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.
THE FABULOUS TR-4CW TRANSCEIVER NOW WITH RIT
FROM RADIO SHACK LTD.


TRIO at Radio Shack Ltd.

ALSO: Jaybeam, Microwave Modules, Bantex, and all the run of the mill amateur items.

We decline to make exaggerated claims to greatness

SECURICOR
B.R.S.

DRAKE ★ SALES ★ SERVICE

RADIO SHACK LTD.
188 BROADHURST GARDENS, LONDON NW6 3AY
Just around the corner from West Hampstead Underground Station

Telephone: 01-624 7174.


Open Monday-Friday 9-5, Saturday 9-12.30. Closed for lunch 1-2.
ISSN 0033-780

EDITOR
A. W. Hutchinson

Editorial assistant
Mrs M. J. Collins

Draughtsman
D. E. Cole

Secretary
Mrs J. D. Brown

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

The Editor, RSGB,
88 Broomfield Road,
Chelmsford,
Essex CM1 1SS
Tel 0245 84938

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

RSGB Headquarters,
35 Doughty St,
London WC1N 2AE
Tel 01-837 8688

ADVERTISING
Advertising, other than Members' Ads, should be sent to:

Mr C. C. Lindsay,
2 Leyburn Gardens,
Croydon,
Surrey CR0 5NL
Tel 01-686 5839

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

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

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

© RADIO SOCIETY OF GREAT BRITAIN 1977
At last...  ...the Mast
TO SOLVE ALL YOUR ANTENNA SUPPORTING PROBLEMS
ALUMAST
SUPERB VALUE... STRONG... LIGHTWEIGHT... ANOTHER 'Western' QUALITY PRODUCT
LISA CAN LIFT IT... and she's only 8!

Consider these star features:
★ One 10' section weighs only 11kg.
★ Easily assembled by one person.
★ Self-supporting... no guys.
★ Can be extended to 200 feet!
★ Climbing rungs incorporated.
★ Corrosion resistant high strength alloy.

PRICES (CARR. PAID). VAT 8% EXTRA.
375/PSS/3, 30' SELF-SUPPORTING

ALUMAST
... only £111.00
TP-1. TOP PLATE, takes 1 ½” mast £6.50
RMP-1. ROTOR MOUNTING PLATE £4.00
FB-1. FIXED BASE £12.00
HB-1. HINGED BASE £21.00
375/PSS/1. ADDITIONAL 10' SECTIONS £37.00

there’s no better buy!
Here’s why...
Some other firms just drive round in their ROLLS-ROYCES!
At ‘Western’ we plough back our PROFITS to give you better value.
The more you buy from ‘Western’... the better savings YOU will get.

Western...  
YOUR SINGLE-STOP SOURCE
New! Extended range ‘PENETRATOR’ series Antennas

Get on top of the pile—up with the New DX-34

★ Heavy duty 2Kw p.e.p. RATING
★ BROADBAND OPERATION
★ SWR less than 1:3:1 at RESONANCE
★ FORWARD GAIN UP TO 9dB
★ FRONT/BACK RATIO UP TO 20dB
★ STAINLESS STEEL HARDWARE

Another ‘Western’ quality product

PRICES (CARR. PAID). 12½% VAT. extra

DX-31 DIPOLE 10/15/20. 2Kw p.e.p. £35.00
DX-32. 2 ele. 10/15/20. 2Kw p.e.p. £55.00
DX-33. 3 ele. 10/15/20. 2Kw p.e.p. £75.00
DX-34. 4 ele. 10/15/20. 2Kw p.e.p. £99.00
TD-10/90. DIPOLE, 10, 40 & 80M £19.50
TD-15/90. DIPOLE, 15, 20, 40 & 80M £19.50
TYPE P. DIPOLE PORTABLE. 10/90. £24.00

WESTERN 70TV
432MHz TRANSVERTER

ONLY £159 + VAT

this will be the new pacesetter!

We have designed and built the 70TV up to a high standard
not down to PRICE! Don’t buy a 70TV if you’re looking for a
cheap unit

BUT if you want to hear signals that some others can’t...
the 70TV is the answer!

★ FULLY STABILISED AC & DC PSU.
★ FULL 10W R.M.S. OUTPUT
★ DOUBLE CONVERSION TO MINIMISE SPURII
★ NOISE FIGURE 2-5dB TYPICAL
★ BUILT-IN 28MHz ATTENUATOR 30:1
★ BUILT-IN RELAYS
★ MATCHES YAESU STYLING.
★ WITHSTANDS INFINITY MISMATCH
★ ALL UNITS ALIGNED ON HEWLETT-PACKARD
SPECTRUM ANALYSER
★ CAN BE DRIVEN BY MOST 28MHz TRANSCEIVERS

Our Agents
Southern: Alan Paxton, G88IZ, Chandlort Ford (04215) 65016
Scotland: Alan Cameron, GM10GQ, Alloa (0259) 21655
N. Ireland: Lee Lysaker, G13C0D, Newtownards (0247) 82440

Opening hours:
LOUTH: 0-12; 1-5pm Mon-Fri. By appointment Sat-Sun.
LEICESTER: May’s Hi-Fi, Churleigate (Tel: 0552-58562)
Mon-Sat 9-4pm; closed Thur.

Western Electronics (UK) Ltd
HEAD OFFICE (All Mail/Enquiries)
FAIRFIELD ESTATE
LOUTH, LINCS, LN11 0JH
Tel. Louth (0507) 4955/6
THE NEWEST LEADER—FT227R FROM
THINK HARDER NOW BEFORE BUYING!

ONLY
£189
INC. VAT

COMPARISONS! Have you ever tried it?
Confusing, isn’t it—turning from one ad to another, some giving one piece of information, others not; some showing data in one form, some in a different form. How can you decide on which 2 metre FM rig to buy?

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...

<table>
<thead>
<tr>
<th>CHANNELS AVAILABLE BY FRONT PANEL CONTROL</th>
<th>YAESU FT227R</th>
<th>TRIO TR7500*</th>
<th>ICOM IC240*</th>
<th>DIGITAL II*</th>
</tr>
</thead>
<tbody>
<tr>
<td>FULL 4MHz COVERAGE (144-148)</td>
<td>400 (800 over 4MHz)</td>
<td>88</td>
<td>22</td>
<td>400</td>
</tr>
<tr>
<td>WITHOUT MODIFICATION</td>
<td>YES</td>
<td>APPARENTLY</td>
<td>APPARENTLY</td>
<td>RECEIVE</td>
</tr>
<tr>
<td>FREQUENCY STEPS</td>
<td>5kHz</td>
<td>25kHz</td>
<td>25kHz</td>
<td>SKHz</td>
</tr>
<tr>
<td>TRUE FREQUENCY DISPLAY</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>FREQUENCY MEMORY FACILITY</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>REPEATER SHIFTS</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>EXTRA</td>
</tr>
<tr>
<td>TONE BURST</td>
<td>YES</td>
<td>YES</td>
<td>NOT YET</td>
<td>YES</td>
</tr>
<tr>
<td>FACTORY-FITTED HIGH/LOW POWER SWITCH</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>EXTRA</td>
</tr>
<tr>
<td>PRICE (INCLUDING VAT)</td>
<td>£189</td>
<td>£225</td>
<td>£198</td>
<td>£264†</td>
</tr>
<tr>
<td>PRICE COMPARISON</td>
<td>LOWEST £36 MORE</td>
<td>£9 MORE</td>
<td>£75 MORE</td>
<td></td>
</tr>
</tbody>
</table>

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

"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


SPECIFICATION:
Freq. ranges (MHz): 1-6-2-4; 3-5-4.0; 7-6-7-39; 14-0-14-35; 21-9-21-45; 28-0-29.7
Input impedance: 50-75 ohms unbalanced.
Maximum SWR: 3:1 with respect to input impedance.
Maximum power: 500 watts PEP.
Insertion loss: 0-5 dB max.
Power ranges (meter): 25W, 250W, 500W, full-scale SWR ranges (meter): Calibrated to 4:1 SWR.
Dimensions: 212(W) x 123(H) x 257(D) mm.
Weight: 4-8 kg

★ PRICE: £85.118 (you have to love it at that price!) inc. VAT 12½%

BOTH THESE NEW MARKET LEADERS FROM

YAESU MUSEN

AVAILABLE FROM
WESTERN ELECTRONICS (UK) LTD., FAIRFIELD ESTATE, LOUTH, LINCS. LN110JH

836
TR-7500
Why settle for anything less?

TR-7500
A most attractive small package with the following vital statistics:
ALL 80 FM channels from 144-146MHz
plus
ALL repeater channels R0-R9
plus
ALL reverse repeater channels RRO-RR9
plus
NO programming required; just unpack and use.
Transmitter output well in excess of the 10 watt spec.
Receiver sensitivity. 12 dB SINAD for less than 0.2 µV.
Unique channel display which shows correct channel number at all times, no need to ask 'did I programme S24 into 15 or 16?'
Repeater, simplex and full reverse repeater operation without touching the main dial.
Automatic tone burst using the TRIO 1750 Hz tuning fork oscillator.
And yes, she lives in Matlock.
DON'T SETTLE FOR ANYTHING LESS THAN THE TR-7500
TR-7500 £225 inc. vat
The ultimate transceiver...TRIO's TS-820. No matter what you own now, a move to the TS-820 is your best move. It offers a degree of quality and dependability second to none, and as the owner of this superb unit, you will have at your fingertips the combination of controls and features that, even under the toughest operating conditions, make the TS-820 the leader that it is.

Unprecedented demand plus the painstaking care TRIO lavishes on each TS-820 created an initial backlog of orders but happily we can now supply the TS-820 from stock. Once you have operated the TS-820, you will not be satisfied with anything else.

Features

**SPEECH PROCESSOR** - An HF circuit provides quick time constant compression using a true HPF as opposed to an IF clipper. Amounts of compression are adjustable to the desired level by a conventional front panel control IF SHIPT. The IF SHIPT control varies the IF passband without changing the receive frequency. Enables the operator to eliminate unwanted signals by moving them out of the passband of the receiver. This feature alone makes the TS-820 the transceiver that it is.

**PLL** - The TS-820 employs the latest phase lock loop circuitry. The single conversion receiver provides performance far superior to the IF SHIPT. It offers superb protection against unwanted cross-modulation. And, new PLL allows the frequency to remain the same when switching sidebands (USB, LSB, CW) and eliminates having to recalibrate each time.

### Specification

**FREQUENCY RANGE:** 1.8-30MHz
**MODES:** USB, LSB, CW, PSK
**INPUT POWER:** 200W PEP on SSB
160W DC on CW
100W DC on PSK
**ANTENNA IMPEDANCE:** 50-75 ohms
**CARRIER SUPPRESSION:** > 40dB
**SIDEBAND SUPPRESSION:** > 50dB
**SENSITIVITY:** (10dB S/N) < 0.2μV
**SELECTIVITY:** SSB 2-4kHz (-6dB)
**SPEECH PROCESSOR:** 4-4kHz (-60dB)
**CW 0-5kHz (optional filter)**
**IMAGE RATIO:** > 60dB
**IF REJECTION:** > 80dB
**POWER SOURCE:** 120/240 Vac
50/60Hz
13.8 Vdc (optional DC converter)
**WEIGHT:** 16Kg (35.2lb)

**TS820 £645 inc VAT, DG1 readout £127**

The Portables

TR2200GX - Represents the very best of TRIO design. It is the latest in the line of continuous progress from the first TR2200 and maintains the TRIO tradition of top quality at a reasonable price. The TR2200GX has all the features that you could want: high power output; sensitive receiver; flexible use from internal batteries or external supplies using the power lead supplied; built-in removable telescopic antenna with flexible whip; built-in metering of signal strength, transmit output and battery condition; fitted with twelve channels at low, low prices; in short, all that you could want.

All operator controls are placed for maximum convenience on the top face of the rig and a protective carrying case is included in the price.

TR3200GX - This is the matching 10 Watt mobile amplifier for the TR2200GX (and all previous models). It is self contained and of very small size but produces well in excess of 10 Watts for 2 Drives of power. It contains a regulated power supply for the TR2200GX and has positive SWR protection for the PA transistor. The amplifier may be switched out of circuit if required, but still supplies power for the TR2200GX.

TR3200. Not content with having the lead in 24 metre handy portables, TRIO have gone one step further and produced the best 70 cm. portable rig to match.

The TR3200 is really terrific; over 2W output with a 20mW signal to 60 mW for local contacts; tailored speech response with a new limiting amplifier and new microphone give you crisp speech quality.

Excellent receiver performances with double IF filtering at 10-7 MHz and 455 kHz with five limiters to guarantee noise free performance on even the weakest signals. 12 channel capability with three channels factory fitted with crystals for SUB, 1B and 20. Supplied with all accessories as the TR2200GX and including a new high gain 5/8 wave antenna.

50p in stamps will get you the full catalogue plus the antenna book.

Don't forget, the following accessories are provided FREE with the TR2200GX and TR3200:

- Removable antenna, carrying case, shoulder strap, battery charger, external power lead. Prices including 12½% VAT.
- TR2200GX: £139 (3 channels) £169 (12 channels)
- TR3200: £182 (3 channels) £212 (12 channels)
  - M8ln: £9.70
  - N4Cad pack: £9.72

HEAD OFFICE 119 Cavendish Rd, Matlock, Derbyshire. 0629-2817 or 2430

RADIO COMMUNICATION November 1977
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.

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 63859) DURING THE EVENING WHEN CALLS ARE CHEAP

HP TERMS NOW AVAILABLE

YOUR SOLE AUTHORISED UK IMPORTER FOR ICOM

THANET ELECTRONICS

143 Receiver Road, Bellinge, Herne Bay, Kent (02273 63859)

---

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

If the answer is YES to all those and it's cheaper than an IC-240 it may well be worth buying.
JUST A HEAP OF WINNERS!

The ICOM range of 2 metre gear is some of the best you can buy—for quality, reliability and excellence of performance!

Add to this the oft’ praised service of THANET with our well qualified technical staff and range of good test equipment and you need have no worries in buying.

FOR MOBILES

IC-240, £198. The well tried and highly popular FM synthesized rig. If you know a friend with one you will know we have every right to boast about the excellent quality of the signal it puts out. (Perhaps that is why we have sold so many!) Now available with Super-Scan as an extra. By the way this is the same size as the SSB unit on the IC-24SE.

IC-24SE, £396. The leader in multi-mode mobiles. Fully synthesized to give full band coverage in 100Hz or 5kHz steps. LED readout of frequency to the nearest kHz. FM, USB, CW, Normal or Reverse Repeat or split frequency working with any spacing, automatic tone burst etc. An excellent bit of engineering which can also serve as a base station.

FOR PORTABLES with a decent power output and large battery capacity

IC-202, £172. The 3W SSB portable which is tunable over all the sideband pitch and can be used, when fitted with extra crystals, to cover 144-148 and 145-8 to 146MHz. Used by many as a prime mover for something bigger because of its excellent clean signal. By far the most popular VHF SSB only set on the market. There are a lot about!

IC-215E, £182. The big boy in FM portables, with Rx sensitivity and transmission quality every bit as good as a base station (and better than many)! A healthy 3W of FM and sensitive batteries with 4 times the capacity of those used in most other portables—so that they don’t run flat on you in the middle of a QSO quite as often. Despite this and its rugged construction it is still easy to carry around. Lots of these about also!

FOR BASE STATIONS

IC-211E, £528. The leader of them all. Fully synthesized VFO with 7 digit LED readout to the nearest 100Hz. FM, CW, LSB, USB. There’s nothing quite like it. Most would make this their choice if it wasn’t for the problem that you have to pay more for the best! (With these days of inflation it isn’t silly to think about HP). See October’s ad for more details.

ALL PRICES INCLUDE VAT, AND DELIVERY IS FREE ON MAIL ORDERS FOR TRANSCEIVERS. WHY NOT POP A NOTE ON THE ANSAFONE FOR A PRETTY COLOURED BROCHURE AND DETAILS?

THANET ELECTRONICS
HERNE BAY KENT
02273-63859

SHOPS

THANET NORTHERN
WOMBEWELL, YOORKS
0228-756229

OTHER AGENTS

(Phone First—All evenings only except Norfolk and Burnley)

LONDON—Terry G8SWM (01-555 0269)
SCOTLAND—Ian GM8GOX (07868 3295)
NORFOLK—Ted G5FEW (05086 6262)
WALES—Tony GW3KDO (0222 702882)
BURNLEY (0222 220401)

MIDLANDS—Tony GAVH (021 328 5305)
NORTH WEST—Gordon GLEQ (Knutsford 0565 4060)

FOR ALL MAIL ORDERS AND SALES DURING BUSINESS HOURS

THANET ELECTRONICS
HERNE BAY
(02273 63859)

RADIO COMMUNICATION November 1977
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 Watley Triple-mix, drift cancelling loop for continuous, split-tuned inclusive coverage of 0.5 to 30MHz.

The receiver is sensitive (0.5µV for 10dB, B + NIN (SSB)) and stable with A.M., SSB and CW modes covered. 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, 6 dry cells are automatically switched in.

FRG-7 Analogue Readout £145 + VAT COUNTER £60 + VAT
FRG-7 Digital Readout £199 + VAT YH55 Headphones £8 + VAT

STOP 
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 1MHz 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 up harmonics of oscillator (chirp). Look at the ergonomics, are there more controls than necessary, preselectors or various tuned receivers. 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 is a 'single knob' tuned digital synthesizer employing a photoelectric sensor for an optical system which eliminates both noise, unreliable rotary switches, and crystal banks.

Full coverage of 8 metres in 5 kHz divisions with a ±200kHz shift plus a memory feature which permits recall of any entered frequency or particular offset.

Bright, large, digital readout gives unequivocal readout of the frequency in use. The receiver offers 0.3µV (for 20dB S:N ratio) sensitivity up to ±2kHz @ 5dB) bandwidth whilst maintaining a remarkable immunity to overload and image problems. The 25W DC input transmitter features Milow power outputs, A.F.P, tone burst on repeaters and an out of band inhibition trip etc.

10-180m. Switched, 50/75 Input, 500W PEP mod handling. Power meter with 25, 50 & 500W P.F.D ranges. 4 position antenna selection 1 wire and 3 SO239 sockets.

10-180m. Switched L.P.F. 15W-200W PIP A/A3), 4W-75W P.P. Push pull SRF 1070's. Negative feedback with ALR to exciter. RF sensing (Adjustable gain level) with override.

18-35MHz TX monitor 10-500w envelope, ramp and cross. Vist. 9Hz-44kHz (+9 and 10-7 provision). Horiz. 10kHz-150kHz, sweep 10kHz-10kHz. 2 tone generator.

NEW STOCK & PRICE LIST SEND SAE or 30p in STAMPS.

SOUTH MIDLANDS COMMUNICATIONS LTD.

OSBORNE ROAD, TOTTEN SOUTHAMPTON, S04 4DN

Head Office, Showrooms
Cables: Aerial Southampton
Tel: Totton (02458) 73323 (2 lines)

SOUTH MIDLANDS COMMUNICATIONS LTD.

ESTABLISHED 1958—19 YEARS

EVENMENTS—AGENTS—ALL QTHR

G3ZUL Stourbridge (03843) 5817 Brian Kennedy
G3MDO DX, B. of Aiton (070463) 2023 Ian MacKintosh
G3STMP Pembroke (033527) 866 Howard Winners
G3WYY Tonbridge (0773) 840346 Merwyn Anderson
Communications Ltd

OF PROFESSIONAL EXPERIENCE

LYA

MONITOR SCPE
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 2W PEP (1W average).

The MONITORSCOPE is designed to be connected between the Transmitter or Linear Amplifier output and the Antenna or Tuning Unit. A visual display of the Transmitter "envelope" is provided. This will allow the Transmitter to be "talked up" to full output power whilst watching for "fast stopping" that would cause distortion and loss of reliability, also the "envelope" produced would create interference to Stations on adjacent frequencies. By using the 2-tone Test Generator which is incorporated, a 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.

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

2 masts, SSB/ CW, IF, RF seaming with manual override, "Microprofile" techniques
135V D.C. 60W drive 4" x 4" x 10" (11"
(VAT + 12%), free delivery.
(Over 15 different models - S.A.A. details)

PA16100B/11. 146MHz 180W output £150

Boom Microphone "Headset"

600 ohms magnetic lightweight boom mic
Ideal for mobiles or contest etc. (Post free but plus 12% VAT.)

MD39 complete
Microphone only
Footswitch only

£41.75
£9.75
£26.15

Coax Relays

1D V C 50 ohms. Silver plated. 4 weeks. P. & P. 30p (VAT + 8%)
Power crossover (at 500 MHz)
CX120 50W 32dB (6) sockets £8.50
CX280 300W 40dB DNC sockets £17.95
CX400W 600W 40dB H sockets £17.95

RF SPEECH
PROCESSOR KP60

Audio to audio via 10-1MHz mains powered, illuminated meter. FT101 FT2 plus suitable. All phone modes superb on FM. NEW!
Ex-stock in Totton £41.25 (+ 12% VAT. P & P FREE)

RF SPEECH
PROCESSOR KP60

Audio to audio via 10-1MHz mains powered, illuminated meter. FT101 FT2 plus suitable. All phone modes superb on FM. NEW!
Ex-stock in Totton £41.25 (+ 12% VAT. P & P FREE)

Coax Slide Switches

Up to 1kW, 1.5GHz, 94dB isolation, 50 ohm "N" or "PL" fittings. Ex-
Stock P. & P. 30p (VAT + 8%)
TW1251 1 in 2 out nickel SO299... £25.40
TW1535 1 in 4 out nickel SO299... £11.50
TW2122 2 in 2 out nickel SO299... £11.50

LEADER ANTENNA COUPLER

LAC805
2.5-200MHz, 50.75cm (SWR < 5) and single wire (10-250 ohms) feed transformed to 50 ohm. Wattmeter 20 & 250W FSO, SSB 500W P.F. POA

LEADER TYPICAL DIP OSCILLATOR

LIM71A
1-2.5MHz on fundamentals battery c/w earphone and 6 plus in coils SWR modulation
1-15MHz Crystal facility... £38.50 (+ 8%)
LIM78B Antenna Impedance meter 1-15MHz
0-10kHz direct reading c/w lead... £38.50 (+ 8%)

ALL YAESU ITEMS POST FREE (+ VAT)

QTR84 World time clock, battery powered, analogue readout £13.30 (+ 8%)
VOM44 Desk microphone, 50Kohm impedance P.P.T. with lock and mic* switch £16.80 (+ 12%)
VOM54 Head microphone, 500ohm or 500Kohm (cable which) P.P.T. £7.50 (+ 12%) £21.25 (+ 8%)

FF500X Low pass filter sharp cut off type c/w 1.5LZ29's... £18.00 (+ 8%)

YY55 Communications headphones low impedance, well padded £23.95 (+ 12%)

YAESU MUSEUM ACCESSORIES

NORTHERN (LEEDS) BRANCH
The Chambers, No. 3 The Parade
North Lane, Headingly, Leeds
Tel: Leeds 0505 70229
Open 9-5pm Tues-Saturday 9-5pm Thurs.

AMATEUR RADIO

(Chas H. Young Ltd.)
178/176 Corporation St. Birmingham
Tels: 'Leeds' 201050. Open Mon-Sat. 9-5.30
Multi-storey Car Park at Rear of shop.

S.M.C. (Jack Tweedy)

176/174 Lowfield Rd.
Bradford 4058

S.H. (Jack Tweedy) LTD

Roger Bales, GS105
78 Chadbournes Rd.
Chesterfield, Derby

Jack Tweedy, GXY

Ham Shack, Roughton Lane
Woodhall Spa, Lincs

Radio Communication
November 1977

483
The fast-selling 2m FM Transceiver.

**Now...** I45.50 reads "£20"

Yes, the latest version now has a calibrated dial giving direct readout in European "S" & "R" channels.

**A POPULAR CHOICE—WHY?**

This superb transceiver is now selling faster than ever before. With FOK's reputation for quality, reliability and above all, after sales service, little wonder. (It really amazes us that some customers are still waiting for spares when the UK importer should have them in stock.) Very rarely do our customers have to wait for FOK spares as we have taken the elementary precaution of making sure that we have most items to hand in our workshop. It ties up capital but it also makes for a happy customer.

**SOMEN QUESTIONS ANSWERED**

It covers 166-168MHz, any frequency, not just the 25kHz spots? It is easy to QSY without having to mind the channel knob all the way round. For example if you hit S20 in the priority position "A" you can immediately flip from say S7 to S10 in a second. Low power is available but only in the low power position! (In the high power position you will typically obtain 12 watts output.) Extra channels can be added simply by plugging in additional crystals thus ensuring complete freedom of movement throughout the band and, more important, a clean spurious free transmission. Tone-burst is automatic but with the facility of switching it out so that a distant repeater can be worked without switching on the local one. A remote VFO is available for complete coverage of 144-146MHz with the addition of a synthesizer available soon.—It also costs a lot less!

**TECHNICAL POINTS**

On the more technical side we can add that such things as helical filters, 10MHz crystal filters, 455kHz ceramic filters are all included in the design. The transmitter is completely protected against open circuit or high SWR and the modulation is crisp and clean. There is a choice of high or low S-meter. The standard frequencies fitted are S0, S10, S20, S30, R0, R10, R20 and R30. Included with the Quartz 16 is microphone, power cord, fuzzy, plug, table stand and English manual.

---

**FDK** for 2 metres Multi-II

23 Channels... Plus Autoscan... and a lot more!

**A TRANSCEIVER YOU SHOULD CONSIDER**

This really is the deluxe 2 metre FM transceiver that outclasses all others. FDK engineering and reliability from the company that specializes solely in VHF communications. But supplemented by the UK backing of WGE in the UK—full time service staff, £1,000's of spares and a fast turn around—no wonder our company has grown—our customers keep coming back to us!

**HIGH POWER OUTPUT**

While some transceivers struggle towards 10 watts output, the FOK Multi-II coasts along at 12 watts or more. The PA is completely protected against open circuit, short circuit, and high SWR.

**A REALLY HOT RECEIVER**

Better than 3-5uV for 90dB quieting is typical front-end sensitivity of the Multi-II. Little wonder, with its built-in RF pre-ampl it is the hottest thing around! But sensitivity is no good without selectivity as well. That's why the Multi-II has a high performance helical filter readout in the front end. This is followed by a 10-1MHz crystal filter and finally a 455kHz ceramic filter. The result—razor sharp selectivity and QRM free reception. 

MANY UNIQUE INNOVATIONS

The unique dial has a back lit light indicator that is only illuminated when channels are fitted. The S-meter can be switched to read conto-zero. A switch allows the transmission and reception of both wide-band and narrow band FM. A further switch allows the tx driver stages to be switched on to monitor the modulation and check both tx and rx netting. A viro socket allows the subsequent use of vio and synthesizers. A switch on the front panel allows the automatic tone-burst to be defeated so that the receiver may be worked without accessing the local one. A further front panel control allows the receiver to tuned approximately plus or minus 4kHz for perfect reception.

**4 CHANNEL AUTOSCAN**

This feature is a most useful and practical innovation, it permits one to monitor the popular calling and repeater channels whilst keeping one's hands firmly on the wheel. Up to 4 channels may be scanned continuously. As soon as a signal appears the receiver locks-on. However a flip of a switch and the autoscan reverts to manual control allowing manual selection of any one of the 4 autoscan channels.

Free Credit! (limited period only) UK licensed amateurs only, Quartz 16 deposit £43, Multi-II deposit £53, Multi-II deposit £59, balance paid over 6 months—send for full details
**FDK Multi-2700 Mk II**

**ANOTHER WINNER!**

**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 housed at home with its internal 230v AC PSU or taken out to the local high spot and run from 10v 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 MHz 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 linear repeaters.) The Multi-2700 has a built-in receiver RF pre-amp—no problems here with a deal receiver.

**DUAL VOX CONTROL**

Until you have handled the Multi-2700 you cannot appreciate the advantages of dual vox 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 143MHz segment at a time resulting in minimum band switching. The flip of a switch and you have full synthesizer control of your transceiver. The bright LED display allows the transceiver to be immediately set to any 2 metre channel. A VOX control ensures the synthesizer can be used equally well on SSB, CW or FM. The versatility of dual VOX 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 "shunt" frequency and continue normal operation on the analogue VFO; set the analogue VFO in 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 60Hz shifts and 1kHz for 70cm 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 calls 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 142 to 168MHz (Tx covers 144-146MHz ± 1MHz shift only). Apart from the 3 existing repeater offsets one further shift may be programmed, AGC control is continuously variable, as is the VOX DELAY and ART-VOX etc. All pre-set controls are easily reached through the top hatch of the transceiver. Separate centre zero and recall 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. £399 inc VAT and Securicor delivery.

---

**WE ALSO STOCK**

| YAESU | BELCOM | MICROWAVE MODULES | SEM | JAYBEAM | HY-GAIN | KEN | STOLLE | CDE | MINI-PRODUCTS | KATSUMI | SAGANT | BANTEX | ASP | POLAR | MOSLEY | G-WHIPS | SEIWA | etc. |

---

**Multi U-II**

**70 cms FM!**

**INCLUDES**
- AUTOSCANN
- 10 CHANNELS FITTED
- RECEIVER IRT
- AUTOMATIC TONE-BURST

SEND FOR 4 PAGE BROCHURE

---

**NAIGAI 2200 Linear**

- 230V AC
- 4CX-350 TUBE
- RECEIVER PRE-AMP
- 10-13W DRIVE
- SWR METER BUILT-IN
- 500W PEP INPUT (400W FM/CW)
- FAN COOLED
- 12V DC OUTPUT (3 AMP)
- COVERS 144-146MHz

£399 inc VAT & Securicor
The world famous YAESU state-of-the-art technique has brought computer theory into VHF communications.

**What** are the frequency splits for repeaters? Don't worry! YAESU has computerized it. In addition to a conventional ± 600kHz split, any transmitter offset frequency is memorized with a touch of a push-button.

**What** was my last frequency channel? Don't check! A touch of a push-button will bring you back to the memorized channel instantly.

**Why** only one knob to select a channel out of 800 channels? YAESU utilizes a "OPTICAL COUPLING" system to select each channel in 10kHz steps and the channel may be offset 5kHz higher with a touch of a push-button. Thus 800 fully synthesized channels are provided with one knob and no rotary switches to get oxidized and noisy.

**When** will the FT-227R be available? NOW!

Many, many other features such as automatic encoder-decoder for tone guarded squelch (TGS) (optional). Tone burst accessed repeater operation, automatic final protection, busy channel indicator, high-low out-put selection, diecast front panel, and famous YAESU quality throughout!

And all at a most attractive price. See your dealer today for an informative catalogue.
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.
A hybrid design utilising the best features of valves and semiconductors is used to give a high performance. 7
Valves—49 Transistors—19 FETs—128 Diodes—25 Ics. The use of the RCA low noise beam deflection valve (7380)
as receiver mixer gives the CQ110E high sensitivity combined with remarkable cross-modulation characteristics.

CQ 301 2KW Linear Amplifier—10 to 160m with built-in power supply and 2 EIMAC 3-500Z Valves
Ex-stock. £760 plus VAT £95, Total £855. (Price includes delivery)

We also stock Antennas and Accessories—Microwave Modules—Modular Communication Systems—Polar
Electronic Developments—Antex Products Components etc.

NEC EQUIPMENT IS AVAILABLE FROM:
Thanet Northern, 64 High Street, Wombwell, Yorks. Tel: (0226) 756229
Cambrian Communications (Tony Blackmore). 2 Joseph Parry Close, Llandough, Penarth, S. Glam.
CF6 1PL. Tel (0222) 702982

100 HIGH STREET, INVERGORDON, ROSS-SHIRE IV18 ODN.
Telephone 0349 852351 Telex 75266

HIRE PURCHASE INSURANCE
YOUR KEENEST BUY FOR YAESU MUSEN!

AS DIRECT IMPORTERS WE OFFER YOU...

THE SUPERB FT-22IR COMES TO YOU FOR ONLY £336.37 VAT AND SECURICOR CARRIAGE PAID—HOPE YOU HAVEN'T JUST PAID MORE ELSEWHERE OM!

1. LOWEST PRICES
2. LARGEST RANGE
3. HIGHEST STOCKS
4. TOP AFTER-SALES SERVICE
5. BEST DEMONSTRATION FACILITIES

TO DESCRIBE THE ATLAS 210X & 215X AS A SUPERB MOBILE RIG IS SIMPLY NOT TELLING THE WHOLE STORY—the receiver section alone will out-perform many a conventional rig

£2.50 FOR 25 PENCE!!
25 pence brings the latest Yaesu catalogue with our Credit Voucher for £2.50 against eventual purchase. A couple of stamps brings the Atlas leaflet or our used equipment list.

YOU ARE ALWAYS WELCOME AT ALUM ROCK WHERE ALL EQUIPMENT IS ON FULL DEMONSTRATION—PLEASE SEE PREVIOUS ISSUES FOR DIRECTIONS AND OPENING HOURS.

SUPER SERVICE FROM YOUR LOCAL MAN!

BRANCH: AMATEUR ELECTRONICS, UK—COASTAL, CLIFTONVILLE, KENT. KEN McINNIES, G3FTE, THANET (0843) 291297. 9 a.m.—10.30 p.m.

BRANCH: AMATEUR ELECTRONICS UK—SCOTLAND. 287 MAIN STREET, WISHT, LANARKSHIRE. GORDON McCALLAM, GM3UCI.

TELEPHONE WISHAW 71382. (EVENINGS CARLUKE 70914)

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

508-514 ALUM ROCK ROAD
BIRMINGHAM 8

021-327 1497
6313

Telex 337045
Get away from the madding crowd below.

The MMT432/28 432MHz Linear Transverter will get you there. This solid state linear mode transverter allows you to operate your 28MHz units at 432MHz... up where there still aren't a lot of people. This precision built British made unit is available direct from ourselves, or from our many retail outlets throughout this country.

Price £109.13 inc. VAT. Not such a high price to pay to enjoy a QSO in the peace and quiet of one of the most civilised up and coming amateur bands.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency coverage</td>
<td>432-435MHz</td>
</tr>
<tr>
<td>Input frequency range</td>
<td>28-30MHz</td>
</tr>
<tr>
<td>Input modes</td>
<td>SSB, FM, AM or CW</td>
</tr>
<tr>
<td>Drive requirements at 28MHz</td>
<td>5mW to 500mW, Variable Input Attenuator</td>
</tr>
<tr>
<td>Power output</td>
<td>10 Watts continuous rating</td>
</tr>
<tr>
<td>Spurious outputs</td>
<td>Better than -60dB</td>
</tr>
<tr>
<td>Receive converter gain</td>
<td>50dB typical</td>
</tr>
<tr>
<td>Receive converter noise figure</td>
<td>3dB maximum</td>
</tr>
<tr>
<td>D.C. power requirements</td>
<td>12 Volts nominal</td>
</tr>
<tr>
<td>Current consumption</td>
<td>2.5 Amps peak</td>
</tr>
<tr>
<td>RF connectors</td>
<td>50 Ohm BNC</td>
</tr>
<tr>
<td>Power connector</td>
<td>5 pin locking DIL</td>
</tr>
<tr>
<td>Size</td>
<td>187 x 120 x 53 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>900 grams</td>
</tr>
</tbody>
</table>

**MICROWAVE MODULES LIMITED**

BROOKFIELD DRIVE, AINTREE, LIVERPOOL L9 7AN

TELEPHONE: 051-523 4011. TELEX: 628608 MICRO G
**YAESU MUSEN PRICES**

**FREE DELIVERY WITHIN U.K.**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT101D</td>
<td>Digital Readout &quot;O&quot;</td>
<td>£480</td>
</tr>
<tr>
<td>MMT144/26</td>
<td>Transverter</td>
<td>£79</td>
</tr>
<tr>
<td>MMD650</td>
<td>50MHz converter</td>
<td>£42</td>
</tr>
<tr>
<td>FT201R</td>
<td>Brackets</td>
<td>£235</td>
</tr>
<tr>
<td>FT202</td>
<td>2m, 23 ch, 12V</td>
<td>£130.50</td>
</tr>
<tr>
<td>FT204</td>
<td>2m, 403 ch, 112V</td>
<td>£140</td>
</tr>
<tr>
<td>FT2V30</td>
<td>Transverter 2m, 12/230V</td>
<td>£128</td>
</tr>
<tr>
<td>FT010</td>
<td>External VFO</td>
<td>£57</td>
</tr>
<tr>
<td>FT010I</td>
<td>+ Clock, ident</td>
<td>£125</td>
</tr>
<tr>
<td>FT200I</td>
<td>1-3-5-30</td>
<td>£529</td>
</tr>
<tr>
<td>FT200B</td>
<td>AC PSU/speaker</td>
<td>£54</td>
</tr>
<tr>
<td>FRG-7 RX</td>
<td>5-30 cont. AC/DC</td>
<td>£415</td>
</tr>
<tr>
<td>FRG-7 RX+</td>
<td>J-Beam Antenna</td>
<td>£287</td>
</tr>
</tbody>
</table>

**MICROWAVE MODULES DESPATCHED TO ANY PART OF THE WORLD POST FREE**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCC270/4G</td>
<td>4m converter</td>
<td>£79</td>
</tr>
<tr>
<td>MCC144</td>
<td>2m converter</td>
<td>£18</td>
</tr>
<tr>
<td>MCC44LD</td>
<td>2m converter</td>
<td>£18</td>
</tr>
<tr>
<td>MCC42C</td>
<td>10cm converter</td>
<td>£22</td>
</tr>
<tr>
<td>AT4V35/1</td>
<td>1m converter</td>
<td>£22</td>
</tr>
</tbody>
</table>

**ALL YAESU AND MICROWAVE MODELS SUBJECT TO VAT IN U.K.**

**A.S.P MOBILE AND BASE STATION ANTENNAS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asp600</td>
<td>1 Vie 2m mobile</td>
<td>£3.26</td>
</tr>
<tr>
<td>Asp620</td>
<td>3 Vie 2m mobile</td>
<td>£3.95</td>
</tr>
<tr>
<td>Asp625</td>
<td>3 Vie 2m mobile</td>
<td>£7,60</td>
</tr>
<tr>
<td>Asp67</td>
<td>3 Vie 3m mobile</td>
<td>£13.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCC370</td>
<td>4m converter</td>
<td>£79</td>
</tr>
<tr>
<td>MCC144</td>
<td>2m converter</td>
<td>£18</td>
</tr>
<tr>
<td>MCC44LD</td>
<td>2m converter</td>
<td>£18</td>
</tr>
<tr>
<td>MCC42C</td>
<td>10cm converter</td>
<td>£22</td>
</tr>
<tr>
<td>AT4V35/1</td>
<td>1m converter</td>
<td>£22</td>
</tr>
</tbody>
</table>

**ICOM**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Icom IC-210</td>
<td>Multi UI 100m mobile</td>
<td>£221</td>
</tr>
<tr>
<td>Icom IC-210</td>
<td>Multi 112m mobile</td>
<td>£184</td>
</tr>
<tr>
<td>Icom IC-210</td>
<td>Multi 1700 Finkeb. Trans.</td>
<td>£435</td>
</tr>
</tbody>
</table>

**J-BEAM ANTENNAS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>C211F  £470</td>
<td>KYOCUTTO DIGITAL II</td>
<td>£335</td>
</tr>
</tbody>
</table>

**FRG-7—DIGITAL**

Yes, the world famous FRG-7 is now available with Digital Read-out fitted in place of KHz Dial.

**Price £180.00**

For customers who already own FRG-7s we can supply the digital read-out complete with installation instructions. **Price £37.00**

**ALL PRICES + 12½% VAT. CARRIAGE FREE.**

---

**LEE ELECTRONICS LTD**

**ESTABLISHED FOR MORE THAN TWO DECADES**

01-723 5521

400 EDGWARE ROAD, PADDINGTON, W.2

LONDON'S LARGEST STOCKISTS OF YAESU & ANTENNA SPECIALISTS

STANDARD, ICOM, BANTEX, JAYBEAN, REVCO, QMTO, ETC.

**SPECIAL EXCLUSIVE OFFER**

Perspex Dust Covers designed and manufactured by us to keep your Yaesu equipment in mint condition. Suitable for Models FT101, FT101B, FT101I, FT351, FT101E, FR210, FT221, FT221A, FR7, etc. Price £4.00 each inc. VAT. Carriage 45p.

FT221, FT221, FT229, FT233, £2.00 each inc. VAT. Carriage 45p.

---

** radiator communication November 1977**

---
The national society representing all UK radio amateurs

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

GENERAL MANAGER AND SECRETARY
G. R. Jessop, CEng, MIERE, G6JP

EDITOR
A. W. Hutchinson

ANNUAL SUBSCRIPTION RATES

<table>
<thead>
<tr>
<th>UK corporate</th>
<th>£2, including VAT</th>
<th>Overseas</th>
<th>£3.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associates under 18</td>
<td>£1.00</td>
<td>Students aged 18 to 21</td>
<td>£2.50</td>
</tr>
<tr>
<td>OAPs with 15 years' membership</td>
<td>£1.00</td>
<td>Affiliated societies</td>
<td>£3.50 (including Radio Communication)</td>
</tr>
</tbody>
</table>

COMPOSITION OF RSBG ZONES

Zone A: Regions 1, 2 and 18
Zone B: Regions 3, 4 and 5
Zone C: Regions 7, 8, 16 and 19
Zone D: Regions 6, 9, 17 and 20

COMPOSITION OF RSBG REGIONS

Region 1: Cheshire, Cumbria, Greater Manchester, Isle of Man, Lancashire, Merseyside.
Region 2: All that part of Humberside north of River Humber, North Yorkshire, South Yorkshire, West Yorkshire.
Region 4: Derbyshire, all that part of Humberside south of River Humber, Leicestershire, Lincolnshire, Nottinghamshire.
Region 5: Bedfordshire, Cambridgeshire, Northamptonshire.
Region 6: Berkshire, Buckinghamshire, Oxfordshire.
Region 7: Greater London south of River Thames, Surrey including that part of London north of the Thames administered by Surrey.
Region 8: Kent, East Sussex, West Sussex.
Region 9: Cornwall, Devon.
Region 10: Dyfed, Gwent, Mid Glamorgan, Powys, South Glamorgan, West Glamorgan.
Region 11: Clwyd, Gwynedd.
Region 12: Grampian, Highland, Island Authorities, Tayside.
Region 14: Central, Dumfries and Galloway, Strathclyde.
Region 15: Northern Ireland.
Region 16: Essex, Norfolk, Suffolk.
Region 17: Isle of Wight, Channel Islands, Dorset, Hampshire, Wiltshire.
Region 18: Cleveland, Durham, Northumberland, Tyne and Wear.
Region 19: Greater London north of River Thames, Hertfordshire.
Region 20: Avon, Gloucester, Somerset.
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
Belgium
Brazil
Denmark
Dominican Republic
El Salvador
Finland
France

(b)
Antigua
Australia
Bahamas
Barbados
Bermuda
Botswana
Brunei
Canada
Cyprus
Gambia

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 the visitor which 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.

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 unlicensed 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:
Rotary 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, G6KG, 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 vhf video display units;
Worlsey-Taibot 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, GB1BR, for "A receiver for 144MHz" published in December 1976.

Amateur convicted
Paul Nicholson, G6LMD, 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 bloated out by obstructions. 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 advised 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.

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.

NEW BOOKS FROM ARRL
Solid state Design for the Radio Amateur
by Wes Hayward, W7Z0I and Doug D'Maw, W1FB
This is a practical and readable manual for the amateur who not only wants to "roll his own" solid-state gear, but design it as well. For the less adventurous, there are many complete designs illustrating the principles described.
Contents are as follows: Semiconductors and the amateur; Basics of transmitter design; More transmitter topics; Power amplifiers and matching networks; Receiver design basics; Advanced receiver concepts; Test equipment and accessories; Modulation methods; Field operation, portable gear and integrated stations; Appendix; Bibliography.
256 pages £7.25 inc. p & p

Getting to know Oscar from the ground up
edited by Joel P. Kleinman, WA1ZUY
First published as a series of articles in QST, this booklet is intended to supply all the basic information one needs to get started as an Oscar operator.
Contents are as follows: Space communication is for everyone; Getting started; Finding Oscar: it's easy; How to use Oscar? Mode B: The benefits are yours; The Oscar-locator: The newest Oscar: Toward the ultimate amateur satellite; What Phase III will do: You... and AMSAT Phase III; Oscar goes to schools; Satellites can save lives; Oscar's vital statistics; The rise and fall of the Oscars. 45 pages, plus full-colour Oscar locator map £2.75 inc. p & p

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, Luanhead, Forfar, Angus DD8 3NR.
Details of the ballot which will then be held 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.

Radio Communication November 1977

853
A multimode transceiver using SL1600 ICs

Part 2. (Continued from October issue)

by P. L. A. BURTON, CEng, MIEEE, MIRE, 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 npn 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 sidetone filter characteristic. An accurate 1,750Hz may also have a use as a repeater access tone.

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, i.e. voltage at pin 6 equal to that at pin 12.

---

* 20 Thornton Crescent, Old Coulsdon, Surrey.
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, e.g. 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.
Fig. 5. Component layout of prototype PCB.

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

Components list

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>470kΩ (nob)</td>
</tr>
<tr>
<td>R2</td>
<td>100kΩ (nob)</td>
</tr>
<tr>
<td>R3</td>
<td>56kΩ (ft)</td>
</tr>
<tr>
<td>R4</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R5</td>
<td>47kΩ</td>
</tr>
<tr>
<td>R6</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R7</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R8</td>
<td>5kΩ</td>
</tr>
<tr>
<td>R9</td>
<td>4.7kΩ</td>
</tr>
<tr>
<td>R10</td>
<td>820Ω</td>
</tr>
<tr>
<td>R11</td>
<td>4.7kΩ</td>
</tr>
<tr>
<td>R12</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R13</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R14</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R15</td>
<td>4.7kΩ</td>
</tr>
<tr>
<td>R16</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R17, 18</td>
<td>220Ω</td>
</tr>
<tr>
<td>R19</td>
<td>560Ω</td>
</tr>
<tr>
<td>R20</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R21</td>
<td>51Ω</td>
</tr>
<tr>
<td>R22</td>
<td>4.7kΩ</td>
</tr>
<tr>
<td>R23</td>
<td>33kΩ</td>
</tr>
<tr>
<td>R24</td>
<td>4.7kΩ</td>
</tr>
<tr>
<td>R25</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R26</td>
<td>2.2kΩ</td>
</tr>
<tr>
<td>R27</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R28</td>
<td>330Ω</td>
</tr>
<tr>
<td>R29</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R30</td>
<td>560Ω</td>
</tr>
<tr>
<td>R31</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R32</td>
<td>560Ω</td>
</tr>
<tr>
<td>R33</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R34, 37</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R35-38, 40</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R41</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R42</td>
<td>4.7kΩ</td>
</tr>
<tr>
<td>R43</td>
<td>330Ω</td>
</tr>
<tr>
<td>R44</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R45</td>
<td>470Ω</td>
</tr>
<tr>
<td>R46</td>
<td>100kΩ</td>
</tr>
<tr>
<td>R47</td>
<td>470Ω</td>
</tr>
<tr>
<td>R48</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R49, 50</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R51</td>
<td>82Ω</td>
</tr>
<tr>
<td>R52</td>
<td>10kΩ</td>
</tr>
<tr>
<td>R53</td>
<td>560Ω</td>
</tr>
<tr>
<td>R54, 55</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R56</td>
<td>2.2kΩ</td>
</tr>
<tr>
<td>R57</td>
<td>1kΩ (see text)</td>
</tr>
<tr>
<td>R58</td>
<td>470kΩ</td>
</tr>
<tr>
<td>R59</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R60, 61</td>
<td>100kΩ</td>
</tr>
<tr>
<td>R62</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R63</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R64, 65*</td>
<td>1kΩ</td>
</tr>
<tr>
<td>R66</td>
<td>4.7kΩ (nob)</td>
</tr>
<tr>
<td>R67†*</td>
<td>15kΩ</td>
</tr>
<tr>
<td>RV1</td>
<td>10kΩ preset</td>
</tr>
<tr>
<td>RV2, 3, 4</td>
<td>1kΩ</td>
</tr>
<tr>
<td>RV3</td>
<td>10kΩ</td>
</tr>
<tr>
<td>RV6</td>
<td>5kΩ lin (nob)</td>
</tr>
<tr>
<td>RV7</td>
<td>10kΩ lin (nob)</td>
</tr>
<tr>
<td>RV8</td>
<td>(Squelch)</td>
</tr>
<tr>
<td>RV9*</td>
<td>25kΩ lin (nob)</td>
</tr>
</tbody>
</table>

* Vertical on board.
† May need selection.
All 1W film types.
Tolerance ±5%.
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, 1806 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 λ/2 dipoles, and this knowledge led him to investigate 1.8MHz sloping antennas.

The author's garden is about 100 by 45ft, so a λ/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 λ/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 λ/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 loading from the 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 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 directivity against 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.

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 KCW2000A.

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 λ/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 λ/4 vertical, then a QSO was a distinct possibility. (In fact, as the 1.8MHz antenna was to
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 λ/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 3λ/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 λ/2 fed by a λ/4 vertical. It was considered that operating in this mode the feed impedance of the antenna should be a good match for 500 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 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, (i.e. to 9H1) it was considered that the directivity found with the λ/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 3/4. 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 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 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 3/4, 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...
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 λ/2 sloping wire made it possible 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

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 capillary 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 fingerprints. Immediately after stencilling, the panel was sprayed with clear varnish to protect the lettering from subsequent erosion. 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 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.

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

Fig 2. Panel lettering

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.
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 10⁶. 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 (Rb⁹⁷). This resonance (actually 6–834685GHz) is used as the reference in an aec loop having as its controlled element a 5MHz quartz oscillator. Fig 2 shows the principal components in the Rb⁹⁷ 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) 600MHz is produced by the multiplier.

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.

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 0.2us (5MHz) fsd. The frequency difference is then found by the relationship

\[ \Delta t = \Delta f / f \]

where \( \Delta \) means “a small change in”. For example, a half scale (0.1µs) deflection over a 24h period represents a frequency difference of

\[ \Delta t = 0.1\mu s / 24h = 1 \times 10^{-7} = 8.64 \times 10^{-8} = 1.16 \times 10^{-12} \]

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 ± 1 part in 10¹⁴. Any detected

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

RADIO COMMUNICATION November 1977
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\textsuperscript{37} 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 8½in 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 led 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 auto-ranging, 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, Garneit Close, Watford WD2 4TT. Tel 0923 33066.

BOOK REVIEW


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.e. 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 Inducance 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.
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 so 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 some 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 Selle 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 6V and becoming rather hysterical, with loads of harmonics, if voltage is raised over 8.5V."

Checking back I was surprised to find that BRS36760 is quite correct: "TT has never included a solid-state Franklin oscillator 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 Laddner and Stoner (1932).

Its praises were first sung to amateurs in a memorable article by E.L. Gardiner, G6GR, in the 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).

"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 Laddner 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)."
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 these 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 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 (77 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);
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 hf/mf broadcast reception. This material is a nickel-zinc ferrite rod made by Neosid Ltd under the code number F79 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 X/2 dipole.

Peter W. Haylett, G3IPV, required some large iron dust cores about 1/4 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 scaled 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 77, 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 hf”.

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 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
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 behind an hf transceiver such as the FT101 will degrade the dynamic range of the receiver by at least a further 5dB, 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 distributions are about right then almost any of the new "wonder mixers" (double-balanced Schottky diodes, power fets or catv-type bipolar) 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") Charmian, 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-MHz 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 digitized 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)](image)

**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 the battery and other batteries. Since then some additional aspects of these topics have been raised.

For example, while visiting Plassey's we noted a compact "Clansman" PR320 10W ssb/sw hf transceiver—a standard military package for several years—fitted with a convenient built-in 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).

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", *SMiTE Journal* April, 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 Photographer*. 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.

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 his 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.
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.

Repeater—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 FJ12 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 1ARU 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

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 (G13TLL) 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 call signs are given in brackets.

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 143-000MHz 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 Baxton 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 Gooday, G8HV, 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

* PO Box 49, Aberdeen AB9 8JA.
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 the year. Several other repeater projects are being 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 a.s.l 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 Aerelite 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, Chesham, GB3LL on RB4 at Llandulas, Chwyl, 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 Leeg 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, G8DXN, 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 a.s.l near Dorchester. Many stations in Holland, Belgium, Germany and even LX1FS 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 G8NAC/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 (AM07f), G3FZL/P (AL45e), G8EYC (ZL5Oh) and G3PMH/P in AN61f.

Don used the site near Lentzewiler in QTH locator CK80c on the recommendation of Tom Douglas, G3BA, who has used Lentzewiler 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 G3ZTZA at Camberley in Surrey has worked as far as Leicester on ssb. G8GP is in London is up to 59 counties on 70MHz and needs one more confirmed for his Senior Award. G13TLL is on 70-150MHz cw from 1300gmt to 1400gmt and asks operators to beam to GI at these times as it 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 44MHz 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 DJ1IBP/P/HBO in Liechtenstein at a distance of 1,100km. G18KIA and EI4CB were among the many stations from the west working 5-94 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, G18HXY, G18KIA, G13TTL 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 G18JTS 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 G18JTS has been completed. Separate skeds can be made with Bo by writing to Spangatan 7A/STR, 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 WX, XJ and XM squares and has now worked all the operators in GI, 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, G4DGG, G4DZU, G3PO1, 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 G3BSU 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, G18KIA, G8HDS, G8ZFS, 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 Alexander 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.

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... G3JY'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 SM0DJK (IS10d), LA9DL (FT06h) and EI9Q (WM6Sd). A further aurora occurred on 4 October. Harold Meeza, BR3S4348, 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. GW8QGI 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 rty. 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 1BA 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 VHFLUHF 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 a.c. 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 a.c. voltage via standard fm circuitry.

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 10m 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 500mA at 480MHz. This feeds the varactor multiplier via a p.e.b 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- or r.f. pack weighing a hundredweight.

To generate the 2150V 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 string of ten 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 overestimating 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.

* 4 Upper Sates, Chaulden, Hemel Hempstead, Herts.
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 V99MB 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 appears to be in response to his fourth (and registered?) request posted on 30 August. AC3PT appears to be having some difficulties but Naoki suggests writing to P. T. Namgyal, The Palace, Gangtok, Sikkim, India, enclosing an IRC 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 (K4EIX), TA1MB (DK3GL), TA1NC (DJ0UI), TA1QR (DJ0UI), TA1RT (K4EPI), TA1RO, TIASK, TAITS, 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-TRAC), 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, Karabuk/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). He 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 "AS1RG" who appeared on the bands during August was a pirate. However, AS1FN 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 Maldives 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 CF11SH was active from an international fishing exhibition in VE1. 9G0ARS was a special call used by the Ghana ARS, and YT01ARU came from the site of the recent Yugoslav conference at Skopje.

Andrew Pomfret, G3JZZ, is in Gambia and using the callsign G3AAP. 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 VP9LP.

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 Maldives, and then to Africa. They will be keeping schedules on 14,160kHz at 1500 and on 21,318kHz at 1700 most days.

As SW1AT'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, Q4DA, will be in Guernsey for the cw section of the CQ WW DX contest (at the end of November). The operators of G4QAA will be G3XFB, G3MZJ, 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 8QR.

874

RADIO COMMUNICATION November 1977
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 see 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, QZ1LO, SM6FZJ, SM0EKG, UR2BU, VE6ANO, VP9LI, VS6HT, W6BVM, W6PHH, SB4CF 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 MOT4 will be as delighted as your scribe to hear that this year this award has been made to Geoff Watts. Geoff, BR3129, 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 HQL70A 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 Bundeland (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, OESTKL, 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
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, GM3CPS 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 G8WJ and G6SA 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 each Peter Lumb, G3IRM, 14 Linton Gardens, Bury St Edmunds, Suffolk, IP32 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**

<table>
<thead>
<tr>
<th>Callign Band Points</th>
<th>Callign Band Band Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>GJ0DA</td>
<td>165,975 GJWZ</td>
</tr>
<tr>
<td>GI6YY</td>
<td>188,400 GILO</td>
</tr>
<tr>
<td>GJ6JX</td>
<td>160,461 GJ6K</td>
</tr>
<tr>
<td>GJ6MWV</td>
<td>144,007 GJ6KX</td>
</tr>
<tr>
<td>G4EHF</td>
<td>129,034 G6CHNY</td>
</tr>
<tr>
<td>G4BEN</td>
<td>121,544 G6COCB</td>
</tr>
<tr>
<td>G6BN</td>
<td>65,200 G6CWCX</td>
</tr>
<tr>
<td>G6BD</td>
<td>56,140 G6KGS</td>
</tr>
<tr>
<td>G6WPB</td>
<td>42,036 G6TXF</td>
</tr>
<tr>
<td>G6DI</td>
<td>46,330 G6SPVA</td>
</tr>
</tbody>
</table>

**CW Section—Multi-Operator, Single Transmitter**

<table>
<thead>
<tr>
<th>Callign Band Band Points</th>
<th>Callign Band Band Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>G4CA</td>
<td>300,000 G6QIL</td>
</tr>
<tr>
<td>G4PVW</td>
<td>502,655 G6G5M</td>
</tr>
</tbody>
</table>

Certificate winners are listed in bold type. Congratulations to G4CA who were world fifth in their category, and also to G6URB who was world fifth on 16MHz.

**PHONE Section—Single-Operator**

<table>
<thead>
<tr>
<th>Callign Band Band Points</th>
<th>Callign Band Band Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6B6TU</td>
<td>1,001,135 G6B6TU</td>
</tr>
<tr>
<td>G4BH</td>
<td>201,300 G4BUE</td>
</tr>
<tr>
<td>G4EF</td>
<td>82,401 G4EENY</td>
</tr>
<tr>
<td>G4W2LA</td>
<td>74,947 G4ZQW</td>
</tr>
<tr>
<td>G4ETK</td>
<td>53,238 G3XBN</td>
</tr>
<tr>
<td>G4EF</td>
<td>46,330 G4EF</td>
</tr>
<tr>
<td>G2AJB</td>
<td>31,320 GW3JMBP</td>
</tr>
<tr>
<td>G3MWZ</td>
<td>55,009 G3XFB</td>
</tr>
<tr>
<td>G6MSB</td>
<td>20,332 G6SAJ</td>
</tr>
<tr>
<td>G4ER0</td>
<td>14,736 G4DJC</td>
</tr>
<tr>
<td>G4DBW</td>
<td>5,720 G3TXF</td>
</tr>
</tbody>
</table>

**PHONE Section—Multi-Operator, Single Transmitter**

<table>
<thead>
<tr>
<th>Callign Band Band Points</th>
<th>Callign Band Band Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6LNS</td>
<td>2,370,032 G6LNS</td>
</tr>
<tr>
<td>G6K6T</td>
<td>1,337,300 G6K6T</td>
</tr>
<tr>
<td>G6GCV</td>
<td>766,538 G6AF</td>
</tr>
</tbody>
</table>
| G6URB | was world sixth on 16MHz. It is interesting to note that some 50 operators took part in the nine multi-operator single-transmitter entries.

**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, G6JL, GM3LY, G6USEL, G4EA, G4EHQ, G4EZT, G4G4DZT, BR75, 31301, 35608 and 38709, and A861.

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

The highest level of F2 MUFs will continue during November and conditions will be good on 28 and 21 MHz. The approaching winter means shorter days so that the higher frequency bands will close early. Rising solar activity should lead to frequent opening of 28 MHz, as shown in more detail in the graph. There will be some chance of working North America on 21 MHz, but Japan will only be heard under exceptional circumstances; this band will close for dx after about 1000 gmt.

The 14 MHz band will probably close for dx between 1900 and 2100 gmt (a little later at the beginning of the month). In exceptional conditions this band may remain open longer, especially with South America and Africa. South America and Africa 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 1730 gmt via the direct path.

As 14 MHz closes early, 7 MHz will become more important for dx after 2000 gmt. The seasonal decline in static on both 7 and 3-5 MHz permits dx traffic on these bands when the greater part of the path lies in darkness; this is more important for 25-70 MHz. During the latter half of the month 3-5 MHz will be interrupted repeatedly by the dead zone.

For information on the use of this table, see page 394. Radio Communication April 77. Please send reports to Mr. J. Sprung, G4AQL, 13 Tidmell Hill Road, Abbots Langley, Wodford, Herts WD5 8EU.

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>USA-East W-1-4</th>
<th>USA-East W-1-4</th>
<th>USA-West W-7</th>
<th>USA-West W-7</th>
<th>Caribbean 4YS3FM1T</th>
<th>Brazil PY</th>
<th>South Africa ZS</th>
<th>South Africa ZS</th>
<th>S-E Asia HS.9SM2</th>
<th>Australia VK</th>
<th>Japan JA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (GMT)</td>
<td>00 06 12 18 24 00 06 12 18 24 00 06 12 18 24 00 06 12 18 24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Mhz</td>
<td>03 09 15 21 27 03 09 15 21 27 03 09 15 21 27 03 09 15 21 27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (GMT)</td>
<td>00 06 12 18 24 00 06 12 18 24 00 06 12 18 24 00 06 12 18 24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Short path 1-5 days
Long path more than 20 days in the month.

The provisional sunspot number for September 1977 from the Swiss Federal Observatory was 441, 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 December, January 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, M.B, Ch.B, MRCS, LRCP, G3FKM

R. Batterby, BSc (Met), Grad Cert Ed, FBIS, G3YE (ex-G8DQO)
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 examiner. Active in all bands, particularly interested in 10Mhz. Wide-ranging interest in RSGB affairs. Occupation: principal, college of further education.

A. M. Cameron, BSc (Hons), G3OSGJ
SWL since 1954. Member of RSGB since 1958. Licensed in 1960. Past chairman and treasurer of Falkirk & D RS GB Group. Area representative for Central Region since 1975. Currently active on all bands between 35 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, AMIIEE, G3BA

R. W. Fisher, G3PWJ

G. I. Knight, GMEEFX
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 G3MBZ recently installed the GB3LER beacon at Shetland, and has given site permission for his home to be used as the location for new 1069hz beacon GB3CMC. Council member of the Radio Electrical and Television Retailers Association.

D. M. J. P. Manley, PhD, BSc, CEng, FInstP, MIIEE, CEng, G3WE
Treasurer, UK (Southern) FM Group. Founder and chairman, Barnborough ARS (Tech College), 1961. Founder and controller, sometime Kennet and Loddon Raynet Group. Group controller, Guildford Raynet. Age 44. Tutor In physics, electronics, mathematics and for the RAIE.

D. M. Pratt, B Tech, CEng, MIEE, MIERE, G3KEP
Member of the RSGB since 1962; Council member since 1975. Member of RSGB Education Committee since January 1972. Former lecturer for the RAIE at Bradford College; member of City and Guilds working party for the RAIE. 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 36. Profession: Engineering training consultant.

D. Smith, G4DAK

obituaries

The Society records with regret the deaths of:

Mr H. Bailey, G2UF
Harold Bailey died on 13 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, G3GB
"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, G8FW
Dick Bland died on 18 September, aged 55. He was an early and popular member of the Sheffield & DRS and active on 144Mhz.

Mr K. N. Cadby, 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 A. C. Carter, G3JLC
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 FRAC.

Mrs S. Margolls
Sylvia Margolls, widow of Maurice, G3NMR, and mother of Laurie, G3ML, 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 a lifetime 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, G8RB, in January;
Mr S. K. Benfell, G3QWP;
Mr H. A. Green, G2VZS, on 9 August;
Mr W. J. Hoffman, G3UY, on 16 August;
Mr S. T. Palmer, G3HHR;
Mr S. Smith, G2CKF;
Mr J. Threlfall, G2DKG, aged 76, in August.
"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 copy of it was sent to 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, checking 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 vandalism of private and public property, the use of football matches as an excuse for rioting, and similar conduct of which we are all aware.

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 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 latter had not been published and had largely been suppressed 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 letter 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 "capitive audience" provided on one frequency.

It should be noted that although we call ourselves an "FM Group", a proportion of our members do 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?

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—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

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, from 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

RADIO COMMUNICATION November 1977 879
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 GS9UT/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 GB9M/T40, the winner of the listeners’ contest. G3YSJ/P will be awarded the VHF Managers’ Trophy for being overall winner.

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 ideal number of entrants is needed for stations only operating within the contest, and this will be considered. The conditions were normal, with almost total use of sb 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 PAs etc beforehand. The adjudicator finds that a large number of entrants asked how their scores were to be calculated; some taking the attitude “How will extra QRP perform in conjunction with aerial gain and low cable losses etc”. Check logs acknowledged from G4AER, G4BE, G8BPC, G6BXT/P, G8BR and GB7MK.

G4ACJ
### Check logs acknowledged with thanks:

G3HOF, G3HIZ, GY3KL, G3JFO, G3LUV, G3LZ0, GM4QW and RS37846.

---

### SEPTEMBER 144MHz OPEN RESULTS

The decision to run the September 144MHz Open Contest under extreme conditions, which involved a considerable amount of uncertainty and lack of consolidation, was based on a series of open and transparent discussions held at the meeting of the VHF Committee. The committee would like to express its gratitude to all those contestants who participated and submitted their results.

The contest was divided into two sections: a Log Submission Section and a Listener Section. Contestants were encouraged to submit their logs, and listeners were invited to log their contact counts for each station.

### LOG SUBMISSION SECTION

<table>
<thead>
<tr>
<th>Station</th>
<th>Callsign</th>
<th>QSOs</th>
<th>Best dx</th>
<th>km</th>
<th>QTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>A467</td>
<td>GM4BWT/P</td>
<td>1280</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRS33740</td>
<td>537</td>
<td>111</td>
<td>PARSAX/P</td>
<td>328</td>
<td></td>
</tr>
<tr>
<td>BRS15222</td>
<td>533</td>
<td>128</td>
<td>PARSAX/P</td>
<td>343</td>
<td></td>
</tr>
<tr>
<td>BRS33853</td>
<td>146</td>
<td>80</td>
<td>PACClS</td>
<td>302</td>
<td></td>
</tr>
</tbody>
</table>

### LISTENER SECTION

<table>
<thead>
<tr>
<th>Station</th>
<th>Score</th>
<th>Stations logged</th>
<th>Best dx</th>
<th>km</th>
</tr>
</thead>
<tbody>
<tr>
<td>A467</td>
<td>1280</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRS33740</td>
<td>537</td>
<td>111</td>
<td>PARSAX/P</td>
<td>328</td>
</tr>
<tr>
<td>BRS15222</td>
<td>533</td>
<td>128</td>
<td>PARSAX/P</td>
<td>343</td>
</tr>
</tbody>
</table>

### THE COMMONWEALTH CONTEST 1978 RULES

1. **Transmitting section**:
   - The general rules for RSVG h contests, to be published in the January 1978 issue of Radio Communication, will apply.
   - Stations operating CW (A1) only, in the 3, 7, 14, 21 and 28MHz bands. Contacts may be made with either transmitters or stations in the Commonwealth or British Mandated Territories.
   - Scoring is based on the number of QSOs logged for each station.
2. **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.
   - Scoring is based on the number of QSOs logged for each station.
   - Log sheets should be submitted in the format specified in the rules, with each band log entered on a separate sheet.

---

**RADIO COMMUNICATION** November 1977

881
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 Downview Crescent, Uckfield, East Sussex TN22 1UD, 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 Colin 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 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) Dateline gmt, (b) call sign of station heard, (c) report and serial number sent by station heard, (d) call sign 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
A3 Tonga Is
A5 Bhutan
C2 Nauru
C5 Gambia
C6 Bahamas
G/GD/GJ/GK/GM/GU/GW VK2 Lord Howe Is
H4 Solomon Is
J3 Grenada
P2 Papua New Guinea VK4 Willis Is
S2 Bangladesh VK5
S7 Seychelles VK6
VE11 Vanuatu VE4
VE12 Vanuatu VE5
VE13 Vanuatu VE6
VE14 Vanuatu VE7

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 on.

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 the competitors.

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 11 miles away. To the surprise of local anglers, Eric Mollart was the first to spot it 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 of stink took place in the nearby car park.

The winner, Alan Simmons of the Mid Thames DF Club, must be congratulated on a superlative and almost flawless performance. Roger Parsons and Paul Yeates qualified for the National Final.

<table>
<thead>
<tr>
<th>Point</th>
<th>Name</th>
<th>Club</th>
<th>Time of arrival</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. Simmons</td>
<td>Mid Thames</td>
<td>19:15</td>
</tr>
<tr>
<td>2</td>
<td>E. L. Mallet</td>
<td>Mid Thames</td>
<td>19:38</td>
</tr>
<tr>
<td>3</td>
<td>D. J. Parson</td>
<td>Oxford</td>
<td>19:29</td>
</tr>
<tr>
<td>4</td>
<td>J. R. Vickers</td>
<td>Stratford-on-Avon</td>
<td>19:56</td>
</tr>
<tr>
<td>5</td>
<td>W. J. North</td>
<td>Mid Thames</td>
<td>19:27</td>
</tr>
<tr>
<td>6</td>
<td>P. J. Vailis</td>
<td>Salisbury</td>
<td>19:32</td>
</tr>
<tr>
<td>7</td>
<td>M. P. Hawkins</td>
<td>Chelmsford</td>
<td>19:34</td>
</tr>
<tr>
<td>8</td>
<td>C. Plummer</td>
<td>Medway</td>
<td>19:35</td>
</tr>
<tr>
<td>9</td>
<td>J. A. Mackmy</td>
<td>Rugby</td>
<td>19:40</td>
</tr>
<tr>
<td>10</td>
<td>A. W. Butter</td>
<td>Chelmsford</td>
<td>19:40</td>
</tr>
<tr>
<td>11</td>
<td>D. E. Newman</td>
<td>Rugby</td>
<td>19:48</td>
</tr>
<tr>
<td>12</td>
<td>P. Woollet</td>
<td>Oxford Heath</td>
<td>19:29</td>
</tr>
<tr>
<td>13</td>
<td>B. M. Brinton</td>
<td>Mid Thames</td>
<td>19:01</td>
</tr>
</tbody>
</table>
After the conclusion of this event the results of the "Best 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 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.

DF National Final results
This year's national final was organised 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 "A" 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 Fichter. The transmitter was hidden deep in the middle of very heavy undergrowth which proved quite an obstacle to most competitors.

Station "B", G3RHF/P, operated by Ron Smith, Chris Scholefield and Roland Parkinson, was located at Whixley, some 10 miles west of Wesham, some 2 miles west of 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 reeled, causing extreme difficulty in maintaining 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", G3FYA/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 an "A" 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 you OK?" He replied, much shaken, "Sign my form!"

Eric Mollett, 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.

1977 Region 1 (RSGB) VHF Contest results

<table>
<thead>
<tr>
<th>Station</th>
<th>HT mult</th>
<th>4m x3</th>
<th>2m</th>
<th>70 cm x 4</th>
<th>Total Region 1 OSOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship Inn Club</td>
<td>1-6</td>
<td>2240</td>
<td>1977</td>
<td>1454</td>
<td>4725</td>
</tr>
<tr>
<td>Bury</td>
<td>1</td>
<td>1733</td>
<td>1094</td>
<td>3692</td>
<td>14</td>
</tr>
<tr>
<td>Alnwick</td>
<td>3</td>
<td>1138</td>
<td>1180</td>
<td>442</td>
<td>2770</td>
</tr>
<tr>
<td>Wirral</td>
<td>1</td>
<td>893</td>
<td>893</td>
<td>1966</td>
<td>119</td>
</tr>
<tr>
<td>G3JEP</td>
<td>1-6</td>
<td>2240</td>
<td>1977</td>
<td>1454</td>
<td>4725</td>
</tr>
<tr>
<td>G3HJZD</td>
<td>1-4</td>
<td>815</td>
<td>283</td>
<td>391</td>
<td>1366</td>
</tr>
<tr>
<td>G3GHP/P</td>
<td>1</td>
<td>557</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3FQ</td>
<td>1-6</td>
<td>411</td>
<td>411</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>G3JZP/P</td>
<td>1</td>
<td>259</td>
<td>259</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>G3LYT/P</td>
<td>1</td>
<td>200</td>
<td>200</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>G3KAX</td>
<td>1</td>
<td>187</td>
<td>187</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>G4F</td>
<td>1-6</td>
<td>180</td>
<td>180</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>G4H</td>
<td>1</td>
<td>172</td>
<td>172</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G4DXX</td>
<td>1-8</td>
<td>75</td>
<td>75</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>G3BDQ (Check)</td>
<td>1-4</td>
<td>100</td>
<td>100</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

The GSMM Shield goes to Ship Inn Club, and the GSCIP Shield to G3JEP.

Verulam ARC Transmitting and Receiving Contest 1977

Tote Card 1. 20000 to 13000 GMT Sunday 27 November.

Section A. 90000 to 120000 GMT 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 are report not to 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 scores 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 countries. Only one contact with a specific station in each section of the contest will count for points.

Logs: Log 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 section of the contest will count for points. Logs must include: 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.

Separate logs for each section of the contest should be sent to J. P. Read, G8BOV, 15 Gartside Way, Whalton, Haria, (tel. 01903) postmarked not later than 20 December 1977. Telephone enquiries after 8pm.

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 |
6-5 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 November, 15 and 29 December). Ainsdale Scout Headquarters. For details contact G3CUZ.

Blackburn (East Lancs ARC)—First Thursday in each month. 7.30pm, YMCA, Blackburn. Sec E. A. Lomax, G4GDR, West End PO, Accrington, Lancs.

Blackpool (B&DARS)—First Monday in the month. Phone G5ND (Blackpool 6G59) 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 G5LXD).

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 more informal 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 G3VBD). Intervening Tuesdays are noggin and natter sessions with G3VBD at the air. Mosses Youths & Community Centre, Cecil Street, Bury. Sec E. R. Thirkell, G4FOE, tel Rochdale 32730.

Carisbrooke (C&DARS)—Mondays, 7.30pm. Carrock House, Ledward Avenue, Crook, Carlisle. A very full programme of lectures and demonstrations has been arranged for the coming months. Full details from G6DVY.

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, Crog-ny-Baa, Near Onchan. Membership includes the first husband/wife licence holders in the Isle of Man (G4DFW and G8DFLA). Sec, G4DFW, tel Douglas 22295.

 Eccles (E&DARC)—Tuesdays, 8.30pm. White Swan, Worsley Road, Swinton, Sec G4AEO.

Lancaster University (IoUARS)—Wednesdays, 8pm. Furness College, Victoria Gate, Lancaster, as are skeds 6 hf and 2m—club callsigns are G8DOU and G3ZBY. There are RAe and morse test classes. Enquiries to John Morris, G4ANB, Dept of Physics. Layland (LHARS)—Second Monday in each month, 7.30pm. "Road & Town", Ultons Walk, Leyland. Details from G-CXII.

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

Liverpool (North Liverpool RC)—Tuesdays, 8.30pm. Informal meetings, "Nags Head", Thornton, Crosby. Liverpool 23. Visitor welcome. Sec R. Porter, 11 Cranmore Avenue, Crosby, Liverpool L23 9QO.

Liverpool University (IoUARS)—Meetings each lunchtime. Visitor 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 Dance on 3 March 1978 please contact the sec, Geoff Plucknett, G4FKA, UoL, Guild of Undergraduates, 2 Bedroom Street North, Liverpool L7 8BD.

Manchester (M&DARS)—Wednesdays 7.30pm. 203 Oroylesden Road, Newton Heath, Manchester 10, Sec G8BYX.

Manchester (South Manchester RC)—11 Nov (not 9 as previously stated) (Annual Dinner), 18 Nov ("Ionospheres in Antarctica"—Bruce Moreman), 25 Nov (Demonstration of vhf/hf gear—G3CELQ). 6 Dec (Simple introduction to microprocessors—D. Wade G5MOW), 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, Alice Road, Sale. Informal meetings Monday evenings at "Greets", Shady Lane, Baguley. Particulars from sec G3GIVW, tel 061-973 3355.

Manchester University (MUARS)—Interested parties should contact G4ADS, QTHR.

University of Manchester (UOM—IoS&TARS)—G3XX is active on all hf bands and G4FOT on 2m and perhaps 25cm. Items for clubainewsletter, or letters from intending members gratefully received by sec, c/o UMIST.

Ormskirk (OARC)—New club. Wednesdays at members’ QTHs. For details contact G3FCVY or sec Peter Kelly. P.O. Box 113, Troutbeck Avenue, Burscough. Alternatively listen 145-000MHz fm/am. Wednesdays 1930-2030. Club interests: vhf/uhf, Ic, rtty, contests, avt. North Western Repeater Group—Informal meetings on the third Thursday in each month. Club Station, "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 (Dia House RS)—Wednesdays, 5.30-0.30pm. Dia House, 21 Chapel Street, Salford, Lancs. Net channel 14525MHz fm—the club station G3WOD monitors this frequency every club night for any other station. Details from sec G5UCM, c/o M33 at above address.

Stockport (SRS)—Second and fourth Wednesdays in the month, 8pm, Blossoms Hotel, Buxton Road, Stockport. 3 Nov (Astronomy), 23 Nov (Constructional Contest), 14 Dec (AGM), 28 Dec (No meeting). Sec, G3FYE. New members and visitors always welcome. Thorlton Cleveleys (TCARS)—First and third Wednesdays in each month, 8pm, morse practise from 7.30pm. St John Ambulance Hall, Fleetwood Road. Contact to "Garnder's Arms", Thornton. Details from sec A. Bullock, G8MKD, 26 Lancaster Avenue, Thornton Cleveleys, Blackpool.

UK FM Group (Western)—Informal meetings first Thursday of each 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. J. J. Stables, G3MMD, 3 Willow Close, Lymm, Cheshire, tel Lymm 3133.

Wigan (W&DARS)—First and third Wednesdays in each month. Poolstock Cricket Club, Kents Avenue, Poolstock. Sec A. Cunliffe, G3QXH, 5 Langholme Road, Garwood, 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 1600 Mondays, 8pm, 2m (fm) Tuesdays 8pm. Sec G9HAV.

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, 8 Beach 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, G8LIW. Details from Brian Ackroyd, G8GIV, QTHR.

Denby Dale (D&DARS)—Wednesdays, 7.30pm. Pie Hall, Denby Dale. Visitors always welcome. Sec G3FQN.

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

Halifax (Northern Heights ARC)—7.45pm. Peat Pitts Inn, Ogden, Halifax (four miles north of Halifax town hall). Sec G3MOW.

Hornsea (HARS)—Wednesdays, 8pm. Rear of Victoria Hotel, Hornsea (facing Hornsea Mere). Sec G4CHI.

Hull (H&DARS)—Fridays, 7.30pm. Dorchester Hotel, Beverley Road, Hull. Sec G3CJLZ. To contact sec G3VBI.

Hull (HURIS)—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 (LUARS)—Tuesdays, 8pm. Union Annexe (second floor), Woodhouse Lane. All new students welcome. Sec G4CNG, QTHR, or "E" block, Lupton Flats, Alma Road, Leeds B, during term.
Otley (OR&S)—Tuesdays, 8pm, 14 Back of Court House Street, Otley, Sec G8BFR.
Scarborough (SARS)—New night. Mondays, 7.30pm. Scarborough Technical College, Scalby Road, Scarborough. Sec G8RTN, pro Charles Whitaker, 1 Ryefield Close, Eastfield, Scarborough.
Sheffield (SUA&PRS)—University—Wednesdays in term, 1pm. The "Red Deer", off Main Street. Details G4RXN.
Polytechnic—This club must expand this year if the Students’ Union is to continue financial support. Details G4CYA, QTHR, tel Sheffield 356900.
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 369297.
Sheffield (ARS)—Third Monday in month, 8pm. Sheaf House Hotel.
Wakefield (W&DARS)—7.30pm. Ines Road School, Wakefield. Sec G3WVO.
York (YARS)—Fridays, 7.30pm (except for third Friday in the month). United Services Clubroom, 81 Micklegate, York. Visitors always welcome. 11 Nov (Talk by a rep from Verobord 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 the clubs in the new year, to talk or lecture, as required.

REGION 3—RR H. S. Pinchin, G3VPE, 1 Cole Bank Road, Lightcliffe, Huddersfield, S.28.
Birmingham (Birmingham University RS)—Every Tuesday during term, 7pm. Students’ Union, G3UB, Sec G4CKK.
Birmingham (Midland ARS)—6 Dec and 10 Jan (Construction and Club Open meeting), 5pm, Room 110, University of Aston, G3ZGQ.
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, G4PGF.
Birmingham (South Birmingham RS)—Thursdays (HF night on the air), 7.30pm. Fridays (Construction and more classes), 7.30pm. 7 Dec (Christmas social), 4 Jan (Surplus sale), 8pm. Hampstead House, Falkirk Road, West Heath, Birmingham, B31 3QY.

Bromsgrove (B&DARC)—11 Nov (Raynet), 9 Dec (Cheese and wine social evening), 8pm, Avoncroft Art Centre, Bromsgrove. G4G6B (G8JKT, QTHR).
Burton-on-Trent (B&T&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), 6pm, Bridgtown Social Club, Womb scaff, Cannock. Sec G3BUU.

Coventry (CARS)—11 Nov (Night on the air), 21 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, Beden Powell House, 121 St. Nicholas Street, Radford, Coventry, G6DML.

Coventry Technical College (CTCARS)—Mondays and Thursdays, 7pm. Wim Lane Annexe of the College, G4JSJ.

Coventry (University of Warwick ARS)—Wednesdays during term. Talk on Sat. 20, 7pm. Crcyliffe Farm, University of Warwick, Coventry, Vice-president G8MIA.
Hereford (HARS)—First and third Fridays in each month, 8pm. Civil Defence HQ, Gable Street, Hereford, G4CNY.
Lichfield (CHARS)—First Monday and third Tuesday in each month, 8pm. Swan Hotel, Tuesday meetings are natter-nites. Members new and swits welcome. Sunday night, 21:1500UTC, Sec Ted Bowden, RS30003, tel Tamworth 68789.

Lichfield (CHA)—Alternate Wednesdays, commencing 9 Nov, 8pm. The Naval Club, Burton Old Road, Lichfield, G4ESK.
Mid-Warwickshire (MWAR)—7 Nov (TV cameras and monitors), 21 Nov ("Shortwave contests and awards" by Syd Smith, RS18635), 26 Nov (Open meeting), 5 Dec (Tape and slide presentation), 18 Dec (Christmas party), 2 Jan (No meeting), 8pm, 61 Emecote Road, Warwick, G4CXL.

Redditch (RRC)—Second and fourth Thursdays in each month, 8pm. WRVSS Central. Salop Road, Redditch. G3EVT.

Shrewsbury (Salop ARS)—Thursdays, 7.30pm. New members welcome. The Albert Hotel, Smithfield Road, Shrewsbury. Joint sec Bob Carter, 11 Ash Close, Sutton Farm, Shrewsbury SY6 6HJ, and Dave Doody, 56 Ellesmere Road, Shrewsbury SY1 2QG.
Solihull (SARS)—15 Nov, 20 Dec, 7.30pm. The Manor House, High Street, Solihull, G4EOR.

Stoke-on-Trent (Son-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 G4EBM. Newcomers welcome. 7.30pm. Harold Clowes Community Centre, off Dawlish Drive, Bottles, Stoke-on-Trent. G3YY.

Stourbridge (SARS)—Informal on the first Tuesday in each month—"Shrine at Cottage" public house, Heath Lane, Oldswinford, Stourbridge. 21 Nov (TV demonstration by Brian Kennedy). 19 Dec (Surplus sale). 7.45pm, Longlands School, Brook Street, Stourbridge. G4CLX.

Stratford-upon-Avon (Supa&DARC)—Meetings will be arranged in Nov and Dec (dates to be decided) at the Youth Hostel, Alveston. G4EKL, tel Stratford 5088. New members welcome.

Sutton Coldfield (SCR)—Second and fourth Mondays in each month, 7.30pm. Central Youth HQ, Clifton Road, Sutton Coldfield. Sec Mrs Liz Furness, 4 Goddore 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 G8DOR), 29 Nov ("Project X"), 7 Dec ("Another solid state device" by G8FSV), 7 Dec (Night on the air), 14, 21, 28 Dec (Check with sec), 14 Jan. 7.30pm, Phoenix Centre, Wedb Crescent, Dawley. G4MXS, 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.

Wolverhampton (WARS)—14 Nov (Natter nite), 21 Nov (Surplus sale), 5 Dec ("PSGB" 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 G4TE and G4DKM). 8pm, Nechallis Cottage, Danescourt Road, Stockwell End, Tettenhall, Wolverhampton WV9 9PH.

Worcester (W&DARC)—7 Nov, 5 Dec, 2 Jan, 8pm. The Old Pheasant, New Street, Worcester, G3TQD.

REGION 4—RR T. Dorn, G3FSD, Sandham Lane, Ripley, Derbyshire.

Derby (DABAR)—Wednesdays, 7.30pm. 119 Green Lane, Derby. Morse classes every Tuesday and Friday, 7pm, when arranged.

Derby (NHARS)—Fridays, 7.30pm. Nunsfield House, Boultin Lane, Coston, Derby. 11 Nov (D altered G3BHY), 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/Social evening), 30 Dec (G4QA), 7CTZ.

Grimsby (GARC)—First and third Thursdays of each month, 8pm. Alexandra Club, Cleethorpes. 17 Nov (Video Tape Show by G3FYJ). Leicester (LSRS)—Mondays, 7.30pm. Club House, Gilrose Estate Cottages, off Groby Road, Leicester. By the time you read this the Leicester uhf repeater should be in operation on RB4. Details from G8CAK. Leicester Raynet Group meets on the second Thursday of each month at County Hall, Glenfield, 7pm. G8CAK.

Mansfield (MARSI)—First Friday in each month, 7.30pm. "The New Inn", Westgate, Mansfield.

Melton Mowbray (MMARSI)—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. Details from Roger Dixon c/o Students’ Union, or QTHR.

RADIO COMMUNICATION November 1977 885
REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 1EA.

Banbury (BARS)—Fridays, 7.30pm. 43 North Bar, Banbury. New members and visitors welcome, Sec S. L. Terry, tel Banbury 4789. Blackburn (BARC)—Mondays, 8pm, Coopers Hill Centre (adjacent to station). 24 Oct (tba), 7 Nov (Film night). Other Mondays, cw classes. Sec G3YMNC.

Burslem (GBR)—First Monday in each month, 8pm. Hedgerley Scout HQ, Sec Peter Flynn, tel Farnham Common 2606. High Wycombe (Chiltern ARC)—Fourth Wednesday in each month, 8pm. 42 Castle Street, High Wycombe. Sec G4PRL, tel Kingston Blount 78 (new memb contact). Maidenhead (M&ARDS)—18 Oct (“GB3HN” by UK FM Group), 8pm, Red Cross Hall, The Crescent, Maidenhead.

Milton Keynes—for next meeting please ring Sec G3THC, tel Milton Keynes 5669. Newbury (N&ARDS)—First Monday in each month, 7.30pm. Newbury College of Further Education, Oxford Road, Newbury. Sec G4EEE. Oxford (G&ARDS)—Second and fourth Wednesdays in each month, 7.30pm. Civil Service Sports Club, Marston Road, Oxford. Visitors welcome. Sec G4BR.

Oxford University (OURS)—Please contact sec M. Evans, G8LTE, Worcester College, Oxford, for meeting details.

Reading (RARC)—Please contact sec G4CC, 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 BHT. Addiscombe (AARC)—Tuesdays, 8pm, “Spreadaegis”, Portland Road, Woodside. Sec G3JSX.

Ashford (Echelord ARS)—Second Monday and last Thursday of every month, 8pm. The Hostel, High St, Ashford. Sec G4ARQ. Coulsdon (GATS)—First Thursday in each month, 7.30 for 8pm. 19th Purley Scout Hall, Chisle Valley Road, Coulsdon. Third Monday in each month, 7.30 for 8pm. 1st Purley Scout Hall, Chisle 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 5956. Croydon (GVC)—First and third Thursdays, 8pm. Etham United Reformed Church, Hackbridge Lane, Selsdon, SE9. 17 Nov (“Simple wire aerials”, G6ELX Ron Glashier). The club is now a limited company. From January 1978 meetings will be at Christchurch Centre, High Street, Eatham, London SE9. Sec G3YWO.

Crystal Palace (CP&DARS)—Third Saturday in each month, 7.30pm. Emmanuel Church Hall, Barry Road, London SE22. Sec G4AVL, tel 01-453 4340. Guildford (G&ARDS)—Second and fourth Fridays in each month. Model Engineers HQ, Stoke Park, Guildford. Sec G4BHQ, tel Guildford 7275.

Kingston (K&DARS)—Second Wednesday in each month, 8.15pm. Berrylands Scouts and Guides HQ, Stirling Walk, Reaembourne 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.

REGION 8—RR D. N. T. Williams, G3MDO, “Seletar”, New House Lane, Thanington, Canterbury, Kent. Brighton (B&ARDS)—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 G3JFT.

Burgess Hill (Mid-Sussex ARS)—7.45pm, Marie Place, Burgess Hill. Details from G3PEQ.

Canterbury (East Kent RS)—1 Dec (Cheese and Wine). Details from G3BHR, QTHR.

Chichester (G&ARDS)—First Tuesday and third Thursday in each month, Castlereagh Boys School. Details from G4ETU, tel 0243 88069.

Crawley (GARC)—United Reform Church Hall, Ifield, Crawley. Details from G3ML.

Darford (DHFDC)—Second Friday in each month. Scout House, Broomfield, Darford. Details from Jeannette Maggs, 25 Leybridge Court, Etham Road, Lee SE12.

Dover (South East Kent YMCA ARC)—6 Nov (Project discussion and decision), 16 Nov (“Getting started on HF” by G3QWO), 23 Nov (HF/TV and night time), 30 Nov (“Gone West” by GB8N, on his visit to the USA), 7 Dec (Project progress), 14 Dec (“Ham interference on cable television” by GBLK), 21 Dec (Construction contest), 28 Dec (Nettines, OSY local). Details from G8KX, 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 G4CVY, pm G3LZ.

Gravesend (GRSGBG)—Mondays, 7.30pm. The Windmill Tavern, Shrubbery Road, Gravesend. Hastings (HERC)/(TT(H)SS&EC)—Details of future events for both units from G3BNF.

Horsham (HARC)—First Wednesday in each month. Civil Defence HQ, Moons Lane, Brighton Road, Horsham. Details of future events from G3NPF.

Midhurst (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, Meaford Close, Loose. Details from Harry Poppy G8KMX, tel Midhurst 61792. Medway (MARTS)—Fridays, 7.30pm. Aurora Hotel, Gillingham. Details from P. J. Poole G4EVL, 5 River Drive, Strood, Rochester, Kent.

Ramsgate (Kent Coast ARC)—Details of meetings from G4DTA, QTHR.

Tonbridge Wells (East Kent ARC)—Details of events from G8MV.

Worthing (W&DARC)—Tuesdays, 8pm. Adult Education Centre, Union Place, Worthing. Details from P. J. Robinson G8KX.

Kent Repeater Group—Details of membership from G3XDV, 5 Lamb Weal, Whitstable, Kent.

Sussex Repeater Group—Information from G8HYV.
REGION 10—RR R. G. Barrett, GW3HEZ, 23 Carshalton Road, Beddau, Pontypridd, Glam. Barry (BCERS)—Thursdays, 8pm. Barry Rugby Football Club, Reservoir Road, Barry. Details from sec GW3VB.

Blackwood (SARS)—Fridays, 7pm, Oakdale Community Centre, Oakdale, near Blackwood. Details from sec GW3XY.

Bridgend (Glamorgan VHF/UFH Group)—Every second Friday in each month, 7.30pm. NCB Social Club, Tondo, near Bridgend. Details from sec GW3HEZ.

GloUCESTER (CRSGB)—Second Monday each month, 7.30pm. The Pantmawr Inn, Pantmawr Estate, Cardif. Details from sec GW3VOW.

Merthyr (Hoover ARS)—Mondays, 7.30pm, Hoover Social Club, Penlrech, Merthyr. 25 Nov (Social evening), refreshments provided. Details from sec GW3RNC.

Newport (NARC)—Mondays, 7pm, Adult Educational Settlement, Brynglas Road, Newport. Details from sec GW6MER.

Pembroke (PRSSGB)—Last Friday in each month, 7.30pm. Defensible Barracks, Pembroke Dock, Dyfed. Details from sec GW3XJQ.

Pontypool (PRSSGB)—Tuesdays, 7pm, Education Settlement, Park Hill Road, Pontypool. Details from sec GW3JH.

Port Talbot (British Steel Corporation ARS)—Thurdays, 7.30pm. BSC Sports and Social Club, Margam. Details from sec GW4ESV.

Rhondda (RARS)—Every other Thursday, 7.20pm. Transport Employees' Club, Pont. Details from sec GW3PHH.

Sully (S&DSWC)—Mondays, fortnightly, 7pm. Sully Bowls and Social Club, 56 South Road, Sully. Details from sec GW6H.

Swansea (SARC)—Tuesdays fortnightly, 8pm. The Commercial Inn, Killay. Details from sec GW8CMA, OTHR.

REGION 11—RR P. H. Hudson, GW3IEQ, “Silthill”, Dinas Dinlle, Caernarvon LL54 5YW.

Rhyll (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 (UCNARS)—Thursdays, 7.30pm. School of Engineering Science, Dean Street, Bangor. Prospective members please contact the sec.

REGION 12—RR F. H. Hall, GM8BZX, 45 Priory Cottages, Llanfair, Forfar, Angus. D8 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, DD3 7NP.

Inverness (Technical College ARC)—Every second Wednesday, 6.45pm. Room C9, Inverness Technical College. Winter programme is being arranged. Sec, John Reid, 37 MacEwen Drive, Inverness.

Lerwick (ARC)—Wednesday evenings at Annabrea House, Lerwick. Sec GM6HTH.

Moray Firth (MFARS)—Wednesdays, 7.30pm. Elgin Technical College. Sec GM8BGV.

Porth (P & DARG)—Details from sec, GM4DJ.

The Highland area representative wishes to resign due to moving house. RR is 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 KY2 2LH.

Berwick upon Tweed (Border ARS)—First and third Fridays in each month, 7.30pm. Roxburgh Hotel, Berwick upon Tweed. Details from GM3UJ.

Dunfermline (DARS)—Second Saturday in each month, 7.30pm. CCTV Studio, Pittencrieff School, Pittencrieff Street, Dunfermline. Details GM3GSO, tel Limekings 313.

Edinburgh (E&DARC)—Tuesdays, 7.30pm. City Observatory, Carlton Hill, Edinburgh. Details from GM4BWT, tel 031-666 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 sec GW2ML.

Glassreithy (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 GM6GEC, tel 031 665 2420; Fife, D. Dalrymple, GM5OLK; Borders, position vacant.

REGION 14—RR I. McKechnie, GM5BOX, 41 Westlea Drive, New Cumnock Bridge, Ayrshire. Kilmarnock, KA1 2JD.

Motherwell (Mid-Lanark ARS)—4 Nov (“Avionics” by GM3CLX), 18 Nov (“Oscar” by GM3BKE), 2 Dec (Constructors competition, GM3HT), 16 Dec (ORP, GM3OlX), 23 Dec (Film night, GM3ULP). Wragholm Hall, Jenkinson Street, New Stevenston, Motherwell ML1 4UQ. Sec GM4AUP.

REGION 15—RR H. J. Campbell, 26 Kilcole Park, Belfast BT4 8LB.

Ballymena (BRC)—Tuesdays, 8pm (RAE and morse classes). 80 Old Cullibackey Road, Ballymena, Fridays (club night), Sundays 3pm (special projects). Sec GI8LSF.

Bangor (B&DARS)—First Friday in each month, 8pm. Redcliffe Hotel, Seacliff Road, Bangor. Interesting winter programme. Sec GI4AAA, 14 Manse Road, Bangor.

Belfast (QUOBC)—Tuesdays, 8pm. Queen’s University Radio Club, 37 Fitzwilliam Street, Belfast.

Belfast (COBYNCAR)—Saturday mornings in new premises, 4th Floor, YMCA, 12 Wellington Place, Belfast. Sec GI8MOR. New members welcome.

Belfast (BRSGB)—Third Wednesday in each month, 8pm. 90 Belmont Road, Belfast. Varied winter programme. Details from GI8FOK.

CarriCargent (CYMARC)—Second Wednesday in each month, 8pm. Carrickfergus YMCA. Sec GM4UF. New members welcome. Mid Ulster BRSGB Group—First Sunday in each month at 0TH of HGBAC. Always something interesting. Sec GI3RW.

North Ulster (NURSGB)—For details, contact GI3UHL. OTHR.

Durham (DUARS)—Alternate Wednesdays during term. Physics Dept, Durham University. All local amateurs are welcome to join. Talks from G4AUF given at all meetings. Sale of RAE and Morse tuition if required (the club has a good RAE pass record). ATV can be received on 805 lines. The club is now equipped with an hf transceiver as well as other gear, Sec G4CO1.

Great Lumley (ARES)—Alternate Wednesdays, 7.30pm. Great Lumley Community Centre. Assistance with RAE and Morse if required. All amateurs and SWL's welcome. Sec G4ULQ, Hartlepool (HRC)—Mondays, 7.30pm. Methodist Church Hall, Grange Road. Sec G3NWU, 73 Emond Gardens, Hartlepool, Middlesbrough (POARC)—Sec G4CDP, 46 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 SWL's, John Thexton G3URE, has resigned, so the secretary is now Fred Snyge, G4DOB, 264 Silver Lommon, Newcastle on Tyne, NES 2HJ. Tel Newcastle 744444. Sec G4ATN, 58 Rainbow, Sunderland. SWL's welcome. Port Sunlight (ARES)—Sec G4AVU, 26 Merton Road, Northwich, Cheshire. The club is now equipped with an hf transceiver as well as other gear, Sec G4CO1.

Great Lumley (ARES)—Alternate Wednesdays, 7.30pm. Great Lumley Community Centre. Assistance with RAE and Morse if required. All amateurs and SWL's welcome. Sec G4ULQ, Hartlepool (HRC)—Mondays, 7.30pm. Methodist Church Hall, Grange Road. Sec G3NWU, 73 Emond Gardens, Hartlepool, Middlesbrough (POARC)—Sec G4CDP, 46 Grange Road, Hartlepool, Cleveland.
Regional Representatives' Conference
24 September 1977

This important event was attended by 16 regional representatives, 13 Council members, the general manager, and Mrs. H. Aillin, 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, G2AMW, 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, led the discussion on the general partition 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 G2MA. 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 requests 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 on what 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, in negotiations with Home Office and negotiations on a worldwide basis for frequency allocations. It was agreed that the QSL Bureaus 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 he accepted that the deliberations of at least some of the committees must inevitably be confidential. The contents of Radio Communication were discussed, but G2BV pointed out that the articles were almost wholly dependent on what was submitted for publication.

G2BV spoke briefly, but very much to the point, on the prospects for WARC 1978 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 Eckerley, 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 G2BNE 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, G2AMW
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.


St. Albans (Verulam ARG)—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 0000-1300 gmt; 11 Dec, 1600 0900-1300 gmt.

Stevenage (S&DATS)—3 Nov (Junk sale), 17 Nov (QSL Bureau-G3CLP). 1 Dec ("DF receivers" by G4DDX), 4 Dec (14MHz 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.

Regrettably, because of my recent job transfer to Yorkshire, I must resign as RRT19. I would like to thank everyone who has helped me, especially the club seers 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. Smith, G4AX.

Cheltenham (CRSGB)—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. G3POE.

Yate (Y&DARC)—First Saturday in each month, 8pm, G3QON QTH. All welcome, including SWLs. Local chat channel S84, 145-mHz, 2100 Wednesday and Saturday. Further info from G6GLC. 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 reactivity), 22 Dec (FET characteristics). 7.30pm. Hut 101, Houndstone Camp (three miles W of Yeovil, off A3980, info at main gate). S20 fm talk-in. Sec G3NOF.

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

Bath (B&BRG)—Tuesdays, 8.30pm. The Crypt, Ascension Church, 33a 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. Sec G4KGE.

Bristol (Shirehampton ARG)—Fridays, 7.30pm. Twyford House, Shirehampton. New members most welcome. G4WBB.

Bristol (BRSBGB)—28 Nov (Regional rep), 18 Dec (Potted lectures). 7.30pm. Small lecture theatre, Queen's University, University Walk, Clifton, Bristol. Sec G4PRC.

RADIO COMMUNICATION November 1977

Mobile rallies calendar

19 March 1978—White Rose Mobile Rally, Lawnswood School, Leeds. Details from G4DZI.

11 June 1978—Ewesgate Castle Mobile Rally. Details later.

23 July 1978—Cornish Mobile Rally, Truro. Details from G3NKE, tel Camborne 71419.

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 GBCC or G4BVE, QTHR.
These subsidised 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 colls, 7 tatts, £25.18AVT, £25. GJ3JPX, QTHR. Tel Canvey Island 63004.
- **Garrard SL66B chassis**, ceramic cartridge, £5. Tad1001C, £1. CFT470C, 50p. Three-gang condenser for 3TD TX, £15.12V 15MHz high quality modulator for QVQ03-20, £10. Multiplier strip to 2m, from 8 or 12MHz tatt, each on 12in in 3in chassis, £4. GJACE, QTHR. Tel 0962 69041.
- **FM1410SA**, 2m, 10W/1W, 12ch, 10 fitted, sensitive preamp, super bleep toneburst, mobile mount, £80. WANTED: Good soled controlled stereo cassette mechanism, at reasonable price. Bill, G8KF, 3 Lillington Garth, Boreham Wood, Herts.
- **Eddystone EC10 MIK2**, 20, new, 150 new, used, mms psu included, manual, £14. 2MHz valve tx, modulator kit, converter 17MHz, £1, 3-6m Raybeam ant, £30. G3HHG, QTHR. Tel 061 748 7968.
- **KW 187 antenna match, mint, offers over £65. Will pay carriage. GJGJ, QTHR. Tel 079 652 2965.**
- **Tri BR55DS communication rx**, 0-5 to 30MHz, amateur bandspread, 100kW and 1MHz txlatt calibrator, vgc, £40. GJ6TE, QTHR. Tel East Grinstead 29544.
- **Transistor SPG 19 IN SEP 1972, £20. Wayne Kerr vhf ammendt bridge 8801, £6. Tektronix square wave scope calibrator/gen type 107, 6-14MHz, £20. 21m Co, video tape on NAB reels, £1 each. Sony 100AC VR, £20. G3YDN, QTHR. Tel West Kingsdown 2577.**
- **IC502 modified for fm tx to cover 140-0 to 144-4 and 145-3 to 145-7, exc cond, nicads, handbook, etc, multimode, 3W, portable, £150. 4C2X50B base, £2. Dave, 5 Ridgeway, Ingatestone, Essex CM4 9AS.**
- **SSB 2m and 70cm gear, Liner 2 and QMT70 70cm transverter, both 10W output, sold tog with 2m rppa and audio speech processor, everything as supplied, buyer inspects, £140 ono, comp. G4FAZ, QTHR. Tel West Kingsdown 2577.**
- **Technical Associates audio speech compressor, £15. G-whip multimode antenna 10-20m, comp with basemount, £15. G4DMN, QTHR. Tel 015 338 2386.**

---

**FT290, FP200** spare valves inc pa, immaculate, £240. Stolle 2010 rotator, RZ100 balancer, cable, £40. Jaybeam 2m 8-et Yagi, £7, 2m hal, £1. TE701 noise bridge, £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. Ono.** Collect or pay cash TeLP. Tel Poundhill 2641 (Nr Crawley), or 01-588 2345 ex 2089, business.

**Trip 7010 2m ssb tx/rx, mint cond, comp with car mount, £150. G4FJO, QTHR. Tel 04859 3964.**

---

**EFEK**

---

**EC16 with mains supply, £50. A rail swr power/meter with chart, £5. Joymatch MK111 abu, £5. Carriage or collect. G3FSV. Tel Market Harborough 4827.**

---

**Rtty UT4, comp double sided pcb, comprising UT4, two circuits (XBS), psu on single 8in by 6inthrough drilled and glass fibre board, £19.50, post paid, delivery three to four weeks. G3RDQ, QTHR. Tel 01-455 8381.**

---

**Rtty power equipment paper winder with belt and ball, suitable for all Cread sevens, £16. Cread TP/N, known as the perforator 45, £16. Xtal controlled AFSK oscillator, old tones, narrow shift, accurate to ±0-1Hz, self powered, metal case, £50. All items carriage extra by arrangement. G3RDG, QTHR. Tel 01-455 8381.**

---

**PSU, stabilized and protected, 28V 20A, buyer collects. Virtually new 4CX250B valves and vhf bases, £24 (4 off). New 4CX250B valves, £24 (4 off), QVQ040A and PTFB new, £7 (3 off), QVQ07-50A and base, £35 (1 off), 12V 5AH nicads, £25 (2 off), 12V 12AH, suitable for Pocketphones, £25 (3 off), GBSBR. Tel 0962 40096.**

---

**Honda 90 with carrier and white panniers, 3000 miles only, very good and well looked after, £150. Or prefer each with cash for FT101. Worldwide, P.O. Box 20, Boreham Wood, Herts.**

---

**Pye Banten AM/AM, £50. Pye AM/AM, £50. SonoC COP 532 LB, £10. Few incom, £25. WANTED: Banten FM/AM, GUSHKV, QTHR, Tel 0481 47278, 6 to 7pm.**

---

**Plessey i/c SL1210, £1.35. SL540C, SL641C, £1.95 (all with holders). RCA CA320A with heatsink, £1.50. Kukula filter MF45-10AZ with 4535 tatts, £17. All brand new, unused, G3MI, QTHR. Tel Chesham 3990.**

---

**Two pairs, Pexy Pocketones PF1, staled, wkg on 423-2MHz, £50 per pair. Spare set of nicads for above, £5. Wallers, G6JGF, QTHR. Tel Leabrooks 2823, 9am-Spm, Ripley (Derby) 810280, after 6pm.**

---

**Yeasu YD844 desk mic, unused gift, £12. G2AKR, QTHR. Tel 061-739 0365.**

---

**FR50B, incl top band, vgc, £85 ono. GZ2AF tx, needs some txlatt, incl filter, wkg on 80 and 20m, £20.50. Heathkit DX1000 100W a.m./low tmwr, np pa valves, £15 ono. G4GIR, QTHR. Tel Great Chesterton 718.**

---

**Heath, wired and tested, hardly used, IM-25 fet, copper bnc, £75. SB634 sin console, £180. SB804 spkr for SB104, £185. HM1023 kW dummy load wattmeter with chart, £140. All prices ono. G5SPF, Tel Bicester 42624 or Upper Heyford 4263.**

---

**Property of silent key, Yeasu Musen FRDX400 rx, FLDX400 tx combination, rx fitted, 2m, mint, as pair £145 ono. Buyer collects.**

---

**Microprocessor F8 by Mostek with 1k ram, 1k rom, 20mA tty interface, 3 parallel ports, £25 ono. S100 (Altair/Imsl) motherboard,**
TR 2 2 0 0GX ,
3 4  B i dw e l l  H i l l ,  H o u g h t o n  R e g i s ,  D u n s t a b l e ,  B e d s ,
c a r r i n g  c a s e ,  m i c ,  f e w  h o u r s  o n l y ,  £ 1 2 5  o n l o s e s .  F R 5 0 B R X ,  m i n t  c o n d ,
m a n u a l s ,  £ 4 0 .  L i n e  s t r o b e  s e l e c t o r  E M I ,  £ 1 0 .  Q Y 4 - 4 0 0  v a l v e s ,  £ 1 0
i n c l  p a i r  6 1 4 6 8 ,  m a n u a l ,  £ 1 3 0 .  F RG 7 r x ,  g e n e r a l  c o v e r a g e ,  a l l  m o d e s ,
T r i o
8 0 - 1 0m ,  w i t h e x t  s p k r ,  £ 7 0 .
F RG 7 ,
G 3DS K ,  Q THR .  T h r e e - r ow  7 6  k e y b o a r d ,  £ 2 . 5 0 .  C o mm a n d  r x  1 9 0 : 5 5 0 kH z ,  £ 3 .  C R 1 0 0
O T H R .  T e l  G t  B o l a s  5 9 3 .
L a b s ,  1 3A ,  £ 2 0 .  R a c a l  c o u n t e r  S A 5 5 0 ,  c r y . .  h a n d b o o k ,  £ 5 5 .  G 2 F SP ,
S i l c h e s t e r 7 0 0 0 2 7 ,  a f t e r  7 p i n .
un m o d i f i e d ,  s e l l  o r  e x c h a n g e  R 3 1 2-R 3 4 2  o r  R 3 4 8  o r  w h y ?  W a r n e r .
ss b  r e c e p t i o n .  £ 3 . 8 .  1 1 1 5 4 l x  p l u s  R 1 1 5 5 r x  ( t r a w l e r  b a n d )  o r i g i n a l ,
or i g i n a l  b o x ,  m a n u a l ,  £ 1 3 0 .  G 4DCQ ,  Q THR .
t a p e s  l i t t l e  u s e d ,  £ 7 5 .  G 3 YQQ ,  Q TH R .  T e l  0 2 5 7  4 5 1 2 1 3 .
i m r n a c ,  £ 2 5 .  S t e v e  W e b b .  T e l  C r aw l e y  2 8 7 8 7 ,  e x t  3 4 0 ,  w k g  h o u r s .
ual s ,  a c c e s s o r i e s ,  £ 1 2 5 .  4 m  V a n g u a r d  w o r k i n g  7 0 . 2 6 ,  7 0 . 3 7 5 ,  c om p
b a n d s  t o  3 0MH z ,  c o m e  w i t h  c a b i n e t  s p k r .  K W 2 0 0 0A t e / r x  w i t h
£ 4 5 .  3 2 k  b i t s  ( 4 k  8 )  r a m  b o a r d s  f o r  S 1 0 0 ,  £ 8 5 .  O t h e r  r n I s c  i t e m s .
E d d y s t o n e
AM 2 5 B ,  b u y  o r  b o r r o w .  G 4 8 1 E ,  Q TH R .
KVG  X F 9B
C o d a r  C R 7 0A ,  o n e  y r  o l d ,  r e a s o n a b l e  o f f e r .  R e a d i n g s ,  " K i l r u s h " ,
M u l t i - E l m a c
B a l a n
T a
F I
T r i o
R A D IO  C O M M U N I C A T I O N
8 0 1 9 7 1
8 9 1
R A D I O  C O M M U N I C A T I O N
8 0 1 9 7 1
8 9 1
22 12in square tower, three sections, 1 at 1ft, 2 at 6ft, £10. Buyer collects.
G2KA, QTHR.

FR005b 1O-50M full 10m coverage, spare valves, Stephens-James Mk1 tuner, both as new, £200. Buyer collects or pays carriage.
Clement, 57 Canterbury Avenue, Lancaster, LA1 4AU. Tel 0524 2389.

W2H11 Homebrew psu, cw filter. £175, SB200, exc cond, £275. AM/200, single ch, rx on 145MHz fm tx, £15. Oxfam FL1 audio filter, £40. GM4AWA, QTHR. Tel 0738 21241 ext 236.

KW2000E, ac psu, good cond, £260. Buyer inspects, sees on the air and collects, no offers, offer accepted: T3A3, high power vert. 2SK140, QTHR. Tel Lingfield 832343.

Q170 transistor 22/14, high power, unused, plugs, instructions, etc. (bought T7500G), bargain at £70 posted paid. G3JNY. New QTHR, TEL 8135 Longlands, Garforth, LS25 2BR. Tel Leeds 555059.

Tri-o PS5 mains psu/digital clock for 7200G or similar 2m rig, as new, under guarantee, £45 ono. GW3YVC. Tel Cardiff 755190.

CD44, £50, T333JR, £40, WMVY sscan kit, £25. GC16T (end), lfa 1 ssb audio module, £20. G3LEZ. Tel Southend-on-Sea 230489.

Edystone 840X rx, £35. 540 rx and 70cm converter, £20. Pye U460L 70cm tx fm, handbook, £22. W3BYO, QTHR. Tel 0202 6651 3318.


Xtals for ladder filter experiments etc. 8/95MHz, HC18U, £1 each. 4 at 75p each and 10 at 60p each. Some 5000MHz CHSU still available, £1 each. SAE with order and remittance to Richard Bower, 16 Manciple Road, Essex, SS18 4ER.

Mobile tx/rx, Marconi H4000, 100W, all transisterised except pa, ac and dc operation, possible operation all bands, set up for 80m and 20m, worked 2L 80m, VK-2W, using G-whp, £100. Prefer buyer view before collect. Tel Chesham 8379. 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, £200 ono. Three 3FP7 long persistence bulbs, £10 each. Tel Low Moor, Lincolnshire.

Microwave Modules|B22/18 10W transverter, constructional details for G3BA 144/28MHz drifter transverter, £70. 2m cross polarisation phasing harness, £1. G3XOF, QTHR. Tel 0283 813782.

RF Amplifier|B4U, Type HMC, £34. 2A, PCR M4, suit swl, £10. W1191A wavemeter, £22. PTC703 rx, £3. Ranger on 144-250MHz, £6. Wanted: FL200B tx or similar, G2D4F tx or RX, KW E-Zee match, M. Wright, 27 Bulbridge Road, Wollton, Salisburry, Wiltshire.


SB192 incl 400Hz filter, SB600 with HP26B mains power, £220. HP13A, mobile power, £30. SB610 monitoroscope, £60. SB200 linear, £200. All vgc. Unused 3F7 crt, £8. Offers considered, Prefer items collected. G3EJG, L. M. Airey, 19 Horseman Drive, Copthorne, York YO2 3SN.

ARAC 102 and 28-30MHz rx, a.m. fm and ssb, £75. SW rx R1475, 2.0MHz, £15. Buyer collects. FDK Multi-2700, as new, £430. Dialing speech processor, £25. Micros includes Microwave 23cm varactor, £22. Converter 23cm-2m, £22, G8FHK, Sharratt, 32 Springfield Way, Cranfield, Beds, MK43 DJN.

Deca type 624 trans mission radar display console, Icv, psu, scanner, mag. See weekends by appt, or photos available. Elsworthy, GW4AG, QTHR.

EC10 MK2, mains and battery pack, exc cond, £100. 2m dash Cambri, xtled R8, R7, SO, £35. UK05, QTHR. Tel 081-761 3151.

Yeao FTDX400, FVDX400 ext vio, exc cond, £250 ono. Will swap for TH3MK3 Molesy Mustang or similar with suitable rotator. Wanted: 819's Emac 4-100A, 4-1000A tubes, also small scope. G3TOS, QTHR. Tel Teen (Staffs) 2952.

Pocketrpic sx/rx, above average cond, circuit diagrams, new batteries, charger, ac psu for rx, improved rx front-end, helical whip on R4G, £115, R598DS, G3XL, Lockwood. The Mills (Suffolk) 5986, evenings or weekends.

ZL12in square tower, three sections, 1 at 1ft, 2 at 6ft, £10. Buyer collects. G2KA, QTHR.

W4008 ohm 10-50M full 10m coverage, spare valves, Stephens-James Mk1 tuner, both as new, £200. Buyer collects or pays carriage.
Clement, 57 Canterbury Avenue, Lancaster, LA1 4AU. Tel 0524 2389.

G29W11 Homebrew psu, cw filter. £175. SB200, exc cond, £275. AM/200, single ch, rx on 145MHz fm tx, £15. Oxfam FL1 audio filter, £40. GM4AWA, QTHR. Tel 0738 21241 ext 236.

KW2000E, ac psu, good cond, £260. Buyer inspects, sees on the air and collects, no offers, offer accepted: T3A3, high power vert. 2SK140, QTHR. Tel Lingfield 832343.

Q170 transistor 22/14, high power, unused, plugs, instructions, etc. (bought T7500G), bargain at £70 posted paid. G3JNY. New QTHR, TEL 8135 Longlands, Garforth, LS25 2BR. Tel Leeds 555059.

Tri-o PS5 mains psu/digital clock for 7200G or similar 2m rig, as new, under guarantee, £45 ono. GW3YVC. Tel Cardiff 755190.

CD44, £50, T333JR, £40, WMVY sscan kit, £25. GC16T (end), lfa 1 ssb audio module, £20. G3LEZ. Tel Southend-on-Sea 230489.

Edystone 840X rx, £35. 540 rx and 70cm converter, £20. Pye U460L 70cm tx fm, handbook, £22. W3BYO, QTHR. Tel 0202 6651 3318.


Xtals for ladder filter experiments etc. 8/95MHz, HC18U, £1 each. 4 at 75p each and 10 at 60p each. Some 5000MHz CHSU still available, £1 each. SAE with order and remittance to Richard Bower, 16 Manciple Road, Essex, SS18 4ER.

Mobile tx/rx, Marconi H4000, 100W, all transisterised except pa, ac and dc operation, possible operation all bands, set up for 80m and 20m, worked 2L 80m, VK-2W, using G-whp, £100. Prefer buyer view before collect. Tel Chesham 8379. 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, £200 ono. Three 3FP7 long persistence bulbs, £10 each. Tel Low Moor, Lincolnshire.
QMT0 2m solid state transverter, £40. Microwave Modules MMCM 28 converter, BNC, £15. MBM 48 Multibeam, £25, 817 beam, £5. Stolle WA 5052 tripler, £144.00 (net price). Paire, £12. Pye low-band a.m. base set, £10. 4V/4 beam, £5. G3YQQ, QTHR. Tel 0257 451213.
Liner 2, exc cond, fitted PA3 preamp, £110.00. Wanted: ICOM IC25S, Chris, 39 Molenv Avenue, Preston PR1 4PL. Tel 0772 25108.
Tri-O 2200, £85.00, fitted, four months old, used once, all accessories incl. nicads, original packing, £110. G6PDQ, QTHR.

**WANTED**
Pye Bantams HP1AM E band unmodified, wkg cond, battery chargers, rechargeable battery cases. Good price paid. T.M.H. Randall, 37 Dinam Road, Caergiog, Holyhead, Gwynnedd LL65 3NY.

Service book or circuit diagram of Telequipment oscilloscope D33 for copy and return. G3FKO, QTHR. Tel Bideford 2964.
FT248.f metric units for 528 to 524 and 50. Reasonable price. G3EJ A, 9 Holybrook Road, Reading.
FL50B tx, good wkg order. Price and details to GSNRQ, D. Austin, 106 Coombe, Sherborne, Dorset.
Eddystone B40 or 760, or any other good general coverage rx, good cond. Also Eddystons 990 or 770 Mk2. Steve Andrews, 12 Malton Way, York Y03 8SG. Tel York 90365.
Codar RQ30 sw atu, pre-war Eddystone components, sw plug-in coils, 0-9002a slow motion reaction capacitor, base board 6-pin coil holders, CI536 WB Stanton senior spkr, CI535 blue-spot inductor dynamic spkr, Eddystone or Belling Lee mains interference unit, Amplion horn spkr. N. Richardson, 2 Edme Road, Maidstone, Kent.
Redlion 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, Redlion psu, wkg or for spares. Crabb, 41 West Drive, Edgbaston, Birmingham.

TR2200/GX or similar 2m fm transverter, rt-suitable for vhf antenna, regulated 12V 3A mains PSU, good quality airband (118-136MHz) rx. P. Green, G8LQM, QTHR. Tel Bristol (0272) 505928, evenings.
Healthkit DX38B and HS81B, vio, mint cond, manuals. Manual for DX40U, buy or borrow for copying. G44FO, Tel Blackpool 58334.
Hallcratere SX110, wkg cond, no mods, manual or circuit. Info and/or circuit for Storno type Q139G-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.
FT191 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. G4HEB, QTHR.
Codar T29 sw 80/160m, good cond. G4GGN, 4 Blythe Way, Solihull, West Midlands, B91 3EY. Tel 021-795 0759.
Hand-held 2m tcvr, 2200G or similar. Complete years QST. Kelman, 61 The Fabric, Oadby, Leicester.
Help! Wanted to buy or borrow for photocopy and immediate return, circuit, manual, handbook or any gen on converter ssb 5020-99 971-7035, for use with B41, B41. Derek Sheen, G4CCW, QTHR. Tel 01-851 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, W.S15 2AQ.

HW32 and HW23 psu, G3MCA, 1 Mosslea Road, Orpington, Kent. Tel 0689 556497.

SP400 or even SP401 spkr, set of top and bottom covers for Dash Cambridge. Urgent G9MLA, QTHR. Tel 0858 2797.
Rigonda 8in tv, model VI100M line output transformer needed. Would buy non-wkg set for spares. Bartlett, 19 Cleeve Drive, Nr Bristol. Tel Yatton 832472.
Pre-war radio books, mgs, cats, very old rx, tx, valves, components, wanted for the Wireless Museum. Collection arranged. Curator. G3KP0, QTHR. Tel Shanklin 2556.
ARR8 or similar rx, GNAS, QTHR. Tel 53718.
Heath line LB220 or 230, or similar, small swr meter, Atlas ac psu, Trio spkr, Trio mic MCA, cassette radio mno, TA bandpass filter. G3NZT, QTHR. Tel Newbury 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 G4B2P, QTHR. Tel 0509 580279.
Sangamo Westlon E772 analysen stet, movement fonctionel, cond otherwise immaterial, G3H20, QTHR. Tel 01-642 4093.

QST mag. April 77, buy, beg, borrow. ZC4AJ, GRSS, RAF Akrotiri, BFPO 57.
FL508 tx, G5EOX, QTHR. Tel 021-449 3365.

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 622A for Redlion GR410 sub tx/rx. G3UCT, 27 Glen Road, Fleet, Hants. Tel Fleet (02514) 6996.

FT200 ext vfo and dc mobile psu required. G3ETU, QTHR.

FT75 tx/rx, DC75 psu. G4FJO, QTHR. Tel 04955 3565.
Manual or circuit diagram required for Coscor Commando range CCC302. 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.
Alrmed G844 rx in good wkg order and cond wanted by sentimental original manufacturers design draughtman of this equipment, GSK2I, QTHR. Tel High Wycombe 38376.

This is a plug for the "Radio Communication Handbook"

Get the optional extra with a difference. The Radio Communication Handbook is the only essential station accessory that plugs into you instead of your rig. Antennas, key clicks, standing wave ratios, filters, measurements, harmonics, propulsion—the equipment does not need to know about these things, but you do! For nearly 40 years the Handbook has been helping radio amateurs to get the most out of their hobby, and it has become one of the most sought-after accessories around. Perhaps not needing a plug helps...

**Volume 1** 484 + xvi pages £8.36 inc p&p

**Volume 2** 324 + xii pages £8.12 inc p&p

---

"Antenna here is the G4BWE filler modified for 20m!" (With apologies to "The G4BWE 'Hitler' Antenna", Technical Topics, August 1977 Radio Communication)
Can YOUR Antenna do all this?

A small selection from our huge file of testimonial letters on the JOYSTICK VARIABLE FREQUENCY ANTENNA (15-30MHz).

Carl V. Guest, Mount Vernon, Ohio, writes—"I set the Joystick antenna on the floor of my operating room which is at street level. On 40 meter CW I worked out to a distance of 700 miles in the afternoon.

"CB" Magazine—"If you are high enough the antenna will operate (especially at 15-20) as well as the well-known 3-element beam with which we compared it. The tests were 'operational, not theoretical'. We find that if we can hear 'em we can work 'em—and in most cases with a 100 watts input.'"

K6MDJ—"Early results are astounding. I've been using a trap dipole for 40-20-15. This JOYSTICK out-performs the dipole 2 x 2."

G3UB—"Do I like the JOYSTICK? I guess so! I took five antenna down and now use the Joystick alone!"

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

SYSTEM 'A' 25w, p.a.p. OR for the SWL £36.00
SYSTEM 'J' 500w p.a.p. (improved Q on receive) £42.60

PARTRIDGE SUPER PACKAGES

COMPLETE RADIO STATIONS FOR ANY LOCATION

All Packages feature the World Record Joystick Aerial (System 'A'), with 81, feeder, all necessary cables, matching communication headsets, Deliv, Security our aim. ASSEMBLED IN SECONDS! BIG CASH SAVINGS!

PACKAGE No. 1. £210.55
As above with R.300 RX. SAVE £17.28

PACKAGE No. 2. £193.11
Is offered with the FRG7 RX. SAVE £12.21

PACKAGE No. 3. £154.86
New low priced package, featuring the all-solid state SMC73 RX, with all the Partridge extras. SAVE £17.28!

RECEIVERS ONLY, inclusive deliv etc.
R.300 £184.50 FRG7 £162.00 SMC73 £128.81

Just telephone your card number—

BARCLAYCARD

phone 0843 82535 (or 82839 after office hours) or write for details, send 9p stamp

NOTE: All prices are those current at time of closing for press, inclusive of 11½% VAT and carriage.

G3CED G3VFA

AMATEUR RADIO BULK BUYING GROUP

NEW PLASTIC IC's from PLESSEY

New low cost version of the famous SL600 series communication IC's are now available. The plastic versions, designated SL6100, are in DIL8 or DIL14 packaging according to type.

Metal Plastic
R.F. Amplifier SL610C £2.45 SL610 £1.82
R.F. Amplifier SL611C £2.40
R.F. Amplifier SL612C £2.45 SL612 £1.82
Limiting Amp. SL613C £2.23 SL613 £1.82
VOGAD SL620C £7.72
AGC Generator SL621C £7.72 SL621 £2.45
AF/VGAD/Sidetone SL622C £5.15
AM/AGC/SSB SL623C £2.75 SL623 £2.75
Multimode Det. SL624C £3.43-
A.F. Amplifier SL630C £3.33-
Double Bal. Mod. SL640C £4.10 SL640 £2.13
Receive Mixers SL641C £4.10-

OTHER NEW SEMI-CONDUCTORS recently added to our range
AYS-1013 £8.25; BC143 30p; BY213 20p; MD101 75p; SL301 £12.19; SL1496 £1.05; SL3046 80p; SL78L06 99p; O901 14p; 1544 7p.

MISCELLANEOUS COMPONENTS
MD108 Ring Mixer £7.65; RS12 Miniature Reed Relay £2.25.

CRYSTAL FILTERS

We are the leading UK stockists for KVG Filters and normally hold the following range in stock:
Model Application 6dB BW Stop band Supplied Price
XF-9A SSB TX 2.5kHz 45dB 2 x Xtls £25.35
XF-9B SSB RX/TX 2.4kHz 100dB 2 x Xtls £35.30
XF-9B01/02 SSB RX/TX 2.4kHz 100dB 1 x Xtal £73.50
XF-9E FM 12kHz 90dB None £22.80
XF-9M CW 500Hz 90dB 1 x Xtal £25.50

S.E.I. OC1246AX SSB RX/TX 2.4kHz 100dB 2 x Xtls £31.50
Also available without Xtls £27.50
Carrier crystals also available separately: £545, 8958-5, 9001, 9001-5kHz at £3.00 each.

VHF COMMUNICATIONS

NOW PUBLISHED—the SUMMER 1977 edition which includes articles on:
INTRODUCTION TO MICROWAVE TECHNIQUES
DESCRIPTION OF 10Ghz TRANSCEIVER
4CX250B COAX-LINE P.A. FOR 70cm
ABSORPTION WAVELENGTH (4130MHz)
70cm FM TRANSCEIVER (Part 1)
SPECTRUM ANALYZER
Send £1.15 for a copy of this edition or £6.50 for 1977 subscription
VHF COMMUNICATIONS is the English language edition of the German publication "U.KW-Berichte", a quarterly amateur radio magazine especially catering for vhf/hf
All special components required for the construction of the described equipment, such as printed circuit boards, coil formers, semiconductors and crystals, as well as complete kits, are available for denmark direct from Germany. Many of the printed circuit boards. In addition to a wide selection of kits, are stocked in the UK. A price list of kits and materials is available—send for your copy.
Orders to VHF Communications at address below.

CHEQUES and P.O.'s should be crossed and made payable to "A.R.B.B.G. or VHF Communications" as appropriate.

COMMUNICATIONS HOUSE (Dept. 701)
20 WASHINGTON SQUARE
WALLINGTON, SURREY, SM6 3RG
Telephone: 01-669 6700
All 2 metre frequencies at the flick of a switch.

The Heathkit HW-2036 transceiver.
* True digital frequency synthesis
* No Channel limitations
* Frequency controlled by front panel switches
* True FM circuitry
* Minimum 10W output — extensible
* No signal generator required
* Safety control circuit to prevent out-of-band operation

The Heathkit HW-2036 transceiver employs a voltage controlled oscillator (VCO) and a 1 MHz crystal time base, so you can select any 2 MHz frequency simply with front panel switches.

It's fast, easy and precise.

There are a host of other features too, including outstanding audio quality.

The specification below shows how good it is.

For more details, send for a copy of the Heathkit catalogue.

**SPECIFICATION**

**RECEIVER**
- Sensitivity: 0.5 μV for 12 dB S/N (or 15 dB of quieting).
- Squelch Threshold: 0.3 V or less.
- Audio Output: 2 W typical at 10% THD (±5 kHz deviation).
- Image Rejection: -45 dB or greater.
- Spurious Rejection: -50 dB or greater.
- IF Rejection: -80 dB or greater.
- Internally Generated Spurious: Below 1 nV equivalent.
- Band Width: 6 kHz at 15 kHz minimum and 60 dB at 30 kHz.
- Modulation Acceptance: 7.5 kHz minimum.
- Current Consumption: 700 mA maximum squelched.

**TRANSMITTER**
- Power Output: 10W minimum into a 50 ω load.
- Harmonic and Spurious Output: -70 dB within 20 MHz of carrier, -40 dB harmonics.
- Modulation: FM, 01 to 7.5 kHz adjustable.
- Duty Cycle: 100% with infinite VSWR.
- Tone Encoder: 3 tones, 70 to 200 Hz, approximately ±100 kHz deviation.
- Transmitter Offset: 0 (simplex), -600 kHz, +600 kHz with crystals supplied. Provision for one additional offset crystal.
- Current Consumption: 7.6 A maximum at 13.8 V.

**GENERAL**
- Speaker: Built-in 2 in × 6 in speaker, jack for additional external speaker.
- Frequency Coverage: Any 2 MHz segment from 143.5 to 148 MHz. Both receiver and transmitter must be aligned for same 2 MHz segment.
- Frequency Increments: 5 kHz.
- Frequency Stability: ± 0.0015%.
- Operating Temperature Range: 15 °C to 25 °C.
- Operating Voltage Range: 12.6 V to 16V DC (13.8 V DC nominal).
- Weight: 6.25 lb.

**HA-202 Amplifier for 40W power output**
* Draws 7 W
* Delivers 40 W
* A perfect match for the HW-2036

**2-Metre Amplifier for 10 W power output**
* Draws up to 1.5 W
* Delivers up to 10 W
* Ideal for hand held or portable rigs

**AC Power Supply**
* 120 and 240 V AC input options
* 13.8 V DC output
* Perfect for the HW-2036

When you receive your copy of the Heathkit catalogue, you'll find full details of all this equipment — plus many more quality kits for the amateur radio enthusiast.

Don't delay. Use the coupon now.

To: Heath (Gloucester) Limited, Department RC-117
Bristol Road, Gloucester, GL2 6EE.
Please send a copy of the Heathkit catalogue.
I enclose 11p in stamps to cover postage.

Name ____________________________

Address _________________________

Showrooms at 233 Tottenham Court Road, London (01-636 7349) and at Bristol Road, Gloucester (Gloucester 29451).

HEATH
Schlumberger

The world's biggest producers of electronic kits.
Professional with Performance

Deco-KW 100 Combined Swr/RF Power Meter is an instrument for measuring a 50 ohm coehaline loading with two ranges 0-100 & 0-1000W when used with a 50 ohm Dummy Load.

Deco-KW 1000 Linear Amplifier for SSB and CW 10-50 metres, 1200 watts p.e.p. Input SSB, can be 'driven' by most 100 watt Transmitters and Transceivers, employs a pair of T10L Tubes in grounded grid,pi-section input and output circuits. Built in 2-4v P.S.U.

NOTE: The well-known KW LOW PASS FILTER passing 3-30MHz is available from stock.

G. W. M. RADIO LTD.
ALL PRICES include VAT and post/packing

DPCO JENNINGS Vacuum relays, 4v coil, new, £5.
GRABSLIN Elapsed time meters, 2 square, 240/100/50, 100,000 hours max. by tenths. New £25.
G.E.C. Air Traffic Control Transmitters, 10 watts A.M. around 121 Mc/s. AC mains, £45.
VITAVOX CH254 Table Microphone stand, new and boxed and professional quality, £5.
AIRLITE model 60 head and boom £30.
VANGUARD units only single channel valve Lo band, no accessories, £11.
ISOLATION TRANSFORMERS, Double wound 0-250v, 0-1k-25k cell or vice versa. 230 watts, 6 x 42 x 31", weight 12lbs, housed type, £4.50. WATTMETERS, Absorption AF No.1, (CT44) 500 microamps to 6 watts at 2.5 ohms to 20,000 ohms, £12.
RCM FREQUENCY METERS. Complete with charts, less power supply. These are recently recalibrated, £20.
MESSERS, 500V DC, modern plastic type, £55 new and boxed.
B44 Nk 3.5 to 75 Mhz xtal controlled AM, no battery lead or mike, £10. Last of the many, Mixes ex-Naval outdoor use. Large rubber mouthpiece cancels out Wind noise. Moving coil 2030 ohm, £2.
SIGNAL GENERATORS, Oscillator test No.1 C7112. Covers 85 Kc to 32 Mhz In 7 bands, AM-CW-FM. Attenuator 1 microvolt to 1 volt. AC mains or 12v DC. Complete with loads checked and over and operated. Compact and well made, £21.50.
VALVE VOLTMETERS CT209. Mains powered. 1-100v DC 1.5-150v AC. Complete probe and mains lead, £16.
NOISE GENERATOR CT119. 150mc-160MHz, 8 minute timer, 5-25-100 ma Dieida Current, metered. Output Impedance 10,000 ohms, attenuator and power meter. AC mains operated, £16.
RECEIVER Pre R129. 19" rack mounting. Xtal controlled in range 117-123 MHz. Speaker and AC mains supply built in, good clean condition, £13.
ANK Lighweight HEAD & MIKE SK88, model K8. Mika 8/300 ohms. headphones 75 ohms, ideal for Mobile use and in excellent condition, £55. £450. UHF Ts Rs chassis. OK for 70 cm-FM. Mains powered and complete except cabinet, £44. £9 Rs £27. Rs £22.

Carriage charges are for England and Wales only.

Terms: Cash with order

G. W. M. RADIO LTD, 40-42 PORTLAND ROAD, WORTHING, SUSSEX

Telephone 34697

P.O. BOX 7 WORTHING

Amateur Radio Products
DECCA COMMUNICATIONS LTD
Crampton Road, Oford, Sevenoaks, Kent
TM16 4EA
Tel: Sevenoaks (0732) 50971

Write or phone for catalogue.
*Every term available on equipment over 15, 20 or 24 weeks.

KW

D. P. HOBBES LTD.

The Component Specialists

G4DSG

Unidan 2002 12 Channel 2m Transceiver fitted five channels £164.26
QMF70 28/44 Scorpion Transverter £109.00
Cobra 28/70 CMS FM, Transverter with Mic. Audio £20.00
2 MHz Self-Tests Linear Amp £150.00
28/144 Solid State Transverter £80.00
3FMT02 2M to 70 CMS, FM Trans- £250.00
verter
144/23 Converter £12.50
432/28 Converter £27.50
Microwave Modules 2 Mtr Converters 2-4, 4-6, 20-30 MHz £20.25
MCM 144/28 LO 2 Mtr Converter £22.50
MCM 70 4 Mtr Converter only £24.75
MCM 432-70 CMS Converter only £28.10

MA 144. 5 Mtr Pre-Ampl £14.85
MMT 432/28M Transverter £110.10
NT 432/440 MHz Transverter £168.63
MMT 144/28 MHz Transverter £29.86
NRW 126/70 6cms Varactor £23.25
NRW 144/28 6cms ¥37.75
FDX Multi-11, 2m transceiver £290.00 11 channel £349.60
WDM 70 220,9 70 220,9 £249.00
FOK Multi-11 22 channel 70cm transceiver fitted £349.60 70cm transceiver £350.25

50K.OHM Push-To-Talk Microphones £6.25
Microwave Modules up to 500 MHz £66.00
50MHz Counter with Built-in 300MHz £25.50
50MHz Precal £27.00
Bantex 2 mtr Mobile Serials £7.14
Bantex Magnetic Mounts £10.40

Cable & Accessories ALL in stock

PART EXCHANGE WELCOME ACCESS OR BARCLAY CARD

11 King Street, Luton, Beds. 20907

RADIO COMMUNICATION November 1977
THE MANAGEMENT OF MODULAR ELECTRONICS
WISH TO APOLOGISE TO CUSTOMERS FOR DELAY IN PROCESSING ORDERS. THIS IS ENTIRELY DUE TO ILL HEALTH, AND IS RAPIDLY BEING RECTIFIED.

MINIMUM ORDER: £1.50 U.K. VAT FREE EXPORT MINIMUM £15
BUSINESS HOURS 09.00 - 13.00, 14.00 - 17.30

MOTOROLA MC12013 Prescaler with MTTL output. Divides by 10 or 11 typical toggle frequency 600MHz. 5V supply. Easy to use with datakey, £18.95.

NEW! PRESCALER KIT. PCB MC12013 all components to build complete with 2 stage input amplifier using 3GHz "TT" pack transistors. All components excluding box. Sensitivity typ. 30uA at 432.5V, + 10%.

MOTOROLA MC14569. Use two, Multiplier, Modulator, Phase Det. etc. With Datakey, £17.95 VAT 4%.

MOS 4069/4161E 10p 3.5V 50 MHz 8% TO92. £15.00.

CERAMIC CAPACITORS. VAT 12.5%.

HFTOWN. 9GHz FET. "TT" Pack (Pin input same as DIP-300) Interchangeable improved low cost replacements for same in most circuits. £9.00.

TRW. Very Low Noise, 9GHz FET. "TT" Pack (Pin input same as DIP-300) Interchangeable improved low cost replacements for same in most circuits. £14.95.

VARACTOR BOLT TYPE ITT VZ695.

INTEGRATED CIRCUITS VAT 5%.

MOTOROLA MC12013 Prescaler with MTTL output. Divides by 10 or 11 typical toggle frequency 600MHz. 5V supply. Easy to use with datakey, £18.95.

NEW! PRESCALER KIT. PCB MC12013 all components to build complete with 2 stage input amplifier using 3GHz "TT" pack transistors. All components excluding box. Sensitivity typ. 30uA at 432.5V, + 10%.

MOTOROLA MC14569. Use two, Multiplier, Modulator, Phase Det. etc. With Datakey, £17.95 VAT 4%.

MOS 4069/4161E 10p 3.5V 50 MHz 8% TO92. £15.00.

CERAMIC CAPACITORS. VAT 12.5%.
**BRICOM**

Coming soon—a variety of VHF amplifiers of different power outputs to suit a variety of conditions. We don’t have too much to say on these at present but we thought you would like to know they are about.

<table>
<thead>
<tr>
<th>Amplifier</th>
<th>Type</th>
<th>Coverage (MHz)</th>
<th>Notes</th>
</tr>
</thead>
</table>
| TX-5980  | Solid State Bi-Linear Amplifier | 40, 20, 15, 10 | Nominal output 50W RMS, 3-30MHz, suitable for cross-mod IF. 100kHz crystal filter is fitted for true AM reception. 
| TX-1000 | Solid State Bi-Linear Amplifier | 100-150MHz, AM/FM, CW and SSB | Infinite VSWR protection, silicon transistor pre-amp, LEO status indication.
| TX-75  | Solid State Bi-Linear Amplifier | 75-90MHz, AM/FM | Specification as TX-100 but nominal output 75-90MHz.

For those who prefer valves we have produced for you a combination of down-to-earth engineering, modern packaging and the result is virtually indestructible.

- **90A** Bi-Linear Amplifier
  - Coverage 40M, 30M, 15M, 10M, PET pre-amp nominal gain, can be 'key-down' for at least one hour, for a true 100W carrier with a superb AM or SSB
  - Coverage 40M, 30M, 15M, 10M, stable grounded grid operation provides power gain of 50-100, pre-amp gives 36dB gain on receive, Input 1-100W, LEO output, fan cooled for extended valve life, RF switched

**KACHINA 1**: this is an all-solid-state transceiver to cover 4m, 6m, 10m, 15m, with 90W AM, 50W PEP SSB. In addition to a highly selective 2MHz crystal filter for SSB, a six crystal filter is fitted for true AM reception. Dual ratio tuning mechanism allows 1MHz band coverage with automatic tuning of SSB signals. Critical design of receivers has shown that major causes of cross-mod IF are low cut-in and low selectivity. The KACHINA 1 utilizes state-of-the-art design resulting in superior performance. In keeping with our belief of cost effectiveness this rig will outshine any other.

To enable us to keep our costs low and therefore prices sensible we must ask that SAE accompanies all enquiries.

**PRICES INCLUDE VAT, and are subject to change with import(s) / exchange rate, etc., for overseas orders.**

---

**TELESCOPIC HILOMAST WINCH OPERATED**

These masts are hand winch operated, of robust construction and are suitable for use under all weather conditions. The sections are of aluminium alloy with fittings of stainless steel. A self-sustaining polyethylene covered winch has been selected for complete safety. Each section is provided with a stainless steel wire rope system. The sections are fitted with full length keys to prevent rotation.

They will support large 3 element antennas providing that the maximum operating heights specified in the following table are not exceeded.

<table>
<thead>
<tr>
<th>Wind speed</th>
<th>WTM/1</th>
<th>WTM/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 mph</td>
<td>Fully extended</td>
<td>Fully extended</td>
</tr>
<tr>
<td>70 mph</td>
<td>Fully extended</td>
<td>Retract to 30 feet</td>
</tr>
<tr>
<td>80 mph</td>
<td>Retract to 25 feet</td>
<td></td>
</tr>
<tr>
<td>100 mph</td>
<td>Retract to 10 feet</td>
<td></td>
</tr>
</tbody>
</table>

Also manufacturers of Pneumatic Hiomas.
SMC MONITOR SCOPE
FRG-7 DIGITAL

194A Northolt Road
South Harrow, Middx.
England. Tel: 01-864 1166

TRANSMITTING EQUIPMENT SOLID ONLY TO
LICENSED AMATEUR OPERATORS

AN E C COMPANY

FOR VISITORS TO LONDON
PLACE YOUR ORDER BY PHONE
WE'LL DELIVER TO YOUR HOTEL OR MEET YOU ON
DEPARTURE AND ACCOMPANY YOU TO THE LAND-
ING OFFICER TO ARRANGE CARRIAGE OF YOUR PUR-
CHASE.

POWER SUPPLIES
SWR BRIDGES,
ETC., ETC.

OVERHAUL, REASSEMBLY AND
REPAIR OF MOST EQUIPMENT UNDER THE CARE OF
G3JXC.

GUARANTEED DELIVERY IN 36 HOURS
ANYWHERE ON UK MAINLAND.
POST ITEMS EXCLUDED.

London—Phone before 2 p.m.
We'll deliver same day.

G3JXC G4FMF
G4ENV

Just telephone your card number
or send your Cheque with Order

01 - 864 - 1166

RADIO COMMUNICATION November 1977

899
The Shop with the Smile!

**AMATEUR RADIO EXCHANGE**

Proprietors: Brenda Aptaker, Bernard Godfrey (G4AOG)

The Aladdin's Cave for the enthusiast, with a secondhand selection that is second to none. Come and browse... Come and buy... Come and have a cup of Brenda's coffee either way.

★ AUTUMN LISTENING ★

Not only... the finest general-coverage synthesised communications receiver on the market, now available in two versions...

Analogue at £122.00 inc. VAT.

Digital at £233.00 inc. VAT.

But also... available from us with special 2m converter and accessories, all for just £17.00 extra.

---

2 NORTHFIELD ROAD, EALING, LONDON W13 9SY. Tel: 01-579 5311

---

**BREDHURST ELECTRONICS**

FOR VHF IN THE NORTH WEST

- FDK
  - MULTII 2m FM fitted 9 channels £200.00
  - MULTII 70cm FM fitted 9 channels—special offer—only £230.00
  - MULTII 2700 2m all mode £483.00
  - VFO for MULTII £89.00
  - AC PSU for MULTII £255.00
  - TM55 Scanning 2m RX fitted 10 Channels £59.00
  - Quartz 2m 2m FM fitted 9 channels £160.00
  - ELECTRONIC DEVELOPMENTS
    - 2m linear 100W output £151.00
    - 2m power amplifier 281144 £51.05
    - 70cm linear 50W £151.00
    - VHF absorption wavemeter £16.00
  - YAESU
    - FRG7 Gen coverage RX £102.00
    - ANTENNA SPECIALISTS
      - APS-272 2m & wave £51.20
      - APS-253 2m & wave £52.0
      - APS-667 2m & 440 MHz collinear £54.02
      - APS-687 2m & 440 MHz collinear £62.14
      - APS-685 2m Base SSW £102.25
    - BCS ELECTRONICS
      - 2m solid state linear £100.00
      - HF solid state linear £155.75
  - Constantly changing stocks of B/Il gear—ring for details

---

BECOME A RADIO AMATEUR.

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

---

**FREE**

Brochure, without obligation to:

BRITISH NATIONAL RADIO & ELECTRONICS SCHOOL

2.0.8 Box 156, Jersey, Channel Islands.

NAME ____________________________________________

ADDRESS _________________________________________

(Back tape please)

---

RADIO COMMUNICATION November 1977
GREAT NEWS FROM Swan ELECTRONICS.

HERE'S THE NEW GENERATION OF FINE TRANSCEIVERS FROM AMERICA'S FOREMOST MANUFACTURER OF COMMUNICATION EQUIPMENT.

SWAN'S NEW 350 A & 350 D (DIGITAL VERSION) GIVE YOU 300 WATTS INPUT ON SSB OR PROVIDES 200 WATTS FOR THE CW MAN WITH DUAL CW FILTER ON RECEIVE.

FOR THE OPERATOR WHO DEMANDS THE ULTIMATE THE NEW 750 CW HAS AN INPUT OF 700 WATTS ON SIDEBAND GIVING FULL LEGAL POWER AND HAS SIMILAR EXCELLENT FEATURES FOR THE CW MAN.

WRITE, PHONE OR CALL IN FOR FULL DETAILS OF THESE EXCITING NEW RIGS FROM THE SOLE IMPORTER:

AMATEUR ELECTRONICS UK
508-514 Alum Rock Road, Birmingham 8
021-327 1497 or 021-327 6313, telex 337045

R.T. & I. offer the finest selection of first-class new and fully overhauled second-hand communications and electronics equipment in the U.K.

- Constantly changing stocks of a vast range of equipment.
- Cash or Hire Purchase terms easily arranged.
- Part exchange welcomed.
- We are 'spot cash' buyers for almost all electronic equipment.

Send S.A.E for our latest list of over 50 receivers and many other interesting items.

R.T. & I. ELECTRONICS LTD.
Ashville Old Hall, Ashville Road, London E.11
Tel: 01-439 4986

RADIO COMMUNICATION November 1977

SAMSON ETM-3C KEYERS
Professional-grade C-MOS keyers built for dependable Marine & Commercial use world-wide—Backed by Spacemark service.
Only 1.5A battery idling current! ETM-3C, £22.88
ETM-4G MEMORY KEYER—Has ETM-3C features plus 4 separate memories (8 combinable). Erase Rewrite memories as often as desired. Send COs etc. just by pressing a button!

JUNKER PRECISION HAND KEY, £25.64
BAUER SINGLE-PADDLE KEY UNIT, £19.85
33mH TORIODS for rty, cw, ssb, filters, 90p each
SSB 90° AUDIO PHASE SHIFT NETWORKS, octal based.
All prices postpaid and include 15½% VAT. Please send stamp with all enquiries.

SPACEMARK LTD.
THORNFIELD HOUSE, DELAMER ROAD, ALTRINCHAM, CHESHIRE
(Tel: 061-828 9438)
FOR THE DISCERNING VHF LISTENER.

QM70 now produce what must be the most comprehensive range of VHFRHF
Receiving Converters available today. Listed below are examples from our range:
70-80MHz  £29.00
80-300kHz  £21.20
430/12MHz  £27.00
54/12MHz  £27.00

PLUS OUR DUAL BAND CONVERTERS

These Dual Band Converters have been specially designed to allow the VHF
Receiving range to cover the 400-450MHz section of the 70cm band "AT THE FLICK OF A SWITCH."

TBA 490  £29.00
TBA 485  £29.00

All our Converters are available with either BNC or Belling Lee sockets. Please
state clearly which are required at the time of ordering.

FOR THE 2 METRE OPERATOR.

230/14MHz SOLID STATE TRANSMITTER

All solid state circuitry employing high gain low spurious mixer configuration. Fully
metered and LEDS to indicate TX and RX condition. Measuring 250mm x 125mm x 90mm,
assisted by 2W output (linear and clean), built-in auto-tune relay. The set
man's delight or use it for driving a high power linear amplifier. Relay contacts already
built-in for switching external linear. Receives side bands employs a superb FET converter.
S029B ent seat. Supplied complete with harness for your web transceiver. £80.00

SCORPION 28/14MHz HIGH POWER TRANSMITTER

* Electronically stabilised DC link to both the local oscillator and receiver.
* 118MHz crystal oscillator for spurious free reception and transmission.
* Receive converter 30dB gain; 30dB noise.
* Highly linearised transmit mixer.
* Incl. ceramic trim under all transmit stages ensures a clean spurious free signal.
* QY00-40A final power amplifier in a high Q circuit.
* Up to 100watts OA output.
* Built in relay switch over relay.
* All power and switching from your HF transceiver.
* Whatever mode your HF transceiver will supply will be faithfully transmitted to
* transmit on 2m band.
* PA current meter.
* Full output even at band edges — OSCAR MEN PLEASE NOTE.
* Study attractive construction.
* Superior ventilation gives no trouble with overheating.

Commercial Communications...
REG. WARD & CO. LTD. G2BSW G8CA

K.W.
102 VSWR Meter and combined Power Meter £15.00
107 Combined E Z March, VSWR and RF Power Indicator, Dummy Load and Antenna Switch for £15.00
3 units £26.00
FR101 S Receiver £26.90
FR101 O Receiver £26.90
FT68B £26.90
FT68B VHF/FM 2m Mobile Transceiver £26.90

3-way Antenna Switches (force off) £7.50
New G/C Receiver FRG.7 £16.40
Technical Associates Audio Switcher £21.80
SHURE MICROPHONES Model 444 £19.29 Modal 201 £16.50 S.E.M. Z-match £23.90
All above prices plus VAT at 10%.

USEO EQUIPMENT
KW201 Rx and handbook, complete with external Heathkit "Q" multiplier, £19.99

AGENTS FOR GIDYM ANTENNAS
Valves for Yaesu, etc., 882A, GUM, 8K6D, 10A7X, 10A7X, 12A7U, 12A7C, 12A7C, 14A9, 16A9, 8K6E, 8K6R, 8K6C, 8K6D, 8K6D, RCA Valves for KV equipment, etc.

Sandia 1m Preamps and 2m converters/Europa transceivers, J Beam and Stolero rotators, 1192 440Mhz ant. trim, insulators, 8K6 0.25m co-ax, and UHF plugs, sockets and reducers, G/Whip mobile antenna, Whips, Mast couplings, Hey-Gen verticals, SWR 10 (Twimeter), SWR/JW for Meters.

AMTRON KITS
TRADE INS WITH PLEASURE our STOCK of GOOD SECOND-HAND EQUIPMENT CHANGES DAILY—LET US KNOW YOUR REQUIREMENTS.
Due to currency fluctuation a price of some import product is liable to alteration.

AOG 15% VAT to all prices except used equipment.

HP TERMS AVAILABLE
CARRYAGE EXTRA ON ALL ITEMS

ACCESS/BARCLAYCARD
AXMINSTER, DEVON EX13 5PD Telephone 33163

---

C & C Electronics
10 West Park
London SE9 4IQ
Telephone 01-652 9397

CRYSTALS
THE MADE TO ORDER CRYSTAL SPECIALISTS
1-OFF CRYSTAL PRICES

<table>
<thead>
<tr>
<th>Group</th>
<th>Price in £</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 0000 to 0.099MHz 100ppm</td>
<td>£14.35</td>
</tr>
<tr>
<td>0.9100 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>0.9200 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>0.9300 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>0.9400 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>0.9500 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>0.9600 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>0.9700 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>0.9800 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>0.9900 to 0.999MHz 100ppm</td>
<td>£20.70</td>
</tr>
<tr>
<td>1.0000 to 1.099MHz 100ppm</td>
<td>£26.85</td>
</tr>
<tr>
<td>1.0100 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.0200 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.0300 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.0400 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.0500 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.0600 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.0700 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.0800 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.0900 to 1.099MHz 100ppm</td>
<td>£32.43</td>
</tr>
<tr>
<td>1.1000 to 1.199MHz 100ppm</td>
<td>£32.43</td>
</tr>
</tbody>
</table>

COMING SOON
At £4.13, the SP6629 150MHz + 100 is ideal as a prescaler for 2-Metre frequency counters.

Please place orders with —

Plessey Semiconductors
Chesney Manor
Swadlincote
Derbyshire
Tel: 07332 2001

---

Integrated circuits from Plessey Semiconductors

Plessey Semiconductors are well known for their range of high performance integrated circuits for radio communication. These circuits are available now from the distributors listed below—the range includes the world-famous SL600 series of radio transceiver circuits and the SL1600 series, their less expensive plastic equivalents.

Recently announced are the SL664 and SL665 narrow band FM receivers in a single DIL package (the SL664 even has a 200mW audio output stage), the SP565 400MHz +10 prescaler (make your own 70cm frequency counters), and the SP8921/SP8922 125 channel 27MHz synthesiser.

---

The Made to Order Crystal Specialists

The prices listed are for use in Great Britain and Ireland. Any requests for orders outside this area should be accompanied by a full specification of the desired crystal.

Minimum Order £10

Please add £10.00 for VAT at 10%

Prices are exclusive of VAT for export orders.
price, up-to-date books for the radio amateur from SAMS-AUDEL

William Orr
Thoroughly revised, this new edition contains the latest information on a multitude of topics, including propagation, vhf communication, recent advances in solid state communications and building and operating all types of radio communications equipment.
£13.65 1080 pages 00-024032-X

TIL Cookbook
Jack Darr
A sound working knowledge of transistor circuits is given for equipment of all sizes, covering drivers and output stages, power supplies, test instruments and test methods, power-output transistors etc.
£6.25 paperback 336 pages 00-021035-8

Reference Data for Radio Engineers, 6th Edition
A favourite with radio engineers since the first edition, the sixth edition of this comprehensive book contains three new chapters on active-filter design, optoelectronics, and optical communications.
£20.95 1344 pages 00-021218-0
Prices shown may be subject to change

ORDER FORM
Please indicate the number of books you wish to order in the boxes and send a cheque or postal order plus 90p per book for delivery to:

Elaine Scribens,
Promotion Dept:
Prentice-Hall International,
66 Wood Lane End,
Hemel Hempstead, Herts HP2 4RG.

cheques/P.Os made payable to
INTERNATIONAL BOOK DISTRIBUTORS

Name

Address

Prentice/Hall International

GOT YOURS YET?

LOSE D DX? Maybe your ANTENNA IS FAULTY. Check it FAST with an Antenna Noise Bridge. MEASURE radiation resistance 30–200 ohms and resonance 140–1000MHz, DIRECTLY, A STRONGER SIGNAL. Order only £2.80 (A, B)

AOD 100–500kHz with an L.F. Converter. Antenna loading, feeds your 3.5–4MHz receiver, only £3.50. (A, B)

MISSING V.L.F.? EXPLORE historic 10–150kHz with a V.L.F. Receiver, only £2.79. (A, B)

UNDERPOWERED? SOUND one "5" point LOUDER with a Speech Compressor. Switched MF/FX, HI FI keeps your audio at maximum and DX adds times TALK POWER. PUNCH through the QRM for only £8.80. (A, B)

WASTING POWER? CHECK your LINEAR last with a Two Tone Oscillator. Two performance for only £7.40. (A)

NOW YOU CAN DIG out the RARE DX from under tiring whistles and CW QRM. Tunable Audio Notch Filter has sharp notch 350–500kHz and drives speaker.

Get DX OTHERS CAN'T HEAR for only £7.94. (B)

DIAL UP the DX with a Crystal Calibrator. Switched EQUAL LEVEL 1MHz, 100kHz, 28kHz harmonics in VHF. No missing "even" ones or unselected "ghosts". GET SPOT ON for only £13.86. (A, B)

AUDIO OKAY? Check TX, RX, HiFi etc with an L.F. Signal Generator, 10Hz–200kHz, sine/square, only £8.50. (A)

ACCURATE TIME always with a 6kHz Time Receiver. Fanitec rad, audio and logic (for your microprocessor) outputs. DON'T lose a second, only £13.76. (A, B)

NO MORE DING-DONG. Now get MUSIC from your DOORBELL—or your CAR. Programmable Chime announces you or your selected guests. 50 easy-to-change tunes or PROGRAM YOUR OWN, only £17.90 (bell transformer or 12V)

(A) — internal 4V battery (supplied), (B) — external 12V

Each easy assembly kit includes ALL parts, printed circuit, smart case, ready wound coils, connectors, screws, etc. Instructions, postage, money back assurance, so SEND TODAY.

CAMBRIDGE KITS 45 (RY) Old School Lane, Milton, Cambridge.
2 ALEXANDER DRIVE, HESWALL, NEW Wirral, MERSEY Side, L61 6XT

CRYSTALS FOR THE NEW BRITISH 7CM CHANNELS

We are stocking the following channels: RBD (345-400/432-450), RBE (348-50/M2O), RBS (349-52/453-50), RST (350-30/352-40), SB (353-35/355-40), SUB (356-30/358-40), and RX for use with FYE UKU Westin-
star (MV11U), UHF Canbium (U108), Pocketst (PP11) and STORO JOLIGUMME etc. For the UKU base stations, the TX crystals for all the above channels are available for $3.90 plus VAT (H). The RX crystals for RS1, RBE, RBS, RST, and SUB for use in the U.S. Base Station, together with the RX and TX crystals for the remaining RF channels (SUS-435-50-
RTTY, SUS-436-40 and SUS-436-43) for all the above equipment are available at $3.90 plus VAT (H) delivery as per class 02 item.

CRystal Suply From Clock Crytals for the Health Kit A/R (202 and HW17A).

145-530/509 • 1435-50/522 • 145-400/516 • 1450/75/725 • 350/516 • 500/725

CRymal Suply From Health kit A/R

7CM TX and RX CRystal AVAIlABILty & PRICE CHART

<table>
<thead>
<tr>
<th>OUTPUT FREQUENCY</th>
<th>144-000</th>
<th>144-045/2</th>
<th>144-400</th>
<th>144-450/2</th>
<th>144-500</th>
<th>144-550/2</th>
<th>144-600/2</th>
<th>144-650/2</th>
<th>144-700/2</th>
<th>144-750/2</th>
<th>144-800/2</th>
<th>144-850/2</th>
<th>144-900/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>49-00 MHz</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
</tr>
<tr>
<td>49-50 MHz</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
</tr>
<tr>
<td>50-00 MHz</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
</tr>
</tbody>
</table>

PRICES: (a) $2.25, (b) and (c) $2.90 + VAT (H).

| AVAILABILITY | (a) and (c) stock items, normally available by return (we have over 1,000 items in stock). (b) On stock normally but it is quite possible we could be able to supply from stock. N.B. Frequencies listed above but in alternative holders and/ or non-stock loads are available as per cods (b).

ORDERING: All we require to know (is) (a) Output frequency, (b) Crystal frequency range, (c) The Holder, and (d) Either the load capacitance (pF or equipment. It is not essential to give the exact frequency, though it would be of assistance to quote it if known.

JAPANESE AND AMERICAN EQUIPMENTS

With the ever-increasing popularity of Japanese equipment, we have further expanded our range of stock crystals. We can now supply for YAESU, TEAC, TEKTRON, FT200, most of the ICOM range and the TRIO-KENWOOD range. We can also supply from stock crystals for the HMM THR800 and HWMAT.

YAESU, TEAC, TRIO-KENWOOD and ICOM are now in stock, all at $2.90 + VAT (H). All popular channels.-For recharger use advice atal frequency required as earlier models have different allotments to later models. We can also supply the crystal to give NORMAL “tune to RX” working (as FT200) for 76 cm we can supply the 14-MHz shift for direct use with a MICROWAVE MODULES MNT783/64 which we can supply for $32.90 + VAT (H). SPECIAL OFFER 1 or 2 with this 70cm shift crystal FREE!!

RF COMMUNICATION RECEIVER RA-117E

Communications Receiver RA-117E, Frequency Range 1-300 MHz in 30 Bands 1 MHz wide. Effective Scale Length 150H

16m corresponds to 100Kc/S. Power 100-125 or 200-250 a.c.

Internal Speaker. Crystal Filter. Bandwidth 100Hz to 13kHz in six stages, plus 5-Meter, Two 1F stages. Slow Motion BFO. Usage 27 Valves (BG7 and BG9). As new condition, with hard-
book and circuit (in metal boxed case) $300.00. (Carriage approx £10). All our sets are bought direct from the Govt. All are bench tested and checked in our own workshop before despatch, for full Colin valuation. Send SAE only for any enquirers. Trade terms on quantities. Working demonstration on RTTY etc, in our works by appointment.

JOHNS RADIO

424 Bradford Rd, Batley, Yorks Tel: 0924-478159

CRAFORD ELECTRONICS

G5AVN G2 1WX

VHF/UHF MOBILE AERIALS

| A5-5 | 144MHz ½ hinged unit (44dB gain) | £8.10 |
| A5-1 | 144MHz ½ hinged unit | £5.90 |
| A5-11 | 144MHz ½ hinged unit with 4 m cable | £12.80 |
| CPW55 | 144MHz ½ hinged unit, S/N Fitting | £12.90 |
| MS-4 | 144MHz ½ hinged unit with 4 m cable | £15.85 |
| A5-12 | 232MHz collinear window Mon, S/N Fitting | £25.90 |
| CUTF8SS | 232MHz collinear window Mon, S/N Fitting | £25.60 |
| A7-19 | 232MHz collinear window Mon, S/N Fitting | £14.70 |
| A7-20 | 232MHz collinear window Mon, S/N Fitting | £14.70 |

The above represents a small sample of our range— an SAE will bring more details or answer your queries.

ACCORDING TO BARCLAYCARD ACCEPTED CARRIAGE & VAT INCLUDED FREE LOVELACE CLOTH, WIDF KINGSFORD, SEVENOAKS, KENT.

TTY E0J 24 Hr. Answer Service 0147485577
WALES GAS  
has for sale a number of  
VHF RADIO LINK EQUIPMENTS  
(PYE U450 and L470 TYPE)  
VHF RADIO TRANSMITTERS/RECEIVERS  
PYE CAMBRIDGE AM 10 TYPE  
A VHF CONTROL SYSTEM  
which was recovered from service  
earlier this year  
and a number of  
PYE RADIO TELEPHONE CONTROLLERS  
TYPE RTC/2B/PSX  
A detailed list can be obtained by sending  
a s.a.e. to  
Wales Gas, Communications Section  
North Area Office, Maelor Works, Marchwiel,  
Wrexham LL13 0UW  
Please note that telephone enquiries cannot be dealt with for the above and that  
WALES GAS does not bind itself to accept the highest or any tender.

BD 187 NPN POWER TRANSISTORS 25p each, 5 for £1.  
56, BC 187-4 ASSORTED TRANSISTORS Untested for 5p.  
FET’s 2N 3051 Type 4 for 75p, BF 250 @ 25p, MFP 102 @ 30p, 2N 3457 @ 30p,  
2N 5458 @ 35p, 2N 9273 Type 22p, E111 @ 10p, E112 @ 10p, E501 @ 10p, J110 @ 50p, E304 @ 25p.  
500yd REEL OF PVC CABLE 25 Strand 0.04 for £3.  
UNMARKED GOOD 400mW ZENERS 6.8V, 10V, 11V, 12V, 15V, 24V, 30V, 33V,  
36VOL. All at 10p for 40p.  
100 ASSORTED NULLDAX CAPACITORS for 5p.  
6 TO 1 FRICTION SLOW MOTION DRIVES @ £5.  
LOUDSPEAKERS 21 Approx. 8 ohm, 40 ohm, 75 ohm All at 75p.  
TUNING VARIATORS Untested, capacity approx. 300pF, usable at 100kHz  
to 5MHz, 10 for 50p.  
VHF TUNING VARIATORS Usable between 5MHz to 1GHz Untested 50 for  
5p.  
NULLDAX NUT FIXING TUBULAR TRIMMERS 15p each.  
WIRE WOUND VARIABLE RESISTORS 1-2K 8 Watt @ 25p.  
MAINS TRANSFORMERS 260 Volt Input, Output 230 volt Tapped 11 volt 1 amp  
@ £1.25 (post and packing 25p).  
SUB-MINIATURE 8p AIRSPACED TRIMMERS @ 15p each.  
BC 187, BC 108, BC 100 TRANSISTORS Metal can type 6 for 50p.  
DUAL GATE MOS FET’S 6670 £8, 6 for £1.10.  
5-5MHz CERAMIC FILTERS @ 27p each.  
VHF POWER TRANSISTORS Unmarked Good 2N 3068 @ 3 for 75p, 2N 3553  
6 for £1.10, 2N 3275 @ £1.  
PISTON TRIMMERS 5 to 25pF @ 22p, 6 to 42pF @ 33p.  
2N 706 Unmarked GOOD TRANSISTORS 12 for 50p.  

25 THE STRAIT, LINCOLN LN2 1JF.

FAST AMATEUR SLOW SCAN TELEVISION SCAN  
The BRITISH AMATEUR TELEVISION CLUB admits to inform, instruct and  
co-ordinate the activities of amateur television enthusiasts and publishes a  
counterpart Journal/CO-TV covering all aspects of the hobby. Membership of  
the club costs only £2.00 per year so why not send for an information leaflet  
today? Large SAE please.  
JUST PUBLISHED—SECOND EDITION. A guide to "AMATEUR TELEVISION,"  
112 pages, containing chapters on Receiving, Transmitting, Monitor, Picture  
sources, Colour, Recording, Slow scan, etc., together with a history of the  
BATC and a list of recommended books. Published by BATC at £2.00, post paid.  
Also available, Slow Scan Television by G3RIH. An introductory booklet for  
SSTV, at 42p post paid.  
The BRITISH AMATEUR TELEVISION CLUB  
64 Showell Lane, Penn, Wolverhampton  
West Midlands WV4 4TT  

NEW ROBOT SSTV  
"480" Solid state slow to fast and fast to slow Scan converter with Digital Random  
Access Memory, for full brightness, non fading, pictures of unbelievable  
definition on a normal TV set. Also picture transmission from a standard CCTV  
camera. £880 incl. VAT. S.A.E. for details please.  
See the "480" in operation at the BATC-SSTV Convention on 19 November.  
AERO & GENERAL SUPPLIES, Halewood House, 22 Rufford Avenue,  
Bracknell, Berkshire RG12 1JN. Tel. 327888  

JAMES & MARTIN ELECTRONICS LTD  
Staines Road, Feltham, Middx.  
PROTOTYPE AND PRODUCTION METALWORK  
Specialists to the Electronics Industry. Panels, chassis and  
sheet metal details. Milling, turning, drilling. Machining in all  
metals and plastics. GSYYV.  
Tel. 01-576 3127. Plant list on application. OS Ref TQ 113748

Telephone 20767  

RADIO COMMUNICATION November 1977
NEW! TONE BURST GENERATOR

TBG-2

* Crystal controlled for dependable stable accurate operation.
* Small size, fits any transceiver. 22-54L x 12-50W x 11-00H. 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.
* Supplied with full instructions. £2.00 each + 12½% VAT, post free.

OEM enquiries invited for these and logic compatible crystal oscillators (TQSO) 240Hz-30MHz.

INTERFACE QUARTZ DEVICES LTD
25 Market St., Crewe, Cheshire, Tel: 0928 33920, 33921

FOR YL'S AND XYL'S

The ONLY POCKET TV SET IN the world!

SINCLAIR MICROVISION. Complete with Ni-Cads and dual voltage chargers, car adaptor, carrying case 6" x 4" x 14".

From £14.00 per month or £215.00

ORDER NOW! Big demand!

All usual VHF and UHF gear

ALL PRICES INCLUDE VAT

SAE FOR DETAILS

BOOTH HOLDINGS BATH

(incorporating Ham Hire and Rent-a-Rig)

Member of T.A.P.A.

4 Golf Club Lane, Saltford, Bristol 712730
G3XOD, G3NXU after 7pm Saltford 2462
G8DP Windsor 51767 after 7pm

RADIO COMMUNICATION November 1977
CONSTRUCTIVE INNOVATION

Each of the products below pioneered new techniques and new performance standards. Sometimes the benefits are obvious, sometimes they are subtle. We like to think that Datong customers appreciate both kinds.

FREQUENCY-AGILE AUDIO FILTER
MODEL FL1

A versatile bandpass or band-reject filter with fully variable bandwidth and centre frequency plus unique search/tick/crack capability for automatic removal of heterodyne whistles. Improves reception of CW, RTTY, and SSB. Connects between receiver and loudspeaker.

R.F. SPEECH CLIPPER
MODEL RFC

Processes speech as a SSB signal at 960Hz to increase its ratio of average to peak levels without adding harmonic distortion. Improves talk power of SSB, FM, and AM transmitters without increasing the peak transmitted power. Connects between microphone and transmitter. (See article by Dr. G. A. Tong, Wireless World Feb. 1976, July and Oct. 1976, 71-81.)

NEW PRODUCTS

MODEL ADI75 A Compact active receiving antenna covering 100 kHz to 150 MHz without tunning or matching units. Price £25.50 (£22.19 inc. V.A.T.)

MODELS MPU and MPU/1 Marine power units for FL1, UC1 or AD170. MPU has integral 13A mains plug. MPU/1 has 18' mains lead. Price £25.50 (£21.99 inc. V.A.T.)

MODEL AD 170 PLUS MPU OR MPU/1. Package price £29.90 (£27.29 inc. V.A.T.)

UP-CONVERTER MODEL UC/1

Adds full receiving coverage from 0MHz to 20MHz to existing receivers or transmitters tuning 25-25 MHz. The full range is covered in thirty 1MHz wide synthesizer controlled segments. Also works as a two metre converter. Connects between receiver and antenna.

SEMI P.O. BOX 6, CASTLETOWN, ISLE OF MAN
Tel. PORT ERIN (0624) 833214

NEW! SENTINEL V.H.F. TRANSMIT POWER AMPLIFIER AND RECEIVE PRE-AMPLIFIER

A new concept in add on units to improve 2 metre performance on transmit and receive. On transmit the Amplifier produces a power gain of 4, up to a maximum of 12 watts in, for 48 watts out. The circuit is suitable for all transmissioine modes. The receive pre-amplifier has the same performance as our Sentinel or Sentinel Auto. Supply voltage is 12.6 v nominal (11.8-13.5v),5mA on receive, up to 8mA on transmit. Size: 5" x 2" front panel, 4" deep. Sockets are 30A29. Price £23.00 + VAT = £28.80.

Also available without the receive pre-amplifier at £44.80 + VAT = £53.00.

SENTINEL TOP BAND CONVERTER

Top Band (Marine Band) to 2 metre converter. If you miss being able to listen on 160 metres this provides the answer. 1.8MHz-2.3MHz in 14 kHz steps out. Price £11.00 + VAT = £12.25.

2 METRE CONVERTERS

Sentinel D. G. Model converters. These provide a performance that cannot be beaten. N.F, N.F. Gain 30dB. Supply 12V (10-15) £5.51. Size is 21" x 11" x 3.5", 0.74 kg. These are also in stock for Marine Band to 25-30 MHz and Satellite Band to 25-50 MHz. Price: £15.00 + VAT = £17.50. IN STOCK.

SENTINEL 2 METRE CONVERTER

Containing a mains power unit and RF gain control. Specification as above. Size: 8" x 2" front panel by 3" deep. Price: £21.50 + VAT = £24.75. IN STOCK.

SENTINEL 2 METRE CONVERTER KIT IF 25-30MHz. Performance as above. Complete unit with box, connecting etc. Prices: £11.50 + VAT = £12.98. We will let them go if you have trouble for £2.95, so you can't go wrong. IN STOCK.

7cms CONVERTERS

The most economical method of listening on 7cms is with our 7cm to 2 metre FET converter, N.F, N.F. Gain 30dB. Price: £11.00 + VAT = £12.20. Size: 32" x 14" x 31", IN STOCK.

SENTINEL 7C

7cms to 25-30 MHz, N.F, N.F. Gain 30dB. Size 32" x 14" x 31", Price £22.50, IN STOCK.

SENTINEL AUTOMATIC 2 METRE PRE-AMPLIFIER

Contains an RF operated relay for connecting straight into your transceiving aerial coaxial. Performance: £8 N.F., 1.8dB gain from selected FETs. Supply 12V nominal. Price: £12.50 + VAT = £14.82. UK sockets, standard, £1259, £1.54 + VAT = £1.89.

THE SENTINEL STANDARD 2 METRE PRE-AMPLIFIER

Same circuit as the one above but without the RF switching. Price: £7.75 + VAT = £8.72, IN STOCK.

THE P3A

Size only about 1 cubic inch to fit inside your transceiver. N.F, Gain 15dB. Price: £5.57 V.A.T. = £6.21, IN STOCK.

SENTINEL H.F. PRE-AMPLIFIER. These are wideband pre-amplifiers from 1-40MHz, N.F, Gain 15dB. In and output impedances 50/75 Ohms. Size: 25" x 12" x 3", Price £7.50 + VAT = £8.57.

SENTINEL H.F. PRE-AMPLIFIER with change over relay. Same specification as above but including a change over relay for switching straight through. This can be operated by your transceiver for direct connection in your aerial coax. Price: £9.90 + VAT = £10.12, IN STOCK.

SEM "2" MATCH

A compact and attractive A.T.U. 25-180 MHz to 50 ohms. Slow motion calibrated dial. Size only 8" x 4" x 7", £39.10 and screw terminals for coax fed or wire aerials. Balanced or unbalanced. Price: £28.50 + VAT = £31.09, IN STOCK.

SEM EUROPA C

Now includes a relay controlled by the ON/OFF switch for switching the H.F. equipment between the Europa or your H.F. aerial. E. E. NO PLUS CHANGING.

* Receive converter—200 MHz N.F., 30dB gain with MOSFETS.
* Transmit converter 200MHz drive for 200W input.
* Spurious output—10dB.
* Size only 9" x 41" front panel, 4" deep.
Price only £25.00 + VAT = £31.25, IN STOCK.

Complete to plug into Yarus equipment.

Complete power supply for Europa £25.00 + VAT = £29.81, IN STOCK.

ALL OUR PRODUCTS CARRY A 12-MONTH GUARANTEE

To order: C.W.O. or credit card. We take credit card orders from anywhere in the world, just send or phone your card number for same day service.

We welcome trade enquiries from anywhere in the world.

If you require more detailed information or help do not hesitate to ring or write.

DATONG ELECTRONICS LIMITED
Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE.
Tel: Pudsey (0532) 552461.

908 RADIO COMMUNICATION November 1977
CB ELECTRONICS

UNIT 3, 771 ORMSKIRK ROAD, PEMBERTON Wigan WN5 8AT Phone Wigan (0942) 218567

THE BEST IN THE NORTH-WEST

Not just another new firm, but people with a wealth of technical experience and know-how relating to amateur radio techniques, requirements and servicing, who will always be pleased to advise and assist in all respects whether it be sales, service or information.

HOW TO FIND US
From M8 Junction 26 follow signs for Wigan A577. At 1st traffic lights (T junction) turn right towards Wigan. At next traffic lights you are BUT turn left, then 10 yards turn right by TELEPHONE KIOSK and shop is slightly to your right. Plenty of parking space. Distance from motorway 1 mile.

From Wigan follow A577 for Sheymarsalade to traffic lights at Pemberton (Ye Olde White Swan Hotel on your left). Turn right then 10 yards and right again by telephone kiosk. Distance from Wigan 2 miles. Closed Wednesday.

AT LIST PRICES

<table>
<thead>
<tr>
<th>MAIN DISTRIBUTORS OF BCS EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>YAESU UNIWIN \ ELECTRONIC DEVELOPMENTS</td>
</tr>
<tr>
<td>J. BEAM LTD.</td>
</tr>
<tr>
<td>C.D.E. \ BELCOM \ S.S.M. \ WESTERN ELECTRONICS \ F.O.X.</td>
</tr>
<tr>
<td>HY GAIN</td>
</tr>
</tbody>
</table>

G2DYM ANTI-T.V.I. AERIALS

INDIVIDUALLY DESIGNED BY EX-B.B.C. TRANSMITTER AND AERIAL ENGINEER. ALL CUSTOM BUILT FOR THE TRANSMITTER OR S.W.L. GSYR's. G2DYm's, WIDEBANO S.W.L. TYPES, DESIGN AND ADVISORY SERVICE. Details—7" x 10", 12p S.A.E. and 3 sp. stamps. LAMBA ANTENNA STUD FARM, WHITEBALL, WELLINGTON, SOMERSET.

70 cm PHASE 2 REPEATERS ARE HERE
Pocket telephone batteries £12.84 pair inc. Compact batteries £10.20 pair inc. Chargers available soon. SAE details. 70 cm 3/4 colinear mobile whip, 5db gain, 45m UR76. £10.34 + £1.50 carr. AMTEST, 55 Vauxhall Street, Worcester WR3 8P A

Please mention RADIO COMMUNICATION when replying to advertisements.

GAREX (G3ZVI)

BRITISH MADE V.H.F. EQUIPMENT

TWO MOBILE

FOURMOBILE

Companion units for 2 or 4 metres. They feature S, RX, TX and PSU for 12V DC input in a single unit 12 x 4 ft. Full coverage tunable AMFM RX with excellent V.F.O. stability even under mobile conditions. Professional grade sensitivity and selectivity. Crystal controlled AMFM TX, with separate audio quality. Based on popular BT components for ease of servicing and readily available of spares. Comprehensive handbook and low cost after-sales service. Prices: Two mobiles £155; Four mobiles £215.30 (Inc VAT).

We stock the popular NR85VF4 1m RX, with switched 164-165MHz V.F.O. and 11 stait controlled channels, idea for fixed, portable or mobile use. Built-in L.S.B., 12V DC operation, 841n.C. (VAT) (stale £2.95 each).

NOW WITH IMPROVED V.F.O.-EXCLUSIVE TO GAREX.

A n.s.a.a brings you full details entry of the above. Credit facilities available and part-exchanges welcome.

NEW COMPONENTS:

Relay GPO type 3000, 122 coil, pull-in current approx 200mA. 1M + 15p.
1464MHz amplifiers. £3.40 per each 8p each + 7sp. Integrated circuits (full spec.)
725 voltage reg., T0S44 case, 15V out at 30mA for 9VAC In. 7sp.
0.05uF 5% film capacitor. 50p each. 2-3 PL.
C0010 AN 8p each for tone-burst pan. 55p.
R5545 Timer for tone-burst pan, or time-out indicator 55p.
209 (T05) H1 (MR0 Op Amps) mobile circuit. 6p.
Realistic pots multiplier, preset, p.c. mlg.
30, 30, 100, 250, 500, 250p, 500p, each 4p + 5p. 50 spares.
BNC 300nn free sockets. 28p each. 10 for £1.45; 50 for £4.90.
Neone Panel mounting, blue, JHB, 6mm hole, 240V, red or amber, £1.25 each, any 5 + 30p; any 10 + 12p.
Mini fresnel, wide and 8p each, 10 - 30p, 100 - 4p.
L.E.O Panel mounting, type JHB, 5-8mm hole, red, £1 or green £1.80.
Any 5 + 9p, classic 1.1A, 0.8A.
Logic probe type JH30 £15.15.
Resistor Kit, 12.122 to 1MA, 97 values, 5% carbon film, 1W or 1W (please state). Replacements available
Starters pack, 5 each value (38p)
Molded pack, 5 each 1W + 1W (7p). £5.40
Standard pack, 10 each (87p). £5.40
Giant pack, 25 each (125p). £12.25
PL29K UHF Plug and remover, 60p each, 6p + 16p.
S027S UHF Socket panel mlg. 55p each, 8p + 19p.
NICAD RECHARGEABLES—physically equivalent to zinc-carbon types. A.A 1.4V; AAU1 1.4V; C0013 3.8V; DUU1 4.4V; PPP 5.2V. ANY 5 + 10% less 10%; ANY 10 + 20% less 20%. S0B switchers, min. DPD1 3sp each; 5 + 16p; 2 pole 3sp position 52p each: 5 + 16p.
Toggles switches. min. full range 10poa to 4P O/CQI. £1.65.
GAREX FM detector/crossover, ready assembled with full fitting instructions. €1.00 easy, easy fit design for AM Cambridge, replaces squelch board with minimum of other modifications, 6.85, Translator Vanguard (AM4EST) version with modified squelch circuit, £2.95. FM/MAC facility requires SPCO switches or relay.
CRYSTALS FOR 10 METRES: (EXC12U) 29.000MHz T1 plus £0.04名誉 for Rs (500g/lb) F.M. lists a range of "C.B." will legitimate £4.35 pair.

INTER SERIES ADAPTOR KIT, Super value, up to 40 different combinations of BNC, UHF, N, TNC & C series connectors, male and female. Complete in PVC wallet, £1.65.


EX-EQUIP. ITEMS (GUARANTEED)

Teroidal Inverters transformers (with circuits)

Input 12V DC; output 130V 300mA (doubled) £3.90
Input 12V DC; output 250V 150mA (doubled) (Ranger) £2.40
HT choke available for 3-4KW Inverters

MAIN TRANSFORMERS, MULTIPLE TYPES

170-170v 50A, 50V 50A, 8-9V, 3-5A, 5-6A 2.85
135-350V, 500mA, 5-6A, 6-10A 3.49
145-160-200-230-250, 100VA £2.93
HT chokes, 1200mA, 1400mA, 1500mA, 1600mA £4.53
24V dimmers (smallest) 2 x 17H, 8 x 10p £2.85
19-7 IFP (wave type) 23 x 3 square double tuned 35p; 5 for 48p; 10 for 85p Mobile PSU 12V DC input (floating for + or —) drain transformer 170, 200 or 300V DC at 100mA, output, fully smoothed, chassis section, self-contained, fully wired and tested, with circuit. £5.45

As above, but partly assembled (as cut out) complete with all components, circuit, finish it-yourself £4.35

PRICES ARE INCLUSIVE OF UK POST AND PACKING AND VAT

Mail order only. Role address for orders and enquiries.
GAREX ELECTRONICS

7, NORVIC ROAD, MARSWORTH, TROW, HERTS HP2 4LB
PHONE CIRENDON (STD 0298) 685964
6.30am-9pm AND WEEKENDS ONLY. S.A.E. with all enquiries please.
**INDEX TO ADVERTISERS**

- Aero & General Supplies
- ADH Electronics
- Amatex
- Amateur Radio Bulletin Board
- Amateur Radio Exchange
- AmiTel
- B. Bamber
- J. Birritt
- Booth Kellett
- Broadhurst Electronics
- Bloom
- British Amateur TV Club
- British National Radio & Electronics
- Cambridge Kit
- CB Electronics
- C & C Electronics
- Commercial Communications
- Crawford Electronics
- Daton Electronics
- A. de Brey
- Gorex Electronics
- GDYM Antennas
- GVM Radio Ltd
- Hartley Crystals
- O. R. Hawks
- Heath
- Helser Electronics
- Hiltona Ltd
- D. P. Holmes Ltd
- Integrated Circuits Unlimited
- Interface Quake Devices Ltd
- John Radio
- Love Electronics
- Marcon Ltd
- Microwave Module Ltd
- Modular Electronics
- Mosley Electronics Ltd
- Partridges Electronics Ltd
- Plessey Semiconductors
- Prentice-Hall International
- QM/TV Electronics Ltd
- Radio Shack Ltd
- RTJ Electronics
- R. T. Systems Ltd
- SEM Electronics
- South Mitford
- Communication Ltd
- Commercial Ltd
- Cover IT
- Cover IT
- Cover II
- Westwood Electronics
- Worley & Stanton Electronics
- Western Electronics (UK) Ltd
- W. H. Westlake
- Yaseu Muen Co Ltd

---

**CLASSIFIED ADVERTISEMENTS**

Private advertisements 15p per word, minimum £3.00.
Trade advertisements 25p per word, minimum £5.00.
Box Number 75p extra to wordeage or minimum.

**FM CRYSTALS from stock**

- 1 metre Channel 185 (148-400) now available.
- Tx ranges 4, 6MHz in HC2S/; S, 12, 16MHz in HC6S/.
- Rx ranges 10, 14MHz in HC6S/; 14, 22MHz in HC8S/.
- Other channels available in ranges;
  - 50(14-5), 60(14-5), 70(14-5), 14, 44, 50MHz in HC8S/.
- Send SAE for free catalogue.

**MIKURHY CRYSTALS**

Green Lane, Milford, Godalming, Surrey GU8 9BS
Phone 94 328 3707

**2M FREQUENCY SYNTHESIZERS**

Eurocat 2m Frequency Synthesizers and ST88 RTTY Terminal units. Full range of Variants (Dex) Rechargeable Batteries, Revo mobile antennas and Panorama mobile/telex/hand-portable sonettes, crystal filters, and more available from:

D. R. HAWKINS
1 Northover Drive, Chard, Somerset.

---

**FOR SALE**

- G.I. AMATEUR SUPPLIES G32ZA for Tivvy, R.F, Ax, Antennas, Mics, etc. Trade-in welcome. Large stocks at 10 Church Street, Enniskeen, N. Ireland. Tel: (0685) 23531.
- E. & H. LISTENERS CARDS. and prompt and economic service, SAE for samples G3ZF, 1 The Close, Redfield, Here.
- RTTY PICTURE PERF. TAPES. 100 pence to choose from. Standard Murray paper tape. Send $5 x 4" for free catalogue. M. Watson, G3WMD, 74 Bowons Avenue, Wembly, Middx.
- QUALITY QSL CARDS. S.A.E. for samples by post (including Silver Jubilee style - if required). Quick delivery. Compass Printing Services, 115 Princesmead, Cheltenham, Glos. GL50 1HW.
- QBL CARDS, LOGBOOK Samples 8p. Bosuprint (G30Y0) Matham Road, Henley, Huddersfield.
- QBL CARDS. printed to your own specification on white gloss cards. Send SAE to Caswell Press, 11 Barons Way, Woodhatsh, Reigate, Surrey.
- C & M ELECTRONICS IN007, 4p. Trimmer, 12-5pF, 10-6pF, 25PF: FX115, 15p; RC107, 10p; 4,005 8p. SAE for further details. 90 Marshallstown Road, Carrigerragh, Bally, P. A. P. 20.
- MICROWAVE CD-AX FHJ-4-180°-180° approx with special N type connectors. Offer. TS700 with T/H and fully stabled, £300. G4DAD, 475 Wellington Road, Northampton, Tel: 14821 anytime.
- FT.200 OWNERS HELP UK EXPORTS & GET FREE SHURE NIC. Your good signal brings us exports. Get our RF Clipper on approval. Send post paid cheque for £49 and try unit for one month. If you keep we cash cheque and send Shure £40. A mic free. Or send extra £10 and we supply 44 mic. Offer applies November and December only. Don't forget our unit improves R.X. performance.—Holdings 361 Longfellow Lane, Blackburn, Tel: 265256.
- S&W RECENTLY PASSED RAE. Hammarlund H1100A, £65, Edgewater EC10 Mk1, £22, Tram 98510D £5. £150 pro preem, £15 each. £35. Rex, Tel Winchester 63784.
- YAESU FT221R, 2m TRANSCEIVER. As new in original packing. Delivery arranged. £295. Box 164 RSB.

---

**MISCELLANEOUS**

- COURSES—RADIO AMATEUR EXAMINATION. City and Guilds, Pass this important examination, and obtain your GB licence, with an RRC Home Study Course. For details of this and other courses (GCE, Professional Examinations, etc) write or phone: The Rapid Results College, Dept JT1, Tuition House, London SW19 4DS. Tel: 01-847 7079 (Careers Advisory Service) or for a prospectus only ring 01-946 1502 ( Brend's recording service).

---

**SITUATIONS VACANT**

**FIELD & BENCH ENGINEER**

for work on radio telephone equipment.

Phone 01-573-4541

---

**AGENTS WANTED**

to produce commercial radio-telephone business on purchase or rental terms. Maintenance contracts available on ensuing business for suitable agents. Excellent opportunity to build a good business without capital BUT—no time-wasters please.

R. T. SYSTEMS, BLAYDON, TYNE & WEAR, NE21 4JW
Electronic Test Engineers and Technicians

The Mobile Radio Division of Marconi Communication Systems Ltd is part of a large electronics organisation. We are called upon to develop and manufacture VHF, UHF, AM and FM mobiles, portables, base stations and digital ancillaries.

If you can find out what’s wrong with this circuit you could be the person we want.

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.

For more information and an application form please write or telephone T. Ford, Marconi Communication Systems Ltd, Mobile Radio Division, Marconi House, New Street, Chelmsford, Essex. Tel.: Chelmsford (0245) 53221.

A GEC-Marconi Electronics Company

MARCONI COMMUNICATION SYSTEMS

RADIO COMMUNICATION  November 1977
B. Bamber Electronics
DEPT RC, 5 STATION RD, LITTLEPORT, CAMBS, CB6 1QE
TEL: ELY (0333) 860185 (TUESDAY-SATURDAY)

ALL BELOW—ADD 8% VAT

MAIN TASTER SCREWDRIVERS 100 to 500V
Standard sizes 5p. Large 70p.

RAIL ELECTRICS 5½ £1.00, 6¼ £1.00.

DIAGONAL SIDE CUTTERS 6½ £1.90.
SMALL SIDE CUTTERS £2.70. JS7 with
Direct holding diection £2.10.

MIDGET OPEN ENDED SPANNER SETS 5 × 1,
2 × 3, 3 × 4, 4 × 6, 8 × 6 GA sizes £2.15 set of 5,
4 × 4.5, 5 × 5.5, 6 × 7.5. 8 × 8, 10 × 11 mm sizes
£2.50 set of 6.

MINIATURE FILE SETS. Set of £1.95. Set of £2.50
(Round, flat, etc.)

TAP AND DIE SETS (16 pieces) each of 2, 4,
6, 8, 10, 12 in Dies. Plug Taps, Taper Taps =
American type tap wrench, 1 type tap wrench, Die
Holder, £1.60.

BRUSHED STEEL MOTORS. 200-250V 50Hz. 2 watts,
1 Rev. every 2 mins., 3 hole fixings, 5/8spindle,
60 each or 2 for £1.50.

CPU/RAM/GRAPH ELECTROLYTICS. Screw ter-
minals, 20.000mfd at 45V (ex-equipment £2 for £1.00)

MINIATURE ROTARY SWITCHES. 4 × 3 way
make contacts, Size approximate. 3½dia. 1½ spine,
10 each.

SMALL WIRE STRIPPER. £1.90.

DIODES, various types. £1.90.

BARGAIN PACK OF LOW VOLTAGE ELECTRO-
LYTICS. Cost £2.35 up to 50 working
Seamsonic manufactures. Approx. £1.60 per pack
(+11½ VAT).

TUNED COILS. 2 section coils, around 1mH, with
black split end knob which move an internal core
to vary the induction. Many uses, easily rewound,
320 each.

FULL RANGE OF BERNARDS/BABANI
ELECTRONICS BOOKS IN STOCK. S.A.S. FOR LIST

NEW FOR THE VHF CONSTRUCTOR. A range of
tuned circuits on formers with slugs and screening
caps. Frequencies quoted are approximate, and
range can be greatly extended by using various
capacitors in parallel.
Type S (3½" square, dumpy type)
Type SA 25 to 35MHz (when 33p fitted in parallel)
£1.75 each. £1.59 each at 15 (with fnding wires)
Type M (3½" square type)
Type S (3½" square type)
£1.75 each. £1.59 each at 15 (with fnding wires)
Type MC 25 to 35MHz (when 33p fitted in parallel)
£1.75 each. £1.59 each at 15 (with fnding wires)
Type MC 45 to 65MHz (when 33p fitted in parallel)
£1.75 each. £1.59 each at 15 (with fnding wires)
Type MF 100 to 200MHz (without slugs) when 30p
varied fitted in parallel
All the above coils available in packs of fve only
(same type) at 80p per pack of 8.

A NEW RANGE OF QUALITY BOXES
& INSTRUMENT CASES.
Aluminium Boxes with lids.
A1016 6 x 2 75p
cm .
A1017 6 x 2 £1.00.
A1018 8 x 2 £1.30.
A1016 10 x 7 £1.50.
A1017 10 x 4 £2.10.
A1018 12 x 4 £3.10.
Vinyl Coated Instrument Cases.
Blue Tapes and White lower sections. Very
smart finish.
W18 9 x 3 £1.60.
W28 6 x 6 £1.30.
W38 6 x 9 £1.90.
W48 6 x 16 £2.50.
W58 8 x 16 £8.00.
W68 12 x 18 £12.00.
W78 14 x 18 £15.00.
VIDICON SCAN COILS (Transistor type, but no data)
complete with vidicon base £5.50 each. Brand new.

ALL BELOW—ADD 8% VAT

PLASTIC PROJECT BOXES with screw on lids (in
Black ABS) with brass inserts.
Type NBB approx. 3½" x 3½" x 1½" £1.60 each.
Type NBR approx. 4½" x 4½" x 1½" £2.50 each.

QUARTZ-ATTAL CONTROLLED CLOCKS. 9 to
12V DC at approx. 3mA required. Dial size approx.
2½, depth of unit approx. 2½. 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 £4.00 to produce) £16.00
each while stocks last, tested before despatch.

OMRON REED RELAY COILS (for reel relates up to
1" dia, not supplied) £12.50mmt coil, 2 for 50c.

PERSP Tuner PANELS (for FM Band 3 tuners)
marked 86-105MHz and Channels 0-9, Clear humber
rest. Dimensions, for modern appearance, size
approx. 8½" x 13", 2 for £3.50.

MIXED COMPONENT PACKS, containing resistors,
capacitors, fne line (suitable for parallel and serial
and hundreds of items, £8.00 per pack, while stocks
last.

PROGRAMMABLE MICROCOMPUTERS (suitable
for main marine operation) with 9 rotating
cams, all individually adjustable, ideal for switching
applications in many instruments, etc., or industrial machine
programming. (Reed slow motion motor to drive cams,
not supplied) 9 switch variation, £15.00.

PLUGS & SOCKETS
BNC PLUGS and REAR COUPLERS £1.50.
N-TYPE PLUGS and REAR COUPLERS £3.00 each, 3 for £1.50.
Greeper (1050) Chassis Lead Terminals
(These are the units which bolt on to the chassis,
the lead is secured by screw cam, and the inner
of the case passes through the chassis). 30p each,
4 for £1.00.

PS/2 Plugs (PTFE) Brand new, packed with reducers,
40p each.

3002 Sockets (PTFE) Brand new, (4 hole fixing type)
50p each.

VALVES
QVQ30/30A (ex-equipment) £3.00.
QVQ10/10A (ex-equipment) £2 or £1.25.

DIP-2 (ex-equipment) £2 or £1.25
DIP-4 (ex-equipment) £2 or £1.25
All the above valves are untested, except for heaters and
no guarantee of emission or otherwise. Sorry, no returns.
MULLARD 6F6 TV STABILISER VALVES (brand
new) 70p each or 2 for £1.20.

Büss VALVES (BRAND NEW), 5 each or 1 for £1.50

SEMICONDUCTORS
PNP Audio Type TOS3 Transistors, 12 for 25p.
BFY1 Transistors, 4 for 85p.

BYX 35/30A Stud Rectifiers, 20 at 5½, 4 for 60p.
BC172 Transistors, 4 for 85p.

BS200 (VHF circ/uni) 3 for 50p.
BS106 (main caps) 4 for 85p.

PBC 108 (plastic BC 108) 3 for 50p
BF182 (UHF amplifier) 2 for 50p.
BF2019 Fet, 3 for 90p.
BC148NP SILICON 4 for 50p.
BC159 PNPN SILICON 4 for 50p.
DAY118 Schematic Diagram 10p.
BA111 Varicap Diodes, 4 for 50p.
HD15 RCA OP-AMPS 4 for £1.00.

DISCART BOXES. We still stock these, but owing
to frequent price rises from our suppliers, and costly
postage charges, it has been found impossible to publish
up-to-date prices on the list. Please ring or write (with
SASE). For latest mail order prices.

ASSC 818R/MICROWAVE DIODES - up to X-Band
maximum, output power 0.66 at 4300W. £2.00.
3 OH D Disc Relays, 5 to 12V DC, 450 ohm coil.
Designed to work directly from TTL logic, simple
Pole Changeover, Contact ratings. 30V, 1A, 5V.

ALL BELOW—ADD 12½% VAT

VARICAP TUNERS Mullard Type ELC1704/04 Brand New, £4.90.
TV plus (metal type) 4 for 85p.
TV line connectors (back-back kit) 4 for 85p.
3 pin Din plug, 4 for 85p.
3 pin Din Sockets, 4 for 85p.
Sockets 5 pins, 5 for 85p.
Speaker plugs 5 pins, 4 for 85p.
RESISTOR PACKS, approx 300 pieces, ± 2 watt
type ± 5% value, our selection £1.05 each.

ELECTROLYTIC CAPACITORS
Dublifier, 50μF, 400V, ± 5% for 85p.
Dublifier, 100μF, 25V, 2 for 30p.
Pleasure Electrolytics, 47μF, 63V, 3 for 50p.
BBC electrolytics, 100μF, 35V, 2 for 60p.
Dublifier Electrolytics, 500μF at 35V, 50p each.
Dublifier Electrolytics, 500μF at 35V, 50p each.
TTY Electrolytics, 1000μF at 35V, 50p each.

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

BARRY BERMAN
RADIO SOCIETY
OF GREAT BRITAIN

ACCOUNTS
AND
REVIEW
FOR THE YEAR
ENDED
30 JUNE 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.


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 WC1N 2AE
Patron: HRH THE PRINCE PHILIP, DUKE OF EDINBURGH, KG

COUNCIL

President
Lord Wallace of Coslany
Executive Vice-President
D. S. Evans, PhD, BSc, MIM, G3RPE
Immediate Past-President
E. J. Allaway, MB, ChB, MRCs, LRCP, GSF&K
Honorary Treasurer
J. G. Brown, LLB, FCA, G3DYV
Telecommunications Liaison Officer
R. F. Stevens, G2BVN

Members
A. M. Allan, GM3ZBE
D. J. Andrews, G3M6J
J. Anthony, G3KQF
R. J. Baker, G3UPR
P. Balasatini, TEng(CIE), MTE, MIAM, G3BPT
J. Balley, G3HCT
D. Byrne, G3KPO
W. F. McGonigle, G1GXP
B. O'Brien, G2AMV
C. H. Parsons, GW9NP
D. M. Pratt, BTEch, MIEE, MIERE, G3KEP
W. A. Scar, MA, FBIS, G2WS
A. W. Smith, GM3AEI (Died 2 October 1978)
R. F. Stevens, G2BVN
G. M. C. Stone, G8FZL
C. J. Thomas, G3PSM
D. M. Thomas, GW3RWX

Retired 31 December 1978

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 £3,000 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 Handbook 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 quite 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 £98,000) and this is not only the result of the increased subscription to £6 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 £5,500 on the membership side which means that the subscription of £6 now being paid by corporate members is slightly more than sufficient to cover the cost of Radio Communication and membership services.

Cost of Mailings
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 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 £200) 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 audited internal accounts show a surplus for the first three months of over £5,000. 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 £7,000), 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

<table>
<thead>
<tr>
<th></th>
<th>1976</th>
<th>£</th>
<th>1977</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscription Income</td>
<td>87,956</td>
<td></td>
<td>126,301</td>
<td></td>
</tr>
<tr>
<td>Gross profit on sales of publications</td>
<td>17,590</td>
<td></td>
<td>59,532</td>
<td></td>
</tr>
<tr>
<td>Quoted Investment income (gross)</td>
<td>241</td>
<td>166</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income tax recoverable</td>
<td>263</td>
<td>85</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td>106,050</td>
<td>187,398</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expenditure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headquarters rates, lighting, heating and cleaning</td>
<td>5,976</td>
<td>7,253</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff remuneration and expenses</td>
<td>39,083</td>
<td>59,146</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pension</td>
<td>300</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone, postage (including books), printing &amp; stationery</td>
<td>10,481</td>
<td>21,238</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td>457</td>
<td>592</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repairs and maintenance</td>
<td>569</td>
<td>1,610</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hire of equipment (including computer)</td>
<td>10</td>
<td>5,330</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation of equipment</td>
<td>939</td>
<td>1,569</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank charges</td>
<td>370</td>
<td>1,216</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audit fees (including under-provision for prior year)</td>
<td>1,465</td>
<td>2,943</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal and professional fees</td>
<td>438</td>
<td>810</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sundry expenses</td>
<td>2,126</td>
<td>777</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bad debts provision</td>
<td>1,141</td>
<td>1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Debenture interest of Lambda Investment Company Limited (gross)</strong></td>
<td>1,141</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Expenditure</strong></td>
<td>63,355</td>
<td>104,745</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Radio Communication</strong>—distributed free to members—cost including staff remuneration and after deducting advertising revenue</td>
<td>47,765</td>
<td>41,480</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Membership certificates, Awards, Trophies, etc.</td>
<td>687</td>
<td>1,556</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QSL Bureau, Beacons and Intruder Watch</td>
<td>1,868</td>
<td>2,214</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contributions to IARU Region 1</td>
<td>1,695</td>
<td>2,633</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deficit (surplus) on rallies and exhibitions (excluding book sales)</td>
<td>(606)</td>
<td>1,559</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of general meetings and Council and committee expenses</td>
<td>4,934</td>
<td>5,831</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taxation</td>
<td>224</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Expenditure</strong> (all of which arises in the Society)</td>
<td>119,922</td>
<td>160,018</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surplus (Deficit) For The Year</strong></td>
<td>(13,872)</td>
<td></td>
<td>£27,380</td>
<td></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Fixed Assets</th>
<th>1977</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>£</td>
<td></td>
</tr>
<tr>
<td>Freehold property at cost</td>
<td>41,675</td>
<td>(1) (2)</td>
</tr>
<tr>
<td>Sinking Fund Policy, at cost</td>
<td>4,169</td>
<td></td>
</tr>
<tr>
<td>Furniture and equipment, at cost less depreciation</td>
<td>7,027</td>
<td>(1) (3)</td>
</tr>
<tr>
<td>Investment in and loan to subsidiary</td>
<td>27,413</td>
<td>(4)</td>
</tr>
<tr>
<td>Total Fixed Assets</td>
<td>52,671</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Assets</th>
<th>1977</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>£</td>
<td></td>
</tr>
<tr>
<td>Quoted Investment at cost</td>
<td>4,055</td>
<td>(5)</td>
</tr>
<tr>
<td>Stocks at lower of cost and net realizable value</td>
<td>40,340</td>
<td></td>
</tr>
<tr>
<td>Debtors, and payments in advance</td>
<td>24,188</td>
<td></td>
</tr>
<tr>
<td>Bank balances &amp; cash in hand</td>
<td>47,027</td>
<td></td>
</tr>
<tr>
<td>Total Current Assets</td>
<td>115,636</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Net Assets</th>
<th>1977</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>£</td>
<td></td>
</tr>
<tr>
<td>Total Current Assets</td>
<td>60,613</td>
<td></td>
</tr>
<tr>
<td>Accumulated Fund</td>
<td>55,023</td>
<td></td>
</tr>
<tr>
<td>Legacy Fund</td>
<td>5,423</td>
<td></td>
</tr>
<tr>
<td>Subscriptions in Advance</td>
<td>18,528</td>
<td></td>
</tr>
<tr>
<td>Total Net Assets</td>
<td>£113,484</td>
<td></td>
</tr>
</tbody>
</table>

Financed by:

<table>
<thead>
<tr>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCUMULATED FUND, Balance at 1 July 1976</td>
<td>5,883</td>
</tr>
<tr>
<td>Less preliminary expenses of the subsidiary</td>
<td>21,570</td>
</tr>
<tr>
<td>LEGACY FUND</td>
<td>5,423</td>
</tr>
<tr>
<td>SUBSCRIPTIONS IN ADVANCE</td>
<td>18,528</td>
</tr>
</tbody>
</table>

**£79,626 £61,261**

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

WALLACE, President

J. D. 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:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-6</td>
<td>£2,185</td>
</tr>
<tr>
<td>1976-7</td>
<td>£62,832</td>
</tr>
</tbody>
</table>

   Add: Subscriptions received during the year

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-6</td>
<td>£132,148</td>
</tr>
</tbody>
</table>

   Less: Amount carried forward at 30 June 1977 representing the forward commitment to membership services

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-6</td>
<td>£68,679</td>
</tr>
</tbody>
</table>

   Total amount of subscription income credited to revenue account in the year

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-6</td>
<td>£126,301</td>
</tr>
</tbody>
</table>

   (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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost 1 July 1977</th>
<th>Additions during year (Net of disposals £2,636)</th>
<th>Cost 30 June 1977</th>
<th>Accumulated depreciation</th>
<th>Book value as shown in Balance Sheet (Book value 30 June 1975, £3,667)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost 1 July 1978</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additions during year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost 1972/77</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Transport 4% Guaranteed Stock</td>
<td>£4,055</td>
</tr>
</tbody>
</table>

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


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

<table>
<thead>
<tr>
<th>1976</th>
<th>1977</th>
</tr>
</thead>
</table>

**SOURCE OF FUNDS**

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surplus (deficit) for the year</td>
<td>(13,872)</td>
<td>27,380</td>
</tr>
<tr>
<td>Sale of fixed assets</td>
<td></td>
<td>524</td>
</tr>
<tr>
<td>Donations, legacies and interest</td>
<td>4,292</td>
<td>1,131</td>
</tr>
<tr>
<td>Adjustment for item not involving the movement of funds:</td>
<td>939</td>
<td>1,569</td>
</tr>
<tr>
<td>Total generated from operations</td>
<td>(8,641)</td>
<td>30,604</td>
</tr>
</tbody>
</table>

**APPLICATION OF FUNDS**

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase of fixed assets</td>
<td>(2,792)</td>
<td>(5,453)</td>
</tr>
<tr>
<td>Repayment of debentures</td>
<td></td>
<td>(500)</td>
</tr>
<tr>
<td>Sinking Fund Policy premiums</td>
<td>(417)</td>
<td>(417)</td>
</tr>
<tr>
<td>£(1,650)</td>
<td></td>
<td>£24,234</td>
</tr>
</tbody>
</table>

**INCREASE/(DECREASE) IN WORKING CAPITAL**

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments</td>
<td>(5,000)</td>
<td></td>
</tr>
<tr>
<td>Stocks</td>
<td>6,329</td>
<td>17,665</td>
</tr>
<tr>
<td>Debtors</td>
<td>15,177</td>
<td>(11,434)</td>
</tr>
<tr>
<td>Creditors and subscriptions in advance</td>
<td>(50,381)</td>
<td>183</td>
</tr>
<tr>
<td>Movement in net liquid funds:</td>
<td>(33,875)</td>
<td>6,414</td>
</tr>
<tr>
<td>Increase in cash balances</td>
<td>22,025</td>
<td>17,820</td>
</tr>
<tr>
<td>£(11,850)</td>
<td></td>
<td>£24,234</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>1976</th>
<th>1977</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
</tr>
</tbody>
</table>

**ASSETS**

<p>| 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 |
| 461    | Debenture issue expenses | 461 |</p>
<table>
<thead>
<tr>
<th>506</th>
<th>Bank balance</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>46,655</td>
<td></td>
<td>46,592</td>
</tr>
</tbody>
</table>

**LIABILITIES**

<p>| 582 | Sundry creditors | 592 |</p>
<table>
<thead>
<tr>
<th>26,886</th>
<th>Loan from the Radio Society of Great Britain</th>
<th>27,313</th>
</tr>
</thead>
<tbody>
<tr>
<td>27,468</td>
<td></td>
<td>27,905</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------</td>
<td>-------</td>
</tr>
<tr>
<td>£19,187</td>
<td></td>
<td>£18,687</td>
</tr>
</tbody>
</table>

**NET ASSETS**

Financed by:

Authorized and Issued Capital

100 shares of £1 each fully paid | 100 |

Revenue Account

Balance at 1 July 1976 | 62 |

1,245 | Rent receivable in the year to 30 June 1977 | 1,244 |

1,141 | Less: Debenture Interest | 1,141 |

85 | Bank charges | 85 |

40 | Audit fee | 40 |

1,246 | 1,244 |

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 |

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.

L. E. Newnham  J. O. Brown  Directors

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, Or 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, Or D. S. Evans, G3RPE, was elected executive vice-president for 1977.

An election was held in November 1976 to fill two ordinary and three additional vacancies on Council. The members elected were Messrs J. B. Bailey, G3HTC, and C. H. Parsons, GWSNP, as ordinary members, and Messrs B. O’Brien, G2AMV, as Zone A member, J. Anthony, G3KOF, as Zone B member and A. M. Allan, GMSZBE as Zone C 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. Paffy, G4JW, who resigned due to ill-health; and its appreciation of Mr A. V. Smith, GM3AEI, 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.

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 stationary, files for output records, other items such as “floppey 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 storey 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 storey, 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 900 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.

Packaging 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.

ATTENDANCE AT COUNCIL MEETINGS

<table>
<thead>
<tr>
<th>Dr E. J. Allaway, G3FKM</th>
<th>July</th>
<th>Sept</th>
<th>Nov</th>
<th>Jan</th>
<th>Feb</th>
<th>April</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lord Wallace of Coslany</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr D. J. Andrews, G3MXJ</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr R. J. Baker, G3USB</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr P. Balestirini, G3BPT</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr R. W. Fisher, G3PWJ</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dr D. S. Evans, G3RPE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr J. O. Brown, G3DVV</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr D. Byrne, G3KPO</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr J. Bailey, G3HTC</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr W. P. McGonigle, G3GXP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr G. E. Pratt, G3KRP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr B. A. Scone, G3SW</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr F. Stevens, G2BWN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr G. M. C. Sith, G3ZFL</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr C. J. Thomas, G3PSM</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr O. M. Thomas, G3RWWX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr H. J. P. Oake, GM3AE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr A. M. Allan, GM4ZBE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr B. O’Brien, G2AMV</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr J. Anthony, G3KQF</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mr A. W. Smith, GMSAEL</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

(Real grad due to ill health)
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 40 different types of membership category used by the computer, and this has taken appreciably longer 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, call signs 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 of information, including over- and under-payment, out-of-stock advice and holding paperwork. Special items such as foreign magazine subscriptions, call sign 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.
   (a) 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.

<table>
<thead>
<tr>
<th>Year</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>17,888</td>
<td>17,901</td>
<td>17,387</td>
<td>17,541</td>
<td>17,707</td>
<td>17,531</td>
<td>17,108</td>
</tr>
<tr>
<td>Overseas</td>
<td>5,108</td>
<td>5,200</td>
<td>5,347</td>
<td>5,079</td>
<td>5,682</td>
<td>5,640</td>
<td>2,834</td>
</tr>
<tr>
<td>Airmail</td>
<td>77</td>
<td>81</td>
<td>82</td>
<td>87</td>
<td>92</td>
<td>90</td>
<td>82</td>
</tr>
<tr>
<td>BFPO</td>
<td>65</td>
<td>66</td>
<td>69</td>
<td>74</td>
<td>72</td>
<td>73</td>
<td>69</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Region</th>
<th>Members</th>
<th>Region</th>
<th>Members</th>
<th>Region</th>
<th>Members</th>
<th>Region</th>
<th>Members</th>
<th>Region</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1,617</td>
<td>6</td>
<td>328</td>
<td>11</td>
<td>187</td>
<td>16</td>
<td>1,409</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1,169</td>
<td>7</td>
<td>1,283</td>
<td>12</td>
<td>572</td>
<td>17</td>
<td>1,251</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1,714</td>
<td>8</td>
<td>1,503</td>
<td>13</td>
<td>325</td>
<td>18</td>
<td>1,442</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1,182</td>
<td>9</td>
<td>502</td>
<td>14</td>
<td>470</td>
<td>19</td>
<td>1,448</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>726</td>
<td>10</td>
<td>554</td>
<td>15</td>
<td>350</td>
<td>20</td>
<td>850</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 23 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 the Woburn 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 10 GHz; 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.

GB2RS

During the year agreement was obtained for the transmission of GB2RS and GB2ATG to take place between the hours of 0000 and 2100 GMT. This improved flexibility should allow a larger listening audience.

The change of frequency from 3-80 to 3-65 MHz 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.

<table>
<thead>
<tr>
<th>Representative</th>
<th>Committee/Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. S. Dryborough, G8HEV</td>
<td>CICR Study Groups 5 and 6</td>
</tr>
<tr>
<td>R. S. Roberts, G6NR</td>
<td>CICR UK General Purposes</td>
</tr>
<tr>
<td>D. A. Hughes, G5GV</td>
<td>BSI TLE 25/1 and 2</td>
</tr>
<tr>
<td>R. A. Sterling, G2WS</td>
<td>Frequency Advisory Committee</td>
</tr>
</tbody>
</table>

Representatives on outside bodies

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 January 1977.

The new A and B licences include the following facilities in addition to the main station telephony (and telegraphy for A licences):

- operation in any vehicle or vessel but not on the sea or within any dock;
- operation as a pedestrian;
- facsimile;
- radio teleprinter;
- television;
- slow-scan television;
- data (on 144MHz and above);
- 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.

QLS BUREAU

The Society’s bureau continues to handle over one million QSL cards each year. This task, for more than 30 years, has 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. Hopefully any successor for this occupation will need to devote (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 the situation cannot possibly 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, G3IR. 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, are also 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 are only 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 21 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.

<table>
<thead>
<tr>
<th>Committee</th>
<th>Total No of meetings</th>
<th>No of Council members</th>
<th>HQ staff</th>
<th>Attending members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Educational Visits</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Scheme</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance and Staff</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>HF Contests</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>IARU Working Group</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Interference</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Membership and Representation</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Microwave Sub-committees</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Mobile and Exhibition</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Propagation Studies</td>
<td>14</td>
<td>1</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Raynet</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Repeater Working Group</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Technical and Publications</td>
<td>14</td>
<td>3</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>VHF</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>VHF Contests</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>156</strong></td>
<td><strong>40</strong></td>
<td><strong>7</strong></td>
<td><strong>141</strong></td>
</tr>
</tbody>
</table>

Committee reports

Individual committee reports have been provided by the chairman of the respective committee.

G. R. Jessop, G6JP
Finance and Staff

The committee has met regularly and considered the many new and imported products which have been bought and the commissioning of the data processor, improving the in-house accounting, 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 operation of the machine and the change from 512 to 91 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 £1,550 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, G4FY, 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 G8MV have been on a working party making preparations for the new examination, which will be introduced in May 1978. 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 Information 11 contains, among 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 GSNZ 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 précis 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 has selected for that year's "bijubeste 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. Similarly increasing is the number of 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. Bastray, 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 centered 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 letter are being drafted by many RSGB members. Committees 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 RRAs (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 G2RS news broadcast service. There have also been frequent
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. Hitchin, serving on the committee, members were able to put forward many suggestions on the running of the event.

Committee members attended many functions throughout the country during the year, thus obtaining the views of members towards and for the society.

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 Weburn 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.

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, Sir St John Ambulance, and 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, stalling 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� counties, 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 1,600.

Technical and Publications

The main tasks of this committee are in connection with Radio Communication and the production of books. During the year 56 articles were submitted to the Society for publication and these were read and evaluated by committee members, with specialist assistance wherever necessary. The production costs of the Journal continue to rise and possible changes in format and printing processes are continuing to be considered. 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 Occultation Reference Books by G4CDY and G6UP; Test Equipment for the Radio Amateur by G2BUP. All these provide model answers to typical RAE questions 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. Eckerel, G4FTJ (book editor), who are both members of the T & P Committee.

R. F. Stevens, G8BN

Telecommunications Liaison

The workload 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 fell 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 79, and further meetings 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 GSKB, 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, G4BSS, 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.

VHF

The committee is concerned with all matters relating to frequencies above 30MHz, including microwaves above 1GHz.

Early in 1977, Geoff Stone, G6FZL, resigned as vhf manager, and subsequently David Evans, G3OUP, was appointed by Council as his replacement. Tom Douglas, G3BA, chairman of the committee, is responsible primarily for all UK vhf 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 Society’s data processor is used for rapid updating and presentation of beacon information, and it is known that the beacon service has a very large following.
- Repeaterers. 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. Unfortunately 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, WHDQ, travelled from the USA to make the presentation, with a talk and 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 positively 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 specialised 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 is necessary to consider a special dfa frequency which is currently being considered.

The committee has spent much time considering factors to be put forward at WARC 79. As a lead-up, the committee, BAP, B, 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 250MHz 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 G8SLB beacon at Romford, the 3-4GHz beacon GB3JOS 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 52km. It is to be noted that all three of the world dx records on bands above 1GHz 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 vhf ‘boxes’ 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/hf contests are held all over Europe, ensuring a plentiful supply of dx 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. Microwaves provide opportunities to test new equipment in practice and to gain more knowledge of modes of operation and procedures that may be 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 rigors 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.


I. F. White, G3EKR
RSGB AREA REPRESENTATIVES

Region 1
G. L. Adams, G3LEQ, 2 Ash Grove, Knutsford, Cheshire WA16 8BB (Mid-Cheshire).
R. Birch, G2FOS, 19 Lloyd Drive, Greasby, Upton, Wirral, Cheshire.
C. Carthern, G4EST, 31 Redvers Drive, Liverpool L8 8BS (Liverpool 22). 
J. Heywood, GB8HQ, 9 Kenilworth Drive, Hazel Grove, Stockport, Cheshire SK7 5LE (Stockport & S Manchester).
J. M. Horrocks, G2BTP, 17 Wood Grove, Whitefield, Manchester M25 7ST.
N. Horrocks, G2CUZ, 34 Sandbrook Road, Ainsdale, Southport PR8 3JE (Southport & D).
G. Lancaster, G3DWQ, 19 Higher Walton Road, Walton-le-Dale, Preston, Lancs (Preston).
A. B. Langfield, GB1OA, 201 St Mary's Road, Moston, Manchester M10 0BN.
R. J. B. Morgan, GD3KGC, Plot 19, Howe Road, Onchan, Douglas, IoM.
G. W. Perkins, G3VUJ, 51 Kingstown Road, Carlisle, Cumbria CA3 8AB.
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 LS15 6PD.

Region 3
W. F. Mienerls-Hahn, G3UOL, 91 The Cheills, Styvechale, Coventry, Warwick CV3 5BE.
S. Powell, G3WRA, Karenza, Canon Pyon Road, Hereford HR4 2RB.
I. R. Brothwell, G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 8LD.
M. Shardlow, G3SZJ, 19 Portrhead Drive, Darley Abbey, Derby DE2 6BJ.
F. Critchely, G3EEL, 35 Waterloo Road, Peterborough, Northants.
S. J. Purser, G6GHZ, 2 Dobson Close, Great Houghton, Northampton NN4 0AX.
P. Erkert, G4BKS, 3 Hartwell End, Southcourt, Aylesbury, Bucks.
C. F. Young, G4CCC, 18 Wincroft Road, Caversham, Reading, Berks.
G. Cuer, G4AVV, 24 Patterson Road, Upper Norwood, London SE19 2NT.
R. S. Hewes, G3TDR, 24 Brightside Avenue, Lateham, Staines, Middlesex.
J. Kornorffier, G20MR, 19 Park Road, Banstead, Surrey.
T. M. Allen, G4ETU, 2 Grange Cottages, Colworth, Chichester, Sussex PO20 6DU (W Sussex south of Downs).
K. A. Crouch, G6KEN, 14 Victoria Road, Capel, Folkestone, Kent.
M. Dennison, G3KDV, 5 Lamba Wharf, Whitstable, Kent.
P. F. Jobson, G3HFL, 41 The Avenue, Gravesend, Kent.
M. A. Lawrence, G3DNO, 18 Briers Avenue, St Leonards-on-Sea, Sussex TN34 2NN.

Region 4
R. G. Hughes, G4CG, Grinnis, Highwall, Sticklepeth, Barnstaple, Devon.
M. C. Locke, G5NKE, Hillside, Bexhill, Camborne, Cornwall.
L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, Devon.

Region 5
T. J. Brooke, G3WHD, Pen Yr Hen, Penhill, Cardiff CF8 8UW.

Region 6
R. Stubbs, BRS14700, Rosala, 81 Dyserth Road, Rhyd, Clwyd LL18 6DT.
M. W. Bannerman, GM32XE, 16 South Street, Newtyle, Angus.
D. W. Dalrymple, GM3OKL, 27 Hazel Place, Leslie, Fife.
J. McVicar, G68EC, 31 Lochend Road North, Musselburgh, Midlothian (Lothians).

Region 7
A. M. Cameron, GM3OGJ, 15 Greycoran, Sauchie, Clackmannan-shire FK10 7EN.
D. M. Plumbridge, GM3KMG, 7 Waterside Gardens, Hamilton, Lanarkshire.
M. Anderson, G3WXY, 32 Knockniew Drive, Tandragee, Craigavon, Co Armagh.
J. T. Barnes, G3US, 95 Crawfordsburn Road, Bangor, Co Down BT19 1BJ.
H. M. Irvine, G3TLT, Fennrock, 103 Old Gransha Road, Bangor, Co Down BT19 2PU.
I. J. Kyle, G8AYZ, Hillside, Galgorm Gardens, Old Galgorm Road, Ballymena, Co Antrim.
M. S. Appleby, G3ZNU, 45 Cedar Avenue, Keggrave, Ipswich, Suffolk.
M. Coan, G4EOL, 117 Ranworth Road, Norwich, Norfolk (Norwich).

Region 8
P. G. Brooker, G3WKC, 107 Venner Avenue, Northwood, Cosew, IoW PO31 5AG.
G. D. Cole, G4EMN, 6 St Anthony's Road, Bournemouth, Hants BH2 6PD.
J. R. Compton, G4COM, Aynsgar, Beech Corner, Durley Brook Road, Durley, Southampton, Hants.
M. Connah, G4FMD, 135 Sevenfields, Highhown, Swindon, Wilts, SN5 7QW.
D. N. Jones, G3IMX, 9 Elsonwood Drive, Camberley, Surrey GU15 2AY (Farnborough & D).
F. B. Le Coccq, BR54159, Les Calisous, Green Road, St Clement, Jersey, CI.
A. C. A. Newman, G2FJX, 74 Victoria Road, Wilton, Salisbury, Wilts (Salisbury).
J. E. Martin, GU3Y1Z, Bonne Chance, Marsais Lane, Vale, Guernsey, CI.
P. J. Sterry, G3CBU, Ashley, Orchard Road, Baslingstoke, Hants.

Region 9
D. Bland, G8KIK, 5 Belgrave Drive, Normanby, Middlesbrough, Cleveland (Teesside).
E. F. Shield, G8GCV, 14 Wellfield Street, Amble, Morpeth, Northumberland.
R. R. Allen, G4CYR, Rossway, Dimmochs Lane, Sarratt, Rickmansworth, Herts.
W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3.
A. J. Messon, G3PS9, 92 Colcharbour Lane, Bushey, Watford, Herts WD2 3NY.
B. Pickford, G4DUS, Netherwood, 130 The Drive, Rickmansworth, Herts (St Albans).
C. J. Raitson, G3YQV, Symphony, Elm Park Road, Pinner, Middx (Harrow & D).
L. J. Smith, G3HJF, 9 Kingborough Close, Harpenden, Herts.

Region 10
R. H. C. Crabb, G8NAB, Wicham Farm, Marston Magna, Yeovil, Somerset BA22 8DT (SE Somerset).
E. A. Perks, G5MA, 40 Carlton Road, Gloucester.
R. Shartland, G4EHE, 33 High Street, Wick, Bristol BS15 7QJ.
J. Thorn, G3PQE, 43 Hill Road, Weston-super-Mare, Avon.
PUBLICATIONS OBTAINABLE FROM RSGB

RSGB members can obtain a 10 per cent discount on the prices listed below (excluding magazine subscriptions and members' sundries). To obtain the discount, deduct 10 per cent, calculated to the nearest penny, from the total value of the order (using the latest price list) and enclose a remittance for the balance. Also enclose an address label from a recent Radio Communication wrapper as proof of membership.

RSGB PUBLICATIONS

Technical books
Amateur Radio Awards ........................................... £2.15
Amateur Radio Techniques (5th edn) ................. £3.55
Guide to Amateur Radio (16th edn) ................ £1.38
Morse Code for Radio Amateurs ............... 54p
NBFM Manual ................................................. £1.38
QSCAR-Amateur Radio Satellites ....................... £2.20
RSGB Amateur Radio Call Book 1977 ........ £2.35
RAE Questions and Answers .................. £2.00
Radio Amateurs' Examination Manual (7th edn) .. £1.50
Radio Amateurs' Examination Revision Notes .. 85p
Radio Communication Handbook 5th edn, Vol 1 .. £3.36
Radio Data Reference Book (4th edn) ........ £3.85
Service Valve and Semiconductor Equivalents 48p
Teleprinter Handbook ........................................ £3.89
Test Equipment for the Radio Amateur (Out of print) ..
TVI Manual (Out of print) ........................................
VHF/UHF Manual ........................................... £6.92
World at their Fingertips (Paperback) .......... £1.63
World at their Fingertips (De-luxe) ........ £2.76

Log books
Standard Log ................................................ £1.34
Receiving Station Log ................................... £1.46
Mobile Mini-Log ........................................... £1.03
De-luxe Log ................................................ £2.00

Maps, charts and lists
Countries List/HF Awards List ................. 25p
Great Circle DX map (in tube) ................ £1.29
Oscar map (in tube) ....................................... 45p
QTH Locator map (Western Europe) (in tube) .. £1.15
QTH Locator map (Western Europe) (on card) .. 57p
RSGB Amateur Radio Prefixes (World) map .. 60p
UHF repeater planning map .................... 40p
UK Beacon List .......................................... 15p
UK Repeater List ........................................ 15p
IARU Region 1 Beacon List ..................... 15p

Members' sundries (No discount)
Callsign lapel badge (5 weeks' delivery) .......... £1.31
Lapel badge (RSGB or RAEN emblem, pin fitting) .. 51p
Tie (Maroon or Blue) ...................................... £1.06
Radio Communication East-binder ............. £3.00
Car window sticker (RAEN) (self-adhesive) ..... 31p
Members' headed notepaper (50 sheets) quarto .. 85p
Members' headed notepaper (50 sheets) octavo .. 80p
Radio Communication back issues (as available) .. 84p
RSGB contest log sheets (100) .................. 77p
RSGB teeshirt (large, medium or small) .... £2.25

Prices include postage, packing, and VAT where applicable. For air mail despatch, please ask for price before ordering. Goods are obtainable, less p & p, at RSGB headquarters between 9.30am and 5pm, Monday to Friday.

POSTAL TERMS: Cash with order. Stamps and book tokens cannot be accepted. Cheques and postal orders should be crossed and made payable to "Radio Society of Great Britain". Giro A/C No 533 2956.

All overseas orders: add £1 to cover insurance if required. Please write your name and address clearly on the order.

ORDER FROM:

RSGB Publications (Sales), 35 Doughty Street, London WC1N 2AE

OTHER PUBLICATIONS

American Radio Relay League
Antenna Book (13th edn) ................................ £3.59
Course in Radio Fundamentals .................. £2.60
FM and Repeaters for the Radio Amateur (Out of stock) ... £10.05
Solid state Design for the Radio Amateur .... £7.25
Hints and Kinks ........................................... £2.27
Radio Amateurs' Handbook 1977 (Paperback) .. £7.18
Radio Amateurs' Handbook 1977 (Hardback) .... £10.05
Ham Radio Operating Guide ......................... £3.90
Single Sideband for the Radio Amateur .......... £3.39
Getting to know Oscar from the ground up .... £2.75
Specialized Communication Techniques .......... £3.58
Understanding Amateur Radio .................. £3.39
VHF Manual ................................................ £3.62
Electronic Data Book ................................... £3.56

Radio Amateur Callbook Inc
American Callbook (USA listings) 1977 (Out of stock) ..
American Callbook (DX listings) 1977 (Out of stock) ..
World Atlas (Amateur radio prefixes) .......... £1.72

Radio Publications Inc
Beam Antenna Handbook ................................ £3.90
Better Short Wave Reception (3rd edn) ........ £2.42
Cubical Quad Antennas ............................... £2.77
Simple, Low-cost Wire Antennas (Out of stock) ....

"73 Magazine" publication
SSTV Handbook (Out of stock) .................

Miscellaneous
International VHF FM Guide (Out of stock) .... £1.02
RTTY the Easy Way ........................................ £4.12
Radio Amateur Operators Handbook ............ £1.11
Radio Valve & Semiconductor Data ............. £2.00

MORSE INSTRUCTION AIDS

G3HSC Rhythm Method of Morse Tuition—
Complete Course (two 3-speed 1p records and one ep
record plus books) ........................................ £5.60†
Beginner's Course (one 3-speed 1p record and one ep
record plus book) ........................................ £4.12†
Beginner's 1p (0-15 wpm) plus book ............ £2.44†
Advanced 1p (9-42 wpm) plus book ............. £3.44†
Three-speed simulated PO test 1in ds ep record .. £1.15†
† Overseas orders: add £1.12.

MAGAZINE SUBSCRIPTIONS

QST (including ARRL membership) (Per annum) £10.50
Subscriptions for QST should be sent to RSGB, 35 Doughty Street, London WC1N 2AE.
See note in "QTC" regarding 73 and CQ

Ham Radio (Per annum) (includes air delivery) £15.00
Ham Radio Horizons ................................... £6.50

Subscriptions and changes of address for Ham Radio Magazine and Ham Radio Horizons should be sent to: Ham Radio Magazine (UK), PO Box 63, Harrow, Middlesex HA1 3HS.
COMING SOON:—

**"KENT" MODULES**

These are fully assembled and working modules for the construction of the first available will be a 20MHz AM IF amplifier and a matching AUDIO AMPLIFIER with squelch, both units offer superb performance with matching "mate of the art" circuitry, construction and delivery to be announced S.A.E. for technical data.

ITT AM1 STARGATE P.C. BOARDS removed from new & unused audio & squelch $8.00, AM IF 1 P.C. board $7.74, and 2 IF 650 kHz with 2nd mixer & crystal filter $32 kHz $8.00, AM modulator P.C. B. $8.00, 3 ch. osc T.X. & Rx with channel switch & knob "high band" $8.20, Mod. Foxber $8.00.

P. C. BOARDS for MS UHF STARGATE! single channel T.X. $195.00, 100 MHz 80, 3 ch. $275.00.

TANTALUM BEAD CAPACITORS 1 mF 20V 3 ch. $3.00, 6.4 mF 25V 33, 116V $2.50 each.

DISC CERAMIC CAPACITORS 300V 22pF 2-200pF in $12 series 3p each.

CARBON FILM RESISTORS 1, 2, 5 watt 10k-1M in E12 series, minimum quantity of 10 per value supplied-price $ 1 & 2 watt 13p each, 5 watt 16p each.

ELECTROLYTIC CAPACITORS - 6.4mF 1/25V, 33116V.

ERIE 1000 pF 500W DISC CERAMIC S 10 for 15P.

MIXED BAG OF CAPACITORS polyester type 250V 10-1000pF, 10-1000V, 1% Tantalum disc $40 each, 10-1000V, 1% $2.50 each, 10-1000V, 1% 330V-25V $2.50 each.

TRIMMER CAPACITORS 1% 10p each, 1% 100p, 1% 1000p, 1% 10k, 1% 1M, 1% 10M, 1% 100M.

MULLAR TUBULAR SOLT-IN TYPE 8-6-4-9.13p each.

CERAMIC MINIATURE COMPRESSION TYPE 8 x 18mm P.C. 10-40p each.

PLASTIC SEMI AIRSAPED 7mm dia. 1-100p, 1-1000p P.C. 10p each, 50p each, 100p each, 1000p each, 10k 10p, 33k 10p, each by 30p.

OXYL AIR SPACE 18, 33, 56, 100, 150, 220,220, 560, 1000, 1500, 2.2M, 1000, 50p each, 100p each, 200p each, 330p each, 500p each, 1000p each, 2000p each, 3300p each.

ERIE 1000p 500V discs ceramics 10 for 15p.

5G BROWN MIC INSERTS same as used in PYE mics.

MOUNT Soldered to mics 300 ohm Imp. $0.20 each, included 2 each for £1.00, you could not buy the capacitors for this price! With circuit.

CARRadio PCBS. Famous British manufacturer nickel plating + P.C.Brush etch "ideal for components" but can be used for a number of projects inc. top band DF set. The P.F. and audio stages are complete, the mixer stage is wired but was originally designed for a paradebly testing, new and unused, only £1.00 inc. circuit. Circuit only!—Solder Stamp = S.A.S.

FM RADIO FRONT END TUNER UNITS 50-100MHz with 10-15MHz L.F. output & fitted with A.M. gain, capacitor, P.E. RF amp, tune, mixer, separate osc. AFC and sync. tuner, plus 0.1% 150kHz crystal filter, and 0.1% 900 MHz crystal filter requires 10-15V DC. SARGAIN ONLY DM£ 3.30 each.

ITEMS FOR FREQUENCY COUNTER FEATURED IN MARCH 1976 R.C.

OCEADE COUNTER PCB. Made to suit our miniature ITT Nite tubes (ITT860S35) suitable for use with 18 way 91" pitch edge connector if required, ready drilled and fanned to take SVNH0, 1716 and 74114. $5 each set of five $24.40. 15 pitch edge connector to suit above PCB £6.60.

MINIATURE NIXIE TUBES ITT860S35 to suit the above decade boards left and right decimal points. $2.70 each, envelope size only 7/8" x 7/8" new and unused with data sheet 80p each, five for £2.50, ten for £4.50.

GOOD INTO CATHODE CRYSTAL GYPS MCO-2M 48p. 10,000-15,000 Khz electrostatic 3p. 7mm 3050V 16p.

SN7408 17p.

SN7451 15p.

SN7406 14p.

SN7412 16p.

SN7450 12p.

SN7414 12p.

IT8271 8p.

IT8273 6p.

IT8274 5p.

IT8262 3p.

IT8264 3p.

TOYO COM74S02 3p.

B:4375V 3db imp. 300 ohm £3.00.

1-4MHz LSB, LSB, FILTER made by Cathode for PYE 10187 Radio Telephones £4.50, all above filters are new & unused except for 445/L0U which is EX-EQUIP.

ERNST TURNER EDGEWATER METERS small precision type 100 microamp FSD, marked 0-100 display range 0.1% x 1/10, make nice "5" meter new boxed £2.50.

JAPANESE TUNING METERS 1", marked "mono/ stereo" special offer 60p each.

SEMICONDUCTORS

HEWLETT PACKARD HP5022-300 paper in place 50p each for £1.75.

VARICAP OISED BR105 in matched sets of 4, $0.40 each.

VHF POWER TRANSISTOR BF1117 (Motorolla) type, 15V 0.3W input 8.00 watts output on 154MHz FM. (2 watts max output) special offer 65p each.

ITT 5853S tubes (ITT5853S) suitable for use in PYE Pocketphones £3.50, £6.50.

REED RELAYS 14 pin DIL made by ASTRALUX type 121A3, 5 volt coil 1000 ohms TTL compatible, with normally open contacts, new 46p each for £2.55.

3 GANG TURNING CAPACITOR 35pft per section direct drive 75p each.

SOLENOID-INSULATORS approx 1" dia £10 60p.

HI-GAIN TRANSCEIVERS all types.

ITALIAN MINIATURES 25p each.

TUBE CAPACITORS electrolytic 10p each, 15p each, 25p each, 33p each, 50p each, 100p each, 150p each, 200p each, 250p each, 300p each, 400p each, 500p each, 600p each, 700p each, 800p each, 900p each, 1000p each.

WIDE RANGE TRANSFORMERS 32p each.

Polystyrene TUBULAR 150p, 8.00 each.

LOW PASS FILTERS 16p each.

3.5-inch COMPUTER PRINTERS 106p each.

50p each.

5G BROWN MIC INSERTS same as used in PYE mics.

MOUNTS soldered to mics 300 ohm Imp. £0.20 each, included 2 each for £1.00, you could not buy the capacitors for this price! With circuit.

CARRadio PCBS. Famous British manufacturer nickel plating + P.C. Brush etch "ideal for components" but can be used for a number of projects inc. top band DF set. The P.F. and audio stages are complete, the mixer stage is wired but was originally designed for a paradebly testing, new and unused, only £1.00 inc. circuit. Circuit only!—Solder Stamp = S.A.S.

FM RADIO FRONT END TUNER UNITS 50-100MHz with 10-15MHz L.F. output & fitted with A.M. gain, capacitor, P.E. RF amp, tune, mixer, separate osc. AFC and sync. tuner, plus 0.1% 150kHz crystal filter, and 0.1% 900 MHz crystal filter requires 10-15V DC. SARGAIN ONLY DM£ 3.30 each.

ITEMS FOR FREQUENCY COUNTER FEATURED IN MARCH 1976 R.C.

OCEADE COUNTER PCB. Made to suit our miniature ITT Nite tubes (ITT860S35) suitable for use with 18 way 91" pitch edge connector if required, ready drilled and fanned to take SVNH0, 1716 and 74114. $5 each set of five $24.40. 15 pitch edge connector to suit above PCB £6.60.

MINIATURE NIXIE TUBES ITT860S35 to suit the above decade boards left and right decimal points. $2.70 each, envelope size only 7/8" x 7/8" new and unused with data sheet 80p each, five for £2.50, ten for £4.50.