr A. E. White, G3HCU

Alan White died on 15 August aged 70. He was well known for his 28MHz activities and his work on beam antennas, first at Chiddingfold and later at Peaslake. Whether organizing club dinners or helping younger members with their licences, he did much to further the cause of amateur radio.

#### Mr G. Wilson, ZL3KN

Mr Wilson, who died on 4 October 1977, was a well-known old-timer in Christchurch, New Zealand.

We have also been advised of the deaths of:

Mr G. Main, GM4AWH;

Mr C. Tinsley, GI8KYA, on 9 June.

#### **EDITORIAL**

Under "Obituaries" in the September issue of Radio Communication we reported the death of Simon Brown, GW4ELI. This was, we regret to say, the result of a hoax letter received from someone who can only be assumed to be suffering from a sick mind. The letter contained so much personal knowledge about GW4ELI that there was no reason to doubt that it was genuine, and it was accepted at its face value, as all other obituary notices have been in the past.

We are glad to say that Simon Brown is still very much alive, but one can imagine the anguish of Simon Brown's widowed mother when she was informed by a member that this notice had appeared.

Although she had received a letter from him in August from the USA, where he had been spending a working vacation from the University College of North Wales, Bangor, the doubts that the published notice raised in her mind could not be completely allayed until her son returned in mid-September

We have all suffered from the infantile pranks of immature minds at some time, but how anyone possessing other than a sick mind, albeit in a mature body, could have perpetrated such a cruel hoax is beyond our

We have, of course, expressed to Mrs Brown our great regret that our trust that an obituary, of all things, was genuine could have been so abused as to cause her so much distress.

Obviously, this situation cannot be allowed to arise in future. It will, therefore, be necessary to refer all future obituary notices received from people not sufficiently well known to us to a local officer of the Society for confirmation. This will invariably lead to delay in publication, but this must be accepted as a small price to pay to avoid a similar occurence in future.

A.W.H

# Looking ahead

2-4 November—ARRA Exhibition, Granby Halls, Leicester. 2 December-RSGB AGM, IEE, Savoy Place, London. Note: Saturday afternoon meeting.

## Special event stations

GB3NBH, 13-14 October

14 October

An exhibition station will be set up at the North Bristol Model Railway and Hobby Exhibition, operating on hf and vhf. As many contacts as possible are welcome, and all QSOs and accurate swl reports will be QSLd via the RSGB bureau. Incoming cards would be appreciated and can be sent via the QSL Bureau or to G8BKR, QTHR. The exhibition, at Horfield Baptist Church, Gloucester Road, Horfield, Bristol (on main A38), will be open on Friday 13 October, 10am-9pm, and on Saturday 14 October, 10am-6pm. Further details available from G8BKR, QTHR.

The following special callsigns will also be on the air during October and November:

**GB3CBS** 

14 October **GB3BSC** Sittingbourne, Kent 18-26 October **GB3PLA** Port of London Arts & Crafts Exhibition, Tilbury, Essex 19-23 October GB3HBS Altrincham, Cheshire GB3HBS, Altrincham, Cheshire
GB3WRS, Whalley Range, Manchester;
GB3KSG, Kinloss, Morayshire; GB3DSG,
Dromore, Co Down; GB3DVS, Scarborough, N
Yorks; GB3CSC, Crawfordsburn, Co Down;
GB3RSS, Halifax, W Yorks; GB2ASG, Tyldesley,
Manchester; GB3NFW, Ringwood, Hants;
GB3STA, Yeovil, Somerset; GB2BOR, Bordon,
Hants; GB3SG, Bingley, W Yorks; GB3BSB,
Bournemouth; GB2SWC, Crewe, Cheshire;
GB3AVS, Shawsbridge, Belfast; GB2BDS,
Bromsgrove, Worcs; GB2SS, Saltash, Cornwall;
GB3SHQ, Edinburgh; GB3CSG, Carrickfergus. 20 October GB3SHQ, Edinburgh; GB3CSG, Carrickfergus, Co Antrim; GB3BBS Blofield, Norwich; GB3HPS, Hatfield Peverel, Essex; GB3GCS, Grimsby, S Humberside; GB3RSR, Mexborough,

Grimsby, 5 Humberside; GB3HSH, Mexborough, S Yorks; GB3PCA, Fareham, Hants; GB3FDS, Dunstable, Beds; GB2FVS, Maulden, Beds; GB3HSD, Tupsley, Hereford; GB3RN, HMS Mercury, Hants; GB3JAM, Palmers Green, London N13; GB3MCR, Bramhall, Cheshire; GB3SDS, King's Lynn, Norfolk; GB3RGS, llford, Fseev; GB3ARS, Alton, Hante; GB3WCS, King's

Amersham, Bucks

Essex; GB3ABS, Alton, Hants; GB3WCS, King's Langley, Herts; GB3YSC, Clif GB3GSG, Carrickfergus, Co Antrim Herts; GB3YSC, Clifton, York;

20-21 October **GB3CBS** Amersham, Bucks 20-22 October **GB3CWR** Lochness, Inverness 20-22 October **GB3KMS** New Malden, Surrey 20-22 October **GB2MS** Maghull, Liverpool 20-23 October GB2LS Lincoln 20-23 October GB3SJS Bridgwater, Somerset 20-23 October GB2BSG Newark, Notts 20-23 October 20-23 October Dunlop, Kilmarnock Thame, Oxon GB2DS **GB3TSG** 20-23 October **GB3BPK** Wigan, Greater Manchester 20-23 October **GB3HSA** Harlow, Essex 21 October **GB3LSG** Ludlow, Salop -22 October **GB3DST** Dereham, Norfolk 21-22 October GB3NSG Newhaven ARRA Exhibition, Leicester 2 November **GB3ARE** 

## **BOOK REVIEW**

Satellites for broadcasting [IBA Technical Review] Edited by Pat Hawker, G3VA, IBA Engineering Information Service. Fully illustrated, 70 pages, soft bound. Published by the IBA. Obtainable from the Chief Accountant, IBA, Crawley Court, Winchester, Hants, SO21 2QA, at a cost of £1.50 per copy. (Free to educators or librarians.)

This review deals comprehensively with the various aspects of broad-casting via satellites. In view of planned development in this field this aspect of broadcasting will undoubtedly have an impact on persons other than those working in this area.

## RSGB SLOW MORSE PRACTICE TRANSMISSIONS

These slow morse practice transmissions are sponsored by the RSGB. Alterations and additions to this list should be sent to the honorary organizer, Mr M. A. C. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex.

Clock		Callsign	MHz	Mode	Town	Clock		Callsign	MHz	Mode		Town
unda	ys	Ť	144-250	A1/A3J		Wedne	esda	ys	[1810	A2		
		00150	145 · 550 slant polarize	F2/F3	V	1135		G3RAF	3.550	A2 A2	27	Locking, Avon
915	100	G3LEQ	to WNW	\$200 M 5 Oct	Knutsford, Cheshire			*	omni-direct			
		9	1·950 29·250	A2/A3		1830		G3LR	145-525	F2	0.4	Accrington, Lancs
15		G3CGD		F2/F3 A1/A3	Cheltenham, Glos	37,50	10	G3NCZ				Blackburn, Lancs
30		G30HM/A	144-180	A1/A3J	Birmingham	1920		G3ZQS	[1-930	(usb)		Darwen, Lancs
30		G3NPB	1.875	A1	St Ives, Cornwall	1830	4.4	LG4CGT	145-525	F2		
00	101	G2FXA	1.900	A1/A3		1900	4.7	G3ULY	1.826	A1/A3J	4.4	Culgaith, Cumbria
30		G3BLS G3HVI	144.750	A1/A3 A2/A3		1900	20	G4FKZ		A1/A3 A2	33	Chadderton, Lancs
			omni-direct					00045	3-550			\$100429000 \$10000
30		<b>GU4CHY</b>	144.500	A1/A3J	St Peter Port, CI	1930	4.4	G3RAF	144-025	A2 A2	4.0	Locking, Avon
00		G3WNR	to north 144 · 750	A1/F3	South Shields, T & W	71020		10000000	omni-direct			and the same of the same of
w	5.53	GSVVIVII	omni-direct	A1/F3	South Shields, 1 & VV	1930	4.4	G3ZYY		F2/F3	4.4	Plymouth, Devon
		r	144.250	A1/A3J		2000	.,	G3SWP		A1 A2/A3J	**	London N22 Doncaster, South Yorks
			145-250	F2/F3	B - 1 - 1 - 1 - 1 - 1 - 1		(3.7		omni-direct		977	
15		G3LEQ -	slant polarize to WNW	d .	Knutsford, Cheshire	2000	289	GM4DSZ	144-230	A1/A3J	CER	Aberdeen
		1	1.950	A2/A3		2015		G3WVJ	to south-so	A1/A3		Staines, Middlesex
115	1.0	G4DVZ	1.915	A1/A3.I	Leeds, Yorks	2100	**	G3HVI		A2/A3	364	Stoke-on-Trent, Staffs
930		G3LDW	144.160	A1/A3J					omni-direct			
200		C270141	omni-direct	41/421	C  -  -  -  -  -  -  -  -  -  -  -  -  -	2130		G3VWL	144 160	A1/A3J	(4)4	Worthing, Sussex
30	* *	G3ZDW	horizontal, o	A1/A3J .	Swinderby, Lincs				F	2.2		
			monzoman, o	inn uncut		Thurse	days		3-550	A2 A2		
londa	ays			222		1135	* *	G3RAF	144-025	A2	Sto	Locking, Avon
			1.810	A2					Lomni-direct			
35	2.5	G3RAF	3·550 144·025	A2 A2	Locking, Avon	1830	2400	G4BNA	3.590	A1	555	Swindon, Wilts
			omni-direct			1830	* *	G3NC		A1	**	Swindon, Wilts
30	4.4	G3VBI	1-910	A1/A3 .	Goole, South Humberside	1830	223	G3LR	145-525	F2	24.6	Accrington, Lancs Blackburn, Lancs
30	555	G3LR	145-525	F2 .	Accrington, Lancs				Γ1-930	A1/A3J		Didentifully Lanes
	94	LG3NCZ		A1/A3J	Blackburn, Lancs	1830	0.53	G3ZQS	_000000	(usb)		Darwen, Lancs
30	11.	rgazos	1.930	(usb)	Darwen, Lancs			LG4CGT	145 525	F2		
		LG4CGT	145 525	F2		1900 1900	12	G3BLS G3ZRZ	1.920	A1/A3 A1/A3	9	Osney, Oxford Blackpool, Lancs
00	1.1	G3ZRZ	1.975	A1/A3 .		1500	1.4	G3ZRZ	Γ1.810	A2	6.0	Diackpool, Lanes
000	100	G4FKZ G4BNV	3·575 144·170	A1/A3 .	Chedderton, Lancs	1930		G3RAF .	3.550	A2		Locking, Avon
000	2.20	G4BNV	horizontally	A1/A3J .	Ottery St Mary, Devon	20182F170			144-025		***	Locking, Avon
		. [	1.810	A2					Lomni-direct			
930	100	G3RAF	3.550	A2	Locking, Avon	1930		G3ASR/A	144-175	A1/A3		Harrow Middlesov
		0011111	144-025	A2	Locking, Avon	(1st an	d 3rd	weeks of	omni-direct		850	Harrow, Middlesex
930		G3ZYY	omni-direct	F2/F3 .	Plymouth, Devon	month		)	vertical	10200000000		20 00 20 0
			horizontally	to south-we	st	1930	44	G3ZYY		F2/F3 A1/A3	1979	Plymouth, Devon Swinderby, Lincs
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000		G3IBJ G3XWZ	1.910	A1/A3	Southampton, Hants Mansfield, Notts	2130	630	G3LQI		F2/F3	S.,	Lancing, Sussex
000	151	GM4ELV _	3-570	AT/ASJ	Arrochar, S/Clyde							
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030	600	G3ASR/A	144 175	A1/A3J	Harrow, Middlesex				3-550	A2 A2		
30		G3YMJ	omni-direct		Harlow, Essex	1135	100	G3RAF	144-025	A2	4.9	Locking, Avon
30	10	G3LQI	145 300	F2/F3	Lancing, Sussex			14272101210	omni-direct			THE PROPERTY AND ADDRESS OF THE PARTY OF THE
1000	7.5					1830	6.4	G4CRI	3-525	A1	177	Helston, Cornwall
uesda	ays	î	1.810	A2		1830	100	G3LR G3NCZ	145 525	F2	6.5	Accrington, Lancs Blackburn, Lancs
125		CORAE	3-550	A2	Laskina Aven				[1930	A1/A3.	ı	
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B30		G4BNA	3-590	A1 .		1900 1900		G3NPB	144 500	A1 A1/A3J	Car	St Ives, Cornwall St Peter Port, Cl
330	5.50	G3NCZ	145-525	F2 ·	Blackburn, Lancs	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		30-3111	to north		5 55	
		(4) 200 mm = 1 mm	1.930	A1/A3J		1900	143	G4FKZ		A1/A3		Chadderton, Lancs
330		G3ZQS G4CGT	145 505	(usb)	Darwen, Lancs	1930	83	G3PQF		F2/F3	0.0	Farnborough, Hants
		.01001	145 525	F2		2030		G3ZDW .	to north-ea:	A1/A3J		Swinderby, Lincs
220		CODAC	3.550	A2 A2	Lastina Auga	2000		632011	horizontal, o			Standardy, Emiles
30	**	G3RAF	144-025	A2	Locking, Avon	2130	0.00	G3VWL .	144-160	A1/A3.		Worthing, Sussex
00		00105	omni-direct		STORY WORK	2200	- 03	G3AWL .	. 144-110	A1/A3.		Peterlee, Co Durham
000	100	G3IQF	1·875 1·910	A1/A3 .					to south			
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			omni-direct				1		r 144-250	A1/A3	ĺ	
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030			145 575	F2/F3 .		0915	45	G3LEQ .	slant polariz		5050	Knutsford, Cheshire
030		G30HM/A	to south 144-180	A1/A21	Birmingham				to WNW	40.44		
030 030		G3KGU		A1/A3J . A1/A3 .		0020		COENY	L1-950		1	Staines, Middlesex
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	**		omni-direct			1135		GSRAF	3.550	A2		Locking Aven
045 200		G3AWL			Peterlee, Co Durham	1135	3 (4)	G3RAF .	144-025 omni-direct	A2	* (6)	Locking, Avon

## VHF NATIONAL FIELD DAY 1978 RESULTS

#### LEADING STATIONS

Winner: MARCH & DISTRICT RAS

1-3GHz leader: G3DY/P (March)

Runner-up: MARTLESHAM RS and IPSWICH RC Leading GW group: Bracknell, UCNW Bangor and G4ERP

Leading GW group: Bracknell, UCNW Bangor an Leading GI group: Ballymore Grouse Beaters CG Leading GM group: S Scotland CG Leading GD group: Isle of Man ARS Leading GU/GJ group: Guernsey ARS 70MHz leader: GM3WOJ/P (S Scotland) 144MHz leader: G3PMH/P (March) 132MHz leader: G4BEL/P (March)

Band and weather conditions for VHF NFD 1978 were not quite what is usually expected in the middle of summer. Tremendous driving rain and winds were the order of the day for most contestants. Many groups were unable to erect their normal stations, and others were forced to close down early due to water getting into the equipment in the appalling weather conditions. On most bands the number of QSOs and points were considerably lower than last year. Again the stations in East Anglia were best situated for the poor propagation, being able to work into the Continent on all bands. The contest ended in a close fought battle between the March and Martlesham/Ipswich groups, but the March & D RAS were able to turn the tables on the runners-up to regain the trophy. For the first time on record the winning station was also band leader on the 144, 432MHz and 1.3GHz bands, with the overall runner-up being runner-up on the same three bands.

It was also noted that East Anglia is now attracting more groups than usual, some travelling many miles in the hope of gaining some of its apparent advantages. But as can be seen it is not only a good site that is needed to do well in VHF NFD, it is good operators, good equipment, good management and a lot of planning and hard work.

#### 70MHz

Now ssb seems to be totally predominant on the 70MHz band, the number of QSOs and activity is gradually increasing. Nevertheless, the most active stations still noticed a steep fall off in their rate of QSOs after about the first four or five hours and, as usual by the Sunday afternoon, QSOs were virtually non-existent. It is very pleasing to see that over 52 per cent of the stations on the band were using homeconstructed equipment, which included complete transverters to the larger antennas now being used by many contestants. Comments received from a number of contestants suggested that a compulsory break should be made in the middle of the night; this would encourage the smaller groups who have manpower problems to enter more bands in the early hours. The committee has an open mind.

#### **EQUIPMENT OF LEADING STATIONS**

March & District RAS

70MHz (G3VCV/P): 144MHz (G3PMH/P): 130W p.e.p. out, 4CX250B pa, 40673 rf,

8el at 45ft.

400W p.e.p. out, 2 × 4CX250B pa, 3N204 rf, 10/10el at 85ft.

432MHz (G4BEL/P):

1-3GHz (G3DY/P):

400W p.e.p. out, 2 × 4CX250B pa, BFR91 rf, 88el at 65ft.

50W p.e.p. out, 2×2C39A pa, HP35821E rf. 4ft dish at 60ft.

**Band Leaders** 70MHz (GM3WOJ/P):

133W p.e.p. out, 4CX250B pa, SD306 rf.

144, 432 and 1,296MHz: as above.

#### 144MHz

As usual the 144MHz band was the only band that provided most stations with contacts in quantity for the duration of the contest, with the leading stations still working over 10 QSOs per hour in the latter stages, despite the poor conditions.

Occasional lifts to the Continent occurred from most parts of G, but were able to work to Eu freely, and G3PMH/P capitalized on this by working over 280 Eu stations to become band leader. The best dx of the contest was made by G4BPO/P in the last 5min, with a contact made via sporadic-E with LZ2KBI/P at 1,847km.

Few complaints were received about stations with poor quality signals, which is remarkable when some last-minute contest groups put their station together for the first time on the day. One of the most common causes of trouble was the over-driven linear amplifier - remember a 4X250 amplifier with an efficient grid circuit only requires about 1 to 2W of drive and not the 10W which comes straight out of the "black box" and produces many milliamps of grid current.

#### 432MHz

Conditions on 432MHz were described by contestants as poor, fair and average, depending on their locations, although quite a number of stations were working into the Continent. Unfortunately, Syledis - a radio navigation system currently operating along the south coast—gave contestants in that area a large amount of QRM on the band and undoubtedly lost them many contacts. With 432MHz being allocated on a secondary basis to amateurs, this cannot easily be overcome. The best dx was made by G4CFI/P (Suffolk) at a distance of 740km, marginally less than last year's 760km by G3NNG/P. Equipment on the band seems to be gradually improving, with more and more stations running bigger antenna systems and rf stages, and, with the advent of the Microwave Modules linear, higher power levels too.



Some of the members of the Martlesham RS and Ipswich RC group finishing off some strawberries from G80NH's garden. Left to right: (front) G80NH, G3XDY and G4GBA: (rear) G8CJL, G3YCY, G3ZNU, G4FZZ, G4EVN and G4AKU

#### **OVERALL RESULTS**

		12270102		sition in					-		sition in		
		Total	70	144	432	1.3	12		Total	70	144	432	1.3
Posn		score*	MHz	MHz	MHz	GHz	Posn	Name of group	score*	MHz	MHz	MHz	GHz
1	March & D RAS	3,542	16	1	1	1	51	Windscale ARG	873	28	88	35	-
2	Martlesham RS and						52	Glenrothes & D ARC	870	29	41	78	_
	Ipswich RC	3,243	17	2	2	2	53	Wessex ARG	854	35	61	59	-
3	Bracknell, UCNW Bangor	(620000)					54	Grafton RS	825	52	50	54	, mine.
-	and G4ERP	2,853	3	10	4	3	55	Plymouth RC	775	10-25	14	47	1
4	Harwell AERE RC	2,541	19	7	3	7	56	Berwick & D ARS	774	14	65	3.00	-
5	Stockport RS	2.452	5	8	7	8		Melton Mowbray ARCG	766	43	71	66	-
6	Wulfrun CG	2,372	4	3	9	15	57	LGSTAL CG	766	63	99	17	1
ž	Norfolk VHF/UHF CG	2,144	8	9	5		59	The Calton Cowboys	765	50	46	74	
						7.	60		737	76	25	63	_
8	South Birmingham RS	1,855	13	33	10	4		Norfolk ARC		41	89	71	
9	Ebor Gp	1,779	2	32	8	725	61	Nunsfield House ARG (Derby)	735				41
10	Cray Valley RS	1,705	34	28	12	6	62	Farnborough & D RS	717	39	101	69	32
11	_ Salop ARS	1,671	21	30	26	5	63	Cheltenham ARA	702	62	87	42	-
	Leicester RS & VHF Group	1,671	27	20	18	9	64	Newquay & D ARS	689	25	73	-	-
13	South Staffs CG	1,652	7	6	33	-	65	Mid-Cheshire ARC	684	55	60	82	-
14	Bedford VHF/UHF Gp	1.650	56	5	19	20	66	Spalding & D ARS	679	65	68	58	100
15	Vectis WGp	1,619	10	17	23	19	67	Isle of Man ARS	678	26	80	92	-
16	ARC of Nottingham	1,511	15	29	15	21	68	Doncaster Met Inst Higher Ed	673	72	49	75	44
17	Horsham ARC	1,433	45	12	41	24	69	Havering & D ARC	664	75	75	38	-
18	Southampton RC and	1,400	40	340	356.0	24	70	Banbury and Milton	001			-	
10	RSGB Gp	1.432	49	16	16	28	70	Keynes & D RS	641		26	40	
**							71		634	69	64	72	47
19	Vange ARS	1,425	32	59	6	_	71 72	Northampton RC	034	69	64	12	4/
20	West Kent ARS	1,418	66	15	11	35	12	Medway ARTS and Bexley	1222		122		
21	The Hillbillies	1,391	44	36	28	10	-225	UHF Gp	630	-	40	27	-
22	Reading ARC	1,381	40	24	30	12	73	Ealing & D ARS	614	78	63	36	1.5
23	Surrey RCC	1,338	24	23	22	38	74	Rugby ARS	611	79	69	37	43
24	S Scotland VHF/UHF CG	1,334	1	-	25	_	75	University of Surrey EARS	594	-	34	57	40
25	Martlet CG	1,323	61	18	20	31	76	Maidenhead & D ARC	562	1,000	78	67	13
26	Crystal Palace & D RC	1,308	68	13	39	17	77	Torbay ARS	561	73	72	68	7
27	Lothians RS	1,289	9	53	24	46	78	Macclesfield & D RS	540	58	85	89	-
28	Southdown ARS	1,267	60	4	76	40	79	Bolton & D ARC	538	59	91	80	The contract of
29	Dunstable Downs RC	1,256	36	81	21	11	80	Clifton ARS	490	77	92	49	(E)
30	Northern Heights ARS	1,238	12	21	63	33	81	South Dorset RS	478	84	43	83	34
			12				82		469	04	70	56	37
31	Crawley ARC	1,235	23	42	50	14		Andover RAC		_			
32	Bristol (RSGB) CG	1,179	46	51	13	45	83	Otley R & ES	458	_	84	31	_
33	Southend Activities Gp	1,153	42	47	14	-	84	Harlow "A" Gp	457	-	54	52	-
34	_ Worthing & D ARS	1,151	11	39	34		85	Ballymore Grouse Beaters CG	445	80	44	76	
	LNewbury & D ARS	1,151	67	22	32	26	86	Basingstoke ARC	443	57	95	-	-
36	Southgate RC	1,145	47	35	45	22	87	Liverpool & D ARS	434		37	73	
37	Guildford & D RS	1,117	31	79	28	25	88	G4AGE/G8EIC	428	71	100	62	-
38	Sutton & Cheam RS	1,115	53	19	51	39	89	Berkshire & Dorset CG	412	-	31	85	-
39	Albright & Wilson ARS	1,108	38	11	87	_	90	Wirral & D ARC	390	23.50	55	70	300
40	Hull & D ARS	1.081	37	62	46	18	91	Denby Dale & Spen Valley Go	363	74	96	90	48
41	Harrow RS	1.053	54	45	48	16	92	Lagan Valley ARS	355	83	57	81	
							93		329	70	97	01	-
42	Gt Lumley AR & ES	1,041	20	48	44	-		Echelford ARS		10000		00	-
43	Preston ARS	1,037	18	82	61	23	94	Rutland Weekend CG	241	-	73	88	-
44	Verulam ARC	1,014	33	56	43	42	95	North Humberside Gp	227	-	66	95	-
45	Guernsey ARS	993	6	58	86	55 <del>55</del> 55	96	Peterborough R & ES	218	-	76	91	_
46	Bridgewater & Coventry CG	981	30	77	55	27	97	Harlow "B" Gp	200	-	90	79	S <del>75</del> 53
47	Mid-Sussex ARS	965	64	38	53	29	98	Edgware & D RS	181	81	86	_	-
48	Shefford & D RS and		27470			x <del>-3</del> ///	99	Lincoln Short Wave Club	172		83	94	_
15.7	Luton CG	920	47	52	60	35	100	G8HJD	149	-	98	84	1944
49	Cornish RAC	887	22	27	-	-	101	Mid-Ulster and GI4FME	124	82	93		-
50	Mansfield RS	877	51	67	65	30	102	St Andrew's Venture Scouts	120		94	93	39.
50	mananelu na	0,7	31	07	60	30	102	Of Palaters venture 3000ts	120		-	00	

\*Total score =  $\frac{70 \text{MHz score} \times 1,000}{70 \text{MHz leader's score}}$ 

144MHz score × 1,000 144MHz leader's score 432MHz score × 1,000 432MHz leader's score 1-3GHz score × 1,000 1-3GHz leader's score

#### 1.3GHz

On 1-3GHz the entry was exactly the same in number as that of 1977, although the leading stations score is some 30 per cent down, and their total number of contacts down by 17. Continental contacts to PA0 were made by the first two stations only, and the general level of activity outside the UK seems to have been quite low. Many QSOs were established direct on 1-3GHz, again emphasizing the trend to independent operation and the real need for the fourth station to enable maximum points to be obtained from the band. It is felt that 432MHz is still needed, especially in conditions as experienced this year, to enable the dx contacts to be established. The best dx this year being made by G3DY/P with a contact of 401km, but still some 80km down on last year's best.

#### Comments

"Everything went wrong, but thanks to the weather, and the attention given to the site by cows, everyone had a dirty weekend."—G3LCH.

"A voice in the gloom said: 'Smile, things could be worse', so we smiled, and things did get worse." - G4DEZ.

"Transverter reconstructed using a mixture of rain, solder and cow dung." – G4ADM.

G4BEL



The Wessex ARG 432MHz team on Bulbarrow Hill, near Blandford, during VHF NFD. Left to right: D. Wade (swl) logging; A. Bagley, G4EKE, transmitting; and A. Hoggan, G8ASX, looking on

#### 144MHz BAND RESULTS

Posn 1	Callsign GM3WOJ	Points 1,490	QSOs 117	QRA XO26	Best dx GU4ASO/P	Km 588	Posn	Callsign	Points	QSOs	QRA	Best dx	Km
2 3 4 5 6	G3UUT GW4ERP GW3XBY GW4CBW GU4ASO	1,208 1,127 1,064 1,053 1,019	116 137 131 131 79	ZO55 YN75 YM44 YN75 YJ48	G4DWB/P ON4ERX/P ON4ERX/P ON4ERX/P GM3WOJ/P	549 533 511 530 588	2 3 4 5	G3PMH G4BPO GW8BHH G6HH G4FDX	5,692 5,493 5,027 4,729 4,233	549 526 516 499 452	AM51 AM67 YM44 AK03 ZM68	F6CJG/P LZ2KBI/P DJ0ZB/P F1EVU/P F0BJT/P	760 1,847 823 650 795
6 7 8 9	GW3NAS G3MPN GM4DIJ G3WIE	993 968 943 856	128 104 79 102	YM25 AM06 YP42 ZK25	ON4ERX/P G4DWB/P G4DWB/P GM3YOR/P	503 540 595 631	6 7 8 9	GW6SW G3PIA GW8BCG G3ZIG	4,029 3,937 3,862 3,841	445 468 474 362	YM25 ZL33 YN75 AM06	PE1AIU HB9MMM/P DL0ET/P DJ7CL	655 797 1,050 675
11 12 13	G3YHM G3UGF G4EQF	845 832 825	108 103 127	ZK09 ZN11 YM50	GM3YOR/P ON4ERX/P ON4ERX/P	622 530 435	10 11 12	GW3UCB GW3OXD G3TNO	3,685 3,458 3,402	456 419 417	YN75 YM54 ZK08	DF1JC F1BMB F1EVU/P	718 810 725
14 15 16 17	GM4CXP G4EKW G3VCV G4GPO	822 809 808 800	69 119 121 103	YP18 ZM04 AM51 AM67	GU4ASO/P G4DWB/P G4DWB/P GM3WOJ/P	670 419 525 492	13 14 15 16	G3VCP G3PRC G3WKS G8FAB	3,228 3,220 3,204 2,860	274 334 364 370	AK 12 YK 21 AL 73 ZL 52	F1BYM GM8NSU/P F6CJG/P PA0JCA/DL	719 613 808
18 19 20	G3KUE G5RP G4DWM	792 787 780	101 113 78	YN 18 ZL33 ZO22	GU4ASO/P GM3YOR/P G3NIL/P	480 526 341	17 18 19	G3KMI G4DZO G4CQR	2,838 2,833 2,743	357 347 413	ZK25 AK11 ZN71	GM4HAM/P F1DRB/P F8OP	606 681 596
21 22 23 24	G4AZS G4DWB G3TIR G4FUU	776 775 737 735	114 55 105 98	YM48 XK63 ZK07 AL66	ON4ERX/P GM4DIJ/P GM4DIJ/P GM3WOJ/P	460 575 543 530	20 21 22 23	G3LRS G2SU G2CPM G4DDY	2,718 2,368 2,340 2,319	400 346 325 257	ZM36 ZN11 ZL53 AL66	DL0ET/P ON4YY DK8VRA DL0XS/P	770 580 622 575
25 26 27 28	G4ADV GD3YEO G4GSD G4EDV	728 711 710 708	56 57 112 74	XK55 XO67 ZM36 YO54	G4DWM/P GU4ASO/P GM3YOR/P G3WQK/P	520 539 430 462	24 25 26 27	G4CCC G3PNR G8MKC G4CRC	2,219 2,182 2,156 2,091	331 240 325 177	ZL54 AM05 ZM73 XK63	F6ARQ/P G3YJX/P DK8VRA G8AZA	719 520 630 550
29 30 31	GM3YOR G2ASF G3PJX	707 700 684	59 83 112	YQ64 YL75 ZL69	G3WIE/P GM4DIJ/P GM3YOR/P	631 479 575	28 29 30	G8FCV G6CW G3SRT	2,079 2,075 2,073	253 327 329	ZK21 ZM04 YM48	GI4GTY/P F1KLQ DK0GM/P	520 565 667
32 33 34 35	G4ERX G4CQZ G3TAA G3NIL	676 675 673 667	112 102 89 91	AL33 ZM80 ZK21 YK19	GM4DIJ/P GM4BVE/P GM3WOJ/P GM4DIJ/P	490 526 493 525	31 32 33 34	GW8KBW G3JFO G8OHM G3IGQ	2,002 1,990 1,978 1,930	262 240 328 314	YM04 ZO55 YM50 ZL76	ON5WL/P GU3HFN/P DF1JC EI9BG	587 535 630 560
36 37 38 39	G4ENA G3AMW GW3UEY G3SVL	666 664 663 647	110 79 87 103	ZL18 ZN18 YM54 ZL67	GM3YOR/P G4DWB/P GM3YOR/P GM3YOR/P	545 524 430 580	36 36 37 38	G3SFG G8CJY G3AHD G3ZMS	1,917 1,907 1,855 1,811	283 297 223 241	YL57 ZL15 ZO55 ZK10	PAONYM/P GM8NSU/P F1CRP/P F1DUZ	590 575 670 606
40 41 42	G3WGV G4DJP G4KF	641 630 624	104 100 101	ZL54 ZN71 AL02	GM3XEP/P GU4ASO/P GM4DIJ/P	503 416 465	39 40 41	G3WOR G8MWA GM4GRC	1,772 1,766 1,732	327 261 175	ZK09 AL43 YQ64	DJ3OS GMFEE/P G3WOR/P	656 570 620
43 44 45 46	G4FOX G3ZTZ G3NPF G3SXY	622 604 602 586	98 102 94 76	ZM26 ZL15 ZK08 YL57	GM3YOR/P GM4CXP/P GM3WOJ/P GM4CXP/P	423 435 512 489	42 43 44 45	G3WSC G3SDS GI4FEE G3EFX	1,724 1,678 1,655 1,625	270 208 150 280	ZK07 YK28 XO11 ZL26	DK1AQ/P DK1AQ/P G8MWA/P HB9MCN	644 760 570 752
47 49 50	G3FJE G3SOU GM3RFQ	580 580 564 559	80 110 88 53	YL57 ZM79 ZL52 YP44	GM3WOJ/P GM4CXP/P GM4DIJ/P G3YHM/P	401 428 475 675	46 47 48 49	GM4HAM G4GNU G4EUZ G3UER	1,612 1,604 1,597 1,595	153 247 193 250	YP44 AL02 ZO22 ZN44	G3KMI/P GI4FEE/P DK1AQ/P F1CRP/P	510 - 560
51 52 53	G4AAH G3ZKE G4ADM	557 539 533 532	84 80 83 102	ZN74 AL16 ZN71 ZL26	G4DWB/P GM3WOJ/P ON4ERX/P GM3WOJ/P	434 505 430 419	50 51	G3AFT G6YB G4BWP GM4BYF	1,571 1,563 1,553 1,527	191 213 258 192	AL16 YL57 ZM79 YP42	DK1AQ/P DJ6BN GI4FEE/P G6HH/P	505 691 478
54 55 56 57	G3MLS G4CAX G4FEV G3TCR	527 526 522	80 99 86	YN67 ZM68 ZL55	GM4DIJ/P GM4CXP/P	410 412 501	52 53 54 55 56	G8AJR GW4DLY G3VER	1,500 1,489 1,446	277 253 257	AL21 YN65 ZM80	DK8VRA GM8NSU/A GM8NSU/A	580 530 450 578
58 59 60	G4BYP G8WY 	517 510 507 507	71 74 72 77	YN70 YN39 AK03 AK03	GU4ASO/P G4DWB/P GM3WOJ/P GM3WOJ/P	420 493 540 540	57 58 59 60	GI4GTY GU3HFN G4EZP G3ZTT	1,439 1,422 1,411 1,410	128 137 249 240	WO40 YJ48 AL33 YN67	G4DDY/P GM4DWN/P DL2OM GM8NSU/A	569 585 515
62 63 64 65	G3MOE G3TAL G3XUP G4DDI	481 480 477 440	80 55 75 66	YL20 ZO56 ZK10 AN51	GM4CXP/P G3TAA/P GM3WOJ/P GM4CXP/P	436 438 525 320	61 62 63 64	G8MCQ G8GBY G8JNW G8LED	1,360 1,316 1,284 1,283	211 193 230 214	YK 19 ZN 18 ZL26 ZM45	F6DYT G4CRC/P F6CJP/P DJ2YA/P	563 524 702 587
66 67 68	G4DIX G3WOI G4BWG	439 436 409	79 80 63 73 73	AL73 ZL53 AK12	GM3WOJ/P G4DWM/P GM3WOJ/P	530 374 540 372	65 66 67	GM8IIO G4ERG G3KDQ	1,265 1,264 1,238	130 174 185	YP18 ZN07 ZN74	G3KMI/P GU3HFN/P DJ2YA/P	556 520 584
69 70 71 72	G3XTT G3TDR G4AGE G3KPU	405 379 353 340	53 56	ZM45 ZL59 ZN64 ZN44	GM4DIJ/P GM4DIJ/P G4DWB/P GM3YOR/P	495 420 330	68 69 70 71	G4DSP G4GEE G4BNR G8HWG	1,209 1,185 1,182 1,144	198 245 204 191	AN51 ZM72 ZL53 ZM26	G4CRC/P GI3IVJ GM4COK PE0IPP	510 492 525 479
73 74 75 76	G3LHJ G3SUC G4CAF G4EOL	333 323 307 300	39 60 63 42	YK33 ZN32 AL22 AM05	G4GPO/P G3XUP/P GU4ASO/P ON4ERX/P	370 330 310 295	72 73 74 75	G3NJA G3YJX G3YZD G8HRC	1,141 1,139 1,133 1,091	150 108 201 199	YK33 XK56 ZN61 AL22	ON6UG/A GM4DWN/P F1KAR F1CJG/P	509 470 449 675
76 77 78 79 80 81 82	G3WMR G3SGT G3UVW GI4EIZ	291 177 106 87	55 47 28 11	AL52 ZL26 ZM72 XO11	G3UUT/P G3UUT/P G3UGF/P G4AZS/P	375 292 190 343	76 77 78 79	G3DQW G4EBU G3WKX G6GS	1,077 1,038 1,024 1,016	170 186 202 214	ZM39 YL75 ZL37 ZL69	GM8NSU/A GM48YF/P GM48YF/P GM4GRC/P	530 476 490 575
81 82 83 84	G3PSP GI4FME GI4FUM	53 44 25	23 20 11	ZL29 XO61 WO40	G4FUU/P GW4ERP/P GW4ERP/P	105 230 257	80 81 82	GD3FLH G4DDC G2AXH	987 966 969	118 204 158	XO67 ZL18 YN18	G4CLK DC8YR GU3HFN/P	677 480
84	G3EAT	1	1	YK28	G3NIL/P	21	83 84 85 86	G3IXH G3XNO G3FPJ G3ASR	936 916 876 826	157 158 168 193	ZN78 ZN13 YN70 ZL29	G4CRC/P G3YJX/P GM8NSU/P DJ6BN	476 402 440 520
70MHz 1 2	Listeners BRS33823 BRS38937	106 4	24 2	ZL27 ZK03	GW4CBW/P G3NIL/P	220 83	87 88 89 90	G58K G8DML G8KGC G8MVVV	762 724 715 640	175 95 150 130	YL20 YO54 ZN71 AL12	ON6UG/A G6HH/P ON5WL GM4WN/P	420 462 504 455
Checklo	ogs received from	n G2AMV ar	d G3IKR.			G5HD	91 92	G4AGJ G3GHN	627 541	101	YN39 AL52	F1ANH F1CRP/P	651 380

1 2 3 4 5 6 7	Callsign GHBAC GBLVS GBLVS GBLYN GBKMK G3UES GBHJD GBCLY G4AGE G4AGE G8BCO Listeners BRS32525 BRS34740 BRS15822 A9090 BRS34310 BRS38337 BRS33823	Points 537 531 530 593 427 397 397 307 156 695 496 489 401 257 144 118	QSOs 81 165 114 180 116 89 51 45 44 115 79 83 40 33 GSEFA and	QRA X061 ZL17 ZL55 ZN32 ZL59 ZL59 ZL67 ZL67 AL41 ZN41 ZN41 ZN40 ZM63 ZL80 ZL27	Best dx G4DKX F1DSQ/P GM4COK G6HH/P PAOLPN/P G8DJW/P G3PRC/P F6EYA/P G14FEE/P PE1ALH/LX/P GM4BVF/P PAOLPN/P G8CLY/P G8CLY/P G3PRC/P	Km 550 370 525 340 345 347 453 305 431 537 620 475 386 360 237	Posn 68 69 70 71 72 73 74 75 76 78 79 80 81 82 83 84 85 85 87 88 89 89 89 89 89 89 89 89 89 89 89 89	Callsign G3VCT G4FCN G4FCN G4FCN G4FCN G3GWB G3XSN GM8MJV G4BZD GMED GMED GBFDL GBFDL GBBY G4DBX G5VPF G4DBX G5VPF G5WBKP GU3MBS GWNZS G3XVA G8ATII G4CDD G8MHV	Points 183 182 174 170 150 146 143 141 139 127 122 116 114 1112 109 105 104 79 78 73 56 50 38	QSOs 99 99 99 99 99 99 99 99 99 99 99 99 99	QRA ZL37 YK33 ZL67 YN65 ZN71 ZM45 Z065 YP44 XO11 AK03 Y064 AL12 YN39 W040 YN67 YK28 AL62 YM04 YN54 YM54 ZN61 YN58 ZN61 YN58 ZN61 YN58 ZN61 ZN61 ZN61 ZN61 ZN61 ZN61 ZN61 ZN61	Best dx ONSUG/A G4CEU/P PAOCKV/P G3BSI/P G3BSI/P G3NNG/P G4HBR/P — GW4BRA/P G8AYN/P G3NNG/P PAONYM/P G8HVY/P GW4BRA/P G4AEZ/P G4FXW — G4BEL/P ON6UG/A G4CFI/P G3NNG/P G3NNG/P G4ARD/P G3NRG/P G3NRG/P G4ARD/P G3NRG/P G4ARD/P G3YTE/P G4HBR/P G3YTE/P	Km 286 296 415 226 415 260 240 - 280 4875 275 264 345 2215 320 1166 1126 1126
		432M	Hz BAND	RESULTS			92 93 94	GD4GWQ G8IXK	37 36	7 14	XO67 ZL17	G3GRO/P	110
Posn	Callsign G4BEL	Points 1,323	QSOs 179	QRA AM51	Best dx DL9GSA	Km 520	95	G3IXH G8FEK	11 6	7	ZN68 ZN07	G3XVA/P G4CDD/P	94 75
2 3	G4CFI G3NNG	1,219	141 174	AM67 ZL33	F6ECI/P DL9GSA	740 609	4224.411						
4 5	GW4BRA G8HVY	1,134	155 117	YN75 AM06	ON6UG/A GM8OVN/P	530 490	1 2	z Listeners BRS33823 BRS15822	64 39	22 17	ZL27 ZL40	GW4BRA/P GW4BRA/P	270 270
6	G3YCW GW6UQ	956 881	144 151	AL33 YN75	DJ90V PA0EZ	510 550	•	511513022	30		2040	GVV4BRA/F	270
8 9 10 11 12 13	G8FIS GW3UBX G3OHM G4BWH G8AYN G3MGS G4CEV	817 732 639 627 602 600 598	97 112 113 108 90 90 100	Z056 YM44 YM50 AL73 ZK21 YL57 AL02	G8AYN/P ONGUG/A ONGUG/A DL9GSA PA0CKV/P PA0EZ PA0ERW	410 494 418 470 510 540 360	Checklo	gs received fron	n G2AMV and	G8KKC/P.			G8ACJ
15 16	G3EKW G8ADM	556 540	104	ZM04 ZL52	PA0EZ DL9GSA	445 614			1-3GHz	BAND RE	SULTS		
1789222224567 2 317334567339414444444448633555533668 3 56	GSSHK GSLM GSFMG G4GZO G4ARD GSFB GSIDZ G4ARD GSTB GSIDZ GM3HAM GMMDMZ G3VZG G8BIS G3VZT G3VZG G8BIS G3VZT G3VZG G8BIS G3VZT G3SXAF G8LYD G4CJJ G3BXAF G3FZL G3MZT G3BXAF G3FZL G3MZT G3BXAF G3HZP G3WZT G3WZT G3BXAF G4CJJ G3BXAF G4CJJ G3BXAF G4CJJ G3BXAF G4CJJ G3BXAF G4CJ G3WZT	500 490 484 483 476 474 447 441 423 410 410 438 382 386 361 359 363 355 348 337 336 332 279 276 264 249 248 247 227 227 221 227 221 227 227 221 227 227	899985137983747888978477953887188647458645753766457855384457664348843953152555	Z056 Z056 Z056 Z056 AK11 ZL18 AL66 ZK25 YP42 X026 ZL15 ZL51 ZL51 ZL51 ZL52 ZK09 Y054 ZL12 ZK09 Y054 ZL12 ZK09 Y054 ZL12 ZK09 Y054 ZL12 ZK12 ZK09 Y054 ZK12 ZK12 ZK12 ZK12 ZK12 ZK12 ZK12 ZK12	GBIDZ/P PAONTYM/P PAONTYM/P FIEBN/P PAOVTW PAOWWW PAOWWW PAOWW PAOWW PAOWW PAOWW GBLYJ/P ONSUG/A DJ50V GBLYJ/P ONSUG/A PAOCKV/P PAOEZ GBLTG/P PAONTYM/P GSTLM/P GMADMZ/P PAOEZ GBLTG/P PAONTYM/P GSTLM/P GMADMZ/P PAOEZ GBLTG/P PAOWW GBLYJ/P ONSUG/A FIEBN/P ONSUG/A GSHK/P PAOEZ GBAYN/P GACFI/P GMADMZ/P PAOEZ GBAYN/P GSTS/P GWABRA/P ONSUG/A GWABRA/P	426 445 445 455 455 455 455 455 455 455 45	Posn 1 2 3 4 5 6 7 8 9 101 112 13 14 15 6 17 8 19 201 22 22 24 25 26 27 8 29 30 31 32 33 34 5 36 7 38 39 40 41 42 43 44 5 46 7 48	Callsign G3DY G3XDY GWABRT G4GZI G3UOH G3RCV G4DGU GWAGTE G8LM G3YTE G4FUZ G3ULT G3VCT G3GRO GW3ONP G3FBR G3SBV G3POY G3WXCP G3W	Points 6,783	QSOs 432 32 32 32 32 32 32 32 32 32 32 32 32 3	QRA AM67 YM50 YM48 ZK213 ZL15 ZL15 ZL15 ZL15 ZL15 ZL15 ZL15 ZL15	Best dx PAONYM/P PEDAGO G3XDY/P G3Y/P	Km 4014 313 224 324 188 289 201 308 161 197 150 140 198 121 180 6 232 195 141 135 248 110 194 123 135 147 110 125 123 136 151 146 154 264 154 264 165 165 171 146 165 165 165 165 165 165 165 165 165 16

# contest news

#### 3.5MHz Field Day 1978 results

Although one might have expected a lot of portable activity in view of the glorious weather, which seemed to have kept many fixed-station operators out of their shacks, only 12 entries have been received for this year's 3-5MHz Field Day. The low level of activity, coupled with the relatively poor band conditions (typical of the present phase of the sunspot cycle), resulted in lower scores than in 1977.

The leading station, G3FJE/P, operated by Derick Handscombe, G4BWP, and John Wayman, G4DRS, consisted of a Codar AT5 transmitter and an FR100B receiver, with heavy-duty accumulators as the power source. Their antenna was an inverted-V with the apex at 35ft agl. It is pleasing to note that home-built rigs were used by several stations, including G4RS/P (vxo-controlled transceiver with a BD123 pa), G3LHJ/P, G3JKY/P (rig powered by two 6V dry-batteries), G3IFF (direct conversion receiver), and G3UFY/P (1-V-1 trf receiver, using DF96/DF96/DL96 valves, built the previous day!). Other rigs employed included a Ten-Tec Triton 2, an FT101, an Argonaut, and three

The clash with the DL-AGCW QRP Contest was welcomed by several entrants as it increased activity. G3RTE/P and G4DDX/P complained of heavy man-made QRM, and offer their apologies to those who called them in vain

The HF Contests Committee thanks entrants for their comments and suggestions-these will be considered when the rules for 1979 are reviewed.

Subject to Council approval, the Houston-Fergus Trophy will be awarded to G3FJE/P. Certificates of merit will be sent to G4RS/P and G601/P

**G3NKS** 

Posn	Callsign	Location	QSOs	Points
1	G3FJE/P	Henlow BFD	83	580
2	G4RS/P	Barden YSN	65	535
3	G601/P	Dudley WMD	69	500
4	G3RTE/P	Barnet HFD	67	495
5	G4BTJ/P	Caistor LCN	53	430
6	G4ELZ/P	Torquay DVN	51	415
7	G4CZB/P	Grafton Regis NHM	43	335
8	G3LHJ/P	Newton Abbot DVN	39	320
9	G4DDX/P	Weston HFD	37	315
10	G3JKY/P	Shoreham KNT	36	285
11	G3IFF/P	Havant HPH	29	265
12	G3UFY/P	Croydon SRY	24	235

Checklogs from G3ZDW, G4FAM and G4GIJ are acknowledged with thanks.

#### The Commonwealth Contest 1978 results

Award winners Senior Rose Bowl: Junior Rose Bowl: Col Thomas Rose Bowl:	P. W. Watson, ZL3GQ. L. Sawkins, VE7CC. A. J. Slater, G3FXB. R. W. Thomas, BRS15822				
Receiving Rose Bowl:					
Band leaders					
	14MHz overseas: VK3MR				
Band leaders 3-5MHz overseas: VK5NLC. 7MHz home: G4BWP.	14MHz overseas: VK3MR. 21MHz home: G3WSL				
3-5MHz overseas: VK5NLC.					

The long-awaited improvement in band conditions at last appeared during this contest, bringing with it higher scores and QSO totals, and an increase in overall entries. Especially pleasing were the 28MHz openings and, for Europe, the long 7MHz opening to the Canadian west coast.

The top two positions this year go to the same stations as in 1977, although Peter Watson, ZL3GQ, increased his margin with a score that put him well ahead of the field. There were many comments from all areas on his outstanding and consistent signal on all bands, and mention should be made of his extensive antenna farm which consists of 3/4/5el guads for 14/21/28MHz and a 160m dipole at 100ft for the lower frequency bands. In second place was Lee Sawkins, VE7CC, who made 438 QSOs. For yet another year (the sixth in succession) Al Slater, G3FXB, won the Col Thomas Rose Bowl as the leading entrant from the UK.

The only band to attract many single-band entries was 14MHz. Here, as in recent years, Stuart Jesson, G4CNY, was the leading UK station. He made 142 QSOs using a T4XC/R4C combination and a 2el quad. The overseas leader on 14MHz was M. Campbell, VK3MR, who had a total

The HF Contests Committee was disappointed to see the continued decline in the number of entries to the receiving section and would welcome suggestions on how this could be improved. The small entry, however, in no way detracts from the win by Ron Thomas, BRS 15822 who managed to double his score of last year and, in so doing, put an end to the winning run of Eric Trebilcock, BCRS195, who has to be content with second place this year.

Many stations will notice that in the tabulation they have suffered a reduction in their claimed scores. In common with all RSGB events, the Commonwealth Contest is subject to detailed log checking. Especially damaging to a score can be an error in callsign, which loses all points (QSO and any bonus) to both sides of the QSO. Even worse are unmarked duplicate contacts, of which the committee takes a very poor view, and deducts up to three times the number of points claimed. Other errors - mistakes in reports or serial numbers - lose a proportion of the points claimed. The implications for care during the contest and checking of the entry should be obvious.

The committee was pleased to receive comments and suggestions with the logs and these will be considered in due course. Suggested changes to the rules included additional bonus points for each UK prefix and a longer period for the contest – possibly 24 or 30 hours out of 36 with a rest period. Over recent years, with the decline in activity from the rarer call areas, particularly in Africa, this contest has become very much a G/VE/VK/ZL affair but, despite this fact, it still remains a very popular event, as evidenced by many log comments. It is hoped that the rise in the number of entries continues in future years.

Comments
"Great condx,
temper" – ZL3GQ. but jamming from JA didn't improve my

"Waited several hours twiddling fingers waiting for stations to appear on 40 metres" - ZL 1AZE.

'Was very pleased to have so many QSOs with real old-timers. Most G fists excellent" - ZE3JO.

"Next year, I will join the men and do all bands!"—G4CNY.
"Despite 35°C and thundery condx. I did better and thundery condx, I did better than last

year"—BCRS195.
"With improved condx and popularity, would prefer longer period"—G2QT.
"Unfortunately the dx I was hearing on 3·5/7MHz was not hearing

me" - G3DYY "Amazed to work three VE7s on 7MHz. Usually hard pressed to find

one!" - G3JKY. "Seemed to be no time when ZL3GQ not audible on one

band"-G3NKS.

"Logs sent by airmail. Surface mail now takes longer than in the days of salling ships" – ZL 1HV.
"Well organized this year – new rig etc, then WHAM – FLU!!" – ZB2CJ.

"Nice to have 9J2BO put Africa on the map" - CG6APN.

"Suggest longer period-24 hours out of 30 or 36" - G5WP

"Cannot support suggestions for two-day contest" - VK2XO.

"Looking forward to next year" - GM3SSB.

#### How the leaders made their scores

		Q	SOs/bo	nus		TX	RX	Antennas
	3.5	7	14	21	28			
ZL3GQ	36/29	95/40	208/55	150/44	53/37	T4XB	R4B/75A4	3/4/5el quads. Dipoles.
VE7CC	30/24	95/46	155/51	121/38	37/31		No details	given.
VE3KZ	18/17	91/36	155/54	150/35	96/23	32S1 30L1	75S1	Slopers. 2el/7MHz. 5el/14MHz/ 21MHz 3el/28MHz.
VE5RG	28/22	124/43	167/45	116/32	87/15		No details	
G3FXB	12/11	61/39		95/45	45/28	T4XC	R4C	Slopers. Delta loop. 2el beam. Quads.
G3MXJ	14/13	54/34	136/58	74/40	50/28	SB401	SB301	Slopers.

		THE STATE OF THE S	TING SECTION		
Posn	Callsign	Points	Posn	Callsign	Points
1	ZL3GQ	6,677	61	VK7JB	1,575
2	VE7CC VE3KZ	5,821 5,687	62	VK3YK VK2AQF	1,538 1,525
4	VE5RG	5,477	63 -	VK2XQF	1,525
4	9H1EL	5,393	65	VK6ED	1,515
5	VESAKG	5,249	66	G2AJB	1,245
7	G3FXB	5,164	67	VK3KS	1,240
8	VE1CD	5,156	68	G4ELZ	1,225
9	G3MXJ	5,061	69	***ZE3JO	1,192
10	VE5RA	5,010	70	GM4GK	1,165
11	ZL2BCO	4,545	71	G6GH	1,150
12	ZL2BR	4,481	72	<b>GM3WRN</b>	1,146
13	VE2WA	4,430	73	G8QZ	1,085
14	9J2BO	4,260	74	**VE7BS	1,066
15	VE7UZ	4,215	75	VK5BO	1,058
16	VO1AW	4,035	76	G3VCL	1,048
17	G5RI	3,936	77	G4FHF	1,040
18	VE6KW	3,844 3,793	78	G3TXF	1,035
19	9H1CH ZL1AIZ	3,695	79 80	*VK3MR	981 968
20 21	G6CJ	3,640	81	*VK8NT VK5FG	950
22	VE3BWY	3,396	82	*VU2DRZ	910
23	VK4XA	3,295	83	++ZL1AZE	908
24	GZQT	3,285	84	VK3YL	860
25	ZD7PV	3,280	85	P29EJ	855
26	G3DYY	3,255	86	VE7AV	850
27	VK2GW	3,060	87	VS6EJ	840
28	G5WP	2,995	88	VK5MD	820
29	VE2WW	2,913	89	*G5ND	810
30	G3SJE	2,635	90	††G4BWP	797
31	G3ESF	2,623	91 -	VK5SW	755
32	G3NKS	2,565	L	VK8GG	755
33	VE3EUP	2,484	93 -	**G3WSL	738
34	VK7RO	2,473 2,460	95 L	*VK3YD	738 735
35	VK3ZC G2HLU	2,450	96	VK2BDU	727
36 37	GM30XC	2,395	97	VE6LB G3YBH	671
38	GSJKY	2,375	98	G5DF	650
39	VK7CH	2,340	99	G8DI	643
40	VK3MJ	2,321	100	VK7RY	630
41	VE1AIH	2,273	101	··GW3CW	615
42	G6RC	2,268	102	*VK4XJ	600
43	G5MY	2,263	103	<b>VE3EVW</b>	590
44	G3VDL	2,260	104	G3CVB	585
45	VK7BC	2,215	105	***VE2AEJ/3	565
46	G3UFY	2,090	106	G3AWR	450
47	G3AZ	2,065	107	††CG6APN	430
48	VK6AQ	1,985	108	G6NK	411
49	CG3BVD	1,975	109	VK4UR	405 403
50	*G4CNY G3GC	1,923	110 111	*GM3SSB	375
51 52	VEIEP	1,900		G4DBW ++VK2BJL	368
53	G3EBH	1,830	113	**ZL2MM	320
54	ZL1HV	1,810	114	VK3XB	225
55	G3HRY	1,780	г	G2BLA	150
56	VK3RJ	1,735	115 -	+VK5NLC	150
57	G3KSH	1,730	10799	ZB2CJ	150
58	G3NOM	1,710	118	**VE3JKC	130
59	GW3MPB	1,665	119	†VK7ZO	115
60	G3VW	1,650			

Posn 1	Callsign BRS15822	Points 3,040	Pośn 2	Callsign BCRS195	Points 2,405
	Hz single band single band			**21MHz s	
400000000000000000000000000000000000000		MARK VARIOUS CO	PERSONAL 1-1275122	***28MHz s	single band

RECEIVING SECTION

Check logs from G2MI, G4FDC, G6HQ, ZL1HY and VE3EK are acknowledged with thanks.

# DF Qualifying event South Manchester results

Fourteen teams gathered at the start, six miles W of Manchester, near the Manchester Ship Canal. The weather was sunny, with light showers. The organizers had hoped for some rain because the "A" station site had been threatened with a pop-festival invasion; fine weather might have seen the operator surrounded by quitars as well as df sets.

might have seen the operator surrounded by guitars as well as df sets. All but two competitors decided to go first for the "A" station, G3FVA/P, located 13 miles NW of the start on a wooded slope bordering Rivington Moor. The "B" station, G3UHF/P, was 14 miles N of the start among the dripping trees and ferns overlooking Wayok reservoir.

Although site tests the week before had shown that signals were audible at the start, a number of competitors had difficulty identifying

## Contests calendar

October-November	er432MHz Cumulative (Rules in August issue)								
7-8 October	432/1,296/2,304MHz (Rules in August issue)								
7-8 October	VK/ZL Oceania (Phone and RTTY) (Rules in September issue)								
14-15 October	21/28MHz SSB (Rules in May issue)								
14-15 October	VK/ZL Oceania (CW) (Rules in September issue)								
21-22 October	7MHz SSB (Rules in June issue)								
22 October	70MHz Fixed (Rules in August issue)								
28-29 October	CQ WW DX (Phone) (Rules in September issue)								
4-5 November	7MHz CW (Rules in June issue)								
4-5 November	144MHz CW (Rules in September issue)								
10-11 November	European DX (WAE) (RTTY) (Rules in July issue)								
11-12 November	2nd 1-8MHz (Rules in October issue)								
25-26 November	er CQ WW DX (CW) (Rules in September issue)								
3 December	144MHz Fixed (Rules in October issue)								

stations on the day. Approximate bearings within the narrow limits laid down in the rules were announced.

The event was organized by members of the South Manchester Radio Club. Thanks go to three xyls, Christine, Mary and Sybil, for arranging the tea at club  $H\Omega$ .

			Time o	f arrival
Posn	Name	Club	Station "A"	Station "B"
1	W. J. North	Mid-Thames	14443	1542
2	D. E. Newman	Rugby	1445	1548
2 3 4 5 6	J. R. Vickers	Slade	1446	1549
4	T. C. Gage	Mid-Thames	15013	1550
5	C. M. Wells	Mid-Thames	1511	1551
6	B. Bristow	Mid-Thames	1444	1553
7	FR. Parsons	Burton-on-Trent	1443	1554
7	L P. Lisle	Mid-Thames	1554	1446
9	E. L. Mollart	Mid-Thames	1445	1555
10	G. Whenham	Coventry	1500	1607
11	P. Homer	Dartford Heath	1445	1608
12	A. Butcher	Chelmsford	1507	1609
13	P. Williams	Slade	1455}	1628
14	C. Merry	Dartford Heath	A-349468	1602

W. J. North was presented with the South Manchester DF Cup. D. E. Newman and T. C. Gage qualify for the National Final.

#### 2nd 1.8MHz Contest 1978 rules

- 1. The general rules for RSGB hf contests, published in the January 1978 issue of *Radio Communication*, will apply.
- When. 2100gmt Saturday 11 November to 0200gmt Sunday 12 November 1978.
- Eligible entrants, Single-operator stations only. British Isles entries must be members of the RSGB.
- 4. Sections.
  - (a) British Isles stations.
  - (b) Overseas stations including El.
- Contacts. CW (A1) only in the 1-8-2MHz band. In addition to RST and serial number, the British Isles stations should send the appropriate county/region letters as published in the January 1978 issue of *Radio Communication*.
- 6. Scoring.
  - (a) British Isles section. Three points for each contact, with a bonus of five points for the first contact with each county/region and each country outside the British Isles.
- (b) Overseas section. Three points for each contact with a station in the British Isles (not El) with a bonus of five points for the first contact with each county/region.
   7. Logs. Column five to be headed "Code received". Entries to be sent
- Logs. Column five to be headed "Code received". Entries to be sent to RSGB HF Contests Committee, c/o Mr D. S. Booty, 139 Petersfield Avenue, Staines, Middlesex TW18 1DH, England.
- 8. (a) Awards. The Victor Desmond Trophy will be awarded to the leading British Isles entry. The Maitland Trophy will be awarded to the Scottish station scoring the highest aggregate number of points in this contest combined with the 1st 1-8MHz Contest 1979. Certificates of merit will be sent to the runner-up and third-placed entry in section (a), to the first three stations in section (b), and to the leading station in each overseas country.
  - (b) A certificate of merit will be sent to the highest-placed entrant in the British Isles section who has held a Class A licence for one year or less at the time of the contest. Candidates for this award should write the date they were licensed on their entry.

#### 144MHz Fixed Contest rules

0900-1700gmt 3 December 1978

All entries and checklogs to: VHF Contests Committee, c/o Mr L. Turner, G4CUT, 59 Harewood Road, Chelmsford, Essex CM1 3DG. The following general rules, published in the January 1978 issue of

Radio Communication, will apply: 1, 2, 3, 5, 7a, 8, 9a, 10a, 11-22.

There will be three sections: A. Single-operator-All mode.

B. Multi-operator-All mode.

C. FM only. (above 144·50 and below 144·90MHz).

Contestants are requested to avoid the rtty, Raynet and other such frequencies.

# your opinion

#### AP TALK-IN FREQUENCIES

The Editor

Radio Communication

Sir - Graham Knight, GM8FFX, rightly points out in his July 4-2-70 Column that 145MHz (or S0 as he calls it), was one of the frequencies chosen by the management of the Alexandra Palace talk-in station as a working channel.

The rationale behind the decision, which was taken after very careful consideration, was primarily to ensure that the maximum number of visitors to London would be able to receive navigation assistance to the exhibition. Equipment in use in 1978 is not all of 1978 vintage, and many FB2FBs, Pye Cambridges and Vanguards and TR2200s, besides the small KP202 and other handhelds, are in everyday service. These older rigs are likely to carry at least S20 (mobile calling channel), S22 and 145MHz (a relic of the past), but do not have the channel flexibility of the latest synthesized transceivers.

Of the established simplex frequencies, S20 is fully recognized and accepted as the mobile calling frequency, and S22 had already been selected as the primary talk-in channel. To have occupied one of the other two remaining popular simplex channels (S21, S23) would have resulted, it was thought, in justifiable complaints to the effect that the talk-in station was monopolizing half the popular simplex channels. (Experience suggests that channels S10-S19 are not by any means universally fitted.)

On the other hand, 145MHz crystals are widely installed in amateur equipment and, while being mindful of a Continental repeater on RO, the risk of causing harmful interference to a station located some hundreds of kilometres away was considered acceptable, unless evidence to the contrary was forthcoming. In the event over 50 per cent of the 900-odd stations worked chose 145MHz in preference to S22, 144-28 ssb or 432MHz, and on numerical grounds alone the inclusion of this frequency could be justified. It is fair to add that even with hindsight the same frequencies would have been selected.

However, at future events other frequencies might suggest themselves as being more appropriate for talk-in service, but this must be left to the judgement of those charged with the responsibility of managing such stations.

M. J. L. Fadil, G4CCA

#### 144MHz CW

The Editor

Radio Communication

Sir - Why is there virtually no cw on 144MHz? As a confirmed cw addict on the hf bands, I have recently turned my attention to 144MHz ssb/cw, and find that the cw calling channel is practically deserted. From quite reasonable results so far on ssb, I feel very optimistic about the success of inter-UK working on cw, but have found scarcely anyone else to help me prove the point!

There must be a lot of cw-orientated people on the band, but it would appear that their keys become disconnected on vhf, and I would like someone to explain the lack of activity. It appears to me that even when there are no "lifts", cw contacts are possible over reasonable distances, and without the very noisy conditions of, for example, top band.

If this letter does nothing else, perhaps it might encourage a few of the cw fraternity to remove their keys from the mothballs, turn their beams of an evening (virtually any evening) towards YP21h, and listen for my lonely and heartrending CQ calls on  $144\cdot05MHz!$ 

T. Hall, GM3HBT

#### THE PRESIDENT'S STATEMENT ABOUT REPEATERS

The Editor

Radio Communication

Sir - May I add a small voice to what I am sure will be a chorus of praise to the President for his magnificent assessment (July issue) of the repeater scene in the UK today. Especially, one warmed to his tribute to the dedicated hundreds (thousands?) of members who have applied high technology, entirely gratuitously, to the formidable job of designing, siting and commissioning the 70-plus repeaters which we British amateurs are privileged to use and enjoy.

Just one point which I think G3RPE might have developed more fully is this: repeaters occupy only 200kHz of the 2MHz width of the 144MHz amateur band, ie 10 per cent (and an even smaller percentage of 432MHz). This leaves 90 per cent of the spectrum clear for people to go and do something else if they do not like repeaters. And one hardly needs to add that in the vhf area there is an infinity of "things to do" and phenomena to explore. Perhaps a little more exploring and a little less grumbling might be to the advantage of our hobby and the image it presents to the outside world.

Jack Hum, G5UM

#### INTERFERENCE STATISTICS

The Editor

Radio Communication

Sir-I read with interest the letter from Mr George, G3ZOH (July 1978).

It is important to realize that the Home Office statistics relate only to those cases reported to the authorities. In a large number of cases originating from amateur transmissions the interference is cured by the amateur himself, either solely, or with the help of the Interference Committee.

Again, it is important to realize that with a carefully planned and engineered station, interference to television or audio equipment is in fact unlikely

Assuming that an amateur is happy about the lay-out of his station, he should then operate at any time of the day that he feels so inclined. Remember that all the time that manufacturers think that their equipment is not being interfered with they are not going to do anything about it. If they get a hundred or so cases involving one particular model, they are going to begin to think that there is something wrong with it, and they will probably be right.

Also in your July issue there was an article describing a tvi filter by Mr Richardson, G4GED. This filter has a very fine performance as a high-pass filter. It will therefore be very useful for vhf operators, for whom harmonic radiation is still of some importance. However, where hf transmissions are involved the problem is usually cross-modulation caused by rf being carried into the receiver on the braid of the coaxial cable. In this case a braid-break filter would be essential. Even this course would not be necessary if the designer of the television receiver had considered the possibility of interfering signals in the first place.

P. F. Jobson, G3HLF Chairman, Interference Committee

#### COST OF AMATEUR EQUIPMENT

Sir - May I add to the remarks contained in the letter from the Ayr Amateur Radio Group in your June issue.

I also would be interested in the reason why £1 equals \$1 in amateur radio currency. Amateur radio is not immune from the effects of inflation of course; but until convinced otherwise, I think we are being seen off" with today's prices, in part due to the ARRA monopoly.

Other reasons could be: high transport costs, Customs duty, and the high overheads incurred by the retailers in maintaining their workshops to service today's highly complex gear; not to mention the biggest cause of inflation, VAT. I do not think one would get the same satisfaction of after-sales service if amateur radio equipment were available from the "cash and carry" type warehouses.

One way of reducing prices is to refrain from buying the equipment!

Also try more homebrewing; it need only be simple whether for ow or ssb. The cost of commercial gear has passed out of my reach; I am glad I still have a junk box and supply of 807s. I get far more enjoyment from contacts using my homebrew gear, at one-twentieth the cost - and I can service it myself, too.

Sir – The short answer to the query from the Ayr Amateur Radio Group is: "Provide more competition" – this soon pushes prices down. Competition from where? Why not the members themselves? The 'old-timers" mentioned in the letter always made their own gear (I built my first transmitter 40 years ago), and if the present generation did the same the costly (and ugly) commercial rigs would soon come down in price. It is a great deal more fun, too, and (dare I say it?) gives you something to talk about on the air - a long-felt need judging from what is heard these days!

T. D. Walshaw, BRS23009 (One-time G2PI)

# members' ads

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB. They must be submitted on the Members' Ads order form printed in alternate issues of Radio Communication, or on a postcard similarly laid out. Each must be accompanied by a recent Radio Communication mailing label addressed to the advertiser, as proof of membership, and a remittance by postal order or cheque for 75p (stamps not accepted). They will not be acknowledged. Those not clearly worded or punctuated will be returned. No correspondence concerning this service can be entered into.

The closing date for each issue is the 1st of the preceding month, but no guarantee of inclusion in a specific issue can be given. Valid advertisements not published in the issue following receipt will be held

over until the next issue.

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 may be edited or abbreviated as necessary.

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD. CHELMSFORD, ESSEX CM1 1SS.

Do not post to RSGB HQ or Advertising Representative

FOR SALE

IC22A, as new, S0, S20-24, R3-7, orig packing, £110. Y0100 monitorscope, as new £100. Creed 7E teleprinter, good cond, buyer must collect, £20 ono. GW3XJQ, QTHR. Tel Manorbier 544, after 6pm. Drake TR4C, MS4, AC4, £350. PN34B, £30. 4NB, £35. MN2000, £125. Nombrex sig gen, comp, ac p/p, £40. Osker swr/pwr meter, £23. SB610 monitorscope, £65. KW E-Zee match, £15. Microwave frequency counter, £45. Shure 444, £12. Jaybeam 10XY, £10. G4CHP. Tel Swainsthorpe 470365.

Trio TS500 tx/rx, 80-10m, ssb/cw, remote vfo, psu, mic, handbook, perfect wkg order, comp hf stn, bargain, £175. G4HAK, 6 Caerleon

FDK Multi 11, 2m, S0, S19-23, R3-7, plus R6 input, as new, orig packing, £165. G4EGR, 41 Wingfield Road, Knowle, Bristol 3. Tel 772804. Drake R4B, T4XB, AC4, MS4, with 12 extra xtals, Electro-Voice mic. manuals, immac cond, offers around £500. G3NSM, QTHR. Tel 0865

Dulocapmet 125Ω Zo screened twin 98/-0076 feeder cable, approx 240ft, sample sent on request, offers. G6ZH, 38 Brentford Close, Cholsey, Nr Wallingford, Oxon. Tel Cholsey (0491) 651259. House move forces sale new equipment: IC202E; IC215, 15ch; nicads;

charger; whips; cases; Yaesu YC500J frequency counter; Modular Electronics 2m rf amp/rx preamp; Datong rf clipper; QM70 2m converter; Dactron 13.8V 7A psu; swr meters; Slim Jim; dummy load. G4BKM, QTHR. Tel Denham 4358.

Yaesu separates FRDX400, all options, FLDX400, manuals, cartons, 6320. Matching spkrs, two, £10 ea. Spare valves, list on request. GW3GHC, QTHR. Tel 0633 680481. FT221, fitted S0, S20-24, xtal controlled channels, exc cond, £240. G3XHX, QTHR. Tel Liskeard 43749, after 7pm.

KW2000B, exc cond, fitted vfo heater stabilizer, thus very stable all bands, £200 or offer. IC22, fitted S0, S20-24, R4-7, 144-48, plus IC201 vfo, giving comp cov on receive, £125 or offer. G3YIV, QTHR. Tel Minster (Sheppey) 875425.

Liner 2, mosfet preamp, Pye insert mic, halo, vgc, £90. Heath IM17 solid-state voltmeter, exc cond, £17. Valteris, G8KLT, 16 Cambrian Street, Jarrow, Tyne & Wear. Tel 0670 714848, evenings or weekends

14-el Parabeam for 2m, £22. 6-el Yagi for 2m, £4. §\(\lambda\) mobile G plane whip, window mount, £3. 2m portable mast, £4. G4DFI, QTHR. Tel

DEC microprocessor type MPS with console, ram, i/o, etc, £100; or exch for heavy duty rotator. 12kW 16-bit parity mos memory, with spare control and psus, suit PDP11/45, offers around £500. GM4GNJ (NOT QTHR). Tel Alloway 43907, after 7pm. QTH, Ascot, three bedrooms, large garage, brick shack, very large garden, all services, now vacant, £25,000. G3WUU, QTHR. Tel 034 47 5482.

HW8 QRP cw tx/rx, QST rit modification and built-in spkr, professionally constructed/aligned, comp with matching psu/swr bridge/atu unit, £90. ZVC board (KVG filter), wkg in solid-state 5W 80m ssb tx/rx, £50. Hunt, G3TXQ, QTHR.

SB104A digital readout broadband tx/rx, SB644 remote vfo, HP1144 psu, change band/frequency and instantly transmit without tune-up, nice outfit, built to professional standards, pcbs ultrasonically de-fluxed, £525. G3XHX, QTHR. Tel Liskeard 43749, after 7pm.

Telford TC10 multimode 2m tx, 10W output, mains or 12V dc, repeat toneburst, vfo, plus one xtal ssb ch, no mods, exc cond, £120; or exch fm portable. G8JML, "Penolver", Scarcewater, Truro, Cornwall. Tel Truro 78020.

Trio TR7010 vhf ssb tx/rx, mint cond, boxed, comp, £140. G4GIX. Tel

Godalming (Surrey) 29283. H/B dc mobile psu for KW2000A, £20, G5WG, QTHR. Tel 01-504

Racal RA63 ssb adapter, reassembled, together with two 18kHz cw filters and bfo, behind 8¾in by 19in panel, £20. G6HL.
High power 2m fm mobile tx/rx, Pye FM25B, multi-channel, 100W input, cables, manual, etc, £65. Marconi TF390F sig gen, £15. Plus carr.
Send sae for list of mobile interference suppressors at discount prices. Haseldine. "Learnington House", Windley Lane, Weston Underwood, Derbys. Tel Brailsford 755.

Drake SPR-4, as returned from comp overhaul, £245. Hawes, 24 Lon-

don Road, Kessingland, Suffolk, Tel 0502 740336. FT2FB, S0, S16, S20, S21, S22, R4, R5, (rx i/p-R5), R6, R7, 144·48, 144·6, mobile mount, etc, vgc, £125; Heathkit Mohican, h/book, £25; both ono. Delivery could be arranged in south. Scott, G4FOY, QTHR (Hants). Tel 0420 82855.

Codar CR70A rx, 0.56-30MHz, Codar PR30 preamp, 1.5-30MHz, Codar spkr, suit swl, £15. Murphy Rover base, mains ps, £10. RX62, Mk2, £7. AES tape loop player chassis, £6. GW2HCJ, QTHR. Tel 076 674 637

FLDX400 tx, unused, £200; FRSDX400 rx, 160-10, 2m, 4m, £200; Europa 2m transverter, unused, £60; TC9 Mk2 2m tx, vfo control, unused, £60; Pye Cambridge 2m mobile fully tunable rx, access tone, £50; all mint. R1155, spkr, psu, £10. Tel 0843 31069.

Yaesu FL/FR400, all options, exc cond, £350. W15U, 10ch, fitted RB0, SU18, £80. Creed 75R, 50Bd, £30. Creed 75, with perf and silence cover, 45 or 50Bd, £60. Wanted: Trio TS520, ASC11 printer, G2DML, QTHR. Tel Dipton 562.

KW2000B with ac psu, little used, £210 ono. G3THA, QTHR, Tel 07048

KW2000B with ac psu, little used, £210 ono. G31HA, G1HA. Tel 070-07169, evenings or weekends.
KW Vespa Mk2, vgc, with psu, handbook, spare 6LQ6, etc, £75.
AR88D, with S-meter, handbook, spare valves, £30; AR88LF, handbook, spare valves, £25; both wkg well, cabinets shabby. Buyers inspect, collect. G3BFQ, QTHR. Tel Hagley (056 286) 5484, evenings.
FT101E, 14 months old, boxed, as new, immac cond, hardly used, £410.

Also 18ft heavy-duty steel lattice tower, suitable for 20ft sliding scaffold pole extension, £10. Buyer collects. G4FVF, QTHR (Sidcup, Kent). Tel 01-302 2039

Yaesu FT7 tx/rx, perfect cond, only four months old, with manual, orig packing, accessories as supplied, save £43 on latest price, £300, no offers please. G3KLF, QTHR. Tel 0473 (Ipswich) 310442, weekends or

evening only.

BRT 402 rx, Marconi Mercury marine rx, psus, both good cond, and exc order, £60 and £35 resp. Seven STC 813s, five new, two almost new, offers. Lack of room forces sale. GM3TNT, 5 Langwell Crescent, Wick,

Trio JR500S amateur bands rx, 80m to 10m and 9-600MHz to 10-200MHz for WWV, £50. Buyer collects. Brown, 165 Canterbury

No 200MHz for VVVV, L50. Buyer collects. Brown, 105 Canterbury Road, Morden, Surrey SM4 6QG. Tel 01-648 0028, after 7pm.

Yaesu FT224 2m/M, 10W/1W, 24ch, toneburst, xtals R3, R4, R6, S0, S20-24, £120, incl carr Securicor. Yaesu FT220, fixed/mobile, ssb/cw/fm, £220, incl carr Securicor. G3PLL. Tel Oakham 812134. GEC Messenger, 2m, fm, mobile, 10ch, 15W, xtalled for R6, R7; exch for Liner 2 or similar. Wanted: FTDX150. G8CJY, QTHR. Tel 0276

Yaesu FT101B, good cond, £345 ovno. SP101B, £12. Good used 572B, £15. Buyers collect or pay carr; GW4BIQ, QTHR. Tel 044 128 3245. Liner 2, Mains psu, mint cond, in maker's box, with spares and mobile mount, PA3 fitted, £110. Will deliver near Manchester. G3ZCE. Tel 061-431 4136.

FT-2FB fm tx/rx, 10W or 1W, fitted 10 simplex and two repeater chs, plus xtals for 145-3MHz, £120; Uniden 2030 fm tx/rx, 10W or 1W, fitted five repeater and six simplex chs, £110; both ono. G8LXY, QTHR.

Drake R4C with nb, 250Hz, 500Hz, 1·5kHz filters fitted, T4X and spare pas, AC4 and SPR4, £600. TV502 Trio transverter, £115 ono. Trio 2200GX, 4ch, nicads, charger, etc, £125 ono. Tel Rotherham 893575.

Five-range portable conductivity tester, as new, by Evershed and Vignoles, leather case, value £100 plus, exch for good sig gen, amateur rx or high band 'scope. Havell, 72 Inkster House, Ingrave Street, Battersea, London SW11.

Liner 2, preamp, good cond, £100. IC22A, 15ch, £115. IC202, nicads, charger, as new, £150. 70cm 48-el multibeam, £12. Would consider part exch for good TS700, FT221 or IC201, GM8BOV, Tel 031-331 2755, after

3CX100AS type valves, 8533 and 7855, new and boxed, £8. 723A/B klystrons, £1. All new N-type plugs, elbows, C-type plugs, elbows and panel jacks, 50p. Accurate standard 1μF, £1. 4m 4-el Yagi, £4. G4AEZ, QTHR.

Liner 2, vgc, preamp, mobile bracket, leads, mic, manual, buyer air test and collect, £110. G&JHZ, QTHR. Tel Sandon 312.

Atlas 210X, c/w mains console and mobile console, mint cond. prefer buyer collects, £475. Datong clipper, £25. G4DXC, QTHR. Tel Bingley 2220

HW32A 20m ssb, tx/rx, with HP13A psu, £55, plus carr. Wanted: HF tx/rx,FT200, KW2000A/B, or why? HQ1 Minibeam. QQVO6/40. S. Macfarlane, 6 Tinto Road, Bearsden, Glasgow. Tel 041-942 8263.

Two Eddystone 770R rxs, 19–165MHz in six ranges, one at £85, one at £55. G3NRU. Tel Maidstone (0622) 29292, evenings.

Creed model 7 teleprinter 24V dc motor, £15. Solartron CD711S 10MHz double beam 'scope, with manual, £50. Take anything solidstate, especially cheap gc rx in px. GW3UCJ, QTHR. Tel Pontardawe (0792) 863556.

2m Storno Viscount, fitted preamp, superb audio, two control boxes, one for shack other for mobile, chs S20, 21, 22, 24, 145-0, R5-7, plus R7 input receive, manual, many spares, £60, G4GLP. Tel Camberley 24706. Possible collector's item, sig gen, by Testgear (Acton) Ltd, VT298 Acorn valves, offers. PSU/spkr cabinets for KW2000, FT/FL400, also Amtron 6in by 8in by 11in, £5 ea. KW107 atu, £60. KW108 'scope, £75. GM3I WS, OTHB, TEL Glenzothes (0592) 754714

GM3LWS, QTHR, Tel Glenrothes (0592) 754714.
FRDX400, FLDX400, KW103, KW E-Zee, Europa B, TR2200GX, BC221, Eddystone 640, Taylor 65B, KW 75Ω dummy load, § whip magnetic mount, or bridge, property of late G4DLS; offers (sae please) to G8GEK,

Heavy brass Marconi marine key, type 365A S/N 6174, ballrace pivots, metal cover. £25. Class D wavemeter, No1 Mk2T, handbook, mains input, £10. Samson ETM3C keyer, as new, £40. HA55 aircraft rx, 108-136MHz, £25. G3IWE, QTHR. Tel Warrington 601485.

Storno 600 (612), 12ch, 10 full, std control box, full leads, etc, second control box, autoscan, mics, xtal t/bursts, h/book, perfect, £155. Europa 2m transverter, £40. 9in video monitor, s/state, mains, 8 by 11 by 9, circuit, £35. Collect. Tel 01-648 5895, anytime.

TS510, PS510, recent checkover, good performance, unmarked case, spare valves, £180. EC10 Mk1, mint, unmodified, £60. Double beam oscilloscope, £20. Wanted: cw filter for TS520. Anzac MD108 mixer.

Bauer keying paddle. Tel 03074 3134. FT200/FP300, mint cond, in orig boxes, never been on the air, manual mic, spare plugs, trimming tools; AEC model 40 standing wave bridge; illness reason for sale; £235. G3KNF, QTHR. Tel 02013 71348.

G3ZSS has gone to Abu Dhabi; his mint gear is for sale: Drake T4XB, R4B, MS4, AC4, £450; FT221R, six months old, £320; FTV250 transverter, £100. Contact G4FKB, QTHR. Tel Stafford 46655.

Icom IC210 fm 2m tx/rx, fully vfo tx/rx, vgc, £180. G3ZCO, QTHR. Tel 0262 78066.

Yaesu FL2100B linear amp, £200. Home-made 2m linear amp, single 4CX250B, completely self-contained, attractive cabinet, well made, £100. Cooper, 17 Castlepark, Fairlie, Largs, Ayrshire.

EC10 rx, battery/mains, manual, £55. Buyer collects. G3TND, QTHR. Tel 027 587 2241, evenings.

IC245E 2m all mode synthesized tx/rx, accessories, £300. 18AVT vertical, £40. G3VZJ, Tel Reading (0734) 413891.
KW204, manual, £180. Buyer collects. G3ZZE, QTHR. Tel 01-949 4920.

KW Vespa Mk2, comp with ac psu and handbook, vgc, £80. G3IBH, QTHR. Tel Hitchin (0462) 56714. Cambridge U10B, SU8, RB2, RB4; IC22A, 18ch, in orig box, with

manual; two new 10ch boards for Westminster. G8IFC, QTHR. Tel Waltham Cross 28144.

KW E-Zee match, KW103 vswr and power meter, as new, £50.

C3VLQ, QTHR. Tel Reading 599591, after 6pm.

FT101E and FV101, £400. Tel 01-804 5249, evenings.

FT75 tx/rx, DC75 psu, G-whip, 10, 15, 20, 40m, £100. G3YIU, QTHR. Tel 0273 602727.

FT101B, £325. IC202, £125. Datong clipper, £25. Modular Electronics 10m to 70cm transverter, £65. Also 2m linear, 10W in, 40W out, with preamp, £35. Sentinel mosfet 2m to 10m converter, £11. NCX5 aux vfo, £20. CT82 noise gen, £15. G3SAR, QTHR.

Liner 2, good cond, exceptionally clean ouput and speech quality, comp with mobile mount, manual and orig packing case, £105. G8ARQ, QTHR. Tel 09363 4373.

Codar CR70A Mk2 gen cov rx, 560kHz-30MHz, incl mw and amateur bands, a.m., ssb/cw, with separate Codar PR40 preselector, £30 ono. Plus carr. GM4HCE. Tel Glasgow 041-339 5256, after 6pm weekdays, all day weekends.

TA33Jr beam antenna, £50. Will deliver 50 miles. Wooden pole, 32ft, £10. Buyer collects. G3TCJ, QTHR. Tel 0579 42073.

3cm front end, incl Gunn tx, varactor tuning/modulation, mixer, ferrite circulator, horn, £69. G8APX, QTHR.

Drake T4XB hf tx, plus AC4 psu, mint cond, all amateur bands 180–10m. G4AXS, QTHR. Tel Barham (E Kent) 381.

Heathkit SB610 monitorscope, with vertical amplifier, wired for 455kHz, plus components for 1kHz/150kHz, 1,000kHz/2,475kHz, 3,000kHz/6,000kHz, comp with manual, £90 ono. Buyer collects. G8VN,

OTHR. Tel Derby 514464. Standard C828 owner? Then why not have full 2m cov with the SR-CV110 vfo, only £35. G4CEU. Tel Rayleigh (0268) 778202, evenings. Labgear Teletext decoder unit, model 7026 for Ceefax 1 and 2, and Oracle, few hours use only, £250. GM3OZB, QTHR. Tel Kilmarnock

FRDX400 with 2m, FLDX400, both in mint cond, recently overhauled by Yaesu agent, £315. TA33Jr, needs some attention, £30. RSGB Bulletin

(bound), '64 to '72 incl, offers? G2AFQ, QTHR. Tel 061-764 2622 TR7010, good cond, extra range xtals, mobile mount, mic, etc, £135. Daiwa gutter clip ant, λ/4, 2m, £4; or free with tx/rx. G3RZC, QTHR. Tel 0424 892504.

FRG7, absolutely as new, £150. Heathkit GR78 gen cov rx, nicad, ext charger, £35. Small rf sig gen, £5. IC201 144MHz multimode, SD306 preamp, £295. Tel Julian, 01-854 2424 ext 335 (office), or 01-778 9603

(evenings).

Trio JR310, 160m, extra n/band filter, manual, spkr, £90. 9R59DE, manual, no mods, £45. Joystick vfa, antenna tuner, £20. 2m converter, 144/28MHz, £12. G/plane, £5; 5-el beam, £5; both 2m. All ono. Bailey, 27 Heathfield Gardens, Stourbridge DY8 3YD. Tel Stourbridge 72254. TR2200GX fm tx/rx, fitted 5ch R4, R6, R7, S20, S22, helical, nicads, MB1A mobile mount, etc, boxed, as new, £130. Lowe SRX30 hf rx, mint cond, £135. Dodgson, G8EFQ. 150a Liverpool Road, Southport,

Merseyside. Tel 0704 68385.

FT200, FP200, all of 10m, orig packing, £220. TR2200G, nicads, helical, int preamp, carrying case, fitted S20-23, R4-7, S0, S14, £100. MMV432, with SU8, RB4, RB10 tx xtals for 2200G, £20. Wanted: FT101B, or late Mk2 (exch considered). Robinson, via G4FRE QTHR. Pure Cambridge 25B, 6ch 2m fm tx, cables and mic ingl. fair cond. £25.

FT101B, or late Mk2 (exch considered). Robinson, via G4FRE Q1HR. Pye Cambridge 25B 6ch 2m fm tx, cables and mic incl, fair cond, £25. Wanted: circuit diagram, or any information on National rec NCX10, postage paid. G4ERQ, QTHR. Tel Alsager 6404. SB220 linear amplifier, 2kW, professionally built, £368; KW107 Supermatch, atu, £61; half new prices. Hallicrafters TO keyer, orig, unmodified, £25. Must sell, getting married. Wanted: LF10 preselector (vlf) for LRD Compring retrieve and money please to G32YM. Tel D632. for HRO-500. Commiserations and money please to G3ZXN. Tel 0632 854450.

HRO, wkg, four coil packs, circuit, spare valves, less psu, £15. Mains chart recorder, one inch per hour, 50µA fsd, three rolls paper, wkg well, £10. Buyers collect or carr £4. G8JPL, QTHR. Tel 021-706 1259, even-

FT220 2m tx/rx, £220. Drake TV3300 low pass filter, £13. Twin meter swr bridge, £6. 4-el 2m quad, £10. Solartron CD523 S2 oscilloscope, dc 10MHz, £40. 2m converter, i.f. 28-30MHz, £10. Two stn intercom/baby alarm, unused, £5. G4EZK. Tel 01-592 4890, evenings. Hammarlund HQ 170-A, 160-6m amateur bands rx, built-in 24h shack

clock/timer, Eddystone plinth spkr, vgc, £130 ono. Buyer collects. Tel Uxbridge (0895) 35656, after 7pm.

2m linear amp EDL144, 100W out, preamp, £105. UHF 12V 50Ω coaxial relay handles, 50W, £5, G8BWR, GTHR. Tel 0926 48388.

Creed 7E r/p, silence cover, good wkg order, £25. Fairbairn. Tel 01-253

8257, office hours. Eddystone EA12 rx, vgc, with manual and spare valves, sensible offers. Please write before calling. Burgis, 11 Morningside Avenue, Portchester, Fareham, Hants.

FT201, as new, £325. DX40 and vfo, £17. KW Valiant tx, £12. 1.6MHz cw and a.m. xtal filters, £12 pr. BC221 xtal, £5. Solartron CD1016

cw and a.m. xtal filters, £12 pr. BC221 xtal, £5. Solartron CD1016 'scope, £45. Heath 1-6MHz Q-Multi, £6. 2m tx, comp, £10. G3MOT, 'Leafield'', Ashmore Green, Nr Newbury, Berks. Tel Thatcham 67010. FT101E, 18 months old, perf cond, £395. Tel Carmarthen 6482. FT101/2, 160m, fan, audio, comp, £260. Trio SP5DS spkr, £4. Yaesu mic, noise cancel, £5. AM10D Cambridge, £18. Xtal cal No10, £3. G3SIO, QTHR. Tel Kingswinford 5924, evenings. FT200, FP200, mint cond, less than 15 months old, £250. Wanted: Eddystone 830/7 or similar gen cov rx. G4CEC, QTHR. Tel 09334 S9488. FM/AM 144MHz tx, xtal/vfo, 10-55W, £30. AM 144MHz tx, xtal, 40W, needs mod transformer, £25. MM 432/28 conv, £18. HC6U xtals, 3,584-000, 8,043-000, 8,063-888, 8,065-277, 8,066-667, 8,077-083, 12,116-666. 16,952-000, £2 ea. Offers. G4FKA, QTHR. Tel Stevenage (0438) 59019. (0438) 59019.

Belcom Liner 2, preamp, psu, £115; also, for use with Liner, 70cm transverter, 10W o/p, comp with cables, £50; both good cond. G8JBN,

OTHR. Tel Lancing 62092, after 6pm. FR50B, vgc, 80-10m and WWV, xtal calibrator, hardly used, £65. Pye 6ch dash Cambridge, on 2m fm, S0, S20–22, R5, R7, £45 or offer. Can deliver reasonable distance. G8GXE, QTHR. Tel Fulmer 2078.

Atlas AC console with vox, £85. KW201, amateur bands only, ssb,

A.m., cw, 160-10, £78; or exch good comms rx. Wanted: KW109 atu; TA33 antenna; Osker swr meter. G4EWG, QTHR. Tel Constantine 588. RTTY: Creed 75 rx only teleprinter, 50Bd synchronous motor, comp with pedestal, silence cover and fluorescent light, £15. Delivery extra by arrangement, G3RDG, QTHR. Tel 01-455 8831.

arrangement, GSDUS, GTRN. 1810-1835 Soci. FT401, 1-18MHz, SP401 spkr, £295 ono. Wanted: TS520S. G3SJJ, QTHR. Tel 0602 253102, after 6pm.

Trio TS700G, £350. VB2200 10W pa for 2200G, with mount for 2200G, £25. MC50 Trio desk mic, £15. G8KNC, QTHR.

Hammarlund HQ170A rx, triple conversion, 160m to 6m, amateur bands, little used, very clean, unmodified, incl ciock, spkr, handbook, spare valves, £125 ono. G3RAU, QTHR. Tel Pound Hill (Sussex) 3824. Mosley Mustang Mk2 3-el beam, (10-15-20m), good cond, plus some spare insulators, £115. Buyer to collect. G4DZC, 53 Highfield Crescent, Portswood, Southampton, Hants.

Storno Viscount 2m tx/rx, 4ch, xtals S20, S21, S22, preamp, control box, cables, £35. Pye Ranger, 145-0, a.m., £10. G8BPJ. Tel Stoke-on-

Storno Viscount, converted for 2m fm, xtal S20, boot mounting, comp with control box, vgc, £30 ono. R. J. Harris, G4GIY, 2 Ayelands, New Ash Green, Kent. Tel 0474 873487.

Sentinel 2m converter, 4-6MHz out and preamp, £10. T1154 tx, with in-

Sentinel Zm converter, 4-6MHz out and preamp, £10. T1154 tx, with info, £16. R1155 rx, int psu, spkr, £12. 813 with ceramic base, £12. 813 heater transformer, 10V at 10A, £8. Tel Chesham 4883.

Heathkit vhf wattmeter, £20. Cantenna dummy load, £10. Antenna switch, £4. KW160 tx, £15. T£15 gdo, £15. V-beam 8XY, £10. Ground plane, £4. AR22 rotator, £20. Motorola Military fm portable; \$WMs; PWs; offers. G4GGK, G8JAH QTHR. Tel Lewis, Rushden 4797.

Eddystone 888A rx, immac, with plinth spkr, manual, spare valves, £80. Please write before calling. Burgis, 11 Morningside Avenue, Portchester, Fareham, Hants.

4CX250B uhf type valve base, with grid cavity tune, brand-new, £25, incl p & p. Transformer-potted SEL, 1185-0-1185V, 360mA, brand-new, £15, incl p & p. G3SEF, QTHR. Tel Cheslyn Hay (0922) 415369.

STE AK20 2m mobile tx/rx, fitted with Eurocat Catronics 7200G type synthesizer, 80ch, vgc, £120. Icom IC30A, 70cm, mobile, 5ch, as new, with 48-el multibeam, £175. G8LGE, QTHR. Tel 0924 825025.

Heath SB303 rx, mint cond, £180 ono. Heath SB200, linear, mint cond,

Heath SB303 fx, mint cond, L180 one. Heath SB200, linear, mint cond, new 572Bs, £240. Heath SB640, remote vfo, good cond, £30. Will deliver. GM3ZXL, QTHR. Tel 041-779 2303.

Magazines: SWM, March '68 to February '72, March '74 to March '75; PW, March '63 to March '70; offers. Mullard stereo preamp module LP1184/2, with data, £2. G8ISI, QTHR. Tel Liphook (0428) 723168.

Heathkit Mohican, vgc, spare front end, manual; magazines, junk box incl; 1MHz, 5MHz xtals; hi-fi spkrs; XO750, etc; first reasonable offer from genuine student or beginner. Harvey, 51 Chestnut Grove, Hainault, Ilford, Essex. Tel 01-500 1720, evenings.

KW Vespa ssb tx, 220W p.e.p., 6LQ6 final and psu, £75. Trio rx 9R59DE, spkr, £40. 160m tx, 10W, int modulator and psu, 5763 final,

smart cabinet. Going transceive. G3KRT, QTHR. Tel Ruislip 38287. KW1000C linear, preset tuning, 80-15m, £90. 5728 (Cetron), boxed, £17. CR100, £5. 8Y/2m, £5. Pye a.m. 2m base tx, £10. Buyers collect or carr extra. Wanted: FT101 or FT201, up to £300 available for good specimen. G3TQF, QTHR. Tel Leicester 394873.

Advance PP4 stabilized psu, 0-80V output, with 0-6A overload protection, £11; sig gen No16, 2-72-3-84GHz, o/p + 10dBm-120dBm, £10 ono; both units in full wkg order. G8JNI, QTHR. Tel Godalming (04868)

Property late G4GIW: FT101E, £400; Avo electronic multimeter CT38, E12; TF1041B vtvm, £15; TF868/1 bridge, £50; TF995A/2 sig gen, £180; 48-el 70cm beam, £10; 10Y/2m Yagi, £10; Creed 7B, £15; Solartron scope, 15MHz, £120; sae lists. G3CBU, QTHR. Tel 0256 58921. Trio 2200G, mint, fitted S0, S20-22, R5-7, with nicads, charger, h/book, spare antenna, £98. G8EEN. Tel Westbury (Wilts) 864478.

KW Vespa Mk2 tx, mint cond, £95. KW77 rx, 160-10, exc cond, £120. G3LXJ, QTHR. Tel Hornchurch 42148.

Amateur radio electronic organ enthusiasts please note that Tony, G3YEF, 402 Dorchester Road, Weymouth, is producing stereo cassette tapes of John Mann on the Eminent Orchestral organ. Two cassettes are planned: (a) "Organ spectaculars", and (b) "Organ all time favourites". John Mann, of "Radio Brighton" fame, now heads the Bognor Regis Esplanade Summer Show, and is considered to be Britain's number one organist. Proceeds from the sale of these recordings will be handed mainly to the Red Cross. Please send sae and £3.75 cheque (A/C pavee) per tape to G3YEF.

FR50B rx, 10-80m, fitted xtal calibrator, attenuator as per Rad Comm June '78, 2m converter, handbook, exc cond, £85. Tel Lochgilphead

Yaesu FT2F 10/1W 2m rig, 5 rptr, 7 simplex, toneburst, £100; Liner 2, with preamp, as used in contests, £100; Icom IC22A, xtal toneburst, 5 with preamp, as used in contests, t. 100; fcom ICZZA, xtal toneburst, 5 rptr, 6 simplex, £140; all vgc, comp with mounts, manuals. Wanted: FT221R, Multi U11. G8LVM, OTHR. Tel 0509 67309, evenings. Trio JR310, full 10m cov, fitted with "narrow" (10AZ) filter, £80 ono. 35MHz HC25U xtal, unused, £2. G4EMW, QTHR. Tel Halifax (0422)

60279

Heathkit HW101 tx/rx, HP23A psu, £160. Buyer collects or pays carr. G3YSE, QTHR. Tel 061-798 9282.

Shack clearance: HRO rxs, one B7G with int mains pack, one un-modified BC221; homebrew 300W ssb/cw tx/rx; 120W cw tx; transformers; xtals; valves (tx and rx); components; at give-away prices to callers. G3AAK, QTHR. Tel Ringwood 3078, weekends.

MN26C radio compass, £12. MN62 radio compass, £12. RAF aircraft morse keys, £3.50. Cowl Gill motor, £7. HRO orig xtals, £3.50. 4X150, £4. TCS6 rx, £12. Xtals 4989, £1. Plus carr. Wanted: u/s FT200 or similar, G3AFN, QTHR. Tel Wormley 2364.

Drake T4XC, plus AC4 psu, 160m xtal, mint cond, orig owner from new, £320, G3RWQ, QTHR, Tel 0905 54303, after 5pm.

Heathkit unique SB630 stn console, for 230V ac 50Hz operation, best offer over £40 secures this immac unit. Heath HD10 electronic keyer, oner over 1.40 secures this immac unit. Heath Hollo electronic keyer, £25. Valves: types 6A.05(1), 6A.M5(1), 6A.S11(1), 6A.V11(1), 6B.N8(1), 6BY6(1), 6B.6(1), 6B.J7(1), 6B.M6(1), 6B.M8(1), 6B.C6(1), 6C.06(1), 6C.6(1), 6E.M8(2), 6E.W6(1), 6F.V6(1), 6F.V6(1), 6H.8(2), 6J.S6C(4) (£2 ea), 6146B(2) (£2.50 ea), 12A.T7(14), 12A.X7(1), 12A.U7(2), 5Z.4G.T(1), GZ.30(1), PL36(1), EY.86/87(1), 6K.D6(1), (£2.50); all valves. 60p ea plus 50p postage, except as indicated. G3NMH, 49 Grimsby Road, Louth, Lincs.

Hallicrafters SR150 tx/rx, psu/spkr, 80 thru' 10, cw/ssb, £195. Europa 2m, transverter, £45. IC22A, 11ch, vgc, auto xtal toneburst, £130. Oscilloscope/wobbulator, £15. 100kHz xtal calibrator, £5. Cassette dictating machine, £15. G3LXX, QTHR. Tel 0625 48526.

Ex-G2DP: Belcom Liner 2, mic and R112 universal base ps; Datong universal rf speech clipper; TTC swr and power meter C3005X; Burns wavemeter TC101; TW2 tx and Twomobile rx; Venner TS20, ps; hb linear based on QQVO6-40A and spare; offers, G3DJK, QTHR. Tel

Pye W15U Westminster, boot mount, single ch, wkg on 433·2, with handbook, £45. Pairs HC6U xtals for SU20 and RB4, £3 per pair. GI8LBP, QTHR. Tel Belfast 22451, 9am to 5pm.

Belcom LA106 2m linear, vgc, with instructions, almost new, £130. Will consider part exch for hf mobile rig, cash adjustment as necessary. I. Green, 90 Foljambe Avenue, Walton, Chesterfield, Derbys S40 3EX. Tel Chesterfield 732 32

TS700G, fitted toneburst, cw sidetone selected automatically when switched to appropriate mode, in orig packing, with handbook, £360. G3USB. Tel Sheffield 890970.

Trio TS820, digital, cw 500Hz filter, £645. G3IKN, QTHR. Tel 0344 26197.

Liner 2, 3N200 preamp, mobile mount, mic, handbook, 144-14-144-37MHz, £95, G8IEM. Tel Horndean (0705) 591735. FT200, FP200, immac cond, £250, offers. 2m 14-el, £8. Fluke digital multimeter (dig Avo), 8600A, offers. G4GLB, QTHR (Greenhithe). Tel

ATU, 10-160m, 500W, wide spaced capacitors, soundly constructed, in cabinet, £22 plus post. Manuals: Collins, RCA, Hallicrafters, Racal, Eddystone; sae list. HRO spares, gearbox, ifts etc; sae list. Sentinel auto hf preamp, with relay, new, £9. Q6/2m, unused, £17. Collect. G3GUU, QTHR.

KW2000, psu, manual, few mods (incl two 6146s in pa); 80V commercial stabilized psu; relays 12V 1250Ω two- and four-pin c/o; 'scope tube (5FP7); offers? G4FNL, QTHR. Tel 0273 555526.

Yaesu FT227R, mint, three months old, 5/8 mag mount, £190. Delta 30 amp, Akai GXC40D tape deck, Goldring record deck, £75. Johnson 20hp s/shaft outboard, with remote controls, £200. G4EMQ, 237 Rowley Lane, Lepton, Huddersfield HD8 0EJ.

House move forces sale: Icom IC215 (15ch); IC202E plus cases; helical whips; nicads; charger; Modular Electronics rf amp/rx preamp; Yaesu YC500J frequency counter; Dactron 13-8V 7A psu; Datong rf clipper; QM70 2m converter; Slim-Jim; dummy load; swr meters. G4BKM, QTHR. Tel Denham 4358.

QTHR. Tel Denham 4388. Liner 2, 3N204 preamp, all maker's acc, £100. Matching stab psu/spkr, £15. Hudson FM20B, 6ch, preamp, £35. 14V 8A stab psu, £8. Prinz T700 a.m./fm stereo tuner, £15. G8KDO, QTHR. Tel 061-643 4859. Mobile p/p. Heathkit HP13B, i/p 12V dc, o/ps 750V 250mA, 300V 150mA, 130V neg bias 20mA, £25 ono. G3MA,QTHR. Heathkit audio gen AG9U, voltmeter V7A; Marconi TF428B; Solarscope CD711S2 and CD518; HRO, two coils, h/b ps; AR30 rotator; meters etc; offers. G3DJK, QTHR. Tel 01-679 2717, after 7pm.

"Rad Com", September '74-August '78, all good cond, 10p per issue or £1 per year; postage contribution please, approx £1. Paul Fulford, 43 Cunningham Drive, Eastbourne, Sussex BN23 6BL.

Cunningnam Drive, Eastbourne, Sussex BN23 bBL.

KW Vespa 2 tx, 6LQ in final, latest mod by maker, with companion rx

KW201, both in good cond, £90 ea, £160 both. Wanted: FL2100B,

KW109. G4CMT, QTHR. Tel 0482 812115.

18AVT/WB five-band trapped vertical antenna, unused since overhaul,

located SW Durham, £20. G2BS, QTHR. Tel Barnard Castle 2814.

Sommerkamp FLDX2000 linear, 1200W, orig carton, manual, £160. J. Sharratt, G3XKF, "Honeysuckle Lodge", Mentmore, Leighton Buzzard, Beds LU7 0RG.

Yaesu FT101E, mint cond, £400. TS820 Kenwood, superb. G4GPL, 32 Deacons Hill Road, Elstree, Herts. Tel Alan 01-953 6921.

Emigration sale: semi-detached modern house, first-class decorative order, garage, gardens, quad 66ft tower, large shack plus quality contents, suit family returning from abroad; must be seen, London. SAE for itemized details. Tel 01-568 1331.

#### WANTED

FT221R, up to £300 for new cond late model. G3BYY, QTHR. Tel Wraysbury 2007.

Sinclair micro-fm rx. R. Garwood, 19 St Stephen's Road, Winchester. Tel 66764.

Tel 06/64.

Oscilloscope, portable type, transistorized 10MHz Telequipment or similar, in good cond, details please. For sale: Two 5FP7 crt, sstv, etc, unused. G3ILD, 30 Loraine Crescent, Darlington DL1 5TF.

Trio TX599 tx, good cond. P.Q. Armitage, 2 Longfield Drive, Amersham, Bucks. Tel Quentin, Amersham (02403) 5670, after 6pm.

18 AVT/WB; for Stoke-on-Trent ARS, c/o 20 Wilfred Place, Hartshill,

Stoke-on-Trent ST4 7LL

Mains transformer for Solartron oscilloscope type CD1014/3; xtals for T9ER mixer vfo, 8,700kHz, 12,200kHz, 19,200kHz, 26,200kHz, 33,200kHz. GW3TKG, QTHR.

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18AVT/WB 10-80m trapped vertical antenna. Yaesu FL50B tx. D. Lloyd, 39 High Street, Twerton, Bath, Avon.

G2DAF rx, must be in good wkg cond, can collect within 50 mile radius of London. Roy Culley. Tel 01-242 4433 ext 4717, office hours, or 01-870 0036, after 6.30pm.

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Hilomast, pneumatic, telescopic, "PNAM" series, 30ft or 48ft extended, wkg order. Also KW107, KW109, KW E-Zee match. G4HAF, G8MPN QTHR (Codsall, nr Wolverhampton). Tel Codsall 3509.

Circuit diagram and/or handbook for Furzehill Laboratories oscilloscope, type 1936, prefer loan, or will purchase. G3DWQ, QTHR. Tel 0772 53810.

Handbook for Lafayette HE30. E.C. Adams, 41 Edinburgh Crescent, Waltham Cross, Herts EN8 70X.

Trio JR599CS, Yaesu FRDX400S, or similar amateur bands rx, with xtal

controlled first oscillator, in mint cond, with manual. Details and price, incl of carr, to Gall 24 Watson Street, Aberdeen.

Monitorscope, in vgc, preferably by Heath, or why? Also lambic squeeze keyer paddle. For sale: Comp G3HSC morse course, all in vgc, f3.50. Steve, G4GTU, 57 Golden Avenue, Angmering-on-Sea, Sussex BN16 1QX. Tel Rustington 4123.

2m linear amp, single or pair 4CX250B, and psu. G4ERG, 42 Wascana Close, Anlaby Park Road South, Hull, Humberside HU4 7BX. Tel 0482 646077, after 6.30pm.

Creed 444 teleprinter, must be mint cond, your price paid, will collect. GM3ZXL, QTHR. Tel 041-779 2303.

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#### **PUSH-BUTTON CONTROL**

Model ASP sets remarkable new standards of performance and ease of operation for speech processing equipment. As well as providing the genuine 6 to 10dB of talk power improvement without harmonic distortion which has made our Universal RF Speech Clipper world famous, Model ASP adds the ultimate convenience of instant push-button selection of the degree of RF processing. This ranges all the way from 0 to 30dB in 6dB steps.

Input level adjustments or meter watching are completely eliminated and the automatic control system ensures that you always get exactly the amount of processing that you want despite changes in voice level, or even despite changes in

With Model ASP you simply select the processing to suit conditions: 0 to 6dB for semi-local work; 12 or 18dB for DX work; and 24 or even 30dB for when the going is really rough.

Having eliminated input setting controls, Model ASP goes even further and simplifies the setting of the transmitter microphone gain. Simply press the "TONE" button and the unit generates a sine wave with the same peak-to-peak amplitude as the processed speech output. Once your transmitter mic. gain (or the preset output level control on the back of Model ASP) is set to give the desired peak P.A. current using this tone, it will be virtually impossible to over-drive the transmitter or to radiate a bad signal.

The result is that you can always rest assured that your signal is exactly as you want it, without the need to watch meters or to carefully control your voice level.

#### TWO PROCESSORS IN ONE

Model ASP really consists of two processors in one case. The first is an audio processor and the second is a true RF clipper.

The audio processor is not intended to give any compression or talk-power enhancement; its job is instead that of an intelligent and unobtrusive yet thorough automatic peak-level adjustor which ensures that the subsequent RF processor always has an accurately defined peak-to-peak input level. It is exclusively the job of the RF processor to boost the talk power.

#### PROVEN RF CLIPPING TECHNIQUE

The main processor uses the well-proven RF clipping technique which has been so successful in our Models RFC and RFC/M, A high-quality SSB signal is generated at 60kHz using the phasing technique because of its smooth frequency response and its long-term reliability. This SSB is then clipped, filtered, and demodulated back to audio. The result is an increase in the average to peak voltage ratio of the speech waveform yet without harmonic distortion.

Unlike some AF or RF compression systems which make you sound fouder without improving your readability, true RF clipping actually increases the intelligibility of speech in noise. This effect acts in addition to the simultaneous increase in your average power level

#### ADVANCED AUDIO PROCESSOR

The audio processor has the demanding job of maintaining a constant peak-to-peak speech amplitude despite wide variations in input level and yet without inbeak specified visible traducing any audible side effects. The circuit has been especially developed for this specialised purpose and is highly sophisticated. It involves detection of both positive and negative speech peaks to allow for the marked asymmetry of many positive and negative speech peaks to allow for the marked asymmetry of many speech waveforms, and a five second 'hang' time after speech ceases so that the background noise remains constant during speech pause. So that the circuit is not fooled into a long-term gain reduction by loud transients (such as from dropping the microphone) dual time constants are used in the control loop together with special logic circuitry to discriminate against non-speech sounds.

#### ACCURATE CONTROL

As well as being highly convenient to use, Model ASP gives a far more accurate control of the degree of RF processing than processors which rely on the operator controlling his voice level to "talk-up" a meter to a desired reading. Moreover, the self-control needed for the latter method all too often evaporates in the excitement of DX operating. With Model ASP on the other hand, you can afford to get excited the united that the processing the processin excited; the automatic control continues to look after your signal while you concentrate on the operating.

#### **FULL MONITORING**

Even a control system with the wide range of Model ASP has its limits and three light-emitting diodes are provided so that you can confirm at a glance that your input is within bounds. If your voice level is too low, the "LO" lamp will stay on. If
your voice level is within the correct range the "OK" lamp comes on instead, and
after a few seconds of speech (during which the processor will "learn" your voice
level) it will stay on for about five seconds after you stop talking. This represents
the "hang" time of the pre-processor. If both "LO" and "OK" lamps go off
longther your input, it too large. together your input is too large.
As a further refinement, the "SPEECH" lamp should stay on only while speech

sounds are present. If it stays on between words there is too much background noise at the microphone for good intelligibility, and you should talk closer to it.

PRICE: £65.00 plus VAT (£73.13 total), including postage (UK only). AVAILABILITY: October. Data sheet in preparation; reserve your copy

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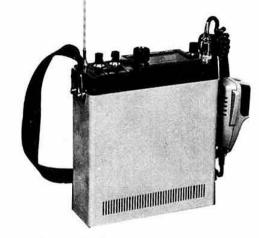
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CQ-P2200E 2m FM Portable Transceiver

#### SPECIFICATION

General	
Frequency range	144.00 146.00 MHz
Channels	12 Channels
Microphone	Dynamic type (10KΩ)
Speaker	3W 8Ω
Supply voltage	Built in batt. DC12V HP-2×8, External
822	power supply 13.5 V
Current consumption	900mA at transmissio 110mA at reception
Semiconductors in	
use	29 transistors; 3 FET' 16 diodes: 2 IC's: 1

(D) mm

power supply 13.5 V deviation 900mA at transmission 110mA at reception 29 transistors; 3 FET's: Multiplication 16 diodes: 2 IC's: 1 Undesired radiation LED Repeater tone 196 (W) × 69 (H) × 219

Transmitter

Emission type

Transmitting power

Antenna impedance Maximum frequency F3 3W (at HIGH), approx, 1W (at LOW) 50Ω

± 10 KHz Crystal controlled variable reactance modulation 12 -60 dB or less 1750 Hz+ 2 Hz

#### Receiver

Receiving system Double superheterodyne Intermediate frequency First IF 10.7 MHz Second IF 455 KHz Sensitivity S/N 30 dB or more at 1µV input -6 dB or less Squelch Pass band width ±10 KHz or more (at -6 dB) Ceramic filter Low frequency output 0.5W (rated output) Overall distortion 10% or less at 1,000 Hz 0.5W

#### DESCRIPTION

This is a very well built piece of equipment with robust case and strong webbing carrying strap. All controls are on the top face making operation easy and comfortable. The built-in extending rod antenna can be used as § or § wave whip depending on the number of sections used. The battery compartment is recessed from the bottom of the unit and is held by one bolt giving easy access to compartment and the battery pack slides out without any connecting wires. External DC supply socket and external antenna socket are recessed into base. The microphone is particularly comfortable to hold and is the right shape and size.

Approx. 2.6kg (including batteries)

The 1750HZ repeater access tone operates on release of the P.T.T. switch thus giving a tone at end of transmission even on normal simplex working.

The transmitted output is switchable 3w or 1w.

The meter serves as 'S' meter on receive, and battery check on transmit.

An LED "ON AIR" Indicator is provided.

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FREQUENCY	1	*	蠹	1	=	12M	1	3	38	\$	*	100	NZS	121
144.030	е	е	e	е	е	е	е	е	е	e	е	е	е	е
144.4 (433.2)	а	e	8	e	e	b	е	е	6	e	е	e	6	6
144.480	e	e	e	e	e	6	е	е	e	e	е	е	е	е
144.800	d	e	e	e	e	d	е	е	е	d	d	e	6	е
144.850	e	e	e	e	e	e	е	е	е	e	6	e	6	е
145.000/R0T	а	b	а	C	C	a	а	а	b	а	а	b	C	е
145.025/R1T	а	b	а	e	e	a	е	а	6	e	e	e	e	е
145.050/R2T	а	b	a	е	е	a	е	а	е	е	е	e	е	е
145.075/R3T	а	b	8	e	e	a	е	а	е	е	е	e	9	е
145.100/R4T	а	b	а	e	e	а	е	а	е	e	e	e	e	е
145.125/R5T	а	b	8	e	е	a	е	а	6	e	е	e	e	e
145.150/R6T	а	b	а	e	е	a	е	а	9	e	е	e	9	е
145.175/R7T	а	b	а	e	e	а	e	а	е	e	е	e	6	e
145.200/R8T	a	b	9	e	e	a	а	а	6	а	а	e	C	e
145.300/S12	e	e	е	е	е	6	e	е	е	e	e	6	е	е
145.350/S14	e	e	C	e	e	C	C	C	е	C	C	e	е	е
145.400/S16	e	e	e	e	e	e	е	е	6	e	е	6	е	е
145.425/S17	e	e	e	е	е	6	e	е	e	е	е	e	е	е
145.450/S18	e	9	e	e	e	е	e	е	9	e	е	e	e	е
145.475/S19	e	e	e	e	e	e	е	е	e	e	е	6	6	6
145.500/S20	8	b	a	C	C	a	а	а	b	а	8	b	C	e
145.525/S21	а	b	a	C	C	a	а	а	e	8	а	e	C	e
145.550/S22	a	b	a	C	C	a	a	а	e	а	а	e	C	e
145.575/S23	а	b	a	C	C	a	a	а	e	а	а	е	C	e
145.600/ROR	а	b	a	C	C	a	а	8	е	а	а	e	C	е
145.625/R1R	e	e	e	e	e	8	а	e	е	a	а	e	C	е
145.650/R2R	e	e	e	C	е	e	8	9	е	а	а	e	C	е
145.675/R3R	e	e	e	C	C	e	а	е	e	а	а	е	C	е
145.700/R4R	е	e	e	C	C	e	а	e	e	a	а	e	C	е
145.725/R5R	e	e	e	C	C	e	а	е	6	a	а	е	C	е
145.750/R6R	е	е	е	C	C	е	а	е	e	а	а	e	C	е
145.775/R7R	е	e	e	C	С	е	a	е	e	а	а	e	C	е
145/800/R8R	а	b	a	C	C	а	а	а	е	а	а	e	C	е
145.950/S38	а	le	е	a	e	e	е	е	e	a	e	e	e	е

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			25 Amp	brjage	– T T	933430000				
4001 4002 4004 3. 4006 4007 4008 4009 4010 4011 4011	.15 7400 .15 7401 .20 7402 .95 7403 .95 7404 .20 7405 .75 7406 .35 7407 .35 7408 .20 7409 .20 7411	.10 .15 .15 .15 .10 .25 .25 .55 .15 .15	7473 7474 7475 7476 7480 7481 7483 7485 7486 7489 7490 7491	.25 .30 .35 .40 .55 .75 .75 .55 .25 1.05 .45	74176 74180 74181 74182 74190 74191 74192 74193 74194 74195 74196 74197	L - .85 .55 2.25 .75 1.25 .95 .75 .85 .95 .95	74H72 74H101 74H103 74H106 74L00 74L02 74L03 74L04 74L10 74L10 74L20 74L30	.35 .75 .55 .95 .25 .20 .25 .30 .20 .35 .45	74\$133 74\$140 74\$151 74\$153 74\$157 74\$158 74\$194 74\$257 (8123) 74\$00 74\$00 74\$00	.40 .55 .30 .35 .75 .30 1.05 1.05
4014 4015 4016 4017 4018 4019 4020 4021 4022 4022	75 7412 75 7413 35 7414 75 7416 75 7417 35 7420 85 7426 75 7427 75 7430 20 7432	.25 .25 .75 .25 .40 .15 .25 .25 .15	7492 7493 7494 7495 7496 74100 74107 74121 74122 74123	.45 .35 .75 .60 .80 1.15 .25 .35	74198 74221 74367 75108A 75491 75492 74H00	1.45 1.00 .75 .35 .50 .50	74L47 74L51 74L55 74L72 74L73 74L74 74L75 74L93 74L123	1.95 .45 .65 .45 .40 .45 .55 .55	74LS04 74LS05 74LS08 74LS09 74LS10 74LS11 74LS20 74LS21 74LS22 74LS22	.20 - .25 .25 .25 .25 .25 .20 .25 .25 .25 .25 .25 .25
4024 4025 4026 1. 4027 4028 4030 4033 1. 4034 2. 4035	.75	.20 .20 .20 1.15 .45 .45 .45 .65 .70	74125 74126 74132 74141 74150 74151 74153 74154 74156 74157	.45 .35 .75 .90 .85 .65 .75 .95 .70	74H01 74H04 74H05 74H08 74H10 74H11 74H15 74H20 74H21 74H22	.20 .20 .20 .35 .35 .25 .45 .25 .25	74S00 74S02 74S03 74S04 74S05 74S08 74S10 74S11 74S20 74S40	.35 .35 .25 .25 .35 .35 .35 .35 .25	74LS37 74LS38 74LS40 74LS42 74LS51 74LS74 74LS86 74LS90 74LS93 74LS107	.25 .35 .30 .65 .35 .35 .35 .55
4041 4042 4043 4044 4046 4049 4050 4066	69 7448 65 7450 50 7451 65 7453 25 7454 7460 45 7470 55 7472	.50 .25 .25 .20 .25 .40 .45	74161 74163 74164 74165 74166 74175	.55 .85 .60 1.10 1.25 .80	74H30 74H40 74H50 74H51 74H52 74H53J 74H55	.20 .25 .25 .25 .15 .25	74S50 74S51 74S64 74S74 74S112 74S114	.20 .25 .15 .35 .60 .65	74LS123 74LS151 74LS153 74LS157 74LS164 74LS193 74LS367 74LS368	1.00 .75 .75 .75 1.00 .95 .75 .65
4071 4081 4082 MC 14409 MC 14419 4511	.25 .30 .30 .50 .85 .95	MCT2 8038 LM201 LM301 LM308 (MI LM309H LM309K (3 LM310 LM311D (MI	.65 340K-5385 .85	LM LM LM LM LM 780	320T12 1. 320T15 1. 324N 1. 339 05 (340T5) 340T12	REGULA 65 65 65 25 75 95 95	LTORS, etc. LM340K15 LM340K18 LM340K24 78L05 78L12 78L15 78M05 LM373	1.25 1.25 1.25 .75 .75 .75 .75	LM723 LM725N LM739 LM741 (8-1) LM747 LM1307 LM1458 LM3900	.40 2.50 1.50 4) .25 1.10 1.25 .65
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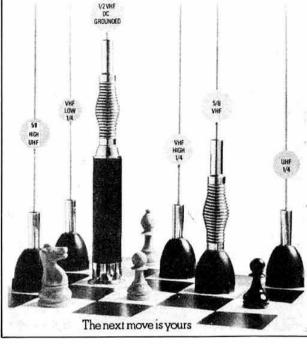
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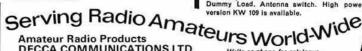


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