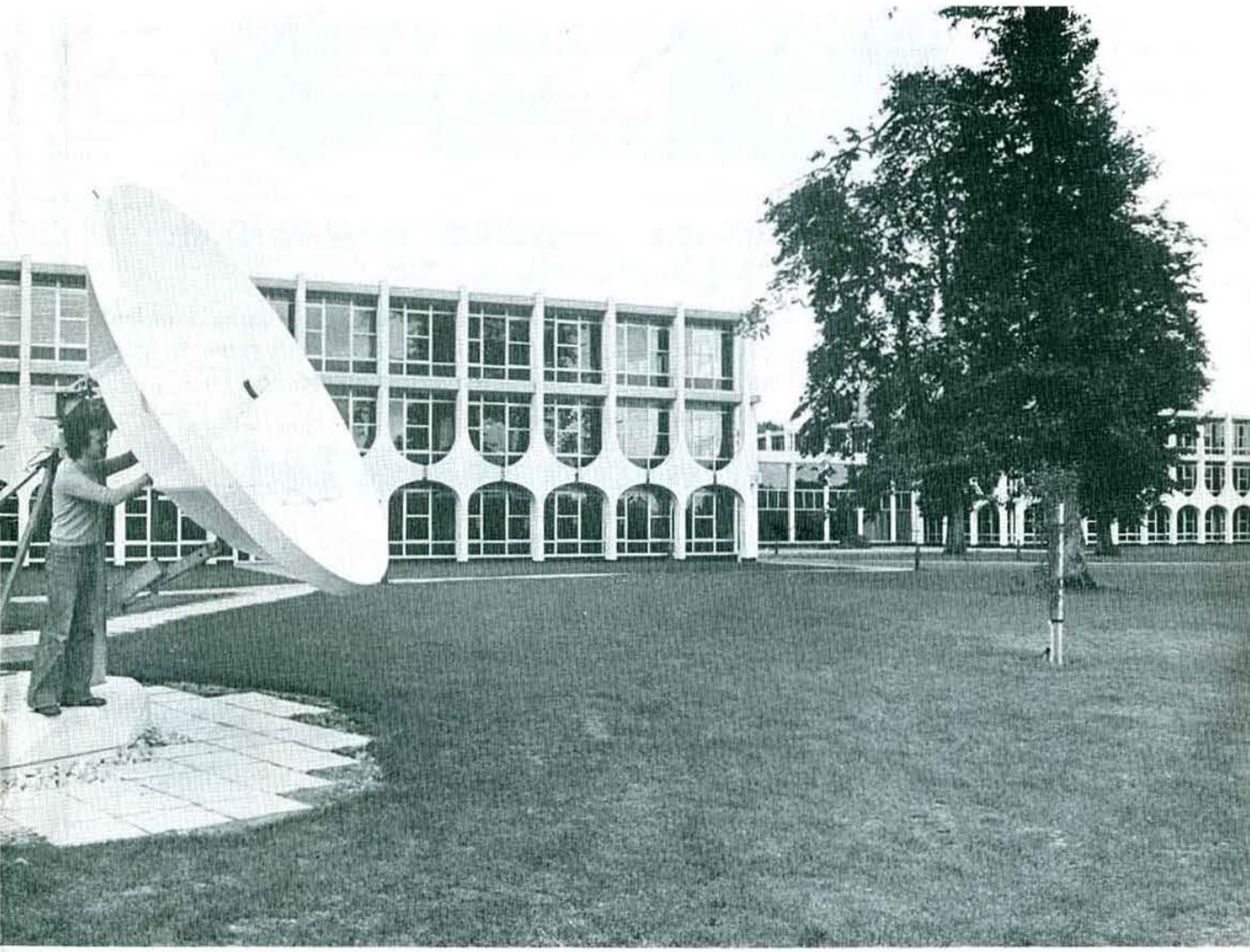
November 1977

radio communication

journal of the Radio Society of Great Britain

WHERE MICROWAVE TABLERS MEET



A 12GHz satellite receiving antenna at the IBA Engineering Centre, Crawley Court, Winchester, where a number of RSGB microwave round tables have been held. The last was on 7 August and is reported under "Microwaves" in this issue. The next takes place on 13 November

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CONTENTS

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Closing date for contributions unless otherwise notified: 4th of month preceding month of publication

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THE NEWEST LEADER—FT227R FROM

THINK HARDER NOW BEFORE BUYING!

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ONLY

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LET US HELP YOU . . . Take as a basic requirement—10 watts FM with a good receiver, freedom from "funnies", and no need to spend extra later to extend flexibility.

NOW READ ON . . .	YAESU FT227R	TRIO TR7500*	ICOM IC240*	DIGITAL II*
CHANNELS AVAILABLE BY FRONT PANEL CONTROL	400 (800 over 4MHz)	80	22	400
FULL 4MHz COVERAGE (144-148) WITHOUT MODIFICATION	YES	APPARENTLY NOT	APPARENTLY NOT	RECEIVE ONLY
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FREQUENCY MEMORY FACILITY	YES	NO	NO	NO
REPEATER SHIFTS	YES	YES	YES	NO
TONE BURST	YES	YES	YES	EXTRA
FACTORY-FITTED HIGH/LOW POWER SWITCH	YES	YES	NOT YET	YES
PRICE (INCLUDING VAT)	£189	£225	£198	£264†
PRICE COMPARISON	LOWEST	£36 MORE	£9 MORE	£75 MORE

NOW . . YOUR CHOICE IS CLEAR . . . THE YAESU FT227R SCORED ALL . . . BE THE FIRST WITH THE BEST! LET A YAESU DO YOUR TALKING FOR YOU.

*All details taken from current advertising

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"WHY DON'T THEY DO AN ANTENNA TUNER?"

Yes—it's a question that's often been asked—and one that's remained unanswered—until now . . . We are therefore especially pleased to be able to announce the **YAESU MUSEN FC-301 ANTENNA TUNER**

FEATURING: ★ All-band coverage, 160-10 metres, ★ Power and SWR measurement, ★ Four-way antenna switching, ★ "Gold-Line" styling ★ Realistic price.

SPECIFICATION:

Freq. ranges(MHz):	1·8-2·4; 3·5-4·0; 7·0-7·39; 14·0-14·35; 21·0-21·45; 28·0-29·7.
Input impedance:	50-75 ohms unbalanced.
Maximum SWR	5 : 1 with respect to input impedance.
Maximum power:	500 watts PEP.
Insertion loss:	0·5dB max.
Power ranges (meter):	25W, 250W, 500W, full-scale
SWR ranges (meter):	Calibrated to 4 : 1 SWR.
Dimensions:	212(W) × 125(H) × 295(D) mm.
Weight:	4·6 kg.

★ PRICE: £88.88 (you have to love it at that price!) inc. VAT 12½%

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1N759A	12v	z	.25
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1N5244B	14v	z	.25
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4013	.40
4014	1.10
4015	.95
4016	.35
4017	1.10
4018	1.10
4019	.60
4020	.85
4021	1.35
4022	.95
4023	.25
4024	.75
4025	.35
4026	1.95
4027	.50
4028	.95
4030	.35
4033	1.50
4034	2.45
4035	1.25
4040	1.35
4041	.69
4042	.95
4043	.95
4044	.95
4046	1.75
4049	.70
4050	.50
4066	.95
4069	.40
4071	.35
4081	.70
4082	.45

— T T L —

7400	.15
7401	.15
7402	.20
7403	.20
7404	.15
7405	.25
7406	.35
7407	.55
7408	.25
7409	.15
7410	.10
7411	.25
7412	.30
7413	.45
7414	1.10
7416	.25
7417	.40
7420	.15
7426	.30
7427	.45
7430	.15
7432	.30
7437	.35
7438	.35
7440	.25
7441	1.15
7442	.45
7443	.85
7444	.45
7445	.65
7446	.95
7447	.95
7448	.70
7450	.25
7451	.25
7453	.20
7454	.25
7460	.40
7470	.45
7472	.40
7473	.25
7474	.35
7475	.35
7476	.30
7480	.55
7481	.75
7483	.95
7485	.95
7486	.30
7489	1.35
7490	.55
7491	.95
7492	.95
7493	.40
7494	1.25
7495	.60
7496	.80
74100	1.85
74107	.35
74121	.35
74122	.55
74123	.55
74125	.45
74126	.35
74132	1.35
74141	1.00
74150	.85
74151	.75
74153	.95
74154	1.05
74156	.95
74157	.65
74161	.85
74163	.95
74164	.60
74165	1.50
74166	1.35
74175	.80
74176	1.25
74180	.85
74181	2.25
74182	.95
74190	1.75
74191	1.35
74192	1.65
74193	.85
74194	1.25
74195	.95
74196	1.25
74197	1.25
74198	2.35
74221	1.00
74367	.85
75108A	.35
75110	.35
75491	.50
75492	.50
74H00	.25
74H01	.25
74H04	.25
74H05	.25
74H08	.35
74H10	.35
74H11	.25
74H15	.30
74H20	.30
74H21	.25
74H22	.40
74H30	.25
74H40	.25
74H50	.25
74H51	.25
74H52	.15
74H53J	.25
74H55	.25
74H72	.55
74H101	.75
74H103	.75
74H106	.95
74L00	.35
74L02	.35
74L03	.30
74L04	.35
74L10	.35
74L20	.35
74L30	.45
74L47	1.95
74L51	.45
74L55	.65
74L72	.45
74L73	.40
74L74	.45
74L75	.55
74L93	.55
74L123	.55
74S00	.55
74S02	.55
74S03	.30
74S04	.35
74S05	.35
74S08	.35
74S10	.35
74S11	.35
74S20	.35
74S40	.25
74S50	.25
74S51	.45
74S64	.25
74S74	.40
74S112	.90
74S114	1.30
74S133	.45
74S140	.75
74S151	.35
74S153	.35
74S157	.80
74S158	.35
74S194	1.05
74S257 (8123)	.25
74LS00	.35
74LS01	.35
74LS02	.35
74LS04	.35
74LS05	.45
74LS08	.35
74LS09	.35
74LS10	.35
74LS11	.35
74LS20	.35
74LS21	.25
74LS22	.25
74LS32	.40
74LS37	.35
74LS40	.45
74LS42	1.10
74LS51	.50
74LS74	.65
74LS86	.65
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$1000 - Up	20%

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THE IC-240

FROM THANET NOW LOOKS LIKE THIS**

STILL £198 INC VAT
AND DELIVERY

The IC-240 from Thanet has had a bit of a face change. Gone is the tone button, which doesn't do anything anyway, and in its place is a crafty little switch which gives simplex in the centre position, normal duplex at DUP A and reverse repeat (on Rx AND Tx) at duplex B. With the IC-240 it is the RECEIVER which is shifted when working Duplex and not the TRANSMITTER as with some other rigs we could mention. This means that you can listen on the input channel or work reverse repeat, merely at the flick of a switch—you don't have to re-tune the channel knob as you would otherwise.

The function of the LH switch has also altered as it now gives high power in the up position and LOW in the down, the centre being OFF. This, together with the facility of easy channel change, clear channel indication and sheer rugged construction still puts the IC-240 at the top of the list.

Now that we have sold several hundred 240's we can tell you that these little sets are extremely reliable. The number we have had back for repair under warranty is really very small and the initial teething problems have been ironed out long ago. By the way, should you be feeling a little upset that your nearly new IC-240 has been made out of date have no fear. Unlike a model change in cars, we can sell you a conversion kit for £3 to bring your set right up to date so that you can't tell the difference. Please don't all rush at once though as initial stocks of these are limited. There will be plenty available later.

Check off these points against that competitive rig:

	YES	NO
Can it cover the whole 2m band 144–146?	☐	☐
Is it easy to qsy from say R7 to S20 without too much knob winding?	☐	☐
Is low power available?	☐	☐
Can you add extra channels, in the order you want them, without having to buy crystals?	☐	☐
Is the tone burst automatic?	☐	☐
Is a scanner available?	☐	☐
Is it relatively easy to add peripheral bits and pieces?	☐	☐

If the answer is YES to all these and it's cheaper than an IC-240 it may well be worth buying.

By the way, if you are worried that 22 Channels will be insufficient, fear not. If you really want to, it is possible to arrange the 240 to cover all 80 Channels between 144 and 146. Once you have the set though, we don't think you will bother to do the mod, as you will hardly ever want to use the extra channels produced.

SEND FOR DETAILS OF THE NEW SUPER-SCAN ADAPTER FOR THE IC-240

** At the moment this is a THANET mod. Until this done in Japan you may not find it on all sets bought from other dealers, but we understand that some intend to fit it.

PLEASE NOTE THAT ALL MAIL ORDERS MUST BE SENT TO HERNE BAY AND NOT TO AGENTS.

ALL WARRANTY AND OTHER REPAIRS FOR SETS BOUGHT FROM THANET AGENTS AND SHOPS MUST BE REFERRED TO OUR SERVICE DEPT IN HERNE BAY WHERE WE HAVE A GOOD RANGE OF TEST EQUIPMENT AND THE TECHNICAL SKILL TO USE IT. SETS FROM OTHER DEALERS *MUST* BE REFERRED TO THAT DEALER.

FOR DETAILS LEAVE YOUR NAME AND ADDRESS OR CALLSIGN ON OUR ANSAFONE (02273 63850) DURING THE EVENING WHEN CALLS ARE CHEAP

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ESTABLISHED 1958—19 YEARS

2-YEAR GUARANTEE "24 HOUR" SECURICOR SERVICE ON YAESU

DIGITAL FRG-7 WITH 100Hz READOUT AND OVER-RANGE

SMC PROUDLY PRESENTS A READOUT MODULE FOR THE FRG-7 INCREASING THE READOUT ACCURACY 100-FOLD

The FRG7 is a general coverage solid state receiver with specifications unparalleled in its price range. It uses a Barlow Wadley Triple-mix, drift cancelling loop for continuous, spin-tuned inclusive coverage of 0·5 to 30MHz.

The receiver is sensitive (0·5μV for 10dB, S + N/N (SSB)) and stable with A.M., SSB and CW modes catered for. A 3 position audio filter, RF attenuator, dial lamp conservation switch, recorder and phone sockets are fitted. It is mains powered, but should the supply fail, or portable operation be required, 8 dry cells are automatically switched in.

FRG-7 Analogue Readout £145 + VAT **COUNTER £50 + VAT**
FRG-7 Digital Readout £199 + VAT **YH55 Headphones £8 + VAT**

FT221R

STOP Think carefully before buying your new 2m multi-mode rig.

LOOK at the published specifications. Remember some manufacturers claim performance figures their equipment can only just reach, Yaesu write their specifications very conservatively. Look at the features:—Internal VOX, CW sidetone, crystal control facility, 600kHz and 1·6MHz shifts, auto tone burst, digital readout options, etc. Look at the spurious outputs (or try to find them if the transceiver has a P.L.O. to clear sub harmonics of oscillator chain). Look at the ergonomics, are there more controls than necessary, preselectors or varicaps tuned receiver. Look inside, take off the case (or merely lift the lid); does it look like the bottom of granny's sewing box or is it modular constructed with plug in boards etc.

LISTEN to weak signals, listen to strong signals, listen to your own signal. Is your PA rated to dissipate 7 times the claimed output power.

TAKE A LOOK—TAKE A LISTEN—GIVE US A CALL—A 221R WITH OUR 2 YEAR GUARANTEE IS WAITING FOR YOU.

THE FT227R NEW FROM YAESU.

The new FT227R uses a 'single knob' tuned digital synthesizer employing a photoelectric sensor for an optical system which eliminates both noisy, unreliable rotary switches, and crystal banks.
Full coverage of 2 metres in 5kHz divisions with a ±600kHz shift plus a memory feature which permits recall of any entered frequency or particular offset.
Bright, large, digital readout gives unequivicable readout of the frequency in use. The receiver offers 0·3μV (for 20dB S+N/N) sensitivity into a ±6kHz (@ 6dB) bandwidth whilst maintaining a remarkable immunity to overload and image problems. The 20W DC input transmitter features Hi/low power outputs, AFP, tone burst on repeaters and an out of band inhibition trip etc.

YC301 MATCH POWER METER

10-160m. Swjtched, 50/75 input, 500W PEP max handling. Power meter with 25, 250 & 500W FSD ranges. 4 position antenna selection 1 wire and 3 SO239 sockets.

FL110 ALL BAND LINEAR AMP

10-160m. Switched L.P.F. 15W→200W PIP A1/A3j, 4W→75W F1 Push pull SRF 1427's. Negative feedback with ALC to exciter. RF sensing (Adjustable hang time) with override.

YO301 MONITOR TX & RX SCOPE

1·8-54MHz Tx monitor 10-500w envelope, trap and cross. Vert. 2Hz-4MHz (+9 and 10·7 provision) Horz. 10Hz-250kHz, sweep 10Hz-10kHz. 2 tone generator.

NEW STOCK & PRICE LIST SEND SAE OR 30p IN STAMPS.

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Communications Ltd

OF PROFESSIONAL EXPERIENCE

YAESU

MONITOR SCOPE ONLY £69 (+ 8% VAT)

The MONITORSCOPE is a convenient Test Instrument allowing "on the air" monitoring and testing of Radio Transmitters operating in the frequency range 500kHz to 30MHz with a power rating of up to 2Kw PEP (1Kw average).

The Monitorscope is designed to be connected between the Transmitter or Linear Amplifier antenna socket and the Antenna or Antenna Tuning Unit. A visual display of the Transmitter "envelope" is provided. This will allow the Transmitter to be "talked up" to a full power output whilst watching for "flat topping" which would cause distortion and loss of readability also the "splatter" produced would create interference to Stations on adjacent frequencies. By using the 2-tone Test Generator which is incorporated, an SSB Transmitter may be adjusted to ensure that it is operating in a linear condition, necessary for good quality SSB transmission. Likewise, amplitude modulation and Morse Keying characteristics can be observed. A flexible screened lead is provided for connection to the Transmitter audio or microphone input.

Brief Specification

Sweep Speed: 20–200Hz.

RF Power Capability: 10–2000 watts PEP.

Max. E.H.T. on C.R. Tube: 1500v. D.C.

Tone Oscillators: Nominally 1·3kHz and 2·3kHz.

Tone Level Output: 0–50mV rms per Tone at 50Kohm.

Power requirement: 115/230v. 45–65Hz. A.C. ± 20%. 10 watts.

Input/Output impedance: 50–57 ohms using two SO239 UHF type connectors.

Panel Controls: Intensity/Power on/off Switch; focus; vertical gain; horizontal shift; Horizontal gain; audio tone (single or 2-tone); tone level; sweep speed.

Rear Controls: Astigmatism, tone balance, "Y" shift. (pre-set).

SOLID STATE MOBILE LINEARS (UHF & VHF) FROM KLM and AMPERE

2 metre, SSB/CW/FM, RF sensing with manual override, "Microstripline" techniques
12V D.C. 10W drive 2" × 6" × 10" (11")
(VAT + 12½%), free delivery.
(Over 15 different models—S.a.e. details)
PA10/160/BL 145MHz 160W output **£160**

2 or 70. Superb RF sensing and dc bias arrangements for all modes. C/w mounting bracket 12V dc 10W drive 2·5" × 5·2" × 7·5".(8·5")
(+ VAT at 12½%), free delivery

APB82A	145MHz	80W out	£102.15
APB57A	432MHz	45W out	£102.15
APB87A	432MHz	80W out	£216.95

Boom Microphone "Headset"

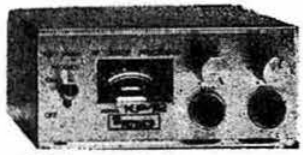
600 ohms magnetic lightweight boom mic
Ideal for mobile or contests etc.
(Post free but plus 12½% VAT.)

MD35 complete	£14.75
Microphone only	£9.75
Footswitch only	£5.95

RF SPEECH PROCESSOR KP60

Audio to audio via 10·7MHz mains powered, illuminated meter. FT101 FT2 plugs suitable. All phone modes superb on FM. NEW!

Ex-stock in Totton £41.35
(+ 12½% VAT. P & P FREE)



Coax Relays

12v DC 50 ohms. Silver plated. 4 weeks.
P. & P. 30p (VAT + 8%)
Power crosstalk (at 500 MHz)

CX120	50W	35dB	Cable entry	£8.50
CX230	300W	40dB	BNC sockets	£17.80
CX600N	600W	40dB	N sockets	£21.50

Coax Slide Switches

Up to : 1kW, 1·5 GHz, 0·3dB less, 1·2 : 1 VSWR, 50dB isolation, 50 ohm "N" or "PL" fittings. Ex-Stock P. & P. 30p (VAT + 8%)

TW2S10	1 in 2 out nickel SO239.. ..	£5.40
TWS150	1 in 5 out nickel SO239.. ..	£11.50
TWS220	2 in 4 out nickel SO239.. ..	£11.50

LEADER WATTMETERS—NEW!

LDM885 Through line (illustrated) (P&p £0.75)
1·8-54MHz. 20-200-1000 W FSD .. **£41.50** + 8%
LPM880 Absorption (P&p £0.95) 1·8-500MHz.
5-20-120 W FSD .. .. .. **£64.00** + 8%

LEADER ANTENNA COUPLER

LAC895
3·5-30MHz. 50/75 coax (SWR < 5) and single wire (10-250 ohms) feed transformed to 50 ohm. Wattmeter 20 & 250W FSD, SSB 500W PIP. .. .. POA

HI MOUNT KEYS (p & p 60p)

BK100 (illustrated left)
Mechanical Bug Key .. .. .. **£12.15** (+8%)
HK808
Handkey marble plinth .. .. **£26.15** (+8%)
HK707
Hand key 0·5Kg. Dec. delv. .. **£7.95** (+8%)

TRANSISTOR DIP OSCILLATOR

LIM815
1·5-250MHz on fundamentals battery c/w earphone and 6 plug in coils 2kHz modulation
1-15MHz. Crystal facility. .. .. **£38.50** (+8%)
LIM870
Antenna impedance meter 1·8-150MHz
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YAESU MUSEN ACCESSORIES

ALL YAESU ITEMS POST FREE (+ VAT)

QTR24 World time clock, battery powered, analogue readout **£13.00** (+ 8%)

YD844 Desk microphone, 50Kohm impedance P.P.T. with lock and micro switch .. .. **£18.00** (+ 12½%)

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FDK Multi-2700 Mk II

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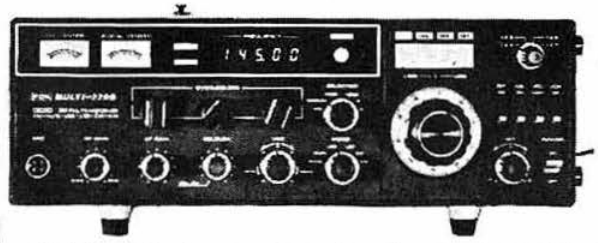

MULTI-2700—THE COMPLETE STATION

The FDK Multi-2700 is a front-line all-mode transceiver that incorporates every conceivable feature to ensure maximum enjoyment. In fact, apart from a mains plug and an aerial, there is little else we can sell the owner of a Multi-2700. All in all it is an unbeatable transceiver at an unbeatable price.

ALL MODES—ALL OCCASIONS

All modes are provided AM FM SSB and CW. For SSB operation VOX is included and for CW, fast break-in is provided with completely adjustable side tone. The 2700 can be used at home with its internal 230v AC PSU or taken out to the local high spot and run from 12v DC. This really has to be the QSO machine that you will never tire of.

BEAUTIFUL TO OPERATE—BEAUTIFUL TO HEAR

The transmitted audio quality of the 2700 is second to none. Its crisp, clear, quality reflects the manufacturer's knowledge that a clean signal sells more products! The Optimised 16·9MHz 8-pole crystal filter gives clean SSB signals and good selectivity. On FM, direct modulation of the VCO gives smooth but penetrating audio. Typical power output is 16 watts but the flip of a switch and you have 1 watt on all modes. (An internal adjustment permits the power to be adjusted from approx 1 watt to 6 watts for driving linears or transverters.) The Multi-2700 has a built-in receiver RF pre-amp—no problems here with a deaf receiver.

DUAL VFO CONTROL

Until you have handled the Multi-2700 you cannot appreciate the advantages of dual vfo control. The conventional analogue VFO with its dual speed silky smooth feel, permits accurate tuning on all modes with 1kHz readout. It also covers a complete 1MHz segment at a time resulting in minimum band switching. The flip of a switch and you have full synthesized control of your transceiver. The bright LED display allows the transceiver to be immediately set to any 2 metre channel. A VXO control ensures the synthesizer can be used equally well on SSB, CW or FM. The versatility of dual vfo control is quite amazing. For example: use the analogue vfo at the SSB end of the band and the synthesizer on the FM channels; set the synthesizer to the "sked" frequency and continue normal operation on the analogue VFO; set analogue VFO to DX frequency whilst continuing normal tuning of the adjacent frequencies on the analogue VFO—the combinations are endless. Repeater shifts are completely taken care of. The Multi-2700 has + / − 600kHz shifts and 1·6MHz for 70cms operation.

ITS VERSATILITY IS ENDLESS

Inter-continental contacts are possible via OSCAR. Press the OSCAR button on the front panel and you bring in the 28MHz downlink receiver converter to enable true transceive operation through the satellite. An audio SPEECH PROCESSOR can be switched in to permit extra punch, the amount of compression being adjustable to suit the operator. RIT operates on all modes and both vfo's. A NOISE BLANKER is included for really excellent suppression of ignition pulses. The receiver section covers 143 to 149MHz (Tx covers 144-146MHz ± 1·6MHz shift only). Apart from the 2 existing repeater offsets one further shift may be programmed. AGC control is continuously variable, as is the VOX DELAY and ANT-VOX etc. All pre-set controls are easily reached through the top hatch of the transceiver. Separate centre zero and rx S-meters are provided. We could go on but if you have read this far perhaps it is time you sent off for the 4-page brochure giving full details of this beautiful transceiver at a really competitive price. **£489** inc VAT and Securicor delivery.

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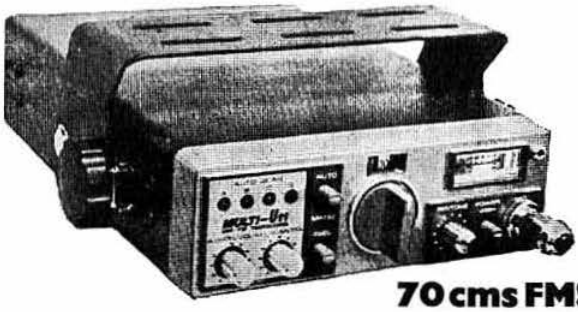

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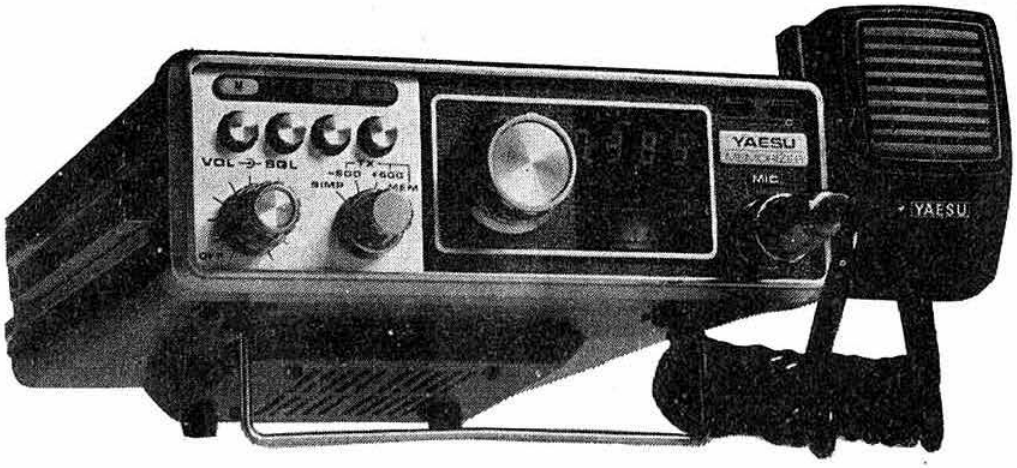

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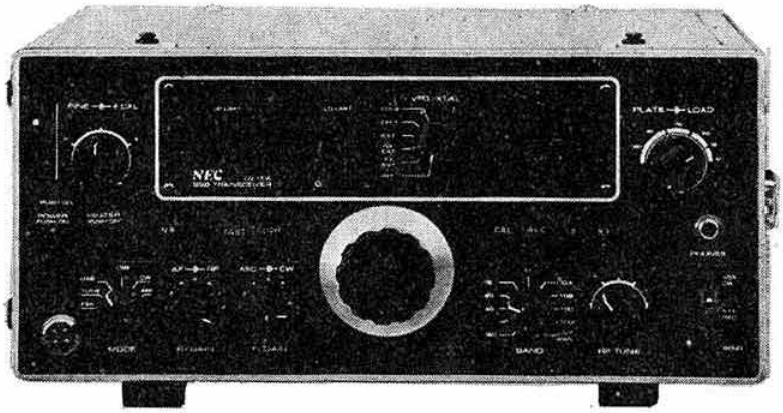
NEC  NEC

CQ110E Transceiver (Ex Stock) £645 plus VAT £80.63, Total £725.63

(Price includes Securicor Delivery)

Frequency Range	10m—15m—20m—40m—80m—160m and 11m and WWV 15MHz on receive only.
Mode	LSB—USB—CW—AM—FSK—FAX/SSTV
Power Requirements	100/110/117/200/220/234 Volts AC or 13.5 Volts DC
Input Power	280 watts PEP (240 watts on 28MHz)

Digital Readout—Separate Crystal Filters for each of LSB, USB, and CW. AC and DC power units are built in. Switched metering for "S" meter, Relative Output, Plate Current, and ALC for setting MIC Gain. The following accessories are supplied with the Transceiver-Microphone, DC Power Cable, AC Power Cable, 5 RCA Plugs, 2 Spare Fuses, 2 Jack Plugs, 2 Allen Keys and a 60 page instruction book. Built-in speaker with 3 watts output.
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SPECIFICATIONS

Frequency coverage	432-436MHz	Receive converter noise figure	3dB maximum
Input frequency range	28-30MHz	D.C. power requirements	12 Volts nominal
Input modes	SSB, FM, AM or CW	Current consumption	2.1 Amps peak
Drive requirements at 28MHz	5mW to 500mW. Variable Input Attenuator	RF connectors	50 Ohm BNC
Power output	10 Watts continuous rating	Power connector	5 pin locking DIN
Spurious outputs	Better than —65dB	Size	187 × 120 × 53 mm
Receive converter gain	30dB typical	Weight	900 grams

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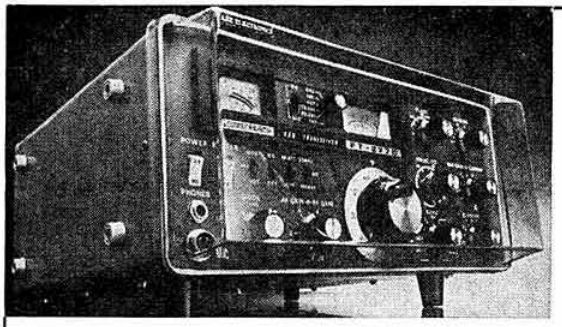

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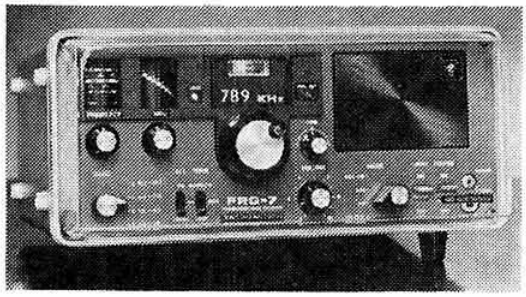

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Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the general manager, from whom full details of Society services may also be obtained

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Zone F: Region 15
Zone G: Regions 12, 13 and 14

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Region 3	Hereford and Worcester, Salop, Staffordshire, Warwickshire, West Midlands.
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Region 5	Bedfordshire, Cambridgeshire, Northamptonshire.
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QTC
amateur radio news

Special event stations

The RSGB is in touch with the Home Office concerning the resumption of the licences of special event stations which were discontinued at the beginning of 1977 owing to the work involved in the issue of the new amateur service licences. The administrative work involved in the issue of the special licences is considerable, bearing in mind that the licence itself is not of the normal type. As part of the approach to the Home Office the Society wishes to hear from those clubs and groups who would wish to apply for a special event station licence, if these again become available.

Please write to RSGB HQ on a *postcard* giving the following information:

(1) name of club or group;
(2) event and date for which licence is desired;
(3) callsign desired;
(4) name and address (or callsign) of person responsible for special event activity in club or group.

Please provide this information by 21 November 1977.

Reciprocal licensing

Given below are two lists showing: (a) countries with which the UK has reciprocal arrangements, and (b) Commonwealth countries and other states that will accept a UK licence as a qualification for the issue of an amateur licence. This information has been provided by the Home Office.

There are also countries whose legislation does not permit the conclusion of a formal agreement, or whose conditions for licensing are to a lower standard than our own, but who are prepared to grant temporary amateur licences; therefore UK amateurs visiting countries not listed, and wishing to operate an amateur station there, should write to the administration concerned well in advance of their visit to ascertain whether a licence can be obtained.

(a)

Austria	West Germany	Norway
Belgium	Iceland	Poland
Brazil	Irish Republic	Portugal
Denmark	Israel	South Africa
Dominican Republic	Italy	Sweden
El Salvador	Luxembourg	Switzerland
Finland	Monaco	USA
France	Netherlands	

(b)

Antigua	Gibraltar	Mauritius
Australia	Grenada	New Zealand
Bahamas	Guyana	Nigeria
Barbados	Hong Kong	Rhodesia
Bermuda	India	Seychelles
Botswana	Jamaica	Singapore
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Cyprus	Malaysia	Zambia
Gambia	Malta	

In connection with reciprocal licences issued by the UK, there appear to be many disappointments for two quite minor reasons. First, applications must reach the Home Office 30 days in advance of the date the licence is required, and second, a licence cannot be issued unless the UK address for the station or for correspondence is entered on the application form.

An authority for an alien to operate the station of a UK amateur for seven days only is also available; the application must be completed by the UK licensee and there must be a reciprocal agreement with the country of which the visitor is a national and he must hold a current licence issued by his own administration.

Commonwealth or alien citizens who reside in the UK may take the UK examinations and obtain our licence. There are certain conditions to be observed and the Home Office will be pleased to answer any written enquiry.

NEW GENERAL MANAGER

Members will be happy to learn that David Evans, G3OUF, will be taking over the position of general manager of the Society on 1 January 1978. He is already well known from his previous period as assistant general manager, as present vhf manager, and for the invaluable work done during the installation of the IBM32 data processor.

George Jessop, G6JP, who has done so much to help the Society through a very difficult three years, will remain at HQ until the end of June 1978. The Society is indeed grateful to him for all his efforts.

It is expected that other senior appointments will be made in the New Year.

John Allaway, G3FKM,
chairman, F & S Committee

Netherlands licence

The following is an extract from a notice issued by the Radio Control Service of the Netherlands Postal and Telecommunications Service:

"By virtue of an amendment of the law of 1 July 1975 making not only the use but also the possession of radio transmitting equipment without the required licence punishable, the PTT has been faced with the necessity of introducing a new registration system for all radio transmitting equipment for which licences have been issued.

"The new system became operative on 1 July 1977.

"For holders of a temporary licence the following arrangement has been made. They will receive a personal registration certificate showing the callsign, the licence category, the licensee's name and address, and the term of validity of the licence. The certificate should be kept with the amateur station. Registration stickers will also be issued and should be affixed to all transmitters, transceivers, transverters and linear amplifiers for which the licence has been issued.

"The new registration system forms part of the licence conditions; consequently, the holder is under an obligation to act in accordance with the above directions. Inability to produce the registration certificate when asked to do so, or the possession of equipment not provided with stickers will be considered as a violation of the licence conditions and may result in withdrawal of the licence.

"In the event of an offence being established by the police in the course of a routine inspection the equipment may, moreover, be seized immediately."

"CQ" and "73" magazines

As from 1 January 1978, the RSGB will discontinue the handling of subscriptions to these magazines. In future, therefore, members should send subscriptions for these magazines direct to the publishers.

SOCIETY AWARDS

Council has approved the following awards for 1977:
ROTAB Cup for outstanding and consistent dx work to Mr A. Slater, G3FXB;
Founders Cup for services to the Society to Mr G. Peck, BRS15402;
Norman Keith Adams Prize for the most original article contributed to *Radio Communication* during the year to Mr F. M. Smith, G8KG, for "Some new insights into the mechanism of the sunspot cycle", published in July 1976;
Courtenay Price Trophy for outstanding technical development in the field of amateur radio during the year to Mr J. P. Martinez, G3PLX, for his work on rtty video display units;
Wortley-Talbot Trophy for outstanding experimental work in the field of amateur radio to Mr J. A. Hardcastle, G3JIR, for his work on high frequency ladder crystal filters;
Ostermeyer Trophy for the most meritorious description of a piece of home-constructed radio or electronic equipment published in *Radio Communication* during the year to Mr N. Davies, G8IBR, for "A receiver for 144MHz" published in December 1976.

Amateur convicted

Paul Nicholson, G8LMD, of Featherstone, Yorkshire, appeared in September at Pontefract Magistrates' Court and admitted offences under the Wireless Telegraphy Act. It was said in evidence that police in West Yorkshire were unable to contact their headquarters by radio because their vhf frequency had been blotted out by obscenities.

Eighteen-year-old Paul Nicholson was fined a total of £120 and his vhf equipment worth nearly £400 was confiscated.

Channel Islands members

As a result of recent program changes to the IBM32 data processor at Headquarters, members in the Channel Islands will now be able to pay their subscription at the rate of £7.76 per annum. This amount is the normal corporate rate less VAT of 24p. Members in the Channel Islands paying the Society by standing order are requested to advise their banks to ensure that the correct amount is now paid. New members in the Channel Islands will also pay £7.76 on joining the RSGB.

Regional Representative, Region 19

Due to change of location of employment, Mr D. S. Smith, G4DAX, has resigned from the office of regional representative for Region 19, and nominations are therefore invited to fill the vacancy.

Not later than 30 November 1977 any five corporate members resident within Region 19 (Greater London north of the River Thames, and Hertfordshire), may nominate any other qualified corporate member resident in the region for the office of regional representative by delivering their nomination in writing, together with the written consent of such person to accept office if elected, to the general manager at RSGB headquarters. Each such nominator shall be debarred from nominating any other person for this election.

In the event of more than one person being nominated, a ballot will be conducted, details of which will be published in the January 1978 issue of *Radio Communication*.

Area representative, Highlands

As Mr R. Dixon, GM3ZDH, is no longer resident in the Highlands area, he has resigned as representative for that area. Nominations are therefore requested to fill the vacancy.

Not later than 30 November 1977 any five members resident in the Highlands area may nominate any other qualified member resident in that area for the post by sending their nomination in writing, together with the written consent of such person to accept office if elected, to the regional representative for Region 12, Mr F. Hall, GM8BZX, 45 Priory Cottages, Lunanhead, Forfar, Angus DD8 3NR.

Details of the ballot which will then be held will be published in the January 1978 issue of *Radio Communication*.

Facsimile transmissions

Following introduction of the new amateur licence, which permits the use of facsimile signals in the 7, 14, 21, 28 and 144MHz bands, interest in this mode of picture transmission is increasing.

Because of this, Arthur C. Gee, G2UK, has undertaken to act as co-ordinator of fax on behalf of the British Amateur Radio Teleprinter Group, of which he is a committee member. His address is 21 Romany Road, Oulton Broad, Lowestoft, Suffolk NR32 3PJ, and he would be pleased to hear from those who have had, or would like to have, experience in this mode.

"A channel scanning arrangement for quartz crystals"

The author of the above article, published in the September issue, has advised us of the following errors:

(1) On page 683, line 18, for 4023A read 4026A;
(2) On Fig 7, pin 2 of the 4026A should be routed to pin 13 of the 4017, and not to earth as shown.

A multimode transceiver using SL1600 ICs

Part 2. *(Continued from October issue)*

by P. L. A. BURTON, CEng, MIEE, MIERE, G3ZPB*

The vox (voice operated transmit relay)

A vox circuit is one which switches a transceiver from receive to transmit when it detects speech at the microphone. The obvious problem with such circuits is to prevent them from reacting to signals from the receiver loudspeaker.

The simplest way to do this is to feed the loudspeaker signals to the vox circuit so that only microphone signals which are not also present in the loudspeaker circuit affect its operation. This is quite difficult and is often liable to cause spurious switching unless the system is carefully adjusted by the operator to compensate for the microphone and the acoustics of the surroundings.

The system used in this transceiver is slightly different. The signal from the microphone is gated by the internal signal to the loudspeaker so that no input to the microphone will affect the vox while there is a signal to the loudspeaker. The only drawback to this system is that the vox cannot operate during the reception of non-syllabic noise. Such conditions are, however, most unusual.

The circuit uses an SL3046 five-transistor monolithic array. Positive half-cycles from the microphone amplifier SL622 (which is powered during reception) turn on TR13 unless prevented by the presence of a loudspeaker signal on TR11. The time constant of the gate circuit is such that vox action can occur in the spaces between words in normal speech.

TR13 turns on TR15 via TR14. An integrator consisting of R61 and C98 controls the time which elapses between the cessation of speech and the reversion to reception. For break-through cw operation (when the operator listens between the dots and dashes of his own transmission) the time constant may be reduced. If the relay is a low power one it may be connected between TR15 collector and +12V, otherwise a pnp driver should be used with an input resistor in its base circuitry.

Sidetone oscillator

The sidetone oscillator is an emitter-coupled multivibrator keyed in the emitter of TR16. A signal is taken from the collector of TR17 and applied to the transmitter audio input.

The sidetone frequency is 1kHz and the system relies on the cw filter to produce a single tone output from the transmitter. If the 500Hz cw filter is omitted the frequency should be raised to about 1,750Hz to place the second harmonic well down the ssb filter characteristic. An accurate 1,750Hz may also have a use as a repeater access tone.

* 20 Thornton Crescent, Old Coulsdon, Surrey.

Since the output impedance of the SL630 is quite high when it is turned off, and likewise that of the sidetone oscillator, the loudspeaker is connected directly to both.

Power supplies and switching

The transceiver board uses three +12V supplies. One is present during reception, one during transmission and one is common. There are three +6V integrated circuit regulators on the board, one from each +12V line, to supply the appropriate SL600s. This type of regulation greatly eases crosstalk via the supplies.

Mode switching is accomplished by applying +12V to the relevant one of the three mode lines: cw, fm or ssb, the two unwanted lines being earthed.

Construction

The transceiver board is constructed of double-sided printed circuit material, and earth connections are made on both sides of the board—plated-through holes would remove this necessity but were not used in the prototype for reasons of cost. It would be almost impossible to make such a system stable on single-sided board, but systems derived from this one and built on double-sided board should not present any particular layout problems. As the board is very small for the complexity of circuitry it carries, some relay connections are wired.

The component layout diagram is shown in Fig 5. It will be found easier to mount the larger components such as coils and relays etc first, followed by the resistors and capacitors. All components are mounted on the "ground-plane" side and should also be soldered on this side if they do not pass through insulated areas on the ground-plane.

The three coils L1, L2 and L3 are wound on miniature 4mm coil formers and mounted on 6-pin bases with screening cans. Transformer T1 consists of 20 turns of 26swg enamelled copper wire tapped at three turns wound on a high frequency ferrite toroid FX3240.

Setting up

It is probably easier to set up and test one mode at a time rather than try to do everything at once. The one exception to this is the carrier oscillator, where it is best to check that all four oscillator frequencies are correct before proceeding to the remainder of the circuits. If the crystals used do not oscillate at their nominal frequency, the two 47pF capacitors C1 and C4 may be changed in value while remaining equal. Alternatively provision is made for crystal trimming by a varicap diode and potentiometer. If this circuitry is used, C1 and C4 will need to be changed to approximately 22pF.

SSB receive

The noise blanker circuitry is set up in this mode as follows:
L1. Adjust for maximum 9MHz signal across R15.
RV2. Adjust for minimum switching noise as noise blanker switches on and off.
S-meter is adjusted by setting RV4 to give half-scale deflection on S9 signals.

FM receive

The fm i.f. strip is best aligned by tuning into a known good-quality fm signal and trimming L2 and L3 for maximum undistorted audio output.

An additional adjustment is required to the noise blanker: set RV5 to balance the IC1 output, ie voltage at pin 6 equal to that at pin 12.

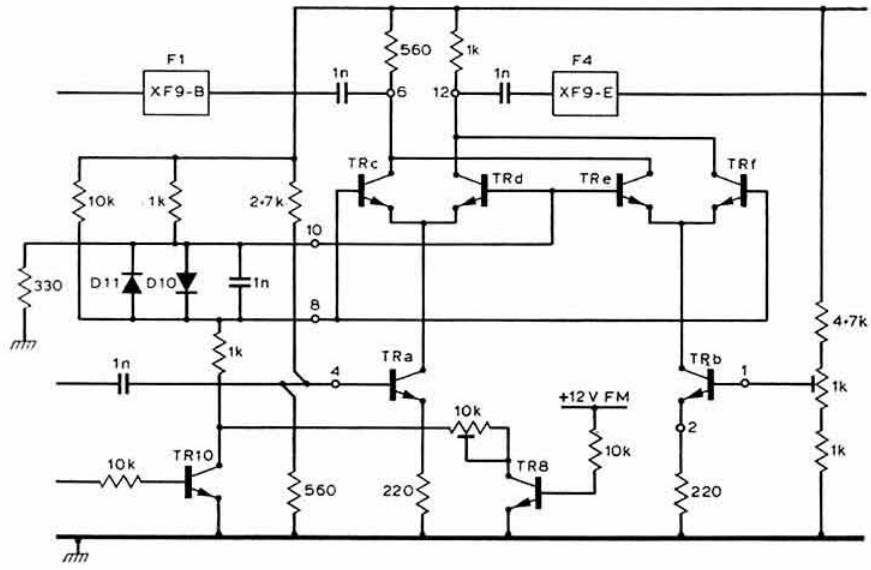

Fig 3. The noise gate

A.M. receive

AGC threshold control RV1 is the only setting required—adjust for optimum agc response on strong signals.

A.M. transmit

Carrier level control RV3 should be adjusted to give the required rf output at the mixer.

Interfacing and operation

In use the transceiver board is built into a system as shown in Fig 1. The bandwidth of the MD108 mixer is 5-500MHz at SK1 and DC-500MHz at SK2. Local oscillator input to the mixer should be approximately 500mV.

Mode and receive/transmit switching may be connected to give one control for a.m./cw/fm/ssb and another for receive/transmit, or alternatively separate modes may be selected for receive and transmit. The power supply requirement is a well-filtered 12V line at a maximum of 200mA.

Modes

As mentioned in the introduction, any combination of modes, either receive only or transceive operation, may be made from this design. Ancillary circuits such as noise blanker, vox and transmit speech processor may be omitted altogether or added as a stage in construction and evaluation. Thus the board may be used to build many different receivers or transceivers, eg ssb receiver, ssb transceiver, ssb transceiver with rf clipping etc.

Acknowledgements

The author wishes to thank: Brian Comer, G3ZVC, for his work on the original multimode transceiver design, particularly the time and effort on the noise blanker; Bernie Wynn, G8TB, for constructing a prototype and giving much helpful advice, and The Plessey Company for permission to reproduce material from their publications.

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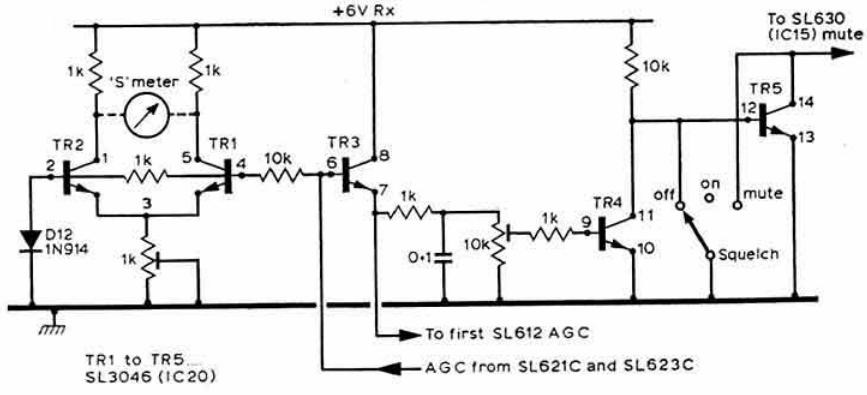


Fig 4. AGC, S-meter and squelch circuit

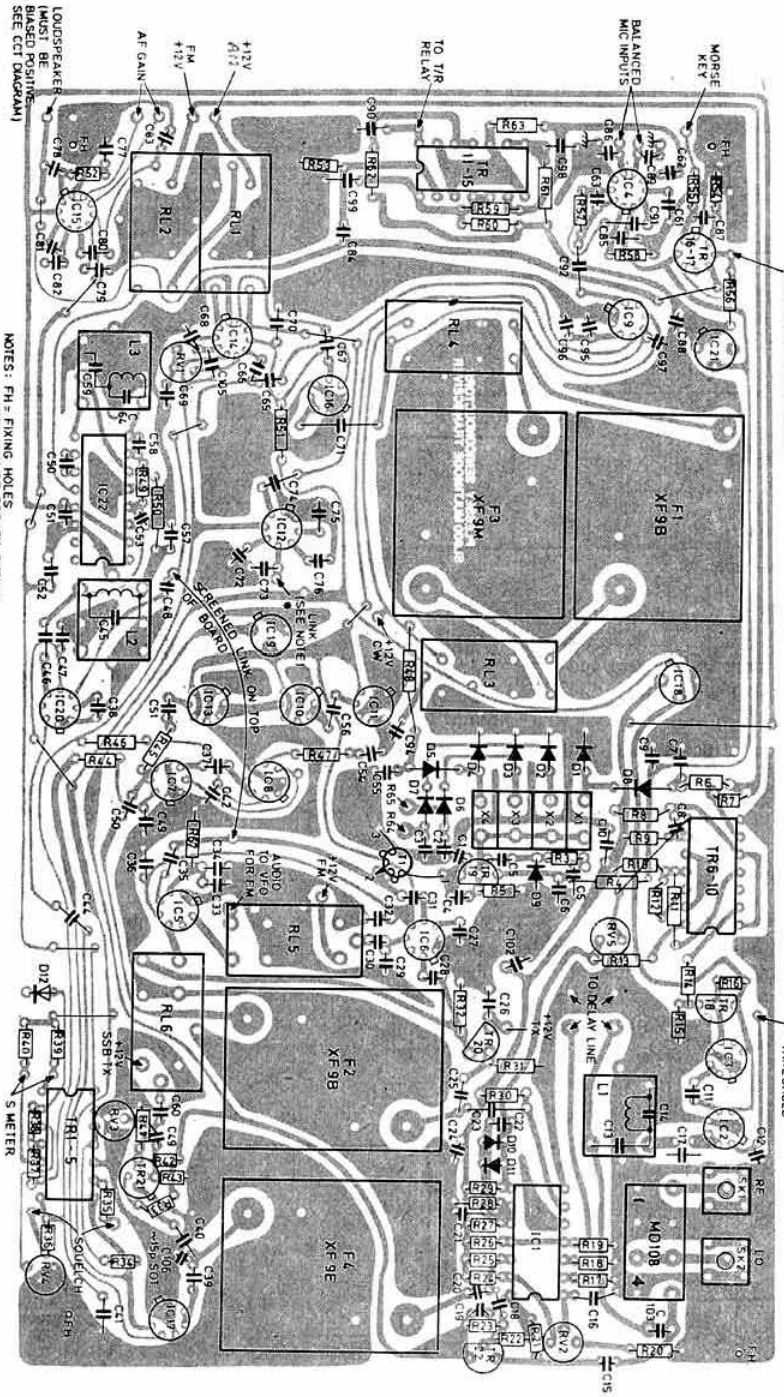


Fig 5. Component layout of prototype pcb

Components list

R1	470kΩ (nob)
R2	100Ω (nob)
R3	56kΩ (ft)
R4	100Ω
R5	47kΩ
R6	1kΩ
R7	10kΩ
R8	5·6kΩ
R9	4·7kΩ
R10	680Ω
R11	4·7kΩ
R12	10kΩ
R13	1kΩ
R14	10kΩ
R15	4·7kΩ
R16	1kΩ
R17, 18	220Ω
R19	560Ω
R20	1kΩ
R21	51Ω
R22	4·7kΩ
R23	33kΩ
R24	4·7kΩ
R25	1kΩ
R26	2·7kΩ
R27	1kΩ
R28	330Ω
R29	10kΩ
R30	560Ω
R31	10kΩ
R32	560Ω
R33	1kΩ
R34, 37	10kΩ
R35, 36, 38, 39, 40	
41	1kΩ
R42	4·7kΩ
R43	330Ω
R44	100Ω
R45	470Ω
R46	100Ω
R47	470Ω
R48	1kΩ
R49, 50	10kΩ
R51	82Ω
R52	10Ω
R53	560Ω
R54, 55	1kΩ
R56	2·2kΩ
R57	1kΩ (see text)
R58	470kΩ
R59	1kΩ
R60, 61	100kΩ
R62	1·8kΩ
R63	1kΩ
R64*, 65*	1kΩ
R66	4·7kΩ (nob)
R67†	15kΩ
RV1	10kΩ preset
RV2, 3, 4	1kΩ
RV5	10kΩ
RV6	5kΩ lin (nob) (Volume)
RV7	10kΩ lin (nob) (Squelch)
RV8	25kΩ lin (nob) (Blanking)

* Vertical on board.
† May need selection.
All ¼W film types.
Tolerance 5%.

Printed circuit boards and all other components required for this project are available from Amateur Radio Bulk Buying Group.

C1	22pF or 47pF (sot)	**C57**	0·1μF
C2, 3	0·1μF	**C58, 59**	10pF
C4	22pF or 47pF (sot)	**C60**	1,000pF
C5	0·1μ (ft)	**C61**	0·1μF
C6, 7	0·1μF	**C62**	10μF (t)
C8	4,700pF	**C63**	0·047μF
C9, 10	0·1μF	**C64**	330pF
C11	1,000pF	**C65, 66, 67**	1,000pF
C12	0·1μF	**C68**	1μF (t)
C13	10pF	**C69**	47μF (t)
C14	100pF	**C70**	0·1μF
C15	1,000pF	**C71**	1,000pF
C16	0·1μF	**C72, 73**	100μF (t)
C17, 18	1,000pF	**C74**	1μF (t)
C19	0·1μF	**C75**	100μF (t)
C20	1,000pF	**C76**	47μF (t)
C21	0·1μF	**C77**	0·01μF
C22, 23	1,000pF	**C78**	100μF (t)
C24	0·1μF	**C79**	0·1μF
C25	1,000pF	**C80**	1μF (t)
C26	0·1μF	**C81**	4,700pF
C27, 28, 29	1,000pF	**C82**	100pF
C30	1μF (t)	**C83**	1,000pF
C31	1,000pF	**C84**	10μF (t)
C32	0·1μF	**C85**	47μF (t)
C33	1,000pF	**C86**	1,000pF
C34	10μF (t)	**C87**	0·47μF (t)
C35	1,000pF	**C88**	0·1μF
C36	0·1μF	**C89**	1,000pF
C37, 38, 39, 40	1,000pF	**C90**	47μF (t)
C41	0·1μF	**C91**	2·2μF (t)
C42	4,700pF	**C92**	10μF (t)
C43, 44	1,000pF	**C93, 94, 95**	1,000pF
C45	220pF	**C96**	10μF (t)
C46	47pF	**C97**	0·1μF
C47	0·1μF	**C98**	22μF (t)
C48	1,000pF	**C99**	10μF (t)
C49	4,700pF	**C100**	0·1μF (nob)
C50	0·01μF	**C101**	1,000μF (nob)
C51	0·1μF	**C102**	100μF (t)
C52	100μF (t)	**C103**	1,000pF
C53	0·1μF	**C104**	1,000pF (ft)
C54	1,000pF	**C105**	10μF (t)
C55	0·1μF	**C106**	15pF
C56	1,000pF	**C107**	1,000pF

nob = not on board.
sot = select on test.
ft = only required for carrier oscillator fine tune circuitry.
All capacitors except C101 (which is aluminium electrolytic) are either bead tantalum (marked t) or miniature ceramic, tolerance 20%.

IC1	SL1496	**TR1-5**	SL3046
IC2	SL1612	**TR6-10**	SL3046
IC3	SL1613	**TR11-15**	SL3046
IC4	SL622C	**TR16-17**	SL301C Dual transistor
IC5, 6	SL1640		
IC7, 8	SL1612	**TR18**	BC178
IC9	SL1640	**TR19**	2N3819
IC10	SL1613	**TR20**	2N3819
IC11	SL1610	**TR21**	2N918
IC12	SL1621	**TR22**	2N706
IC13	SL1613		
IC14	SL1623	**D1-8**	IN4148
IC15	SL630C	**D9**	MV11 (ft)
IC16, 17	SL1612	**D10-11**	MBD101
IC18, 19	SL78L06	**D12**	IN4148
IC20	SL1640		
IC21	SL78L06	**Delay line**	Belfuse 0420-0400-05 or similar
IC22	SL624		

F1	XF9-B or QC1246AX	**X1**	8,545kHz
F2	XF9-B or QC1246AX	**X2**	9,001·5kHz
F3	XF9-M	**X3**	8,998·5kHz
F4	XF9-E	**X4**	9,001kHz

T1 6:1 toroidal rf transformer
L1 3·1μH nominal, slug tuned screened rf coil
L2 550μH nominal, slug tuned screened rf coil
L3 370μH nominal, slug tuned screened rf coil
RL1-6 National RS miniature relays, 12V
Diode ring Anzac MD108 □

oscar news

Orbital calendar

In co-operation with AMSAT, W6PAJ has published an improved AMSAT-OSCAR orbital calendar containing all orbits for 1978 for Oscar 7. The calendar includes information on the operating schedules and frequencies for the spacecraft and also the telemetry decoding equations. Also included is step-by-step information on how to determine times of passage of the satellite.

The orbital calendar is available post paid for $5 or 30 IRCs. To AMSAT members the cost is $3, and free to life members. Overseas orders will be airmailed. Orders and payments should be made in USA currency to: Skip Reymann, W6PAJ, PO Box 374, San Dimas, California 91773, USA. Orders may also be charged to Visa (Barclaycard) or Mastercharge. To speed up the processing of the order please include a gummed, self-addressed label. Proceeds from the orbital calendar benefit AMSAT. It is understood that members of AMSAT—UK will be able to purchase calendars from G3AAJ. A further announcement will be made.

Computer print-out

A perpetual computer print-out is available for Oscar 7. This provides time, azimuth angle, elevation angle and range, all printed out at 1min time intervals. The print-out is based upon the latitude and longitude of each individual QTH. The present cost is $4.50 (air mail), and further information can be obtained from W. Johnston, WB5CBC, 1808 Pomona Drive, Las Cruces, New Mexico, 88001, USA.

Launch information

With launches of the Soviet RS satellites and AMSAT Oscar D to take place during the next year, up-to-date information on launch dates and times can be obtained from the GB2RS news bulletins or the AMSAT UK net on 3,780kHz at 1015am on Sundays.

"Guide to Oscar operating"

This is a nine-page leaflet produced by AMSAT UK for those who wish to commence operating through Oscar 7. Copies may be obtained by sending a 8½ by 6in sase to G3RWL, QTHR.

Mode switching

Due mainly to the excessively high power employed by a number of European stations, Oscar 7 is subject to random mode switching. At this time of the year the spacecraft is in almost 100 per cent sunlight and the battery temperature is high. To ease the problem, users may find that an increasing number of orbits are being devoted to mode B, where battery drain is greater.

The 432MHz uplink power used by some stations is being quoted as 20kW erp. With the recommended erp of 100W, efficient communication is usual and it is possible to reduce power to 10W and continue to communicate. High-power users can usually be readily identified and it is hoped that other users will have no hesitation in drawing attention to the recommended erp. □

The G3XAP directional antenna for the lower frequencies

by A. P. ASHTON, G3XAP*

IN a previous article [1], the author described various compromise antennas that he had used for working dx stations on 1·8MHz. At that time only VK/ZL was required to achieve a 1·8MHz WAC with a 9W dc input, and he spent one complete winter period trying unsuccessfully to contact VK6HD. It was known that considerable success had been achieved on 1·8MHz with sloping $\lambda/2$ dipoles, and this knowledge led him to investigate 1·8MHz sloping antennas.

The author's garden is about 100 by 45ft, so a $\lambda/2$ sloping wire (approximately 265ft) was not possible at this site. Rather than set up a station at an alternative location, it was decided to investigate the use of a $\lambda/4$ sloping wire—fortunately a diagonal across the garden points towards VK6. The immediate problems were how to suspend such a wire and how to feed it.

Fig 1, which was also published in [1], shows that the "loading wire" is acting as a top-fed sloping $\lambda/4$ wire fed by the vertical section. What was not known, however, was what effect the vertically-polarized radiation from the vertical section would have on the radiation from the loading wire. It was decided that an antenna of this type would be easier to investigate on one of the hf bands where its physical size would make for easier handling, and consequently a scaled-down version was constructed for 28MHz and receiving tests were carried out on this frequency. Because there were few dx stations operating on this band during the test period, it was difficult to compare reception of stations from different

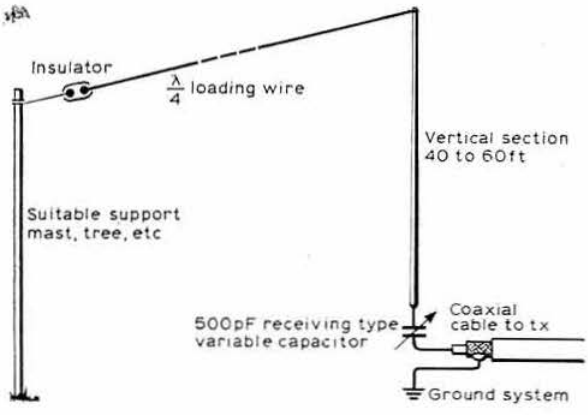


Fig 1. Layout and feed system for a 1·8MHz antenna with $\lambda/4$ "loading wire"

directions. Therefore a second, identical antenna was constructed and the feeders were run to a switch so that rapid switching from one antenna to the other was possible. By altering the direction of the sloping wires it was possible to get a good picture of the radiation pattern of this antenna and it was soon realized that some directivity was present.

These simple tests indicated that the antenna showed some dx gain in the direction of the sloping wire, and the next step was to find out to what extent the gain was dependent on the angle between the wire and the ground. In fact it was found that the angle was not very critical, and little difference in gain was noted as the angle of slope was varied. Maximum gain was apparent when the end of the sloping wire was in close proximity to the ground, but some loss of directivity was noted when the wire approached a horizontal position. These test antennas were resonated by small series variable capacitors as shown in Fig 1, and it was noted that changes in slope of the loading wire had very little effect on the antenna resonance. However, when the direction of the sloping wire was changed, larger differences were noted; and with the wire pointed towards the second antenna, the detuning was very considerable indeed, and even when resonance was restored the antenna did not perform well. With the wire pointing directly away from the second antenna, the detuning was somewhat less pronounced. Anyone intending to reproduce these tests for themselves must consider which direction they wish to work into, and it is suggested that the antennas are sited as shown in Fig 2.

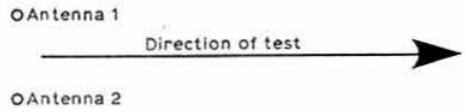


Fig 2. Siting of two antennas for comparative tests

Transmitting tests carried out with two South American stations showed that the directivity was present, but the results were inconclusive in terms of the degree of gain attained, as high levels of QSB were experienced at the time. However, the difference between signal reports from the two antennas, one with the loading wire pointing towards South America and the other with the loading wire pointing in the opposite direction was around two "S" points on the station KW2000A.

It had been established, therefore, that directivity was present, but a comparison with a known antenna type was now necessary in order to put the degree of gain into some perspective. Further comparisons showed that the sloping wire antenna had a loss of around one "S" point when compared with a $\lambda/4$ vertical antenna having an identical ground system. (This loss is at dx, and cannot necessarily be compared with a free space loss). This result caused more than a little disappointment until two pertinent points were considered—first, the 28MHz antennas used in the tests were only 3ft 9in from the ground at their highest points. It was considered that surrounding objects may have had a lot of influence at these heights, whereas at a height of 60ft on 1·8MHz these influences should be considerably reduced. Second, if a compromise antenna on 1·8MHz could put a signal into Western Australia that was only one "S" point down on that from a full-size $\lambda/4$ vertical, then a QSO was a distinct possibility. (In fact, as the 1·8MHz antenna was to

*30 Ford View Road, Stowmarket, Suffolk IP14 2BL.

have a compromise radial system [1], the loss would probably be somewhat more than one "S" point).

A 1·8MHz antenna was erected with a 60ft vertical section and a $\lambda/4$ loading wire, and was resonated with a series capacitor at the feedpoint. The wire was sloping in a south-easterly direction, and within a few days EP2BQ was worked and a 579 report received. The transmitter input for this QSO was only 4·5W which suggested that the antenna was operating in an efficient manner. In December of the same year, VK6HD was worked to complete the 1·8MHz WAC, and that station heard G3XAP on at least one other occasion. It was noted during this period that it was very difficult to work into North America, although other European stations did not appear to be having this difficulty. The loading wire was therefore trimmed down so that the antenna became self-resonant on 1·825MHz again, and W stations were again worked with ease. Although this was not conclusive proof, it is suggested that the directivity of the antenna had been considerably reduced by this adjustment in length. The attainment of a 1·8MHz WAC award marked the end of a long struggle for the author, but also meant that with this ambition achieved he had more time available to investigate directivity with antennas of this type.

Tests on 3·5MHz

It had been noted during the erection and tuning of the 1·8MHz antenna that with an appropriate adjustment in length of the sloping wire the antenna could be used as a $3\lambda/4$ antenna on 3·5MHz. As the antenna's vertical section was 60ft this would mean that the antenna would take the approximate form of a top-fed sloping $\lambda/2$ fed by a $\lambda/4$ vertical. It was considered that operating in this mode the feed impedance of the antenna should be a good match for 50Ω feeder. The changeover was made and, after tuning, it was noted that a very good vswr was achieved—around 1·1 : 1. The first QSO with this antenna was with a station in Malta on 3·5MHz ssb, and the report received with an input of about 150W p.e.p. was 5-9 + 50dB. Other G stations working the 9H station were receiving reports of about 5-6 to 5-9.

On that same evening many W stations were heard at very low signal strength but other European stations were giving

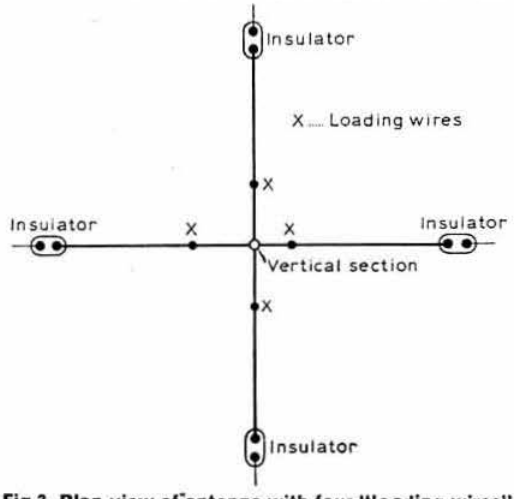


Fig 3. Plan view of antenna with four "loading wires"

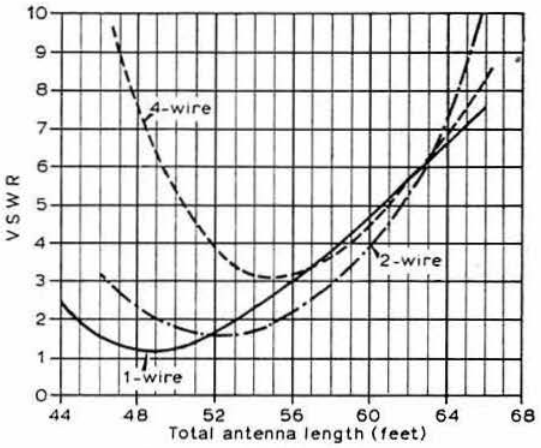


Fig 4. Antenna length *v* vswr

Antenna length (ft)	VSWR 1 wire	2 wire	3 wire
44	2·4	—	—
47	1·3	2·7	8·8
50	1·4	1·8	5·2
53	2·1	1·7	3·5
56	3·2	2·3	3·2
59	4·4	3·8	4·2
62	6·0	5·9	5·8
65	8·3	9·6	8·3

them very good signal reports. This suggested that the author's antenna had a null in a north-westerly direction. As the "loading wire" was still pointing to the south-east, (ie to 9H1) it was considered that the directivity found with the $\lambda/4$ sloping wire was also present with this antenna, but was much more pronounced. After a few hours of listening to the W stations and being unable to make contact with any of them, the author altered the direction of the sloping wire.

The immediate result of this operation was a dramatic increase in the signal strength of the American signals—followed by a period of continual S9 reports on the G3XAP signals from these same stations. Although no logical tests had been carried out, it was already apparent that a high-gain antenna had been devised—that is, high-gain for this frequency. As there was insufficient room to erect a second 3·5MHz antenna for a meaningful comparison and evaluation, the author's opinion of this antenna was derived solely from the very large number of QSOs that followed over the next few weeks—and the very large number of S9 reports that accompanied them.

Attempts to achieve omnidirectional performance

The unidirectional antenna is capable of achieving extremely good results at long distance, but suffers from one big disadvantage—it is not easily rotatable. It is possible to alter the direction of the sloping wire, and hence alter the direction of radiation as described above, but in practice the physical movement of a wire 140ft in length is difficult—especially in a small garden containing such obstacles as trees, linen posts, etc. It was thought that the antenna could be made practically omnidirectional by using a number of sloping wires—pointing in different directions and joined to a single point at the top of the vertical section—instead of just the single loading wire. Such an antenna would

obviously require a large amount of space, but even at the G3XAP location such an antenna could be accommodated for any frequency from 7MHz upwards.

A 7MHz version of the antenna was therefore erected, with a 40ft vertical section and a single loading wire of around 65ft in length. This wire was trimmed until a low vswr was achieved on 7·005MHz, showing that the antenna was working as a 3λ/4. Again, very good results were immediately achieved—VK/ZL was workable with absolute ease—and the direction of radiation was altered by simply changing the direction of the sloping wire. Three more wires were then added to the top of the vertical section—identical in length to the first wire after it had been "tuned", and the four wires were run in directions 90° apart, as shown in Fig 3.

The result was disastrous—a very high vswr was noted on the feeder and the receiver sensitivity was extremely low. This effect on the receiver was so immediately apparent that at first it was thought that there was a mechanical fault somewhere on the feeder/antenna system. Despite numerous checks and adjustments to the length of the sloping wires it was not possible to achieve a good match between the base of the antenna and the feeder.

The author was unable to understand this phenomenon and it was therefore decided to investigate this antenna in more detail. Again the hf bands were used, as the 7MHz aerial was still large enough to make erection, trimming of wires, etc difficult for one person. A 14MHz version of the antenna was erected with a 20ft vertical section and a single loading wire—this single wire was trimmed down 3ft at a time—the feeder vswr and a remote field strength reading being noted after each adjustment. This exercise was then repeated with two and then four loading wires, care being taken in the latter two cases to ensure that each loading wire was exactly the same length for each measurement. The results of these tests are given in Figs 4 and 5; note, however, that the field strength readings are arbitrary and the relative field strengths of the three antennas cannot be compared (ie the sensitivity of the field strength meter was altered between tests on the different antennas).

It will be noted that the feed impedance of the antenna changes as the number of loading wires is increased, but, as a noise bridge was not available at the time of the tests it is not known whether the change was an increase or a decrease. It seems reasonable to assume that it is an increase, as a decrease would mean that the impedance would pass through 50Ω and hence a very low vswr should be obtainable by trimming the loading wires. After some experimentation, the vswr of the four-wire antenna was brought down to around 1·2 : 1 by inserting an "L" network at the feedpoint, and this antenna was compared with a single-wire version on 14MHz. The four-wire version appeared to be practically omnidirectional, but signal reports received during transmitting tests indicated that it was around two to three "S" points down on the single-wire version working in its favoured direction.

It is assumed that there is an interaction between the radiated components of the loading wires which tends to cancel out low angle radiation and raise the feed impedance. (The tests referred to were with dx stations). During these tests it was noted that there appeared to be some high-angle radiation in the direction opposite to the direction of the loading wire—this was seen as an increase in signal strength

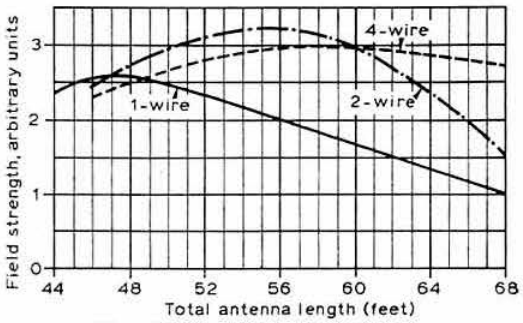


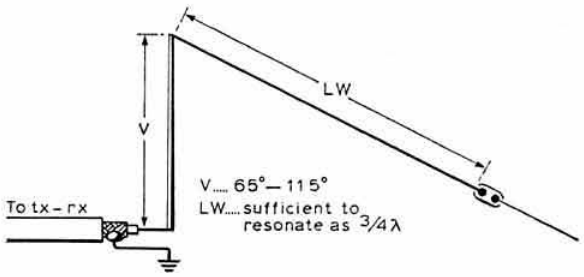
Fig 5. Antenna length *v* field strength

Antenna length (ft)	Field strength 1 wire	2 wire	3 wire
44	2·3	—	—
47	2·6	2·6	2·4
50	2·5	2·9	2·6
53	2·2	3·2	2·8
56	2·1	3·3	2·8
59	1·9	3·1	2·9
62	1·4	2·6	3·0
65	1·1	1·9	2·8

from near European stations when the loading wire was pointed away from them. This property had also been noted on the 3·5MHz version of the antenna.

It was concluded that a high-gain omnidirectional antenna could not be devised using this approach, and the author is still unable to fully understand why. Undoubtedly the detuning experienced by increasing the number of loading wires was due to the effect that these wires have on one another and to the large capacitance that exists between the wires and the ground system. What is not fully understood is why the system does not exhibit low-angle radiation when the reactance is removed by using an "L" network at the feedpoint.

Attention was turned back to the single-wire unidirectional antenna and it was found that provided the overall length of the antenna was adjusted to form a 3λ/4, the ratio of lengths of the vertical and the loading wire was not critical. The design in Fig 6 was therefore evolved. The angle of slope is a matter for individual experiment, and is not an easy parameter to establish, as the optimum angle of radiation for long distance varies from band to band. Work carried



Band (MHz)	Vertical length (ft)
1·8	95 — 170
3·5	48 — 85
7	25 — 42
14	12 — 21

Fig 6. Design of single-wire unidirectional antenna

out at G3XAP has shown that the slope of the loading wire does have an effect on the gain attainable at long distance, but assessment of the optimum angle requires resources not available to the author.

The heights required for the 1·8 and 3·5MHz antennas may put these devices outside the use of the average amateur, but it is suggested that this antenna is aimed at those among our ranks who are prepared to put effort into a project in order to arrive at an above-average station. The author believes that the work put in at G3XAP led to the development of an antenna system for 1·8MHz that was very much above average; the attainment of a WAC certificate for 1·8MHz with a 9W dc input, and to the working of many North and South American stations on 1·8MHz with an input of only 4·5W. The antenna described above with the $\lambda/2$ sloping wire made it posssible to work all continents on 7MHz within a few days using a transmitter input (cw) of around 100W.

It is intended to carry on investigations with the hope of arriving at an omnidirectional low-angle antenna, as it is felt that the unidirectional properties of the antenna described limit the overall usefulness of the device. Some answers to the problem are already being found, and it is hoped that the outcome may be published in the near future.

Reference

[1] "160m dx from suburban sites", A. P. Ashton, G3XAP, *Radio Communication* December 1973. □

Lettering of panels and meter movements

by R. V. Heaton, G3JIS*

READERS may be interested in this simple method of lettering panels and meter scales using UNO pens and stencils which can be obtained from any drawing office supplier (Fig 1).

For those not familiar with the UNO pen, it is used as follows: Indian ink is placed in the small cup directly above the ink tube. A plunger with a knurled end is attached to a wire which passes down the ink tube and limits the ink flow by capilliary action. If the pen does not write immediately it is applied to the surface to be written on, the plunger can be rotated and moved up and down a fraction of an inch; this causes the ink to flow. The stencil should be placed on a straight edge to ensure the letters are at the same height. When the lettering is completed, the pen should be washed out thoroughly with cold water. When necessary, the stencils may also be washed with cold water.

In the example shown in Fig 2 the stencilling was carried out on the panel directly, keeping it free of greasy fingermarks. Immediately after stencilling, the panel was sprayed with clear varnish to protect the lettering from subsequent erasure. Fig 3 shows an additional scale marked 0 to 0·5, 1·0, 1·5, 2·0, 2·5 and 3·0 which was added to the existing 0 to 10 scale provided by the meter manufacturer.

The results can be judged from the photographs. Perhaps

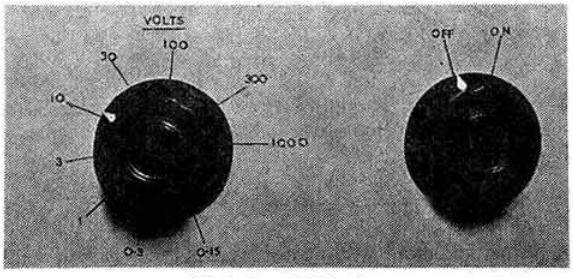


Fig 2. Panel lettering

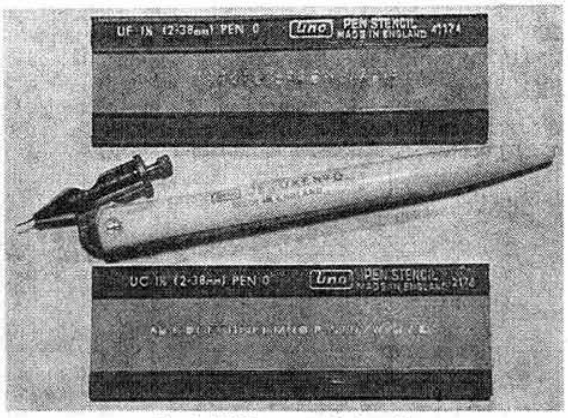


Fig 1. UNO pen and stencils

they are not up to the highest standard for constructor cup projects, but the system is relatively inexpensive over a period of time. In the alternative system of plastic stick-on letters, storage adversely affects the adhesive properties of the letters.

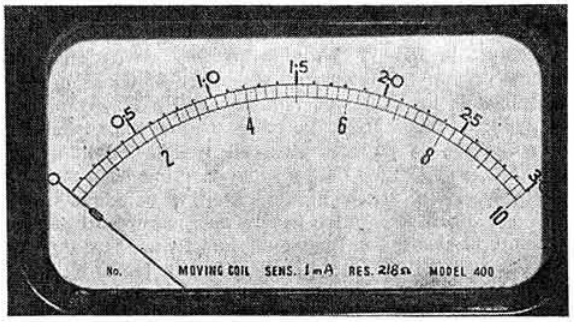


Fig 3. Dial scale marking

The stencils cost approximately 70p each, with the pen costing 80p (at 1976 prices). There are a number of stencil manufacturers in this field offering different type faces and different heights of lettering in graded sizes. Ask to see a selection before deciding which to buy. □

*20 Tewkesbury Avenue, Davyhulme, Urmston, Manchester M31 1RJ

Secondary standards

by K. VINEY, G8KDC*

READERS of the many constructional articles recommending use of the BBC's 200kHz transmission as a frequency standard may be interested in the principles and operation of the "drive" source itself, which provides a guaranteed long-term stability to an accuracy of ± 1 part in 10^{11}. The equipment, manufactured by Hewlett-Packard, is the property of the National Physical Laboratory (NPL).

Two units, a main and a spare, are housed in temperature-controlled rooms and provide outputs at 5, 1 and 0·1MHz. This last is doubled to 200kHz before being amplified to 10W ready for the first stage of the lw transmitter. In addition these "drives" can be supplied with an integral clock set to Universal Time (Co-ordinated) as an optional extra! UTC, as it is commonly referred to, is a modification of a time scale based on the earth's rotation about its axis with correction for angular velocity and seasonal variations. A 1s step adjustment is also incorporated as allowed by the Bureau International de l'Heure in Paris.

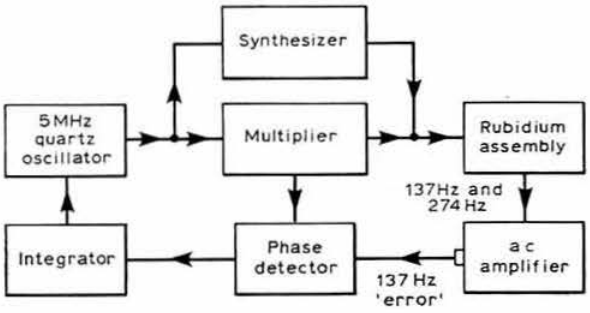


Fig 1. Simplified oscillator block diagram

General principles

As shown in Fig 1, this high stability drive derives its accuracy from the unvarying frequency of an absorption resonance in the element Rubidium (Rb^{87}). This resonance (actually 6·834685GHz) is used as the reference in an afc loop having as its controlled element a 5MHz quartz oscillator. Fig 2 shows the principal components in the Rb^{87} assembly. Here, atoms of the vaporized rubidium in the absorption cell are excited to new energy levels at or near the natural absorption frequency. Exactly at resonance the gas increases its opacity to light (from the lamp) by about 0·5 per cent and this is detected by the solar cell.

Frequency control

The 5MHz quartz oscillator undergoes two processes:
(a) 5·315MHz is generated by the synthesizer;
(b) 60·0MHz is produced by the multiplier.

*20 Great Thrift, Petts Wood, Orpington, Kent.

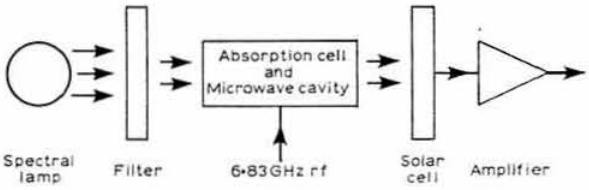


Fig 2. Rubidium assembly

These two signals are summed and fed to the microwave cavity via a harmonic generator/step recovery diode for selection of the final shf frequency.

Fig 3 shows how, by scanning this signal frequency at an audio rate, a second harmonic (274Hz) appears in the solar cell when "on" frequency and a fundamental (137Hz) when "off". The photo-diode current is thereby amplitude modulated. The amplitude of the fundamental is now proportional to the frequency error and it can be separated, filtered, amplified and synchronously demodulated, using as a reference the original audio modulation.

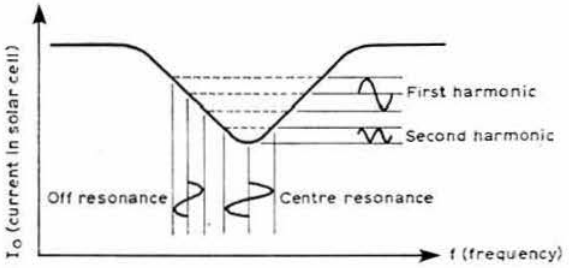


Fig 3. Rubidium absorption plot

The resulting dc output from the phase detector forms an error signal which, after being integrated (to slow feedback response), is fed to a varactor diode in the crystal oscillator. By the use of this phase-locked loop technique, the Rb^{87} stability is transferred to the 5MHz oscillator.

Calibration

On-station monitoring is carried out by comparing the phase of two of these drives (main and reserve) and displaying their difference on a pen recorder. The latter is adjusted so that a 360° phase shift corresponds to a 0·2μs (5MHz) fsd. The frequency difference is then found by the relationship

$$\frac{\Delta t}{t} = \frac{\Delta f}{f}$$

where Δ means "a small change in". For example, a half scale (0·1μs) deflection over a 24h period represents a frequency difference of

$$\frac{\Delta t}{t} = \frac{0{\cdot}1\mu s}{24h} = \frac{1 \times 10^{-7}}{8{\cdot}64 \times 10^{4}} = 1{\cdot}16 \times 10^{-12}$$

A further and more precise measurement is carried out daily at the NPL in Teddington. The Radio 2 transmission is received off air and compared with the NPL's own "primary" atomic standard. This is based on Caesium 133 and has a long-term stability within $\pm$ 1 part in 10^{13}. Any detected

phase change is similarly converted to a frequency error and correction, if required, effected at Droitwich. This is accomplished either by altering the microwave excitation frequency or, for finer adjustment, the magnetic field surrounding the Rb^{87} cell.

The long-wave transmission radiates approximately 400kW rf from a four-wire "T" aerial which itself is supported by two 700ft masts. Most of the UK is thereby covered and field strengths in excess of 25mV/m out to a radius of 150 miles can usually be relied on.

Acknowledgement

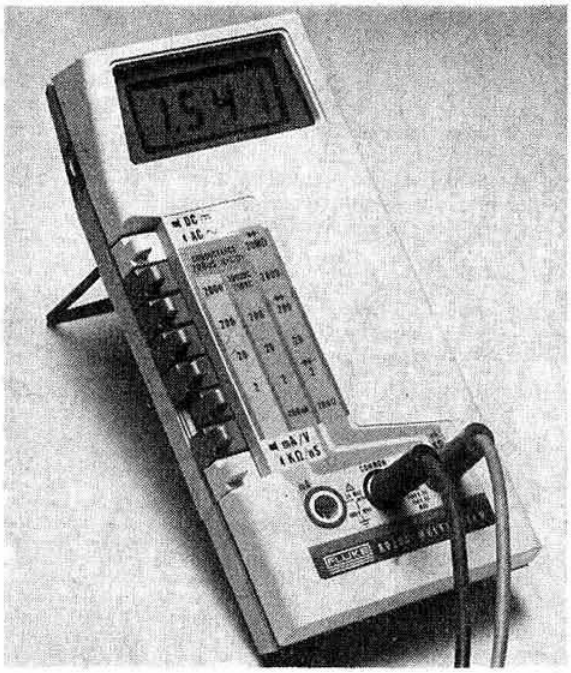
Thanks are extended to the chief engineer, transmitters, of the BBC, and the director of the National Physical Laboratory for permission to publish this article. □

NEW PRODUCT

New pocket-sized Fluke 8020A dmm

The Fluke International Corporation has introduced a new, low-cost, multi-function miniature digital multimeter, intended for use by both the professional engineer and the hobbyist.

Priced at £99, the Fluke Model 8020A digital multimeter features an extremely lightweight and attractive design, to withstand the rigours of frequent field use. It incorporates a 3½-digit liquid crystal display of ½in character height, and has the various function and range push-button selectors so arranged to allow one-handed operation by the user. A custom-designed cmos/lsi circuit provides analogue-to-digital conversion and display decoding and drive. Together, the use of the lsi circuit and lcd help to ensure maximum battery life from the small 9V alkaline cell, which consequently gives up to 200h operation.



Standard features of the 8020A include autozero and autopolarity, and the instrument has a total of 26 ranges and six functions. These include 10 voltage ranges from 100μV to 1kV dc or 750V ac, with a basic dc accuracy of ±0·25 per cent; six of resistance from 100mΩ to 20MΩ with a basic accuracy of ±0·2 per cent; three for diode test functions of 2kΩ, 200kΩ and 20MΩ; and two conductance ranges.

Extensive overload protection is a built-in feature of the 8020A. The instrument is protected against accidental or unknown input conditions up to a continuous 300V dc or rms ac on all functions and ranges, and against transients up to 6kV.

Further information can be obtained from the Fluke International Corporation, Garnett Close, Watford WD2 4TT. Tel 0923 33066.

BOOK REVIEW

Solid state Design for the Radio Amateur by Wes Hayward, W7ZOI, and Doug DeMaw, W1FB. Published by the American Radio Relay League Inc. 256 pages, copiously illustrated: present *QST* format. Price: £7.25 inc p & p from RSGB Publications (Sales).

The radio amateur has had many opportunities of learning the fundamental theory of solid-state devices from his technical journals, but not so many of putting this knowledge into practical design with a guiding hand towards good practice. This book is designed to supply such a need, with simple explanations and the minimum of mathematics, indeed the latter is little more than arithmetic. More than that: the information is conveyed mainly by example rather than precept, and teaching from the particular to the general is no bad way when dealing with technical matters and technically-minded people.

The authors point out that after the early days of home construction, the complexity of receivers and single-sideband transmitters in the late 'fifties brought in the "appliance era" when few amateurs built either transmitters or receivers. "The dominance of semiconductor technology has changed this. Today it is straightforward to build receivers of simple design while using transistors and ICs." Then follow 42 pages of immensely practical details of the design of receivers and their circuits. This is followed by 32 pages of Advanced Receiver Concepts, which are mainly concerned with receiver front-end design, i.f. amplifier design, and frequency-counter fundamentals.

The other chapter subjects are Semiconductors and the Amateur, Basics of Transmitter Design, More Transmitter Topics, Power Amplifiers and Matching Networks, Test Equipment and Accessories, Modulation Methods, Field Operation, Portable Gear and Integrated Stations.

Four appendices deal with the Phasing Method of SSB, Bandpass Filters, Distortion Properties of Amplifiers and Receivers, Transistor Models and Amplifier Analysis, and the Inductance of Toroidal Coils. There is a bibliography of some 150 references, most of which are to *QST* articles and some other amateur magazines, but some are to professional journals and technical books, all being of comparatively recent years and so reasonably available.

The reviewer thinks that this book is important in its value to the practical intelligent amateur, and because it is timely and just what is needed to encourage the home construction of amateur gear with the undoubted pleasure such activity brings.

T. P. A.

technical topics

Pat Hawker, G3VA

THIS month our topics range from the very simple to the quite complex; but emphasizing always that complexity in communication equipment is only as good as the sum of a large number of relatively simple circuits. But no space for philosophizing, straight down to details.

Franklin in solid-state

Ray Brock, BRS36760, has been experimenting with a tunable oscillator arrangement which would appear to have been sadly neglected in its solid-state form but which in thermionic guise was at one time held in very high esteem for its exceptional stability; the Franklin oscillator. His prime object was to develop a good oscillator for direct-conversion receivers, capable of being readily band-switched without calling for changes in frequency-conscious component values or presenting any problems of coil tappings. In doing this he appears to have highlighted features of this form of vfo that could prove equally attractive for other applications. Indeed his letter led me to search along the untidy shelves of my "library" to trace something of the history of this type of oscillator. But first the comments from BRS36760:

"Fired by interest in direct conversion for ssb reception I have been building various receivers; apart from the fundamental problem of 'image' sidebands the results have been excellent and a really good af filter works wonders in this type of receiver.

"During this work I made up oscillators for several frequency bands, including six Vackar oscillators which were fine up to 20MHz but which needed drastic component variations for each band; and two Seiler oscillators which proved better than the Vackars above 12MHz but again needed considerable changes for the different bands. Neither type lent itself to easy band-switching.

"Looking through the literature, I was attracted by the Franklin oscillator and surprised to find this has apparently never been suggested in *TT*. I built one with two FETs and it appears to be exceptional, giving stable output over the tuning range 15 to 20MHz. Although I have not tried one for the lower frequencies, I suspect that this approach is the answer to the requirement for a switchable, stable oscillator.

"The circuit (Fig 1) is adapted from the valve Franklin oscillator in the *Radio Communication Handbook*, using rf chokes as drain loads. Initially it appeared excessively sensitive to changes in loading but by taking the rf output from a three-turn winding on the tank coil, I achieved better results. I now use a conventional buffer amplifier after this take-off, and my oscilloscope shows no change in output for quite large changes in load. It does seem rather sensitive to voltage, going out of oscillation below about 6V and becoming rather hysterical, with loads of harmonics, if voltage is raised to over 8·5V."

Checking back I was surprised to find that BRS36760 is quite correct: *TT* has never included a solid-state Franklin other than a brief mention of the source-coupled form; *ART* has long included a valve Franklin as part of a 3-4MHz tunable i.f. strip dating from 1961, and a rather plaintive note that the Franklin and Butler oscillators "have perhaps been the least exploited of tunable oscillators, yet appear to offer a number of advantages".

It is truly surprising that more attention has not been given to the Franklin arrangement in connection with semiconductor devices, for it might almost have been designed for them. The valve Franklin has of course a long and distinguished history. It was one of the developments by "Franklin of Poldhu" and widely used by the Marconi Company in marine transmitters, achieving world-wide recognition by being included in that classic book of the 'thirties: *Short-wave Wireless Communication* by Ladner and Stoner (1932).

Its praises were first sung to amateurs in a memorable article by E. L. Gardiner, G6GR, in the *T & R Bulletin* of July 1939, but there was hardly time for many of us to follow his advice before the Post Office inspectors came to cart off all amateur transmitters. G6GR, in the days when British amateurs prided themselves on their T9X notes, was one of the very few pre-war authors to advocate a "master oscillator" (vfo) approach. He used his 1·7MHz Franklin on all bands up to and including 56MHz, where he found it was more stable than the crystals then used (though possibly these were not all "zero-temperature" cuts).

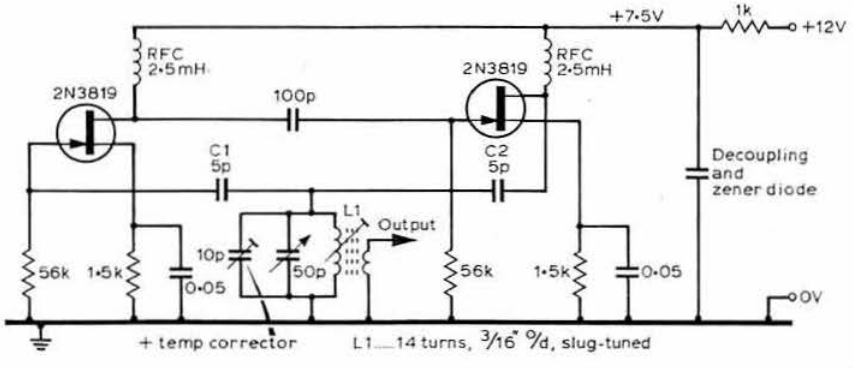


Fig 1. Solid-state tunable Franklin oscillator (15–20MHz) as developed by BRS36760 although possibly capable of further optimization (see text for suggested reduction of the value of C1, C2 and the question of the rf take-off). BRS-36760 notes that without the source biasing resistors the oscillator drew 28mA for some 5V output and was unstable; with 1·5kΩ resistors results were very good with a zener stabilized power line of between 6 and 8V, and the oscillator drew 6mA and provided 1V output. BRS36760 found the inductive take-off coil necessary to overcome excessive sensitivity to loading variations, although the classic Franklin take-off point would be the gate of one of the FETs

As we have noted frequently, there is no one oscillator circuit that automatically ensures stability regardless of mechanical/temperature/voltage variations. The Franklin is no exception, but it does have certain advantages, although not all the published designs take full benefit of these.

A tunable oscillator consists in essence of two parts: a tuned circuit of high Q and a "maintaining circuit" (the amplifier that replenishes the losses in the tuned circuit). An advantage of the Franklin is that the maintaining circuit is only very loosely coupled to, and imposes very light loading on, the resonant circuit; another practical advantage is the single two-terminal coil which has one end earthed, with no capacitive or inductive divider that is frequency conscious. Because of the loose coupling those changes affecting the maintaining amplifier should have only very limited effect on the frequency.

In the original commercial Franklin circuits the two coupling capacitors were usually *under 1pF*, and the G6GR circuit in 1939 specified under 2pF. More recent circuits seem to suggest 5 or even 10pF, apparently because of the lower Q coils that are often used (some articles have even suggested that the Franklin *needs* only a low Q coil, which to me sounds poor advice). As the early writers made clear, the stability of the Franklin oscillator depends upon the quality of the *LC* circuit and the looseness of the coupling that can be achieved.

For these reasons, although I feel that BRS36760 has performed a most valuable service in reminding us all of the neglected Franklin, I suspect that his circuit values may not be optimum and I am not altogether happy at taking the rf directly from the tank coil rather than from the maintaining amplifier. But his taking the plunge should encourage us all to have another look at this oscillator (which might for example lend itself to use with integrated circuits normally *not* recommended for stable oscillators). It contains all the ingredients for a wide-range, band-switched stable oscillator, though of limited output. It might have been designed with the fet and dual-gate mosfet or even cmos ic devices in mind! Its only significant disadvantage is that it should not be expected to provide high output directly. It will readily function as a crystal oscillator, by simply substituting a crystal for the tuned circuit.

Electronic dc fuse

How many power supplies actually have a genuine fuse and not just a piece of wire put in as a last resort when all available cartridge fuses of the correct rating had finally blown? The usual way to overcome this perennial problem is to think in terms of miniature contact breakers or current sensing circuits.

In *Electronics* (15 September 1977) Russell Quong comes up with a further suggestion: a combination of thyristor (scr) with an electromagnetic relay: see Fig 2. A momentary depression of S1 allows current to flow into the load but also energizes the relay: the contacts close, allowing current to continue to flow into the load and the relay winding, with R2 chosen to suit the relay energizing current.

However, if the current drawn by the load is such that the voltage drop across R1 exceeds 0·65V, then the thyristor "fires" and there will now be only about 2V across the relay coil, causing the relay to drop out and so disconnect the dc power supply from the load, although this can be reset simply by depressing S1 again.

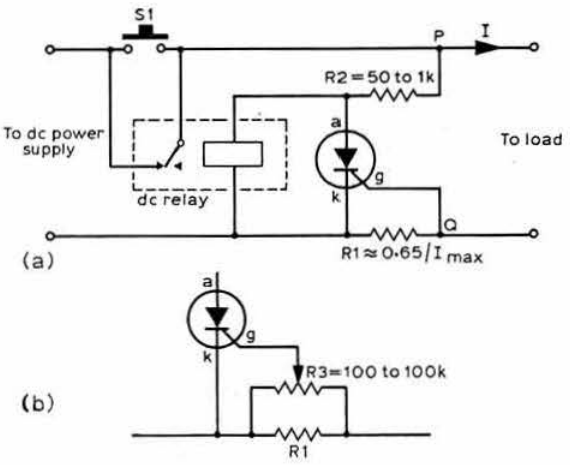


Fig 2. Electronic re-settable dc fuse (a) which opens the relay when the thyristor "fires" due to a voltage drop of more than 0·65V across R1. The modification shown in (b) provides an adjustable tripping current facility

The modification shown in Fig 2(b) provides the user with a variable "fusing" current; useful with a general-purpose power supply on the workbench.

A receiver with a memory

Rather more than 12 years ago I noted (*TT* July 1966) the introduction of what were in effect some of the first general-purpose "all-solid-state" hf communication receivers that really tried to come to grips with the (at that time) extremely tricky art of getting good results from the then-available transistors. One of these models was the Plessey PR155 which I had been able to test out for a couple of days on the amateur bands, although it was designed primarily for the professional market.

For that period this was a very good, effective receiver with partial-synthesis (ie synthesized first oscillator with variable i.f. technique) and with a good deal of thought given to the layout and "operability" of the controls. This model subsequently remained in production for a considerable number of years, incorporating various modifications to take advantage of new components etc. But the basic design had been determined before the emergence of mixers of wide dynamic range and before it was accepted that for professional applications one really needed to be thinking in terms of stabilities of one or two hertz throughout the hf spectrum.

Now the PR155-series has been superseded by a brand-new design, the PR2250-series which Plessey recently showed for the first time to the technical press. This new design provides interesting evidence of how much more stringent are the current requirements for top-flight modern receivers – and how much more complex have become the designs needed to meet these: full frequency synthesis but with the provision of a rotary incremental tuning control to simulate a free-running vfo; a very high order of front-end linearity to allow the receiver to cope with strong signals (+27dBm intercept point taking into account the built-in agc-controlled pin-diode attenuator); high spectral purity of the synthesizer to minimize any reciprocal mixing (130dB/Hz 20kHz);

The new Plessey PR2250 receiver with a memory

a non-volatile "memory" to provide instant recall of any 16 frequencies (including mode, bandwidth and agc characteristics): a keypad that not only allows the operator to "enter" or "update" the memorized information, but also lets him shift immediately to any frequency between 10kHz and 30-MHz without touching the tuning knob, although this then provides him with the ability to search or fine-tune around the new frequency with a tuning rate of either 20 or 1kHz (with 10Hz increments) per knob revolution.

The basic design is a double-conversion superhet with front-end switching-mode fet mixer providing up-conversion to 65MHz. The signal path is then through a crystal curbing (roofing) filter before conversion down to 1·4MHz, where there are five bandpass crystal filters ranging from 8kHz bandwidth (for isb) down to 100Hz as a carrier filter to feed phase-locked loops that reconstitute a carrier for those commercial transmissions that include a pilot carrier. A sidechain provides a 100kHz take-off point.

The frequency synthesizer also incorporates two phase-locked loops using a Plessey-developed technique that they call "Gemini". Frequency display is with seven-segment, non-flicker LEDs down to 10Hz. Front-end pre-mixer selectivity is provided by sub-octave filters.

Although the front panel still shows a firm family-likeness to a communication receiver, there are no mechanical linkages from it to the main receiver circuits which are in the form of demountable modules; the electrical connections are via flexible printed-wire strips and the whole set can be stripped down into a series of building blocks in a matter of minutes to reduce "mean time to repair". In one of the screened modules is a microprocessor (claimed as unique in this type of equipment) which allows the receiver to be fitted into various forms of programmed control that have become a feature of modern "surveillance" systems. But one is reassured to find that the receiver can be manually operated as a processor-enhanced rather than a computer-dominated system.

But a price has to be paid for all this sophistication. Whereas the PR155 when introduced in 1966 carried a basic price tag of around £750, that on the PR2250, although competitive with other high-performance designs, is in the region of £6,500! First find your oil field!

Ferrites and dust cores for vhf

Recently, R. D. C. Thoday (*Wireless World* September 1977, pp47-48) drew attention to the availability of reasonably cheap ferrite rods which have good characteristics at vhf and which open up the possibility of built-in receiver antennas at vhf similar to those widely used for lf/mf broadcast reception. This material is a nickel-zinc ferrite rod made by Neosid Ltd under the code number F29 in the form of rods 123mm long by 8mm in diameter. The article includes details of a vhf ferrite-rod antenna unit for Band 2, with the output from the rod antenna amplified by an RCA 40673 dual-gate mosfet to form an "active" antenna with an output roughly −11dB relative to a $\lambda/2$ dipole.

Peter W. Haylett, G3IPV, required some large iron dust cores about $\frac{3}{8}$in in diameter for use at vhf. He tried some odd lengths of dust cores previously acquired at a local junk sale, but found them thoroughly unsatisfactory at vhf. Following a hunch, he ground up one of the cores in a length of old iron tube sealed at one end; then sieved the results through a tea strainer and collected the finer dust in some round glass sample tubes.

He reports that "the results were truly remarkable. I had produced extremely good cores from virtually useless material. They are genuine iron dust cores and can be made in any size by using suitable plastic containers".

He points out that in many parts of the world specialized vhf iron dust cores are difficult to obtain and—where available—are often expensive.

Dynamic range on vhf

In the September *TT*, in appending some notes to the very interesting active mixer circuit from DJ2LR using four catv-type bipolar transistors, I pointed out that while wide dynamic range is an important and highly desirable characteristic for hf receivers, it has to be admitted that in practice many amateurs continue to achieve reasonable results on generations of hf equipment which have been designed down to an amateur price and which leave much to be desired in their ability to handle strong signals. Jokingly I suggested that with such equipment it might be a good tactical move to persuade all other local amateurs that it was "much more fun on vhf".

This remark has prompted Ian White, G3SEK, to comment on the general question of the need for good dynamic range in vhf receivers. He writes: "When trying to con your locals on to vhf don't tell them that they will have no receiver-overload problems up on 144MHz; the chances are that they will be even *worse* than on hf! I believe that problems of inadequate dynamic range are far more pressing on the average amateur on vhf than they are on hf.

"The reason is two-fold: dynamic range needs to be greater on vhf since one needs to be able to receive very much weaker signals and yet to cope with the local signals which can be very big indeed. Yet many amateurs are using vhf receivers having a more restricted dynamic range than they would tolerate on hf!

"Look at some numbers. First, the noise floor of a good vhf ssb receiver can be 15 to 20dB *lower* than its hf counterpart and you need to use that order of sensitivity to hear weak dx signals against the very low background noise level at vhf. But strong local signals can be very, very big. Remember that every vhf dx operator has a multi-element beam, and even a modest transmitter power will give him an effective

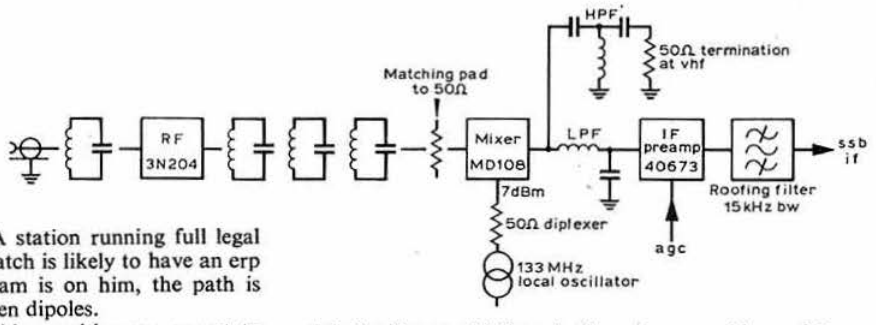


Fig 3. Basic outline of the approach being adopted by G3SEK to achieve an exceptionally wide dynamic range on a 144MHz receiver

radiated power of over 1kW. A station running full legal power on ssb with a beam to match is likely to have an erp of over 10kW. And if *your* beam is on him, the path is equivalent to over 100kW between dipoles.

"Most UK amateurs in the bigger cities can expect to have several such stations within a few miles (three near me in Greater Didcot and another half-dozen running rather lower power). Fortunately it is relatively rare that the local beam antennas are pointing exactly at one another, but nevertheless on almost any evening a vhf receiver can be subjected to incoming signals of —10 to —20dBm *in-band*. Compare that with a noise floor of say —145dBm and you can see that there can hardly fail to be problems, especially from blocking and intermodulation.

"Yet vhf receivers are for the most part ill-equipped to deal with strong signals. Putting a vhf transverter ahead of an hf transceiver such as the FT101 will degrade the dynamic range of the receiver by at least a further 15dB, as does the widespread use of pre-amplifiers in an attempt to "improve" commercial front-ends of poor sensitivity.

"Fortunately the problem *can* be solved, though I believe the most important tool for the job is not a soldering iron but a scientific calculator to help *design* effective front-end gain distribution. If the gain distribution is about right then almost any of the new "wonder mixers" (double-balanced Schottky diodes, power FETs or catv-type bipolars) should do the trick.

"The current version of my experimental front-end (Fig 3) uses the MD108 diode ring mixer in a single-conversion circuit converting from 144MHz straight down to 10·7MHz. Correctly applied this device will give a receiver dynamic range of at least 140dB with respect to blocking, about 95dB with reference to intermodulation products (two equally-strong signals to give ips at the noise-floor level) and 105dB wrt noise modulation appearing at the noise-floor level. The noise modulation comes from the phase-locked vfo, and without a balanced mixer like the MD108 it would be much worse. The overall noise figure was measured at 1·8 to 2·0dB, which is about as good as one needs for terrestrial work on 144MHz. I am currently writing up this work for *Radio Communication* and the design is still evolving by fits and starts. However, even at this stage it is fair to say that for all practical purposes the receiver is immune to overload, in that the limiting factor is usually the signal quality of incoming signals rather than receiver deficiencies."

Audio filtering and processing

An enormous number of narrowband, bandpass and lowpass "active" af filter circuits based on op-amps, both for cw and phone operation, are appearing in the various journals these days, though generally the performance would seem comparable with the various units published in *TT* a year or two back. As someone who quite often finds an af filter (admittedly an old "passive" one) reasonably useful as a counter to interference, I find it a little worrying that so few of the articles on audio filters take the trouble to stress the limitations as well as the advantages of narrow filters as a means of determining the overall selectivity characteristics of a receiver. For instance, to be most effective such a filter really needs to be preceded by linear stages; yet virtually no receivers (except some direct-conversion models) are really designed to handle strong interfering signals in a linear fashion right through to af. An ssb transceiver with a 2·4kHz filter will pass down the i.f. strip all the signals in the passband—and if some of these are much stronger than the wanted signal, the subsequent use of a narrow filter is unlikely to result in a clean signal free of blocking. Another problem, of course, is that not all receivers are sufficiently stable to allow really narrowband filters to be used, without frantic retuning after every "over". But most important of all is that it is difficult to find a narrow filter that does not introduce severe "ringing".

A novel, if rather complex, approach to the use of sophisticated signal processing for cw signals has been described by F. J. ("Dud") Charman, G6CJ, in an article "Coherent QRM and noise filter" in *Mercury* (journal of the Royal Signals Amateur Radio Society), Spring 1977. This was developed to assist in the reception of 1·8MHz cw signals from VK5SO in South Australia. His processor is a practical form of a time-domain transversal filter, based on a series of all-pass filters using 741 op-amps. (If anyone is worried at the idea of how any "filter" can be "all-pass" remember we are now in the world of time-domain filtering, where the purpose of the "filter" is to provide a time *delay*). His processor in fact consists of five all-pass sections; a 741 "adder"; and an LM380 output stage. It provides a narrow, steep-sided filter which does *not* ring and which also reduces non-coherent noise such as atmospherics, power-line clicks etc. However, G6CJ does warn that such a system needs a nice "clean" cw signal to work on and will *not* improve a signal having a bad spectrum. Since a long-distance signal is quite likely to be "smeared" by multi-path effects even if it starts out "clean", I suppose this could be a significant handicap, although undoubtedly this does seem a very interesting approach indeed.

The future in fact looks fairly bright for interesting forms of signal processing with the development of "bucket brigade" and "charge coupled devices" (ccd). Richard J. Harris, G3OTK, has pointed out that it has been very difficult to obtain analogue devices capable of delaying an audio signal by up to, say, 100ms without using tape recorders or clocking digitalized signals through long-shift registers, and then reconstituting the analogue waveforms. Now, however

there are bucket-brigade devices already on the market that can delay a 3kHz bandwidth signal in analogue form by up to about 75ms (though at present the price may leave little change from £100!).

Analogue delay lines would be an excellent way of improving vox operation to prevent the "ox" effect of clipping off the first syllable of every sentence; or for noise blankers of various forms. Let us hope the prices of these devices soon drop dramatically.

Audio clipper/filter

An altogether more conventional but nevertheless interesting filter/noise clipper arrangement comes from a note in *QST* (August 1977) by WA3JGU: Fig 4. This has a 750Hz series-tuned passive filter which is based on one of the popular 88mH toroids and which can be switched out while searching for signals. The clipper is an ingenious system that provides three different clipping "levels" by using four germanium diodes (D1 to D4) and two silicon diodes (D5 to D6). The particular arrangement shown in Fig 4 is for use with medium impedance headphones (say 500Ω) and receivers that provide a headphone output at low-impedance. In these circumstances the inclusion of the matching transformer more than compensates for losses in the filter/clipper. For use with low-impedance phones the transformer can be omitted and R2 replaced by an 8Ω resistor.

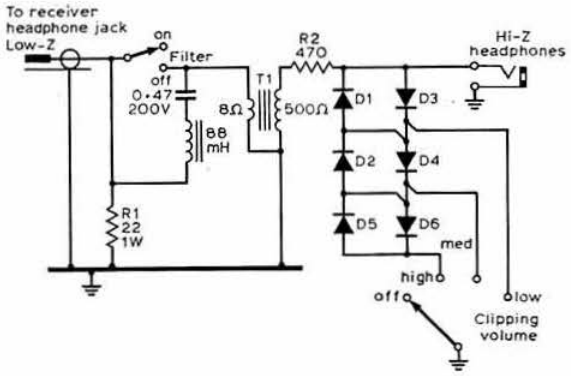


Fig 4. WA3JGU's audio clipper/filter with adjustable clipping levels (*QST*)

Portable power and rapid charging

In two recent items (*TT* September and October) attention has been drawn to the question of (a) portable operation completely independent of mains supplies; and (b) rapid recharging of nicad and other batteries. Since then some additional aspects of these topics have been raised.

For example, while visiting Plessey's we noted a compact "Clansman" PR320 10W ssb/cw hf transceiver—a standard military packset for several years—fitted with a convenient built-on low-torque hand generator. This is said to be capable of fully recharging the 1Ah battery in roughly 3h of winding time, and in practice would usually need much less winding in order just to top up the battery. Such a system thus represents a complete, portable radio station capable of operating at reasonable power levels over extended periods independent of mains or vehicle supplies. Indeed the idea that if one talks too much (with the greater power drain on transmit) one has to spend more time winding the generator handle, has an element of rough justice about it; at least it would help eliminate that scourge of the amateur bands: "the alligator operator" (all jaw and no ears).

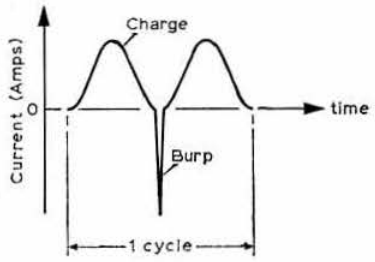


Fig 5. Typical charging current waveform of a ReFLEX "burp" charger

Again, at Racalex 77, we spotted a Racal-Tacticon dc/dc multi-outlet battery charger suitable for recharging from large 28V military vehicle batteries a batch of six 24V 3·3Ah batteries in two or four hours, representing a charging rate for nicad units considerably faster than the usual one-tenth *C* rate, where *C* represents the ampere-hour of storage capacity (for example a small 100mAh nicad is usually charged at 10mA; for 3·3Ah units the "conventional" rate would be 0·33A, requiring at least 10h to fully recharge a battery).

The special "burp" charger for television "eng" operations mentioned in the September *TT* works not at one-tenth *C* but at 4C, or 40 times the conventional figure! Since writing the original item, I have traced a more detailed description of these very sophisticated chargers (ReFLEX-20 made by Christie Electric of California). This is "System for 20min recharging of sealed nickel-cadmium batteries", *SMPTE Journal* April 1977, Vol 86, pp204–9.

This explains that the burp system was developed for military and avionic purposes in the late 'sixties, and that for full effectiveness has to be combined (when used for nicad rather than lead-acid units) with quite elaborate voltage-sensing techniques to determine just when the charging *must* be terminated. We have also noticed that the diagram of the burp charger given in the September issue (Fig 8) showed incorrectly the polarity of the charge-dumping string of 40,000μF electrolytic capacitors. These provide a negative and not a positive burp, as indicated in Fig 5 which shows the form of the charging current of the ReFLEX charger.

The SMPTE article also brings out another important point about nicad cells that deserves to be more widely known: these cells can have a self-conditioning "memory" rather like electrolytic capacitors. If a cell is repeatedly cycled so that it is only partially discharged, it "remembers" this lower limit and its capacity gradually tends to decay. If, after a number of such cycles, any attempt is made to discharge the cell more fully, it polarizes badly.

This is a point of considerable practical importance, since many of us tend to aim at keeping cells fully charged by topping them up after each period of use, rather than occasionally letting them discharge deeply. By coincidence, G8CZT has also drawn my attention to this "memory" phenomenon of nicad cells, based on some comments in *Scientific American* and *Amateur Photograph* . These

suggest that where nicad cells have acquired a "memory" they can be "de-programmed" over a period of time by gradually giving them longer and longer use before re-charging. We suspect, however, that this memory effect may be more important for the larger nicad cells used in the USA than for the smaller units more commonly used here.

CW transmitters with a difference

Very often, it seems, a way of solving design problems is to stand them, or yourself, the other way up. This is not necessarily to advocate Yoga stances for amateur designers, though I suppose it could be called "orthogonal lateral thinking". An interesting example of this approach is to be found in "Digital techniques in transmitter construction" by Rudolf Faessler, HB9EU, in *DL-QTC* No 7 (July) 1977, pp 256-259.

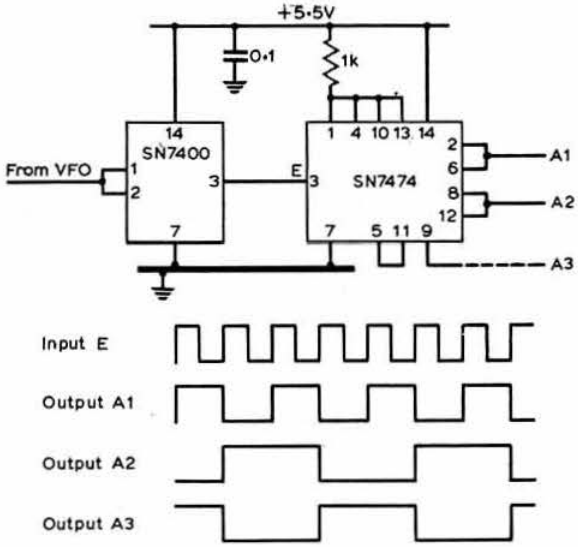


Fig 6. Showing how a double-D flip-flop ic is used as a frequency divider

HB9EU points out that for many decades hf amateur transmitters were based on the principle of putting the oscillator on the lowest frequency band and then doubling up successively to the harmonically-related higher-frequency bands. Then came ssb, with its need to avoid Class C frequency doublers, and the heterodyne form of multi-band exciter, a technique resulting in good stability but not without its problems of spurii. The availability of digital integrated circuits, which so far have found relatively

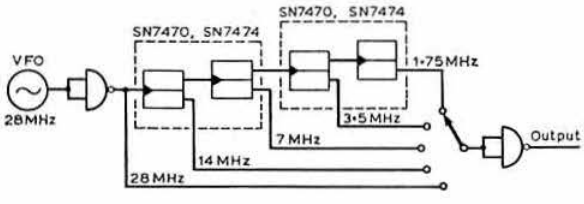
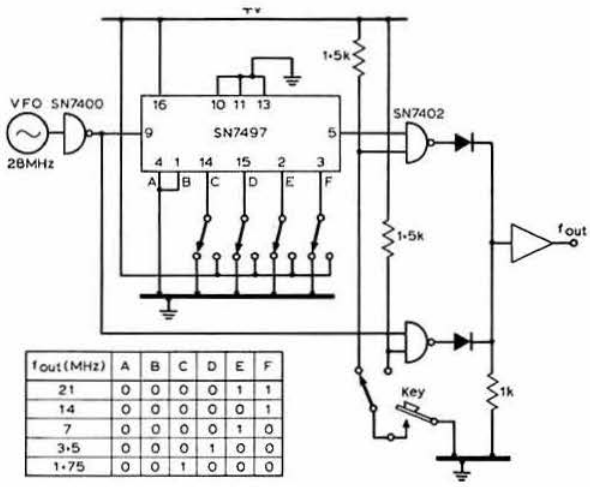


Fig 7. Principle of a frequency divider for five amateur bands



fout(MHz)	A	B	C	D	E	F
21	0	0	0	0	1	1
14	0	0	0	0	0	1
7	0	0	0	0	1	0
3·5	0	0	0	1	0	0
1·75	0	0	1	0	0	0

Fig 8. Frequency division by means of a programmable integrated circuit

restricted use in transmitters, opens up another possibility, at least for cw operators: putting the vfo on the *highest* band and then dividing *down*.

HB9EU in his German text describes in detail various ways in which a compact hf cw exciter could be based on this upside down concept. These include a detailed design for 14/7/3·5MHz using standard ttl devices with a 14MHz vfo, and also an outline for a six-band 28/1·75MHz unit based on a medium-scale-integration device, the SN7497 synchronous-rate multiplier (Fig 8).

Shorter notes and tips

Two quick tips from Roger Wheeler, G3MGW.

(1) Plastic plant labels (20 polythene labels cost about 20p) can be drilled and make good spreaders for open-wire feeders, being low-loss and weather resistant (sounds an excellent idea to someone who once almost set a house on fire while attempting to boil wooden spreaders in wax!).

(2) To find the current rating of a mains transformer: (a) measure open circuit secondary voltage with rated primary voltage applied: (b) load secondary until the voltage across the load has fallen by 10 per cent and consider the current then flowing as the rated secondary current (based on the fact that *most* transformers are designed for 10 per cent regulation). A further test consists of running the transformer for a time with this load and check that it does not overheat (55°C rise above ambient is typical).

Several readers draw attention to new devices soon to be available in the Plessey SL600 series of communications circuits.

(1) The SL664/SL665 low-power i.f./af device *for nbfm*. Each circuit is a complete i.f. strip consisting of pre-amplifier, limiting amplifier, quadrature detector, carrier squelch, dc volume control and af amplifier.

(2) The SL660 is designed as a complete i.f. amplifier, detector and squelch system but uses a dual-conversion system and phase-locked-loop demodulator. Input frequencies can be up to 25MHz and again the device is specifically intended for nbfm communications. □

4-2-70

Graham Knight, GM8FFX*

Repeaters

At the request of the VHF Committee, G3ZNU and some members of the Norfolk FM Group have recently carried out tests at a site at Tacolneston in Norfolk. These have established that input frequencies of 145·000MHz and 145·025MHz are usable from that site. A proposal has now been received at RSGB HQ and it has the active support of the VHF Committee and its Repeater Working Group who feel that this proposal will not have the same series of problems which beset the original Bacton proposal. Information about this proposal can be obtained from G4ABB or G8GTZ.

The Cleveland Raynet Group has submitted to the RSGB a proposal for GB3RC, a portable R8 repeater for use only during exercises and emergencies; information on this new concept repeater is available from G8EIA. A further proposal is awaited from a group in Suffolk which also wishes to establish a portable emergency repeater on the 144MHz band; information on this proposal can be obtained from G3WXZ.

Two further proposals are awaited by the RSGB from groups in Perthshire and Cumbria who wish to establish 144MHz repeaters. These proposals, if licensed, would fill the gaps between the coverage of GB3MP, GB3CS and GB3GN.

No firm date has been set for the commencement of operation of GB3GN, the R7 repeater to be located near Aberdeen. This repeater was licensed in May but at the time of writing has no equipment at the site and no antennas erected. The result of an extraordinary meeting of this repeater's group held on 12 October may expedite this long-talked-of repeater.

The Sussex Repeater Group, having successfully commissioned GB3BR and expecting GB3NX to be licensed shortly, has taken up the original requirement for a 144MHz repeater to cover the east and west Sussex coastline and parts of southern Sussex. The committee of the group feels the proposal should be made known to as wide an audience as possible and is informing local clubs and societies by letter. Anyone else who is interested should contact Chris Goadby, G8HVV, Twin Firs, Hophurst Lane, Crawley Down, West Sussex.

Following the Home Office decision announced last month, several of the Phase 2 repeaters are now licensed, and among the first expected on the air are GB3LI, located at Seaforth Grain Terminal, Liverpool, on channel RB10 (433·250MHz output and 434·850MHz input), and GB3CR near Chester on RB6 (433·150MHz output and 434·750MHz input).

At a recent meeting of the West of Scotland UHF Repeater Group, the chairman, Mike Parks, GM8HBU, demonstrated on a dummy load a working uhf repeater suitable for use on GB3ML or GB3GL. The logic boards for the uhf repeaters have been designed to interchange with those in the vhf repeater GB3CS. Thanks to the co-operation which exists between the vhf and uhf repeater groups the new logic boards have already been air tested on GB3CS.

Now that Phase 2 is under way the RSGB awaits proposals under Phase 3. Groups in Yeovil, Somerset (G8KME); Barnsley, Yorkshire (G3TPX); Northern Ireland (GI3TLT) and Exeter, Devon (G8GRF) will be making proposals for 432MHz repeaters in Phase 3. Information about these proposed repeaters can be obtained from the operators whose callsigns are given in brackets.

Repeater Working Group open meeting

An open meeting of the Repeater Working Group will take place on 28 January at the Wirral Mercury Motor Hotel, Blackford Cross, near Chester. Everyone interested in repeaters is invited to attend this open meeting. Further details next month.

Repeaters—a continuing responsibility

Many groups contemplating putting a repeater on the air often forget that the work does not end when the unit is licensed and operational. In fact this is only the start of the work involved—groups have a continuing responsibility for the maintenance of their repeaters. Some idea of the work involved can be had from studying the maintenance records of the GB3TW group. They recently had to replace the coaxial feeder to the transmitter antenna as it had been damaged by water: fitting the new cable to the antenna and getting the 200ft of the special FHJ2 cable in place called for five hours' work by a professional team of riggers.

Groups like those responsible for maintaining GB3CS and GB3TW have a complete set of stand-by duplicate equipment available to replace any individual section of the repeater which develops a fault. A spare pa unit for GB3TW has been under test in the beacon GB3NEE for some weeks; running at 25W output 24 hours a day is certainly a good reliability test. The GB3TW group even has spare silver-plated filters. Like many other repeater groups the logic at GB3TW has been modified from time to time to eliminate most of the blips and bleeps. The IARU Region 1 access scheme which was fitted some time ago has proved to be most successful and is of course now in use at GB3CS and GB3MP. Roger Jones, G3YMK, and the other members of the Tyne & Wear Group committee acknowledge the help they have received from the GB3CS group in connection with the latest experiment at GB3TW involving the use of an SD306 preamplifier. The GB3CS maintenance records show that 45 separate visits have been made to the site since the repeater was installed.

From the above remarks it will be apparent that putting a repeater on the air and keeping it on the air is not a task to be undertaken without a great deal of planning and forethought. Like beacons, little is heard from the users until a breakdown occurs.

Repeater group of the month—UKFMW

The UK FM Group (Western) which is presided over by RSGB Council member Basil O'Brien, G2AMV, has increased its membership by 25 per cent during the last six months and now boasts a total of 460 members. The UKFMW Group operates four repeaters at present, GB3MP, GB3LL, GB3MR and GB3ST. Three more

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4-2-70 RSGB BEACONS

Callsign	Frequency (MHz)	QTH Locator	ERP (watts)	Antenna	Beam direction	Height asl (metres)	Keying mode
GB3SX	70·685	AL71d	16	Halo	Omni	168	F1
GB3SU	70·695	ZN61a	20	2 tilted turnstiles	Omni	440	A1/F1
GB3NEE	144·130	ZO12a	30	25-el Yagis	SE + NW	360	F1
GB3GI	144·137	XO41j	40	24-el Yagis	SE + NE alternately	191	F1
GB3VHF	144·150	AL52j	40	5-el Yagi	NW	268	F1
GB3CTC	144·915	XK64a	75	Stacked cloverleaf	Omni	122	A1/F1
GB3LER	144·965	ZU65f	65	28-el Yagis	NE + S	107	F1
GB3ANG	144·975	YQ35c	20	4-el Yagi	SSE	900	F1
GB3SUT	432·89	ZM31b	60	28-over-8 Yagis	N + SE	270	F1
GB3EM	432·910	ZN32b	50	8-over-8 Yagi	SSE	600	F1

432MHz repeaters are soon to be added to the group's roster as the Phase 2 units GB3LI, GB3CR and GB3MA come into service before the end of this year. Several other repeater projects are planned by this most active group and the number of repeaters in the care of the UKFMW will probably rise to double figures by 1978.

The largest-coverage repeater operated by the UKFMW is undoubtedly GB3MP on R6 (145·150MHz input and 145·750MHz output). This repeater is located at the Moel-y-Parc IBA transmitting site in North Wales, a place chosen by the UKFMW committee in preference to other good locations which, although eminently suitable, were often used by contest groups. Two separate antennas are used at GB3MP: the receive antenna is at 300ft asl and the transmit antenna is 100ft lower down the mast. The group estimates that more than 60dB attenuation is achieved by the height separation but a total of six cavity filters are also used to ensure there is no desensitization of the receiver. The loss on the special Aerialite 363 coaxial cable is less than 1dB /100ft; the cable is the double-sheathed type used for television relay installations. The repeater has the IARU tone access system incorporated and has a 2min time-out. GB3MP is very simple to use, with none of the high and low indicators which complicate some repeaters.

The group's other three repeaters are 432MHz units GB3MR on RB4 located at Park Moor, Cheshire; GB3LL on RB4 at Llanddulas, Clwyd, and GB3ST on RB2 from Stoke-on-Trent. GB3ST was the last repeater to be included in the Phase 1 plan and it took only eight weeks from the submission of the proposal to actually getting the repeater on the air. GB3ST is presently on a time clock and is switched off between 1.30am and 6am. This repeater is in steady use during the day and a time recorder has shown it is used during 32 per cent of the time available. Is this the busiest 432MHz repeater in the country?

The UKFMW also publishes a quarterly news sheet called appropriately *Talkthrough*, and holds regular meetings at the Legh Arms, Knutsford. Membership costs £1 annually plus a 25p joining fee, and further details can be obtained from Gordon Adams, G3LEQ, QTHR.

Activity on fm

During the month of September and at the beginning of October many fm enthusiasts found they were able to use this mode to work long distances. Keith Watkins, G8IXN, at Camborne, was able to contact lots of French and Spanish amateurs on narrow band fm from his home location in Cornwall. Nick Foot, G8MCQ and G8JQK set up a portable station at the Hardy Monument, a site 230m asl near Dorchester. Many stations in Holland, Belgium, Germany and even LX1PS could be worked easily with 15W output from an HW202 to an 8-el beam. Some of the Dutch stations could be worked on a hand-held transceiver. G8JQK changed to 432MHz to work G8LWM at Brighton, a distance of 100 miles, with just a Pye Pocketphone.

Fred Wall, G4GJW, at Tottenham in London, used 10W of fm from a Telford TC10 and a loft antenna to work GW8NAC/P at Cardiff and many Dutch PA0 and PD0 stations. These PD0 stations hold the Dutch Class D licence and are restricted to low power fm on S13, S14, S15 and S16 and are not allowed to use vfo-controlled transmitters.

A plea from G8KLV at Chippenham should be heeded by all 144MHz fm operators. He reminds users that 145·500MHz (S20) is the fm calling frequency. Please remember to QSY off the calling frequency once a QSO has been established.

Sven Webber, GM8ACC, in Stronsay, Orkney Islands, is now active on 433·170MHz fm and is looking for skeds with stations in the south. Several PA0 stations were worked from Scotland on 433·550MHz fm during the recent good conditions.

Those fm operators who are limited to 10W and an inside antenna may be given inspiration by the fact that GM8FFX was extremely surprised to hear G4DAX/A calling him from Yorkshire. Dave was using the simple equipment described above and said he was very pleased to work to Aberdeen direct. The contact, which was Q5 throughout the QSO, demonstrates that dx can be worked on 144MHz against seemingly impossible odds.

Expedition to Luxembourg

Don Field, G3XTT, left his home base of Northampton in September to visit Luxembourg during the period of the 144MHz Open Contest. Using 10W output from a Liner 2 transceiver to feed an 8-el Yagi, G3XTT worked 68 stations in nine countries including DL, DM, F, HB9, HB0, LX, ON and PA0. Although his operating time was limited to six hours he confirms working the following English stations G3YMD/P(AL76b), G8KUC (AL56j), G4BPO/P (AM67f), G4CVI/P (AMO7f), G3FZL/P (AL45e), G8EYC (ZL5Oh) and G3PMH/P in AN61f.

Don used the site near Lentzweiler in QTH locator CK80c on the recommendation of Tom Douglas, G3BA, who has used Lentzweiler for previous Luxembourg expeditions, and he would be pleased to advise on sites to anyone contemplating future LX expeditions.

Unlicensed operation on 144MHz

A recent sweep by the authorities in the Manchester area netted quite a large number of pirates who have been operating illegally on the 144MHz band on both simplex and repeater frequencies. A large amount of very expensive equipment was confiscated. One person who had regularly jammed transmissions from what he thought was a safe site on private land in Wales was also tracked down successfully.

New European meteor scatter record

Dave Price, GW4CQT, at Cwmbran in South Wales, has set a new European ms record by contacting UW6MA in QTH locator square TH during the Perseids shower. Dave now has the QSL card confirming this 3,100km contact. On the

card UW6MA mentions that he heard several bursts of Dave's cw signals which exceeded 2min. This contact is 700km farther than the year's previous best between G3ZEM and UO5BF. Dave Price, GW4CQT, has come to be very well known and respected for his ms operating ability and is to be congratulated on this latest achievement.

Tropo conditions

During the last eight weeks there have been many periods of excellent tropo conditions on all three bands. On 70MHz the 1W QRP station operated by G3ZTZ/A at Camberley in Surrey has worked as far as Leicester on ssb. G8GP in London is up to 59 counties on 70MHz and needs one more confirmed for his Senior Award. GI3TLT is on 70·150MHz cw from 1830gmt to 1845gmt and asks operators to beam to GI at these times as he is on every day. GM3WOJ, Chris Tran from Dumfries, is very active on the band and remarks on the strong signals to be heard from the London area, especially from G3OSS and G8GP.

On 144MHz the band has been full of dx, with operators like G4ASR in Cornwall being able to work 16 countries in three days; his best dx being EA, LX, HB9 and DJ1BP/P/HBO in Liechtenstein at a distance of 1,100km. GI8KIA and EI4CB were among the many stations from the west working 5-and-9 plus LA and SM stations.

The same good conditions prevailed on 432MHz, allowing LA6HL, who uses 10W from a Microwave Modules transverter, to work GM3JFG, GI8HXY, GI8KIA, GI3ZTL and EI6AS. Some of the GI and EI stations were working 432MHz dx which could not be heard elsewhere in Britain. Doubtless Jack Hum, G5UM, will be receiving lots of claims for new "firsts".

Meteor scatter + convention

Bo Nilsson, SM7FJE, the very-well-known ms operator, writes to say he has a sked with GI8JTS on 144·160MHz ssb on 3 January. If you live in GI or EI, he invites you to be on the frequency from 1900gmt and to call in, after the contact with GI8JTS has been completed. Separate skeds can be made with Bo by writing to Spangatan 7A/5TR, S21144 Malmo, Sweden. He runs high power, is located in square GQ56b, and mentions that due to ms expeditions he has been able to add WJ, XJ and XM squares and has now worked all the locators in G, GD GJ, GU and GW. SM7FJE and a group of ms enthusiasts from Sweden recently attended a ham convention in Estonia and one of the subjects under discussion by UA1DZ, UA2AAC, UB5WW and others was the possibility of the group coming over to the next vhf convention which takes place at the Winning Post Hotel, Twickenham, on 25 February. As G3SEK, G4DGU, G4DZU, G3POI, G3DAH and GW4CQT have all already indicated they are going to the Winning Post this should make for a very lively ms seminar.

Auroral reports

The aurora season is with us again with six events during a single 14-day period. For those who keep auroral calendars the events occurred on 11, 13, 19, 21, 22 and 26 September. The first event on 11 September was a weak affair which started at 1930gmt and lasted until 2230gmt. A stronger event occurred on 19 September: it started at 1600gmt and lasted on 144MHz until 1915gmt, but GB3SU on 70MHz could still be heard at Aberdeen via the aurora at 2050gmt. During this aurora many GM, GI and GW stations were able to work each other and Scandinavia.

A major event took place on 21 September and lasted from 2300gmt till 0200gmt. During this aurora the beacons GB3GI, GB3LER, GB3NEE, DL0PR, SK4MPI, SK7VHF and LA4VHF could all be copied with rough auroral notes. Bryn Llewellyn, G4DEZ, at Didcot was a very strong signal on ssb, no doubt assisted by his new Nag 144 linear amplifier. LA6HL, GI8KIA, G8HDS, G8IZS, OZ1AED, DC1XC and SM7GMX were all outstandingly strong signals on ssb. GM4CXP worked nine countries in two hours—this was his 39th aurora. During this event unsuccessful attempts were made by GM8FFX to contact DC1XC and G8JHL who could both be heard via the aurora on 432MHz.

Two further weak events occurred, one on 22 September which lasted from 1700gmt to 1900gmt, and another on 26 September which started at 2205gmt and lasted until 2300gmt. It is most interesting that Ed Tilton, W1HDQ, predicted this last aurora to the exact day, back in May at his Alexandra Palace lecture.

During all the above events, the reactivated beacon GB3LER was the first indicator of auroral conditions. GB3LER has been stronger than any other beacon and is proving to be Britain's best auroral indicator.

REAL DX 1977

70MHz	G3DAH—GM3ZBE	670km
144MHz	GW4CQT—UW6MA	3,100km
432MHz	G8AGU—OZ5GF	1,145km

The grapevine

Dave, G8JAG, and Sheila, G8KPL, say they are tired of being asked when they are taking their cw test. "Do we really need it? Technically we are as well qualified as Class A operators." Dave and Sheila are looking forward to other readers' comments but add "we are emigrating to Brazil soon"; GM8FFX will forward the expected sacks of mail . . . G8AGU reports complaints of blower noise from his 70cm linear from Bordeaux—Paul is changing it to a pair of champagne-cooled 4CX250s . . . G3JYP's Quagi has quad radiators and reflectors and normal Yagi elements . . . GM3WOJ wants skeds on 70MHz . . . Details of the Three Musketeers Award will be given next month.

Late news

G4DSC doing well in the auroral openings with 144MHz contacts to SM0DJW (IS10d), LA9DL (FT06h) and EI9Q (WM65d). A further aurora occurred on 4 October. Harold Meerza, BRS34348, and G8BKR at Bristol both report poor conditions for the October UHF Contest although Harold reports that GB3SUT and GB3EM were well above average the day after the contest. F6BQH (AK09g) and many PA0 stations were easily worked by G8BKR on 432MHz a few days before the contest. GW8OGI is the latest-issued call-sign to appear on a letter to 4-2-70, it belongs to 15-year-old Ian Wareing who is already equipped for rtty. GB3SV, the Phase 2 432MHz repeater serving the Stort Valley area, came into service on 13 October. Next month's *4-2-70* will include all 105 repeater proposals and detail their frequency, location and operational status. □

microwaves

Dain Evans, G3RPE*

Winchester round tables

First a reminder that the next round table will be held on 13 November at the IBA Engineering HQ, Crawley Court, starting at any time after 10am.

Despite inadequate publicity, for which apologies, about 30 people turned up for the round table held on 7 August. In reviewing current developments G8DEK concluded that, after looking at the output of various designs of Gunn oscillators on a spectrum analyser, the G8APP design for low-power diodes (February 1976 *Radio Communication*) was the least noisy oscillator. This is, of course, due to its basically high-Q design, and a comparable performance would be expected from similar types. Examples are shown as Figs 6, 7 and 8 in the article on p288 in the May 1974 *Radio Communication*, and Fig 2 on p668 of the September 1976 issue. Figs 7 and 8 are also reproduced as Figs 8.52 and 8.53 in the current edition of the *VHF/UHF Manual*. The low noise bandwidth means that it is possible to pick up about 10dB system gain by using an i.f. bandwidth of 10–20-kHz, as opposed to the 100–200kHz commonly used, and the practicality of this has already been demonstrated. It seems that the distinction between narrow and wide band is becoming rather blurred!

It was concluded that adopting a.m. rather than fm was hardly worthwhile: the drop in mean power with a.m. nearly balanced the gain due to the greater sensitivity of the a.m. detectors compared with fm detectors. The use of high-power oscillators was not necessarily an advantage if the i.f. bandwidth had to be increased to accommodate the greater noise bandwidth and thermal instability associated with these devices. One approach mentioned was to use either a low-power Gunn oscillator in a high-Q cavity or a crystal-controlled source to injection-lock the higher-power device. G3JVL reported that he had been able to injection-lock a 10mW Gunn oscillator by supplying a few hundred microwatts of rf simply via an OSM connector fitted to the broad face of the cavity. The centre conductor provided adequate coupling.

Another technique for improving the stability of the oscillator was to lock it on to a separate high-Q cavity. One method for doing this was to connect the oscillator to the external circuitry, including the cavity, via a phase shifter. The latter enables the effective length between the oscillator and the cavity to be adjusted. At a critical value, the oscillator will lock. A second method was to couple the cavity to the rear of the oscillator but no design details were given.

G3WDG described his method for applying afc to an oscillator. The oscillator is connected to a directional coupler (about 30–40dB) with mixer diodes fitted at both ends of the side arm. One diode is driven by a crystal-controlled source; for example, the 96MHz source used in the 10GHz marker (*Radio Communication* May 1976, p352). The second is used as a conventional mixer which produces an afc voltage via standard fm circuitry.

* 4 Upper Sales, Chaulden, Hemel Hempstead, Herts.

G3JVL showed two items of equipment which were of great interest. The crystal-controlled receiver that he is developing consists of a single length of waveguide 16 approximately 10in long fitted to a standard 4 by 3 by 2in diecast box. Starting at the antenna input there is a 60MHz-wide bandpass filter at signal frequency which feeds into the mixer diode, and this is followed by a 20MHz-wide local oscillator filter, a varactor multiplier and an adjustable rf short. The construction of the filters was given in the October 1977 issue. The local oscillator chain consists of an overtone crystal oscillator on about 160MHz and a tripler which generates about 500mW at 480MHz. This feeds the varactor multiplier via a pcb filter.

The second item of equipment was a portable high-power (4W) transmitter. This used a Litton 3957 twt with a small driver, the psu for which runs off a 12V accumulator and is contained in a 7 by 4½ by 3in diecast box. The whole transmitter could be picked up with one finger—this came as a surprise to the writer who expects to see a half-rackful of psu weighing a hundredweight.

To generate the 2,150V at 30mA stabilized supply required from 12V, the dc is fed to a 100W inverter which produces 40V ac. This feeds a heater transformer to produce the 6·3V floating heater supply, and also feeds the ht transformer. The ht is stabilized by dropping most of the 2kV through a long string of zener diodes and using the difference to control the 40V ac input to the ht transformer. He has produced a similar psu generating about 3kV at 6mA to power an E3084 twt which is another attractive device for amateur use.

G8DEK reported that tests using high-power equipment of this sort still continue to produce good results over obstructed paths 100km in length. The troposcatter mode employed involves a loss of about 80–90dB above the free-space value, but fortunately dishes of about 1m diameter seem ideal. An interesting observation is that better results seem to be achieved under windy conditions. This should make this mode particularly attractive for use in contests.

Finally, a large number of contacts over what are normally non-optical paths are being reported, and these clearly are the results of "openings". In spotting these, beacons are invaluable of course, and the more there are the better. Alternatively, it was suggested that pairs of stations set themselves up on a semi-permanent basis from their homes so that tests could easily be done on demand on a very much more extended time basis than possible with portable operation, and with the advantage that a higher-gain antenna can be used than that on a beacon.

Travelling wave tube amplifiers

It is becoming increasingly clear that travelling wave tube amplifiers are of particular value to amateurs as a means of developing reasonable amounts of power at the higher microwave frequencies. Their main attraction is that they have a gain of typically 40dB, which means in practice that there should be few problems in generating "clean" drive at the power level required—of the order of a milliwatt. Although the power supplies necessary tend to be a little difficult, it seems that once again we may have been over-estimating the problems involved.

The Microwave Sub-committee is trying to compile a list of suitable types and sources of supply. Any help would be appreciated. □

the month on the air

John Allaway, G3FKM*

News from overseas

G3VME left the UK on 21 October for a three-year tour of duty in Liberia. He hopes to be on the air with an EL call by the time this is being read.

Roland Hewett, 9H5F, the only remaining British serviceman licensed in Malta, left the island on 5 October, thus denoting the end of an era on the island. There is now no one to continue to use the 9H5 prefix. Roland's UK call is GM3XLU.

G3XGY, ex-operator of VS9MB between April 1969 and April 1970, still has his own logs for contacts made between those dates. QSLs should be sent direct (with postage or IRCs) to B. A. Harris, 4 Flamingo Crescent, Worle, Weston-super-Mare, Avon, BS22 8XH.

Naoki Akiyama, JH1VRQ, external secretary of JARL, asks readers not to give up hope of obtaining a QSL from AC3PT. On 12 September he received a QSL for his contact made on 31 August 1974 and it appeared to come in response to his fourth (and registered!) request posted on 30 August. AC3PT appears to be having some difficulties but Nao suggests writing to P. T. Namgyal, The Palace, Gangtok, Sikkim, India, enclosing sae and IRCs.

DX news

Region 1 News lists known and active Turkish stations and also their QSL route. The information comes from Halit Yetkin, TA1HY, TRAC QSL manager, who points out that cards for other TA calls not mentioned cannot be forwarded. Stations in European Turkey (with QSL details in brackets) are as follows: TA0A-TRAC HQ station (TRAC), TA1AM (K4EPI), TA1AV, TA1BAJ, TA1BE, TA1DS (all via TRAC), TA1HY (TRAC or W5QPX), TA1IB (TA1HY), TA1KT (K4IEX), TA1MB (DK3GL), TA1NC (DJ0UJ), TA1QR (DJ0UJ), TA1RT (K4EPI), TA1RO, T1ASK, TA1TS, TA1UA, TA1VG (all via TRAC), and TA1ZB (TRAC/W5QPX). In Asiatic Turkey are TA2BK (TRAC), TA2ETV (club station of the ITI Academy of Eskisehir) (TRAC), TA2MM (DJ0RR), TA2QR (ex-TA1QR) (DJ0UJ), TA2SA (DJ0ZG/TRAC), TA2SC (WA3HUP/TRAC), TA2VG (ex-TA1VG) (TRAC), and TA2ZB (DJ9ZB). TA2AE closed down in 1973 and TA2EA in 1972 but cards may still be sent via TRAC whose address is PO Box 699, Karakoy/Istanbul, Turkey.

Louis Varney, G5RV, set sail early in October for South America. The M/S *Romney* was scheduled to call at Santos, Brazil, for a few days, and to arrive at Montevideo by the beginning of November. Louis has taken his TS520 (and G5RV aerial!) and will be active on all bands 3·5 to 28MHz with his CX5RV call until April or May 1978. He will be looking especially for UK contacts. Visits to Bolivia and Paraguay are planned for March and operation as a guest operator is hoped for.

It would appear that the "A51RG" who appeared on the bands during August was a pirate. However, A51PN has been active again on ssb and cw on both 14 and 21MHz (favouring 21MHz cw) especially at weekends. He also checks into the SEANET on 14,320kHz at 1200. 8Q7AD is a Japanese amateur who is in the Maldive Is for a three-months stay. He has an FT101, FL2100 and a beam for 14 and 21MHz, and has been heard on 14,150kHz between 1200 and 1500.

According to *West Coast DX Bulletin* VE3FXT has plans to operate from a possible new country. This is Bophuthatswana—located south of Botswana and NW of Pretoria. It is to be another "homeland" in South Africa and the change will take place on 6 December. The new territory will have its own stamps and flag. VE3FXT will be with ZS6DN and will use a rhombic aerial and operate for at least 10 days.

HU0YS celebrated the 156th anniversary of independence in El Salvador. 8J1HAM was a special Japanese station, and CF1ISH was active from an international fishing exhibition in VE1. 9G0ARS was a special call used by the Ghana ARS, and YT0IARU came from the site of the recent Yugoslav conference at Skopje.

Andrew Pomfret, G3LZZ, is in Gambia and using the callsign C5AAP. 9V1SO has left Singapore and may now be found as G3XGY. VS5DB has returned to England and is G3UPT.

Readers interested in making contact with S American stations on 3·5MHz might look for ZP5AO who is to be found between 0200 and 0500 in the vicinity of 3,770-3,785kHz especially looking for Europeans. He often has others with him such as LU2AFH and VP8LP.

QSLs for those who contacted WG1JFK last year have now started to arrive. G3SZG reports that most direct cards have been despatched, and that the remainder are being sent out via the bureaux early in October.

Dxpeditions

N4WW/K4YFQ and K1MM/WA1JKJ are due to leave Chile on 17 November en route for Juan Fernandez Is. They hope to operate as N4WW/CE0Z for seven days between 20 and 30 November. Frequencies to be used are given as (ssb) 3,770, 3,795, 7,095, 14,195, 21,295, 21,350 and 28,595kHz, and (cw) 1,825, 3,505/3,525, 7,005/7,025, 14,025, 21,025 and 28,025kHz.

West Coast DX Bulletin mentions that GM3WBB and his wife are on an overland tour through Europe, Asia and Africa. They hope to go through to China, Hong Kong, India, Singapore and the Maldive Is, and then to Africa. They will be keeping schedules on 14,160kHz at 1500 and on 21,318kHz at 1700 most days.

5W1AT's visit to the Tokelau Is, planned for July/August, did not take place. However, the next boat goes late in November and ZM7AT may appear on the air at that time.

The Channel Contest Group, G4DAA, will be in Guernsey for the cw section of the CQ WW DX contest (at the end of November). The operators of GU4DAA will be G3FXB, G3MXJ, G4BUE and G4EHF, and each may operate using his own callsign on ssb for a few days before and after the contest weekend.

G3VZT and G3XVY will be in Montserrat for one week before and one after the weekend mentioned in the previous

* 10 Knightlow Road Birmingham B17 8QB.

Geoff Watts (see text)

Angela Hornagold, G4CKQ, operating GB2SM at the Science Museum. She is one of a regular team of people which, on Sunday afternoons, demonstrates various aspects of radio communication to visitors

Photo: G3YCQ

paragraph, using the callsign VP2MAD. They will be active on all bands 1·8 to 28MHz, and especially during the contest. Please QSL via the bureau or to the address in "QTH Corner" with sae and return postage.

A group of American amateurs—K2KA, K4SMX, WB4URC, W2PAU and WA5EHA—will operate from Navassa Is during the contest. The operation should start on 23 November and last until 30 November.

Welcome

The following overseas amateurs joined the Society during September: EI6AS, K2UR, N5NM, OZ1LO, SM6FZJ, SM0EKG, UR2BU, VE6ANO, VP9IJ, VS6HT, W6BVM, W6HPH, 5B4CF and 9H1AG.

Iceland and Faeroes Is

GM3YOR and GM3OLK are preparing an expedition to these two areas during July and August 1978. It is intended to operate on all bands 1·8MHz to 432MHz, and anyone interested in assisting in the venture is asked to contact GM3YOR (A. B. Givens, 41 Veronica Crescent, Kirkcaldy, Fife) for further details.

CQ DX Hall of Fame

Readers of *MOTA* will be as delighted as your scribe to hear that this year this award has been made to Geoff Watts. Geoff, BRS3129, first became interested in radio in 1935 and at that time used a home-built three-valve receiver and wire aerial. After the war he graduated to a Hallicrafters Super Sky Rider, a Sky Champion, and then an Eddystone 640 with (later) a Geloso converter. He now uses an HQ170A and his aerials consist of a G5RV and a TA31Jr beam. Geoff probably holds a world record for a listener of having all DXCC countries confirmed, with the exception of Clipperton Is. He is the only listener to hold the Amateur Achievement Award, and now also the only listener to have been awarded the CQ DX Hall of Fame Award which has previously been awarded to transmitting amateurs of international fame such as Gus Browning and Iris and Lloyd Colvin. This is a measure of the value to dxers of Geoff's services, and also of *DX News Sheet* which he has been producing for the past 16 years.

Contests

Attention is drawn to three new points applying to the **1977 CQ WW DX Contest.** Please note that single-operator stations are now defined as those in which one person does all the operating, logging and spotting—outside assistance places the entry in the multi-operator class. All entrants with more than 200 contacts on any band *must* now include a "dupe" sheet with their entry (and those with less are invited to do so also). For each duplicate contact removed from a log by the contest committee a penalty of three additional points will be exacted.

The All Austria Contest

1900 19 November to 0600 20 November.

1·8MHz band and cw only. Exchange RST and QSO number (from 001)—the exchange must be confirmed by repeating the code. Each contact counts one point, and the multiplier is two for each Austrian Bundesland (ie OE1-OE9), and one for each other prefix worked. Listeners may enter and should log date, time, frequency, call of station, and given and received numbers. A station may only be logged for three consecutive contacts, after which it may only be logged again after another five entries. A declaration that the station was operated in strict accordance with the contest rules and local licensing regulations should be enclosed with the log which should be posted before 15 December to: Klaus Tiede, OE5TKL, Postfach 28, A-5230 Mattighofen, Austria. Top scores from each country will receive a certificate.

The Hungarian DX Contest

1600 10 December to 1600 11 December

3·5 to 28MHz. Single-operator, single- or multi-band, multi-operator multi-band. CW only. Call "Test HA". Exchange

QTH Corner

C31OH	DK8EV, D Schneider, Bergstr 66, D-4060 Viersen 12, W Germany.
C31OJ/M	DK4AP, R. Dvorak, Stiegel 5, D-3400 Goettingen, W Germany.
C31OZ	DC6RJ, J. Winkler, Ludwig-Thomastr 19, D-8440 Straubling, W Germany.
C5AAC	PO Box 227, Banjul, Gambia.
C5AAP	A. M. Pomfret, c/o British High Commission, PO Box 507, Banjul, Gambia.
CX5RV	L. Varney, c/o Sra A de Prando, Canelones 2203 Apt 1, Montevideo, Uruguay.
EP2IA	via W4YE, L. W. Smith Jr, 5441 Summit St, Centreville, Va, 22020, USA.
GU4DAA	G3FXB, A. J. Slater, "Wychwood", Park Lane, Maplehurst, Horsham, Sussex (or via G3DRN).
HS9FK	Ismail Bin Abdul Razak, 9M2FK, 281-C Jalan Pekelilling, Bukit Glugor, Penang, Malaysia.
J28AG	Radio Club GET, SP 85014, Djibouti, Rep of Djibouti.
J28AJ	G. Lecocq, BP 215, Djibouti, Rep of Djibouti.
J28AK	G. Havouis, SP 85031, Djibouti, Rep of Djibouti.
J28AQ	Radio Club RIAOM, SP 85010, Djibouti, Rep of Djibouti.
J28AQ	G. Rouault, SP 85014, SP 85014, Djibouti, Rep of Djibouti.
J28AR	R. Olivier, SP 85032, Obock, Rep of Djibouti.
SM0AGD/S2	via SM3CXS, J. Svensson, Berghemsv 11, S-86021 Sundsbruk, Sweden.
S79S	W6SP,
S88TH	Ted Henry, Box 64398, Los Angeles, Cal, 90064, USA.
ex-VQ8CB	E. Mazery, F6BHY, G-5 Valmante, 19 Av de Lattre de Tassigny, F-13009, Marseille, France.
KH6JJD/VQ9	T. F. Rogers Jr, 5193 Iroquois Av, Ewa Beach, Hawaii, 96706, USA.
VP2MAD	via G3VZT, R. K. Johnston, Church Farm, Wickmere, Norwich, Norfolk.
VR4BC	PO Box 225, Honiara, Solomon Is.
VS5MM	via VS6BY, P. T. Walker, c/o PO Box 541, Hong Kong.
8J1HAM	JARL QSL Bureau, PO Box 377, Tokyo, Japan.
8Q7AD	via JA1UMN, H. Sato, 837-4131 Seyamachi, Seyaku, Yokohama 246, Japan.
9N1AR	via G3PTO, J. A. Reynolds, 24 Shaldon Rd, Horfield, Bristol, BS7 9NW.
ex-9V1SO	B. A. Harris, G3XGY, 4 Flamingo Cresc, Worle, Weston-super-Mare, Avon.
ex-5Z4LW	O. Hope, LA2UA, Madlamarkveien 121, 4042 Hafrsfjord, Norway.
3B8BJ	via H. Wiehe, Rue General Hall, Les Gasernes, Curepipe, Mauritius.

RST plus QSO number (from 001). HA stations will also send a two-letter code indicating their location as follows: BA, BP, CS, FE, GY, HA, HE, KO, NO, PE, SA, SO, SZ, TO, VA, VE, ZA. Each contact with HA counts one point, and a station may be worked on each band for credit. Multipliers are the Hungarian "counties" contacted on each band added together. Logs should be in the usual form and should be accompanied by a signed declaration and summary sheet. They should be posted before 22 January 1978 to: Radio Amateur League of Budapest, H-1553 Budapest, PO Box 2, Hungary.

In the **1976 All Asian DX Contest** (CW section) **G3ESF** scored 8,835 points in the multi-band section. **GM3CFS** 8,150, and G6NK 384. On 14MHz UK entrants were **G4BUE** (13,583), G3TXF (11,711), G3PVA (4,978), G6GH (336), and G4FAM (288).

TOPS CW Contest

1800 3 December to 1800 4 December.

Call CQ QMF. 3·5 to 3·6MHz only—use low end for dx working. Single- or multi-operator sections. Contacts with own country count one point, with other stations in same continent two points, and elsewhere five points. Contacts with GW8WJ and GW6AJ count 25 points each. Total score is total points multiplied by the number of prefixes worked. Exchange RST plus serial number (from 001). Logs should be sent to reach Peter Lumb, G3IRM, 14 Linton Gardens, Bury St Edmunds, Suffolk, IP33 2DZ, no later than 31 January 1978. In the 1976 event there were 214 single-operator and 33 multi-operator entries—only nine of these being from UK participants. Congratulations to **G4BUE** on winning the contest single-operator section with 162,023 points.

Results of the **1976 CQ WW Contests** have now appeared in *CQ*. Unfortunately no prior information was received so earlier publication in *MOTA* was not possible. They are as follows:

CW SECTION—SINGLE-OPERATOR

Callsign	Band	Points	Callsign	Band	Points	Callsign	Band	Points
GD5AGA	All	192,975	G3MWZ	All	10,990	**G3GRL**	7MHz	114,456
G3DYY	,,	184,800	G3ILO	,,	13,082	G3XKR	,,	39,072
GI3JEX	,,	160,461	G6NK	,,	8,512	G3HTA	,,	35,360
GM3MZV	,,	144,007	**G3RZI**	21MHz	100,674	G3TVW	,,	31,752
G4EHF	,,	129,624	G4CNY	,,	67,396	G4DBW	,,	648
G3YBH	,,	121,344	G3DOG	,,	6,840	**GM3CFS**	3·5MHz	86,022
G3XBN	,,	82,320	**G3HCT**	14MHz	286,552	**G3HZL**	,,	20,678
G2AJB	,,	66,740	**G3KDB**	,,	238,875	G4BBA	,,	6,072
GW3MPB	,,	62,926	G3TXF	,,	183,872	**G3UBR**	1·8MHz	11,376
G8DI	,,	46,330	G3PVA	,,	73,834	G3YMC	,,	3,575
			GM3KLA	,,	25,140			

CW SECTION – MULTI-OPERATOR, SINGLE TRANSMITTER

GC4DAA	2,300,942	G3GIL	274,239	**GM3ZRC**	65,720
G3VPW	502,495	G3KMI	154,128		

Certificate winners are listed in bold type. Congratulations to **GC4DAA** who were world fifth in their category, and also to **G3UBR** who was world fifth on 1·8MHz.

PHONE SECTION—SINGLE-OPERATOR

Callsign	Band	Points	Callsign	Band	Points	Callsign	Band	Points
GD5BTU	All	1,061,228	**GW3GHC**	28MHz	9,460	G3VOF	14MHz	42,009
G3YBH	,,	201,300	**G4BUE**	,,	9,126	**GM3BCL**	,,	41,738
G4EHF	,,	82,401	**G4CNY**	21MHz	261,887	G4CVZ	,,	38,934
GW3SLA	,,	74,947	G3ZQW	,,	62,964	G3IRM/M	,,	1,375
G4ETK	,,	53,238	G3XBN	,,	21,508	**G3XKR**	7MHz	33,649
G8DI	,,	46,330	G4CHP	,,	16,434	**G3TIW**	3·5MHz	82,082
G2AJB	,,	31,320	**GW3MPB**	,,	9,151	G3NLY	,,	70,656
G3MWZ	,,	25,020	**G3FXB**	14MHz	672,462	G3UKS	,,	16,000
G3MSB	,,	20,352	G3MXJ	,,	440,132	**GC3YIZ**	,,	6,802
G4ERD	,,	14,388	G4DJC	,,	245,484	**G3UBR**	1·8MHz	2,976
G4DBW	,,	5,720	G3TXF	,,	68,997	G4BXT	,,	1,159
			G4DKT	14MHz	68,820	G3MYC	,,	952

PHONE SECTION – MULTI-OPERATOR, SINGLE-TRANSMITTER

G3LNS	2,270,032	G8JC	649,128	GW4FCG	174,303
GW4ENT	1,337,700	G3FVA	302,706	**GM3ZRC**	82,502
G3RCV	766,656	G2ASF	176,958	G3UNU	87,492

G3UBR was world sixth on 1·8MHz. It is interesting to note that some 50 operators took part in the nine multi-operator single-transmitter entries listed.

Band reports

Conditions on the hf bands have improved beyond recognition during the past month. According to the *West Coast DX Bulletin* WWV's forecasts during September gave solar flux indices ranging from 82 up to 119, and associated AP indices rising up to 42. Cycle 21 showed only a six count increase in the 12-month running sunspot numbers in the first year—March 1976 to March 1977—and this is less than average. This is not a good omen for a very high peak to the cycle.

Many thanks to the following contributors to *MOTA*: G2DHV, G2HKU, G5JL, GM3LYY, G3UOL, G4DSE, G4EAN, G4EHQ, G4EZT, GI4GDV, BRSs 17567, 31301, 35608 and 38709, and A8961.

Stations listed in italics were using cw, the others ssb.

3·5MHz. 0100 LX0RL, VP2LDD, VP2MJE (QSL to W6EL). **0200** VP2LDB, 8P6AH (QSL to WA4WTG). **0300** HI, HP, JY4MB (QSL to DJ9ZB), YV. **0400** HH2MC, KP4EBH. **0500** W4/, 5/, 8/, 0, 9Y4NP. **0600** KH6ZZ, ZL. **2300** JY3ZH.

7MHz. 0100 *VP2VL, W7NCO*. **0300** 9K2DR. **0500** CP6CY, *EL2ET*, HK, *KH6AT, PY1ZA, JA8UI/PZ* (QSL to JA8AHA), *W6/, 7,* ZL. **0600** EA9FD, *HC2SL, VP9ID/P*, VK, *W6/, 7, ZL*. **0700** *CT2BZ* (QSL to WA4FVT), VK, *W6/7*, ZL. **0800** W6/7.

14MHz. 0000 FY7AW. **0600** FK8AI, AU, AY, KAA, JA, ZL. **0700** CE0AE, FO8EU, *FO8ET*, KC4AAA, *VR4BT*, ZK1DR, 3D2DM. **0800** FK8CK, *FW8AX*, HD8CD, KL7, KX6BQ, VK, ZL. **0900** 3D2GA (c/o Qantas Airways, Nadi). **1100** P29DS, ZL. **1200** BV2B, 9V1TF. **1300** FK8AX, HM0U, JA, VR4DX, 4S7DA. **1400** *JT1AX*, P29JS, VE8, W7, YB7AAA. **1500** WB5SGZ/DU2 (QSL to K3GBZ), HL9TG, KC6BS,

KG6SW (QSL to W7YBX). **1600** AP5HQ, S79S, VU2KVI, W6/7. **1700** CR9AJ, KH6BB, *TA1HIA*, 8Q7AD, 9M6VW. **1800** C9MDB, EA7VU/EA9 (QSL to W6UOU), HS1WR. **1900** C5AU, C6AEY, *FP8AA*, ZD7PV. **2000** VP9IR. **2100** HD8CD, HU0YS, TR8LE, VP8PE. **2200** A4XGX, VP2SAA. **2300** SU1CR, XE.

21MHz. **0800** C5AAU, JA, W7JXE/SU, ZL. **0900** JA, KG6DX, P29JS, S88TH, ZL. **1000** JA, *KG6JIH*, *SU1IM*, *VK8GG*, *W1*. **1100** *VR4BT*, VR4DN. **1200** VP2MJE, 9M2BY. **1300** A9XCD, *VK*, ZS2MI. **1400** CR9AJ, *J28AY*, JA, *VU*, W1-W5, W8-W0, 9V1SP. **1500** KH6JJD/VQ9. **1600** *LU*, *PZ*, *YV*, 7P8AC. **1700** HZ1AB, S79DF, 5N2NAS, 5Z4NI. **1800** *HI*, VP8NY, *ZS*, 9G0ARS. **1900** HH2MC (QSL to WA4AKU), *VP8PL* (QSL to G3LIK), VP8PP, W6/7, 5H3KS, *5T5ZR*, 9L1SE. **2000** W6/W7, 9Y4. **2100** CE, CX, *FG*, HK, *LU*, TG, VK2JO, VP2AZB. **2200** K5CO/5A.

28MHz. Europeans on many occasions. **0800** JA, P29JS. **0900** 4Z4EO. **1100** ZS. **1300** 5T5ZR. **1400** A4XGY, JY3ZH, ZP, ZS. **1500** TU2GM. **1600** EL, LU, PY, TR8JCV, WA1AKS, W3HCW, ZD7SD, ZE, ZP, ZS, 6W8FA, 8P6AH. **1700** CE8CH, EA8OZ, EL2AH, LU, PY, VP8HZ. **1800** CX, LU, PY, PZ5AA. **2100** LU, PY, TU2FH, WB2RRR.

It is clear that this band is open quite frequently when there are no signals to be heard! Calling "CQ" may well produce interesting results.

Many thanks to the authors of the following for items obtained from their publications: the *West Coast DX Bulletin* (**WA6AUD**), *DX'press* (*PA0TO*), *CQ Magazine* (**W1WY**), the *Ex-G Radio Club Magazine* (**W3HQO**), *DX News Sheet* (**Geoff Watts**), *RSZ Newsletter* (**9J2KL**), and *Long Skip* (**VE1AL/3**).

Please send all items for **December** issue **to reach G3FKM** no later than **5 November,** and for **January** by **5 December.** □

HF PROPAGATION STUDY

Predicted HPFs (MHz × 10) for November 1977

GMT =	00	02	04	06	08	10	12	14	16	18	20	22	24
Aden	155	150	139	261	356	376	373	362	272	190	167	159	155
Ascension	173	164	161	138	317	369	369	364	347	274	201	183	173
Bahrain	147	143	140	260	359	378	368	247	229	177	153	149	147
Bangkok	129	124	124	234	329	355	329	285	200	136	128	128	129
Barbados	157	134	140	133	139	255	352	352	346	309	204	162	157
Bermuda	133	121	120	121	120	183	315	343	338	303	199	154	133
Bogota	145	128	133	133	130	168	345	354	348	309	204	161	145
Buenos Aires	167	154	155	140	214	307	340	360	347	300	204	174	167
Cape Town	167	161	159	172	318	374	368	360	343	229	194	181	167
Colombo	131	138	140	263	355	375	362	327	232	168	145	144	131
Cyprus	138	134	130	215	327	355	351	335	248	166	147	139	138
Dakar	173	164	161	138	317	369	370	364	347	274	201	183	173
Denver	125	122	119	121	120	116	125	230	299	248	171	138	125
Fairbanks	147	141	135	128	135	145	145	150	157	169	141	140	147
Falklands	168	157	158	140	253	288	315	345	347	291	202	177	168
Gibraltar	101	96	96	87	187	244	246	243	230	159	119	105	101
Hongkong	114	114	114	202	299	284	214	181	166	126	114	114	114
Honolulu	141	136	129	128	131	144	129	126	122	188	144	135	141
Iceland	87	87	88	87	98	190	221	219	195	140	102	88	87
Jamaica	133	120	122	124	121	153	324	343	340	300	196	154	133
Lagos	173	166	158	133	342	371	370	364	346	243	199	182	173
Las Palmas	147	136	138	124	241	328	336	331	315	243	176	153	147
Lima	159	141	147	136	152	205	357	356	348	309	205	166	159
Los Angeles	135	126	126	121	120	120	117	174	285	232	167	140	135
Malta	116	112	110	119	256	295	291	284	243	152	131	117	116
Mauritius	161	155	149	253	350	369	369	361	295	195	174	167	161
Mexico	126	116	115	119	115	143	176	318	321	275	187	141	126
Moscow	98	96	96	125	235	282	282	255	195	117	105	96	98
Nairobi	163	157	141	242	352	371	369	364	326	204	181	168	163
New Delhi	135	131	133	260	345	361	309	227	183	147	138	138	135
New York	125	121	120	124	120	126	247	318	322	280	188	144	125
Osaka	125	124	120	138	242	186	154	139	139	130	119	120	125
Perth	141	136	139	263	355	347	319	277	229	166	145	143	141
Rio de Janeiro	169	158	158	140	235	348	370	360	347	295	202	177	169
Salisbury	168	162	149	223	337	374	370	362	342	213	188	176	168
Seychelles	157	152	149	258	342	361	368	360	280	194	173	161	157
Singapore	135	131	133	260	345	364	346	299	208	147	138	138	135
Suva (a)	147	136	129	126	166	232	265	246	174	148	135	138	147
Suva (l)	177	166	159	129	266	253	234	219	177	228	200	186	177
Sydney (s)	114	114	114	202	299	307	280	256	176	126	114	114	114
Sydney (l)	161	144	148	136	167	216	183	166	152	173	204	167	161
Teheran	141	138	140	263	355	375	360	321	220	167	145	144	141
Vancouver	140	141	133	128	126	133	130	143	197	192	150	139	140
Wellington (s)	133	126	122	126	225	284	270	242	162	135	120	129	133
Wellington (l)	171	157	161	143	214	181	168	158	164	191	202	182	171

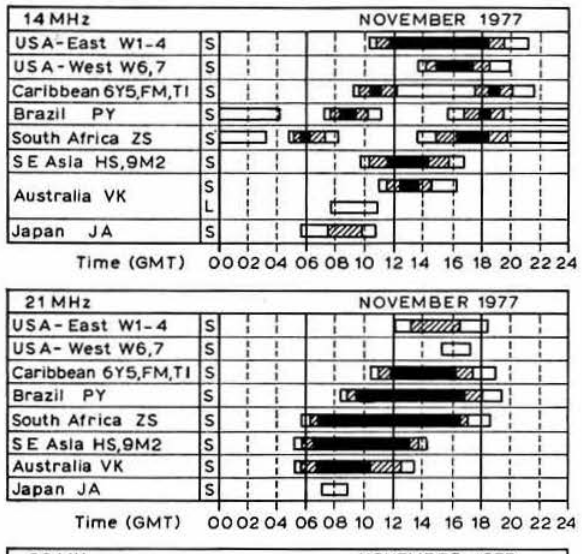
For information on the use of this table, see page 284, *Radio Communication* April 1976. Please send reports to Mr J. Spurling, G4AQI, 15 Tibbs Hill Road, Abbots Langley, Watford, Herts WD5 0EE.

Propagation predictions

The highest level of F2 MUFs will continue during November and conditions will be good on **28** and **21MHz.** The approaching winter season means shorter days so that the higher frequency bands will close early. Rising solar activity should lead to frequent opening of **28MHz,** as is shown in more detail in the graph. There will be some chance of working North America on **21MHz,** but Japan will only be heard under exceptional circumstances; this band will close for dx after about 1900gmt.

The **14MHz** band will probably close for dx between 1930 and 2100gmt (a little later at the beginning of the month). In exceptional conditions this band may remain open longer, especially with South America and Africa. Seasonal conditions will favour traffic via the indirect path, especially with South America and east Asia before noon and western North America during the afternoon. On favourable days traffic with KH6 will be possible between 1630 and 1730gmt via the direct path.

As 14MHz closes early, **7MHz** will become more important for dx after 2000gmt. The seasonal decline in static on both **7** and **3·5MHz** permits dx traffic on these bands when the greater part of the path lies in darkness; this is more important for 3·5 than 7MHz. During the latter half of the night **3·5MHz** will be interrupted repeatedly by the dead zone.



The provisional sunspot number for September 1977 from the Swiss Federal Observatory was 44·1, with a high level of solar activity during the second half of the month. The predicted smoothed numbers continue to climb rapidly and the forecasts for January, February and March 1978 are 40, 42 and 44 respectively.

Election of 1978 RSGB Council

Ballot forms for this election are being distributed to members of the Society with this issue of *Radio Communication*. Only corporate members are allowed to vote.

PERSONAL DETAILS OF THE CANDIDATES

E. J. Allaway, MB, ChB, MRCS, LRCP, G3FKM
Licensed since 1949. Council member since 1970, President 1976. Member of President's Working Party, IARU Working Group, Telecommunications Liaison and HF Contests committees, and chairman of Finance & Staff Committee. Regular contributor to *Radio Communication* and other Society publications. Chief interest: the preservation and extension of the amateur radio service's facilities at WARC 1979. Operates mainly on hf bands. Profession: doctor.

R. Bellerby, BSc (Met), Grad Cert Ed, FBIS, G3ZYE (ex-G8DTO)
Member of the RSGB since 1965. Member of the Royal Naval ARS and the Royal Signals ARS. Past-secretary of the Thornton Cleveleys ARS and Mid-Sussex ARS. Editor, *Mid-Sussex Matters*! Member, Brighton & DRS. RAE class instructor. Active all bands, particularly interested in 1·8MHz dx. Wide-ranging interest in RSGB affairs. Occupation: principal, college of further education.

A. M. Cameron, BSc (Hons), GM3OGJ
SWL since 1954. Member of RSGB since 1958. Licensed in 1960. Past chairman and treasurer of Falkirk & D RSGB Group. Area representative for Central Region since 1975. Currently active on all bands between 3·5 and 432MHz with particular interest in mobile and amateur satellite aspects of antenna design and use. Conducting long-term propagation tests on 144MHz in relation to observable weather phenomena. Interested in making amateur radio known to young people and promoting RSGB membership among all amateurs and SWLs. Profession: Systems engineer with IBM.

T. P. Douglas, MBE, AMIEE, G3BA
Licensed as 2CNI in 1936: full licence as GM3BA in 1937. Member of RSGB since 1936; chairman, VHF Committee since 1976. Founder member of FOC 1938. County representative, Northamptonshire, 1947. President, Midland ARS, 1955. GB2RS newsreader since 1963 on vhf. Raynet mobile column controller, Sutton Coldfield and East Group. Beaconkeeper for GB3SUT since its inception in 1972. Retired from BBC this year after 39 years' service, including 21 years as senior transmitter manager, Sutton Coldfield.

R. W. Fisher, G3PWJ
Member of RSGB since 1956. Licensed 1961. Regional representative for Region 3 1966-73. Council member, Zone B, 1973-7. Past member of Membership & Representation Committee. GB2RS 144MHz newsreader since 1973. Particular interests: vhf and repeaters. Member of Worcester & DARC, Raynet, and of GB3MH/MS Repeater Group. Profession: electronics service engineer.

G. I. Knight, GM8FFX
Age 34. Joined the RSGB as an associate member in 1957. Currently contributor of "4-2-70" in *Radio Communication*. Member of the VHF Committee. With GM3ZBE recently installed the GB3LER beacon at Shetland, and has given site permission for his home to be used as the location for new 10GHz beacon GB3CMS. Council member of the Radio Electrical and Television Retailers Association.

D. M. J. P. Manley, PhD, BSc, CEng, FInstP, MIEE, CDipAF, G3OWF
Treasurer, UK (Southern) FM Group. Founder and chairman, Farnborough ARS (Tech College), 1961. Founder and controller, sometime Kennet and Lodden Raynet Group. Group controller, Guildford Raynet. Age 44. Tutor in physics, electronics, mathematics and for the RAE.

D. M. Pratt, BTech, CEng, MIEE, MIERE, G3KEP
Member of the Society since 1952; Council member since 1975. Member of RSGB Education Committee since 1966 and chairman of the committee since January 1972. Former lecturer for the RAE at Bradford College; member of City and Guilds working party for the RAE. Co-ordinator of the Amateur Radio Observation Service which he developed as a member of the Telecommunications Liaison Committee in 1977. Active on all bands 1·8 to 144MHz. Particularly interested in home construction and in amateur radio training and recruitment. Has had several articles published in radio journals. Age 38. Profession: Engineering training consultant.

D. Smith, G4DAX
SWL since 1953, licensed 1973. Active 3·5-432MHz. Retiring Region 19 representative on employment move to Yorkshire. Past-secretary, UK FM Group (London). Immediate past-chairman, GB3HR Repeater Engineering Group (SW Herts UHF Group). Member, Torbay and Verulam AR clubs, and Tyne & Wear Repeater Group. Age 37. Profession: technical officer, Civil Service.

obituaries

The Society records with regret the deaths of:

Mr H. Bailey, G2UF
Harold Bailey died on 15 August, aged 88. He was first licensed in 1920 and represented the RSGB at the Paris Congress of 1924. He was an early experimenter in television, and in later years was active with the Manchester Raynet group. He was a member of RAOTA and an honorary member of several USA clubs.

Mr G. Billison, G6GB
"Gerry" Billison died on 27 September. He had been a member of the Society and the Thames Valley ARTS for about 40 years. An active cw operator in his earlier days, he kept up his contacts until the last.

Mr R. Bland, G8FGW
Dick Bland died on 18 September, aged 55. He was an early and popular member of the Shefford & DRS and active on 144MHz.

Mr K. N. Cady, G3GHR
G3GHR, who died recently, had been an amateur since the 'thirties. He served in the Royal Signals until 1948 and was a life member of the Signals Association.

Mr L. C. Carter, G3ILC
Les Carter died on 26 September, aged 65. He was a keen cw operator and took part in many contests. He was an active member of the Kingston & DARS, and a member and one-time secretary of the railwaymen's radio society FIRAC.

Mrs S. Margolis
Sylvia Margolis, widow of Maurice, G3NMR, and mother of Laurie, G3UML, and Johnnie, died on 23 September, aged 50. She was introduced to amateur radio in 1958 when G3NMR became licensed, and together they produced the newsletter of the Amateur Radio Mobile Society, later to become *Mobile News*. From 1967 to 1969 she was honorary public relations officer of the RSGB, and later became even better known as a regular broadcaster on BBC national and local radio.

Mr R. J. Thomas, G3KMT
Ronald Thomas died on 14 September. He was president of the Southend & DRS, senior lecturer at Southend Technical College, and active in Scouting and the ATC.

Mr R. Sharpe, G3AWY
Robert Sharpe died on 16 September. He was a member of the Royal Naval ARS and active in Raynet. Just prior to his death he had been appointed Raynet controller for Portsmouth. He was active on all bands.

We have also been advised of the deaths of:
Mr R. A. Bartlett, G6RB, in January;
Mr S. K. Bennellick, G3WPN;
Mr H. J. Green, G3VZS, on 9 August;
Mr W. J. Hoffman, G3YUG;
Mr S. T. Palmer, G8HHU;
Mr S. Smith, G2CKF;
Mr J. Threlfall, G2DKG, aged 76, in August.

your opinion

"YOUR OPINION"—EDITORIAL POLICY

Among the letters published last month was one which purported to come from Mr J. D. Davis, G3PAQ, but which we have since learned was a hoax. A genuine letter from G3PAQ giving his real views and those of the UK FM Group (London) is published below.

Naturally, we are sorry that following publication of the hoax letter, Mr Davis was put to considerable inconvenience in assuring people of his genuine views.

We were, of course, both victims of the prevalent code of misconduct by which minorities in many fields of activity inflict their juvenile anti-social acts upon the majority. There is no need here to list the various manifestations of this which abuse the hobby of amateur radio—these are well known, particularly in the repeater sphere—but they are on a par with the vandalization of private and public property, the use of football matches as an excuse for rioting, and similar conduct of which we are all aware.

In the same issue, a letter from Mr G. C. Moore, G3MCY (which we have no reason to doubt was genuine) referred to the "fun" (or pleasure) aspect of the hobby—if any endorsement of the view that this is declining were needed, the episode of this hoax letter and the emotions it aroused are surely relevant.

Mr Davis raises the question of checking the authenticity of letters submitted for possible publication. As far as is known, a hoax letter has not previously been received and therefore the need even to consider checking the authenticity of letters has never arisen. To say that a member of the editorial panel should know that views expressed are contrary to what he knew them to be implies that the holder of such views is never likely to change them. The function of the panel is to advise the editor, not to check that every item submitted for publication is genuine.

Indeed, if we had to authenticate every item received—and every piece, not only letters, appearing in our pages (except from regular contributors who are well known to us) is vulnerable to the hoaxer—the administrative cost in time and money would lead to a more expensive journal which would be far less topical than it is at present.

There is no way in which this can be done that cannot be overcome by a determined hoaxer, and anything smacking of vetting by, say, yet another committee would surely be unacceptable to the vast majority of readers.

It has always been this editor's policy to be totally impartial when selecting those letters for which space is available in any particular issue. Having no axe to grind on behalf of any of the many minorities which make up the hobby, we judge all letters on their freedom from libel, defamation and offensiveness, and on their possible interest to the membership at large.

Some may wonder how the hoax letter came to be chosen while other letters commenting on the Home Office letter on repeaters were not. The letters not published had largely been superseded by information under "Current Comment" in September and October, while the hoax letter was asking for readers' opinions and not commenting on the Home Office letter.

Despite its nature, the hoax letter may yet serve a useful purpose, as the letters Mr Davis receives in response to it should provide valuable information on readers' opinions of the ideas expressed. Should he wish to submit a breakdown of *all* those opinions, Mr Davis knows that space will be made available for it.

A. W. Hutchinson

REPEATERS

The Editor
Radio Communication

Sir—It was with some concern that I read in the October issue of *Radio Communication* a letter purporting to have been written by myself. As some readers will already know, this letter was not authentic and indeed expressed some views which were well known to be diametrically opposed to mine and those of the UK FM Group (London). The first paragraph would be pretentious and inaccurate—as anyone involved in any way with our group would have immediately realized.

In no way are we considering the possibility of closing down GB3LO. In fact in recent weeks we have been building a second 144MHz repeater and investigating the possibility of making GB3LO the first dual-channel repeater in the UK. We feel that in London, as has been found in other major cities of the world, the problem of misuse would be substantially reduced if there were several vhf repeaters. This would spread the high traffic load and remove the attraction to the offenders of a large "captive audience" provided on one frequency.

It should be noted that although we call ourselves an "FM Group", a large proportion of our members actively participate in many other fields of amateur radio including ssb, cw, dx chasing, rtty, Oscar, tv and microwave work. Some people hold the view that increasing the number of repeaters is detrimental to other users of the bands. We think that there is sufficient space available for repeaters to share the allocations with others without encroaching upon their activities or detracting from their enjoyment.

There is a small number of people who express strong anti-repeater views. However, it is becoming very difficult to believe that most of the GB3LO misuse originates from those motivated by such feelings. The increasing indications are that much of the disruption on the London vhf repeater is merely a form of vandalism coming in many cases from unlicensed operators (and incidentally, also occurring on simplex contacts). Surely, to curtail the operation of any repeater because of such activities would be simply giving way to this vandalism?

With reference to the 432MHz repeater coverage of London referred to in the published letter, there are many areas not adequately covered by the existing five repeaters in their current locations (only one of which is in London itself).

On a positive note, it is important that the general upsurge of mobile activity both on 144 and 432MHz triggered by the repeaters is maintained in the interests of band occupancy—particularly with WARC 79 in mind.

It is disappointing that the Society allowed the letter to appear in print without checking its authenticity, particularly since at least one member of the editorial panel was well aware that our views were contrary to those expressed. It also seems unfortunate that of all the correspondence resulting from the publication, without comment, of the Home Office letter in the August issue, the only letter printed was bogus.

Incidentally, I should like to thank all who wrote to me in good faith following the October issue. These letters have been read with considerable interest and forwarded to the VHF Committee/Repeater Working Group.

J. D. Davis, G3PAQ

A SAD BUT HAPPY YL

The Editor
Radio Communication

Sir—I was surprised and somewhat saddened to read in your June issue that certain yl operators feel it is desirable or necessary to form a British YL Association, the aims being "to further yl operating in the UK, to promote friendship, and help in any matters arising from or relating to yl interest".

My own experience, since first working to become a licensed radio operator, has been to be encouraged in every possible way to develop my interest in radio from all ages and stages of operators, to be received with the utmost friendliness in all spheres of amateur activity, and to have been offered all possible help with the hobby.

Since I first commenced my RAE course, I have been accepted in a predominantly male environment with the utmost courtesy, and with the friendly helpfulness which is one of the aspects of the radio amateur fraternity that I particularly admire.

I am very happy to have joined the ranks of radio amateurs without being segregated as a yl—long may it continue.

Kay Forbes, G4BFE

SEND ANOTHER LABEL!

The Editor
Radio Communication

Sir—I have been a member of the RSGB since September last year and therefore have received 12 *Radio Communication* address labels. I understand that I must send these back if I want any of the following: publications from the RSGB publications dept, to put an ad in the Members' Ads page, to apply for awards—what else I wonder? Well as it happens I have bought several books and applied for three awards. I have only **ONE** label left, hi. Would it be possible to add to the end of the list of RSGB publications: "Address labels from recent *Radio Communication* wrappers supplied to members who have run out of labels and cannot wait until the precious next label arrives". May I be the first in the queue to order 10 more labels?

D. Hutchinson, MB, BCh, GI4FUM

contest news

August 1977 70MHz Contest results

This contest again produced good activity unaided by propagation and weather conditions, which may have been the reason for a drop in entries in the portable section but an increase of fixed stations. Also a number of portables disliked the timing and suggested a single-day event. Supporting this point G3UUT/P achieved third place while only operating on the Sunday. The VHF Contests Committee will give consideration to this point before next year's event.

Certificates will be awarded to the winners and runners-up in both sections; and to BRS34740, the winner of the listeners' contest.

G3JYP will be awarded the VHF Managers' Trophy for being overall winner.

G4BEL

PORTABLE SECTION

Posn	Callsign	Points	QSOs	QTH	Pwr	Ant	Best dx	Km
1	G3JYP	1,038	91	YO29	100	8Q	GJ3WMR/P	594
2	GM4DMZ	856	66	XO26	50	8E	GU3HFN	590
3	G3UUT	810	82	ZO55	100	4E	GJ3WMR/P	554
4	GW3WRA	777	101	YL05	50	5Q	GM3ZBE	580
5	GJ3WMR	659	58	YJ60	25	6E	G3JYP/P	594
6	G3JFO	572	66	ZN07	40	4E	GJ3WMR/P	525
7	G4ERP	561	91	ZL01	130	8E	GM4DIJ	454
8	G3FJE	508	92	ZM79	120	4/4	GM4DMZ/P	450
9	G3PFM	438	64	YK09	50	5Q	GM4DMZ/P	452
10	G3LMH/A	432	71	ZL74	80	4E	GM4DMZ/P	457
11	G3SNN	430	77	YL10	50	4E	GM4DMZ/P	320
12	G6YB	393	59	YL49	50	10E	GM4DMZ/P	389

FIXED SECTION

Posn	Callsign	Points	QSOs	QTH	Pwr	Ant	Best dx	Km
1	GU3HFN	710	58	YJ48	180	4/4	GM4DMZ/P	590
2	G4AEQ	626	82	YN48	30	6E	GJ3WMR/P	505
3	G3NHE	610	90	ZN54	80	4E	GJ3WMR/P	448
4	G3UKV	538	80	YM28	100	4E	GM3ZBE	502
5	G4ASR	519	80	AL22	60	6E	GM4DMZ/P	465
6	G3OIT	513	75	AL33	20	4E	GM3ZBE	655
7	GD2HDZ	475	47	XO68	80	4E	G3OIT	440
8	G3WHK	392	68	ZL49	100	4E	GM4DMZ/P	465
9	G3XCS	361	31	XK49	40	4E	G3JYP/P	490
10	G4BBA	354	60	ZM39	60	4E	GM4DMZ/P	380
11	G3MXH	352	54	AL22	100	4E	GM4DMZ/P	485
12	G8IL	298	42	ZL72	50	4E	GM4DMZ/P	442
13	G4ALE	290	58	ZL50	40	4E	GM4DMZ/P	470
14	G3NEO	275	39	ZN54	30	5E	GU3HFN	420
15	G8GP	271	38	ZL50	30	3E	GM4DMZ/P	495
16	G3FIJ	259	33	AL05	100	4E	GD3YEO/P	440
17	G4AEZ	254	44	ZL30	50	4E	GM4DMZ/P	455
18	G3OHC	253	38	ZM31	120	4E	GJ3WMR/P	390
19	G4BWW	212	33	YN35	60	4E	GU3HFN	470
20	G3UES	210	43	ZL66	100	4/4	G3JYP/P	355
21	G3BTO	188	34	ZL55	50	4E	G3JYP/P	405
22	G3HBG	185	25	ZL60	30	4E	GM4DMZ/P	500
23	G3TWG	182	41	ZL37	18	4E	G3JYP/P	370
24	G5UM	162	36	ZM35	8	4E	GM4DMZ/P	315
25	G3UVS	135	13	XK50	60	4E	G3UUT/P	461
26	G3TAL	102	18	ZK14	8	4E	G3UUT/P	403

LISTENERS SECTION

Posn	Station	Points	QSOs	QTH	Ant	Best dx	Km
1	BRS34740	355	66	ZM	4E	GU4HFN	—
2	BRS15822	226	50	ZL40	3E	GD3YEO/P	425
3	BRS33823	112	32	ZL27	Di	G3JYP/P	345
4	BRS38519	99	23	ZL64	Di	G3JFO/P	325

Check log acknowledged from GD3YEO/P.

144MHz Fixed Contest rules

0900-1700 gmt 4 December 1977

All entries and checklogs to: VHF Contests Committee, c/o Mr L. V. Turner, G4CUT, 59 Harewood Road, Chelmsford, Essex CM1 3DH.

The following general rules, published in the January 1977 issue of *Radio Communication*, will apply: 1, 2, 3, 4c, 5a, 6a, 7a, 8, 9a, 10a, 11-22.

144MHz QRP Contest results

Once again the fifth annual QRP Contest was a success, with many contestants asking for more, and on other bands. The number of portable stations has nearly doubled. In general the rules seem acceptable but an ident serial number may be required for stations only operating within the contest, and this will be considered. The conditions were normal, with almost total use of ssb and no cw. Speech compressors as well as site occupancy caused problems to some stations.

The date of the QRP Contest next year should be made known on the Continent well in advance; one station alerted a number of PA0s etc beforehand. The adjudicator finds that a large number of entrants stated how their power was achieved, with some taking the attitude "How will extra QRP perform in conjunction with aerial gain and low cable looses etc". Check logs acknowledged from G4ASR, G4BBE, GI8BPC, GW8BXT/P, G8BKR and G8MFK.

G8ACJ

PORTABLE SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km
1	GW4ERP	1,548	214	YN75	F1DPU/P	572
2	GD4AFN	1,260	134	XO67	F6DTE/P	605
3	G4BZD	1,190	153	ZN44	G4CRC/A	468
4	GM8GEC	1,044	111	YP42	G3COJ	600
5	GW3WRA	1,030	153	YL05	F1BVK	490
6	G3NNG	1,028	198	ZL33	ON4YZ	450+
7	GM8DKG	918	90	YP42	F6DTE/P	760
8	G3PQY	921	133	ZO77	F6DTE/P	635
9	G3UUT	895	120	ZO55	G4CRC/A	530
10	G3VRE	835	163	ZL52	PA0ZWR	430
11	G3XWZ	815	141	ZN62	G3ZPJ/A	415
12	G3SPJ	811	124	YO78	F1DPU/P	679
13	G8EAH	807	119	ZN07	G4CRC/A	512
14	GW6YB	796	134	YL15	F1DPU/P	438
15	GW8FEO	792	118	YN52	GM8FFX	441
16	G4CRC/A	771	75	XK63	GM8GEC/P	580
17	G8LVS	758	144	ZN61	F6DTE/P	505
18	GW3ZLQ	746	123	YL06	PE0MAR	460
19	G8KIN	728	148	ZL18	GI8KIA	476
20	G4ELO	668	138	ZM64	F6DTE/P	420
21	GW3ZTT	657	109	YM04	PE0MAR	533
22	G4CLB	634	120	YM79	PA0IHD	405
23	G8CXK	620	128	ZM37	F1DPU/P	505
24	G4DZO	583	109	AK11	GD4AFN/P	475
25	GW3BPM	562	62	XM17	GM8FFX	590
26	G8JXK	552	75	YK05	GM8DKG/P	510
27	G4CIK	539	119	ZK10	GD4AFN/P	477
28	G8HVD	537	107	AK03	G3UUT/P	387
29	G8FDL	516	92	YN28	G4CRC/A	443
30	G3VJG	515	105	ZL08	F6DTE/P	420
31	G3VEF	506	103	ZK05	F1CRP/P	390
32	G8FAT	488	91	ZL17	GM8DKG/P	445
33	G3UGF	456	64	ZN49	F1DPU/P	603
34	G3SDS	454	75	YK18	ON5NY	370
35	G3UUP	410	128	ZL26	ON4YZ	403
36	GW3OHM	396	68	YM25	ON5NY	460
37	G8MDH	359	96	ZL33	PE0MAR	375
38	G8LHC	345	60	YM47	F6DTE/P	440
39	G3GGL	316	66	YM47	F6DTE/P	440
40	G3ILO/A	269	51	YL37	GM8DKG/P	445
	G3YGR	269	47	AL77	F6DTE/P	434
42	G8IXZ	255	35	YK24	G3SPJ/P	366
43	G8IWA	253	52	ZN11	G3ZPJ/A	455
44	G8KAX	249	71	AL32	GD4AFN/P	439
45	G3GDU	244	71	ZL80	F1CVE/P	340
46	G4DHF	216	40	ZN49	GW3BPM/P	295
47	G8KLO	109	72	YM50	G8AGT	115

FIXED SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km
1	G3BDQ	1,998	154	AK04	PA3ABW	440
2	G8KUC	1,086	148	AL56	GD4AFN/P	495
3	G4DGA	712	161	ZL58	GI8KIA	525
4	G3ZZJ	541	83	YN37	F6DTE/P	535
5	G4APL	466	106	ZL60	GD4AFN/P	440
6	G8MMV	300	78	AL12	GW4ERP/P	270
7	G8ETB	243	73	ZL37	F8DP/P	395
8	G8LDY	237	57	ZL30	GD4AFN/P	400+
9	G4AEZ	195	43	ZL30	F1CRP/P	480
10	G4DLB	190	45	ZM74	ON5NY	325
11	G8MJG	138	30	ZN13	G4DGA	272
12	G8NIY	133	52	ZL10	ON5NY	140
13	G3WOI	114	40	ZL54	G3DAH	170
14	G8LXJ	112	26	ZK18	F6DTE/P	325
15	G4AZA	94	26	ZL24	G3WCS	220
16	G3ZSE	69	29	AL43	ON5NY	174
17	G8MMG	63	34	YN79	G3GGL/P	80

September 144MHz Open Contest results

The decision to run the September 144MHz Open Contest under experimental rules provided the VHF Contests Committee with much useful information in support of their claim that the radial system of scoring is superior to, and as accurate as, the Continental one point/km system. There is no doubt that the radial system is far more convenient for both contestants and adjudicator, and the committee acknowledges with thanks the efforts of all those contestants who slaved many additional hours in working out their totals by both methods. Nobody commented in favour of points/km, which is hardly surprising. As for accuracy, with only two exceptions the positions in the table are independent of the system of scoring; and even in those cases of disagreement the error is less than the dimensional instability of the QTH Locator map. The results will be further analysed, and used to try and persuade the other countries in IARU Region 1 to adopt the radial system at the conference in Hungary next May.

The conclusions to be drawn from the experimental rule that QTH need not be logged were much less clear-cut. Only about one-third of the entrants passed any comment at all: the leading stations were largely in favour of dropping the QTH, as might have been expected since they benefit the most from a shortened contest exchange; but those lower down the table preferred to retain the exchange of QTH, giving reasons such as county chasing, listener interest, and aversion to rubber-stamp QSOs. Although the committee's private predictions of the outcome of the experiment were confirmed in every detail, we are little closer to resolving the controversy in the absence of a clear mandate from contestants.

Conditions were far from exciting, although stations favourably situated found no lack of Continental stations to boost their scores. DX activity reached a peak on Sunday morning. Some deliberate jamming was reported from one area, but the general standard of signals and operating was high. However, one cw operator consistently ignored reports of poor signal quality from a monitoring station and was nearly responsible for having his whole team's effort disqualified.

Congratulations to the overall winners, the Hastings Electronics & Radio Club, G6HH/P, who receive the Mitchell-Milling Trophy. Certificates of merit go to the winners and runners-up in each section.

G2HIF

Check logs acknowledged with thanks from:
G8NQP, G8MHV, G8KNL, G3VIJ, G3JFO, G8IUY, G3ZLQ, G8NQW and BRS37884.

FIXED SECTION

Posn	Callsign	RSGB radials	IARU 1pt/km	QSOs	Best dx	km	QTH
1	G8KUC	3,656	90,339	411	DM2GPL/P	812	AL56
2	G8IQO	2,984	75,462	274	F1AMC/P	815	AK12
3	G3NNG	2,520	—	386	DC8RAA	600+	ZL23
4	G8EYC	2,269	56,242	379	F1DRA/P	728	ZL50
5	G4DEZ	2,085	51,835	329	F1EKU/P	740	ZL34
6	G3GNR	2,006	50,134	201	PA0NYM/P GM8NSU/A	708	XK20
7	G4FDX	1,488	—	286	DC9KU	470	ZL08
8	G3XFW	1,415	34,783	222	F1EKU/P	745	YK07
9	G8AZA	1,327	32,807	137	DL3SR/P	708	ZO69
10	G3ERN	1,266	—	244	GM4BWT/P	470	AL11
11	G3BZU	1,232	30,080	192	F1EWG	855	ZK05
12	G4BRA	1,219	29,985	259	PA0JCA/P	479	ZL47
13	G4BWH	1,052	—	191	GM4BWT/P	580	AL62
14	G3UGF	964	—	159	F6CTT/P	450	ZN11
15	G8NOP	862	22,285	162	F1DPX	537	ZM02
16	G8NOG	822	21,207	160	ON6AT/P	516	ZN75
17	G8KWC	784	19,284	142	PA0ZAZ/P	445	ZL32
18	G4FJD	763	—	133	DC6EX/P	503	AL31
19	G8ILO	683	17,185	110	F1DRA/P	690	AL34
20	G8LVM	675	—	149	F1KAR/P	350	ZM14
21	G8LKR	627	—	131	GD3FLH/P	374	ZM79
22	G8JXV	548	16,197	131	HB9AGG/P	710	ZL60
23	G8LDY	529	13,198	105	PA0ZAZ/P	350	ZL30
24	G4FVP	511	—	65	F6CTT/P	615	ZO02
25	G8KSS	472	—	70	F1EKU/P	775	YL38
26	G4AGQ	460	11,278	116	F1EKU/P	702	ZL66
27	G4AZA	420	10,616	76	DF5FG/LX/P	532	ZL24
28	G8FAX	382	9,398	101	DL3SR/P	456	AL31
29	G3YIN	379	9,670	77	G8FIS/P	360	ZL72
30	G3GGL	378	9,390	76	F1DXP	502	YM59
31	G8KHI	303	7,677	78	F6CTT/P	274	ZL09
32	G3KRC	270	—	64	G8FIS/P	320	ZL29
33	G8LHT	249	—	57	G3YMD/P	310	ZN34
34	GI8BPC	247	—	41	G4BEW/P	517	WO19
35	G8DOB	195	4,794	60	ON4AT/A	287	ZL38
36	G8DXD	188	4,825	37	F1CPR/P	410	YM69
37	G8KMG	131	—	35	G8FIS/P	276	ZL10

PORTABLE SECTION

Posn	Callsign	RSGB radials	IARU 1pt/km	QSOs	Best dx	Km	QTH
1	G6HH	6,035	148,706	597	EA1CR	909	AK03
2	GW3OXD	5,465	136,647	604	DJ5CDQ	962	YM54
3	GW8IZS	5,182	129,894	581	DC8RA/A	779	YM44
4	G3PMH	5,059	121,761	586	F1KFA/P	655	AN61
5	G4BPO	4,943	123,699	521	F6CJG/P	720	AM67
6	G4CVI	4,620	115,315	390	F1BUW	665	AM07
7	G3YMD	4,373	108,713	448	F1KFL	732	AL76
8	G4BEM	3,977	—	580	F1DUE/P	795	ZN61
9	G3FZL	3,805	95,006	375	F1EKU/P	669	AL45
10	GW3WRA	3,398	—	418	DC9KU	650	YL05
11	GM4BWY	3,023	—	302	F1DPX	976	YP44
12	G4DZO	2,976	75,077	346	EA1CR	923	AK11
13	G8GCP	2,961	73,587	430	EA1CR	875	ZK09
14	G4EEE	2,640	66,761	405	F1KFL	737	ZL53
15	G8FIS	2,615	—	306	F1KGT/P	603	ZO55
16	G3OGY	2,511	62,824	313	F6CTI/P	924	ZL74
17	G3JEQ	2,461	—	383	F3GZ/P	760	ZL77
18	GW8CSA	2,378	—	319	ON4DE	564	YL15
19	G2XV	2,286	—	389	HB9BDI/P	825	AM72
20	G3PQY	2,240	55,581	305	G3OUR/P	607	ZO77
21	G4BEW	2,192	—	264	F1DPX	575	AM06
22	G4DSP	2,041	—	351	F1DPX	548	ZM07
23	G3ULT	1,986	50,230	360	F1EKV	713	ZL54
24	G8GCC	1,917	47,986	301	F1EKU/P	879	ZM21
25	G3EFX	1,775	43,350	335	F1EKU/P	747	ZL26
26	G8APZ	1,721	—	195	PA0EZ/P	624	YK21
27	G4ADV	1,690	—	155	F1EKU/P	800	AK54
28	G3UVW	1,653	41,359	318	DC8RAA	675	ZM72
29	G8LED	1,651	—	334	F1BBD	480	ZM45
30	G3XWZ	1,560	39,934	281	DF5FG/LX/P	625	ZN62
31	G8NAJ	1,446	—	282	PA0NYM/P	440	ZM31
32	G8MFW	1,434	—	276	F1DXP	550	ZM25
33	G3SPJ	1,417	35,988	213	PA0HWB/A	562	YO78
34	G3OUR	1,375	34,586	95	F1BRZ/P	988	WJ09
35	G4BZD	1,357	—	216	SP6BTI/DC/P	490	ZN44
36	G3AHD/A	1,284	31,481	203	ON6AT/A	520	YN46
37	GW4BP	1,241	31,805	201	F1DPX	540	YM05
38	G4CAR/A	1,233	—	236	PA0ZAZ/P	440	ZM21
39	G8KAX	1,228	30,421	260	F1DRA/P	725	AL31
40	G8LQT	1,128	—	210	PA0NYM	536	ZL01
41	G3UER	1,003	24,952	170	SP6BTI/DC/P	540	ZN44
42	GM8DVD	916	24,290	101	G4AVD	545	YP66
43	G3FJE/A	743	—	143	DL0WU	550	ZM79
44	G3XTT/LX	554	13,796	68	G3PMH/P	534	CK80
45	G3FOO	514	—	—	—	—	YN55
46	G3COJ	254	5,232	40	G4BPO	341	YL63
47	G8FAT/M	169	4,201	35	PA0ZAZ/P	360	ZL39
48	G8GXE/A	109	—	33	GW8CFQ	245	ZL47
49	G8INO/P	83	—	—	—	—	—
50	G3ILO	1	28	1	—	—	—

LISTENERS SECTION

Posn	Station	Score	Stations logged	Best dx	Km
1	A867	898	126	GM4BWT/P	485
2	BRS34740	537	111	PA0ZAZ/P	435
3	BRS15822	533	129	DF5FG/LX/P	—
4	BRS33823	246	60	PA0CIS	302
5	BRS38519	125	33	F1KAR	270

The Commonwealth Contest 1978 rules

Transmitting section

1. The general rules for RSGB hf contests, to be published in the January 1978 issue of *Radio Communication*, will apply.

2. When. From 1200gmt on Saturday 11 March 1978 to 1200gmt on Sunday 12 March 1978.

3. Eligible entrants. Members of the RSGB resident in the UK and radio amateurs licensed to operate within the British Commonwealth or British Mandated Territories.

4. Contacts. CW (A1) only, in the 3·5, 7, 14, 21 and 28MHz bands. Contacts may be made with any station using a British Commonwealth callsign, except those within the entrant's own call area. UK stations may not work each other for points. In accordance with IARU recommendations, contestants are requested to confine their operations to within the lower 30kHz of each band.

5. Scoring. Each completed contact will score five points. In addition, a bonus of 20 points may be claimed for the first, second and third contact with each Commonwealth call area (as listed in the accompanying table) on each band. All British Isles stations (G, GB, GD, GI, GJ, GM, GU and GW) count as one call area.

6. Logs. Separate logs are required for each band. Each band log should be separately totalled and should include at the end a check list of call areas worked on the band. Logs should be set out as shown in the general rules for RSGB hf contests. Separate band

totals should be added together and the total claimed score entered on the cover sheet.

7. Entries. Entries may be single- or multi-band. Single-band entries should show contacts on one band only; details of contacts made on other bands should be enclosed separately for checking purposes. Multi-band entries will not be eligible for single-band awards.

Each entry will consist of the separate band logs together with a signed declaration. The form of declaration is shown in the general rules for RSGB hf contests.

Entries should be addressed to D. J. Andrews, G3MXJ, 18 Downsview Crescent, Uckfield, East Sussex TN22 1UB, England. Adjudication will commence on Monday 15 May 1978. Any entry received after this date may be excluded from the contest. Overseas stations are therefore advised to forward their logs by airmail.

8. Awards. To the winner, the BERU Senior Rose Bowl. To the runner-up, the BERU Junior Rose Bowl. To the leading UK station, the Col Thomas Rose Bowl. Certificates of merit will be awarded to:

(a) First, second and third placings in home and overseas multi-band sections;

(b) The leading home and overseas single-band entries on each band.

Commemorative certificates will be sent to the leading station in each overseas call area. Commemorative certificates are also available to other entrants on request, and five IRCs should be enclosed to cover postage.

Receiving section

1. When. Times and dates as for transmitting section.

2. Eligible entrants. Members of the RSGB resident in the UK and all SWLs resident in the British Commonwealth or British Mandated Territories. Only the entrant may operate his receiving station for the duration of the contest. Holders of transmitting licences are not eligible to take part.

3. Scoring. To count for points a station outside the entrant's own call area must be heard in a contest contact. CQ or test calls will not count for points. A station may be logged only once on each band for the purpose of scoring. Where both stations in a contact are heard they should be logged separately and points may be claimed for both entries, provided that the stations are outside the entrant's own call area.

Each complete log entry will score five points. In addition, a bonus of 20 points may be claimed for the first, second and third stations heard in each Commonwealth call area on each band. All British Isles prefixes count as one call area.

4. Logs. A separate log is required for each band. Logs should show the following details: (a) Date/time gmt, (b) callsign of station heard, (c) report and serial number sent by station heard, (d) callsign of station being worked, (e) points claimed, (f) bonus points claimed. Each log must be set out on one side of foolscap or A4 log sheets and must show the band to which the log refers. A check list showing the call areas on each band must be included.

5. Entries. (a) Each entry will consist of the log sheets, check list and a signed declaration that the receiving station was operated in accordance with the rules and spirit of the contest and that the entrant does not hold an amateur transmitting licence. (b) entries should be addressed and sent as in rule 7 of the transmitting section.

6. Awards. The BERU Receiving Rose Bowl to the winner. Certificates of merit to the leading entrant in each continent.

Commonwealth call areas

The following call areas are recognized for the purposes of scoring in the 1978 Commonwealth Contest:

A2	Botswana	VE5	
A3	Tonga Is	VE6	
A5	Bhutan	VE7	
C2	Nauru	VE8	
C5	Gambia	VK1	
C6	Bahamas	VK2	
G/GD/GI/GJ/GM/GU/GW		VK2	Lord Howe Is
H4	Solomon Is	VK3	
J3	Grenada	VK4	
P2	Papua New Guinea	VK4	Willis Is
S2	Bangladesh	VK5	
S7	Seychelles	VK6	
VE1		VK7	
VE2		VK8	
VE3		VK9	Christmas Is
VE4		VK9	Cocos Is
VK9	Norfolk Is	ZD7	
VK0	Heard Is	ZD8	
VK0	Macquarie Is	ZD9	
VK0	Australian Ant	ZE	
VO		ZF	
VP1		ZK1	Cook Is
VP2A	Antigua, Barbuda	ZK1	Manihiki Is
VP2D	Dominica	ZK2	Nuie
VP2E	Anguilla	ZL1	
VP2K	St Kitts, Nevis	ZL2	
VP2L	St Lucia	ZL3	
VP2M	Montserrat	ZL4	
VP2S	St Vincent & Dep	ZL5	
VP2V	British Virgin Is	ZL	Auckland & Campbell Is
VP5	Turks & Caicos Is		
VP8	Falkland Is	ZL/K	Kermadec Is
VP8	S Georgia	ZM7	
VP8	S Orkney Is	3B6,3B7	Agalega & St Brandon
VP8	S Sandwich Is		
VP8	S Shetland Is	3B8	Mauritius
VP9		3B9	Rodriguez Is
VQ9	Chagos Is	3D	Fiji
VR1P	British Phoenix Is	3D6	Swaziland
VR1	Gilbert & Ocean Is	4S7	
VR3	Fanning & Christmas Is	5H3	
		5N2	
VR6		5W	Samoa
VR8	Tuvalu	5X5	
VS5		5Z4, 6Y5	
VS6		7P8	
VS9	Gan	7Q7	
VX9	Sable Is	8P	
VY0	St Paul Is	8R	
ZL/C	Chatham Is	9G1	
VU	India	9H	Maltese Is
VU	Laccadive Is	9J2	
VU	Andaman & Nicobar Is	9L1	
		9M2	W Malaysia
YJ		9M6/9M8	E Malaysia
ZB2		9V1	
ZC4, 5B4		9Y4	

This list has been compiled from the RSGB Countries List and from information supplied by the Foreign and Commonwealth Office.

Slade DF Qualifying Event results

Twenty-one teams assembled at Pershore for the start of the last qualifying event to be held this year. Good weather and excellent signals from both stations caused competitors to split evenly in deciding which station to locate first.

Station "B" was concealed in a wood at Bromsberrow in the Malvern Hills, and although it was located by all teams during the afternoon it was approached via a most tortuous route by many of them.

Station "A" was located at Tewkesbury in between the rivers Severn and Avon. Competitors were able to approach to within 20 yards of the transmitter site only to find their way barred by the river, with the nearest dry access point 1½ miles away. To the surprise of local anglers, Eric Mollart was the first to strip off and brave the cold and muddy waters, and he was followed by at least five others. Later Eric had travelled some two miles by car before discovering that his trousers were still on the river bank. It was also reliably reported that the first df streak took place in the nearby car park.

The winner, Alan Simmons of the Mid Thames DF Club, must be congratulated on a lapse time of only 17min between stations. Roger Parsons and Paul Yeates qualified for the National Final.

			Time of arrival	
Posn	Name	Club	Station "A"	Station "B"
1	A. Simmons	Mid Thames	1515	1458
2	E. L. Mollart	Mid Thames	1426	1518
3	R. J. Parsons	Oxford	1428	1519½
4	J. R. Vickers	Stratford-on-Avon	1526	1423
5	W. J. North	Mid Thames	1527	1434
6	P. J. Yeates	Salisbury	1432	1532
7	M. P. Hawkins	Chelmsford	1534	1434½
8	C. Plummer	Medway	1535	1433
9	B. J. Mahony	Rugby	1540	1423
10	A. W. Butcher	Chelmsford	1440	1547
11	D. E. Newman	Rugby	1446	1548
12	P. Woollett	Dartford Heath	1526½	1558
13	B. M. Bristow	Mid Thames	1601	1420

14	T. C. Gage	Mid Thames	1601½	1521
15	J. McBurney	South Manchester	1602	1518
16	D. Holland	South Manchester	1519	1602
17	B. R. Poole	Mid Thames	1609	1532
18	P. M. Williams	Slade	—	1448
19	G. Whenham	Coventry	—	1527
20	P. Lisle	Mid Thames	—	1610
21	P. J. McNeil	RSGB Hereford	—	1621

After the conclusion of this event the results of the "Bert Simmonds Memorial Trophy" competition were announced. Brian Bristow was the winner and he was presented with the trophy, to be held for one year, by Cliff Simmonds. This competition, based on the RSGB qualifying events with points scored as in gp motor racing for the first six "home", has aroused considerable interest, and Slade Radio, donors of the trophy in their golden jubilee year, are happy to acknowledge the co-operation of the RSGB.

Final placings in the competition are as follows:

Posn	Name	Club	Points
1	B. M. Bristow	Mid Thames	24
2	P. Lisle	Mid Thames	22
3	A. Simmons	Mid Thames	20
4	E. L. Mollart	Mid Thames	18
5	G. A. Whenham	Coventry	16
6	M. P. Hawkins	Chelmsford	14
7	I. Butson	Chelmsford	13
	W. J. North	Mid Thames	13
9	J. R. Vickers	Stratford	10
10	P. Tyler	Mid Thames	9
11	C. Plummer	Medway	8
12	B. J. Mahony	Rugby	7
13	T. C. Gage	Mid Thames	6
14	C. Wells	Mid Thames	5
15	A. W. Butcher	Chelmsford	4
	R. J. Parsons	Oxford	4
17	D. E. Newman	Rugby	3
18	B. R. Poole	Mid Thames	2
	J. Everest	Dartford Heath	2
20	M. Easterbrook	Dartford Heath	1
	P. J. Yeates	Salisbury	1

DF National Final results

This year's national final was organized by the South Manchester RC and took place in the Chester area on 18 September. Seventeen teams assembled at the start just off the A41 about eight miles south-east of Chester. Good signals were received from all three transmitters. About 50 per cent of competitors chose station "C" as their "first" while the others split equally between "A" and "B".

Station "A", G3WFT/P, was located near Hunger Hill in Delamere Forest, about 10 miles from the start, operated by Dave Holland and John Fletcher. The transmitter was hidden deep in the middle of very heavy undergrowth, which proved quite an obstacle to most competitors.

Station "B", GW3UHF/P, operated by Ron Smith, Chris Scholefield and Roland Parkinson, was located at Bwlchgwyn, west of Wrexham, some 13 miles from the start. The area comprised an extremely steep mountainside, covered with an impenetrable jungle of rhododendrons, trees and bushes. Several hundred yards of antenna had been erected, ensuring extreme difficulty in obtaining close bearings. The transmitter was located half-way up a narrow gully, the operator and gear being balanced on a plank under the roots of a large tree.

Station "C", G3FVA/P, was located about three miles from the start, on Bickerton Hill and operated by Geoff McBurney, Colin McKenzie and John Edwards. The transmitter was located on a ledge below the top of a cliff, utilizing a "T" into an L-shaped antenna which ran along the top, then down the hill. One competitor slipped off the ledge and down the steep drop. After the crashing had died down, the operators shouted "Are your OK?" He replied, much shaken, "Sign my form!"

Eric Mollart, being the only person to find all three stations, was the winner, and Peter Miles, the RSGB trophies manager, presented the National DF Trophy and South Manchester RC DF Cup to him.

Posn	Name	Club	Time of arrival		
			Station "A"	Station "B"	Station "C"
1	E. L. Mollart*	Mid Thames	1446½	1604	1354
2	C. D. Plummer	Medway	1514½	—	1409
3	R. J. Parsons	Oxford	1517	—	1402
4	D. E. Newman	Slade	—	1553	1402½
5	M. P. Hawkins	Chelmsford	—	1555½	1352
6	T. C. Gage	Mid Thames	1601	—	1420
7	I. R. Butson	Chelmsford	—	1601½	1424
8	G. A. Whenham	Coventry	1418	—	1614
9	P. Lisle	Mid Thames	1425	—	1615
10	C. M. Wells	Mid Thames	1424½	—	1620
11	P. T. Tyler	Mid Thames	1423	1620½	—
12	A. Simmonds	Mid Thames	1629	—	1412
13	B. R. Poole	Mid Thames	—	—	1423
14	B. Bristow	Mid Thames	—	1603	—
15	B. J. Mahony	Rugby	—	1603½	—

The other two competitors located station "B", but unfortunately after 1630.
* E. L. Mollart qualifies for the 1978 DF Final.

1977 Region 1 (RSGB) VHF Contest results

Section	Ht mult	4m × 3	2m	70cm × 4	Total	Region 1 QSOs 4	2	70
1. Multi-op								
Ship Inn Club	1·6	2031	1657	1445	5133	14	43	21
Bury	1	1313	1195	1094	3602	14	42	13
Isle of Man	1	1783	1704		3487	14	50	
Ainsdale	2	1138	1190	442	2770	10	38	13
Wirral	1	701	498	270	1469	14	33	9
2. Single-op								
G4CZP	2		2240		2240		29	
GD2HDZ	1·4	815	243	311	1369	8	9	6
G8GHO/P	1		557		557		34	
3. Outside								
G3FJE/P	1·6	411			411	7		
G3JZP/P	1		259		259		19	
G8JTP/P	1		203		203		15	
G8KAX	1·8		197		197		6	
G4ESK	1·6		180		180		10	
G8KLR	1·8		172		172		8	
G8DXD	1·8		75		75		4	
G3BDQ (Check)	1·4		166				5	

The G3SMM Shield goes to Ship Inn Club, and the G2CIP Shield to G4CZP.

In HF NFD, the RR's Cup and G3LWQ Rosebowl were awarded to Leyland Hundred ARG, and the 80m Tent Trophy to Bury RS.

Verulam ARC Transmitting and Receiving Contest 1977

Section 1. 2m 0900 to 1300gmt Sunday 27 November.
Section 2. 160m 0900 to 1300gmt Sunday 11 December.

Contacts. To consist of an exchange of reports, serial numbers beginning at 001 and name of county (new county boundaries) or country (if outside UK); using any permitted mode. Contacts via repeaters will not count for points.

Entry. The contest is open to all licensed operators and SWLs. Portable, mobile and fixed stations may take part.

Scoring. 1 point per contact. 10 points per contact with G3VER, the Verulam Club station. The total score in each section of the contest is to be multiplied by the number of UK counties worked in that section. Countries outside the UK count as additional counties. Only one contact with a specific station in each section of the contest will count for points.

Logs. Logs must include the following information: date; time; callsign; RS(T) and serial number sent; RS(T), serial numbers and county received; points claimed. Any convenient logsheet containing the above information may be used. The location of the entrant's station, if different to his normal address, must be stated.

SWL entries. Scoring, etc, will be as for the transmitting section but the following differences should be noted.

Only contacts made by stations taking part in the transmitting sections of the contest will count for points. Logs must include: date, time; callsign of station heard; report (RS(T)) by SWL on station heard; report, serial number and county sent by station heard; callsign of station being worked; points claimed. A particular station must only appear once in the "Station heard" column.

Awards. Specially endorsed certificates will be awarded to the winners, second, third and fourth placemen of each section in both the transmitting and SWL classes. Certificates for all entrants are available provided an sae of minimum size 9 by 6¼in is included with the entry.

Separate logs for each section of the contest should be sent to J. P. Read, G4BOU, 15 Garrard Way, Wheathampstead, Herts, (tel 2908) postmarked not later than 20 December 1977. Telephone enquiries after 6pm.

Contests calendar

12-13 November	2nd 1·8MHz
4 December	144MHz Fixed
1978	
15 January	Affiliated Societies
11-12 February	First 1·8MHz
11-12 March	Commonwealth
9 April	Low Power
7 May	Region Round-up CW
21 May	Region Round-up SSB
3-4 June	HF NFD
24-25 June	Summer 1·8MHz
16 July	3·5MHz FD
2-3 September	SSB FD
14-15 October	21/28MHz
21-22 October	7MHz SSB
4-5 November	7MHz CW
11-12 November	2nd 1·8MHz

club news

RSGB affiliated societies and clubs, and RSGB groups, are invited to submit items for inclusion in "Club News" to their regional representatives (not direct to the editor).

Items of news and dates of forthcoming events should reach RRs by 22 November for the January issue.

REGION 1—RR W. M. Furness, G3SMM, 16 Coniston Avenue, Sale, Cheshire M33 3GT.

Ainsdale (AARC)—Thursdays fortnightly (3 and 17 Nov, 1, 15 and 28 Dec). Ainsdale Scout Headquarters. For details contact G2CUZ.

Blackburn (East Lancs ARC)—First Thursday in each month, 7.30pm. YMCA, Blackburn. Sec E. A. Lomax, G4DGR, West End PO, Accrington, Lancs.

Blackpool (B&DARS)—First Monday in the month. Phone G5ND (Blackpool 64508) for details of venue.

Bolton (B&DARS)—Main meeting first Wednesday in each month, informal meeting third Wednesday in each month, 8pm. Bolton Recreation Club, Kensington Place, Bolton. Hon sec G4FSN (ex G8LXD).

Bolton (Edbro Radio Club)—New club! Details from the sec c/o Edbro Ltd, Lever Street, Bolton.

Bury (BRS)—Main meeting, second Tuesday of the month. RAE classes and morse instruction every Tuesday as well as informal meetings of Club members. 8 Nov (not 9 as previously stated) (Giant surplus equipment sale), 13 Dec (AGM), 10 Jan 1978 ("RTTY today" by G3VDB). Intervening Tuesdays are noggin and natter sessions with G3BRS on the air. Mosses Youth & Community Centre, Cecil Street, Bury. Sec E. R. Thirkell, G4FQE, tel Rochdale 32730.

Carlisle (C&DARS)—Mondays, 7.30pm. Currock House, Lediard Avenue, Currock, Carlisle. A very full programme of lectures and demonstrations has been arranged for the coming months. Full details from G8DVD.

Chester (C&DARS)—Tuesdays, 8pm, except for first Tuesday in the month. YMCA Chester. Further details from the ASR. G3PYU.

Douglas (IoMARS)—Mondays fortnightly, Keppel Hotel, Creg-ny-Baa, Near Onchan. Membership includes the first husband/wife licence holders in the Isle of Man (GD4FWQ and GD8LFA). Sec, GD4FWQ, tel Douglas 22295.

Eccles (E&DARC)—Tuesdays, 8.30pm. White Swan, Worsley Road, Swinton. Sec G4AEQ.

Lancaster University (UoLARS)—Wednesdays, 8pm. Furness College. Visitors are welcome, as are skeds on hf and 2m—club callsigns are G8DOU and G3ZBY. There are RAE and morse test classes. Enquiries to John Morris, G4ANB, Dept of Physics.

Leyland (LHARG)—Second Monday in each month, 7.30pm. "Rose & Crown", Ulnes Walton, Leyland. Details from G3XII.

Liverpool (L&DARS)—Tuesdays, 8pm. Conservative Association Rooms, Church Road, Wavertree. Sec G4EST.

Liverpool (North Liverpool RC)—Tuesdays, 8.30pm. Informal meetings. "Nags Head", Thornton, Crosby, Liverpool 23. Visitors welcome. Sec R. Porter, 11 Cranmore Avenue, Crosby, Liverpool L23 0QD.

Liverpool University (UoLARS)—Meetings each lunchtime. Visitors from the Polytechnic and other colleges most welcome. Club shack, Reilly Building: Club active on Top to Two, G3OUL/G8JUL. Ex-members, and others, interested in attending the Society's Dinner (probably in March 1978) please contact the sec, Geoff Plucknett, G4FKA, UoL, Guild of Undergraduates, 2 Bedford Street North, Liverpool L7 7BD.

Manchester (M&DARS)—Wednesdays 7.30pm. 203 Droylesden Road, Newton Heath, Manchester 10. Sec G8IYX.

Manchester (South Manchester RC)—11 Nov (not 9 as previously stated) (Annual Dinner), 18 Nov ("Ionospherics in Antartica"—Bruce Moreman), 25 Nov (Demonstration of vhf/uhf gear—G3LEQ), 2 Dec ("Simple introduction to microprocessors"—D. Wade G8MQW), 9 Dec (Club Quiz), 16 Dec ("Demodulation of fm signals"—T. Winter G4AOK), 23 Dec (Christmas party), 30 Dec (Club closed). Meetings Fridays, 8pm. Sale Moor Community Centre, Norris Road, Sale. Informal meetings Monday evenings at "Greeba", Shady Lane, Baguley. Particulars from sec G3VIW, tel 061-973 3355.

Manchester University (MUARS)—Interested parties should contact G4AOS, QTHR.

University of Manchester (UoM—IoS&TARS)—G3CXX is active on all hf bands and G8FOT on 2m and perhaps 23cm. Items for club/magazine/newsletter, or letters from intending members gratefully received by sec, c/o UMIST.

Ormskirk (OARC)—New club. Wednesdays at members' QTHs. For details contact G3SZV or sec Peter Kay, G4GCB, 24 Laurel Avenue, Burscough. Alternatively listen 145·000MHz fm/a.m. Wednesdays 1930-2030. Club interests: vhf/uhf, hf, rtty, contests, atv.

North Western Repeater Group—Informal meetings on the third Thursday in each month, 8pm. "Globe Club", Willows Lane, Accrington, Lancs. Details from sec G4FZN.

Preston (PARS)—Thursdays fortnightly commencing 3 Nov, 8pm. "Windsor Castle" (private room), St Pauls Square, Preston. Sec G8KTM.

Salford (Dial House RS)—Wednesdays, 5.30-9.30pm. Dial House, 21 Chapel Street, Salford, Lancs. Net channel 145·25MHz fm—the club station G3WDH monitors this frequency every club night for any other station. Details from sec G8JCM, c/o M38 at above address.

Stockport (SRS)—Second and fourth Wednesdays in the month. 8pm, Blossoms Hotel, Buxton Road, Stockport. 9 Nov (Astronomy), 23 Nov (Constructional Contest), 14 Dec (AGM), 28 Dec (No meeting). Sec, G3FYE. New members and visitors always welcome.

Thornton Cleveleys (TCARS)—First and third Wednesdays in each month, 8pm, morse practise from 7.30pm. St John Ambulance Hall, Fleetwood Road North (next to "Gardner's Arms"), Thornton. Details from sec A. Bullock, G8MKO, 26 Lancaster Avenue, Thornton Cleveleys, Blackpool.

UK FM Group (Western)—Informal meetings first Thursday of the month. 8.30pm, Legh Arms, Knutsford. Sec G3LEQ, tel Knutsford 4040.

Warrington (W&DARS)—Tuesdays, 7.45pm. Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington. Sec R. E. J. Staples, G3MMD, 3 Willow Close, Lymm, Cheshire, tel Lymm 3533.

Wigan (W&DARS)—First and third Wednesdays in each month. Poolstock Cricket Club, Keats Avenue, Poolstock. Sec A. Cunliffe, G4EII, 50 Langholm Road, Garswood, Wigan.

Winsford (Mid-Cheshire ARC)—Wednesdays. Technical Activities Centre, rear of Verdin Building, Verdin Comprehensive School, Grange Lane, Winsford. RAE class 7pm to 8pm. Morse class every third Wednesday. Net nights 160m Mondays, 8pm, 2m (fm) Tuesdays 8pm. Sec G8HAV.

Wirral (WARS)—First and third Wednesdays in each month, 7.45pm. Sports and Recreation Centre, Grange Road West, Claughton, Birkenhead. Sec G3DLF.

Difficulties are sometimes experienced by club secretaries in compiling lecture programmes. To try to help matters, would any member who can offer lectures/demonstrations write to the RR with details of topic offered, distance he is prepared to travel, whether reimbursement of expenses would be expected and any other relevant particulars.

REGION 2—RR R. C. Andreang, G4CMT, 6 Beech Avenue, Bilton, Hull, Humberside.

Barnsley (B&DARS)—Fourth Friday in each month. 7.30pm. King George Hotel, Peel Street, Barnsley. Sec G3LRP.

Bradford University (UBURS)—Thursdays, 7.30pm. N10, University Main Building, Richmond Road. Come and see our 2 metre station, G8IIW. Details from Brian Ackroyd, G8GOV, QTHR.

Denby Dale (DD&DARS)—Wednesdays, 7.30pm. Pie Hall, Denby Dale. Visitors always welcome. Sec G3FQH.

Goole (G&DARS)—Fridays, 7.30pm. (during school term only). Goole Grammar School. Details from chairman G3VBI.

Halifax (Northern Heights ARS)—7.45pm. Peat Pitts Inn, Ogden, Halifax (four miles north of Halifax town hall). Sec G3MDW.

Hornsea (HARS)—Wednesdays, 8pm. Rear of Victoria Hotel, Hornsea (facing Hornsea Mere). Sec G4CHH.

Hull (H&DARS)—Fridays, 7.30pm. Dorchester Hotel, Beverley Road, Hull. Sec G3LZQ.

Hull (HUR&ES)—Fridays 1pm. Room 313B, Union Building. All amateurs invited. Enquiries to G4FVP, QTHR.

Leeds (White Rose RR)—Wednesdays, 7.30pm. (Lectures start 8pm). Sec G4DZI.

Leeds (LUUARS)—Tuesdays, 8pm. Union Annexe (second floor), Woodhouse Lane. All new students welcome. Sec G4CNG, QTHR, or at "E" block, Lupton Flats, Alma Road, Leeds 6, during term.

Otley (OR&ES)—Tuesdays, 8pm. 14 Back of Court House Street, Otley. Sec G8DFZ.
Scarborough (SARS)—New night. Mondays, 7.30pm. Scarborough Technical College, Scalby Road, Scarborough. Sec G3RTN, pro Charles Whitaker, 1 Ryefield Close, Eastfield, Scarborough.
Sheffield (SU&PRS)—University—Wednesdays in term, 1pm. The "Red Deer", off Main Street. Details G4BXN.
Polytechnic—This club must expand this year if the Students' Union is to continue financial support. Details G4CYA, QTHR, tel Sheffield 303030.
Sheffield (Association of Sheffield ARCs)—Mondays, 7.45pm (first Monday in month, during term). This group meets to bring together the smaller clubs in the area and to provide a joint newsletter. Details G4CUW, QTHR, tel Sheffield 363927.
Sheffield (ARS)—Third Monday in month, 8pm. Sheaf House Hotel.
Wakefield (W&DARS)—7.30pm. Ines Road School, Wakefield. Sec G3WWF.
York (YARS)—Fridays, 7.30pm (except for third Friday in the month). United Services Clubroom, 61 Micklegate, York. Visitors always welcome. 11 Nov (Talk by a rep from Veroboard Ltd). As a result of Bill Lowe's advert in August *Radio Communication*, we are to have a talk in either February or March 1978. Sec G3WVO.

RR2 wishes everyone "A merry Christmas and happy New Year". Secretaries please note that RR2 is available for visits to clubs in the new year, to talk or lecture, as required.

REGION 3—RR H. S. Pinchin, G3VPE, 61 Cole Bank Road, Hall Green, Birmingham B28 8EZ.

Birmingham (Birmingham University RS)—Every Tuesday during term, 7pm, Students' Union. G3IUB. Sec G4CKK.
Birmingham (Midland ARS)—6 Dec and 10 Jan (Construction and club station), 7pm. Brasshouse Centre, off Broad Street, Birmingham. 22 Nov (Lecture), 13 Dec (Christmas party). 8pm. Room 110, University of Aston, Gosta Green, Birmingham. G3ZKQ.
Birmingham (Slade RS)—11 Nov (Discussion on the Leicester exhibition), 25 Nov (AGM), 9 Dec (Discussion—"Home brew versus commercial equipment"), 23 Dec (No meeting), 6 Jan. 8pm. The Committee Room, Church House, Erdington, Birmingham. G4FGF.
Birmingham (South Birmingham RS)—Thursdays (HF night on the air), 7.30pm. Fridays (Construction and morse classes), 7.30pm. 7 Dec (Christmas social), 4 Jan (Surplus sale). 8pm. Hampstead House, Fairfax Road, West Heath, Birmingham, B31 3QY. G8KPA.
Bromsgrove (B&DARC)—11 Nov (Raynet), 9 Dec (Cheese and wine social evening). 8pm, Avoncroft Art Centre, Bromsgrove. G4GBE (G8JTK, QTHR).
Burton-on-Trent (BonT&DARS)—Wednesdays, 7.30pm. Stapenhill Institute, Burton-on-Trent. G3ACR. New members welcome.
Cannock Chase (CCARS)—First Thursday in each month (Business meeting), other Thursdays (HF and vhf club stations, natter-nites, morse classes, talks etc). 9pm, Bridgtown Social Club, Walsall Road, Cannock. G4CHI. Visitors welcome.
Coventry (CARS)—11 Nov (Night on the air), 18 Nov (Demonstration by Lowe Electronics), 25 Nov ("IARU"), 2 Dec (Night on the air), 9 Dec (Members' slide show), 16 Dec (Social evening—see sec), 23 Dec (No meeting), 30 Dec (No meeting), 6 Jan. 8pm, Baden Powell House, 121 St. Nicholas Street, Radford, Coventry. G8DMI.
Coventry Technical College (CTCARS)—Mondays and Thursdays, 7pm. Winfray Annexe of the College. G8ISJ.
Coventry (University of Warwick ARS)—Wednesdays during term. Talk-in on S20. 7pm. Cryfield Farm, University of Warwick, Coventry. Vice-president G8MIA.
Hereford (HARS)—First and third Fridays in each month. 8pm, Civil Defence HQ, Gaol Street, Hereford. G4CNY.
Lichfield (LARS)—First Monday and third Tuesday in each month. 8pm, Swan Hotel. Tuesday meetings are natter-nites. New members and swls welcome. Sunday net noon, 21·150MHz. Sec Ted Bowen, RS33003, tel Tamworth 68756.
Lichfield (Chad RC)—Alternate Wednesdays, commencing 9 Nov. 8pm, The Naval Club, Burton Old Road, Lichfield. G4ESK.
Mid-Warwickshire (MWARS)—7 Nov (TV cameras and monitors), 21 Nov ("Shortwave contests and awards" by Syd Smith, RS18612), 28 Nov (Open meeting), 5 Dec (Tape and slide presentation), 19 Dec (Christmas party), 2 Jan (No meeting). 8pm, 61 Emscote Road, Warwick. G8CXL.
Redditch (RRC)—Second and fourth Thursdays in each month, 8pm. WRVS Centre. Salop Road, Redditch. G3EVT.
Shrewsbury (Salop ARS)—Thursdays, 7.30pm. New members welcome. The Albert Hotel, Smithfield Road, Shrewsbury. Joint secs Bob Carter, 11 Ash Close, Sutton Farm, Shrewsbury SY2 6HU, and Dave Doody, 56 Ellesmere Road, Shrewsbury SY1 2QP.
Solihull (SARS)—15 Nov, 20 Dec. 7.30pm, The Manor House, High Street, Solihull. G4EQF.
Stoke-on-Trent (S-on-TARS)—Thursdays, 7.30pm. 2A Racecourse Road, Oakhill, Stoke-on-Trent. G4CWN.
Stoke-on-Trent (North Staffs ARS)—First and third Mondays in each month—lectures etc. Second, fourth and fifth Mondays in each month—natter nites, Raynet and club station G4BEM. Newcomers welcome. 7.30pm. Harold Clowes Community Centre, off Dawlish Drive, Bentilee, Stoke-on-Trent. G3YBY.
Stourbridge (StARS)—Informals on the first Tuesday in each month. 9pm, "Shrubbery Cottage" public house, Heath Lane, Oldswinford, Stourbridge. 21 Nov (TV demonstration by Brian Kennedy, G3ZUL), 19 Dec (Surplus sale). 7.45 pm, Longlands School, Brook Street, Stourbridge. G4CLX.
Stratford-upon-Avon (S-upon-A&DARC)—Meetings will be arranged in Nov and Dec (dates to be decided) at the Youth Hostel, Alveston. G4EXR, tel Stratford 5638. New members welcome.
Sutton Coldfield (SCRS)—Second and fourth Mondays in each month, 7.30pm. Central Youth HQ, Clifton Road, Sutton Coldfield. Sec Mrs Liz Furness, 4 Goodere Drive, Polesworth, Tamworth, Staffs B78 1BZ.
Tamworth (TARS)—Second and fourth Mondays in each month. Indoor Sports Centre, Corporation Street, Tamworth. New members welcome. G4EUF.
Telford (T&DARS)—9 Nov (Surplus sale), 16 Nov ("Amateur television" by G8DIR), 23 Nov (Club project starts), 30 Nov ("Another solid state device" by G8FSV), 7 Dec (Night on the air), 14, 21, 28 Dec (Check with sec), 4 Jan. 7.30pm, Phoenix Centre, Webb Crescent, Dawley. G8MXS, tel Much Wenlock 357. Visitors welcome.
Willenhall (W&DARS)—Alternate Wednesdays. Morse classes available at the end of each meeting. "The Three Crowns", Stafford Street, Willenhall. G3YHN xyl.
Wolverhampton (WARS)—14 Nov (Natter nite), 21 Nov (Surplus sale), 5 Dec ("RSGB" by G3VPE), 12 Dec (Natter nite), 19 Dec (Social evening—see sec), 26 Dec (No meeting), 2 Jan (No meeting), 9 Jan ("The 1977 ARRL National Convention, Toronto" by G4BTE and G4DGM). 8pm, Neachells Cottage, Danescourt Road, Stockwell End, Tettenhall, Wolverhampton WV9 9PH. G8EDG.
Worcester (W&DARC)—7 Nov, 5 Dec, 2 Jan. 8pm, The Old Pheasant, New Street, Worcester. G3TQD.

REGION 4—RR T. Darn, G3FGY, Sandham Lane, Ripley, Derbys.

Derby (DADARS)—Wednesdays, 7.30pm. 119 Green Lane, Derby. Morse classes every Tuesday and Friday, 7pm, when arranged.
Derby (NHARG)—Fridays, 7.30pm. Nunsfield House, Boulton Lane, Alvaston, Derby. 11 Nov (Derby repeater GB3DY), 18 Nov (Surplus sale), 28 Nov (Electronic components for the '80s), 2 Dec (Technical film show), 9 Dec ("The Silent Teletype "by G3TVU), 16 Dec (Year in Retrospect), 23 Dec (Night on the air/Scoial evening), 30 Dec (Quiz). G4CTZ.
Grimsby (GARC)—First and third Thursdays of each month. 8pm, Alexandra Club, Cleethorpes. 17 Nov (Video Tape Show by G3FGY).
Leicester (LRS)—Mondays, 7.30pm. Club House, Gilross Estate Cottage, off Groby Road, Leicester. By the time you read this the Leicester uhf repeater should be in operation on RB4. Details from G8CAC. Leicester Raynet Group meets on the second Thursday of each month at County Hall, Glenfield, 7pm. G8CAC.
Mansfield (MARS)—First Friday in each month, 7.30pm. "The New Inn", Westgate, Mansfield.
Melton Mowbray (MMARS)—7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray.
Nottingham (ARCON)—Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham.
Nottingham University (NURS)—Alternate Thursdays during term-time. Details from Roger Dixon c/o Students' Union, or QTHR.

REGION 5—RR P. F. Chilcott, G4BBA, 258 Coneygree Road, Peterborough PE2 8LR.

Bedford (B&DARC)—New shack! New night! Wednesdays at an exclusive shack in Ravensden. Further details from GB3BD, G4FEV on Bedford 64148, or G4FNS on Bedford 54074.
Cambridge (C&DARC)—Fridays, 7.30pm. Corporation Yard, Victoria Road. Sec G4BAO.

Cambridge (CUWS)—Tuesdays during term. Christ's College. Sec G4DZY.
Corby (CTCARG)—Mondays, 7.30pm. Corby Technical College. Clubhouse and GB3CI in grounds.
Dunstable (DDRC)—18 Nov (Quiz night, team contest), 2 Dec (DF receiver design), 9 Dec ("One minute please"), 16 Dec (Christmas party). Fridays, 8pm. Chews House, 77 High Street South. Sec G3HJF.
March (M&DRAS)—Tuesdays, 7.30pm. 2 Grays Lane. Sec G8GNE.
Northampton (NRC)—Thursdays, 8pm. Spencer Dallington Community Centre, Tintern Avenue, off Gladstone Road. Sec G8LHR.
Peterborough (GPARC)—24 Nov ("More use of components" by G8BSO). 7.30pm, Southfields School. Sec G4BBA, tel 65213.
Peterborough (PR&ES)—Third Friday each month. 7.30pm, Scout Hut, Occupation Road. Sec G3EEL.
Shefford (S&DARS)—Thursdays, 8pm. Church Hall. Sec G8HHO.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 7EA.

Banbury (BARS)—Fridays, 7.30pm. 43 North Bar, Banbury. New members and visitors welcome. Sec S. L. Terry, tel Banbury 4769.
Bracknell (BARC)—Mondays, 8pm. Coopers Hill Centre (adjacent to station). 24 Oct (tba), 7 Nov (Film night). Other Mondays, cw classes. Sec G3YMC.
Burnham Beeches (BBRC)—First Monday in each month, 8pm. Hedgerly Scout HQ. Sec Peter Flynn, tel Farnham Common 2609.
High Wycombe (Chiltern ARC)—Fourth Wednesday in each month. 8pm, 42 Castle Street, High Wycombe. Sec G4FRL, tel Kingston Blount 52006. New members welcome.
Maidenhead (M&DARC)—18 Oct ("GB3SN" by UK FM Group). 8pm, Red Cross Hall, The Crescent, Maidenhead.
Milton Keynes—for next meeting please ring sec G3THC, tel Milton Keynes 316730.
Newbury (N&DARS)—First Monday in each month, 7.30pm. Newbury College of Further Education, Oxford Road, Newbury. Sec G4EEE.
Oxford (O&DARS)—Second and fourth Wednesdays in each month, 7.30pm. Civil Service Sports Club, Marston Road, Oxford. Visitors welcome. Sec G4BHR.
Oxford University (OURS)—Please contact sec M. Evans, G8LTE, Worcester College, Oxford, for meeting details.
Reading (RARC)—Please contact sec G4CCC, for details of next meeting.

RR6. If you hear me "on the air", please call, or ring Penn 4240.

REGION 7—RR N. A. Smith, G3HFO, 7 The Byeways, Surbiton, Surrey, KT5 8HT.

Addiscombe (AARC)—Tuesdays, 9pm, "Spreadeagle", Portland Road, Woodside. Sec G3SJX.
Ashford (Echelford ARS)—Second Monday and last Thursday of every month. 7.30 for 8pm, The Hall, St. Martin's Court, Kingston Crescent, Ashford, Middx. Sec G3TDR, tel Staines 56513.
Bexley Heath (North Kent RS)—Second and fourth Thursdays, 8pm. St Mary's Institute, 2 North Cray Road, Bexley. Sec G4ARQ.
Coulsdon (CATS)—First Thursday in each month, 7.30 for 8pm. 10th Purley Scout Hall, Chipstead Valley Road, Coulsdon. Third Monday in each month, 7.30 for 8pm. 1st Purley Scout Hall, Purley Park Road, Purley. Sec G4DLD, tel Burgh Heath 59956.
Cray Valley (CVRS)—First and third Thursdays, 8pm. Eltham United Reformed Church Hall, 1 Court Road, London SE9. 17 Nov ("Simple wire aerials", G6LX Ron Glashier). The club is now a limited company. From January 1978 meetings will be at Christchurch Centre, High Street, Eltham, London SE9. Sec G3YWO.
Croydon (Surrey Radio Contact Club)—First and third Wednesdays in each month, 7.30 for 8pm. TS "Terra Nova", 34 The Waldrons, Croydon. Sec G3FWR, tel 01-657 3258.
Crystal Palace (CP&DRS)—Third Saturday in each month, 7.30pm. Emmanuel Church Hall, Barry Road, London SE22. Sec G4AVV, tel 01-653 4340.
Guildford (G&DRS)—Second and fourth Fridays in each month. Model Engineers HQ, Stoke Park, Guildford. Sec G4BHQ, tel Guildford 76375.
Kingston (K&DARS)—Second Wednesday in each month, 8.15pm. Berrylands Scouts and Guides HQ, Stirling Walk, Raeburn Avenue, Surbiton. Sec G4APG.
New Cross (Clifton ARS)—Fridays, 8pm. 225 New Cross Road, London SE14. Details from R. A. Hinton, 42 Sutcliffe Road, Welling.
Reigate (RATS)—First Tuesday in each month, 8pm (Natter nights). Marquis of Granby, Hooley Lane, Redhill. Third Tuesday in each month, 8pm. Constitutional Centre, Warwick Road, Redhill. Sec G3XSZ.
Sutton and Cheam (S&CRS)—Meetings at Sutton College of Liberal Arts, Cheam Road, Sutton and at Ray's Social Club, London Road, North Cheam. Details from Sec G2DMR.
Thames Ditton (Thames Valley ARTS)—6 Dec (To be announced), 3 Jan (AGM), 7 Feb (Junk sale). 8pm, Giggs Hill Green Library, Giggs Hill Road, Thames Ditton. Sec G3ZNW.
Wimbledon (W&DRAS)—Second and last Fridays in each month, 8pm. St John Ambulance HQ, 124 Kingston Road, Wimbledon SW19. Sec G3XTC, tel 01-644 3968.

Affiliated society representatives met on 15 September in preparation for the Regional Representatives Conference on 24 September. The RR was informed of views within the region, which he put forward to the conference and is pursuing in other ways. The next meeting was arranged for 12 January 1978.

REGION 8—RR D. N. T. Williams, G3MDO, "Seletar", New House Lane, Thanington, Canterbury, Kent.

Brighton (B&DRS)—9 Nov ("Solar Spectroscopy" by Comdr. H. Hatfield), 23 Nov (AGM), 7 Dec (Film evening), 21 Dec (Christmas party). Details of future events from hon sec G8JFT.
Burgess Hill (Mid-Sussex ARS)—7.45pm, Marle Place, Burgess Hill. Details from G3PEQ.
Canterbury (East Kent RS)—1 Dec (Cheese and Wine). Details from G8GHH, QTHR.
Chichester (C&DARC)—First Tuesday and third Thursday in each month. Lancastrian Boys School. Details from G4ETU, tel 0243 88069.
Crawley (CARC)—United Reform Church Hall, Ifield, Crawley. Details from G3MGL.
Dartford (DHDFC)—Second Friday in each month. Scout House, Broomfield, Dartford. Details from Jeanette Maggs, 25 Leybridge Court, Eltham Road, Lee SE12.
Dover (South East Kent YMCA ARC)—9 Nov (Project discussion and decision), 16 Nov ("Getting started on HF" by G3OWQ), 23 Nov (HF/VHF and natternight), 30 Nov ("Gone West" by G8NY, on his visit to the USA), 7 Dec (Project progress), 14 Dec ("Ham interference on cable television" by G8LKS), 21 Dec (Construction contest), 28 Dec (Natternite, QSY local). Details from G8KEN, 14 Victoria Road, Capel-le-Ferne, Folkestone.
Eastbourne (Southdown ARS)—7 Nov (Homebrew gear demonstration and possible liaison with Eastbourne Model Flying Club), 5 Dec (AGM). Details from sec G8CVV, pro G3LFZ.
Gravesend (GRSGBG)—Mondays, 7.30pm. The Windmill Tavern, Shrubbery Road, Gravesend.
Hastings (HERC)/(ITT(H)S&AC)—Details of future events for both units from G8DNO.
Horsham (HARC)—First Wednesday in each month. Civil Defence HQ, Moons Lane, Brighton Road, Horsham. Details of future events from G3NPF.
Maidstone (MYMCAARS)—First and third Fridays devoted to the beginner, RAE and morse tuition, 7.30pm. Alternate Fridays, wide range of lectures and use of club shack, Melrose Close, Loose. Details from Harry Poppy G8KMX, tel Maidstone 61792.
Medway (MARTS)—Fridays, 7.30pm. Aurora Hotel, Gillingham. Details from P. J. Poole G4EVY, 5 River Drive, Strood, Rochester, Kent.
Ramsgate (Kent Coast ARC)—Details of meetings from G4DTA, QTHR.
Tunbridge Wells (East Kent ARC)—Details of events from G8LMV.
Worthing (W&DARC)—Tuesdays, 8pm. Adult Education Centre, Union Place, Worthing. Details from P. J. Robinson G8MSQ.
Kent Repeater Group—Details of membership from G3XDV, 5 Lambs Walk, Whitstable, Kent.
Sussex Repeater Group—Information from G8HVV.

REGION 9—RR H. W. Leonard, G4UZ, 4 Start Bay Park, Strete, Dartmouth TQ6 0RY.

Camborne (Cornish RAC)—1 Dec (Social evening and film show), 5 Jan (Marconi 75th anniversary—co-ordinated by G3VWK). 7.30pm. SWEB Clubroom, Pool, Camborne. Cornish net each weekday, 10am on 3·715MHz and on Sundays, 11am on 3·692MHz. Details from G3NKE, tel Camborne 712419. Visitors welcome to club meetings.

Exeter (EARS)—Second Monday in each month, 7.30pm. Community Centre, St Davids Hill, Exeter. Details from G3HMY.
Newquay (N&DARS)—Alternate Wednesdays, 7.45pm. Treviglas School, Newquay. Details from G8GOR, tel Newquay 4168.
North Devon (NDRC)—Second Wednesday in each month at QTH of G4CG, fourth Wednesday at QTH of G2FKO. Full details from G4CG.
Plymouth (PRC)—First and third Tuesdays in each month. 7.30pm. Virginia House, Bretonside, Plymouth. Visitors most welcome. G4EJO.
Saltash (S&DARC)—First and third Fridays in each month. 2 Dec ("There and back again" by G4CDU), 16 Dec ("Wine making at home", with samples, by G4UZ). 7.30pm. Burraton TOC-H Hall, Saltash. Sec G8LLR, tel Plymouth 771135.
Torbay (TARS)—Every Friday with special meeting on last Saturday of each month. 26 Nov ("Marine biology"), 10 Dec (Christmas party at Newton Abbot Community Centre), 31 Dec (No meeting).

REGION 10—RR R. G. Barrett, GW8HEZ, 23 Carshalton Road, Beddau, Pontypridd, Glam.
Barry (BCoERS)—Thursdays, 8pm. Barry Rugby Football Club, Reservoir Road, Barry. Details from sec GW3VBP.
Blackwood (BARS)—Fridays, 7pm. Oakdale Community Centre, Oakdale, near Blackwood. Details from sec GW3KYA.
Bridgend (Glamorgan VHF/UHF Group)—Second Wednesday in each month, 7.30pm. NCB Social Club, Tondu, near Bridgend. Details from sec GW8HEZ.
Cardiff (CRSGB)—Second Monday each month. 7.30pm, The Pantmawr Inn, Pantmawr Estate, Cardiff. Details from sec GW3VOW.
Merthyr (Hoover ARS)—Mondays, 7.30pm. Hoover Social Club, Pentrebach, Merthyr. 25 Nov (Social evening), refreshments provided. Details from GW3RNC.
Newport (NARC)—Mondays, 7pm. Adult Educational Settlement, Brynglas Road, Newport. Details from sec, GW8MER.
Pembroke (PRSGBG)—Last Friday in each month, 7.30pm. Defensible Barracks, Pembroke Dock, Dyfed. Details from sec GW3XJQ.
Pontypool (PRSGBG)—Tuesdays, 7pm. Education Settlement, Park Hill Road, Pontypool. Details from GW3JBH.
Port Talbot (British Steel Corporation ARS)—Thursdays, 7.30pm. BSC Sports and Social Club, Margam. Details from GW4ESV.
Rhondda (RARS)—Every other Thursday, 7.20pm. Transport Employees' Club, Porth. Details from GW3PHH.
Sully (S&DSWC)—Mondays, fortnightly, 7pm. Sully Bowls and Social Club, 58 South Road, Sully. Details from sec GW8JHF.
Swansea (SARC)—Tuesdays fortnightly, 8pm. The Commercial Inn, Killay. Details from sec GW8CMA, QTHR.

REGION 11—RR P. H. Hudson, GW3IEQ, "Silhill", Dinas Dinile, Caernarvon LL54 5TW.
Rhyl (R&DARC)—It is regretted that this club has been closed until further notice.
Conway Valley (CVARC)—Second Thursday in each month. The Quaries, Llandulas, Colwyn Bay.
Bangor (UCNWARS)—Thursdays, 7.30pm. School of Engineering Science, Dean Street, Bangor. Prospective members please contact the sec.

REGION 12—RR F. Hall, GM8BZX, 45 Priory Cottages, Lunanhead, Forfar, Angus, DD8 3NR.
Aberdeen (ARS)—Fridays. Cowdray Club, 5 Fonthill Road, Aberdeen. Sec, GM4BKV.
Dundee (Kingsway Technical College ARC)—Wednesdays, 6.30pm. Kingsway Technical College. Talks are being arranged. Information from sec, Robert Officer, 17 Broomwell Gardens, Monikie, Broughty Ferry, Dundee, DD5 3QP.
Inverness (Technical College ARC)—Every second Wednesday, 6.45pm. Room C30, Inverness Technical College. Winter programme is being arranged. Sec, John Reid, 37 MacEwen Drive, Inverness.
Lerwick (ARC)—Wednesday evenings at Annsbrae House, Lerwick. Sec GM3HTH.
Moray Firth (MFARS)—Wednesdays, 7.30pm. Elgin Technical College. Sec GM8LVG.
Perth (P & DARG)—Details from sec, GM4DQJ.

The Highland area representative wishes to resign due to moving house. RR12 wishes to thank GM3ZDH for his services, and would like to hear from any member willing to act as representative for the Highlands area.

REGION 13—RR A. B. Givens, GM3YOR, 41 Veronica Crescent Kirkcaldy, Fife KY1 2LH.
Berwick upon Tweed (Border ARS)—First and third Fridays in each month, 7.30pm. Roxburgh Hotel, Berwick upon Tweed. Details from GM8IIO.
Dunfermline (DARS)—Second Wednesday in each month, 7.30pm. CCTV Studio, Pittencreiff School, Maitland Street, Dunfermline. Details GM3MGX, tel Limekilns 313.
Edinburgh (E&DARC)—Tuesdays, 7.30pm. City Observatory, Carlton Hill, Edinburgh. Details from GM4BWT, tel 031-668 1119.
Edinburgh (Leith Nautical College ARC)—First and third Thursdays in each month. 7.30pm, Leith Nautical College, 59 Commercial Street, Leith, Edinburgh 6.
Edinburgh (Lothians RS)—Second and fourth Thursdays in each month, 7.30pm. Adult Education Centre, Riddles Court, High Street, Edinburgh. Details from GM4BYF, tel 031-447 3201.
Glenrothes (G&DARC)—First Sunday and every Wednesday in each month. Old Nursery School, Provosts Land, Douglas Road, Leslie, Fife. Details, GM3YOR, tel Kirkcaldy 200335. Annual "Open Night" to be held in the Laurel Bank Hotel, Markinch, Fife, on Wednesday 23 Nov. 7.30pm. Refreshments will be served at a small charge. All amateurs SWL's and friends are invited. Please advise GM3YOR so that catering arrangements can be made.

Area representatives: Lothians, J. McVicar GM8GEC, tel 031 665 2420; Fife, D. Dalrymple, GM3OLK; Borders, position vacant.

REGION 14—RR I. McKechnie, GM8DOX, 41 Westerlea Drive, Bridge of Allan, Stirlingshire FK9 4DQ.
Motherwell (Mid-Lanark ARS)—4 Nov ("Avionics" by GM3CLX), 18 Nov ("Oscar" by GM8BKE), 2 Dec (Constructors competition, GM3HBT), 16 Dec (QRP, GM3OXX), 23 Dec (Film night, GM3ULP). Wrangholm Hall, Jerviston Street, New Stevenston, Motherwell ML1 4UQ. Sec GM4AUP.

REGION 15—RR H. J. Campbell, 26 Kilcoole Park, Belfast BT14 8LB.
Ballymena (BRC)—Tuesdays, 8pm, (RAE and morse classes), 86 Old Cullybackey Road, Ballymena. Fridays (club night), Sundays 3pm. (special projects). Sec GI8LSF.
Bangor (B&DARS)—First Friday in each month, 8pm. Redcliff Hotel, Seacliff Road, Bangor. Interesting winter programme. Sec GI4AAM, 14 Manse Road, Bangor.
Belfast (QUoBRC)—Tuesdays, 8pm. Queen's University Radio Club, 37 Fitzwilliam Street, Belfast.
Belfast (CoBYMCARC)—Saturday mornings in new premises, 4th Floor, YMCA, 12 Wellington Place, Belfast. Sec GI8MQR. New members welcome.
Belfast (BRSGBG)—Third Wednesday in each month, 8pm. 90 Belmont Road, Belfast. Varied winter programme. Details from GI8FOK.
Carrickfergus (CYMCARC)—Second Wednesday in each month, 8pm. Carrickfergus YMCA. Sec GI4FUE. New members welcome.
Mid-Ulster RSGB Group—First Sunday in each month at QTH of GI4BAC. Always something interesting. Sec GI3WWY.
North Ulster (NURSGBG)—For details, contact GI3UHL, QTHR.

REGION 16—RR R. E. G. Kendall, G8BNE, "Wesley", Ranworth Road, Hemblington, Blofield, Norwich.
Bury St. Edmunds—New club! Second Monday of each month, 7.30pm. Details from J. Munro, 29 Angel Hill, Bury St. Edmunds.

Chelmsford (CARS)—First Tuesday in each month, 7.30pm. Marconi College, Arbour Lane, Chelmsford. Details from R. Brocks, 30 Rowan Drive, Heybridge, Maldon.
Colchester (CRA)—Wednesdays, 7.30pm. 114 Ipswich Road, Colchester (above Candor Motors). Details from G3YAI.
Great Yarmouth (GYRS)—Last Thursday in each month, 67 Southdown Road, Great Yarmouth. Details from G3NHU.
Harlow (H&DRS)—Tuesdays, 8pm. Mark Hall Barn, First Avenue, Harlow. Details from G3WUX.
Ipswich (IRC)—9 Nov (Informal), 30 Nov ("Aerials" by G8KET), 14 Dec (Informal), Ranelagh Road School, Ipswich.
Loughton (L&DRS)—18 Nov (Informal), 2 Dec ("DX TV" by Peter Lawler, G4CMD and Ted Harrison, G8NPF), 31 Dec (No meeting). 8pm, Loughton Hall, Rectory Lane, Loughton. Details G8DZH QTHR, tel 01-508 3434.
Lowestoft (L&DARC)—Fridays, 7.30pm. Morse class every Tuesday. YMCA, Park Road, Lowestoft.
Martlesham (MRS)—Details, G3ZNU, PO Res Centre.
Norwich (Norfolk ARC)—9 Nov ("Photocopiers" by G3SGS), 16 Nov (CW tuition and committee meeting).
Norwich (U of East Anglia R&EC)—Details from P. Gowen, G3IOR.
Southend (S&DRS)—Fortnightly from 18 Nov. 8pm, Church Hall, Sir Walter Rayleigh Drive, Rayleigh, Essex. Contact hon sec G3YOA, A. R. Adams, 9 Fairland Close, Rayleigh, Essex.
Vange (VARS)—Thursdays, 8pm. Youth Hall, Barstable Tenants' Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

Area representatives are urgently required in the following areas; West Norfolk, West Suffolk, East and West Essex. Nominations (by five RSGB members) to G8BNE, QTHR please.

REGION 17—RR L. Hawkyard, G5HD, 100 Shirley High Street, Southampton, Hants.

Basingstoke (BARC)—First Saturday and third Wednesday in each month, 7.30pm. Chineham House, Popley, Basingstoke. Sec G3CBU.
Basingstoke (UK FM Group, Southern)—7 Dec (tba). Chineham House, Basingstoke. Details from pro G8ECO.
Bournemouth (Wessex ARG)—First and third Fridays in each month, 7.30pm. The Dolphin Hotel (club room), Holdenhurst Road, Bournemouth. Sec G. Cole, G4EMN, tel Bournemouth 20027.
Chippenham (C&DARC)—Tuesdays, 7.30pm. Sheldon School, Hardenhuish Lane, Chippenham. Sec G8BXG.
Fareham (F&DARC)—Wednesdays, 7.30pm. Porchester Community Centre, Room 9. Sec D. Thompson, tel Fareham 2799.
Farnborough (F&DRS)—Second and fourth Wednesdays in each month, 7.30pm. Railway Enthusiasts' Club, Access Road, off Hawley Lane, Farnborough. Sec G4FEA.
Guernsey (GRES)—Tuesdays and Fridays, 8pm. Details from sec GU8ITE, PO Box 100, Guernsey.
Horndean (H&DARC)—Second Thursday in each month, 7.30pm. Merchiston Hall, Horndean. Net Sundays 6.30pm. 21·40MHz. Sec G4CHO.
Jersey (JARS)—Sundays, 10.30am, and Fridays, 8pm. Le Hocq Tower, St Clement, Jersey. Sec Mary McTaggart, 19 Parade Road, St Helier.
Poole (PRAS)—Last Friday in each month, 7.30pm. Poole Technical College. Sec Graham Tizzard, tel Poole 4641 ext 34.
Portsmouth (P&DRC)—Wednesdays, 7.30pm. Portsmouth Community Centre, Malins Road, Buckland, Portsmouth. G3CNO.
Salisbury (SR&ES)—Tuesdays, 7.30pm. Salisbury Activity Centre, Wilton Road. Sec G3FIX.
Southampton University (SUARC)—Tuesday evenings. Also informal meetings every lunchtime in the clubroom, Old Union Building. Sec D. Price, G4BIX, Chemistry Dept.
Southampton (SRSGBG)—Second Saturday in each month, Lanchester Building, Southampton University; Wednesdays, the clubroom, Kent Road; both at 7.30pm. AR G4COM.
South Dorset (SDRS)—7.30pm. Lecture Hall, South Dorset Technical College, Newstead Road, Weymouth. Details from G3YWG.
Swindon (SD&ARC)—Alternate Wednesdays, 7.45pm. Clubroom above Coldharbour Public House, Blunsdon, just north of Swindon. Sec G8KWC.
Winchester (WARC)—First and third Fridays in each month, 7.30pm. Antrim House, St Cross Road, Winchester. G4BKE.

REGION 18—RR P. J. Fay, 5 Harland Way, The Glebe, Washington, Tyne & Wear.

Durham (DUARS)—Alternate Wednesdays during term. Physics Dept, Durham University. All local amateurs are welcome to join. Talk-in by G4DUR on R5 or S20 before all meetings.
Easington (AR&EC)—Tuesdays and Thursdays, 7.30pm. Easington Village Workmen's Club. RAE and morse tuition if required (the club has a good RAE pass record). ATV can be received on 625 lines. The club is now equipped with an hf transceiver as well as other gear. Sec G4COI.
Great Lumley (AR&ES)—Alternate Wednesdays, 7.30pm. Great Lumley Community Centre. Assistance with RAE and morse if required. All amateurs and SWLs welcome. Sec G8JLQ.
Hartlepool (HRC)—Mondays, 7.30pm. Methodist Church Hall, Grange Road. Sec G3NWU, 73 Eamont Gardens, Hartlepool.
Middlesbrough (POARC)—Sec G8CDP, 48 Grange Road, Hartlepool, Cleveland.
Morpeth (Northumbria RC)—Now meets Thursdays, British Legion premises, Gambois, near Blyth. Sec G4AVO.
Newcastle on Tyne (Tyne & Wear Repeater Group)—First Wednesday in each month. Arts Common Room, University of Newcastle. Open to all amateurs and SWLs. John Thexton G3URE, has resigned, so the secretary is now Fred Signey, G4DOB, 264 Silver Lonnon, Newcastle on Tyne, NE5 2HJ. Tel Newcastle 744444.
South Shields (SS&DRS)—Fridays, 7.30pm. Trinity House. Old and new members welcome. Sec G8BQF, 67 Lauderdale Avenue.
Middlesbrough (Teesside Repeater Group)—Last Tuesday each month, 7.30pm. 196 Marton Road, Middlesbrough, Cleveland. All amateurs and SWLs invited but first contact sec Mrs Pauline Bland, G8MBK, 5 Belgrave Drive, Normanby, Middlesbrough, Cleveland.
Tyneside (TRS)—Mondays, 8pm. The Community Centre, Vine Street, Wallsend. Sec Alex Frazer, 35 Percy Street, Tynemouth.

Slow morse—Tom Luxmore G3AWL will shortly commence slow morse transmissions on 144·210MHz, at 2200-2230 on Tuesdays and Fridays, to give increasing practise to the large number of SWLs and G8-plus-threes in the region.

REGION 19—RR (Post vacant)

Acton, Brentford & Chiswick (ABCRC)—15 Nov (Report on MCC Contest), 20 Dec (2m SSB by G3IGM). 7.30pm, Chiswick Trade & Social Club, 66 High Road, Chiswick. Sec G3GEH, tel 01-922 3778.
Barking (BR&ES)—Mondays (Construction), Wednesdays (CCTV techniques), Thursdays (Informal). Morse classes Tuesdays. 7.30pm. Westbury Recreation Centre, Westbury School, Ripple Road, Barking, Essex. Sec N. Dowsett, 44 St Anne's, Barking.
Cheshunt (CDRC)—New premises—Church Room, Church Lane, Wormley, Herts. Wednesdays, 8pm.
Chingford (Silverton RC)—Fridays, 7.30pm. Friday Hill House, Simmonds Lane, Chingford E4. Visitors very welcome. Sec G4AJA, tel 01-529 2282.
Ealing (EDARS)—Tuesdays, 8pm. Northfield Community Centre, Northcroft Road, London NW13. Newcomers and old-timers very welcome. Sec M. E. J Cummings, G8KPN, tel 01-997 5947.
East London RSGB Group—20 Nov (Technical film show), 18 Dec (AGM and junk sale). Details from sec J. B. Bundock, G4CJQ, tel 01-524 3169.
Edgware & District RS—10 Nov (Informal), 24 Nov (RAE question session), 8 Dec (Junk sale), 22 Dec (No meeting), 12 Jan (AGM). 8pm, Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Sec G4BZY, tel 01-952 2495.
Harrow (RSH)—4 Nov (Op amps, flip flops and fets), 11 Nov (Informal), 18 Nov (Microprocessor applications by G4AUF), 25 Nov (Bring and buy sale), 1 Dec (Quiz), 8 Dec (Informal), 15 Dec (Christmas celebration) 22 and 29 Dec (No meeting), 6 Jan (Junk sale). Fridays, 8pm. The Roxeth Community Centre, Scott Crescent, West Harrow, Middx. Sec G4FBK, tel 01-864 1412.
Havering (H&DARC)—Wednesdays, 8pm. British Legion Club, Western Road, Romford.
Holloway (Grafton RS)—7.30pm. Holloway Institute, Archway Annexe, Highgate Hill, London N19. Sec G3ZKE.
Ilford RSGB Group—Thursdays, 8pm. 50 Mortlake Road, Ilford. Details from D. T. Sapworth, G3YMW.
Northolt (British Airways European Division ARS)—First Monday in each month. Trident Club, Western Avenue, Northolt, Middlesex. This club is open to non-BA employees by invitation. Contact G3OUF, tel Amersham 21573 for details. Civil Aviation Sunday net at 1100-1200gmt on 3·68MHz, listen for G3NAF or G3BEA.

Regional Representatives' Conference

24 September 1977

This important event was attended by 16 regional representatives, 13 Council members, the general manager, and Mrs H. Allin, who acted as minuting secretary.

The President, Lord Wallace, opened the meeting by welcoming the regional representatives and stressing the importance of close liaison between them and members of Council. The chairman for the conference, G2AMV, echoed the President's welcome and explained that the agenda had been based on domestic matters in view of the consideration of the Society's structure currently being undertaken by the President's Working Party.

The executive vice-president, G3RPE, lead the discussion on the general organization of the Society with particular reference to Council elections and membership of committees. Suggestions from the RRs were noted for consideration by the President and his colleagues. The discussion on the System of Representation was introduced by G3MXJ. He felt that lack of communication was one of the problems within the Scheme of Representation. He praised the newsletter being issued to representatives and thought that it should be used as a basis for two-way discussion. It was agreed that the Scheme of Representation worked very well indeed when those operating it maintained a high level of activity in their duties.

The general manager referred to the location of headquarters and felt strongly that it should be maintained in the country's capital city. Numerous reasons included the close liaison maintained on a day-to-day basis with the Home Office and the £15,000 annual income from the over-counter sale of books etc at Doughty Street.

The chairman then read a paper he had prepared on affiliated societies. From the reactions that followed it became apparent that attitudes to the RSGB differed widely in different parts of the country. GW8NP introduced the controversial subject "Services to non-members" and it was generally accepted that in some areas it was inevitable that the national society must represent the interests of all amateurs whether members or not, eg negotiations with the Home Office and negotiations on a worldwide basis for frequency allocations. It was agreed that the QSL Bureau was among the finest in the world.

The general manager then spoke on the duties and involvement of representatives and the dissemination of information. There was a general feeling that regional representatives would like to have more immediate information. Nevertheless it was accepted that the deliberations of at least some of the committees must inevitably be confidential. The contents of *Radio Communication* were discussed, but G2BVN pointed out that the articles were almost wholly dependent on what was submitted for publication.

G2BVN spoke briefly, but very much to the point, on the prospects for WARC 1979 and about the very considerable preparatory work which was being and had already been undertaken. He also referred to the Society's most gratifying sales of books and plans for future publications. At this stage Mr Ray Eckersley, the Society's book editor, was introduced to the regional representatives.

Under "Any other business" the chairman mentioned several facilities that were available to assist RRs in their duties.

Finally the regional representatives repeated the appreciation expressed by G8BNE in his after-lunch speech for the opportunity to meet Council and air their views. It was said that the success of the meeting would be measured by its results and it was hoped that the event could take place on a more regular basis.

Basil O'Brien, G2AMV
chairman, Membership & Representation Committee

Shelburne (SRC)—Wednesdays 7pm-9pm (Electronics for beginners); Thursdays, 7pm-9pm (Club evenings). Shelburne Youth Centre, Hornsey Road, London N4.
South Kensington (Baden Powell House Scout ARG)—Third Tuesday in each month, 8pm. Baden Powell House, Queensgate, South Kensington.
Southgate (SRC)—Second Thursday in each month, 8pm. The Green, Winchmore Hill, London N21. Sec G4AEZ, tel 01-366 7166.
St. Albans (Verulam ARC)—24 Nov ("RTTY" by representatives of BARTG), 23 Dec (AGM, followed by festivities). Main meetings, 7.30pm, Market Hall, St. Albans. Informal meeting, second Thursday each month, RAFA HQ, Victoria Street. Do not forget 1977 Verulam Contest. 27 Nov, 2m 0900-1300 gmt; 11 Dec, 160m 0900-1300 gmt.
Stevenage (S&DARS)—3 Nov (Junk sale), 17 Nov (QSL Bureau-G3CLP), 1 Dec ("DF receivers" by G4DDX), 4 Dec (144MHz Fixed Contest), 15 Dec (Social), 5 Jan (Phase mod/frequency mod).
UK FM Group (London)—Second Tuesday in each month, 7.30pm for 8pm. Grove Park Hotel, Junction Bolton/Spencer Roads, Grove Park, Chiswick.

Regretfully, because of my recent job transfer to Yorkshire, I must resign as RR19. I would like to thank everyone who has helped me, especially the club secs who have written regularly and made my job easier. To all the clubs who have invited me to visit them, many thanks for their hospitality. D. S. Smith, G4DAX.

REGION 20—RR G. Mather, G3GKA, 8 Hills Close, Keynsham, Bristol.

Bath (B&DRG)—Tuesdays, 8.30pm. The Crypt, Ascension Church, 35a Claude Avenue, Oldfield Park, Bath. Sec N. S. Cridland, Flat 3, 30 Paragon, Bath. BA1 5LY.
Bristol (BARC)—Tuesdays, 7.30pm. The University Settlement, Barton Hill, Bristol 5. Sec G8KGE.
Bristol (Shirehampton ARC)—Fridays, 7.30pm. Twyford House, Shirehampton. New members most welcome. G4BWB.
Bristol (BRSGBG)—28 Nov (Regional rep), 19 Dec (Potted lectures). 7-9.30pm. Small lecture theatre, Queen's Buildings, University Walk, Clifton, Bristol 8. Sec G4FRG.
Cheltenham (CRSGBG)—First Thursday in each month, 8pm. The Old Bakery, Chester Walk, Cheltenham. 1 Sept (The Society President). Sec G3KII.
Gloucester (GARS)—First and third Thursdays in each month. 7.30pm. Chequers Bridge Centre, Painswick Road, Gloucester. Sec G3MA.
Weston-super-Mare (WsMARS)—Second Friday in each month, 7.30pm. Room Lewis M2, Worle School, New Bristol Road, Worle. G3PQE.
Yate (Y&DARC)—First Saturday in each month, 8pm. G3RQN QTH. All welcome, including SWLs. Local chat channel S24, 145·6MHz, 2100 Wednesday and Saturday. Further info from G8LGC.
Yeovil (YARS)—3 Nov (Pre-war amateur radio), 10 Nov (Radio slides), 17 Nov (Members five-minute talks), 24 Nov (SSB), 1 Dec (WAB), 8 Dec (Pulse code modulation), 15 Dec (Sine waves and reactance), 22 Dec (FET characteristics). 7.30pm. Hut 101, Houndstone Camp (three miles W of Yeovil, off A3088, info at main gate). S20 fm talk-in. Sec G3NOF.

Mobile rallies calendar

19 March 1978—White Rose Mobile Rally, Lawnswood School, Leeds. Details from G4DZI.
11 June 1978—Elvaston Castle Mobile Rally. Details later.
23 July 1978—Cornish Mobile Rally, Truro. Details from G3NKE, tel Camborne 712419.

Looking ahead

2 December—RSGB AGM, IEE, Savoy Place, London WC2.

1978

2 April—Northern Radio Societies Association Convention and Exhibition, Belle Vue, Manchester. Details from G8BCG or G4BVE, QTHR.

members' ads

These subsidized flat-rate advertisements are accepted as a service to members of 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* wrapper addressed to the advertiser, as proof of membership, and a remittance by postal order or cheque (stamps not accepted) for 75p for 40 words or less. Excess words must be paid for at the same rate of 75p for 40 words or less. 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

B2 tx/rx Spy set, 12v psu, Tx OK, rx wkg but weak, top band to 20m, 6 tx coils, 7 xtals, £25. 18AVT, £25. G3JPX, QTHR. Tel Canvey Island 63004.

Garrard SL65B chassis, ceramic cartridge, £5. Tad100IC, £1. CFT470C, 50p. Three-gang condenser for 3TDZ rx, £1. 15W 12V high quality modulator for QQVO3-20, £10. Multiplier strip to 2m, from 8 or 12MHz xtal, each on 12in by 3in chassis, £4. G8ACE, QTHR. Tel 0962 69041.

FM14410SA, 2m, 10W/1W, 12ch, 10 fitted, sensitive preamp, super bleep toneburst, mobile mount, £80. *Wanted:* Good solenoid controlled stereo cassette mechanism, at reasonable price. Bill, G8KUF, 43 Lullington Garth, Boreham Wood, Herts.

Eddystone EC10 Mk2 rx, brand new, unused, mains psu included, manual, £145. 4m valve tx, modulator kit, converter 28MHz i.f., 3-el Jaybeam ant, £30. G3HJG, QTHR. Tel 061 748 7585.

Sommerkamp 747 (FTdx560), £250. Yaesu FV400S vfo, £32. Magnum Two, £65. Heathkit HM102 swr wattmeter, £16. Heathkit HM2102 swr wattmeter, £18. Shure mic 444, £9. KW E-Zee match, £10. G3OWY, QTHR. Tel Chester 41600, 6-8pm.

KW 107 antenna match, mint, offers over £65. Will pay carriage. G4GJ, QTHR. Tel 097 66 2965.

Trio 9R59DS communication rx, 0·5 to 30MHz, amateur bandspread, 100kHz and 1MHz xtal calibrator, vgc, £40. G8JTE, QTHR. Tel East Grinstead 22944.

Transistor SPG 19in ISEP shelf, £20. Wayne Kerr vhf admittance bridge 8801, £6. Tektronix square wave scope calibrator/gen type 107, 0·4-1MHz, £20. 2in CrO_2 video tape on NAB reels, £1 each. Sony 2100ACE vtr, £175. G8AYN. Tel West Kingsdown 2577.

IC202 modified for fm xtals to cover 144·0 to 144·4 and 145·3 to 145·7, exc cond, nicads, handbook, etc, multimode, 3W, portable, £150. 4CX250B base, £8. Dave, 5 Ridgeway, Ingatestone, Essex CM4 9AS. Tel Ingatestone 2797.

SSB 2m and 70cm gear, Liner 2 and QM70 70cm transverter, both 10W output, sold tog with 2m rf preamp and audio speech processor, everything as supplied, buyer inspects, £140 ono, comp. G4FAZ, QTHR. Tel 030 57 71053, evenings.

Property of late BRS27761. Sony CRF 230, 23 bands, £180. Braun 1000, £80. Drake R4A, £80. Barlow Wadley XCR30 Mk2, £80. Brookes, 11 West Ridge, Billericay, Essex CM12 9NN.

Technical Associates audio speech compressor, £15. G-whip multimobile antenna 10-20m, comp with basemount, £15. G4DMN, QTHR. Tel 051 336 2386.

FT200, FP200 spare valves inc pa, immaculate, £240. Stolle 2010 rotator, RZ100 ballrace, cable, £40. Jaybeam 2m 8-el Yagi, £7. 2m halo, £1. TE701 noise bridge, £14. 2m hi-Q break, £4. Portable sectional mast, £5. Tel Cheltenham 53178.

SWM 1970-1976 incl, September 1972 missing, many misc issues, £1 per year. Rad Com 1974-1976 incl, some misc issues, £1 per year. Or why. Collect or pay postage. Hill. Tel Poundhill 2641 (Nr Crawley), or 01-588 2345 ext 2089, business.

Trio 7010 2m ssb tx/rx, mint cond, comp with car mount, £150. G4FJO, QTHR. Tel 04895 3664.

FTDX401 tx/rx with FV401 and spkr, Datong clipper, all as new, £340. G3YQA, QTHR. Tel Hull (0482) 811468.

Trio TV502 transverter, as new, bargain at half today's price, only £85 ono. GM3FRZ, QTHR. Tel Aberdeen (0224) 37398.

Heath SW717, gen cov, mint cond, ideal swl, £50. F. Thompson, 12 Pentland Avenue, Moston, Manchester. Tel 681 5053.

Heathkit HW100 5-band tx/rx, exc cond, comp with ac psu, spkr and Shure 201 mic, first class dx station for only £185. G3WY, QTHR. Tel Evesham 45497.

EC10 with mains supply, £50. Asahi swr/rf power meter with chart, £8. Joymatch Mk111 atu, £5. Carriage or collect. G3SFV. Tel Market Harborough 4827.

FT101 Mk2, exc cond, £320 ono. RAE course, £20. Morse records 7BP7, slow scan tube. R. P. Morris, 6 Lilliput Road, Lilliput, Poole, Dorset BH14 8JZ. Tel Bournemouth 707910, evenings or weekends.

350 American valves, tv, audio rf, small pa, line output etc. G3PTV, QTHR. Tel Doncaster 885099.

FT200 plus FP200, vgc, £210. HQ1 Minibeam, £35. AR40 rotator, £30. 8-el Yagi plus 25m (approx) low loss coax (50Ω), £6. BC221 with charts, £10. 20ft mast with stand-off brackets, £10. M. W. Booth, G4DCF, QTHR. Tel Barnsley (0226) 790540.

Liner 2, mint cond, unfitted preamp, boxed, manual, £115. SSM 9MHz xtal filter, ssb gen with home-brew mixers and vfo giving QRP o/p on 2m, £25. 9-el 2m Yagi, £5. Buyers inspect and collect. G8CYT, QTHR.

Rtty UT4, comp double sided pcb, comprising UT4, two clocks (XB6), psus on single 8in by 6in throughplated and drilled glass fibre board, £19.50, post paid, delivery three to four weeks. G3RDG, QTHR. Tel 01-455 8831.

Rtty power equipment paper winder with ball and bail, suitable for all Creed sevens, £16. Creed 7P/N3, known as the perforator 45, £16. Xtal controlled AFSK oscillator, old tones, narrow shift, accurate to ±0·1Hz, self powered, metal case, £20. All items carriage extra by arrangement. G3RDG, QTHR. Tel 01-455 8831.

PSU, stabilized and protected, 28V 20A, buyer collects. Virtually new 4CX250B valves and vhf bases, £8 (4 off). New 4CX250B valves, £6 (4 off). QQVO640A and PTFE base new, £7 (3 off). QQVO7-50A and base, £8.50 (1 off). 12V 5AH nicads, £6 (2 off). 13·8V 1·2AH, suitable for Pocketphones, £2.50 (3 off). G8BSR. Tel 0952 460096.

Honda C90 with carrier and white panniers, 3000 miles only, vgc and well looked after, £150. Or prefer exch with cash for FT101. Would consider full range FT200, clean cond. Also require KW E-Zee match. G8CEW, 7 Gaisford Road, Worthing. Tel 208405.

Hudson AM109 base stn, 40W, tuned close to 4m with cct, £10. AM108 boot mount mobiles, sw, manual, retuning info, control box, cables, etc, £7 each. G3TPO, QTHR. Tel 01-699 9660.

Pye Bantem AM/HB, £50. Pye AM/HB, £50. Storno CQP 532 LB. £70. Few incomp, £25. *Wanted:* Bantem FM/HB. GU3HKV, QTHR, Tel 0481 47278, 6 to 7pm.

Plessey ICs SL612c, £1.35. SL640c, SL641c, £1.95 (all with holders). RCA CA3020A with heatsink, £1.60. Kokusai filter MF455-10AZ with 453·5 xtal, £11.75. All brand new, unused. G3MI, QTHR. Tel Chesham 3990.

Two pairs, Pye Pocketfones PF1, xtaled, wkg on 433·2MHz, £30 per pair. Spare set of nicads for above, £5. Walters, G8JGF, QTHR. Tel Leabrooks 2623, 9am-5pm, Ripley (Derbys) 810280, after 6pm.

Yaesu YD844 desk mic, unused gift, £12. G2AKR, QTHR. Tel 061-973 0395.

FR50B, incl top band, vgc, £65 ono. G2DAF tx, needs some xtals, incl filter, wkg on 80 and 20m, £22.50 ono. Heathkit DX100V 100W a.m./cw tx, no pa valves, £15 ono. Going tx/rx. G4EIK, QTHR. Tel Great Chesterford 718.

Heath, wired and tested, hardly used, IM-25 fet, bench vom, £75. SB634 stn console, £160. SB604 spkr for SB104, £25. HM2103 KW dummy load wattmeter, £75. All prices ono. G5BPF. Tel Bicester 43624 or Upper Heyford 2463.

Property of silent key, Yaesu Musen FRDX400 rx, FLDX400 tx combination, rx fitted, 2m, mint, as pair £345 ono. Buyer collects. Apply first instance, G2AIA, QTHR.

Microprocessor F8 by Mostek with 1k ram, 1k rom, 20mA tty interface, 3 parallel ports, £85 ono. S100 (Altair/Imsai) motherboard,

£45. 32k bits (4k × 8) ram boards for S100, £85. Other misc items. Tel Stirling 70126, evenings.

Multi-Elmac rx, suitable mobile 12V broadcast band down to 10m a.m. ssb, with 12V psu and spkr, £40. HT dc gen 12V/400V, £5. G5SN, QTHR. Tel Southend 554846.

Equipment of late G3YUG, comprising "Atlanta" rx 240V, all bands to 30MHz, compl with cabinet spkr, KW 2000A tx/rx with psu shure mic, AVO mod 7 needs repairing. Offers invited. G5SN. Tel Southend 554846.

Codar CR70A, one yr old, reasonable offer. Readings, "Kilrush", Philpot Lane, Chobham, Woking.

KVG XF9B filter with xtals, £25. *Wanted:* Manual for Pye Vanguard AM25B, buy or borrow. G4BIE, QTHR.

Eddystone 888A, 2m tx, teleprinter 7, 2m and 70cm converters, 2m and 70cm antennas, mast and rotator, many other items for vhf and rtty. For comp list, send sae. G8ENZ, QTHR. Tel Egham 5737.

Liner 2 with PA3 preamp, original packing, £110. Codar AT5 tx and mains psu, £25. Heath GR110 vhf auto scanning monitor, some xtals, 144-146MHz, 8 ch, £55. You pay carriage or collect. G3MOE, QTHR. Tel Cheltenham 24217, evenings, most weekends.

Trio TR7010, almost new, extra chs fitted, £140. Tower winch, epicyclic geared, with stainless steel wire rope and handle, offers. R216, good wkg order, £50. CR100, working, £15. Jackson. Tel Leeds 503133, daytime, Otley 4164, evenings.

Trio QR666 general coverage rx, fitted fm tuner, immac, full manuals, accessories, £125. 4m Vanguard working 70·26, 70·375, comp mobile set-up, full control gear, mic, spkr, λ/4 whip, full manual, immac, £25. Steve Webb. Tel Crawley 28787, ext 340, wkg hours.

Pye Lynx (auto) tv camera, f1·9 lens, spare vidicon, £35. HB 70cm video tx and ps, £12. HB 70cm a.m. tx, £12. 8in monitor 405/625, manual, £12. Philips LDL 1002 vtr (7in reels) with 4 CrO_2 1/2in tapes little used, £75. G3YQQ, QTHR. Tel 0257 451213.

Trio 7200G fitted S0, S20, S21, S22, R3, R6, R7, SU8 xtal toneburst, SSM rf amp, very sensitive rx, comp with mobile brackets, leads, original box, manual, £130. G4DCQ, QTHR.

Murphy B4OD rx, latest model with B9A and B7G valves, perfect ssb reception, £38. T1154 tx plus R1155 rx (trawler band) original, unmodified, sell or exchange R312-R342 or R348 or why? Warner, 34 Bidwell Hill, Houghton Regis, Dunstable, Beds.

HW32, whole band coverage, cw facility, £45 or exchange JR500. Home built, water-cooled, 144MHz linear, self contained except for eht, £25. *Wanted:* YL1110 vhf tetrodes. Chris Bartram, G4DGU, QTHR. Tel Steventon (023584) 330, early evenings.

KW Atlanta 10-80m ssb, power pack, separate 4A vfo, £230. KW E-Zee match, £20. KW 103 swr and power meter, £12. 52Ω dummy load, £10. Going vhf. Buyer inspects and collects. G3LUG. Tel Silchester 700027, after 7pm.

SC/MP Introkit, keyboard, fully built, £100. TS700 with all xtals, £300. Microwave coax FHJ-4 50Ω, 180ft, approx, offers. G4DAW, 479 Wellingborough Road, Northampton. Tel 714821, anytime.

Tower two section BX1 c/w winches, G/post, £110. Fibre glass poles 12ft long, £3 each. F/S indicator AP679801, £5. Scope Erskine Labs, 13A, £20. Racal counter SA550, c/w handbook, £55. G2FSP, QTHR. Tel Gt Bolas 593.

KW204 160m thru 10m 180W p.e.p. ptt mic, lp filter, spare valves, incl pair 6146B, manual, £130. FRG7 rx, general coverage, all modes, still under guarantee, manual, £130. Or both £250, cash sale. G3BIA, QTHR. Tel 01-377 6705.

Packard 205AG audio gen 110V, £5. ATE FSK2 freq/shift exciter, £6. LB12/600 rebroadcast rx, £5. ATE 6A distortion tester, £6. Three-row 7B keyboard, £2.50. Command rx 190/550kHz, £3. CR100 coilpack, offers. AR88 i.f. bfo audio transformers, offers. Collect. G3DSK, QTHR.

FRG7, five months old, £135. Self-contained homebrew 80/20, 25W, ssb filter, tx, £40. Self-contained linear to match 2XTT21, £20. £50 the pair. To incl intercon leads. HRO B/S coils, £1.50 each. G3GOT, QTHR.

U450 tx, £15 ono. EC10 rx Mk1, £40. Marconi oscilloscope TF2200, manuals, £40. Line strobe selector EMI, £10. QY4-400 valves, £10 each. Balun 50/600Ω, 500W, £12. Creed mod 75R, £20. 7B preforated paper, £5. Cambridge, £25. GW3WEQ. Tel 0978 840018.

TR2200GX, mint cond, fitted S20, S21, R5, 6, 7, nicad batteries, carrying case, mic, few hours only, £125 ono. FR50 BRX, mint cond, 80-10m, with ext spkr, £70. *Wanted:* FT200, FP200, good cond. Morrison, 14 Woodcote Road, Tettenhall, Wolverhampton. Tel 0902 755634.

Trio TR7200G, R5, R6, R7, R0, S20, S22, mint cond, £130. AR40 antenna rotator system, as new, unused, £35. Q412M quad, as new, unused £8. Buyer collects. P. Hough, 20 Vallis Road, Frome, Somerset. Tel 0373 61831, evenings.

FRDX400 160 to 10m plus 2m, exc cond, £125. Russell. Tel Beaconsfield (049 46) 2009, after 7pm.

IC202 2m portable ssb tx/rx, mains psu, £150. AR40 rotator, £20. 8-el Yagi, £7. Gutter mount ⅝ whip, £7. D/load, £5. SNR bridge, £7. RF field indicator, £5. Morse key, £1.50. Class D wavemeter, £4. 4MH 2m a.m./tx, psu, £8. G4DFS. Tel Barnsley 790386.

AR77E gen cov rx, 0·54-31MHz, ham bands bandspread, 2m converter, 28-30MHz i.f., components for mod to 4·5-6·5MHz i.f., £28. Buyer collects, or will deliver Manchester area. Paul Swain. Tel 061-485 7752.

KW2000E, matching spkr/ac psu, Shure 202 mic, manual, £250. No offers. Buyer inspects, tests on all bands and collects. G5VS, QTHR. Tel Maidenhead 25637.

Yaesu FT75, ac and dc psus, FV50B vfo, £165 the lot. Liner 2 with preamp, £115. Trio JR310, good cond, £70. G4ETH, QTHR. Tel Worcester (0905) 840409, evenings.

14ft pole, £2.50. 4ft stub, £1.50. Stolle auto rotator, £27. Stub bearing, £5. 8Y/2M, £4.50. 4/4Y, £4. MBM48, £9. PSUs: 12V 2A, £10; 5V 1A, £7; 5V 50A, £20; 12V 50A, £30. FT620B, a.m. filter, 100W o/p 4m transverter (Feb Rad Com), £320. 70cm transverter, £40. 70cm linear, £50. 12V/700V/250V inverter, £12. Why not ring? Open to negotiation. Chris, G3WOS, QTHR. Tel home, Rugby 890517, work, Bedford 67466 ext 3471.

FT200/FP200 and Liner 2. Offers. *Wanted:* Ledex 6ch unit for Pye AM25B, xtals for same, 100-250MHz frequency meter. Squance. Tel 0232 20864, day, 0247 66256, evenings.

Recent Icom IC240 with mobile mount and all accessories, mint cond, exc rig, £150. Bang and Olufsen 2000 de luxe stereo ¼ track tape recorder, 7in—3¾in—1⅞in. 7in reels, three heads, 3ch mixer, 2 × 8W output, multiplay—echo, etc, good cond, one owner, £75. G3K2X, QTHR. Tel Plumtree 5516.

Icom IC2F, the original Black Box. 6ch inc S0, S20, S22, R6, R7. Mosfet rf stage, improved modulator, new mic, comp with leads and mobile bracket, £39. G4DCQ, QTHR.

Uniden 2020 tx/rx 80-10m, good cond, £340. Barlow Wadley xtal controlled rx XCR-30, fm tuner, £120. Avo 16, £35. Electronic AVO EA113, £55. All equip in good cond. Offers. G3PKQ. Tel 01-558 2928.

Blank QSL cards, one type only, sae for sample, 8p per 10, plus p & p. G4FDC, 41 Wiltshire Way, Tunbridge Wells, Kent TN2 3DD.

Hammarlund HQ170 rx, ham bands 160-6m, £100. 5-stn intercom, £10. Codar PR30 pre-selector, £7.50. No10 calibrator, £5. ZVC ssb with YF90F filter, xtals for 5MHz mixer/phase-lock vfo 40-15-10, £35. Reasonable offers considered. G3XAT, QTHR. Tel Dorking (0306) 86253, after 6pm.

Transverters 21MHz i.f. 6-40A pa, internal psus, 2m, £40. 4m, £35. HF linear, unfinished, internal psu, requires 2 × 4CX250b, £15. 70cm, 46-el, Multibeam, £10. 2m Skybeam, £8. 4m, 4-el, £8. Rad Com 1959 onwards. Buyers collect. Sae sale list. G3ZMD, QTHR. Tel Luton 38729.

Collectors' BC rx, Murphy, 3ft 6in high, wood case, mw, lw, fair cond, £25. *Wanted:* EC10 Mk2 or marine EC10 rx, must be mint cond. G4AYV, 106 Erithway Road, Green Lane, Coventry.

Liner 2, exc cond, comp with preamp and all accessories, clean sig, sensitive rx, £110. G8LAE, 10 St Andrews Close, Old Windsor, Berks SL4 2QO. Tel Windsor 62166.

FDK Multi-11, 10ch, R3-R7, S20-S23, incl, £140 ono. G8NDL, 127 Church Street, Stratford, London E15 3EH.

Mobile antenna mount, Tavasu, extra heavy duty, suitable for G whip, unused, incl PL259 plug, £4.80 incl postage. Extendarod for mobile antenna, unused, £5.50 incl postage. Will sell separately or £10 the lot. G3RYI, QTHR.

FT101E, unmarked, £400 ono. Magnum 2 transverter, recently serviced and checked, £80. *Wanted:* Tilt over tower and rotator. G8JUV, QTHR. Tel 051-632 4927.

Seiwa vhf monitor rx, S20, 21, 22, comp with nicads, leather case, £40 ono. Solartron psu, SRS153, 0-500V at 100mA 6·3V lt at 4A, fb cond, £12.50. Mosley RD5 sw listeners dipole, 80, 40, 20, 15 and 10m, £12. Waters and Stanton mini dipole, 80-40m (trapped), as new, £12. Taylor valve tester, type 45c, manuals, incl tv tube testing extension, £18 ono. Storno Viscount 4m, xtalled 70·26MHz, heavy duty psu, 0-30V at 12A, 4m ground plane ant, £50 the lot. G8NQD, 450 Castle Lane West, Bournemouth. Tel 517200, after 6pm.

Liner 2, perf cond, mic, £100. Auto-transformer 150VA £3.50. 23W Adcola iron, new, £2.50. Valves, meters, trans, transistors, cases, etc. Send sae for lists. G3HRN, Wright, 18 Granville Avenue, Newport, Salop. Tel 0952 811168.

WB4VVF accu-keyer, ttl keyer, homebrew, neat metal case, fitted side tone, Bauer single paddle, £15. Various valves, used, OK, 6L6, 6V6, 866, 807, 40p each plus post. Isolation transformer, Siemens-Schuckert, double wound 240V primary cable input, 110V secondary, USA 2 pin outputs, fully cased, £15, plus carriage. VCR 97 cr tube, mu metal screen, £4. 813 valves, one new, £2; two used but OK, £1 each plus postage. G3XJJ, QTHR. Tel 0604 716196.

Hammarlund HQ170A rx, Marconi c/r bridge, AVO meter, Rad Coms and SW Mass, £110. G3TPI, QTHR. Tel Loughborough 61032.
BC348-L with p/p, £15. Homebrew rx, Electroniques front end, 85kHz and 1·6MHz i.f., £15. Geloso vfo, 807 pa, 500V psu, £15. 38·666 xtal, £1.50. Small audio amp (valve type), £1. G3WUZ, QTHR. Tel 0278 76 277.
Microwave Modules MMT 432/28 10W transverter, constructional details for G3BA 144/28MHz driver transverter, £70. 2m cross polarization phasing harness, £1. G3XOF, QTHR. Tel 0283 813782.
FSK modem units, mint, £3. B44 70·26MHz, £5. B44, £8. PCR Mk3, suit swl, £10. W1191A wavemeter, £2. PTC703 rx, £3. Ranger on 144·25MHz, £6. *Wanted:* FL200B tx or similar, G2DAF tx rx, KW E-Zee match. M. Wright, 27 Bulbridge Road, Wilton, Salisbury, Wilts.
300 magazines, *Rad Com* and *Bull*, 1966-1976 (132 copies); *Short Wave Magazine*, 1966-1975 (120 copies); *Radio Constructor*, volumes 22, 23, 25, 26 (48 copies); £7. Buyer collects. *Wanted:* Lafayette HA55 and R1155. R. Woodman, Tel 01-571 1443.
SB102 incl 400Hz filter, SB600 with HP23B mains power, £220. HP13A, mobile power, £30. SB610 monitorscope, £60. SB200 linear, £200. All vgc. Unused 5FP7 crt, £8. Offers considered. Prefer items collected. G3GEJ, L. M. Airey, 19 Horseman Drive, Copmanthorpe, York YO2 3SN.
ARAC 102 and 28-30MHz rx, a.m., fm and ssb, £75. SW rx R1475, 2-20MHz, £15. Buyer collects. FDK Multi-2700, as new, £430. Datong speech processor, £15. Microwave Modules 23cm varactor, £22. Converter 23cm-2m, £22. G8FAK, Sherratt, 32 Springfield Way, Cranfield, Beds, MK43 0JN.
Decca type 624 true-motion radar display console, tcvr, psu, scanner, mag cond. See weekends by appt, or photos available. Elsworthy, G4AYG, QTHR.
EC10 Mk2, mains and battery packs, exc cond, £100. 2m dash Cambridge, xtaled R6, R7, S0, £35. U10B, mint cond, xtaled RB4 433·318, £35. Rtty terminal unit CV89, plugs, manual, good cond, £20. G8GYC, QTHR. Tel Kingsley 88123.
NCX5 tx/rx 10/80, ac psu, mic, manual, mint, £170. Collect or pay carriage. G3TFN, QTHR. Tel 061-761 2952.
Yaesu FTDX400, FVDX400 ext vfo, exc cond, £250 ono. Will swop for TH3MK3 Mosley Mustang or similar with suitable rotator. *Wanted:* 813's Eimac 4-400A, 4-1000A tubes, also small scope. G3TQS, QTHR. Tel Tean (Staffs) 2852.
Pocketfones tx/rx, above average cond, circuit diagrams, new batteries, charger, ac psu for rx, improved rx front-end, helical whip, wkg on RB4. *Wanted:* R1155, 9R59DS. G3XLL, Lockwood. Tel Mellis (Suffolk) 596, evenings or weekends.
22ft 12in square tower, three sections, 1 at 10ft, 2 at 6ft, £10. Buyer collects. G2HKA, QTHR.
FR50B rx 10-80m, full 10m coverage, spare valves, Stephens-James Mk1 tuner, both as new, £80. Buyer collects or pays carriage. Clement, 57 Canterbury Avenue, Lancaster, LA1 4AU. Tel 0524 2389.
HW101 Homebrew psu, cw filter, £175. SB200, exc cond, £275. AM25T Vanguard, single ch, rx on 145MHz fm, tx lb, £15. Datong FL1 audio filter, £40. GM4AWA, QTHR. Tel 0738 21241 ext 238.
KW2000E, ac psu, good cond, £280. Buyer inspects, sees on the air and collects. Strictly cash, no offers. *Wanted:* TA33, high power version. G3UKI, QTHR. Tel Lingfield 833243.
QM70 transverter 28/144, high power, unused, plugs, instructions, etc, (bought TS700G), bargain at £70 post paid. G3JNY. New QTHR, 7 Long Meadows, Garforth, LS25 2BR. Tel Leeds 553058.
Trio PS5 mains psu/digital clock for 7200G or similar 2m rig, as new, under guarantee, £45 ono. GW3YVC. Tel Cardiff 755190.
US Navy bug key, £5. *Wanted:* Handbook for Solartron CD1212 scope. G3HVA. Tel Basingstoke 61211 ext 226, office hours.
CD44, £50. TA33JR, £40. W0MXV s/scan kit, £25. GC166T f/end, ifa 1·6 ssb, audio module, £20. G3LEZ. Tel Southend-on-Sea 230489.
Eddystone 840c rx, £35. 640 rx and 70cm converter, £20. Pye U450L 70cm fm tx, handbook, £20. G8BKU, QTHR. Tel 0202 886512.
Rigonda electronic organ, single manual, semi-portable, good cond but occasional intermittent fault, £150 ono. GM3ZDH, Dixon, "Wahligoe", Coe Gardens, Soroba, Oban, Argyll, PA34 4JT. Tel 0631 4597.
Xtals for ladder filter experiments etc, 8·95MHz, HC18U, £1 each. 4 at 75p each and 10 at 60p each. Some 5·000MHz HC6U still available, £1 each. SAE with order and remittance to Richard Bowell, 16 Margarite Way, Wickford, Essex SS12 0ER.
Mobile tx/rx, Marconi H4000, 100W, all transistorised except pa, ac and dc operation, possible operation all bands, set up for 80m and 20m, worked ZL 80m, VK-W 20m, using G-whip, £100. Prefer buyer view and collect. G4BG, QTHR. Tel Salisbury 5379.
Europa B 144MHz, slight fault on transmit, CPS10 psu, new July 1977, unused, offers. Buyer collects or could deliver local area. Hygain 18V vertical antenna, £20 ono. Three 5FP7 long persistance tubes, offers. Buyer collects. G3ZXF, QTHR.
Microwave Modules 2m converter, 2-4MHz i.f., £16. G8LVX. Tel 01-904 0878 (Wembley), after 5.30pm.
4m mobile equipment, Pye Vanguard AM25T, comp, ready to instal, xtalled, wkg on 70·375 and 70·26MHz, £35. Leak Delta 30 stereo amp, perf order, operating and servicing manuals, used only with headphones, £35. G3TIR, QTHR.
KW Vanguard tx, a.m. cw 80/10, circuit, gen, £25. Buyer inspects, collects, or pays carriage. *Wanted:* 2V accumulator for vintage radio. G4FYT, QTHR. 48 Cherry Tree, North Allington, Bridport, Dorset.
S27 Hallicrafters rx, BC348 psu, faulty Heathkit valve, voltmeter, wind scr, sig gen, desk mics, large amount home built equipment, components etc, £100. Would exchange for good general coverage rx. G3SNH, Harrison, 202 Whitegate Drive, Blackpool, Lancs. Tel 64394.
FT200B, FP200B, perf cond, little used, £250. Heathkit SW717G swl rx, £50 ono. Hartley 25A oscilloscope, £25. Fletcher, Woodwick, Bristol Road, Compton Martin, Bristol.
Heathkit RA1 amateur bands rx, 2m converter, fm detector board incl but not fitted, circuits, £23 or offers. Pye base tx with QQVO6/4GA, needs attention, a.m. with fm circuit, £6. Carriage extra G8HAY, QTHR.
Codar AT5, without psu, £15. R1155 rx, suitable for beginner, £10. G4BSK, QTHR. Tel West Drayton 43400.
Marconi "Atlanta", comp, aditional spkr, 15kHz to 28MHz, offers around £90. G5SN, QTHR. Tel Southend 554846.
Trio 9R59DS gen cov communication rx, 550kHz-30MHz, vgc, voltage stabilizer, manual, £40 ono. G4AJM, QTHR. Tel Mundesley 720689.
Datong FL1 audio filter, new cond, few hours use only, £35. Postage arranged within reasonable distance. GI3ZCK, QTHR. Tel (0232) 56221 ext 36, business hours.
Heath GR78 rx, fitted Burns fm detector, £40 ono. KW E-Zee match, £15. Bowhay, 20 Park Road, Bracknell, Berks. Tel Bracknell 22169.
Standard C828M, vfo, manuals, as new, no mods or offers, £180. Liner 2, £100. New audio ic, Heath IC/102, sig gen, as new, £28. MM 432-28 converter, hardly used, SP5DS spkr, £3. Buyers collect. G8KLI, QTHR. Tel 021-472 4678.
Wireless set No19 Mk2 and 3, hf rx/tx, 2-8MHz, comp, less valves, meter and case, 50p each. Useful for parts or could be got wkg. Buyers collect. G8LHB, QTHR. Tel Hornchurch 54570.
TS413/BU, TF144G sig gens, Solartron 523 scope meganode, Elliot gas noise gen, 6in coating plant, mechanical and xtal filters, tx variables, pot cores, various vhf/uhf components. *Wanted:* HP415B manual. SAE for further details. G2CPM, QTHR. Tel 0635 40464.
ARAC 2/10m rx, £75. MM 144/28 Lo converter, £15. Vanguard (USA) 2-stage 2m preamp, £8. Burns 2m LPF, £5. Jaybeam items, 70cm parabeam (unused), £12. MBP ant base (unused), £2.50. Circular polarization harness, £2.50. Two JBL boom-to-mast clamps, 50p ea. Realistic (USA) compressor amp, £8. Starphone AM7 driver board, £5.50. 3ch osc for above, £1.50. Denco DR30 rx for spares, offers. 10·7/455 i.f. strip, Balmod xtal, Collins mech filters, £12. "N" plugs and sockets, 50p ea. SO239 plugs, 25p ea. Reducers, 10p ea. BNC plugs, 25p ea. Denco 455/465 IFTs 13, 14, and 18, most new, 50p ea. IN21 microwave diodes, 30p ea. Pye BPF 25-32MHz, 40p ea. Pye AF o/p trans, 30p ea. 36 and 8MHz B7G xtals and bases, 75p ea, two at 25p. 3 gang tuning caps (new), £1.10 ea. AGFA slide projector, £15. Buyer to collect or arrange carriage/post. G8AWB, QTHR. Tel Weybridge 49109.
For sale or offered in part exch for FR101. Trio QR666 gen cov rx, fitted marker, £100. New MM 144MHz converter, £12. Illoca 35mm stereo camera, stereo projector, £300 worth for £150. Bower. Tel Huddersfield 862773.
Heathkit SB303, calibrated 100% OK, as new, mains atu PM2, antenna control selector, many years of *Rad Com*, *W/W* and *Ham Radio* mags. All going for one bargain price, £200. Turner. Tel Thetford (0842) 2484 ext 40, 9am to 5pm, or 61648, after 6pm.
Complete rtty receiving system, Creed 7B, base, silence cover, terminal unit, exc wkg order, pleased to demonstrate, £35. Steel scaffold pole, £7. HT transformers 450-0-450 at 250mA, £2. 250-0-250 at 100mA, £1. G4AEI, QTHR. Tel Reading 85123 ext 7614, working hours.
Electro voice 729SRD Hi-Z hand or stand, mic, ptt, £8.50. *Wanted:* Remote vfo for Swan 350, full details cond, age, price. G2AK, QTHR. Tel Aldridge 52518.
ITC cctv camera and 9in monitor, mains operation, int or ext sync, auto brightness control, F1·6 16mm tamron lens, coaxial connectors, universal mount, all included, hardly used, worth £300, offers. Third, Keyhead, St. Fergus, Aberdeenshire.

QM70 2m solid state transverter, £40. Microwave Modules MMC70/28 converter, BNC, £15. MBM 48 Multibeam, £5. 8Y/2 beam, £5. Stolle 2010 rotator, £30. 144/70cm varactor tripler, £12. Pye low-band a.m. base stn, £10. 4Y/4 beam, £5. G3YQQ, QTHR. Tel 0257 451213.
Liner 2, exc cond, fitted PA3 preamp, £110 ono. *Wanted:* ICOM IC225. Chris, 93 Malvern Avenue, Preston PR1 4PL. Tel 0772 25108.
Trio 2200GX, 3ch, fitted, four months old, used once, all accessories incl nicads, original packing, £110. G8DPD, QTHR.

WANTED

Pye Bantams HP1AM E band unmodified, wkg cond, battery chargers, rechargeable battery cassettes. Good price paid. T.M.H. Randall, 37 Dinam Road, Caergeilliog, Holyhead, Gwynnedd LL65 3NY.
Service book or circuit diagram of Telequipment oscilloscope D33 for copy and return. G2FKO, QTHR. Tel Bideford 2964.
FT243 8 m/c xtals for S20 to S24 and S0. Reasonable price. G3EJA, 9 Holybrook Road, Reading.
FL50B tx, good wkg order. Price and details to G8NRQ, D. Austin, 105 Coombe, Sherborne, Dorset.
Eddystone 940 or 750, or any other good general coverage rx, good cond. Also Eddystone 990 or 770R Mk2. Steve Andrews, 12 Malton Way, York YO3 6SG. Tel York 59035.
Codar RQ80 swl atu, pre-war Eddystone components, sw plug-in coils, 0·0002μf slow motion reaction capacitor, base board 6-pin coil holders, C1936 WB Stentorian senior spkr, C1933 blue-spot inductor dynamic spkr, Eddystone or Belling Lee mains interference unit, Amplion horn spkr. N. Richardson, 2 Edna Road, Maidstone, Kent.
Redifon psu connector for GR410/T, 24-way McMurdo plug to Plessey 25-way socket (military spec quick-release type), manuals and/or circuit diagram for GR410/T, Redifon psus, wkg or for spares. Crabb, 41 West Drive, Edgbaston, Birmingham.
TR2200G/GX or similar 2m fm portable tx/rx, rotator suitable for vhf antenna, regulated 12V 3A mains psu, good quality airband (118-136MHz) rx. P. Green, G8LQM, QTHR. Tel Bristol (0272) 503928, evenings.
Heathkit DX60B and HG10B, vfo, mint cond, manuals. Manual for DX40U, buy or borrow for copying. G4GFQ. Tel Blackpool 43834.
Hallicrafters SX110, wkg cond, no mods, manual or circuit. Info and/or circuit for Storno type CQM13G-12. G4EFH, QTHR.
Old timer wishing to get back on air after several years. QRT requires reasonably priced rig for 160-10m KW2000 or similar, or separate tx/rx. 60 miles radius Winchester for inspect/collect. G2PS, QTHR. Tel Kings Somborne 426.
FT101 or FT201, must be unmodified. Details to G4BG, QTHR. Tel Salisbury 5379.
Gen cov or amateur bands rx for jnr member of school RC, must be wkg please. Give details of model, cond and price. GM4EHB, QTHR.
Codar T28 rx 80/160m, good cond. G4GGN, 4 Blythe Way, Solihull, West Midlands, B91 3EY. Tel 021-705 0759.
Hand-held 2m tcvr, 2200G or similar. Complete years *QST*. Kelman, 61 The Fairway, Oadby, Leicester.
Help! Wanted to buy, or borrow for photocopy and immediate return, circuit, manual, handbook or any gen on converter ssb 5820-99-971-7205, for use with B40, B41. Derek Sheen, G4CCW, QTHR. Tel 01-651 1410.
Wanted for swl, amateur band rx. All replies answered. My age 14 years, so not above £45 please. Offers to Mark Bagnall, 57 Bush Drive, Rugeley, Staffs, WS15 2AQ.
HW32 and HW23 psu. G3MCA, 1 Mosslea Road, Orpington, Kent. Tel 0689 56497.
SP400 or even SP401 spkr, set of top and bottom covers for Dash Cambridge. Urgent! GM8LMA, QTHR. Tel 0856 2797.
Rigonda 6in tv, model VL100M line output transformer needed. Would buy non-wkg set for spares. Bartlett, 19 Cleeve Drive, Nr Bristol. Tel Yatton 832472.
Pre-war radio books, mags, cats, very old rx, tx, valves, components, wanted for the Wireless Museum. Collection arranged. Curator. G3KP0, QTHR. Tel Shanklin 2586.
AR88 or similar rx. G3NAS, QTHR. Tel 53718.
Heath linear SB220 or 230, or similar, small swr meter, Atlas ac psu, Trio spkr, Trio mic MC50, cassette radio mono, TA bandpass filter. G3NZT, QTHR. Tel Newby Bridge (Cumbria) 550.
United States general advanced or extra class amateur wanted who would be willing to conduct novice licence examination for ex-patriate USA citizen aged 14 years, around April or May 1978. Please contact G4BZP, QTHR. Tel 0509 880279.
Sangamo Weston E772 analyser meter, movement functional, cond otherwise immaterial, G3HZ0, QTHR. Tel 01-642 4093.
QST mag, April 77, buy, beg, borrow. ZC4AJ, GRSS, RAF Akrotiri, BFPO 57.
FL50B tx. G8EQX, QTHR. Tel 021-449 3386.
W/S Canadian No29, comp with carrier, atu, all connectors and ancillary items, individual and/or damaged items considered. Also, CT160 valve tester and ssb gen/demodulator unit type 6202A for Redifon GR410 ssb tx/rx. G3UCT, 27 Glen Road, Fleet, Hants. Tel Fleet (02514) 6998.
FT200 ext vfo and dc mobile psu required. G3ETU, QTHR.
FT75 tx/rx, DC75 psu. G4FJO, QTHR. Tel 04895 3664.
Manual or circuit diagram required for Cossor Commando range CC302. Purchase or loan. G3ULY, QTHR. Tel Culgaith 286, evenings.
Heathkit HW-12A tx/rx for 80m. Mains transformer for telequipment D33 scope. G3UFW, QTHR. Tel Romsey 515884.
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Modulation Acceptance: 7.5kHz minimum.
Current Consumption: 700mA maximum squelched.

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Harmonic and Spurious Output: −70dB within 20MHz of carrier, −45dB elsewhere, −40dB harmonics.
Modulation: FM, 0 to 7.5kHz adjustable.
Duty Cycle: 100% with infinite VSWR.
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Transmitter Offset: 0 (simplex), −600kHz, +600kHz with crystals supplied. Provision for one additional offset crystal.
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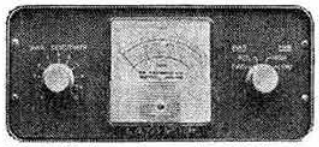

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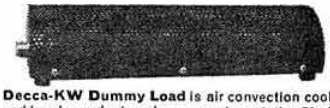

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Full range of Receivers, Transmitters, Transceivers for 2 metres. AR10, 28-30MHz tunable I.F. **£37.50.**

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Converters, Transverters, send SASE for full details.

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JAYBEAM

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VHF mobile antennas

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50 ohm dummy load	£24.00
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Katsumi Electronic Keyers	£60.75
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SWL Tuning Units 550kHz to 30MHz	£23.00

Send SASE for full details of Rotators, antennas, etc.

Good clean equipment wanted. Spot cash paid. If you have equipment surplus to your requirements we would be pleased to sell this on commission for you.

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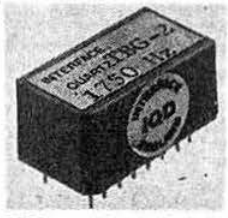

★ **Crystal controlled for dependable repeater access.**
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Just connect in the push-to-talk line 5-15V, +ve or −ve earth. 16-way DIL package may be soldered on to a PCB or simply glued into a convenient position.
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Copy and remittance to: C. C. LINDSAY,
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C & M ELECTRONICS IN4007, 8p. Trimmers, 2-25pf, 10-60pf, 22p; FX1115, 2½p; RC107, 10p; BC307, 8½p. SAE for further lists. 60 Marshalltown Road, Carrickfergus, BT38. P & P, 20p.

MICROWAVE CO-AX FHJ-4-50Ω-180′ approx with special N type connectors. Offers. TS700 with T/B and fully xtalled, £300. G4DAW, 479 Wellingborough Road, Northampton. Tel: 714821 anytime.

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SWL RECENTLY PASSED RAE. Hammarlund HQ100A, £65. Eddystone EC10 Mk1, £35. Trio 9R59D £40. PR30 preamps, £5 each. Rex, Tel Winchester 63784.

YAESU FT221R, 2m TRANSCEIVER. As new in original packing. Delivery arranged. £295. Box 164 RSGB.

MISCELLANEOUS

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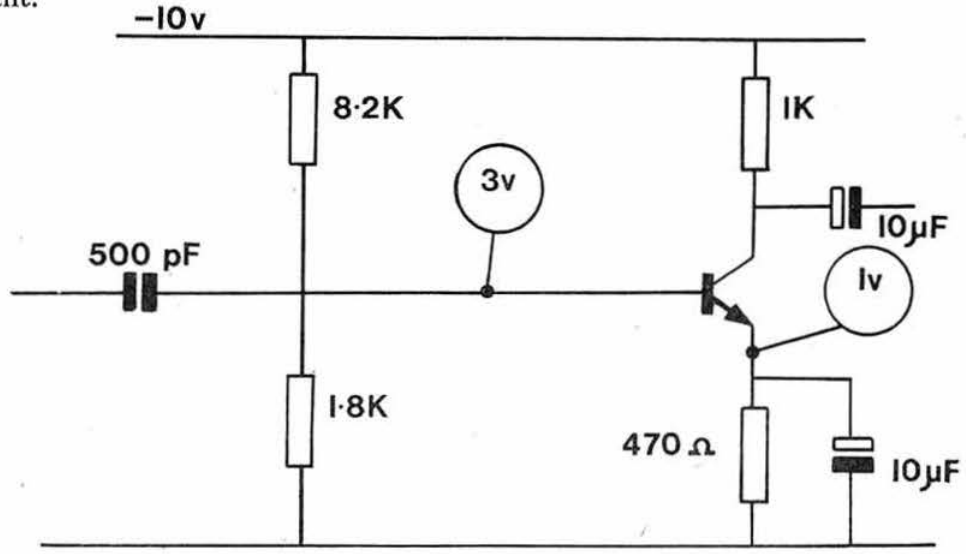

If so, then maybe you would like to turn your hobby into a career with us. These positions are based in Chelmsford and in addition to a competitive salary we offer a contributory pension life assurance scheme and relocation expenses in approved cases.

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MINIATURE FILE SETS, Set of 6 **£1.90.** Set of 10 **£3.25** (Round, flat, etc.)
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TUNED COILS, 2 section coils, around 1MHz. with a black smart tuning knob, which moves an internal core to vary the inductance, many uses, easily rewound, 3 for **50p.**
FULL RANGE OF BERNARDS/BABANI ELECTRONICS BOOKS IN STOCK. S.A.E. FOR LIST
NEW FOR THE VHF CONSTRUCTOR. A range of tuned circuits on formers with slugs and screening cans. Frequencies quoted are approximate, and range can be greatly extended by using varying capacitors in parallel.
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Type MB 22 to 32MHz (when 33pf fitted in parallel)
Type MC 25 to 35MHz (when 33pf fitted in parallel)
Type MD 38 to 50 MHz (when 33pf fitted in parallel)
Type ME 45 to 60MHz (when 33pf fitted in parallel)
Type MF 100 to 200MHz (without slug) when 0 to 30pf variable fitted in parallel)
All the above coils available in packs of five only (same type) at **50p per pack of 5.**

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Aluminium Boxes with lids.
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AB16 10 × 7 × 3 **£1.50**
AB17 10 × 4½ × 3 **£1.30**
AB25 6 × 4 × 3 **£1.00**
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Blue Tops and White lower sections. Very smart finish.
WB1 5 × 2½ × 2½ **60p**
WB2 6 × 4½ × 1½ **£1.10**
WB3 8 × 5 × 2 **£1.60**
WB4 9 × 5½ × 2½ **£1.80**
WB5 11 × 6½ × 3 **£2.00**
WB6 11 × 7½ × 3½ **£2.25**
WB7 12 × 6½ × 5½ **£2.60**
WB353 8 × 5½ × 3½ **£2.00**

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ALL BELOW—ADD 8% VAT

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Type NB3 approx. 4½" × 3⅝" × 1½" **60p each.**
QUARTZ-XTAL CONTROLLED CLOCKS, 9 to 12V DC at approx. 3mA required. Dial size approx. 2", depth of unit approx. 2", Not in cases, unit only, smart modern appearance, black face with white lettering, 12 hr, with second hand, and red hour and minute hands (Cost over £40 to produce) **£10.00 each** while stocks last, tested before despatch.
OSMOR REED RELAY COILS (for reed relays up to ¼" dia, not supplied) 12V, 500ohm coil, 2 for **50p.**
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MIXED COMPONENT PACKS, containing resistors, capacitors, switches, pots, etc. All new, and hundreds of items, **£2.00** per pack, while stocks last.
PROGRAMMERS (Magnetic devices) contain 9 microswitches (suitable for mains operation) with 9 rotating cams, all individually adjustable, Ideal for switching disco lights, displays, etc., or industrial machine programming. (Need slow motion motor to drive cams, not supplied) 9 switch version, **£1.50.**

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BNC PLUGS (ex-equip) **5 for £1.50.**
N-TYPE PLUGS 50ohm **60p each, 3 for £1.50.**
Greenpar (GE30015) Chassis Lead Terminations (These are the units which bolt on to the chassis, the lead is secured by screw cap, and the inner of the coax passes through the chassis). **30p each, 4 for £1.00.**
PL259 Plugs (PTFE) Brand new, packed with reducers, **65p each.**
SO239 Sockets (PTFE) Brand new, (4 hole fixing type) **50p each.**

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QQV03/20A (ex equipment) **£3.00.**
QQV03/10 (ex equipment) **75p or 2 for £1.20.**
DET-22 (ex equipment) **2 for £1.00.**
6BH6 (ex equipment) **2 for 50p.**
All the above valves are untested, except for heaters and no guarantee of percentage of emission is given. Sorry, no returns.
MULLARD 85A2 85V STABILISER VALVES (brand new) **70p each or 2 for £1.20.**
6BW6 VALVES (BRAND NEW). 85p each or 2 for **£1.50.**

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PNP Audio Type TO5 Transistors. **12 for 25p.**
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BYX 38/300 Stud Rectifiers. 300V at 2·5A, **4 for 60p.**
BCY72 Transistors, **4 for 50p.**
BSX20. (VHF osc/mult.) **3 for 50p.**
BC108 (metal can) **4 for 50p.**
PBC 108 (plastic BC 108) **5 for 50p.**
BF152 (UHF amp/mixer) **3 for 50p.**
2N3819 Fet. **3 for 60p.**
BC148 NPN SILICON **4 for 50p.**
BC158 PNP SILICON **4 for 50p.**
BAY31 Signal Diodes **10 for 35p.**
BA121 Varicap Diodes, **4 for 50p.**
741CG RCA OP-AMPS **4 for £1.00.**

DIECAST BOXES. We still stock these, but owing to frequent price rises from our suppliers, and costly postal charges, it has been found impossible to publish up-to-date prices on these items. Please ring or write (with SAE). for latest mail-order prices.

AEI CS10B/R MICROWAVE DIODES: up to X-Band, max. noise figure 8.5dB at 9.375GHz. **80p each.**
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STABILISER PANEL (AT26352) **£3.00.**
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SSB CHANNEL OSCILLATOR PCB. 4 channel with trimmers, for 4 Fundamental xtals (2 stage) **£1.00.**
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LIMITED SUPPLY ONLY . . . ORDER NOW!

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Large reel **£2.75.**
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Standard Model **£5.00.**
Skirted Model **£5.50.**
Space Nozzles **60p each.**
MULTICORE SOLDER
Size C1SAV18 Savbit, 18SWG **56p.**
¼Kg. (1·1lb) 60/40, 20SWG on Plastic Reel, **£3.00.**
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Dubillier Electrolytics, 50µF, 450V, **2 for 50p.**
Dubillier Electrolytics, 100µF. 275V, 2 for **50p.**
Plessey Electrolytics, 470µF, 63V, **3 for 50p.**
TCC Electrolytics, 1000µF, 30V, **3 for 60p.**
Dubillier Electrolytics, 5000mfd at 35V, **50p each.**
Dubillier Electrolytics, 5000µF at 50V, **60p each.**
ITT Electrolytics. 6800mfd at 25V, high grade, screw terminals. with mounting clips. **50p each.**

A LARGE RANGE OF CAPACITORS AVAILABLE AT BARGAIN PRICES. SAE FOR LIST.

RADIO SOCIETY OF GREAT BRITAIN

ACCOUNTS AND REVIEW FOR THE YEAR ENDED 30 JUNE 1977

RSGB HQ

Radio Society of Great Britain

35 DOUGHTY STREET, LONDON WC1N 2AE

3 November 1977

NOTICE IS HEREBY GIVEN that the FIFTY-FIRST ANNUAL GENERAL MEETING of the Society will take place at the Institution of Electrical Engineers, Savoy Place, London WC2, at 6.30pm on Friday 2 December 1977 for the transaction of the undermentioned business:

1. To receive and, if approved, confirm the Minutes of the Fiftieth Annual General Meeting as published in the August 1977 issue of *Radio Communication*.

2. To receive and, if approved, adopt the audited accounts of the Society for the year ended 30 June 1977 and the Financial Report of the Council to the members of the Society for the year ended 30 June 1977.

3. To announce the names of members to serve on the Council for the year 1978.

4. To authorize Council to fix the remuneration of the auditors for the ensuing year.

5. To transact any other business which may be properly transacted at an Annual General Meeting.

Any member entitled to attend and vote at the above meeting may appoint a proxy to attend. A proxy need not be a member of the Society.

By Order of the Council

G. R. JESSOP

Secretary

Notes

(a) Forms for the appointment of proxies may be obtained from the Secretary upon request.

(*b*) The instrument appointing a proxy shall be deposited at the office of the Society not less than 48 hours before the time appointed for holding the meeting.

Radio Society of Great Britain

35 DOUGHTY STREET, LONDON WCIN 2AE

Patron: HRH THE PRINCE PHILIP, DUKE OF EDINBURGH, KG

COUNCIL

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Lord Wallace of Coslany

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J. Anthony, G3KQF
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B. O'Brien, G2AMV
C. H. Parsons, GW8NP
D. M. Pratt, BTech, MIEE, MIERE, G3KEP
W. A. Scarr, MA, FBIS, G2WS
A. W. Smith, GM3AEL (Died 2 October 1976)
R. F. Stevens, G2BVN
G. M. C. Stone, G3FZL
C. J. Thomas, G3PSM
D. M. Thomas, GW3RWX

** Retired on 31 December 1976*

Secretary & General Manager: G. R. Jessop, CEng, MIERE, G6JP

Auditors: Edward Moore & Sons, Chartered Accountants

Bankers: Barclays Bank Ltd

FINANCIAL REPORT OF COUNCIL TO THE MEMBERS OF THE SOCIETY

THE balance sheet as at 30 June 1977 and the income and expenditure account for the year ended on that date are submitted herewith and set out on the following pages for the approval of the members.

The results for the year and the financial position of the Society are eminently satisfactory. Taking round figures, the surplus this year is £27,400 as compared with the deficiency last year of £13,800. This is a very gratifying turn-round. In fact the original budget for the year ended 30 June 1977 allowed for a deficiency of £9,000 and although the explanation would appear to lie with the sale of books, these figures are worth looking at in greater detail.

The first quarter of last year in fact started with a deficiency but it was becoming very apparent that the sale of the *VHF/UHF Manual* was so successful that we would soon run into a surplus position. The second quarter saw the availability of the *Radio Communication Handbook* Volume 1, and both these books sold at such a rate that a reprint has become necessary. Over £119,000 was received from the sale of books against a budgeted figure of £70,000 but it was not the entire reason for the successful year.

Membership subscriptions are shown in the accounts as £126,000 (previous year £88,000) and this is not only the result of the increased subscription to £8 which commenced in 1976 but is also a product of our new data processor which has enabled the Society to collect subscriptions more efficiently. There has also been a net increase in our membership.

Another reason for the successful year lies in the increased gross income from advertising which has gone from £45,000 in the previous year to nearly £58,000 this year. The income has been set against the cost of producing *Radio Communication* and this will partly explain why the cost this year compares favourably with the previous year's figure. There are some magazines which are wholly paid for by advertising and it would be nice to see *Radio Communication* joining their ranks!

Subscription income
For many years the membership has been subsidized by the profit on the sale of books, but there is a net surplus of £6,500 on the membership side which means that the subscription of £8 now being paid by corporate members is slightly more than sufficient to cover the cost of *Radio Communication* and membership services.

Cost of rallies
The figure in past years has shown a surplus but the deficiency of approximately £1,500 shown in the accounts resulted from the exhibition at Alexandra Palace. Provisionally, we had hoped that there would be a profit but a number of unexpected charges were advised at a later date thus giving rise to the shortfall.

Expenses generally
Although there has been an upsurge in our income there is also a substantial increase in our overall expenditure. Part of this explanation lies in the increase in the sale of books which resulted in higher carriage and packing charges. Of course, in addition there are the usual inflationary increases.

QSL Bureau
The accounts show a figure for the cost of the QSL Bureau which has been combined with the cost of beacons and the Intruder Watch. This figure has increased by approximately £400 during the year, which is accounted for by the increased postal charges. However, with the retirement of Arthur Milne, who has so splendidly run the QSL Bureau for many years at a minimum cost to the Society, this minimal cost will become a larger figure for the current and future years as we will have to pay fair commercial rates for the work to be done.

Lambda Investment Company Limited Debentures
A decision has been made to redeem £1,500 Debenture Stock (last year the amount redeemed was £500) and the names of the holders will be announced in December 1977. It would appear that with our improved results, a further redemption will be made next year.

"Radio Communication"
Although the editorial office was at headquarters during the period of the accounts, it has subsequently been moved to Chelmsford. This was necessitated by the difficulties of obtaining suitable editorial staff in London but which was reasonably easy to obtain in Chelmsford. While the use of extra premises will increase the cost of producing *Radio Communication*, in view of the lower salaries paid outside London the net increase in the cost will be less than £2,000.

The current year to 30 June 1978
The sale of books continues at its high level and the unaudited internal accounts show a surplus for the first three months of over £8,000. This indicates a greater surplus for this year than the figures shown in the accounts. In fact, the sale of books is so successful that there is a storage problem at Headquarters and we are beginning to burst at the seams. This is in spite of the removal of the editorial office away from Headquarters. There is also the interesting point that the Society's income from books may soon exceed the Society's subscription income.

Summary
The Society finds itself in a stronger position than it has been in for many years. Examination of the balance sheet shows that we held cash at 30 June 1977 amounting to £47,000 (last year's figure was £7,200), and a special thank-you is due to the general manager, the book editor, and Roy Stevens (who has given many unpaid hours to the Society) and especially not forgetting all the other staff at Headquarters. Their efforts are reflected by the figures in the accounts.

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)
AND ITS SUBSIDIARY COMPANY

CONSOLIDATED INCOME AND EXPENDITURE ACCOUNT

for the year ended 30 June 1977

1976 £	£		Notes	1977 £	£
		INCOME			
87,956		Subscription income	(1)		126,301
17,590		Gross profit on sales of publications	(6)		59,532
241		Quoted investment income (gross)			166
—		Income tax recoverable			85
263		Bank interest			1,314
106,050		**Total income**			187,398
		EXPENDITURE			
	5,976	Headquarters rates, lighting, heating and cleaning		7,253	
	39,083	Staff remuneration and expenses		59,146	
	300	Pension		300	
	10,481	Telephone, postage (including books), printing & stationery		21,238	
	457	Insurance		522	
	569	Repairs and maintenance		1,610	
	10	Hire of equipment (including computer)		5,320	
	939	Depreciation of equipment		1,569	
	370	Bank charges		1,216	
	1,465	Audit fees (including under-provision for prior year)		2,843	
	—	Legal and professional fees		810	
	438	Sundry expenses		777	
	2,126	Bad debts provision		1,000	
	1,141	Debenture interest of Lambda Investment Company Limited (gross)		1,141	
	63,355			104,745	
	47,765	*Radio Communication*—distributed free to members—cost including staff remuneration and after deducting advertising revenue		41,480	
	687	Membership certificates, Awards, Trophies, etc.		1,556	
	1,868	QSL Bureau, Beacons and Intruder Watch		2,214	
	1,695	Contributions to IARU Region 1		2,633	
	(606)	Deficit (surplus) on rallies and exhibitions (excluding book sales)		1,559	
	4,934	Cost of general meetings and Council and committee expenses		5,831	
	224	Taxation		—	
119,922		**Total expenditure**			160,018
£(13,872)		**SURPLUS (DEFICIT) FOR THE YEAR** (all of which arises in the Society)			£27,380

Donations, legacies and interest totalling £1,131 (1976: £4,292) have been credited direct to Legacy Fund

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)
AND ITS SUBSIDIARY COMPANY

BALANCE SHEETS 30 JUNE 1977

1976 The Society & Subsidiary £	1976 The Society £		Notes	1977 The Society £	1977 The Society & Subsidiary £
		FIXED ASSETS			
41,675	—	Freehold property at cost	(1) (2)	—	41,675
3,752	—	Sinking Fund Policy, at cost (Surrender value: £4,349 (1976: £3,853))		—	4,169
3,667	3,667	Furniture and equipment, at cost less depreciation	(1) (3)	7,027	7,027
—	26,986	Investment in and loan to subsidiary	(4)	27,413	—
49,094	30,653			34,440	52,871
		NET CURRENT ASSETS			
4,055	4,055	Quoted investment at cost (Market value £4,093 (1976: £3,958))	(5)	4,055	4,055
22,675	22,675	Stocks at lower of cost and net realizable value		40,340	40,340
35,622	35,622	Debtors, and payments in advance		24,188	24,188
29,233	28,727	Bank balances & cash in hand		47,027	47,053
91,585	91,079			115,610	115,636
61,053	60,471	**Less** Creditors & accrued charges		54,431	55,023
30,532	30,608			61,179	60,613
£79,626	£61,261	**NET ASSETS**		£95,619	£113,484
		Financed by:			
8,071	8,009	**ACCUMULATED FUND.** Balance at 1 July 1976		(5,863)	(5,801)
(13,872)	(13,872)	Balance brought forward from the Income & Expenditure Account		27,380	27,380
(5,801)	(5,863)			21,517	21,579
(722)	—	Less preliminary expenses of the subsidiary		—	(722)
(6,523)	(5,863)			21,517	20,857
4,292	4,292	**LEGACY FUND**		5,423	5,423
(2,231)	(1,571)			26,940	26,280
62,832	62,832	**SUBSCRIPTIONS IN ADVANCE**		68,679	68,679
19,025	—	**6% DEBENTURE STOCK** of Subsidiary (Redeemable at par on or before 30 June 1997: Secured on the assets of that Company)		—	18,525
£79,626	£61,261			£95,619	£113,484

(The notes on pages vi and vii form part of these accounts)

WALLACE, *President*

J. O. BROWN, *Treasurer*

NOTES ON THE ACCOUNTS

1. Accounting policies:

(a) Subscriptions—cash received in respect of subscriptions for the year has been apportioned on a time basis from the actual dates subscriptions were receivable. The summary of subscriptions accounts (including life subscriptions) is as follows:

1975–6		1976–7
£		£
48,165	Subscriptions in advance 1 July 1976	62,832
102,623	Add: Subscriptions received during the year	132,148
150,788		194,980
62,832	Less: Amount carried forward at 30 June 1977 representing the forward commitment to membership services	68,679
£87,956	Amount of subscription income credited to revenue account in the year ..	£126,301

(b) Life subscriptions are credited to Income & Expenditure Account over a period of 10 years.

(c) Depreciation—no depreciation has been provided on the freehold property. Furniture and equipment has been depreciated using a straight-line basis on cost so as to write off the assets over their estimated useful lives.
Cost of computer programming is being written off over five years.

2. The Council is of the opinion that the present market value of the Society's freehold property (which is held in the subsidiary company) is in the region of £100,000.

3. Furniture and equipment:

Cost 1 July 1976	13,272
Additions during year (Net of disposals £2,636)	2,818
Cost 30 June 1977	16,090
Accumulated depreciation	9,063
Book value as shown in Balance Sheet (Book value 30 June 1976, £3,667)	£7,027

4. The share capital of the subsidiary, Lambda Investment Company Limited (registered in England), is £100 in shares of £1 each and all the shares are held by the Society or its nominees. The debenture stock has been subscribed for or purchased by individual holders in their own right.

5. Investment

		Cost
£4,145	British Transport 4% Guaranteed Stock 1972/77..	£4,055

This investment is charged to Barclays Bank Ltd as security in case the Society requires overdraft facilities.

6. The sales of publications during the year amounted to £118,930 (1976—£59,753). Advertising revenue amounted to £56,867 (1976—£45,250) before deducting commission.

7. The Society administers certain prize and memorial funds totalling £659 (1976: £617) which are not included in the accounts.

CONSOLIDATED STATEMENT OF SOURCE AND APPLICATION OF FUNDS

for the year ended 30 June 1977

1976 £		1977 £
	SOURCE OF FUNDS	
(13,872)	Surplus (deficit) for the year	27,380
—	Sale of fixed assets	524
4,292	Donations, legacies and interest	1,131
	Adjustment for item not involving the movement of funds:	
939	Depreciation	1,569
(8,641)	**Total generated from operations**	30,604
	APPLICATION OF FUNDS	
(2,792)	Purchase of fixed assets	(5,453)
—	Repayment of debentures	(500)
(417)	Sinking Fund Policy premiums	(417)
£(11,850)		£ 24,234
	INCREASE/(DECREASE) IN WORKING CAPITAL	
(5,000)	Investments	—
6,329	Stocks	17,665
15,177	Debtors	(11,434)
(50,381)	Creditors and subscriptions in advance	183
(33,875)		6,414
	Movement in net liquid funds:	
22,025	Increase in cash balances	17,820
£(11,850)		£ 24,234

REPORT OF THE AUDITORS TO THE MEMBERS OF THE RADIO SOCIETY OF GREAT BRITAIN

Certain documentary evidence which was required for the purpose of our audit could not be produced to us and as a result we have not obtained all the information we required for our audit as regards income from subscriptions and publications.

As a result we have not been able to form an opinion on the accuracy of the income of the Company or of subscriptions received in advance and debtors. We believe, however, that the amounts stated in the accounts for these items are substantially correct. Subject to the foregoing, in our opinion, the accounts set out on pages iv to vii, prepared under the historical cost convention, together give on that basis a true and fair view of the state of affairs of the Company and its subsidiary at 30 June 1977 and of their surplus of income and of their source and application of funds for the year ended on that date and comply with the Companies Acts 1948 and 1967.

4 Chiswell Street, London EC1Y 4XB.
14 October 1977

EDWARD MOORE & SONS
Chartered Accountants

LAMBDA INVESTMENT COMPANY LIMITED

Report of the directors

The directors have pleasure in submitting their report for the year ended 30 June 1977. The company is a wholly-owned subsidiary of the Radio Society of Great Britain (a company incorporated in England) and was formed to acquire the freehold property, 35 Doughty Street, London WC1, which is the headquarters of the Society. The directors are of the opinion that the market value of the property is in the region of £100,000.

The directors are Messrs L. E. Newnham (Chairman), R. F. Stevens, G. R. Jessop and J. O. Brown (Secretary); the first two named hold one share each as nominees of the Society and Mr Newnham holds £300 Debenture Stock. Mr J. O. Brown retires by rotation at the Annual General Meeting, and being eligible, offers himself for re-election. A resolution re-appointing Messrs Edward Moore & Sons as auditors will be proposed at the Annual General Meeting.

By order of the Board
J. O. Brown
Secretary

BALANCE SHEET 30 June 1977
and
REVENUE ACCOUNT for the year ended on that date

1976				1977	
£	£	£		£	£	£
			ASSETS			
41,675			Freehold property at cost			41,675
3,752			Sinking Fund Policy, at cost (Surrender value £4,349 (1976: £3,853))			4,169
241			Preliminary expenses			241
481			Debenture Issue expenses			481
506			Bank balance			26
46,655						46,592
			LIABILITIES			
	582		Sundry creditors		592	
	26,886		Loan from the Radio Society of Great Britain		27,313	
27,468						27,905
£19,187			**NET ASSETS**			£18,687
			Financed by:			
			Authorized and Issued Capital			
100			100 shares of £1 each fully paid			100
			Revenue Account			
62			Balance at 1 July 1976			62
	1,246		Rent receivable in the year to 30 June 1977		1,224	
		1,141	*Less:* Debenture interest	1,141		
		65	Bank charges	40		
		40	Audit fee	43		
—	1,246				1,224	—
19,025			**6% Debenture Stock** (redeemable at par on or before 30 June 1997—secured on the assets of the Company).			18,525
£19,187						£18,687

L. E. Newnham } *Directors*
J. O. Brown }

Report of the auditors to the members of Lambda Investment Company Limited
In our opinion, the accounts set out above prepared under the historical cost convention give on that basis a true and fair view of the state of the Company's affairs at 30 June 1977 and of the result for the year ended on that date and comply with the Companies Acts 1948 and 1967.

4 Chiswell Street, London EC1Y 4XB
14 October 1977

EDWARD MOORE & SONS
Chartered Accountants

THE YEAR IN REVIEW

Some of the activities of the RSGB during the 12 months ended 30 June 1977

COUNCIL

The 42nd President, Dr E. J. Allaway, G3FKM, completed his year of office on 31 December 1976 and on 1 January 1977 Lord Wallace of Coslany became the 43rd President.

Lord Wallace was installed as President of the Society at a very successful reception held in the Members' Dining Room at the House of Commons, Westminster, on 22 January when 250 members and guests were present. This event was limited to a total of 250 and was over-subscribed although a nominal charge was introduced for the first time to counter the increased cost due to inflation.

At the Council meeting held in the afternoon before the reception, Dr D. S. Evans, G3RPE, was elected executive vice-president for 1977.

An election was held in November 1976 to fill two ordinary and three zonal vacancies on Council. The members elected were Messrs J. Bazley, G3HCT, and C. H. Parsons, GW8NP, as ordinary members, and Messrs B. O'Brien, G2AMV, as Zone A member, J. Anthony, G3KQF, as Zone B member and A. M. Allan, GM3ZBE as Zone G member.

Council wishes to record its thanks for their services to retiring members, Messrs D. Byrne, G3KPO; R. J. Baker, G3USB; R. W. Fisher, G3PWJ; and J. R. Petty, G4JW, who resigned due to ill-health; and its appreciation of Mr A. W. Smith, GM3AEL, who regrettably died suddenly on 2 October 1976—he will long be remembered for his vigorous support of the Scottish members.

Meetings of Council

Council met on three occasions in the Council Chamber of the Institution of Electronic & Radio Engineers and wishes to record its thanks to the director of the institution for making this accommodation available. In 1977 Council met on four occasions in the Churchill Room of London House (opposite headquarters) and wishes to thank the warden of this establishment for arranging this very convenient venue for our meetings.

As recorded in last year's report an IBM System 32 data processor was installed at headquarters in mid-July 1976. A progress report on the establishment of programs and integration into the headquarters' operations is given later in this report.

Council has set up a working party (the 1977 President's Committee) to examine the Society's organization and committee structure and will put forward its recommendations for consideration and possible implementation in the autumn of this year, which is outside the period covered by this report. Early in 1977 Council approved the appointment of new managers for microwaves and for emergency communications.

ATTENDANCE AT COUNCIL MEETINGS

	July	Sept	Nov	Jan	Feb	April	June
Dr E. J. Allaway, G3FKM	X	X	X	X	X	X	X
Lord Wallace of Coslany	—	—	X	X	X	X	X
Mr D. J. Andrews, G3MXJ	X	X	X	X	X	—	X
Mr R. J. Baker, G3USB	—	—	X				
Mr P. Balestrini, G3BPT	X	X	X	X	X	X	X
Mr R. W. Fisher, G3PWJ	X	—	X				
Dr D. S. Evans, G3RPE	X	X	X	X	X	X	X
Mr J. O. Brown, G3DVV	X	—	X	X	X	—	X
Mr D. Byrne, G3KPO	—	—	X				
Mr J. Bazley, G3HCT				X	—	X	—
Mr W. F. McGonigle, GI3GXP	X	X	X	X	X	X	X
Mr D. M. Pratt, G3KEP	X	—	—	X	X	X	X
Mr W. A. Scarr, G2WS	X	X	X	X	X	X	X
Mr R. F. Stevens, G2BVN	—	X	X	X	X	X	X
Mr G. M. C. Stone, G3FZL	X	X	—	X	X	X	X
Mr C. J. Thomas, G3PSM	X	X	—	X	—	X	X
Mr D. M. Thomas, GW3RWX	—	X	X	X	—	X	—
Mr C. H. Parsons, GW8NP	X	X	X	—	X	X	X
Mr A. M. Allan, GM3ZBE				X	X	X	—
Mr B. O'Brien, G2AMV				X	X	X	X
Mr J. Anthony, G3KQF				X	X	X	X
Mr A. W. Smith, GM3AEL	X	—	(deceased 2 Oct)				
Mr J. R. Petty, G4JW	(Resigned due to ill health)						

DATA PROCESSOR

The installation of a machine of this nature, although compact in itself, needs adequate space to store a ready supply of the various stationery, files for output records, other items such as "floppy discs", and space for sorting and filing the paperwork.

In addition, although the particular machine involved has no great environmental requirements, nevertheless appropriate heating and ventilation is needed for the operator. Also, all such machines produce some noise if only from the small ventilating blowers and the printer, so it is necessary to keep the noise level as low as possible and so reduce operating strain.

To house the IBM System 32 machine at HQ a ground-floor storeroom at the rear of, and external to the main body of the building, was chosen. This provided accommodation of considerably lower fire risk than would have been the case within the main building. A minor extension to the storeroom, by adding a bay window, provided the extra space required at a low cost. To combat noise, the ceiling was covered with sound-absorbing tiles and the floor was carpeted. Fire-resistant doors were also included in the structural alterations.

As it is necessary to sort the incoming mail into separate categories before offering it to the machine operator for action, facility for this is provided in a small connecting room between the main building and the machine room. The structural work was completed within a few days of the original target and before the machine arrived.

After the machine was installed there was naturally a good deal of inconvenience, mainly caused by having to keep the old membership stencil system active until it could take over the work. Once it had been decided to obtain the IBM32 a considerable amount of preliminary work was involved in creating intermediate-stage records of membership on cards suitable for translation into magnetic disc records.

In reaching this first objective it was inevitable that the transferred records would still contain a significant number of errors from the old system, and overcoming such errors was one of the primary reasons for changing to the new machine with its very quick access time. During the transfer of the records over 600 associates were found who had not transferred to full-rate membership although they were over 18 years old.

By the end of 1976 the forecast staff economies were achieved, although rather later than expected, and the new *temporary* membership card had been circulated to all known home members. The issuing of these membership cards had two main objectives:

(a) to enable the introduction on 1 January 1977 of members' discount on Society publications;
(b) to enable members to provide corrections to our records in respect of address, callsign etc.

Packing and mailing over 15,000 cards is no mean task to be handled by a staff already fully employed on normal duties. Much useful corrective information was received as a result of this first mailing, enabling many hundreds of corrections to be made.

It will be recalled that the case for a data processor was that it was required for two main areas of operation:

(a) membership records and subscription accounts;
(b) accountancy for all sales and advertising.

The programs for all this work proceeded as soon as the member listing had been established.

Summary of programs

Before listing the programs that are actively in operation it should be remembered that a data processor does not think, and therefore each program has to be precisely accurate for the job to be done. For example, our membership record program is very complex and required considerable testing to cover over 40 different types of membership category used by the computer, and this has taken appreciably more time than originally anticipated. Programming delays caused a backlog of entries of membership renewals, and staff worked overtime to solve this problem. This also resulted in delays in printing renewal notices and production of new and up-to-date membership cards.

At this point it should be stated that it was always known that it would take a full year to establish the membership records and to clear up all the errors from the old system. With the progress that is being made there is little doubt that this will be fulfilled.

1. Programs to deal with a vast variety of membership problems and posting of "Radio Communication"

(a) Changes of address, callsign and other recorded information with a number of control safeguards.
(b) Produce statistics on membership based on a variety of parameters. Regional membership lists and monthly lists of new members.
(c) Produce pre-sorted labels for mailing *Radio Communication* under the Post Office/Periodical Publishers Association rebate contract.
(d) Membership cards showing renewal date.
(e) Make out personal renewal notices which state the amount owed by each member.
(f) Produce reminders for members who have not paid their subscriptions or under-paid their subscriptions.
(g) Automatically stop the despatch of *Radio Communication* if subscriptions are not paid within the period of grace allowed.
(h) List members who do not renew their subscriptions.
(i) Enter subscriptions into the system.

2. Programs to handle members' and non-members' orders for books and other items

(a) Daily financial summary to balance with cash received.
(b) Despatch information, including over- and under-payment instruction, out-of-stock advice and holding paperwork. Special items such as foreign magazine subscriptions, callsign badges etc are fully catered for.
(c) Full stock control information including low stock advice for HQ staff when stock falls below pre-set level.
(d) Amend stock using up-date programs. Add new items, change description and prices.
(e) Full facilities for allowing members a 10 per cent discount.

3. Programs to handle trade orders

(a) Check availability of stock against any order. If stock not available, automatic advice to customer.
(b) Produce records of all books ordered.
(c) Produce despatch information.
(d) Produce invoices after goods are despatched when transport/postage costs are known.

4. Ancillary programs

(a) Invoicing of advertising accounts.
(b) Providing labels for use with regular postings, such as Council and committee papers, news bulletins, etc.
(c) Keep tight stock control of goods sold from HQ over the counter.

Programming in progress

At the end of June 1977 work still needed to be done on:
(i) monthly statements for trade accounts;
(ii) programs associated with trade account enquiries;
(iii) modification to advertising accounts programs, and a number of other minor improvements.

Operational problems

In the period, now almost one year, only minor mechanical faults with the printer have occurred (failure of the drive belt). Static did prove a problem but an investigation by the makers and regular anti-static spraying of the carpet has overcome this elusive problem.

Staff training on the computer has proved to be as easy as was anticipated and staff generally welcome time on the machine.

Several simple print-out jobs, such as repeater and beacon lists, are produced on an automatic basis without attention.

MEMBERSHIP

During the year there has been a steady intake of new members, while at the same time there has been the removal of duplicated, lapsed, overdue and under-paid members' records. This, together with the corrections of callsign and address details, makes it difficult to quote the final actual membership total.

Probably the most useful figures that can be quoted as a realistic guide are the totals of the address labels printed by the machine and these are as follows.

	Dec	Jan	Feb	Mar	Apr	May	June
UK	17,388	17,281	17,397	17,541	17,797	17,931	17,108
Overseas	2,192	2,200	2,347	2,526	2,582	2,640	2,584
Airmail	77	81	82	87	92	90	92
BFPO	65	65	69	74	72	73	69
	19,722	19,627	19,895	20,228	20,543	20,734	19,853*

* This fall was due to the removal of 800 lapsed/overdue members for August, September and October.

New members							
UK	99	183	60	282	168	215	—
Overseas	21	31	14	66	27	31	—
Total	120	214	74	348	195	246	—

New licences	1974–5	1975–6	1976–7
Class A	405	493	57
Class B	761	566	467
Class A/M	472	495	—
Class B/M	434	485	—
Class TV	26	24	—
Total increase	1,192	1,084	524

With the introduction of the new comprehensive licence negotiated by the Society, the issue of separate mobile and tv licences has been discontinued. The considerably reduced number of Class A licences is mainly due to the removal of non-renewals from the active list.

REPRESENTATION

During the year the circulation of the regional and area representatives newsletters has continued. Issue No 13 was circulated in June.

Just how effective these newsletters have been is unknown but there has been a continuing increase in the number of area representatives. We now have 67, an increase of about 20 during the year. It is hoped that the material provided has proved useful in their work as Society representatives.

As promised for several years, each of the regional representatives was provided with a list of members resident in their region, and since then monthly lists of the new members have been provided to enable them to make contact.

An analysis of the regional membership provides a useful guide to the Society's influence in the various areas.

Region	Members	Region	Members	Region	Members	Region	Members
1	1,817	6	935	11	187	16	1,409
2	1,168	7	1,385	12	272	17	1,251
3	1,714	8	1,503	13	302	18	442
4	1,182	9	524	14	470	19	1,648
5	724	10	554	15	350	20	850

These totals are naturally affected by the population density of the area concerned, although there are some where a significant increase in members could be expected.

From a breakdown of grades of UK membership, there is a substantial proportion (about 25 per cent) of listening members. A relatively large number of these are likely to become licence-holders eventually. However, there are many potential new members that might be expected to become members if the Society can be "sold" to them. Also there seems little reason why we should be satisfied with a membership total of less than 25,000 within the next year or two.

EXHIBITIONS AND CONVENTIONS

Alexandra Palace, August 1976

As indicated in last year's report, the Society had decided to once again hold an exhibition for the benefit of members in the London and south-east England area.

Alexandra Palace was chosen as the venue because of the relative freedom for car-parking, and the GLC had previously indicated the complete renovation of this establishment as an exhibition centre. This first three-day exhibition here was run as an alternative to theWoburn Abbey mobile rally and was not supported generally by the trade, but those who did attend did very worthwhile business.

Members' reaction to the exhibition was very encouraging, and the facilities for refreshment of all kinds were very good. More than 4,500 visitors attended. A report on this was published in the October 1976 issue of the journal.

Leicester, October 1976

The Society again attended this trade show, and for the first time our enlarged professional stand was used for the display and sale of our publications.

As has become usual, a very considerable and increased turnover in the sale of publications was achieved. As an event it is relatively expensive to man the stand adequately but as a venue for members to meet their friends and members of Council, it is always very worthwhile.

Alexandra Palace, May 1977

Originally it had been proposed to hold the VHF Convention as a one-day event, but it was felt that a three-day exhibition and convention would be much more attractive and that the beginning of May would be a good time for such an event, when the trade could be expected to give their support.

The first combined exhibition and convention wholly organized by the Society showed the benefit of an attractive venue, together with the well-attended lectures and the social aspect with the dinner and dance. Undoubtedly some detailed improvements are needed in various areas to improve the overall display and more adequate planning of the lectures.With wider publicity, attendance should be increased.

A feature of this year's event was the successful microwave display, including television received over an urban path on 10GHz; the relatively low power and simplicity of the equipment was well shown. Another feature was the effective talk-in station; traffic information being provided by the use of a large-scale map. A full report appeared in the June 1977 issue of the journal.

Rallies

During the year rallies and similar events were held in most regions of the country and were well attended, but with the large number of fixtures a number of events took place at the same time. To avoid this requires a good deal of planning but it is felt that a real attempt should be made to avoid clashing dates if the maximum support is to be given by the regular traders.

Conventions

The **Scottish VHF Convention** was again held in Dundee at the University. This very well supported event was attended by the deputy vhf manager, Tom Douglas, G3BA; and the general manager, who addressed the meeting respectively on repeaters/vhf operation and the data processor/Society matters. An excellent dinner was held in the evening, attended by most of the Zone G representatives and 150 members and guests.

On the same weekend the **Welsh Convention** was again held at Blackwood Community Centre, where an increased attendance ensured a fully successful event. Past-President C. H. Parsons, GW8NP, was accompanied by the Zone E Council member, Mr D. M. Thomas, GW3RWX, and 350 members and friends.

Both these events have become national events representing Scotland and Wales and are now regular fixtures of the calendar.

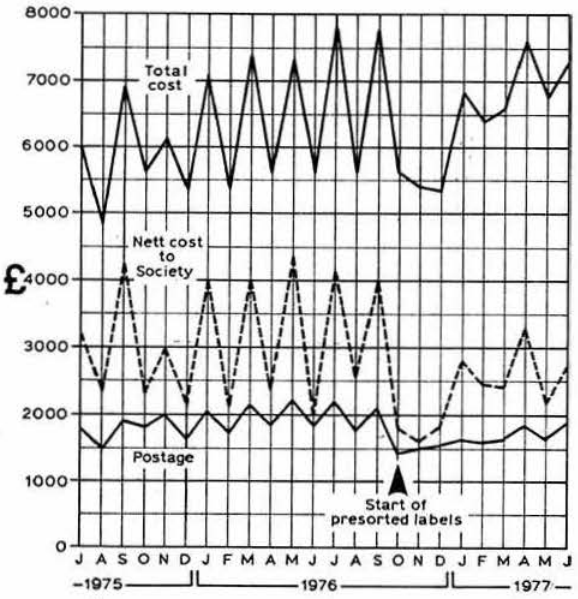
Once again the **Northern Radio Societies** held their convention at Belle Vue, Manchester. The attendance this year was greater than ever before and a larger venue will need to be found for next year's event.

"RADIO COMMUNICATION"

Production of the journal has once again been faced with rising print and paper costs, but the regular revision of advertising rates to keep pace with costs, together with lower postage costs under the PPA contract, has reduced the net cost to the Society from £3,000 to £2,670 per month; notwithstanding that the total number of pages during the year was 976, compared with 924 for the previous year.

Comparative totals for the last two years

	1975–76	1976–77	Change
Number of copies printed	248,550	253,700	+2%
Number of copies posted	237,844	237,555	—
Postage	£22,498	£21,135	–6·1%
Total production cost	£73,540	£79,278	+7·8%
Net production cost	£36,047	£32,108	–11·0%



As clearly shown in the graph, the changeover to pre-sorted labels took effect from October with the consequent reduction in postal cost. The gradual rise in postal costs during the year is covered by the regular intake of new members.

During the year consideration has been given to alternative methods of producing the journal in order to achieve further economies, and estimates from various printers using the latest processes are being compared.

GB2RS

During the year agreement was obtained for the transmission of GB2RS and GB2ATG to take place between the hours of 0900 and 2100gmt. This improved flexibility should allow a larger listening audience.

The change of frequency from 3·60 to 3·65MHz has brought some criticism and it is again being examined by the Membership & Representation Committee. The whole question of preferred frequency, both on hf and vhf, together with adequate transmissions and location of stations is the responsibility of this committee. Correspondence on this very important service should be directed to the chairman of the committee.

Some criticism of the content of the bulletins has arisen from time to time. Members must appreciate that HQ can only include items notified to it; it cannot generate news!

HONORARY OFFICERS AND REPRESENTATIVES ON OUTSIDE BODIES

The Council wishes to record its thanks to the members who have devoted much of their time and effort to the various aspects of the Society's work, without their assistance many areas of activity could not be undertaken.

Honorary officers

Awards manager, hf	C. R. Emary, G5GH
Awards manager, vhf	Jack Hum, G5UM
Intruder Watch organizer	S. A. G. Cook, G5XB
QSL Bureau Manager	A. O. Milne, G2MI
Slow morse organizer	M. A. C. MacBrayne, G3KGU
Taped lecture library curator	S.W. Coursey, G3JJC
VHF manager	G. M. C. Stone/D. A. Evans, G3FZL/G3OUF
Microwaves manager	D. S. Evans, G3RPE
Emergency communications manager	P. Balestrini, G3BPT
Telecoms liaison officer	R. F. Stevens, G2BVN
Trophies manager	P. A. Miles, G3KDB

Representatives on outside bodies

R. G. Flavell, G3LTP	CCIR Study Groups 5 and 6
R. F. Stevens, G2BVN	CCIR UK General Purposes
	BSI TLE 25/1 and 2
	Frequency Advisory Committee
D. A. S. Dryborough, G8HEV	CCIR Study Group 8
	BSI TLE 23/1, 25/3, 25/6
R. S. Roberts, G6NR	BSI TLE 1/5, 1/30, 25/4, 25/6
R. J. Hughes, G3GVV L. E. Newnham, G6NZ W. A. Scarr, G2WS	RAE Advisory Committee

NEW COMPREHENSIVE LICENCE

During the year, following considerable discussion between the Telecommunications Liaison Officer and the Home Office, a new comprehensive amateur licence was agreed and became effective on 1 January 1977.

The new A and B licences include the following facilities in addition to the main station telephony (and telegraphy for A licences):

(a) operation in any vehicle or vessel but not on the sea or within any dock;
(b) operation as a pedestrian;
(c) facsimile;
(d) radio teleprinter;
(e) television;
(f) slow-scan television;
(g) data (on 144MHz and above);
(h) double sideband suppressed carrier.

RAYNET

The inclusion of the county emergency planning officers in the authorities who may call on the Raynet groups has led to a significant increase in this organization's membership and activity.

QSL BUREAU

The Society's bureau continues to handle over one million QSL cards each year. This task has, for more than 38 years, been operated by Mr A. Milne, G2MI, and his wife.

Mr Milne has now asked us to find a replacement manager for this much-used service. Inevitably any successor for this occupation will need to devote his (and her) full time to it and the cost will be significantly greater than at present. The matter is under active consideration.

AMATEUR RADIO IN BROADCASTS

The public knowledge of amateur radio is, regrettably, all too little, and it is believed that this can only be improved by the Society and its associated groups and affiliated societies making their presence known and offering suitable material for broadcasting by the authorities.

Since October 1976, when *Radio London* enabled HQ to put on more than an hour's broadcast in which six people took part, there has been a regular monthly feature of 10–20 minutes organized by Mr E. W. Yeomanson, G3IIR. Various forms of feedback have indicated that a substantial audience exists for the information broadcast.

Several other local radio stations, such as Belfast, Stoke and Derby, have been carrying programme material. Usually local radio will co-operate in this kind of broadcast and it is felt that a greater effort in this respect should be made in the provinces so as to inform the public generally of the proper image of amateur radio.

COMMITTEES OF COUNCIL

During the year some proposals have been made to revise the present committee structure, and this is being reviewed by the 1977 President's Committee. In the meantime all the existing committees have continued their work.

Members should appreciate the amount of time devoted by the committees on their behalf in the various subjects. Meetings can only be effective if the persons concerned are prepared to devote not only their time at the meetings but also the travelling involved and the work arising from the meetings.

From the summary table it will be seen that 141 committee members attended a total of 94 meetings. Assuming 2½ hours per meeting this amounts to more than 2,300 man-hours.

Of course, these meetings cannot be held without cost which, with inflation, is increasing quite rapidly and this will have to be kept under constant review. However, the Society's policy remains that attendance at these meetings by those members from the provinces who are prepared to give their time, is regarded as most important, particularly for some of the more controversial subjects such as contests, Raynet and repeaters.

COMMITTEE MEMBERSHIP

Committee	Total No of members	No of corresponding members	No of Council members	HQ staff	Attending members	No of meetings
Education	9	2	1	—	7	5
Educational Visits Scheme	6	1	1	—	5	—
Finance and Staff	10	—	8	1	10	12
HF Contests	11	1	3	—	10	7
IARU Working Group	9	1	4	—	8	5
Interference	10	2	1	1	8	2
Membership and Representation	8	—	7	1	8	4
Microwave Sub-committee	7	—	1	—	7	1
Mobile and Exhibition	8	—	1	—	8	9
Propagation Studies	14	5	1	—	9	4
Raynet	10	—	1	—	10	5
Repeater Working Group	12	—	—	—	12	10
Technical and Publications	14	3	3	3	11	6
Telecommunications Liaison	12	1	6	1	11	6
VHF	15	5	2	—	10	10
VHF Contests	9	—	1	—	9	8
Totals	158	17	40	7	141	94

Committee reports

Individual committee reports have been provided by the chairman of the respective committee.

G. R. Jessop, G6JP

COMMITTEE REPORTS

Finance and Staff

The committee has met regularly and considered the many new and important problems which have been brought about by the commissioning of the data processor, improving the in-house accountancy, publication prices with adequate recovery of operating costs, introduction of members' discount and the overall financial position.

The introduction of the IBM32, with a great deal of work in programming, has been completed, although the rate of progress has been slower than had been anticipated. At a relatively early stage in the program development it became clear that a larger memory would significantly improve the operating of the machine and the change from 5·1 to 9·1 megabyte store was agreed by Council very early in 1977.

During the year consideration has been given to the possible change of *Radio Communication* to an A4 format and production by more economic means. No decision has yet been made.

As shown by the accounts, the year has been one of considerable progress. This has been due to the successful appearance of two of the Society's best selling books, the *VHF/UHF Manual* and the *Radio Communication Handbook*, and the maintenance of realistic prices of American publications.

The committee agreed that re-organization of the accounts department was necessary and that the employment of a qualified accountant would be required to achieve a satisfactory state. Mr N. J. Horn commenced his duties on 18 April 1977.

With the improved state of finances, it was agreed to redeem £1,500 of stock in the Lambda Investment Co and, as last year, the holders to be repaid will be chosen by ballot.

Assistant General Manager David Evans, G3OUF, returned to British Airways at the beginning of 1977 and, after selection by the committee, Mr R. Senter, G4BFY, commenced a trial period on 2 May 1977. Although no longer an employee, Mr Evans continues to devote many hours on the data processor and its programs.

The committee wishes to express its thanks to Miss V. Williams and Miss L. Gnocchi for their enthusiasm in working overtime to bring the membership records up to date.

E. J. Allaway, G3FKM

Education

The committee continues to be involved with matters relative to the Radio Amateurs' Examination. G3KEP and G8MW have been on a working party making preparations for the new examination format which will be introduced in May 1979. A survey has been carried out in an attempt to establish the reason why people apparently travel long distances in order to take the RAE at the Society's centre in London. In general, this was found to be due to lack of knowledge of more local examination centres.

A new booklet, *Radio Amateurs' Examination Questions and Answers*, has been compiled by the committee and will be published in August. It is based on the present style of RAE paper, but the information it contains, being almost entirely related to solid-state devices, will continue to be of value to intending candidates for the examination for many years.

The committee presented its biennial lecture for young people at the Science Museum in January, and G6NZ organized the Society stand and information service at the British Association Science Fair at Canterbury.

Pages for the Post Office "Viewdata" teletext system have been provided by the committee, and these have now been incorporated into the experimental service.

During the year the committee has been joined by G3FGY who is responsible for the visual aids and display aspects of the committee's work. The sound track of the highly successful tape/slide lecture *The World at Your Fingertips* is currently being modified by G2CVV to include realistic sound effects for the respective slides.

The Educational Visits Scheme co-ordinated by G3JNK continues to attract requests for short introductory lectures on amateur radio to be given in schools.

The Education Committee has seven members and two corresponding members and has held five meetings during the year.

D. M. Pratt, G3KEP

HF Contests

During 12 months under review the committee met on 10 formal occasions. The meetings follow a regular agenda covering:

(a) Contest rules, when the adjudicator submits to the committee a draft set of rules having taken into account the comments and suggestions received from contestants in the previous event. The rules are agreed and prepared for publication in *Radio Communication*.

(b) Contest reports, again by the adjudicator, who gives the committee a precis of logs received, together with comments, and raises any point he considers should be put to the whole committee for a ruling. The adjudicator confirms that he will be able to complete checking in time to meet the publication deadline.

(c) Correspondence, whether directed to Doughty Street or to an individual member of committee, is reported, together with the action that has been taken.

(d) Certificates. The position is reviewed at each meeting to ensure that they are issued as early as possible.

Following a major review of all rules that took place two years ago it appears from comments received that the majority of entrants are now happy with the present format.

A new contest will be introduced in 1978, occupying the period that was selected for this year's "Jubilee Test". This event proved to be extremely popular, with an unprecedented number of requests that a contest along similar lines remains in the annual programme. So next year will see the first "Region Round-up".

Last year activity in all events showed a consistent increase, with more G4s appearing in the top 10. Undoubtedly the largest increase took place during the Low Power Contest held in April. Here it is interesting to note how little commercial equipment was being used. Similar increases in activity have taken place in df events, which this year have been organized by Mr E. L. Mollart.

Two new members, G3KDB and G4FAM, were invited to join the committee in January to assist with the additional work.

J. Bazley, G3HCT

International Amateur Radio Union Working Group

With the approach of the World Administrative Radio Conference in 1979, the work of the IARU Working Group has been concentrated on related topics—retention and extension of the amateur bands being the prime interests. Representatives have attended meetings in Geneva and in the UK, as reported in *Radio Communication*. Consolidation of the recommendations of the 1975 Region 1 Conference in Warsaw is now being followed by preparation for the 1978 Region 1 Conference in Hungary; technical papers for the latter are being drafted by many RSGB committees. Members of the IARU Working Group have given talks to several affiliated societies; further lectures can be arranged through G3HCT, the group's information officer.

R. J. Hughes, G3GVV

Membership and Representation

This committee has been meeting regularly every two months. Discussions have taken place on numerous important matters, including the scheme of representation. Any recommendations in this context are being delayed until after the Regional Representatives Conference in September. New terms of reference for the committee have been drafted and passed to the President's Working Party.

Once again a meeting of the committee has been held in the provinces. Five regional representatives attended, as observers, a meeting recently held in Manchester. In the evening they were joined by nearly 20 local representatives from their regions and a useful discussion took place. It is intended to continue with the policy of holding M & R Committee meetings in other parts of the country.

Following several requests a letter has been drafted as a suggestion to RRs (and others if required) for sending to non-members with a view to obtaining their support as members.

It has been recommended, and Council has agreed, that a special committee be established to review, in its entirety, the Society's GB2RS news broadcast service. There have also been frequent

discussions regarding the benefits accruing to the Society from its new data processor. This was particularly apparent from the comprehensive "print out" of the whole membership which was available at Alexandra Palace to assist members of the committee in answering queries.

B. O'Brien, G2AMV

Mobile and Exhibition

The committee met monthly throughout the year. Most of the meetings were devoted to arrangements for stands at the two main exhibitions, ARRA exhibition at Leicester, and the Society's own exhibition at Alexandra Palace. With the exhibition organizer, Mr J. Hitchins, serving on the committee, the members were able to put forward many suggestions on the running of this event.

Committee members attended many functions throughout the country during the year, thus obtaining the views of members towards exhibitions, rallies and meetings.

Both at the Leicester and London exhibitions a very welcome number of new members joined the Society. Large numbers of Society publications were sold and many members' enquiries dealt with. The committee members who staffed the stands were very grateful for the assistance of HQ staff and Council members and wives.

Many enquiries were received concerning the Woburn Abbey Rally, which is now back in the rally calendar and to-date appears to be a very popular open-air function for the mobile operators. The committee is again grateful to Dunstable Downs Radio Club who are organizing the talk-in stations.

N. Miller, G3MVV

Propagation Studies

The interests of this committee include auroral studies, CCIR projects, ionospheric predictions, and the international beacon project. The auroral warning system continues to be extended, under the direction of G2FKZ; the latter always welcomes reports relating to communication under auroral conditions. Members of the committee have attended meetings of Study Groups 5 and 6 of CCIR, thereby ensuring that the serious and scientific work of radio amateurs is both utilized and known. The introduction of the new "HF Propagation Study" charts in *Radio Communication* has brought a number of favourable comments from readers. The international beacon project has been responsible for the introduction of several new beacons on the 28MHz band—the long-term analysis of reports of reception of these beacons continues.

R. J. Hughes, G3GVV

Raynet

The committee is pleased to report an active and fruitful year, and the increased activity reported in 1976 has continued, due mainly to the inclusion of county emergency planning officers in our list of authorized users. Most counties where groups exist have written Raynet into their contingency plans for major emergencies and disasters. We feel that this is of considerable importance, being further concrete evidence of the standing of Raynet (and the radio amateur) in official circles, which in the best tradition of radio amateur expertise in service to the community can only help in the preservation of our frequency allocations in 1979.

The committee has been invited to send delegates to a "Symposium on major incident intervention" being mounted by the City of London Police during October. An exhibit will be staged and the chairman will be delivering a paper on Raynet communications on the second day. This is the second time that Raynet has been invited to participate in such a symposium, which is open to all emergency organizations, industry and commerce having an interest in intervention or the provision of equipment at peacetime disasters.

The year has seen Raynet featured at rallies and exhibitions around the country, the highlight being the Raynet participation in the display and lecture programme at Alexandra Palace. Our display was the most ambitious to date, and we were particularly pleased to welcome visitors from Switzerland and France to the stand.

Field activity during the period has included the involvement of groups in several "live" callouts occasioned by floods and gale damage in various areas. At the specific request of the British Red Cross Society, St John Ambulance and the police, Raynet has been in active attendance at several county shows and similar events. In all these operations the organizers and users expressed appreciation for the efficient service and method of working of the groups concerned, stating in two cases that loss of life would probably have occurred without the support of our emergency communication facilities.

Administratively, a new Raynet manual effective from 1 May 1977 has been issued. This clarifies the method of appointment of county/area, sector and group controllers, modernizes the text and includes the new user services. The committee notes with pleasure the appointment by Council of a Society emergency communications manager, and appreciates the issuing of a certificate by Council in recognition of the service rendered by Dr A. C. Gee, G2UK. At the annual committee dinner, the chairman accepted a "badge of office" in the form of a silver medallion on behalf of the service from Arnold Matthews, one of the founder members.

A paper entitled "Raynet—emergency communications and community services" has been prepared by the chairman for presentation at the IARU Region 1 conference in 1978.

Membership continues to increase, and we now have over 70 groups throughout the country with a membership in excess of 1,800.

P. Balestrini, G3BPT

Technical and Publications

The main tasks of this committee are in connection with *Radio Communication* and the production of books. During the year 58 articles were submitted to the Society for publication and these were read and evaluated by committee members, with specialist assistance where necessary. The production costs of the journal continue to rise and possible changes in format and printing processes are continually under scrutiny by the committee. The bulk post despatch envisaged in the last annual report has been implemented, but the saving on this was partly offset by a later large increase in postage rates. The cost of postage, both on the journal and books, is now at an unfavourably high level. One benefit from the introduction of bulk post despatch has been that the necessity to over-trim the journal to avoid a higher postage charge on individual issues has been obviated. The despatch of *Radio Communication* flat in plastic envelopes appears to have met with universal approval.

The appearance of volumes 1 and 2 of the *Radio Communication Handbook* was a long awaited event, and the sale of both books has been very satisfactory. At the end of the year under review arrangements are being made for a reprint of volume 1. As with previous editions there have been considerable overseas sales. A further edition of the *VHF/UHF Manual* by G3RPE and G6JP sold in large quantities immediately on appearance. Sales of the *Call Book* were satisfactory bearing in mind the cost of this publication. During the year, revised editions of the following books were in preparation: *Amateur Radio Techniques* and *Guide to Amateur Radio* by G3VA; *Radio Data Reference Book* by G4CDY and G6JP; *Test Equipment for the Radio Amateur* by G2BUP. In addition a publication providing model answers to typical RAE questions was compiled by the Education Committee for publication in August 1977. A new edition of the *RAE Manual*, taking into account the new RAE syllabus, is under discussion with the Education Committee.

The committee wishes to acknowledge the co-operation of Messrs A. W. Hutchinson (editor) and R. J. Eckersley, G4FTJ (book editor), who are both members of the T & P Committee.

R. F. Stevens, G2BVN

Telecommunications Liaison

The work-load of this committee has increased during the year under review and no lessening can be anticipated in the immediate future. The activities of the committee fall broadly under two headings, liaison with the Home Office and preparation for WARC 1979.

Co-operation with the Home Office is maintained on a daily basis by the general manager and telecommunications liaison officer. The new amateur licence was introduced on 1 January 1977 and the co-ordination of the various facilities has been welcomed by users. The repeater network has developed and the Phase 1 uhf stations have been brought into operation without major problems. However, the usage of some vhf repeater stations is a continuing disgrace to the persons concerned and a great deal of time has been spent in

endeavouring to rectify this intolerable situation. The position regarding the so-called citizens' band has been kept continually under review.

The operation of the Amateur Radio Observation Service has been finalized and G3KEP has undertaken the organization of this new activity.

The Home Office is co-ordinating frequency proposals from the various services for WARC 1979, and further meetings and liaison will take place. The position of the amateur service in other countries has been noted and there is general world-wide conformity with the IARU proposals. The Society's Intruder Watch, under the guidance of G5XB, forms an indispensable part of the preparation for 1979, and G3PSM continues as the co-ordinator of the IARU Monitoring System which deals with intruder activity on a global basis.

Messrs R. W. Price, G4BSO, and C. E. Benson, G3MUX, continue to provide the committee with specialist advice on planning matters, and appreciation of this valuable service is recorded.

The work of this committee cannot be satisfactorily conducted in isolation, and during the year there has been liaison with the IARU Working Group, Repeater Working Group and VHF Committee.

R. F. Stevens, G2BVN

VHF

The committee is concerned with all matters relating to frequencies above 30MHz, including microwaves above 1GHz.

Early in 1977, Geoff Stone, G3FZL, resigned as vhf manager, and subsequently David Evans, G3OUF, was appointed by Council as his replacement. Tom Douglas, G3BA, chairman of the committee, is responsible primarily for all UK vhf/uhf matters while the vhf manager concentrates on the international aspects.

Among the topics discussed by the VHF Committee are:

Beacons. There are over 20 in the UK, for which the Society holds the licences; initial technical work, frequency allocations etc are handled by the committee. The RSGB is responsible for the frequency co-ordination of all IARU Region 1 beacons over 50W erp. This task has been handled most competently by committee member Brian Bower, G3COJ. The Society's data processor is used for rapid up-dating and presentation of beacon information, and it is known that the beacon service has a very large following.

Repeaters. With over 100 repeater groups in the UK it is estimated that at least a quarter of all licensed amateurs in the country have used or are interested in, repeater networks. Mobile activity on repeaters is flourishing and newcomers include many dedicated hf operators. On uhf, Phase 2 of the uhf plan was presented to the Home Office in April. On vhf there has been little progress despite an enormous amount of work done at committee level, particularly by the VHF Committee's Repeater Working Group. A number of outstanding vhf fm repeaters and many other special projects are being considered.

Exhibitions. The committee planned a programme of talks and lectures covering all frequencies above 30MHz for the May Alexandra Palace Exhibition. Guest speaker, Ed Tilton, W1HDQ, travelled from ARRL with his wife Leitha, to attend, and gave a memorable survey of vhf topics taken from his wide and long experience in the USA. The entire vhf programme was well-attended. Following the exhibition the committee decided that Alexandra Palace had primarily been successful among the newcomers to vhf, but that amateurs interested in more obscure aspects were perhaps not catered for. Another series of talks on general vhf matters at the next Alexandra Palace Exhibition is planned but a specialized vhf convention of a rather different format to former conventions will be held to cater for the specialized and highly technical interests.

Band-planning. This is now dealt with primarily at international level, and the views of the committee put forward at international conferences are voiced among those of other IARU Region 1 national societies. On 70MHz, which is a special UK allocation, three fm fixed-channel frequencies have recently been introduced. On 144MHz, band-planning to consider a special data frequency is currently being considered.

IARU matters. The committee has spent much time considering factors to be put forward at WARC 79. As a lead-up, the committee, BARTG, BATC and the VHF Contests Committee are considering a number of papers for presentation at the next IARU Region 1 meeting in April 1978. A wide range of papers relating to vhf activities has been planned. In addition, it is Society policy to try to establish a new vhf band in the 50MHz region.

Microwaves. To deal with the technical, international and operational aspects of microwaves, Dain Evans, G3RPE, was appointed microwaves manager during the year, and the committee is now considering the formation of a separate microwaves committee instead of the present Microwaves Sub-committee.

Interest in exploring the potential of the microwave bands in general has continued at a steady rate, although the 10GHz band still attracts a high proportion of the effort. A valuable focus for this activity during the year has been the microwave round tables, three held at Winchester and one in Sheffield, organized by the Microwaves Sub-committee.

Members of the sub-committee have also been directly concerned with the establishment of the GB3LBH beacon at Romford, the 3·4GHz beacon GB3UOS at Sheffield, and with preparing for the 10GHz beacon GB3ALD on the island of Alderney. During the year, the 1·3GHz beacons GB3AND and GB3WRN also became operational. Beacons for other of the microwave bands, including 24GHz, are under active consideration.

The year has been successful more in terms of the quality of operation rather than quantity. Continued exploitation of the super-refraction mode of propagation produced the new 10GHz world record of 521km. It is to be noted that all three of the world dx records on bands above 1·3GHz were held by UK stations during the period under review. To encourage the investigation of other possible dx modes, much attention has been given to technical problems involving fixed station operation. From preliminary observations it appears that "openings" at the higher microwave frequencies may be rather more common than previously thought; these are especially important as they allow the use of low-power equipment. An alternative approach, which has already met with some success, is the use of high-power (by amateur standards) equipment to work over long (100km) obstructed paths by tropospheric scatter.

The RSGB has always taken a leading role in international affairs and continues this tradition in the microwave field. Much of the current growth of interest in Europe in this part of the spectrum can be traced back to the lead provided by UK amateurs. At the IARU Region 1 conference to be held next year, it seems likely that a separate microwave stream may be justified.

T. Douglas, G3BA

VHF Contests

The VHF Contests Committee organized 18 contests during the year, covering all bands from 70MHz to 24GHz. As promised, the 1977 contests calendar differed little in form from its predecessor, and it aroused unusually little comment. The calendar is devised around major contests on the first weekends in March, May, July, September and October. These are the dates on which vhf/uhf/shf contests are held all over Europe, ensuring a plentiful supply of dx if conditions are good. Other contests are scheduled according to the pattern that has evolved over the years, although there is little room for manoeuvre within the constraints of maintaining a balance of interests and avoiding clashes with other major RSGB and national events.

Contests serve several purposes in furthering technical development on the bands above 70MHz. Microwave contests provide opportunities to test new equipment in practice and to gain more knowledge of modes of propagation that the professionals have overlooked. The competitive aspect of these events is an extra incentive to do one's best, so the Microwave Sub-committee asked that 10GHz activity periods be organized as cumulative contests. A member of the sub-committee has joined the VHF Contests Committee with this primary task.

On the lower bands, contests are a yardstick for measuring operating skill and station performance. Only the very best receivers can hope to deal with the vast range of signal levels that occur simultaneously in a vhf contest, and such receivers are still the province of the home constructor. It is equally difficult—though possible—to transmit a signal that remains strong but clean throughout the rigours of a 24-hour contest: this, too, is in the hands of the operator rather than the equipment dealer. VHF contests will continue to provide a spur towards the development of effective, well-operated stations.

Our thanks to Messrs M. T. Deacon, G3XHU, and P. W. Willcocks, G4BWY, who retired from the committee at the end of 1976. New members in 1977 are Messrs C. W. Suckling, G3WDG, and R. J. Taylor, G4BEL.

I. F. White, G3SEK

RSGB AREA REPRESENTATIVES

Region 1

G. L. Adams, G3LEQ, 2 Ash Grove, Knutsford, Cheshire WA16 8BB (Mid-Cheshire).
K. Birch, G2FOS, 19 Lloyd Drive, Greasby, Upton, Wirral, Cheshire.
C. Cartmel, G4EST, 31 Redvers Drive, Liverpool L9 8BS (Liverpool & D).
J. Heywood, G8BHQ, 9 Kenilworth Drive, Hazel Grove, Stockport, Cheshire SK7 5LE (Stockport & S Manchester).
J. M. Horrocks, G8GTP, 17 Wood Grove, Whitefield, Manchester M25 7ST.
N. Horrocks, G2CUZ, 34 Sandbrook Road, Ainsdale, Southport PR8 3JE (Southport & D).
G. Lancefield, G3DWQ, 191 Higher Walton Road, Walton-le-Dale, Preston, Lancs (Preston).
A. B. Langfield, G8IOA, 201 St Mary's Road, Moston, Manchester M10 0BN.
R. J. B. Morgan, GD3KGC, Plot 19, Howe Road, Onchan, Douglas, IoM.
G. W. Perkins, G3VIJ, 35 Kingstown Road, Carlisle, Cumbria CA3 0AB.
R. E. Staples, G3MMD, 3 Willow Close, Lymm, Cheshire (Warrington).
A. Thorne, G3ART, 37 Garborough Close, Crosby, Nr Maryport, Cumbria (S & W Cumbria).

Region 2

J. W. Thompson, G3WQM, 80 Albion Avenue, off Beckfield Lane, Boroughbridge Road, York.
Ms C. Wade, G4CUY, 74 Cow Close Road, Leeds LS12 5PD.

Region 3

W. F. Mienerts-Hahn, G3UOL, 91 The Chesils, Styvechale, Coventry, Warks CV3 5BE.
S. Powell, G3WRA, Karenza, Canon Pyon Road, Hereford HR4 2RB.

Region 4

I. R. Brothwell, G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ.
M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ.

Region 5

L. Critchely, G3EEL, 36 Waterloo Road, Peterborough, Northants.
S. J. Purser, G8GHZ, 2 Dobson Close, Great Houghton, Northampton NN4 0AX.

Region 6

P. Erkiert, G4BKS, 3 Hartwell End, Southcourt, Aylesbury, Bucks.
C. F. Young, G4CCC, 18 Wincroft Road, Caversham, Reading, Berks.

Region 7

G. Cluer, G4AVV, 24 Patterson Road, Upper Norwood, London SE19 2NT.
R. S. Hewes, G3TDR, 24 Brightside Avenue, Laleham, Staines, Middx.
J. Korndorffer, G2DMR, 19 Park Road, Banstead, Surrey.

Region 8

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