October 1979

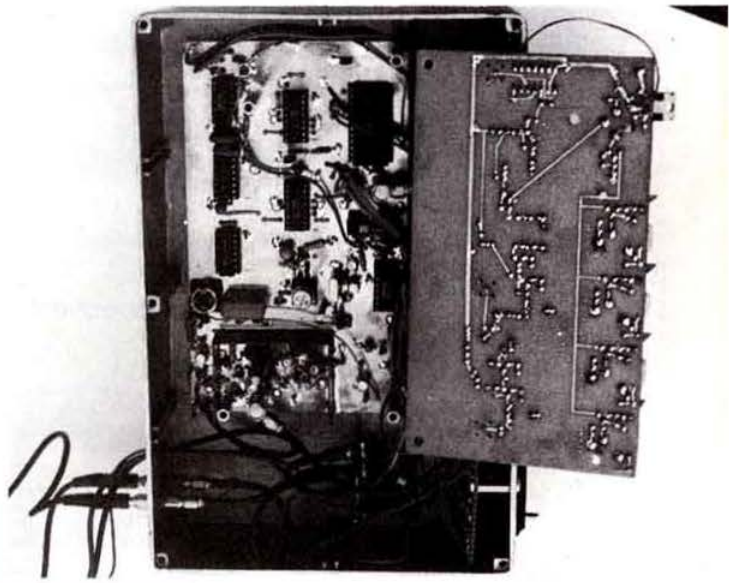
# radio communication

journal of the Radio Society of Great Britain

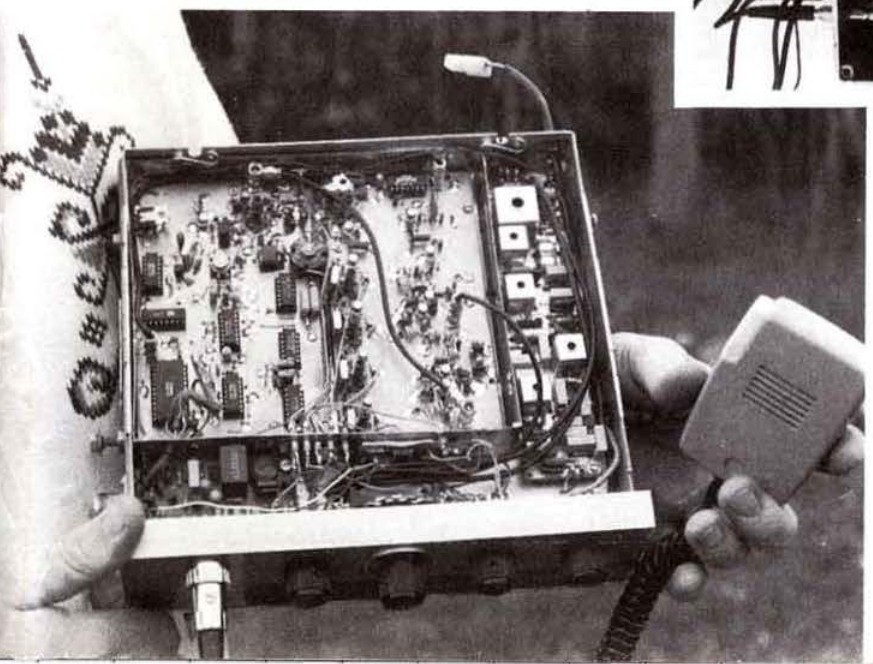
## IN THIS ISSUE

## A 25kHz step synthesizer with half-channel facilities for 145–146MHz

by D. G. CUTTS, G4FAW



Prototype with top board removed



G4FOE's unit, mounted in an a.m. Pye Westminster, with screen removed

COMPONENTS FOR

# AMATEUR RADIO BULK BUYING GROUP

RADCOM PROJECTS

## MULTIMODE 1600 TRANSCEIVER
(Oct/Nov 1977 Rad Com)
Special price for component kit, **£260.00.**
Receive only kit also available, **£230.00.**
PCB, **£15.65;** QC1246AX, **£34.00;** Less carrier xtals, **£31.00;** 8545kHz xtal, **£3.00;** 400ns delay line, **£1.95;** MD108, **£7.65;** RS12V Relay, **£3.80;** Toroid, **85p.** **Minikit 3** (R's and C's), **£23.45.**

## G3ZVC SSB TRANSCEIVER (Sept-1974 Rad Com)
PCB, **£3.15;** Toroid, **85p;** MD108 Ring Mixer, **£7.65;** QC1246 AX Filter, **£34.00;** or YF-90F Filter, **£28.60** (Not recommended for HF Band use this project).
**SPECIAL PRICE FOR COMPONENT KIT, £97.40 or £86.40.**
Also available—but not included in kits: *Reprint of article,* **15p** plus SAE, 25Ω Loudspeakers—2½", **£2.00.** Metal Cabinet, **£2.00.** Min. 50Ω coaxial connectors—PCB mount socket, **84p** and plug, **£1.48.**

## G3XGP MINI D.F.M. (June 1973 Rad Com)
PCBs: 1/P Amp, **£2.15;** Display, **£1.90;** 1MHz Clock, **£2.45.** Component kit (1MHz Clock version), **£50.75.**

## G3TDZ FM TRANSCEIVER (March 1978 Rad Com)
Most parts available:
**PCBs:** Audio, **£2.40;** Rx, **£5.70;** Tx, **£5.75;** 9MHz Osc, **£1.60.**
**KITS** available as follows:
Receiver (less 455kHz coil), **£47.95;** Transmitter, **£31.95.**

## G3TDZ ADD-ON POWER AMP (June 1978 Rad Com)
Complete kit including aluminium case, **£14.10.**

## G3PLX RTTY VIDEO DISPLAY (April 1977 Rad Com)
**Kit** (excluding modulator & keyboard), **£90.45.**
Set of printed circuit boards, **£18.75;** 2513, **£8.50;** AY5-1013, **£4.85;** 2102-1, **£1.95;** SN74188, **£2.40** each or ready programmed **£7.00** per pair.
7MHz xtal, **£3.50.**
**Mini-kit 3** (all R's & C's), **£4.80.**
Also available: Cabinet, **£2.40** or to match CT100 T.U. **£8.70.**
**Flashing cursor kit, £7.95.**
**Diode Matrix kit, £16.35.**
NOTE regarding PROM program: The PCBs and programmed PROMs supplied by us make use of a slightly different program sequence resulting in different pin connections to those published in the 'Rad Com' article. Whilst constructors buying PROMs and PCBs from us will have no difficulty, those producing their own PCBs or having PROMs programmed elsewhere should note this important difference. A detailed modification sheet is available with the PCBs.

## VHF FM MONITOR RECEIVER
as described in April 1979 edition of 'Practical Wireless'. A high performance crystal controlled NBFM receiver design suitable for use on 2m or VHF marine band etc. Our kits do not include crystals. Prices are as follows:

Single channel version: **£43.30**
Multichannel version: **£46.25**

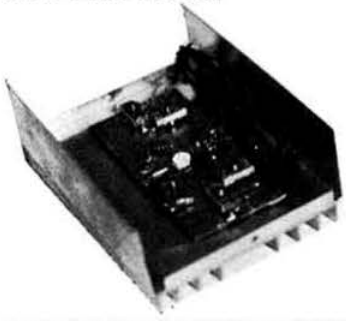
## NEW SL1600 SSB TRANSCEIVER
Parts available for plastic i.c. version as detailed in Plessey 'Radio Communications Handbook'.
PCB: **£3.30;** Other components as per price list.
COMPONENT KIT: **£80.60.**

## PLASTIC IC's from PLESSEY
Low-cost version of the famous SL600 series communication ic's are now available. The plastic versions, designated SL1600 series, are in DIL8 or DIL14 packaging according to type.

| | Metal | | Plastic | |
|---|---|---|---|---|
| **R.F. Amplifier** | SL610C | **£2.82** | SL1610 | **£1.94** |
| **R.F. Amplifier** | SL611C | **£2.82** | SL1611 | **£1.94** |
| **R.F. Amplifier** | SL612C | **£2.82** | SL1612 | **£1.94** |
| **Limiting Amp.** | SL613C | **£4.84** | SL1613 | **£2.27** |
| **VOGAD** | SL620C | **£4.26** | — | — |
| **AGC Generator** | SL621C | **£4.26** | SL1621 | **£2.61** |
| **AF/VOGAD/Sidetone** | SL622C | **£10.49** | — | — |
| **AM/AGC/SSB** | SL623C | **£7.77** | SL1623 | **£2.93** |
| **Multimode Det.** | SL624C | **£3.94** | — | — |
| **AF/VOGAD** | — | — | SL1626 | **£2.93** |
| **A.F. Amplifier** | SL630C | **£2.72** | SL1630 | **£1.94** |
| **Double Bal. Mod.** | SL640C | **£4.74** | SL1640 | **£2.27** |
| **Receive Mixer** | SL641C | **£4.74** | SL1641 | **£2.27** |

## THE PLESSEY 'RADIO COMMUNICATIONS HANDBOOK'
A superb reference book on the use of Plessey i.c.s. for transmitters, receivers, High Speed Dividers and Frequency Synthesisers, includes an improved G3ZVC type T/R module using 1600 series i.c.s. **£2.25.**

## NEW 10 WATT 2M PA KIT



A 10 watt output version of our famous 40 watt 2M PA kit is available, for boosting the output of 1-2 watt 2M FM transmitters.
**12 volt supply Auto T/R switching.**
**Complete with cabinet and full instructions.**
**Kit price £20.50 inc VAT + 65p post.**
**Also available ready-built at £30.00.**

## 40 WATT PA KIT
**Still available at £22.00 + 65p post.**
Requires 12 volt supply and 10 watt drive.
**Also available ready-built at £31.50.**

## BARGAIN CORNER
Special offer on LEDs while stocks last:

| | | | |
|---|---|---|---|
| FND357 | 0·3" CC | **£1.20** ea | **£4.40** for 4 |
| DL304 | 0·3" CC | **£1.30** ea | **£4.80** for 4 |
| DL500 | 0·3" CC | **£1.35** ea | **£5.00** for 4 |
| DL704R | 0·3" CC | **£1.20** ea | **£4.40** for 4 |

Access

**All prices include VAT but please add 30p post. Data—Catalogue 45p plus large 21p SAE**

**AMATEUR RADIO BULK BUYING GROUP, DEPT 900**
**COMMUNICATIONS HOUSE, 20 WALLINGTON SQUARE, WALLINGTON, SURREY**
**Tel: 01-669 6700. Open 9am to 5.30pm Mon to Fri, 9am to 1pm Sat. Closed for lunch 12.45 to 1.45pm**

BARCLAYCARD VISA

ISSN0033-780



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# radio communication

October 1979 Volume 55 No10

## CONTENTS



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# Discover the unrivalled ASTRO 102BX with Dual PTO's

## Plus IF Passband Tuning/Full Band Coverage, Speech Processing, 235 Watts PEP All Bands and Much More

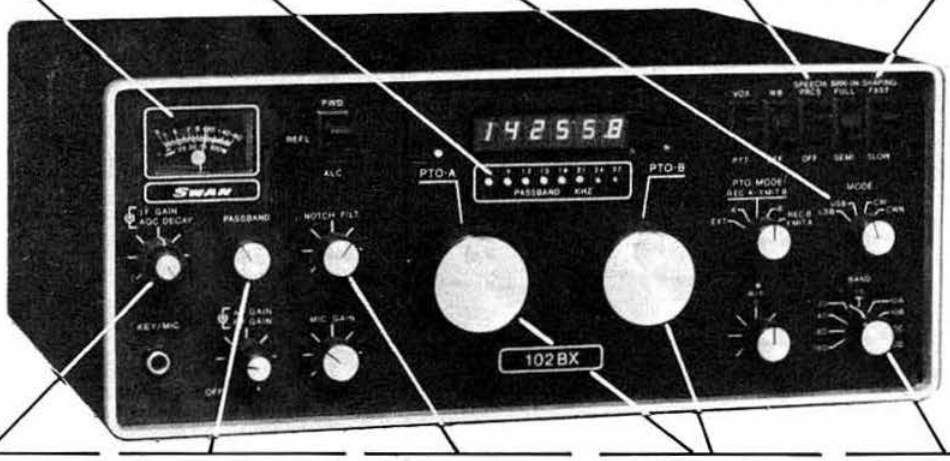
**4-Function Meter**
reads "S" units in receive, and selects forward power, reflected power, or ALC in transmit.

**Visual Display of Passband Tuning**
A series of 8 LED's indicate the equivalent band width and position of the passband from 0·6 to 2·7kHz as the passband tuning knob is rotated.

**300Hz Crystal CW Filter**
Cascaded with the passband filters and tunable through the passband. Combined with notch filter yields unrivalled CW performance.

**Full or Semi CW Break-in**
A must for the avid CW operator!

**2 Position CW Wave Shaping**
Your choice of soft or hard CW rise and decay time!




**Variable AGC Decay**
Continuously variable to suit your preference.

**Passband Tuning with 16 Pole Filters**
Two 8-pole crystal filters in cascade provides a 1·4:1 shape factor at −100dB! The ultimate in selectivity.

**Tunable Notch Filter**
Provides the ability to "notch out" QRM. When used in conjunction with the passband tuning, provides the ultimate in removing interference.

**Dual PTO's**
Two independent high stability PTO's provide true split band operation. The digital counter reads the PTO selected, or in split band reads the PTO used for receive, then switches to the transmit frequency selected when the mic is keyed.

**All Band Coverage using PLL and Synthesizer for Band Selection**
Full coverage of 160 metres through all of 10 metres in nine ranges . . . diode matrix programmed for now—or for the future!

ALL SOLID STATE
QUALITY AMERICAN CONSTRUCTION

# SWAN ASTRO 102BX

SWAN ELECTRONICS
*A member of the Cubic Corporation family of companies*

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# AMATEUR ELECTRONICS UK

# A Knob with a new twist "VRS"

## Swan Astro 150 Exclusive Microprocessor Control w/memory gives you over 100,000 fully synthesized frequencies, and more!

- VRS—Variable Rate Scanning, a dramatic new technique for unprecedented tuning ease and accuracy
- POWER—235 watts PEP and CW on all bands for that DX punch
- Advanced microcomputer technology developed and manufactured in the U.S.A.
- Price? See your authorized SWAN dealer for a pleasant surprise!


**Dual Meter**
Reads PEP output in watts and receive "S" units.

**Mike Tuning**
For accurate 100Hz steps or fixed rate scan.

**Full Break-in CW**
(or semi, switch selected)

**Wide Frequency Coverage**
10M—28·0-30·0 MHz
15M—20·8-23·0 MHz
20M—13·8-16·0 MHz
40M—6·0-8·3 MHz
80M—3·0-4·5 MHz
160M—1·8-2·4 MHz*
*in lieu of 10M band on Model Astro 151

FULLY SOLID STATE

# SWAN ASTRO 150

SWAN ELECTRONICS

*A member of the Cubic Corporation family of companies*

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# AMATEUR ELECTRONICS UK

## AEUK – Your number one

**AS FACTORY APPOINTED DISTRIBUTORS WE OFFER YOU— WIDEST CHOICE, LARGEST STOCKS, PROMPTEST DEAL AND FAST, SURE SERVICE RIGHT THROUGH —**

**ABOVE WE SHOW THE NOW FIRMLY ESTABLISHED FT-227R 2m MOBILE NOW ALSO AVAILABLE IN ITS SCANNING VERSIONS. ON THE RIGHT IS THE SUPERB FT-225RD, THE 2m BASE STATION THAT HAS EVERYTHING, DESIGNED FOR THE MAN WHO INSISTS ON THE BEST. AT LEFT IS THE FT-202R HAND-HELD—SO COMPACT BUT SO EF-FECTIVE.**

**THE WIDEST CHOICE FROM 2-10**

**THE YAESU RANGE IS NOW SO GREAT THAT IT SIMPLY CATERS FOR EVERY TASTE – THIS MAKES IT A *MUST* TO BROWSE THROUGH YAESU'S MAIN CATALOGUE—PLEASE SEE OUR OFFER ON FACING PAGE.**

**THE FT-901DM IS THE HF BASE STA-TION *PAR EXCELLENCE* AND ITS RECEIVER PERFORMANCE ALONE IS SIMPLY OUT OF THIS WORLD. TOGETHER WITH THE RANGE OF MATCHING ANCILLARY UNITS— WHICH ARE GROWING ALL THE TIME—THIS BUILDS A STATION WHICH FULFILS EVERY CON-CEIVABLE REQUIREMENT FOR THE OPERATOR WHO DEMANDS THE ULTIMATE.**

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

**FROM SOUTH AND EAST.** We are located approximately two miles from Junction 5 of the M6 from which follow signposts to Birmingham. Within ¼ mile turn right at Clock Garage and proceed towards city. After one mile look for traffic lights at Fox & Goose and immediately over the lights take minor left fork into Alum Rock Road. We are located one mile from this point.

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

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

**Hours: 9.30-5.30 Continuous including Saturdays—Early closing Wednesday, 1 p.m.**

Access

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

Access

# AMATEUR ELECTRONICS UK

## source for YAESU MUSEN

**THE SUPERB FT-101Z AND FT-101ZD TRANSCEIVERS ARE NOW APPEARING IN LARGE NUMBERS ON THE H.F. BANDS FOR THE SIMPLE REASON THAT THEY REPRESENT THE BEST VALUE FOR MONEY AVAILABLE TODAY BUT PRICE NOTWITHSTANDING MANY OPERATORS ARGUE THAT THE RECEIVER PERFORMANCE IS SUPERIOR TO ANYTHING THEY HAVE HANDLED BEFORE—CALL, 'PHONE OR WRITE (PLEASE SEE FACING PAGE) FOR FULL DETAILS.**

## FT101ZD Series High Performance Transceiver

**FULL COVERAGE**
Full band coverage is provided on the FT-101ZD: 160 through 10 meters, plus WWV/JJY reception on 5MHz. Teamed with the FTV-901R transverter, operation can be extended to 72, 144, and 430MHz from your desk top.

**CLEAN OUTPUT SIGNAL**
With today's crowded bands, we all have the responsibility to keep our transmitted signal free of spurious radiation. YAESU engineers have included RF negative feedback, for a clean output signal.

**STATE OF THE ART NOISE BLANKER**
The all-new noise blanker is extraordinarily helpful in reducing the level of impulse noise. The blanking level may be adjusted from the front panel.

**RF SPEECH PROCESSOR**
A high-performance RF speech processor is built into every FT-101ZD, providing an increase in your average talk power of approximately 6dB. The processor level can be adjusted from the front panel, for optimum signal enhancement.

**WORLD-WIDE POWER CAPABILITY**
The FT-101ZD has provision for operation from a variety of AC voltages, from 100 to 234 volts. When you're travelling, you'll never need a heavy, bulky transformer for operation with your FT-101ZD. A DC-DC converter is an available option, for mobile operation. The FT-101ZD is small enough to qualify as carry-on baggage on most airlines, and is equipped with a strong, side-mounted handle for ease of carrying.

**VARIABLE IF BANDWIDTH**
Using two 8-pole crystal filters with superior shape factors, the FT-101ZD variable bandwidth system is a valuable tool on today's crowded bands. With the turn of a dial, high-pitched SSB "buckshot," or unwanted CW signals, can be eliminated from the IF passband.
Compare for yourself: other systems use a single filter in the IF; though you can move away from one interfering signal, you may move into more QRM. The YAESU design actually varies the bandwidth, *eliminating* the QRM. Other manufacturers would have you spend hundreds of pounds on different filters for 2.1kHz, 1.8kHz, 1.5kHz, 800Hz, 500Hz, etc. With the FT-101ZD, you have continuously variable bandwidth—from 2.4kHz down to 300Hz.

**DIGITAL PLUS ANALOG READOUT**
The FT-101ZD features digital plus analog frequency readout. The display features big, bright LED digits, for maximum readability. For extra savings, the economy model FT-101Z gives you the same precision analog display, at a significantly reduced cost. You can add the digital display later, if you wish.

**INTERFACE WITH 901 SERIES COMPONENTS**
Your FT-101ZD may be used with all of the exciting FT-901DM series accessories. The FV-901DM synthesized, scanning VFO provides storage and recall of up to 40 frequencies, in addition to its 3-speed scanner and auto scan function. Sae for information on other accessories.

---

**ATLAS RADIO INC.**

**AS DIRECT IMPORTERS AND MAIN AGENTS WE OFFER THE FAMOUS ATLAS 210X and 215X TOGETHER WITH ALL ACCESSORIES FROM STOCK.**

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BRANCH: AMATEUR ELECTRONICS, UK—COASTAL, CLIFTONVILLE, KENT, KEN McINNES, G3FTE, THANET (0843) 291297. 9 a.m.-10.30 p.m.
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# LOWE ELECTRONICS Ltd

## TS-120—The system approach by TRIO

What do we mean by the "System Approach"? Well, take the TS120V at **£408,** including V.A.T. and you have the finest 20W PEP mobile HF transceiver you could buy. Consider the single conversion, PLL derived, top performance transceiver; the passband tuning; the digital readout; the noise blanker; the superb engineering; THEN maybe add the matching mains PSU for home use: PS20 **£52,** including V.A.T.: and you have an equally great fixed station; OR maybe add the extra VFO, or the external speaker and the 100 Watt ATU: SP120 **£25.50,** including V.A.T.; AT120 **£69,** including V.A.T.: OR maybe take a look at the new TS120S at **£495,** including V.A.T. **What's the TS120S?**

## It's a compact, up to 200 watts PEP input, all solid-state HF transceiver with such standard features as built-in digital readout, IF shift, new PLL technology . . . and requires no tuning!

**Exciting and perfect for car or ham shack use! But, there's more to say about the TS-120S! This unique all solid-state HF, SSB/CW transceiver produces a hefty signal and also offers a lot of other great features in a very attractive, compact package.**

**FEATURES:**

All solid-state with wideband RF amplifier stages. No final dipping or loading, no transmit drive peaking, and no receive preselector tuning! *Just dial your frequency and operate!*

Five bands, plus WWV. Transmits and receives on 80/75, 40, 20, 15, and all of 10 meters . . . and receives WWV on 15MHz.

200 watts PEP (160 watts DC) input on 80-15 meters, 160 watts PEP (140 watts DC) input on 10 meters. LSB, USB, and CW.

Digital frequency display (standard). 100-Hz resolution. Six digits. Special green fluorescent tubes eliminate viewing fatigue. Analog subdial, too, for backup display.

IF shift (passband tuning), to remove adjacent-frequency interference and sideband splatter.

Advanced PLL circuit, which eliminates need for heterodyne crystal element for each band. PLL lock frequency, CAL marker signal, and counter clock circuit use single reference frequency crystal. Simplifies circuitry, improves overall stability. Also improves transmit and receive spurious characteristics.

Attractive, compact design. Measures only 3½" high × 9¼" wide × 13½" long, and weighs only 4·9 kg (11·7 lbs.) A perfect size for convenient mobile operation and rugged enough for either mobile or portable use. Also has all the desired features for optimum ham-shack operation at home.

Noise blanker. You'll wonder where the ignition noise went.

See the big little TS-120S rig and matching accessories (VFO-120 remote VFO, SP-120 external speaker, PS-30 AC power supply, MB-100 mobile mounting bracket, AT-120 antenna tuner and YK-88C CW Filter) at the centre for all that's good in Amateur Radio—LOWE ELECTRONICS in MATLOCK. Or—send for full details right now.

TRIO + LOWE = SATISFACTION.

# LOWE ELECTRONICS Ltd

## AR240 FROM A. O. R.

### SURELY THE MOST AMAZING HAND-HELD TRANSCEIVER YET!

**FULL COVERAGE 144 148MHz**
**CHANNEL SPACING 5kHz**
**FULLY SYNTHESIZED**
**+600 and −600kHz SHIFTS**
**1750Hz TONEBURST**
**1½ WATT OUTPUT**


The AR240 is a truly staggering rig. In a small hand-held unit, you have a fully synthesised 2 metre FM transceiver covering 144–148MHz in 5kHz steps. Frequency selection is by direct reading top mounted decade switches giving instant access to any frequency in the tuning range. Power output is over 1W and the receiver sensitivity is not only excellent, it's maintained across the full tuning range by automatic voltage controlled tracking. Both up and down 600kHz repeater shifts are built in as is a 1750Hz tone burst.

What more could you ask for in a hand held?

## LS707

We happily present the only 70cm multi-mode transceiver available today. The LS707 is a high quality, high performance unit which covers 430–440 MHz in ten 1 MHz bands with full VFO control. All the desirable features are included; Vox; break in CW; calibrator; noise blanker; RIT; etc. together with true all mode FM, AM, USB, LSB and CW operation.

The LS707 is built using plug-in modules, and the quality of construction is of the best. Transmitter output is nominally ten watts and the receiver is GOOD. Fixed channel operation is available and the overall impression of the LS707 is that it will satisfy the most demanding user.

**ON OFFER! £495 inc VAT** PSU—any 12V @ 3-4A will do.

**EMPORIUM NEWS** *The new Emporium is now completed to first floor level but when will it be ready? For those who travel the Matlock to Chesterfield road, why not stop at the site and have a look—you'll have to look hard, the main building is deliverately hidden behind a banking and there will be a 30 foot flying bridge approach from the customer car park. Great design by G8GIY.*

*Clearly 1980 is going to be a Trio year with the new product line taking off like a Saturn V. Do you know about the TS770, TS180S, TS120S, TR7625, RM76, R1000 and all the other good things. If not, why not pay us a visit soon and see them in the flesh.*

*Don't forget all the other things that we stock, from the full professional range of Trio Test instruments to a wide range of monitor receivers for all frequencies including air band and marine band. We are also stockists of small computer systems and are about to introduce a TRS80 compatible system of our own. If you have any queries in this area contact Rob Stead at our Matlock office.*

**NEW THINGS** *We shall soon be introducing a new credit card scheme for our customers along the lines of "a regular monthly payment allows you to buy X hundred pounds worth of equipment right now".*

*A special feature of the scheme is that card holders will receive regular information on package deals or special discounts which will be available only to them. Also useful is the ability for the card holder to call by telephone and order goods for immediate despatch simply by quoting the card number—useful when you suddenly realise that you need that new microphone before the weekend! More news later, the scheme will probably get under way at this year's Leicester show.*

## HC1400 ON OFFER! £199 inc VAT

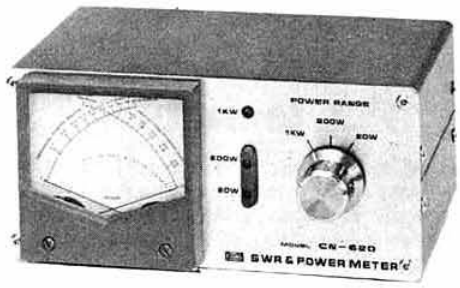
The HC1400 is a new powerful (30 watts) 2 metre FM transceiver for mobile/fixed station use, with a most comprehensive array of features. Using a TMS 1100 microcomputer to control all functions gives complete and easy operation of a complex transceiver.

Features include coverage from 144–148MHz in 5kHz steps; digital frequency readout of transmit and receive channels; selectable channel steps using either the all-electronic channel control or the optional remote control microphone; high power TX (30 watts plus); three memories for storing any frequencies within the tuning range for instant recall and also for programming repeater shifts of up to 4MHz wide.

Normal repeater and reverse repeater shifts are provided together with a fully automatic tone burst. It's too much to talk about in a short advertisement so why not call us and ask any questions. It's top quality, certainly; top value undoubtedly.

Remote frequency readout and remote control microphone available as options.

## CN-620 SWR & POWER METER




**CN-620 SWR & POWER METER**

The CN-620 is a radical departure from the accepted norm for in-line power and SWR measurements and represents a considerable improvement over all existing power meters.

The system is based on a crossed needle twin meter, one needle indicating forward power, the other reflected power. The point at which the two needles cross indicates the SWR existing on the system. In one instrument, you combine power and SWR measurement with high accuracy and simplicity of operation.

The CN-620 is simply inserted into any 50 ohm coaxial line. No adjustments are necessary in order to use the instrument. The CN-620 covers the frequency range from 1·8–150MHz and can measure power as low as 400mW reflected and as high as 1kW forward using three easy to read ranges. With the CN-620, doubt in measurement is a thing of the past and once you have used the CN-620, all other power meters will seem old fashioned.

**£52.81 inc VAT**

| CN-620 SPECIFICATION | |
|---|---|
| Frequency range | 1·8–150MHz |
| Line impedance | 50 ohms |
| Power ranges forward | 20W, 200W, 1kW |
| Power ranges reflected | 4W, 40W, 200W |
| Through power rating | 1kW CW, 2kW P.E.P. 1·8–30MHz<br>250W CW, 500W P.E.P. 140–150MHz |
| Min. power for SWR measurement | 5W |
| Connectors | SO239 |
| Size | 165 × 75 × 97mm |

# LOWE ELECTRONICS Ltd

## R-1000 — stand by to receive the world


It's goodbye Wadley loops and hello to the new, true up-conversion, PLL system HF general coverage receiver from Trio.

The new R-1000 is going to turn the general coverage receiver world upside down since it combines professional performance with a really attractive price, thanks to Trio's commitment to using advanced technology to simplify operation rather than make complex gimmickry.

The R-1000 uses an advanced PLL system in an up-conversion scheme to a high (48MHz) first IF to remove any possibility of image responses. The receiver covers the entire frequency range from below 200kHz right up to 30MHz in 30 bands, each 1MHz wide. The bands are selected, not by ambiguous knob twiddling as in receivers using the Wadley loop but by a 30 position band switch which controls the PLL system.

The band switch also electronically selects the appropriate band pass filter network in the RF stages of the receiver so there are no "preselector" or "antenna trim" controls to twiddle—simply set the band switch to the range required—that's it!

A highly stable VFO tunes each 1MHz range and its linear, back lit scale makes readout easy. However, in addition to this dial, Trio have also provided 5 digit true frequency digital readout so as to guarantee spot on accuracy on any frequency. As a further feature, the digital display can also be switched to read time, this being derived from a quartz standard. Marvellous for accurate log keeping. The display uses high intensity readout units which can be dimmed for use in low light conditions.

As for what else is inside this superb instrument—selectivity is catered for by three custom made IF filters; a 12kHz wide AM filter; 6kHz narrow AM filter; and a new 2·7kHz SSB filter with a shape factor of better than 1:2 6:60dB. Selectable sidebands are available at the touch of a switch.

For the first time in a mid price receiver, a true noise blanker is provided to remove pulse type ignition noise.

To minimise front end overload, a step RF attenuator is included which gives 0-60dB attenuation in four steps.

All the rear panel connectors are recessed on a sloping panel so that you can stand the receiver either on its back, or pushed hard against a wall when used in conventional shelf mounting. The antenna inputs allow the use of either a high impedance wire aerial or a 50ohm balanced input so that the proverbial long lump of wire will work really well with the R-1000.

Almost forgot—the R-1000 will work from either 12V dc or any mains supply from 100-240V 50/60Hz so you can really take it anywhere with you.

We're not too convinced about the carrying handle but the people we asked were divided almost 50:50 on this aspect so—leave it on. After all, the design allows it to be folded away out of sight!

How big? 300mm wide × 115mm high × 218mm deep
How heavy? 5·5Kg (about 12lb)
How much? Not yet decided but about **£295.00**, including V.A.T.
How soon? Get thi' name down now. Demand will outstrip supply.

The basic features of the R-1000 do not tell the full story, because you cannot explain the superb "feel" of the receiver until you can handle it in the flesh. So, the advice is to see it soon at Lowe Electronics in Matlock.

### HEAD OFFICE AND SERVICE CENTRE

**119 CAVENDISH ROAD, MATLOCK, DERBYS. TEL: 0629-2817 or 2430. TELEX 377482. OPEN 9-5.30 TUES-SAT. PHONE IN 9am-9pm.**

For personal attention on the South Coast contact John, G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Ringmer 812071.

For equally helpful attention in Scotland contact Sim, GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. 041-771 0364.

**FOR ALL THAT'S BEST IN HAM RADIO CONTACT US AT MATLOCK ANYTIME**

# ICOM..... Simply the Best

## There's not much more you can say!

It's over five years since we started to represent ICOM in the UK—and since then thousands of UK amateurs have bought it, tried it, and liked it. We are proud to represent Icom here and do our best to provide the back-up service which a product of this quality deserves. We have a service department to be proud of, with up to date (and expensive) test equipment, plus engineers whose job it is to know Icom equipment. If you can get over to see us, we will be pleased to demonstrate the range and let you operate our station (if you are licensed). If you find Kent too far away and would like to see before you buy then why not visit one of our agents and dealers scattered throughout the country.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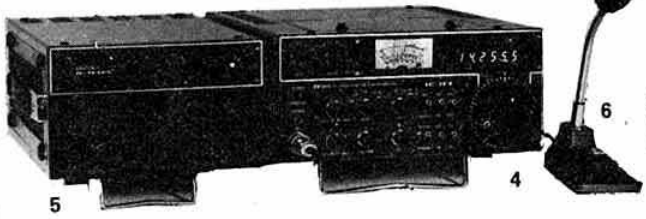
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**AGENTS** (PHONE FIRST—All evenings and weekends only, except Norfolk and Burnley)
**Scotland**—Jack GM8GEC (031-665 2420) **Wales**—Tony GW3FKO (0222 702982)
**Burnley**—(0282 38481) **Midlands**—Tony G8AVH (021-329 2305)
**North West**—Gordon G3LEQ (Knutsford (0565) 4040) **Yorkshire**—Peter G3TPX (022678 2517)

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BARCLAYCARD VISA

# THANET ELECTRONICS

**143 Reculver Road, Beltinge, Herne Bay, Kent (02273 63859)**

Access

ICOM®

**DAVE G4ELP**

# THERE WILL SOON BE A CHOICE OF THREE ICOM SYNTHESIZED FM MOBILE RIGS FOR 2 METRES AS WELL AS THE IC-245E—WHICH COVERS FM AND SSB!


## IC-240 THE FAMOUS ONE

So well known that it is hardly necessary to say much about it! We told you a lot about it in September's issue so just as a reminder here are the main points:

- ★ Easy to use on the move without looking.
- ★ 22 Programmable channels—15 popular ones already done and seven for you to program to your own choice.
- ★ Full reverse repeat at the flick of a switch.
- ★ Dial calibrated in channel numbers for factory programmed channels.
- ★ Automatic tone burst which operates on 'Repeat' mode.
- ★ Superb quality and performance—as thousands of owners will confirm.
- ★ Excellent value for money.

## IC-280E THE REMOTEABLE ONE

Again we have often talked about this model before and there are now many in use. The scanning version is particularly popular and many find the 280 ideal for mounting in 'awkward' cars because of the remote facility. Main points are:

- ★ 80 channels in 25kHz steps.
- ★ LED frequency readout.
- ★ 3 programmable memories.
- ★ Complete front panel can be mounted remotely from the rest of the set by using the CK28 extension kit.
- ★ Scanner available for only £10 extra—this then also provides auto tone burst and instant facility for listening on the repeater input.


## IC-255E THE NEW ONE


So new that they aren't available in the UK yet—so this is just to whet your appetite! We will have a demo model on show at Leicester. Features (to the best of our knowledge until we get the sample) are:

- ★ 25 watt output (1 watt low power).
- ★ 5 Memories.
- ★ 2 VFOs.
- ★ Built in scanner (with optional mic for scan control from the mic). Can scan the whole band, a selected portion, or just the memories.
- ★ Normal and reverse repeat—600kHz shift built in plus another user programmable shift, from the front panel (for 70cm transverting?).
- ★ Size 64 × 185 × 223mm.
- ★ **Price about £255.**

**WHICHEVER YOU CHOOSE YOU CAN'T GO WRONG WITH ICOM**

**FROM THANET ELECTRONICS OF COURSE**

DELTA OSCAR NANCY TANGO
FOXTROT OSCAR ROMEO GOLF ECHO TANGO

**NIE ZAPOMNIJ—PAID ANGHOFIO—NICHT VERGESSEN—NE FORGESU—N'OUBLIEZ PAS**

# DON'T FORGET

Whatever language you speak, you will be in very good company at the

# ARRA
## EIGHTH NATIONAL
# AMATEUR RADIO
## and
# ELECTRONICS EXHIBITION

## at the
## Granby Halls, Leicester
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£500 in Voucher Prizes PLUS Free Raffle prizes at 14.00, 15.00, 16.00 and 17.00 hrs each day.

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**DON'T FORGET — INDISPUTEDLY THE FINEST SHOW IN EUROPE!!**

# WATERS & STANTON ELECTRONICS

## FDK MULTI-700E

### THE PERFECT 2M FM MOBILE TRANSCEIVER

**12½kHz or 25kHz + 25 Watts**
**£229 inc. VAT & Delivery**


When a transceiver has so many more features than its rivals and yet sells for less than most, then surely it can be rightly described as the "best buy" for 1979. Truly a concept of design that looks to the future as well as the present. Its powerful 25 watts makes it twice as powerful as its competitors and ensures more solid QSO's. 2 RF stages in the receiver ensure that the high power is matched by the most sensitive receiver on the market. No more xtals to buy, the Multi 700E comes 144·75 to 145·975MHz in 25kHz click tuned channels. And for the 1980's 12½kHz channels can be interspaced at the touch of a button. Repeater operation is taken care of at the flick of a switch for either normal repeater mode or reverse mode for listening on the input channel. Automatic xtal controlled tone-burst is built in and the power output is continuously variable down to 1 watt. Altogether a remarkable transceiver at an amazing price. Included in the package is a quick release mobile bracket, matching microphone, mounting hardware kit, DC fused lead and English operating manual. Send SAE for full details of the "PERFECT" rig.

## HOLD IT!

### FDK PALM IV

### 1 WATT 6 CHANNEL 70cms HAND-HELD

Another first from our Japanese factory. The smallest, cheapest and finest 70cms hand-held ever to be offered to the radio amateur. And if we sound enthusiastic about this delightful little package, you're right. Look at what £159 buys—Palm IV fitted SU20; 6 channel capability; simplex, plus and minus 1·6MHz shift; single xtal per channel (£3); xtal controlled automatic tone-burst; quarter wave flexible BNC whip; ni-cad rechargeable battery pack; 240V AC mains charger; external 12 volt cigar lighter; power cord; built in condenser microphone; 1 watt output and English operating manual. This is the ultimate in portability and slips easily into one's coat pocket. Optional accessories include, leather case, HP7 external battery pouch for prolonged life and all the popular simplex and repeater channels ex-stock (£3 each or 5 for £12!)

**£159 inc. 15% VAT**
**ex-stock**


### STOP PRESS!

Mobile safety mics back in stock complete with boom and gear lever switching boxes. State transceiver model when ordering. **£20.95** inc. VAT.

# WATERS & STANTON ELECTRONICS

# TRIO HAS COME TO THE SOUTH EAST

TRIO

APPROVED TRIO DEALER

ALL PRICES INCLUDE 15% VAT

TRIO TS120V £408
TS120S £495

**SOLID STATE RIG RELIABLE AT LAST**

Up until now there has been a natural reluctance to accept solid state HF rigs as anything but a second rig or mobile unit with dubious reliability of the PA devices. Now at last the new TS120 series gives you 80-10 metre coverage at either 10 watts output or 100 watts output. Digital readout and variable selectivity are just two features that put them in a class above any other solid state rig we know of (apart from the TS180S)—even those costing nearly £1,000. The TS120 will put to shame many of the older valve PA designs and can confidently be regarded as a good reliable base or mobile station—and no tune-up means instant QSY from band to band at the flick of a switch.

**THE DX OPERATOR'S EXECUTIVE RIG**

## TRIO TS820S £832

The Trio TS820S must be the HF operators dream come true. Many superlatives have been used to describe it and all are justly deserved. It's the transceiver that you'll hear from about every corner of the World with its distinctive, clean, crisp audio. A most effective RF processor ensures a remarkable improvement in readability under QRM conditions without any degradation of quality and RF negative feedback produces just about the cleanest signal you'll find anywhere. 160-10 metres, 200 watts PEP input and 0·2uv for 10dB S-N all add up to an enviable package. Add to this the digital readout display and unique selectivity obtained by "bandpass tuning" of the IF section produces a transceiver that is today's DX operator's No. 1 choice. For further information or credit terms, just drop us an S.A.E.

**THE COMPLETE HF STATION**

## TRIO TS520S £542

The TS520 is now the most widely sold HF rig in the World. Just listen for a while on the HF bands and you'll realise just how many TS520's there are about. Full 6 band coverage of 160-10 metres with 200 watts PEP input and built-in speech compressor will get your signal around the World with ease. And, of course, the TS520 gives you a remarkable receiver performance to match. With the TS520 you are buying the best engineered HF rig in its price bracket—and that's our own opinion having tried them all! Ask any owner of a TS520 what he thinks of it—he'll tell you his only regret is all the QSO's he lost by not changing to Trio before! If you have a limited budget yet want performance and a rig that will hold its price, then the TS520 is your choice.

**THE MOBILE RIG WITH 80 CHANNELS**

## TRIO TR7500 £240

The TR7500 2 metre FM transceiver combines simplicity of operation with advanced design. Full coverage of 144-146MHz in 80 × 25kHz channels means no more crystals to buy. Dial indication meets the modern operator's requirements—if you want S20 you simply dial "20". For R6 you simply dial "6"—if you're one of those operators who finds channel numbers easier to use than frequency readout, then we can recommend this as a "best buy". Reverse repeater operation is, of course, a single switch action—as it should be. The package comes complete with microphone, mounting bracket and DC leads.
Performance is equal to the best in a remarkably small package—15-18 watts transmitter output and better than 0·2uv sensitivity matched with the unparalleled Trio quality and attention to detail makes the TR7500 hard to beat.

**THE IDEAL STARTER RIG!**

## TRIO TR2300 £199

The TR2300 is a remarkable package which combines all the advantages of a portable station with those of a mobile transceiver. In many ways it's the ideal "starter rig" in amateur radio. Full band coverage from 144-146MHz in 80 × 25kHz channels plus 600kHz repeater shift and 1750Hz automatic tone-burst complete its versatility.
The dial is directly calibrated in frequency and has illumination for night use. The transmitter is exceptionally clean with an output power in excess of 1 watt. Receiver sensitivity is every bit as good as the best mobile rigs and either internal batteries or an external DC source may be used. Fits easily into a suitcase or on the corner of a desk and makes a really compact mobile rig. Price includes carrying case, shoulder strap, battery charger, external DC cord and, of course, the Waters & Stanton 12 month warranty. An absolute bargain—we even sell them to our staff!

# WATERS & STANTON ELECTRONICS

# WE'VE MOVED!

By the time you read this we should be firmly established in our new premises. The ground floor will comprise display, retail, and demonstration areas for our ever increasing range of products. The first floor will be devoted to increasing our mail order and back-up service to customers comprising mail order despatch area, office and administration area, newly equipped multi-thousand pound service department and pre-delivery test section, and of course warehouse unit. Hopefully we shall have succeeded in moving with the minimum of inconvenience to our customers and certainly upon completion we now have the most modern and well equipped premises in the South of England including our own private car park. Our main telephone number remains Hockley (03 704) 6835 and any mail addressed to our old premises at 31 Spa Road will automatically be re-directed to 18-20 Main Road Hockley. How to find us? – as you descend the hill into Hockley, look to the left and we are the first double-fronted shop in the new office and shop development.

**TRIO**

| | |
|---|---|
| TS820S 160-10m transceiver 200w digital | £832.00 (3.75) |
| TS820 160-10m less digital | £710.00 (3.75) |
| SP820 External speaker | £39.00 (1.50) |
| TS520S 160-10m transceiver 200w | £542.00 (3.75) |
| SP520 External speaker | £18.00 (1.25) |
| VFO520S External VFO | £103.00 (3.75) |
| TS120S 80-10m Solid state 200w | £495.00 (3.75) |
| TS120V 80-10m Solid state 10w | £408.00 (3.75) |
| PS20 AC PSU (TS120V) | £52.00 (3.75) |
| PS30 AV PSU (TS120s & TS180s) | £98.00 (3.75) |
| MB100 Mobile mount | £17.00 (0.75) |
| AT200 1·8-30MHz ATU | £95.00 (1.50) |
| MC50 Desk microphone (Super!) | £27.50 (1.50) |
| MC30S Noise cancelling hand mic. | £13.30 (0.50) |
| TS770 2m/70cm all mode transceiver | t.b.a |
| TR7500 2m FM mobile 10w 80ch. | £240.00 (3.75) |
| TR2300 2m FM portable 80ch. | £199.00 (3.75) |
| MB2 Mobile mount (2300) | £18.90 (1.00) |
| TS180s 160-10m solid state transceiver | £825.00 (3.75) |
| TR3200 70cm portable 3 ch. fitted | £190.00 (3.75) |

**YAESU**

| | |
|---|---|
| FRG-7 General coverage receiver | £214.00 (N/C) |
| FRG-700 Digital readout receiver | £375.00 (N/C) |

**LOWE RECEIVER**

| | |
|---|---|
| SRX30 0·5-30MHz AM/SSB/CW | £178.00 (N/C) |

**ICOM (NOTE NEW PRICES!)**

| | |
|---|---|
| IC215E 2mFM 3 watt 12 chs | £162.50 (N/C) |
| IC202S 2m SSB 3 watt portable | £199.00 (N/C) |
| IC240 2m 22 ch's 10 watts | £193.00 (N/C) |
| IC280E 2m FM 80 ch's 10 watts | £250.00 (N/C) |
| IC211E 2m All mode transceiver | £549.00 (N/C) |

**MICROWAVE MODULES (NEW PRICES)**

| | |
|---|---|
| MMT 432/28-S transverter | £136.75 (N/C) |
| MMT 432/144-R transverter | £173.50 (N/C) |
| MMT 144/28 transverter | £90.75 (N/C) |
| MMC 144/2-4; 4-6 or 28-30 IF | £21.85 (N/C) |
| MMC 144/28 LO converter | £24.15 (N/C) |
| MMC 70/28 converter | £21.85 (N/C) |
| MMC 70/28 LO converter | £24.15 (N/C) |
| MMC 432/28 S converter | £29.90 (N/C) |
| MMC 432/144 S converter | £29.90 (N/C) |
| MMC 1296/144 or 28 converter | £32.00 (N/C) |
| MMC 28/144 10m up converter | £20.70 (N/C) |
| MMD 050/500mHz counter | £69.00 (N/C) |
| MMA 144 2m pre-amp | £14.90 (N/C) |
| MMD 500P 500mHz pre-scaler | £23.00 (N/C) |
| MMV 1296 varactor tripler | £34.50 (N/C) |
| MML 144/100w linear amplifier | £142.50 (N/C) |
| MML 432/100w linear amplifier | £228.00 (N/C) |
| MML 144/25W | £48.30 (N/C) |

**SEM**

| | |
|---|---|
| 2m converters | £23.00 (N/C) |
| 70cms converters | £23.00 (N/C) |
| 2m pre-amp | £13.22 (N/C) |
| 2m auto switching pre-amp | £17.83 (N/C) |
| 70 cms auto switching pre-amp | £20.90 (N/C) |
| 2m PA3 pre-amp | £8.00 (N/C) |
| 70cm PA3 pre-amp | £10.00 (N/C) |
| 2m 48 watt linear/pre-amp | £66.70 (0.95) |
| So23q sockets | £1.73 extra |
| HF auto pre-amp 2-40mHz | £14.95 (N/C) |
| HF pre-amp 2-40mHz | £10.90 (N/C) |
| HF Z-MATCH ATU 80-10m | £40.25 (1.00) |

**VHF MONITOR Rx's**

| | |
|---|---|
| TM56B 12v/240 AC auto scan 10 ch's | £106.00 (N/C) |
| TM56B Marine model | £115.00 (N/C) |
| SR9 12v DC Amateur model | £48.00 (N/C) |
| Extra xtals | £2.45 (N/C) |

**FDK**

| | |
|---|---|
| Multi 3000 2m All mode | £519.00 (N/C) |
| Multi 800D 2m 25 watts | £289.00 (N/C) |
| Multi 700E 2m 25 watts | £229.00 (N/C) |
| Multi Palm II 2m hand-held special package | £139.95 (N/C) |
| Multi Palm II 70cm handheld | £159.00 (N/C) |
| M-11/Q16 xtals £5.00 Palm II xtals £2.95 | |
| Multi-Palmsizer 2m synthesised 40 channel hand-held | £159.00 (N/C) |

**DENTRON**

| | |
|---|---|
| MLA 2500 160-10m 2Kw linear | £699.00 (N/C) |
| MT3000A 3Kw 160-10m tuner | £280.00 (N/C) |
| MT2000A 3Kw 160-10m tuner | £180.00 (N/C) |
| 160-10AT Supertuner 1Kw | £99.95 (N/C) |
| JR Monitor 160-10m tuner 300w | £59.95 (N/C) |
| W-2 160-10m PEP/SWR meter | £59.95 (N/C) |
| MT 200A Transceiver | £399.00 (N/C) |
| 1Kw 80-10m linear 240v GLA 1000 | £295.00 (N/C) |

**AR**

| | |
|---|---|
| AR240 Synthesised hand-portable | £199.00 (N/C) |

**MIZUHO**

| | |
|---|---|
| 2m SSB 1 watt portable | £165.00 (N/C) |
| Extra xtals | £3.00 |

**NAIGAI**

| | |
|---|---|
| 2200 2m 500w PIP linear | £485.00 (N/C) |

**ADONIS MICROPHONES**

| | |
|---|---|
| AM802G Compressor - 3 outputs | £59.95 (N/C) |
| AM502G Compressor - 1 output | £39.95 (N/C) |

**ASP MOBILE ANTENNAS**

| | |
|---|---|
| 201 - 2m ¼ wave | £3.50 (1.00) |
| 2009 - 2m 5/8th wave | £9.25 (1.00) |
| 677 - 2m 5/8th wave deluxe | £14.95 (1.00) |
| 462-70cms colinear | £8.25 (1.00) |
| 667 - 70cms colinear deluxe | £17.95 (1.00) |
| Magnetic base and cable | £8.50 (1.00) |
| "No-hole" boot mounts | £3.75 (0.50) |

**HF ANTENNAS**

| | |
|---|---|
| HQ-1 20-15-10m mini-quad | £96.50 (2.50) |
| C4 20-15-10m vertical | £48.50 (2.00) |
| Mosley 20-15-10m mini-beam 600w | £99.00 (2.00) |
| Mosley 2Kw version | £129.00 (2.00) |
| TA32 600 watts 20-15-10m | £81.00 (2.00) |
| TA33 600 watts 20-15-10m | £118.00 (2.50) |

**All prices include VAT at 15%**
**Carriage costs shown in brackets**

| | |
|---|---|
| Mustang 2Kw 20-15-10m | £135.00 (2.50) |
| Hy-gain 12 AVQ 20-15-10m | £43.00 (2.00) |
| Hy-gain 14 AVQ 40-10m | £60.00 (2.00) |
| Hy-gain 18 AVT/WB 80-10m | £87.00 (2.25) |
| Mosley TD3JR 20-15-10m dipole | £26.00 (1.00) |
| Mosley RD5 SWL ham dipole | £31.00 (1.00) |
| EL-40X 80-40 Mini dipole | £39.50 (1.00) |
| HF5 5 band vertical | £41.50 (1.00) |

**VHF ANTENNAS (JAYBEAM)**

| | |
|---|---|
| 4Y/4M 4el yagi | £14.95 (2.00) |
| C5/2M 5db colinear | £35.65 (2.00) |
| 5Y/2M 5el yagi | £8.85 (1.50) |
| 8Y/2M 8el yagi | £11.50 (1.50) |
| 10Y/2M 10el yagi | £24.75 (2.00) |
| PBM10/2M 10el parabeam | £29.90 (2.00) |
| PBM14/2M 14el parabeam | £36.30 (2.50) |
| 5XY/2M X'd 5 element | £18.40 (1.50) |
| 8XY/2M X'd 8 element | £23.00 (2.00) |
| 10XY/2M X'd 10 element | £30.45 (2.00) |
| Q4/2M 4el quad | £19.10 (1.50) |
| Q6/2M 6el quad | £25.30 (2.00) |
| D5/2M 5 over 5 | £15.85 (1.50) |
| D8/2M 8 over 8 | £21.15 (2.00) |
| SVMK vertical Kit | £5.75 (1.25) |
| UGP/2 Ground plane | £8.15 (1.25) |
| HO/2M 2m halo | £3.70 (0.75) |
| HM/2M Above with 24" mast | £4.50 (0.75) |
| C8/70cm 8db colinear | £45.40 (2.50) |
| D8/70cm 8 over 8 | £17.85 (2.00) |
| PBM18/70 18 el parabeam | £21.45 (2.00) |
| MBM/48 70 el Multibeam | £25.00 (2.00) |
| MBM88/70 88 el Multibeam | £33.30 (2.00) |
| 8XY/70 8 el X'd yagi | £27.70 (1.50) |
| 12XY/70 12 el X'd yagi | £34.20 (2.00) |
| D15/1296 15 over 15 | £26.90 (1.50) |

**ACCESSORIES**

| | |
|---|---|
| 9502 rotator | £51.00 (1.75) |
| KR400 rotator | £97.00 (2.00) |
| AR40 rotator | £54.50 (1.50) |
| Stolle 2030 rotator | £55.00 (1.50) |
| Stolle 2010 rotator | £50.00 (1.50) |
| CDE44 rotator | £109.00 (2.00) |
| HAM-M MkIII rotator | £159.50 (2.00) |
| Shure 444 microphone | £27.50 (0.75) |
| Shure 201 microphone | £11.75 (0.75) |
| Shure 526T microphone Type II | £36.35 (0.75) |
| Hand morse key | £9.70 (0.50) |
| EK121 Electronic "Bug" | £31.00 (0.75) |
| 50ohm balun | £11.25 (0.50) |
| UR67 per metre | £0.62 (0.05) |
| UR43 per metre | £0.22 (0.03) |
| 5 core cable per metre | £0.30 (0.03) |
| HP3A high pass filter | £3.00 (0.20) |
| Drake low pass filter | £18.40 (0.75) |
| TV1 ferrite rings | £0.35 (0.05) |
| Plastic antenna insulators | £0.25 (0.05) |
| Twin SWR meters 3-150mHz | £13.50 (0.50) |

**JAYBEAM (HF)**

| | |
|---|---|
| TB 3 ele 2kW Beam | £155.00 (2.00) |
| VR3 Triband vertical | £39.00 (2.00) |

**HILOMAST LTD**

| | |
|---|---|
| PNAM-1 Telescopes to 9m | £244.00 (14.00) |
| PNAM-2 Telescopes to 14¼m | £299.00 (15.00) |
| SAE for details. | |

MONDAY–SATURDAY 9-5·30 **THE COMPLETE HAM RADIO CENTRE** EARLY CLOSING WED 1·00pm

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# KYOKUTO

KYOKUTO DENSHI COMPANY LIMITED

## KDK FM2016E 2m FM DIGITAL SYNTHESIZED TRANSCEIVER


The KDK FM-2016E is a 12V DC two metre FM transceiver for mobile and base station use. It has been compactly designed with emphasis on maintenance and ease of use by using the latest CMOS IC digital PLL circuitry.

Rx 144·000–148·995MHz and Tx 144·000– 145·995MHz.

Direct readout of operating frequencies by large size LEDs.

The most commonly used, 100kHz and 10kHz, switches are mounted coaxially. These will not go below the 0 or above 9 position facilitating frequency changing by feel only, for "eyes-on-the-road" motoring and use by those with impaired sight.

An electronic memory using CMOS RAMs (Random access memory ICs drawing only 25nA!) allows any four out of the 1,000 channels to be written-in (stored) at a flick of a switch. An auto-charging back up NiCad battery maintains the RAMs contents after disconnection from the power.

The plus 600kHz and minus 600kHz positions of the mode switch provide for normal repeater operation. In position 1T–2R the set Tx's on the frequency in memory channel 1 and Rx's on memory channel 2 (likewise the 3T–4R position). This provides for non-standard shifts, and is also convenient for use in conjunction with up-converters.

The memory may be scanned in the "closed" mode, (the scanner will stop at the first channel in use) or in the 'open' mode, (stopping at the first empty channel). Scan-hold allows transmission immediately the scanner stops.

Dual-gate MOS-FETs are used for the RF and mixer to provide superior inter-modulation characteristics with high sensitivity. Performance is held constant across the wide frequency range covered, by automatic electronic tuning.

A monolithic crystal in the first IF and a commercial quality 15-pole ceramic filter in the 2nd IF provides extremely sharp selectivity. The 2nd IF is built with discrete components to keep stray coupling to a minimum and a ceramic discriminator has been adopted for excellent temperature stability and long-term alignment.

The RIT (Receiver incremental tuning) and centre zero meter are useful for contacts with off-frequency or drifting stations.

The single conversion transmitter uses a balanced mixer, five stages of electronic tuning, and a four-stage low pass filter for a clean, spurious-free signal.

The ultra-modern silicon transistor in the final will survive even an infinite VSWR.

Power: HIGH (15 Watts) and LOW (1 Watt), is selectable by a front panel switch (useful with a linear).

Direct FM of the VCO results in superb audio.

A two mode (burst or continuous) tone generator is adjustable from 1,750 to sub-audible frequencies.

A 5-pin "DIN" connector is provided on the rear panel for a KDK SC-12A SELCALL (tone encoder-decoder) unit, headset-microphone combinations or similar.

**£250** inc. VAT at 15% (£217.39 + VAT) **SEE ONE TODAY**

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**PEAK READING VHF WATTMETER**

50 TO 200MHz
50, 500, 1,500W

Peak (PEP) or Average (RMS) readings. Remote coupler mounting possible.

**£79.00** (p&p free) (+VAT 15%)

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USES 3 CORE CABLE
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MOTOR

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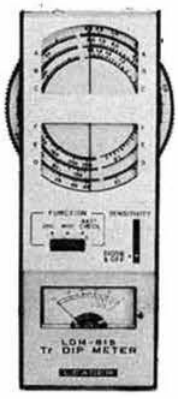

## LDM 815

**DIP METER ABSORPTION METER**

1·5–250MHz
XTAL TEST

Neat self-contained plug-in coils. Reliable instrument.

**£45.00** (p&p free) (+VAT 15%)

## HF12

**VHF RECEIVER POCKET SIZE**

12 CHANNEL
130–170MHz

Supplied c/w case, charger, NiCds, etc. S(20, 21, 22, 23) and R(0, 1, 2, 3, 4, 5. 6. 7).

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**LINEAR AMPLIFIER**

144–148MHz
80W output
12VDC 10–12A
10W Nom Drive
RF switching
Remote control
All modes
SSB/FM switch
E310 2·5dB Amp
Pre amp switch
10dB RF gain
$5\frac{3}{8}$" × 3" × 8"

**£99.00** (p&p free) (+VAT 15%)

**RC1 £15.** (p&p free) (+VAT 15%)

## KLM PA15-160BL

**LINEAR AMPLIFIER**

144–148MHz
160W output
12VDC
15W max drive
RF switching
Manual switch
All modes
Over temp prot
Good heatsink
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Circuit Breaker
10" × 7" × $2\frac{1}{4}$"

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### ASCOT ANTENNAS VHF MOBILE (Carriage £0.95) + VAT 15%

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 340 | ¼λ | Standard Base | £2.10 | 085 | ¼ & ⅝ | Cable Assembly | £2.80 |
| 310 | ¼λ | Swivel Base | £3.50 | 095 | ¼ & ⅝ | Fibreglass Mount | £2.10 |
| 344 | ¼λ | Sprung Base | £5.55 | 092 | ¼ & ⅝ | Magnetic Mount | £8.95 |
| 440 | ⅝λ 2m | Standard Base | £3.50 | 084 | ¼λ | Cable Assembly | £4.15 |
| 330 | ⅝λ 2m | Swivel Base | £4.45 | 088 | ¼λ | Cowl Mount | £4.95 |
| 341 | ⅝λ 2m | Sprung Base | £6.65 | 091 | ¼λ | Magnetic Mount | £9.80 |
| 350 | ¼λ 2m | Fine Tune Base | £7.15 | 089 | | Gutter Mount | £4.75 |
| 351 | ¼λ 2m | Sprung 350 Base | £8.25 | 093 | | Boot mount | £2.90 |
| 057 | | 127cm Tapered Whip | £1.95 | 031 | | Blank off ¼λ & ⅝λ | £0.80 |
| 056 | | 63cm Parallel Whip | £0.95 | 044 | | Blank off ¼λ | £0.45 |

### BANTEX VHF MOBILE ANTENNAS (Carriage £0.90) + VAT 15%

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 42SS | ¼λ 4m | Stainless whip | £1.75 | B5U | ¼λ | 70cm whip | £2.10 |
| 40GF | ¼λ 4m | Glass whip | £3.55 | UCL | ¼ & ½ | 70cm Colinear | £6.45 |
| 20SS | ¼λ 2m | Stainless whip | £1.50 | UDL | ⅝ & ½ | 70cm Colinear | £11.95 |
| 18GF | ¼λ 2m | Glass whip | £2.80 | BM | | Standard base ½" | £1.65 |
| B5 | ⅝λ 2m | Glass whip | £7.75 | BC | | Claw base | £3.50 |
| BGASS | ¼λ 2m | Stainless whip | £8.60 | BD | | Trunk lip base | £5.50 |
| BGAGF | ¼λ 2m | Glass whip | £9.10 | BMM | | Magnetic base | £10.95 |

### CUSHCRAFT VHF OMNI ANTENNAS (Carriage £0.90) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| ARX2 | Ringo Ranger 2m | £21.50 | ARX450 | Ringo Ranger 70m | £21.50 |
| AR2 | Ringo 3dB ¼ 2m | £12.75 | CX1000 | Ringo 3dB 10m | £25.75 |
| AR25 | QRO AR2 | £15.00 | ABW144 | Big wheel 2m | £14.50 |

### H-SMC (Carriage £1.60) + VAT 15% See opposite page also

| | | | | | |
|---|---|---|---|---|---|
| GDX1 | Discone 80 480MHz | £37.50 | 250/28 | 10M base loaded | £11.75 |
| GDX2 | Discone 50 480MHz | £39.50 | 260/144 | 2m, ⅝ λ Gutter clip | £17.15 |
| LT606 | LogP 50-500MHz | £75.95 | 260/70 | 4m, ⅝ λ Gutter clip | £17.15 |

### JAYBEAM VHF FIXED ANTS (Carriage about £1.00) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| 4Y/4M | 4 element yagi | £13.00 | 5XY/2M | 5 element crossed | £16.00 |
| PMH2/4M | 2 way harness | £9.20 | 8XY/2M | 8 element crossed | £20.00 |
| D15/23 | 15 over 15 slot | £23.40 | 10XY/2M | 10 element crossed | £26.50 |
| UGP/2M | Ground Plane | £7.10 | PMH2/C | Circular harness | £5.20 |
| C5/2M | Vert Colinear | £31.00 | PMH2/2M | 2 way harness | £6.85 |
| 5Y/2M | 5 element yagi | £7.70 | PMH4/2M | 4 way harness | £7.85 |
| 8Y/2M | 8 element yagi | £10.00 | C8/70 | Vert. Colinear | £39.50 |
| 10Y/2M | 10 ele long yagi | £21.50 | D8/70 | 8 over 8, slot fed | £15.50 |
| 14Y/2M | 14 ele long yagi | £27.50 | PBM18/70 | 18 ele. Parabeam | £18.70 |
| PBM10/2M | 10 ele Parabeam | £26.00 | MBM48/70 | 48 ele. Multibeam | £21.80 |
| PBM14/2M | 14 ele Parabeam | £31.60 | MBM88/70 | 88 ele. Multibeam | £29.00 |
| Q4/2M | 4 element quad | £16.60 | 8XY/70 | 8 element crossed | 20.00 |
| Q6/2M | 6 element quad | £22.00 | 12XY/2M | 12 element crossed | £29.80 |
| D5/2M | 5 over 5, slot fed | £13.80 | PMH2/70 | 2 way harness | £5.90 |
| D8/2M | 8 over 8, slot fed | £18.40 | PMH4/70 | 4 way harness | £12.40 |

### G-WHIP HF MOBILE ANTENNAS (Carriage £0.95) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| TRIBANDER | 10-20M Slide | £20.00 | FLEXIWHIP | 10M Mast | £14.40 |
| LFCOIL | 40/80/160M | each £5.70 | FF | 15/20/40/80/160M each | £5.70 |
| LFWHIP | Telescopic | £2.60 | GW BASE | Standard base | £3.65 |
| MULTIMOBILE | 10-20M Auto | £23.00 | 35BASE | Heavy Duty base | £5.00 |
| MMCOIL | 40/80/160M | each £5.70 | TA | 35 to G-Whip | £0.80 |
| MMWHIP | Telescopic | £2.60 | EXTENDAROD | Extension | £9.50 |

### GEM QUAD FIBREGLASS 10-20M (Carriage £2·£9) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| GQ2E | 2 Element quad | £124.00 | GQ4E | 4 Element quad | £249.00 |
| GQ3E | 3 Element quad | £187.00 | GQCK1 | 1 Element Conversion kit | £63.00 |

### MOSLEY TRI-BAND BEAMS (Carriage £3.50) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| TA32 | 2 ele. 200W RMS | £70.00 | MUSTANG2 | 2 ele. 1KW RMS | £95.00 |
| TA33 | 3 ele. 200W RMS | £105.00 | MUSTANG3 | 3 ele. 1KW RMS | £130.00 |

### SMC TRAPPED DIPOLES 10-80M. (Post £0.75) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| S500 | Standard – 14 SWG | £26.50 | P500 | Portable – Cu/Terylene | |
| HP1K | High Power – 14 SWG | £29.00 | | braid, c/w 75ft feeder | £32.50 |

### WIRE & BRAIDS (Post and Packing extra) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| 7/029H | Cu Hard Drawn | yd £0.15 | 14 SWG | Cu Hard Drawn | yd £0.13 |
| 7/036H | Cu Hard Drawn | yd £0.18 | BRAID | Cu/Terylene, ¼" | yd £0.14 |
| 7/044H | Cu Hard Drawn | yd £0.24 | 7/029S | Cu Soft Drawn | yd £0.13 |

### AERIAL INSULATORS (Post Extra) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| SMCP1 | 3" Polyprop. ribbed | £0.37 | EGG1 | 1½" Egg porcelain | £0.33 |
| SMCP2 | 8½" polyprop. ribbed | £1.85 | IP3 | 3" Porcelain ribbed | £0.48 |

### WIGHTRAPS AERIAL TRAPS (Post £0.40) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| WTS | Standard – White | £5.85 | WHTB | "Space Saver", 3·5MHz | |
| WTHP | High Power – Blue | £8.25 | WTTB | resonance, for 1·8MHz | £7.50 |

### BALUNS 3-30MHz (Post £0.50) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| BN86 | 1:1, "U" bolt mount | £13.50 | W2AU1 | 1:1, c/w spark gap | £9.50 |
| HIQ | 1:1, "Hang up" Type | £8.70 | W2AU4 | 4:1, c/w spark gap | £9.50 |

### LIGHTNING ARRESTORS COAXIAL (Post £0.30) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| SM566 | Spark, SO239/PL259 | £2.55 | NSK7S | Gas, SO239/SO239 | £7.50 |
| SM567 | Spark, SO239/SO239 | £2.55 | LA1 | Gas, Bulkhead | £39.50 |

### CABLES RF FEEDERS (Carriage extra) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| RG58U | 50Ω 0·2" Stranded | yd £0.18 | 307EP | 75Ω "Economy" | yd £0.12 |
| UR43 | 50Ω 0·2" Solid | yd £0.17 | UR70 | 75Ω 0·225" Stranded | yd £0.18 |
| UR76 | 50Ω 0·2" Stranded | yd £0.17 | UR39 | 75Ω 0·306" Medium | yd £0.27 |
| UR67 | 50Ω 0·405" Heavy | yd £0.42 | UR57 | 75Ω 0·405" Heavy | yd £0.45 |
| RG213 | 50Ω 0·405" Heavy | yd £0.42 | 302 | 75Ω Flat twin | yd £0.11 |
| 306 | 300Ω Ribbon | yd £0.12 | 3X21 | 240Ω Oval twin | yd £0.08 |

### COAX PLUGS UHF (Post and Packing £0.20) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| PL259 | Standard UHF plug | £0.48 | SO239 | Free angle UR43 | £0.88 |
| UG175/U | Reducer UR43 | £0.12 | PL258 | Back-back, female | £0.79 |
| UG175/U | Reducer UR70 | £0.12 | PL274 | Back-back, chassis | £0.93 |
| PL259R | "Reduced" plug | £0.58 | | Back-back, male | £1.20 |
| PL259SL | "Solderless" UR67 | £0.55 | M359 | Angle (1m + 1f) | £0.93 |
| PL259SS | "Solderless" UR43 | £0.55 | | "T" (3 females) | £1.48 |
| PL259P | Push-on plug | £0.69 | M358 | "T" (2 fem. 1 male) | £1.20 |
| PL259E | Elbow plug UR43 | £0.83 | | 4-way (3 fem. 1 male) | £1.85 |
| | Panel mount PL259 | £0.93 | | SO239/Car + phono | £0.60 |
| SO239F | 4 hole socket | £0.42 | | SO239/2·5mm Jack | £0.69 |
| SO239T | 2 hole socket | £0.42 | | SO239/3·5mm Jack | £0.69 |
| SO239NI | Socket "nut" inside | £0.51 | 255/U | SO239/BNC male | £1.53 |
| SO239NO | Socket "nut" out | £0.51 | 273/U | SO239/BNC fem. | £1.53 |

### COAX PLUGS BNC (Post £0.20) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| UG88 | Plug, Stnd UR43 | £0.54 | UG914 | Double male | £0.93 |
| UG959 | Plug, Large UR67 | £2.66 | UG274 | "T" 2 female, 1 male | £1.44 |
| UG291 | Socket, 4 hole stnd. | £0.56 | | "T" 3 female | £1.74 |
| UG1094 | Socket, Nut fixing | £0.56 | UG306 | Elbow adaptor | £1.62 |
| UG89 | Socket, Free, UR43 | £0.72 | 255/U | BNC male/SO239 | £1.53 |
| UG914 | Double female | £0.93 | 273/U | BNC female/PL259 | £1.53 |

### MASTING (Carriage extra) + VAT 15% (N.B. Max 20', Max BRS 13')

| | | | | | |
|---|---|---|---|---|---|
| 1¼" od | Aluminium 16g | ft £0.42 | 2" | Al. Thick wall 1⅞" | £1.05 |
| 1½" od | Aluminium 16g | ft £0.46 | 2" | Steel Galv. 1⅝" | £0.82 |

### MAST BANDS & PLATES (Carriage £0.40) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| SMP3 | 3 hole guy plate 2" | £0.85 | SMB43 | 3 hook band | £1.15 |
| SMP4 | 4 hole guy plate 2" | £1.55 | SMB151 | 4 hook band 2" | £1.65 |

### ROPES—WIRES (Post and Packing extra) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| 3mm | HT steel, 0·63T. | yd £0.18 | X150 | Rustproof, ¼" D. | 490' £16.30 |
| 4mm | HT steel, 1·5T. | yd £0.24 | 7X18g | Galvanised | 100' £4.40 |

### ROPES—TERYLENE (Post and Packing extra) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| ⅜" | BS150 lbs (circ.) | yd £0.07 | ¼" | BS1250 lbs (circ.) | yd £0.14 |
| ½" | BS650 lbs (circ.) | yd £0.10 | 1" | BS2450 lbs (circ.) | yd £0.27 |

### CABLE GRIPS (Post and Packing £0.30) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| ⅛" | Bulldog, galv. | £0.19 | HD9 | Plated brass line clamp for | |
| ¼" | Bulldog, galv. | £0.16 | | copper wire | £0.44 |

### SHACKLES (Post and packing £0.30) + VAT 15% N.B: Pin sizes given.

| | | | | | |
|---|---|---|---|---|---|
| ¼" | D galvanised | £0.24 | ⅜" | D galvanised | £0.33 |
| ⅜" | D galvanised | £0.28 | ½" | D galvanised | £0.42 |

### THIMBLES (Post and packing £0.20) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| F1235 | 1¼" Nylon, for terylene | £0.14 | 1½" | Galv. for steel | £0.13 |
| F985 | 1½" Nylon, for terylene | £0.16 | 1½" | Galv. for steel | £0.15 |

### RIGGING SCREWS TURNBUCKLES (P&P £0.30) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| | 4" × ⅜" pressed | £0.75 | | 6" × ⅝" | £2.85 |
| TPR933 | 4½" × ⅝" | £1.65 | | Miscellaneous | P.O.A. |

### GUY STAKES (Carriage £1.00) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| GS18 | 18" Angle galv. | £2.55 | GS36 | 36" "T" section, Heavy | |
| GS27 | 27" "T" galvanised | £3.75 | | Duty, Galvanised | £7.75 |

### STAND OFF BRACKETS (P&P £1.75, Sec. £2.80) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| W12 | 12" bracket | pair £6.50 | W21 | 21" bracket | pair £9.50 |
| W18 | 18" bracket | pair £8.75 | W24 | 24" bracket | pair £11.50 |
| W18HD | 18" Heavy Duty | pair £11.75 | W24HD | 24" Heavy Duty | pair £14.25 |

### RAWLBOLTS (Post and packing £0.40) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| | ¼" rawlbolt | £0.24 | | ⅜" rawlbolt | £0.42 |
| D2 | ½" rawlbolt | £0.29 | | ⅝" rawlbolt | £1.45 |

### MAST TO BOOM CLAMPS (Post and Packing £0.70) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| SMC53 | 1 2" mast, 1" boom | £1.10 | JBL73 | 1·2" mast, 1¼" boom H.D. | £1.50 |
| SMC63 | 1 2" mast, 1 1¼" boom | £1.25 | CP1 | 2" × 2", 6" × 6" plate | £2.30 |

### MISCELLANEOUS HARDWARE (P&P extra) + VAT 15%

| | | | | | |
|---|---|---|---|---|---|
| SMC59/15 | 2" mast sleeve 15" long | £4.20 | MBP | Mast Base Plate 2" | £3.40 |
| SH2 | Snap hook 2½" | £0.68 | ER4 | Earth rod 4' c/w clamp | £4.25 |
| MC1 | Mast cap cast alloy 2" | £1.85 | UB2 | U bolts 2" × ⅜" | £0.32 |


**SOUTH MIDLANDS COMMUNICATIONS LIMITED.**
OSBORNE ROAD, TOTTON
SOUTHAMPTON, SO4 4DN
Hours of business:
9-5.30 Monday Friday
9-1.00 Saturday

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| G3ZUL | Brian | Stourbridge | (03843) 5917 |
| GM8GEC | Jack | Edinburgh | (031665) 2420 |
| GI3WWY | Mervyn | Tandragee | (0762) 840656 |
| GW3TMP | Howarth | Pontybodkin | (035287) 846/324 |
| GW4GSW | Alan | Swansea | (0792) 24140 |

# Communications Ltd

**"THE COMMUNICATORS"**

YAESU

## NEW 5 BAND VERTICAL

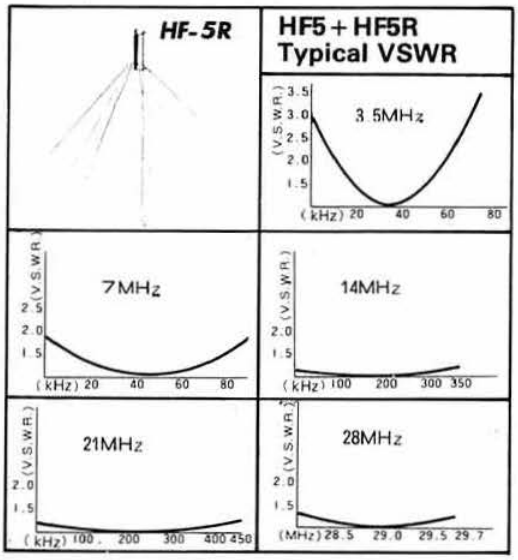
## SMCHF 5 £35 + VAT

*Part illustrated to the right*

80, 40, 20, 15, 10 metre coverage from this remarkable new antenna. Only 4·8m (15¾') high and 4·2cm in diameter, it nevertheless handles up to 500W PEP on 10, 15 and 20m. (200W PEP 40 and 80) within its 1·5:1 VSWR bandwidth. 50 ohm coaxial feed is to an inbuilt SO239 socket.

Suitable for mounting at ground level on an earth post (with or without radials), or in an elevated position (only 2·9Kg) with wire radials or better still with the HF5R (1·8Kg) radial kit.

The HF5R (max power 150W PEP) has five solid radials of very similar length (2·05 to 2·2m) that slope at 45° to the vertical.




HF5 : **£35** (+ P&P*) + VAT 15% **£40.25**
HF5R: **£20.25** (+ P&P*) + VAT 15% **£26.85**
*CARRIAGE: on either *or* both together £1.50

*10m, 15m, and 2m ⅝λ of similar construction available soon.* ▶

## VHF MOBILE AERIALS

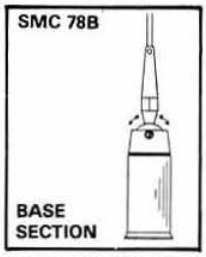
### MORE GAIN—PRACTICAL SIZE

A new range of antennas combining gain with practical construction. The base of the antenna element is a PL259M connector, handy for quick removal, tests, portable operation etc, all offer excellent VSWR, and 50 ohm feed and good bandwidth.

| | 78F | 78B | 258 |
|---|---|---|---|
| BAND | 144MHz | 144MHz | 432MHz |
| TYPE | ¼λ | ¼λ | ⅝+⅝ |
| GAIN | 4·5dB | 4·5dB | 5·5dB |
| POWER | 100W PEP | 150W PEP | 100W PEP |
| LENGTH | 1·75m | 1·72m | 0·94m |
| WEIGHT | 400gm | 440gm | 190gm |
| PRICE | £10 + 15% | £11 + 15% | £10 + 15% |

P&P on any element/antenna £1.00


Shows fold-over provision mounted on GMCA. *SMC258 generally similar.*




Shows angle adjustment ball. Recommended where RG4M is mounted directly onto car.


Cast, heavy chrome plate. GMCA £5.00 + 15% VAT (P&P £0.20—free with element)


C/w 4m. RG58 & PL259 RG4M £3.00 + 15% VAT (P&P £0.30—free with element).

Access

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

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

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

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YAESU

# FT901DM

## FOR THE PERSON WHO NEEDS THE BEST

## TO TRY IT IS TO BE CONVINCED

The FT901DM Transceiver offers unparalleled receiver performance combined with state-of-the-art transmitter design from 10 to 160 metres. Some transceivers have WWV reception but no 160 capabilities, others have 160 but no WWV, CB, or crystal calibrator. Some offer selectable sideband but no AM probably no FSK and almost definitely no FM (Tx *and* Rx. CW was just not an afterthought on the 901. For instance the internal Curtis ic keyer (designed for amateur radio applications) is powered directly by the set and provides immunity to RF interference and false keying through contact bounce. All these features, including an advanced noise blanker, are standard equipment on the DM, not costly extras.

Full size digital plus clear analogue frequency display and memory circuitry provide the ultimate in versatility and operating efficiency. The "calibratable readout allows you to set the exact CW transmit frequency (no more falling out of the bottom end of the band) and when used in conjunction with the audio peak filter provides measurement of incoming signals frequency directly (without looking for near non-existant zero beat). The velvety smooth tuning dial action provides great setting accuracy whilst the phase locked loop local oscillator unsurpassed stability. The memory unit can store (at the press of a button) any transmit, receive, or transceive frequency, thus permitting (in any segment), split operation for DX or 10 metre repeater use (remember the FM).

Filtering is the heart of a receiver. In addition to numerous band stop filters, crystal filters of 600Hz*, 2·4kHz, 6·0kHz*, and 12kHz define the IF bandwidth. This is only part of the story. By a mixing process two crystal filters' passbands' overlap by a desired amount to provide selectivity continuously variable from the normal 2·4kHz right down to 300Hz without even having the CW Filter installed! Do not be fooled by other systems such as "IF shift" (N.B. this "width" system also moves the Centre Frequency) which only move the passband and cannot change the bandwidth. (Known in the trade as "QSY into the QRM" devices). Other filters worthy of note are the Rejection Tune, tunable notch for removing unwanted narrow signals from the IF passband and the Audio Peak Filter A.P.F. razor sharp filter, without ringing, which produces a dramatic increase in signal to noise ratio and QRM rejection on CW.

The FT901 is a complex instrument but the internal layout is clear and straightforward, computer style plug in circuit boards being used throughout. By substitution and extenda board tests, valuable service time is saved in unsoldering components from deep inside the chassis. This approach also reduces point to point (rats nest) wiring and results in a clean compact unit with high component density.

Purity of emission is important both legally and ethically. Out of band spurii interfere with other services and can cause TVI. Equally important is your reputation amongst other amateurs, which will deteriorate quickly if you transmit distortion products across the band. The FT901 includes a built-in low pass filter, toroidal output circuitry and R.F. negative feedback on the 6146B PA's for a spurious free output signal. The in-built R.F. speech processor with front panel level control increases average talk power (by filling "holes" in your voice pattern) by about 6dB without audible harmonic distortion.

Ergonomics or human engineering is often neglected in design. On the '901, knobs are positioned logically and push buttons with LED indicators are used where necessary.

For /A, /P, or /M the '901 is surely the ultimate station in one box, with provision for operating from a variety of voltages. 100-234V AC (50/60Hz) and 12V DC with inbuilt invertor.

Accessories include: the FV901DM external VFO (synthesized 100Hz step, spin and 3-speed electronic tune + auto search with 40 memory channels), the FC901 antenna tuner/power meter, the SP901 speakers, the Y0901 monitorscope (with or without panoramic adaptor facilities), the FTV901 transvertor for 4, 2, and 70cms (with repeater shifts etc) in one box and the YVM video monitor, YR901 Morse, RTTY decoder (to TV video monitor or TTU) etc.

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G. M. C. Stone, CEng, FIEE, FIERE, G3FZL
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**Zone E.** D. H. Adams, GW3VBP
**Zone F.** W. F. McGonigle, GI3GXP
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Region 7—D. A. G. Pedder, G3LFX
Region 8—D. N. T. Williams, G3MDO
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*Correspondence to RRs and honorary officers should be addressed directly to them (QTHR).*

# RADIO SOCIETY OF GREAT BRITAIN


**35 Doughty Street, London WC1N 2AE**
Telephone 01-837 8688



Founded 1913
Incorporated 1926
Member society, International Amateur Radio Union


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

## The national society representing all UK radio amateurs

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

**GENERAL MANAGER AND SECRETARY**
D. A. Evans, G3OUF

**EDITOR**
A. W. Hutchinson

## ANNUAL SUBSCRIPTION RATES

**UK corporate: £10,** including VAT — **Overseas: £10**

**Associates under 18: £4.** — **Students aged 18 to 21: £6**
*(Student applications should give the member's age at last renewal date and include evidence of student status)*

**Affiliated societies: £10** (including *Radio Communication);*
**£6** (excluding *Radio Communication).*

## COMPOSITION OF RSGB ZONES

| | |
|---|---|
| **Zone A:** | Regions 1, 2 and 18 |
| **Zone B:** | Regions 3, 4 and 5 |
| **Zone C:** | Regions 7, 8, 16 and 19 |
| **Zone D:** | Regions 6, 9, 17 and 20 |
| **Zone E:** | Regions 10 and 11 |
| **Zone F:** | Region 15 |
| **Zone G:** | Regions 12, 13 and 14 |

## COMPOSITION OF RSGB REGIONS

| | |
|---|---|
| **Region 1** | Cheshire, Cumbria, Greater Manchester, Isle of Man, Lancashire, Merseyside. |
| **Region 2** | All that part of Humberside north of River Humber, North Yorkshire, South Yorkshire, West Yorkshire. |
| **Region 3** | Hereford and Worcester, Salop, Staffordshire, Warwickshire, West Midlands. |
| **Region 4** | Derbyshire, all that part of Humberside south of River Humber, Leicestershire, Lincolnshire, Nottinghamshire. |
| **Region 5** | Bedfordshire, Cambridgeshire, Northamptonshire. |
| **Region 6** | Berkshire, Buckinghamshire, Oxfordshire. |
| **Region 7** | Greater London south of River Thames, Surrey including that part of London north of the Thames administered by Surrey. |
| **Region 8** | Kent, East Sussex, West Sussex. |
| **Region 9** | Cornwall, Devon. |
| **Region 10** | Dyfed, Gwent, Mid Glamorgan, Powys, South Glamorgan, West Glamorgan. |
| **Region 11** | Clwyd, Gwynedd. |
| **Region 12** | Grampian, Highland, Island Authorities, Tayside. |
| **Region 13** | Borders, Fife, Lothian. |
| **Region 14** | Central, Dumfries and Galloway, Strathclyde. |
| **Region 15** | Northern Ireland. |
| **Region 16** | Essex, Norfolk, Suffolk. |
| **Region 17** | Isle of Wight, Channel Islands, Dorset, Hampshire, Wiltshire. |
| **Region 18** | Cleveland, Durham, Northumberland, Tyne & Wear. |
| **Region 19** | Greater London north of River Thames, Hertfordshire. |
| **Region 20** | Avon, Gloucester, Somerset. |

# GB2RS NEWS BULLETIN TRANSMISSIONS

## Changes to schedule

Commencing Sunday 7 October, transmission of the weekly RSGB GB2RS news bulletin will be made in accordance with the new schedule given in Table 1.

The changes have been made following deliberations of a committee set up to recommend ways in which the news bulletin service could be improved. The most important criteria were:

**(1)** The need to use frequencies conforming to IARU band plans, particularly to avoid rtty frequencies on 3·5 and 7MHz.

**(2)** The need to use bands and modes which would enable the news bulletins to reach the widest possible audience, bearing in mind the types of equipment currently in use.

**(3)** The advisability of choosing times and frequencies which would avoid:

*(a)* calling channels;

*(b)* other "standard" channels such as rally talk-in channels;

*(c)* times and frequencies used by other countries, such as Eire, Belgium and France, for their news broadcasts.

**(4)** The knowledge that the GB2RS licence was granted for the benefit of all radio enthusiasts, not solely for RSGB members.

When the new schedule has been in operation for a few months, it is intended to conduct a coverage survey. Details will be published in *Radio Communication*, as will any additions and amendments to the schedule.

**Table 1. New GB2RS schedule**

| INTENDED RECEPTION AREA | NORMAL READER | RESERVE READER | LOCAL START TIME |
|---|---|---|---|
| **Frequency: 3,640kHz. Mode: SSB** | | | |
| NE Scotland | GM3HGA | GM3VEY | 1130 |
| **Frequency: 3,650kHz. Mode: SSB** | | | |
| SE England | G2MI | G4ARZ | 0900 |
| Midlands | G2CVV | G8QZ | 0930 |
| SW England/Wales | G8ML | G3JFH | 1000 |
| N Ireland | GI3GAL | GI3SXG | 1030 |
| NE England | G5VO | (*Vacancy*) | 1100 |
| E Scotland | GM4CUZ | GM4FLP | 1430 |
| **Frequency: 3,660kHz. Mode: SSB** | | | |
| Central Scotland | GM3TCW | (*Vacancy*) | 1130 |
| **Frequency: 7,047·5kHz. Mode: AM** | | | |
| UK | G3LEQ | G2CVV | 1100 |
| **Frequency: 144·250MHz. Mode: SSB. Horizontal polarization** | | | |
| N from Midlands | G3BA | G3KQF | 0930 |
| NE from S Devon | G3CHN | (*Vacancy*) | 1000 |
| NW from Manchester | G3SMT | G4IAL | 1000 |
| NNW from Cleveland | G8LIC | G8FTZ | 1000 |
| SW from London | G3FZL | G3IIR/G3VAG | 1030 |
| S from Aberdeen | GM8GHV | GM3ZBE | 1030 |
| S Wales/W Country | (*Vacancy*) | (*Vacancy*) | 1100 |
| W from Bangor, Co Down | GI3TLT | GI3SXG | 1130 |
| **Frequency: 145·525MHz (S21 FM). Vertical polarization** | | | |
| Jersey | GJ8KNV | GJ4ICD | 0930 |
| Cornwall | G2ABC | (*Vacancy*) | 0930 |
| Hampshire, north | G8CKN | G3PZN | 0930 |
| Suffolk | G3ZNU | G4FSG | 0930 |
| Leeds | G3SPX | (*Vacancy*) | 0930 |
| Co Down | GI3WEM | (*Vacancy*) | 0930 |
| Edinburgh | GM4EHO | (*Vacancy*) | 0930 |
| London | G3FZL | G3IIR/G3VAG | 1000 |
| Birmingham | G3PWJ | G3BA | 1000 |
| Lincolnshire | (*Vacancy*) | (*Vacancy*) | 1000 |
| Tyneside | G4FUT | (*Vacancy*) | 1000 |
| Glasgow | GM8PSM | GM3UCI | 1000 |
| Elgin | GM8LHE | (*Vacancy*) | 1000 |
| Southampton | G8LVC | G8ADM | 1030 |
| E Sussex coast | (*Vacancy*) | (*Vacancy*) | 1030 |
| S Wales/W Country | (*Vacancy*) | (*Vacancy*) | 1030 |
| Manchester | G3LEQ | G3JWK | 1030 |
| Carlisle | G8DVD | G3VIJ | 1030 |

The map on facing page shows the positions of all the transmitters, and it will be seen that there are still well-populated areas where volunteer readers are still needed, particularly for 144MHz transmissions.

Suggestions for further improvements will be welcomed by the general manager, or committee members G2AMV, G2CVV, G3BA and G3KQF. Items for the bulletins should be sent to the membership services officer at RSGB HQ.

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# QTC

## amateur radio news

### Licence figures

The Home Office has advised that at the end of July the numbers of amateur radio licences in force were:

Class A.....17,213; Class B.....8,146.

### New callsign prefix series

The ITU has provisionally allocated the prefix series H8A to H9Z to the Republic of Panama.

The series T3A to T3Z has been allocated to the Republic of Kiribati, formerly the Gilbert Islands, and will replace the VR1 to VR3 prefixes.

### 1980 Council election

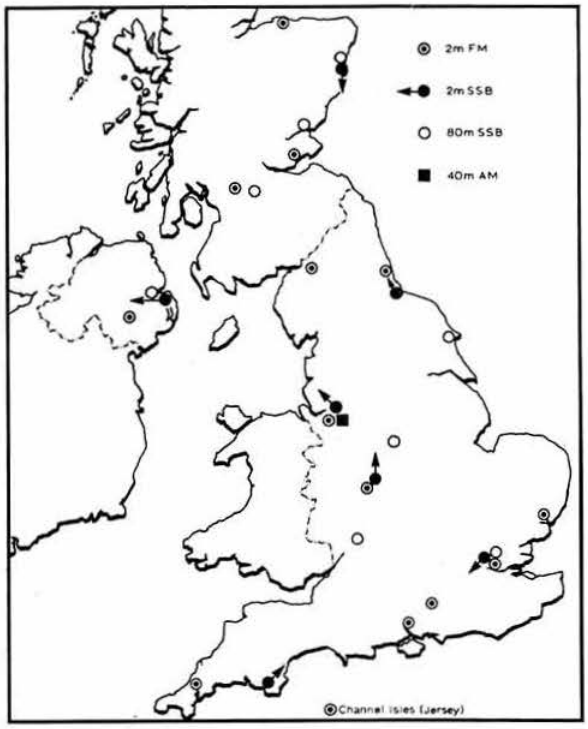
The November issue of *Radio Communication* will contain a ballot paper, envelope and election addresses by candidates for the 1980 Council election.

In view of current postal difficulties, any member who does not receive these documents by mid-November should telephone the general manager at RSGB HQ and request a duplicate set.

### QSL Bureau—increased postal charges

Members will be aware that the minimum inland letter postage rate was increased on 20 August to 8p second class and 10p first class.

Those whose QSL envelopes bear 7p stamps should send their sub-manager a supply of 1p stamps, so as to avoid having to pay twice the deficit when their next batch of cards is delivered.




GB2RS transmitters

## QSL Bureau—G4HAA-HZZ series

From 1 October Mr G. Thompson, G8KLI, 6 Kendal End Road, Barnt Green, Birmingham B45 8PU, has been sub-manager for the G4HAA-HZZ series.

## RSGB at Leicester Exhibition

The RSGB will have a fully manned bookstall and information desk at the Amateur Radio Retailers Association Exhibition being held in Leicester on 8–10 November. Also available on the stand will be the Society's identity card equipment, and members wishing to purchase an identity card must bring their current Home Office transmitting licence with them.

## Society awards

At its meeting on 11 August, Council approved the following awards recommended by the Technical & Publications Committee for the year ended 30 June 1979:

The Norman Keith Adams Prize, for the most original article contributed to *Radio Communication,* to Mr N. S. Hoult, G4CIK, for "A Rugby, MSF, time-code clock" (February 1979).

The Courtenay Price Trophy, for outstanding technical development in the field of amateur radio, to Mr J. A. Hardcastle, G3JIR, for his work on ladder crystal filter design.

The Wortley-Talbot Trophy, for outstanding experimental work in the field of amateur radio, to Dr C. Suckling, G3WDG, on microwaves.

The Ostermeyer Trophy, for the most meritorious description of a piece of home-constructed radio or electronic equipment published in *Radio Communication,* to Mr N. B. Pritchard, G8AYM, for "A frequency counter for a 144MHz transmitter" (May 1979).

## RSGB PRESIDENT 1980

At its meeting on 11 August, Council unanimously elected Mr Peter Balestrini, TEng (CEI), MITE, G3BPT, as RSGB President for 1980.

Mr Balestrini, who has been a member of Council since 1974 and the Society's emergency communications manager since February 1977, is this year's executive vice-president. He was chairman of the Raynet Committee from 1967 to 1978, and is currently serving on the Raynet, Mobile & Exhibition, Telecommunications Liaison and Finance & Staff committees. He has also served on the VHF Committee and the committee of BARTG.

## Netherlands anniversary

In October, Netherlands radio amateurs are celebrating the fiftieth anniversary of the issue of the first amateur licence in their country.

To mark the occasion they will be allowed to add 50 to the figure in their callsigns (eg PA0 will be PA50, PA3 will be PA53 etc) during the period 10 October to 10 November. A special contest will also be held during the period.

The Netherlands national society VERON will be holding its annual "Day for the Amateur" on 27 October at the RAI Congrescentrum in Amsterdam, and this will be a special festive occasion to mark the anniversary. Throughout the day, in addition to the regular events such as lectures and a home-built exhibition, entertainment programmes are offered for ladies and children, and there will be a special "50 years of amateur radio transmission" exhibition.

A gala evening will round off the day for members and guests, and visiting amateurs will be very welcome.

## Earl Mountbatten of Burma

The Society was deeply shocked to learn of the murder of Earl Mountbatten of Burma, and extends its sincere condolences to the members of his family, particularly the Society's patron, HRH Prince Philip, who was Earl Mountbatten's nephew.

For more than 50 years Earl Mountbatten had a keen interest in electronics, and qualified as a communications specialist at the Royal Navy Signal School, Portsmouth, in 1925. At the school he won the prize as the most outstanding student in wireless engineering, and in the following year he was appointed Reserve Fleet Wireless and Signal Officer.

From 1929 to 1931 he was senior wireless instructor at the Signal School, and during this time he was responsible for the *Admiralty Handbook of Wireless Telegraphy,* which became the standard work in its field. From 1931 to 1933 he held the post of Fleet Wireless Officer, Mediterranean.

In 1935 Lord Mountbatten was elected a Fellow of the British Institution of Radio Engineers, which later became the IERE and of which he became president in 1946 and charter president in 1961.

Throughout his years as a career naval officer, great war leader and statesman, Lord Mountbatten never lost his interest in electronics, and used his great knowledge and experience to further the advancement of the science. A memorial to his activity in this field will be the National Electronics Council's Mountbatten Lectures, the first of which he gave himself last year; but an everlasting memorial will be the part he played in the influence electronics has and will have on the lives of many generations.

We salute that memory.

# A 25kHz step synthesizer with half-channel facilities for 145–146MHz

by D. G. CUTTS, G4FAW*

## Introduction

Since the arrival of synthesized fm black boxes for 144MHz operation there has been a need for a lower cost equally effective alternative. The following description is the result of a lot of work on synthesizers over a period of about two years.

The Mk1 synthesizer was programmed with thumbwheel switches and had a vco output frequency in the 3MHz range, which required multiplication factors of the order of ×48; nevertheless it worked, and in fact is still in use in the author's car. The Mk2 has been found to be a great improvement.

This synthesizer design was conceived with four main criteria in mind:

(i) ease of operation;
(ii) ease of construction;
(iii) ability to connect to any rig;
(iv) spectral cleanliness.

Under mobile conditions thumbwheel switches are difficult to use, as they need a great deal of attention from the driver to obtain the required channel. For this reason a rotary switch with a seven-segment channel number display was incorporated in the design. It was decided to have 40 channels, ie 145 to 146MHz, with 12·5kHz spacing optional. Forty-way switches were investigated but were found to be scarce and very expensive, so a method of channel switching using readily available components had to be found.

The synthesizer consists of a vco (voltage controlled oscillator) which operates at the required signal frequency, eg 145 to 146MHz for transmit and 134·3 to 135·3MHz for receive, assuming a 10·7MHz i.f. This is then mixed with a crystal-controlled oscillator to provide a suitable frequency for operating the programmable divider, 4059 (IC3), (2·5 to 3·5MHz i.f.). The first section of IC3 is dividing by two, the second and third sections by 0 to 40, and the fourth section by 10. This has the effect of an overall division ratio of 200 to 280, giving 12·5kHz output to drive one input of the phase comparator, when the loop is locked. By applying +9V to pin 3 of IC3, 12·5kHz is added to the indicated channel.

A 12·5kHz reference frequency for the other input is produced by dividing a 6·4MHz crystal oscillator by 512. The output of the phase comparator is fed back via an integrating loop filter to control the vco frequency to complete the loop.

This method of prescaling by mixing with crystals is a cleaner method of achieving frequency synthesis; with the vco operating at the signal frequency, it does not have to be multiplied (and consequently all the noise multiplied) to obtain the final output frequency. Also, no digital dividers are required to obtain a suitable frequency to operate the 4059 programmable divider.

## VCO

The vco consists of a basic grounded-drain Hartley oscillator, the frequency determining components being L1, C12, D2 and D3; it operates from 134·3 to 135·3MHz for receive, and 145 to 146MHz for transmit.

The frequency of the oscillator is controlled by D3 and D2 varactor diodes, which are coupled into the main tuned circuit

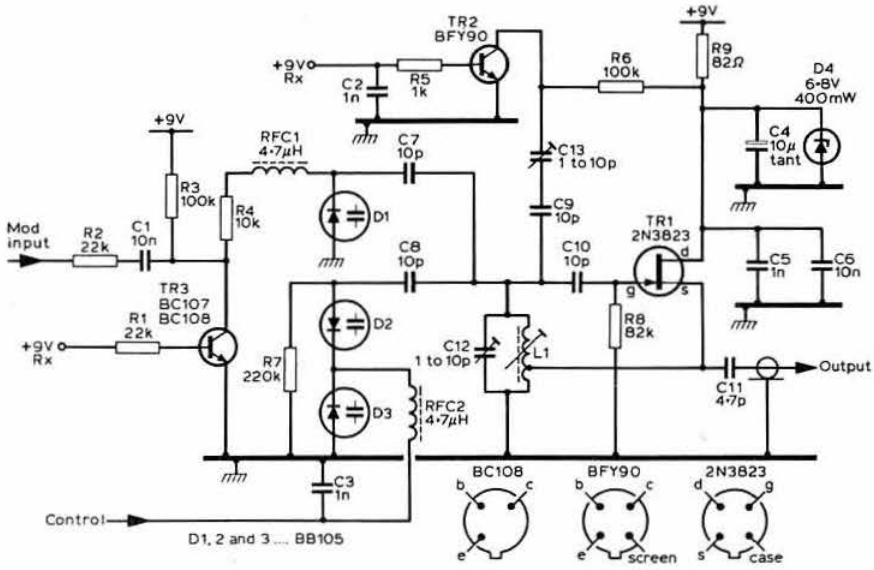



Fig 1. Variable crystal oscillator

*17 Hintlesham Close,
Stowmarket,
Suffolk IP14 2PF.

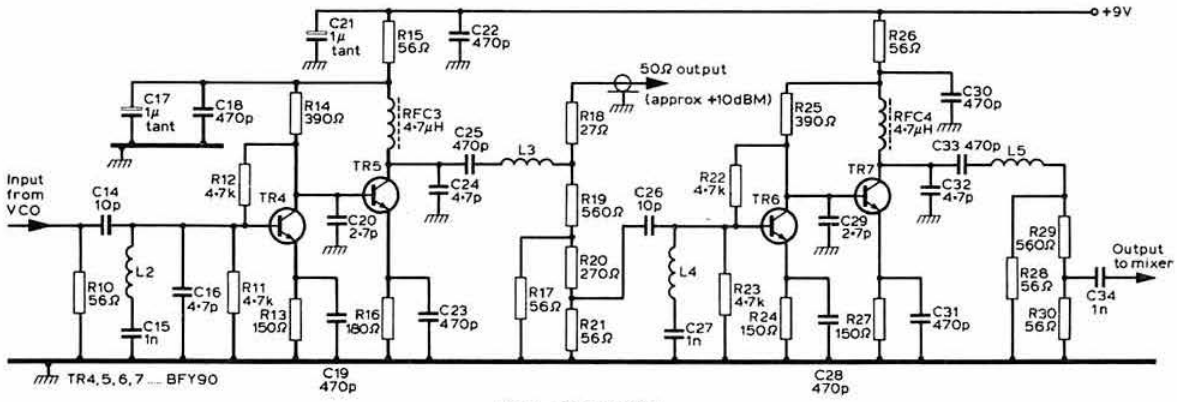



Fig 2. RF amplifier

by C8. R7 provides a dc path for D2. To assist the pll (phase locked loop) in locking quickly, C13 is provided to lower the natural frequency of the vco on receive.

Modulation is applied to the vco using a third varactor, D1. On receive TR3 is switched on, which shorts out any audio which may otherwise get into the vco. This also has the effect of helping to pull the vco frequency down on receive.

## Amplifiers

The vco is then amplified by TR4 and TR5 to a level of approximately +10dBm (10mW) for the output of the synthesizer. Part of this output is sampled via an attenuator, R17, 19, 20 and 21, to a second amplifier consisting of TR6 and TR7. These amplify the signal to approximately +10dBm again. This is then attenuated to feed the mixer. The purpose of this attenuator/amplifier/attenuator network is to provide a large attenuation in the reverse direction to stop the mixing frequency getting to the output of the synthesizer.

## Crystal oscillators/mixer/i.f. amplifier

The crystal oscillators are normal Colpitts series-tuned oscillators. The inductors and capacitors in series with the crystal make sure that the crystal oscillates in its overtone

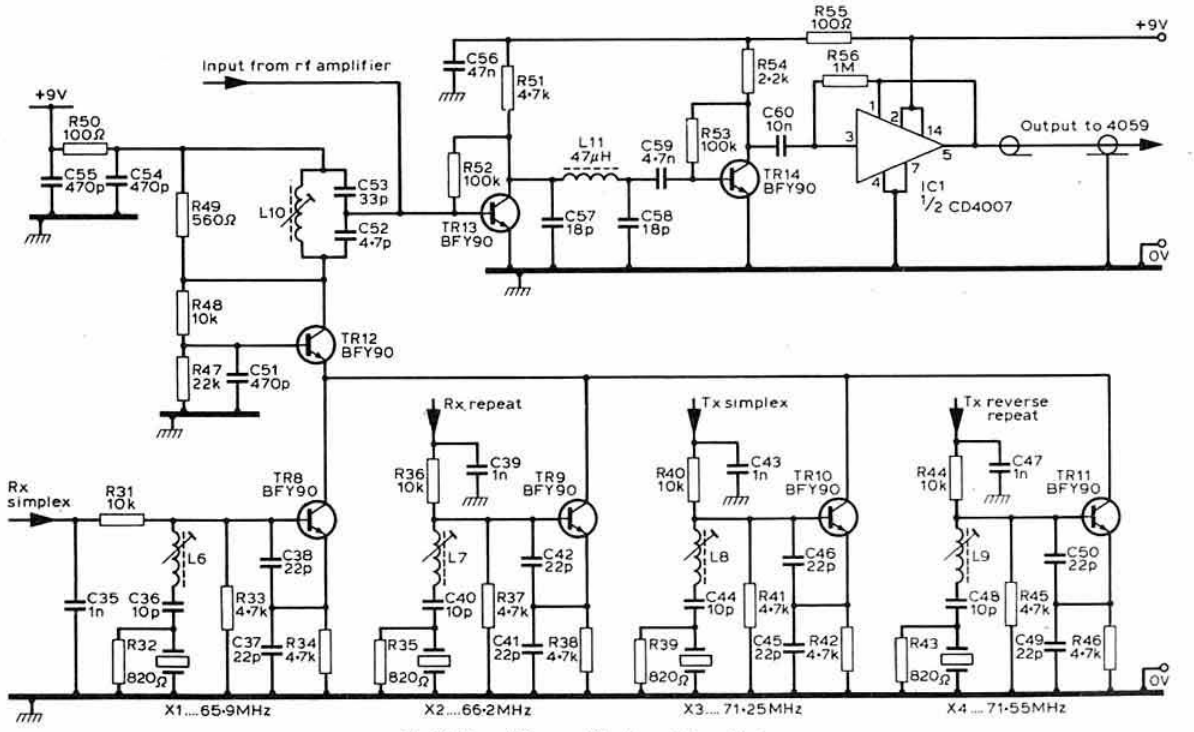



Fig 3. Mixer/i.f. amplifier/crystal oscillators

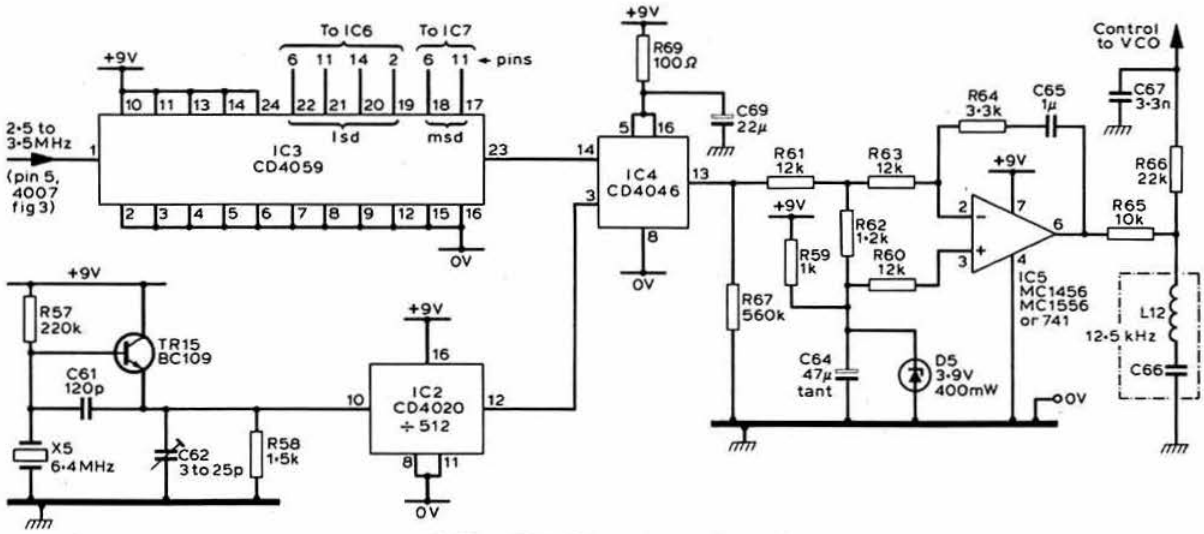



Fig 4. RF oscillator/phase detector/loop filter

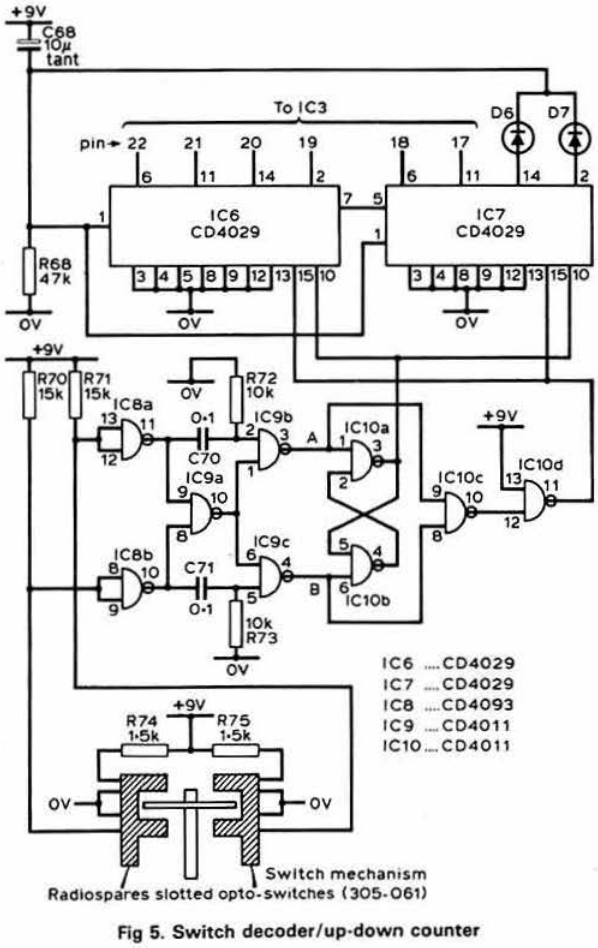



Fig 5. Switch decoder/up-down counter

mode. The oscillator required is selected by applying +9V to the base resistor (R31, 36, 40 or 44).

The selected oscillator operates in cascode with TR12, whose collector is tuned to twice the crystal oscillator frequency. The output from TR12 is fed to the mixer, TR13; this signal is mixed with the signal from the vco. C57, C58 and L11 form a low-pass filter to obtain f(vco)-f(xtal). TR14 amplifies this frequency (2·5 to 3·5MHz) and IC1 brings it up to cmos compatible levels.

## Construction

The synthesizer is constructed on two double-sided boards. The upper side of the board is a ground plane with the holes countersunk to avoid the component leads shorting to the ground plane. All earth connections are made to the ground plane of the board.

Screens are desirable round the vco, crystal oscillators and doubler stage to help reduce the spurious outputs from the synthesizer. These screens can be made from any solderable material, ie copper foil, tin plate, pcb etc. It is also recommended that the boards are sealed in an rf-proof box away from the transmitter output, with 1,000pF feedthrough capacitors feeding in power etc. The prototype was mounted in a die-cast box measuring 5½ by 8½ by 2in, and another unit was mounted in a modified a.m. Pye Westminster (see photographs on front cover). It is important for stability purposes that the boards are rigidly mounted and that the frequency-determining components in the vco, ie C7 to C13 and L1, are glued to the board when it is certain that the circuit is operating correctly (polystyrene cement is ideal for this purpose).

## Alignment

The adjustment of the unit is very simple: connect a frequency counter to pin 9 of IC2 and adjust C62 to read 3·20MHz. Connect the output of the synthesizer to a frequency counter. Disconnect the input to IC3, switch the synthesizer to transmit, and adjust C12 so that the output reads approximately 146·3MHz. Then switch the synthesizer to receive and adjust

## Components list

| | |
|---|---|
| R1,2 | 22kΩ |
| R3,6,52,53 | 100kΩ |
| R4,31,36,40,44, 48,65,72,73 | 10kΩ |
| R5,59 | 1kΩ |
| R7,57 | 220kΩ |
| R8 | 82kΩ |
| R9 | 82Ω |
| R10,15,17,21, 26,28,30 | 56Ω |
| R11,12,22,23,33 34,37,38,41 42,45,46,51 | 4·7Ω |
| R13,24,27 | 150Ω |
| R14,25 | 390Ω |
| R16 | 180Ω |
| R18 | 27Ω |
| R19,29,49 | 560Ω |
| R20 | 270Ω |
| R32,35,39,43 | 820Ω |
| R47,66 | 22kΩ |
| R50,55,69 | 100Ω |
| R54 | 2·2kΩ |
| R56 | 1MΩ |
| R58,62 | 1·2kΩ |
| R60,61,63 | 12kΩ |
| R64 | 3·3kΩ |
| R67 | 560kΩ |
| R68 | 47kΩ |
| R70,71 | 15kΩ |
| R74,75 | 1·5kΩ |

All resistors ¼W 5 or 10%

| | |
|---|---|
| X1 | 65·9MHz |
| X2 | 66·2MHz |
| X3 | 71·25MHz |
| X4 | 71·55MHz |
| X5 | 6·4MHz |

| | |
|---|---|
| C1,6 | 10nF ceramic |
| C2,3,5 | 1nF ceramic |
| C4,68 | 10μF tantalum |
| C7,8,9,10 | 10pF silver mica |
| C11 | 4·7pF ceramic or silver mica |
| C12,13 | 1-10pF trimmer |
| C14,26,36,40,44 48 | 10pF disc or plate ceramic |
| C15,27,34,35,39, 43,47 | 1nF disc or plate ceramic |
| C16,24,32,52 | 4·7pF disc or plate ceramic |
| C17,21 | 1μF tantalum |
| C18,19,22,23,25 28,30,31,33, 51,54,55 | 470pF disc or plate ceramic |
| C20,29 | 2·7pF disc or plate ceramic |
| C37,38,41,42, 45,46,49,50 | 22pF disc or plate ceramic |
| C53 | 33pF disc or plate ceramic |
| C56 | 47nF disc or plate ceramic |
| C57,58 | 18pF disc or plate ceramic |
| C59 | 4·7nF disc or plate ceramic |
| C60 | 10nF disc or plate ceramic |
| C61 | 120pF polystyrene |
| C62 | 3-25pF trimmer |
| C63 | 0·1μF tantalum |
| C64 | 4·7μF tantalum |
| C65 | 1μF any type (non-polarized) |
| C66 | To form 12·5kHz filter with L12 (see text) |
| C67 | 3·3nF disc or plate ceramic |
| C69 | 22μF tantalum |
| C70,71 | 0·1μF any type |

| | |
|---|---|
| L1 | 2·5t 20swg on 4mm former tapped ¾-turn from cold end with slug |
| L2,3,4,5 | 4t 20swg 4mm diameter, 5mm long |
| L6,7,8,9 | 12t 30/31swg 4mm core with slug |
| L10 | 5t 20swg 4mm core with slug |
| L11 | 47μH Cambion inductor |
| L12 | (See text) |
| RFC1,2,3,4 | 4·7μH Cambion inductor or 2t 30swg on ferrite bead |
| D1,2,3 | BB105 |
| D4 | 6·8V 400mW zener diode |
| D5 | 3·9V 400mW zener diode |
| D6,7 | General purpose silicon diode |
| IC1 | CD4007 |
| IC2 | CD4020 |
| IC3 | CD4059 |
| IC4 | CD4046 |
| IC5 | MC1456/MC1556 |
| IC6,7 | CD4029 |
| IC8 | CD4093 |
| IC9,10 | CD4011 |
| TR1 | 2N3823 |
| TR2,4,5,6,7 8,9,10,11, 12,13,14 | BFY90 |
| TR3 | BC107/8 or any general purpose npn silicon transistor |
| TR15 | BC109 |

A set of two boards and five crystals is available from the author at £3.50 per crystal and £3 per board, inclusive of p & p.

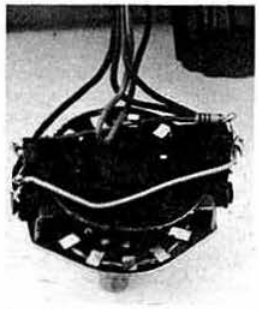
C13 to approximately 135·7MHz. Reconnect the input to IC3; the loop should now lock. Switch to Channel 00 simplex and adjust L8 to read 145MHz on the counter. Switch to REVERSE REPEAT and adjust L9 for an output of 145·6MHz. Now go to RECEIVE SIMPLEX and adjust L6 for 134·3MHz. Now switch to REPEAT and adjust output for 134·9MHz.

The synthesizer is now fully aligned and ready for use.

## Channel switch

The basis of the channel switching revolves around the fact that the 4059 requires 0 to 40 in bcd (binary coded decimal), which means that simple counter chips can be used to provide the count. 4029s were chosen because they had the facilities required and were readily available and cheap. 4029s need a signal to tell them whether to count up or down, and a clock signal to tell them when to count. This is provided by IC8, 9, 10, which convert the output from the optical slotted switches into suitable signals for the 4029s. This method of up/down counting is appropriate for incorporating in channel scanning, and for channel changing buttons on the microphone. It should be noted that ICs 6, 7, 8, 9 and 10 can be omitted and bcd thumbwheel switches substituted. In this case the seven-segment display may also be left out.

The switch is constructed from an old rotary wafer switch, and a disc which has the same number of slots as the switch mechanism has clicks is soldered or glued to the shaft. The two optical switches are then positioned over the disc, not quite 180° apart. This has the effect of producing two square waves which overlap; ie, are out of phase. IC9 converts these to up pulses and down pulses at points A and B, and IC10 converts these to up/down pulses and clock pulses.



**Detail of prototype channel change switch**

## Reset circuitry

The 4029 reset circuitry consists of D6 and D7 and C68 and R67. This is designed so that on switch-on the counters will reset to Channel 00. The two diodes reset the counter to Channel 00 if any channel above 39 or below 00 is selected.

Due to the nature of the 4029s a push-button on the front panel could be provided to set to any channel desired, but this facility was not included on the printed circuit board because of lack of space.

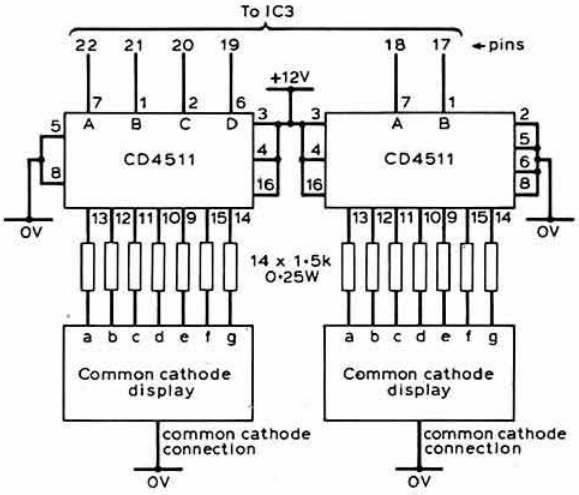



Fig 6. Display

## Display

The display is conventional circuitry using CD4511 bcd to seven-segment decoders and common cathode displays. A printed circuit board was not produced for this as it was felt that individual requirements for this circuit differ considerably, eg size and dimensions, and there are many different displays on the market. It is best to build this on a piece of Veroboard to suit the dimensional requirements of the case.

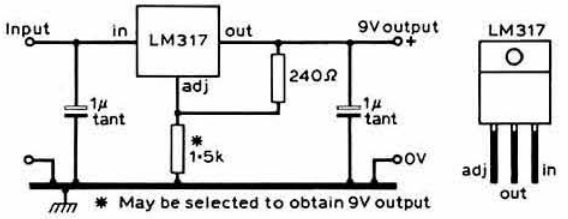



Fig 7. Voltage regulator

## 12·5kHz filter

A 12·5kHz notch filter is needed at the output of the loop filter to remove any remainder of the 12·5kHz reference signal. This is formed by L12 and C66. In the prototype L12 was 7·5mH and C66 was 0·022μF. L12 was wound with approximately 400 turns of 40swg wire on a small pot core and C66 varied until a resonance occurred at 12·5kHz.

## Conclusion

At the time of writing this article several units had been built and had been operating successfully for many months. Reports have been very good and the synthesizer has proved to be very versatile and reliable.

The overall design is very clean with no spurious responses greater than 65dB below the output of the transmitter.

The author would like to thank the Marconi International Marine Company Limited for its permission to use some circuits of its design, and also G4FOE for building and proving the design. □

# RSGB Woburn Rally 1979

This year's Woburn Rally was blessed with fine weather which, after the rain of other years, was very welcome and brought a record attendance to this popular event. Two large marquees housed 50 trade exhibitors and the "flea market".

A new feature at this year's rally was a much enlarged and professional RSGB HQ stand, which held the publications sales counter, enquiries and identification card section. This was staffed by Mobile & Exhibition Committee members, Council members and HQ staff, who were able to deal with members' questions on the spot.

Committee members from Raynet and BARTG staffed their respective stands, answering questions and gathering more members. RAIBC was represented by G3VIJ who, with his caravan and awning, was able to meet members and chat in the warm sunshine.

The talk-in stations were again operated by Dunstable Downs Radio Club who, with their very-well-equipped caravan, did a superb job.

A large "Thank you" is due to the members and friends who assisted in preparing the marquees on the Saturday and helped to make the Sunday's event so smooth-running, and, not least, to all the visitors who attended.

EQUIPMENT REVIEW

# The Dentron MT3000A antenna tuner

by P. J. HORWOOD, G3FRB*

THE Dentron MT3000A is a complete antenna tuning system covering 1·8 to 28MHz, capable of matching a 50Ω transmitter to balanced and unbalanced antennas of all types.

Physically, it is well constructed from cadmium-plated steel and, being fairly large, is quite heavy. The electrical components are of good quality and are well assembled; no failures occurred during testing but, when received, the fixing of the internal potted balun transformer had fractured in transit.

In use, the ability to connect three coaxial feeders, a long-wire and a balanced system permanently to the tuner, and select them by a front-panel switch, was very convenient, obviating changing leads when band-changing. The antenna tuner itself would of course need retuning each time. Other useful facilities include a built-in dummy load with 200W capability, and forward and reverse power meters with 200 and 2,000W range selection.

The dummy load is convenient for adjustment of pa tune and load; for UK users the resistor will allow tune-up at full power with two-tone drive (400W p.e.p., 200W mean), observing its duty-cycle limitations.

The metering range switch has an in-built fluorescent signal flag which gives nearly as much indication as if it were illuminated. Coaxial socket No 1 is a direct position, bypassing the tuner but passing through the metering.

The published power capability of 3,000W p.e.p. is of course for USA inputs. However, the variable capacitors have a very adequate spacing and should allow high-power operation with high-impedance end-fed antennas.

Measurements were made on each amateur band and with various dummy antennas to check its matching ability. The power meter accuracy was checked using a standardized power meter. At the 100W level used, the indication was within the published ±10 per cent.

**Table 1. Power meter accuracy**

| MHz | Indicated power (watts) | MHz | Indicated power (watts) |
|---|---|---|---|
| 1·8 | 96 | 7·1 | 97 |
| 2·0 | 90 | 14·2 | 95 |
| 3·5 | 94 | 21·2 | 95 |
| 3·8 | 95 | 28·5 | 90 |

The ability of the Dentron MT3000A to convert various passive loads to a resistive 50Ω was checked with the polar display on a Hewlett-Packard 8407A network analyzer.

*2 Chestnut Grove, Wilmington, Dartford, Kent DA2 7TG.

**Table 2. MT3000A technical details**

| | |
|---|---|
| **Frequency coverage** | 1·8–30MHz |
| **Input impedance** | 50Ω (resistive) |
| **Output impedance,** | |
| **Coaxial 1, 2×3** | 50Ω nominal |
| **Long wire** | Either high or low impedance |
| **Balanced line** | 75 to 600Ω |
| **Power capability** | 3,000W p.e.p. |
| **Wattmeter accuracy** | ±10 per cent full scale |
| **Insertion loss** | 0·5dB or less after tuning |
| **Dimensions** | 5½in high, 14in wide, 14in deep |
| **Weight** | 18lb |
| **Dummy load power handling** | 200W for 30s<br>1:1 duty cycle |

To save the need for a large tabulation where all the results are satisfactory, only the frequencies and passive loads used are listed, together with notes on problem areas.

It is probably true to suggest that in most instances where a less-than-perfect match could be obtained, this could be corrected by a small adjustment of the pa tank circuit; provided the units were not separated by an excessive length of coaxial cable.

**Table 3. Measurements obtained**

**Frequencies of measurement**
2·0, 3·7, 7·1, 14·0, 21·2, 28·5MHz

| **Loads used (resistive)** | |
|---|---|
| Long wires | 300, 1,000, 5,000Ω |
| Balanced loads | 300, 600Ω |
| Unbalanced loads | 50Ω |
| Resistive 3:1 vswr | 50Ω |

All the above could be converted to a non-resistive 50Ω, with the exception of the following combinations:

| Frequency | Load | | Result |
|---|---|---|---|
| 2MHz | 5,000Ω | long wire | 40Ω resistive |
| 14MHz | 5,000Ω | long wire | 5:1 vswr |
| 14MHz | 300Ω | long wire | 50+j0·5Ω* |
| 21·2MHz | 5,000Ω | long wire | 50+j5Ω* |
| 28·5MHz | 600Ω | balanced | Unable to tune |
| 28·5MHz | 5,000Ω | long wire | 60−j75Ω* |
| 28·5MHz | 300Ω | balanced | Unable to tune |
| 28·5MHz | 50Ω | unbalanced 3:1 resistive vswr | 45+j10Ω* |

*−j infers capacitive reactance
+j infers inductive reactance

The response of the tuner was examined when correctly tuned on each band, using a Hewlett-Packard 8552B sweep generator and spectrum analyzer combination. The results were satisfactory and do not justify the cost of reproduction here.

The most significant point seen on these displays was the insertion loss. Using the 1dB/cm range it was possible to measure this as follows:

| Band (MHz) | Insertion loss | Band (MHz) | Insertion loss |
|---|---|---|---|
| 2 | 0·4dB | 14 | 0·2dB |
| 3·5 | 0·3dB | 21 | 0·2dB |
| 7 | 0·2dB | 28 | 0·2dB |

## Conclusion

The tuner was so flexible it was necessary to decide what not to measure rather than the reverse. It will prove just as flexible in use by the all-band hf operator, and now that sterling is so strong compared with the dollar, American products may become more attractive.

We are grateful to Waters & Stanton Electronics for lending the equipment on which this review is based. □

EQUIPMENT REVIEW

# Holdings' G3LLL FT101 fm accessories

by T. G. GILES, G4CDY*


**The fm discriminator mounted on top of an FT101**

ONE of the most popular ways of getting on to the vhf and uhf bands is still to use a transverter with an hf transceiver. This is fine for ssb, cw and possibly a.m., but very few hf transceivers have facilities for fm; which is arguably the most popular mode. Holdings of Blackburn have built up a reputation for being experts on all things connected with the Yaesu Musen FT101, mainly through their rf clipper and their numerous "mod" sheets. They manufacture three units which make the FT101 perform as an fm transceiver with built-in repeater shift, and kindly loaned them for this review. The fm demodulator is priced £39.90, the modulator £10 and the repeater shift unit £10.

## FM discriminator

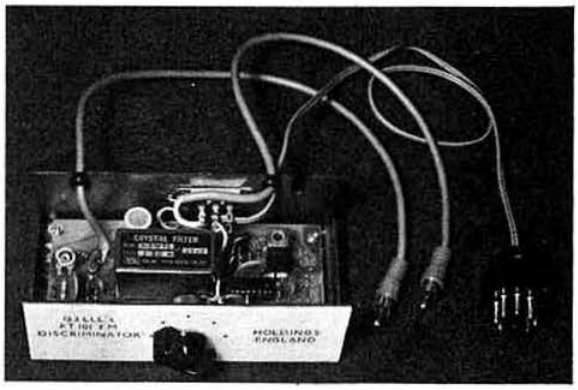
The unit is built into a steel box, 140 by 75 by 50mm, which is the same as the one used for the rf clipper. The front panel is white with black lettering and covered in clear perspex. It has two controls: a squelch potentiometer on the front panel and a small slide switch marked AM/FM on the rear panel. There are three fly leads, each terminated in suitable plugs to go straight into the back of the FT101. Connecting the unit only involves plugging these leads into the IF OUT, AF IN and vfo sockets, and does not involve any internal changes.

The circuit consists of a dual-gate fet preamplifier and matching stage feeding a 15kHz bandwidth six-pole crystal filter. Gain of this stage can be adjusted with a preset potentiometer. The remainder of the circuit uses a CA3089 type of ic limiting i.f. amplifier and quadrature detector. A single tuned circuit provides the phase shift element for the detector. This coil is slug tuned and preset in manufacture, but its alignment can be checked by screwing the core in or out to obtain best audio quality. The squelch control operates the ic's internal carrier operated squelch detector. A clever feature of the unit is the application of some dc bias to the a.m. detector diode of the FT101 to cut it off when the fm unit is switched on. This seemed quite effective and removes the need to attack the FT101 with a soldering iron or to unplug the fm unit when a.m. or ssb is being used.

The unit was tested on the reviewer's Mk3 FT101, and by G3LHZ on his Mk1 version. It worked satisfactorily on both transceivers and provided good audio quality from fm signals. On the earlier rig, the tuning was found to be a little asymmetric, probably due to loading from the ssb filter. Holdings suggest a minor modification (the inclusion of a resistor) to overcome this effect. Also on the earlier FT101, even on strong signals, some high frequency noise was present, but could probably be removed with a simple top cut circuit. The noise was not present on the later transceiver, possibly because there is some high frequency roll-off built into the audio output stage or, alternatively, the reviewer's ears do not respond at this high frequency.

The mute does work but requires some juggling with the rf gain and squelch controls in order to set up the threshold. It does not have any hysteresis or a very clean switching action, as many other people have found when using this type of consumer integrated circuit on narrow-band fm. A proper noise-operated squelch circuit would overcome these problems but would also put up the cost of the unit.

A 0·28μV emf 144MHz fm signal into a home-brew two-dual-gate fet converter in front of the FT101 tuned to 28MHz




**FM discriminator with case removed**

*54 The Mount, Coulsdon, Surrey.

produced a signal + noise-to-noise ratio of 10dB. Although this was not really a test of the fm unit (the sensitivity is more a function of the converter and FT101) it did show that the performance of such a system is similar to that of a dedicated vhf fm receiver.

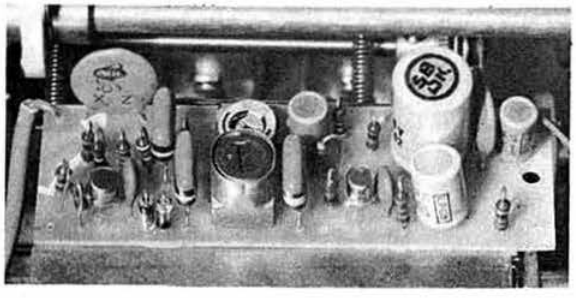
## FM transmit unit

The normal way of obtaining fm on the FT101 is to apply audio to the clarifier line when on transmit. Holdings suggest a very simple way that this can be achieved without any additional circuitry. This consists of disconnecting the link between the microphone amplifier and modulator boards (pin 8 of PB1315 and pin 9 of PB1184). The output of the microphone amplifier (pin 8 of PB1315) is then connected to the clarifier line on either the vfo or the fix board. A simple single-pole changeover switch can be used to select normal operation or fm. The FT101 function switch must be set to a.m., and the carrier level adjusted for the required output power.

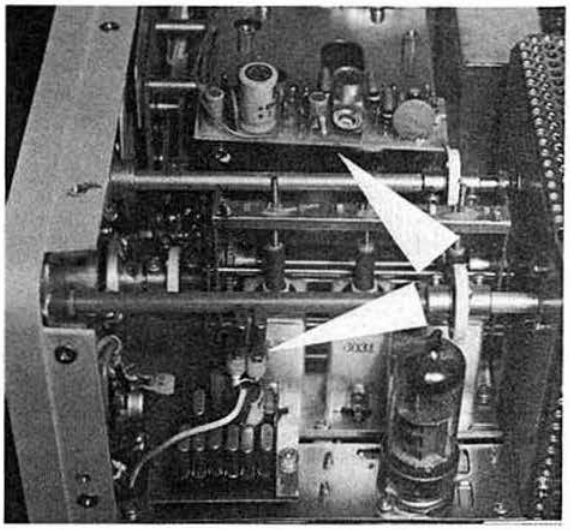
Using the normal hand microphone, setting the MIC GAIN to "2" produced 5kHz peak deviation. Reports received using this simple technique were satisfactory, but the general comment was that it lacked the punch of a normal fm rig. This was obviously due to the lack of frequency response tailoring and clipping normally used on fm. To overcome this, Holdings manufacture a small printed circuit board which contains the necessary clipping and filtering. The board has a simple single-stage amplifier with pre-emphasis, a double-diode clipper, an LC low-pass filter followed by another single transistor amplifier. In operation the unit is wired between the FT101 microphone amplifier output and the clarifier line.

Full installation instructions for the unit are supplied and the total time required is about two hours. Most of the time is taken up in mounting a miniature toggle switch which is supplied so that normal modulation or fm can be selected. Holdings suggest that the switch can be fitted over the smoothing capacitor adjacent to the IF OUT socket. However, the reviewer found it easier to mount it just below the key jack socket. The printed circuit board can be mounted alongside the vfo on the top of the chassis, see photograph. The board was attached by two 6BA solder tags soldered to the ground track and held under the screws securing the side screen to the vfo. The board requires a +13·5V supply and connection to the clarifier line. Both of these can be obtained from the FIX and/or RF PROCESSOR UNIT mounted on top of the vfo.

There is no alignment involved in the use of the fm modulator, and the only adjustment is a preset potentiometer. It was found that with the preset half-way, 3kHz deviation was achieved; and when fully clockwise, 6kHz. The FT101 MIC GAIN was found to be best at about position 1, but could be increased as high as position 4 to give extra clipping for dx contacts.



FM transmit unit board



The fm transmit unit (above) and the shift module (below) installed in an FT101

One minor problem was experienced with this method of obtaining fm; the deviation and speech quality varied slightly with the position of the clarifier control. This is probably due to ac loading from the clarifier circuitry, even when switched out. The modulation became badly distorted when the clarifier was set fully clockwise, ie at −5kHz. With the control in the normal central position no problems were experienced.

## Repeater shift module

One disadvantage of using an ssb transceiver on fm is that duplex operation through repeaters is not possible. Theoretically it could be done by changing ranges and retuning the transceiver between transmit and receive, but it is not a very practical technique for fast break-in operation!

Holdings give two methods that can be used to provide a −600kHz shift in the FT101.

The first is by a small diode switching module which plugs into the 28MHz D-range crystal socket. The module then has two sockets on top, one for the original crystal and the other for a special crystal supplied to give the desired shift. Normally the D-range crystal is in circuit, but if +13·5V is applied to the control wire of the module it will switch to the shift crystal. This can then be wired through a repeater shift switch to a point that has 13·8V on transmit. Full details are given in the instructions. The instructions also say that the unit introduces some losses into the oscillator circuit which can reduce the sensitivity of the receiver. On the reviewer's FT101 EX no reduction in sensitivity was experienced.

The second method Holdings suggest is to use a small relay to switch the crystal, and they will supply details of how this can be done. The relay switching technique is said to overcome the loss of local oscillator injection that the diode circuit can give.

(Continued on page 934)

# microwaves

Charles Suckling, G3WDG *

## Optimizing microwave receivers

For the amateur interested in getting the best performance from his equipment, perhaps the most seemingly difficult task is that of optimizing the receiver. Most microwave receivers are, at least in part, homebuilt, and so will require alignment. The traditional way of doing this entails finding a weak signal on the band, such as a beacon, and adjusting all the variables for best audible signal-to-noise ratio. This method has the disadvantages that the signal may vary in strength with changing propagation conditions, and that it relies on operator skill.

A better method is to connect a source of wideband noise to the input of the receiver, via an attenuator to ensure that the receiver sees its correct input impedance (suitable attenuators were described in *Microwaves* March 1979) and, where possible, at least 10dB of attenuation should be used. The noise source is switched on and off manually, and the ratio of the noise output powers from the receiver with the noise source on and with the noise source off is measured. This ratio is proportional to the overall sensitivity of the receiver, an increase in the on-to-off ratio corresponds to a decrease in its noise figure. The receiver should be operated in its linear region and with maximum i.f. bandwidth. A suitable noise level indicator is an audio output meter (see *Microwaves* July 1977 and July 1979). It is more convenient to reset the receiver gain (at rf preferably) after adjustments have been made to give a chosen reference noise level with the noise source off. This normalizes the measurement so that the noise power output with noise source on can be used directly as a measure of receiver sensitivity, without the need to compute the ratio. The value of attenuation between the noise source and the receiver should be such as to give only a few decibels increase in noise when the noise source is switched on. Suitable noise sources for 0–1GHz and 10GHz are described below. For manual use, the sources should be fed with + 12V via a 1kΩ resistor to the "input from voltage amplifier" connection.

*31 Oakwood Road, Chandler's Ford, Hants SO5 1LW.

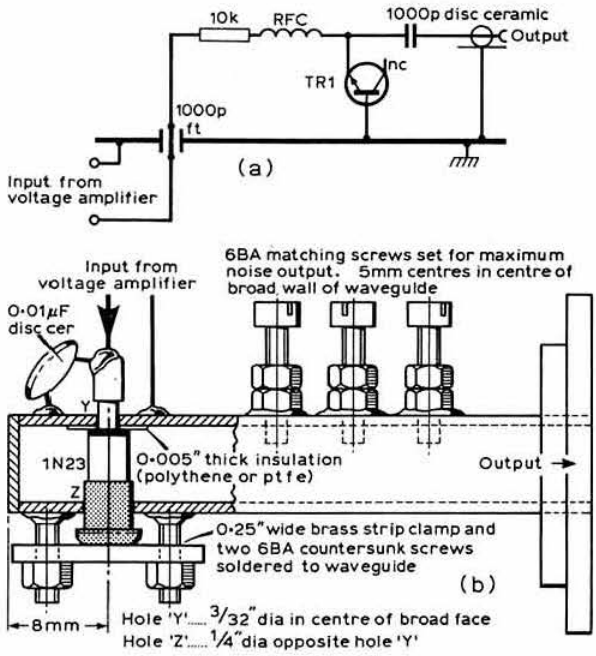



**Fig 1. (a) A noise source suitable for 0–1GHz. RFC: 3t 2mm id wound in resistor lead. TR1: 2N2369, or similar vhf transistor (see text). (b) A noise source for 10GHz**

If the receiver to be optimized has any significant response at the image frequency (as have most receivers without deliberate filtering between the preamplifier and mixer), a filter should be placed between the noise source and attenuator to prevent the receiver being set up for some optimum point for the signal and image frequencies combined. The use of such a filter is good practice anyway—some designs of mixer may be transparent at the i.f. frequency, and energy from the noise source on the i.f. frequency could leak through and upset the readings.

While this method is capable of very good results, it is extremely tedious to have to reset the receiver gain every time an adjustment is made. Fortunately a device has been designed to perform the measurements automatically ("An alignment aid for vhf receivers" by G4COM *Radio Communication* January 1976); this device allows the receiver sensitivity to be displayed directly on a meter.

In the light of considerable experience with this unit, several useful modifications have been made. First, the original noise source has been improved upon, and two suggested designs are shown in Fig 1. The first is suitable for all bands from hf to 1·3GHz, and possibly even 2·3GHz. The selection of the transistor is very important as some devices give very little noise. Several transistors of different types should be tried to find one with high noise output. Unfortunately it is not possible to quote a particular transistor, as even some devices of the same type by the same manufacturer vary considerably. Usually variants of the 2N2369 (BSX19/20) seem to work well. The other noise source uses a 1N23 diode mounted in WG16, and

# Holdings G3LLL FT101 fm accessories

(Continued from page 933)

## Conclusion

The three units all worked very well and made fm operation of the FT101 very satisfactory. Use of the demodulator required no modification to the transceiver, the installation of the modulator and shift units is fairly easy, and the internal changes needed would probably not affect the resale value of the equipment.

The use of fm is not restricted to the vhf and uhf bands. There are a number of stations on both sides of the Atlantic which are operating fm around 29·6MHz. One important consideration when using fm on an ssb transmitter is that the power input should be reduced to the a.m. operating conditions. If this is not done the pa valves could easily be damaged and the 150W dc power input limit could be exceeded. □

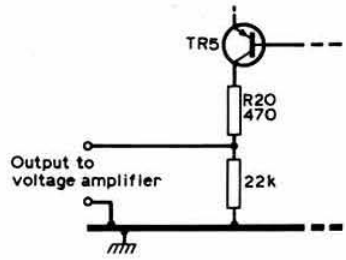



**Fig 2. Voltage amplifier to enable the G4COM alignment aid to drive the above noise sources**

covers 10-10·5GHz. Similar types of mounts using this diode could be built for 3·4 and 5·6GHz. A 1N26 diode may prove suitable for noise generation at 24GHz, but this has yet to be tried. Again, device selection is necessary.

Both types of noise source require biasing with a greater voltage than that provided by the G4COM device. Fig 2 shows the simple ic amplifier used by the writer to produce sufficient voltage to drive the noise sources, and Fig 3 shows the method used to interface this to the G4COM unit. TR5 and R20 are the components so marked in the original circuit diagram.

In use, the noise source, filter, attenuator and receiver conditions should be arranged as for the manual method described above. The requirement for receiver linearity is not so critical, for an ssb receiver, since the agc action will not follow the chopping rate. With an fm receiver it is still very critical, since any limiting will reduce the on-to-off ratio measured by the alignment aid, giving serious errors. Adjust the input attenuator to the receiver so that this does not occur. In checking this, the noise source may be switched on permanently by removing the −12V supply to the alignment aid, and switched off by also removing the +12V supply. Initially choose a value of attenuation so that the on-to-off ratio is about 3dB. The audio gain of the receiver should be advanced until the meter reading is independent of the audio gain setting, over a reasonable range. This should correspond to a gently audible "puttering" sound from the loudspeaker. If the meter reading cannot be made independent of the audio gain setting, the value of C1 may be increased to 0·33μF. Too great an on-to-off ratio may also cause this effect. If very large improvements are made to the receiver during alignment, ensure that the increased on-to-off ratio does not overload the unit.

Used in the above way, receivers are aligned to an input impedance set by the designed value of the attenuator's impedance, usually 50Ω. However, antennas, changeover

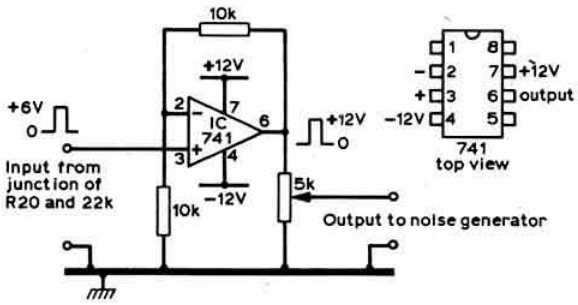



**Fig 3. Modification to the G4COM circuit to interface with the voltage amplifier**

relays etc will not, in general, present this impedance exactly to the receiver. This mismatch may be acceptable on transmit, but on receive could well degrade the noise figure considerably, particularly with very-low-noise preamplifiers. The G4COM device can also be used to complete the optimization of the receiver, in situ on the antenna. In this case the noise source is connected directly to a dipole or similar antenna, placed sufficiently close to the receiving antenna. The changeover relays etc should be assembled exactly as they are intended to be used (with the same leads). The receiver can then be optimized in its real environment. If the preamplifier has a very low noise figure, the antenna should be pointed skywards to reduce the pick-up of ground noise, which would tend to mask the receiver noise and make alignment more difficult.

The writer has used the G4COM device for optimizing 144 and 432MHz equipment, as well as for 1·3, 2·3 and 10GHz receivers. It enables such things as tapping points, matching circuits, device dc conditions etc all to be set up without difficulty. On 10GHz it is vital for optimizing more complex devices such as the G3JVL narrow band mixer, as well as for simpler wideband equipment. Many improvements were made to the writer's wideband equipment by optimizing the matching to the i.f. preamplifier, the level of local oscillator injection, Gunn diode bias point etc. It was even noticed that having a 1mA meter in the dc return path for the mixer diode caused about 0·5dB degradation in noise figure. A switch is now fitted to short out the meter, when it is not required for monitoring purposes! Also it is possible to select the best mixer diode if several are available—there is a considerable variation in noise figure of the common types of diode.

## New 10GHz world record

The 521km world record on 10GHz held for nearly three years by G4BRS/P and GM3OXX/P was broken on 12 July by I0SNY/7 (HB19f) and I3RGH/3 (FF19b) with a contact over a 550km path. Then followed a spate of new world records!

On 18 July I4CHY/7 (HB10c) worked I3CLZ/3 (FF17j) over 571km, only to lose the record eight minutes later when I3CLZ/3 worked I0SNY/7 at 582km. This record lasted for three days until I2FZD/3 (FF25h) worked I4CHY/7 over a distance of 589km.

The current world record QSO took place on 27 July at 1818gmt between I2FZD/2 (FF12a) and I4CHY/7 (IB01g) over a 633km path. This contact, and most of the others, were monitored by the Italian microwave manager I4BER from his holiday QTH at GD27h. The equipment in use for the record-breaking QSO was typical of that generally used in Italy—Gunnplexers to 1m dishes. Signal reports over the 633km path were 59 with heavy QSB.

Congratulations indeed to all those who took part in these very successful tests.

## 24GHz

Over the next few months it is planned to publish constructional details for 24GHz equipment based on the Plessey GDO33 Gunn oscillator. The writer would be very pleased to receive any contributions on this subject.

The 24GHz beacons for GB3IOW and GB3ALD are on the point of becoming licensed, and G3VPF is starting their construction. He desperately needs some lengths of WG20 and components for the beacons. Any donations of hardware would be greatly appreciated.

*(Continued on page 952)*

# technical topics

Pat Hawker, G3VA

RECENTLY a reader drew my attention to a fascinating article published almost 60 years ago: "Research for the Wireless Amateur" by W. T. Ditcham (*Wireless World* 15 May 1920). This emphasized that there was enormous scope for the private experimenter in radio, and also indicated that "the valve in its present form is not immune from criticism and is far from being the last word in electronic relays". The author noted that Dr W. H. Eccles had already demonstrated that it was possible to produce continuous oscillations from a galena crystal contact, and added, perceptively: "If a crystal can be caused to oscillate, it can probably also be made to amplify, and one gets a futuristic glimpse of cascade crystal amplifiers which will quickly relegate valve receivers to the background for all ordinary purposes."

Well today the transistor and the integrated circuit have nearly succeeded in doing just that—but not quite. One finds that there is still a lively and considerable interest among members in the use of valves, frequently for reasons which are technically sound and not just nostalgic. Often we are asked to include more valve circuits in *TT*, but unfortunately there are practical problems. For those without a well-filled junk box, many of the once-standard types of valves are getting progressively more and more scarce and expensive; again, the valve manufacturers have for some time virtually abandoned work on new applications and new types, except for the most specialized purposes. In his 1920 article W. T. Ditcham suggested that experimenters could try making their own valve substitutes from lamps and car bulbs, indicating that electron flow is not stopped by glass. Perhaps, soon, those of us who wish to stay thermionic will need to think seriously about such ideas again!

## More on high-current supplies

The notes in the July *TT* on high-current 12V power supplies for running solid-state equipment in the shack or on the workbench continue to attract interest and comment. Anthony B. Plant, G3NXC, for example, writes:

"Although you made the point about the need for heavy gauge wiring and for high-value capacitors, you missed out the even more important point concerning the separation of the rectifier wiring from the dc output wiring in the circuit diagrams. Fig 1 shows the preferred approach and, although particularly important for high current supplies, the same approach is also good practice for any type of psu.

"It should be appreciated that the ripple current in a rectifier/capacitor circuit can be very high; for example, in the supplies shown in Figs 5 and 6 in the July issue the peak charging current for a 25A load will be in the region of 65A! If this current flows through any lead common to the dc output the most likely result is considerable ripple applied to the load.

"Another problem with high-current supplies is that of voltage drop along the leads connecting the supply to the load. This problem can effectively be eliminated by the use of remote sensing as in Fig 1. The power supplies shown in Figs 5 and 6 of the July issue could be improved in this way, but unfortunately suppliers using three-terminal ic regulators cannot use this technique so, for these, heavy-gauge wiring between the supply and the load is essential. The 47Ω resistors shown in Fig 1 prevent runaway should the sense leads be omitted or fall off.

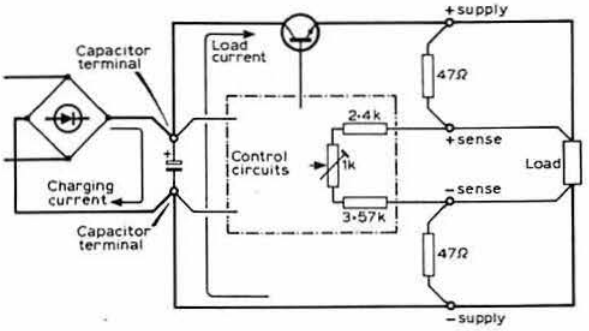



**Fig 1. G3NXC's approach to high-current power supplies underlines the importance of separating the rectifier wiring from the dc output wiring to reduce ripple, and the use of remote sensing to overcome voltage drop along the connecting leads**

"It is also most advisable when using, for example, four 2N3055 power transistors in parallel as the main series pass elements, to ensure that the load current is shared equally between the four devices, otherwise one or two transistors may "hog" a large percentage of the total current. It is therefore advisable and more satisfactory to put a small resistor, say 0·1Ω for a 25A supply, in series with the emitters of each of the four devices. This, of course, has the disadvantage that some of the voltage is lost across these resistors; however, with four 0·1Ω, even at 25A the voltage drop will be only 0·625V which should usually prove acceptable."

## Batttery-stabilized supply

Peter Smith, G3HWL, uses a technique that has been described before in *TT* (and *ART*) for low-current supplies—the use of a battery as a voltage stabilizer—and finds this satisfactory for a 5V supply capable of delivering high peak output. He writes:

"The system of Fig 2 has been in use for some months; no problems have come to light and the risk of excess output voltages seems minimal. The psu is based on a 723 regulator and is current limited at 5A, with regulated voltage output 14V. The battery comprises a pack of 10 7Ah F-size nicad cells floated across the output of the psu, with one of the series links between psu and battery made of much thinner wire to act as a simple fuse. A safety feature consists of an RS thermal switch

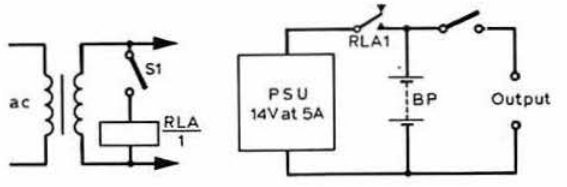



**Fig 2. The use of nicad cells to provide voltage stabilization, higher peak output currents, and a temporary "no break" emergency supply in the event of mains failure, as used successfully by G3HWL. The relay isolates the battery pack when no mains is applied while S1 is a thermal switch which de-energizes the relay if the temperature of the nicad cells rises excessively**

in contact with the nicad battery pack, wired to interrupt charging should a fault condition develop which causes the cells to overheat.

"The disadvantages of this approach are the cost of the nicads and the slight variation in output level. But, in its favour, the output current for short duration peaks may be very high (obviously if the mean current out exceeds the charging current the battery pack will, in time, discharge). Further, the unit forms a 'no-break' supply in not being completely mains dependent and capable of continuing to provide power for a time in the absence of mains power. Theoretically there is a problem in that the nicads should not be charged under constant-voltage conditions, but experience to date has revealed no problems with the arrangement as described. A similar approach could be adapted for different requirements in terms of output current or battery capacity, and a switched meter showing voltage/current is a useful addition."

## Synthetic zener diodes

Some years ago Dr A. C. Carr, G3OSU, drew attention to the use of two silicon transistors to form a means of providing adjustable voltage stabilization (*ART6*, pp233–4): Fig 3(a). Fred Brown, W6HPH (former G5AWI) extends this idea to other combinations of semiconductors that can be used to

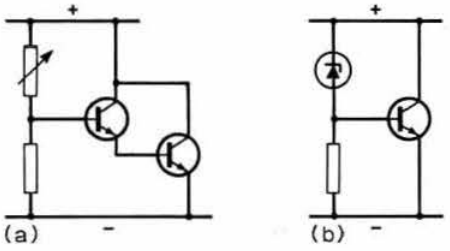



**Fig 3. (a) Adjustable voltage stabilizer using synthetic zener diodes formed by two transistors, as described some years ago by G3OSU. (b) Commonly used combination of low-wattage zener diode with a power transistor to increase power capacity**

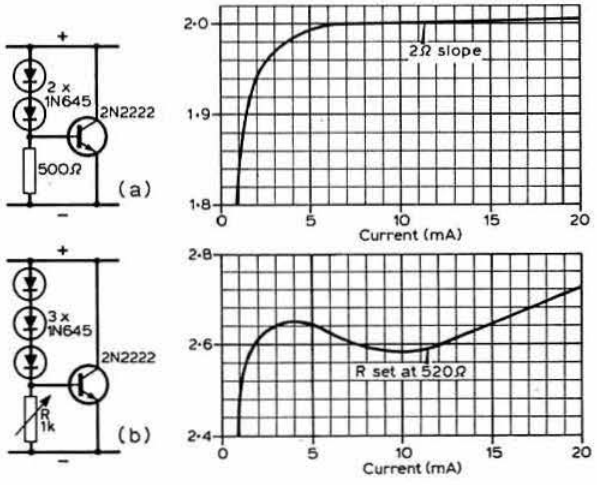



**Fig 4. Adjustable voltage stabilizer which is basically similar to Fig 3(b) but with zener diodes replaced by forward-biased silicon diodes having low slope resistance**

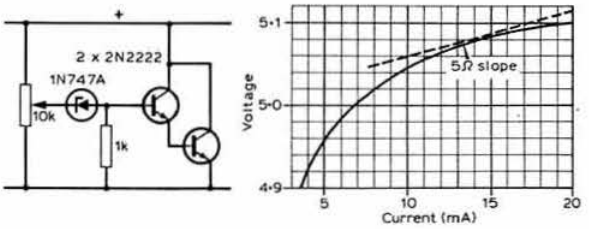



**Fig 5. Form of adjustable voltage stabilizer offering improved temperature coefficient**

simulate the action of zener diodes, but with improved characteristics. He writes:

"It is common practice for a low-power zener diode to be combined with a power transistor, as in Fig 3(b), to increase greatly the current capacity. Where this is done the stabilized voltage will be approximately 0·6V more than that of the zener, but the power/current capacity will be substantially that of the power transistor.

"The arrangements of Fig 4 are essentially the same as Fig 3(b) but with the zener diode replaced by ordinary forward-biased silicon diodes. The circuits of Fig 4(a) and (b) are useful in providing a low slope resistance in the voltage range below 3V where ordinary zeners suffer from high dynamic resistance. For currents greater than 10mA, the slope resistance of the arrangement shown in Fig 4(a) is only 2Ω, while an interesting property of that of Fig 4(b) is that the slope can be made zero, or even slightly negative, over part of the current range by properly setting the variable resistor R. It should be noted, however, that the circuits shown in Fig 3(a) and Fig 4 suffer from rather high negative temperature coefficients: essentially that of a silicon pn junction, or roughly 0·4 per cent/°C.

"The form of adjustable voltage regulator shown in Fig 5 has a better temperature coefficient than that of Fig 3(a), and if a zener of slightly positive temperature coefficient is used there is a possibility of full temperature compensation. Unfortunately at low currents ordinary zener diodes seem always to have slightly negative coefficients. The adjustable range of the circuit of Fig 5 is from about 4V up to the $BV_{ce}$ of the transistor.

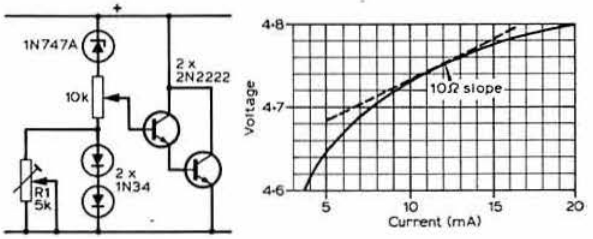



**Fig 6. Adjustable voltage stabilizer capable of full temperature compensation**

"Finally, the arrangement shown in Fig 6 does provide temperature compensation, though at the cost of a somewhat higher slope resistance. The temperature compensation is provided by the two germanium diodes, and can be controlled by the adjustable shunting resistor R1. With a 3·6V zener, this circuit will regulate to well above 10V, but for lowest slope resistance it is usually preferable to use a zener diode with a breakdown only slightly less than the intended value of the stabilized voltage."

## FT101 strong-signal modifications

The item in *TT* in August (page 739) reporting ZL2BAF's low-cost but very effective method of improving the strong-signal performance of the receiver section of the FT101 attracted considerable interest; but as a result it was soon discovered that the abridgements of the *Break-in* article on which the *TT* item was based had unfortunately omitted part of a sentence referring to Models 101B and E. The appropriate passage (with corrections and additions in italics) should be: "Remove screw securing noise-blanker board PB1182 (PB1292 in FT101E and 101B). For 101 Mk2 locate Q2 and bias resistors (R5 4·7kΩ and *R6* 22kΩ); *Q1 in the 101B and E, and its bias resistors R1 4·7kΩ and R2 22kΩ*".

G3SEU also notes that there appears to be an error in some FT101E manuals, as the noise blanker board is PB1582 on the Yaesu circuit diagram but PB1292 in the manual. He also points out that the third from last paragraph in the August item refers to FT101E and B models, as the previous paragraph provides alternative instructions for the FT101 Mk2. Those who have successfully completed the modifications confirm that they really do what ZL2BAF claimed.

## Second look

*TT* (August) gave details of a simple 28MHz preamplifier for use on receivers lacking sensitivity on this band. This resulted in a reminder from Ron Broadbent, G3AAJ (94 Herongate Road, Wanstead Park, London E12 5EQ) that AMSAT-UK can supply constructional details of a useful 40673 dual-gate mosfet preamp for this band, complete with a printed circuit board, for 60p.

*TT* (February) noted the absence of any comprehensive public collection of second world war clandestine radio equipments (which owed much to pre-war amateur practice). To some extent this has now been rectified by a new exhibit at GB2SM (Science Museum, London) with a show case devoted to "clandestine and infiltration" units, including: MCR1 miniature communications receiver (built in large numbers for Special Forces by Philco); B2 (Type 3 Mk2) suitcase set; the Polish AP4 2–16MHz three-waveband transmitter/receiver with 6L6 power oscillator; Marconi beach landing set Type F; and some much more recent compact units, including Mk122, Mk123, Type 53/1. But, so far, none of the SIS/MI6 equipments, which would be interesting in showing the use of very simple "straight" rather than superhet receivers which often suffered from excessive second channel response. A recent contact on 7MHz with old-timer Bill Daly, G2VZ, shows that a B2 with external vfo still puts out a useful signal.

## The simplest el-bug?

The HB9ABO cmos el-bug (*TT* February) has proved a popular design, and recently Jim Bolton, G3HBN, demonstrated to me "on-air" the excellent code that can be produced by its use. It may therefore seem a little premature to draw attention to a very simple keyer based on that most common of all ic devices, the 555 timer: Fig 7. It comes from a note by Alan Monet, WA9KAN, in *QST* June 1979, pp42–43, although he acknowledges an earlier article in *73 Magazine* of May 1977. The NE555 forms the basic keyer with TR1 forming a relay driver. The use of a keying relay permits the keyer to be used for positive or negative keying systems, although there would seem to be no reason why the LA8AK technique (*TT* February 1979) should not be used instead.

The relay should be a 12V device with 300Ω coil and a pull-in

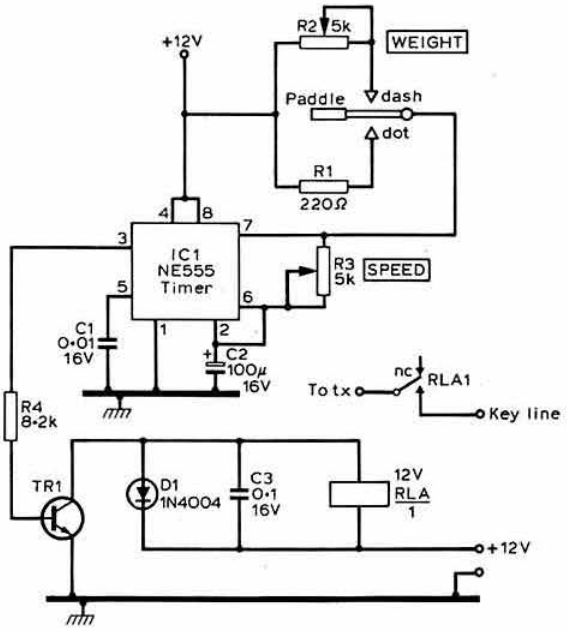



**Fig 7. Simple 555 el-bug keyer that (with relay isolation) can be used on positive or negative keying systems. D1 may be 1N4004 or equivalent. TR1 can be 2N697, 2N2222, 2N3904 or equivalent**

between 20 and 30mA. Power consumption will be quite significant, and it will be advisable to use either a 12V mains supply, reasonably high-capacity rechargeable battery or a physically large dry battery.

When the unit is keyed, pin 3 of the 555 goes "high", so forward-biasing the relay-driver transistor, TR1, which can be a 2N697, 2N2222, 2N3904 or equivalent. When saturated, almost the full 12V is developed across the relay coil. R3 controls the speed of the keyer, while R2 regulates the weight of the dah, and R1 governs the dit.

## The "dasher" key

*(The wrong diagram was accidentally included last month with this item which is repeated here with the correct diagram).*

A means of converting a normal mechanical bug key into a simple form of mechanical/electronic el-bug is described by Joseph Fenn, KH6JF, in *Ham Radio* (March 1979, p68). This uses a 555 ic timer in conjunction with a small 6V dc, sensitive relay to provide automatic dashes when the dash control is held over, while of course also providing automatic dots by means of the usual vibrating action. The two controls provide speed and weight adjustment, and unlike most el-bugs it can be set to provide dashes of any required ratio to the dots, permitting the long-dash style of sending sometimes cultivated by amateurs. A rechargeable nicad battery is used, and the unit is enclosed in a small screening box, connected by two-core-plus-shield cable to the bug key, with the screen taken to the frame post. If, in spite of these precautions, strong rf fields cause erratic dash lengths, this can usually be cured by putting ferrite beads on the input and output leads. The only change needed to a Vibroplex-type key is to disconnect the lead under the base from the dash contact post.

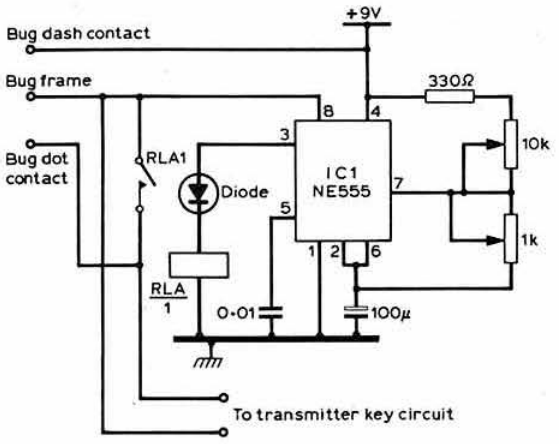



**Fig 8. KH6JF's 555 "dasher" unit providing automatic dashes on a mechanical bug key. The diode can be any small-signal switching diode, K1 is a small 6V relay. Shielded twin lead (plus ferrite beads for higher power) should be used between the "dasher" and the key to eliminate rfi problems**

## The bi-band dipole antenna

Although it has been pointed out in the past that, provided open-wire feeders and an atu are used, a dipole antenna cut for 14MHz can be used quite successfully on 14, 21 and 28MHz (and even reasonably effectively on 7MHz) many amateurs still prefer untuned feeders. Multiband dipoles with coaxial feeders can be built by using the paralleled dipole technique (see *Radio Communication* June 1979, p527), but an alternative technique providing a 300Ω feedpoint on adjacent, harmonically related bands has been described by Ron May, VK1PM (*Amateur Radio* July 1979).

This antenna (Fig 9) uses the properties of a λ/4 stub to provide an approximate 300Ω resistive feedpoint on the two bands. The dimensions given are for 3·5MHz and 7MHz but these could be scaled for other bands. On the higher frequency band the centre section of the antenna acts as a folded dipole and so provides the 300Ω impedance. The end sections being each λ/4 long do not introduce reactance, and in effect are disconnected from the folded dipole section due to the impedance mismatch. On the lower frequency band the full length of the antenna element forms a λ/2 radiator, with a T-match section to the 300Ω line. For those who do not want to take the 300Ω balanced feeder into the shack, it is possible at any point to insert a 4:1 balun transformer and then use 70Ω coaxial cable.

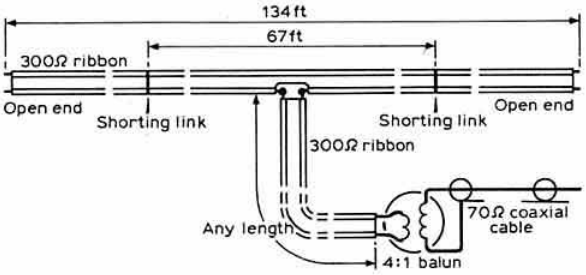



**Fig 9. Bi-band dipole provides resistive match to 300Ω line on two adjacent harmonically related bands**

## A cw delay-line

Stephen Price, G4BWE, has developed an electronic delay-line technique to overcome the common problem found with the "semi-break-in" facilities fitted to many transceivers. In such systems the change-over from receive to transmit modes is initiated by the first depression of the key during each period of sending. Although such systems are usually reliable, they often suffer from the disadvantage that the electro-mechanical change-over relay introduces a finite delay period into the change-over. This can often result in the corruption or disappearance (if a "dit") of the first symbol, although it serves to trigger the change-over relay; furthermore some transceivers tend to produce an annoying "chirp" for a very short period immediately following the change-over. G4BWE writes:

"Fortunately an elegant solution can be provided by digital electronics. By feeding the morse symbols through a multiple-stage binary shift register, a controlled time delay can be introduced. Then if the change-over system is coupled directly to the key (as normal) the relay will be energized by the first 'key down' movement, but (while the relay is in course of 'pulling in') the first dit or dah will be travelling through the shift register at a rate determined by the clock oscillator. The delay can be set so that the cw will not emerge from the register until the transmit change-over has been completed.

"In order to implement the system, it is necessary to break any internal connection between the transceiver's keying and change-over circuitry: however, alternatively, for those operators who prefer not to modify their equipment, it is possible to construct an outboard 'cw interface' unit as follows: undelayed morse is fed via a switching timer to the ptt contact on the microphone socket; the audio input contact, however, is coupled to the output of a low-level 800Hz oscillator which is keyed by the delayed morse.

"Fig 10 shows the 'cw delay'. A 64-stage static shift register (CD4031) is clocked by an astable multivibrator which consists of NAND gates A and B (half of CD4011). RV1 sets the clock frequency and thus determines the delay time. The shift register

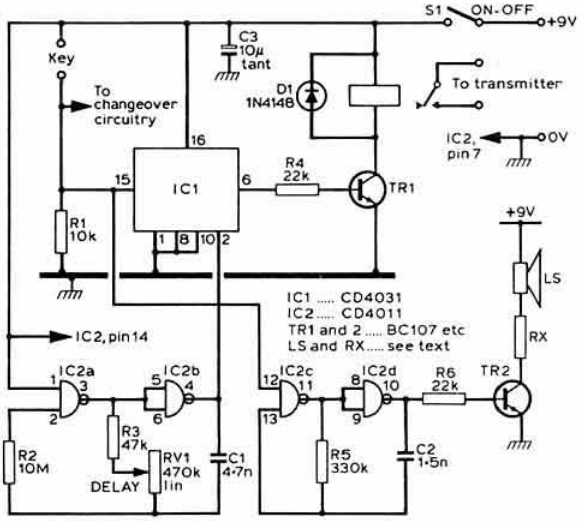



**Fig 10. G4BWE's cw delay line using 64-stage shift register so as to avoid corruption or loss of the first morse symbol when using semi-break-in keying**

input (pin 15) may be fed from any type of key. R1 is a 'tie down' resistor which ensures that a logic 0 is always present on pin 15 when the key is 'up'. The shift register output (pin 6) feeds TR1 base via the current limiting resistor R4. Although a keying relay is shown, TR1 may be operated as a switching transistor.

"Gates C and D of the CD4011 in conjunction with R5 and C2 form a sidetone oscillator which drives a miniature loudspeaker via TR2. RX should be chosen to obtain the best compromise between sidetone volume and battery consumption for the particular loudspeaker used (eg an 80Ω loudspeaker in series with RX 270Ω). It will be necessary to incorporate the sidetone circuitry should the key already boast such a facility. The sidetone monitor of the transceiver *must* be disabled or the operator will be confused by hearing the delayed cw.

"The cw delay unit can best be housed in a metal box to screen the circuitry from rf, and the whole unit is powered by a small 9V battery (eg PP6)."

## Earth leakage mains protection

Peter Lee, G3SPL, continuing the question of mains safety, draws attention to the use of earth-leakage circuit breakers (elcb). These devices operate by monitoring the go and return currents in the line and neutral mains wires; if a disparity greater than a specified figure (eg 30mA) is detected, the circuit breaker trips, disconnecting the load from the mains supply.

Such breakers trip within about 30ms, sufficiently fast to protect a very high percentage of humans from mains hazards even in what would otherwise be potentially very dangerous circumstances. G3SPL works at a high-power transmitting station, and equipment is serviced inside a screened (Faraday) cage representing a "very earthy" situation. But on the one occasion when he touched a live point on a piece of equipment, the elcb tripped before he even felt the shock!

He admits that a good elcb is not a cheap device (about £25) but in view of the degree of confidence they provide they cannot be regarded as a luxury.

It happened that just when I received G3SPL's letter, I came across a leaflet for a proprietary elcb unit, which simply plugs into a 13A socket, providing two protected output sockets and complete with test push button, visual trip indicator and other fail safe features. It is rated at the unusually low tripping current of 10mA yet "designed to overcome the inconvenience of false tripping previously associated with elcb systems". I have no personal knowledge of this unit or how it compares with any competitive units, but for those interested it is called the "Besafe" system and is marketed at about £45 by Burke Electronics Ltd, 2 Clairmont Gardens, Glasgow G3 7LW (041-339 8255). But note that an elcb system provides no protection against shock *beyond* the primary winding of the isolating mains transformer since it is insensitive to load variations. In other words you can still get a shock from your ht supplies!

## Balanced dipoles and coaxial cable

From time to time we have commented rather coolly on the virtues and vices of balun transformers used between a coaxial feeder and a dipole element. However, a novel, virtually no-cost technique that appears to offer useful advantages has been described by Robert B. Dome, W2WAM, in *QST* May 1979, page 43.

He notes that, ordinarily, when a balanced dipole element is fed from coaxial cable an unwanted current flows down the outside conductor jacket of the cable. While such an arrangement may have a total radiated power equal to that when the element is fed from a balanced feeder, the radiation pattern may be distorted and the radiation from the feeder may contribute to tvi.

W2WAM shows (with mathematical justification) how the simple expedient of connecting the shield (outer conductor) of the cable to earth at a point $\lambda/4$ from the antenna feedpoint results in a minimum diversion of transmitter power on to the outside conductor of the cable.

Clearly this technique would be easy to implement on single-band dipole-type antennas or beams for the lower-frequency amateur bands. There could, of course, be problems for multi-band operation or where the antenna is more than $\lambda/4$ above earth (could a $3\lambda/4$ section be equally effective?). A possibility worth investigating would be the use of an "artificial earth" consisting of one or more $\lambda/4$ wires, insulated at the far end, attached to the cable. It has been noted before that the use of artificial earths of this type can very effectively eliminate the problem of the "hot" earth point that often occurs when a long-wire antenna is used from an upstairs operating position. Altogether this could prove a powerful new technique for minimizing an old problem.

## Switch-on surge reduction

A note from H. E. Whatley, G2BY, describes a simple way to prolong the working life of equipment, such as high-power amplifiers, transmitters and linears, where a heavy in-rush current occurs when it is switched on. This surge can be particularly heavy when, by chance, the switch is closed just near the peak of the mains cycle. Do you ever wince at that nasty and ominous "thump" when you switch on?

G2BY minimizes this problem and ensures a silent and non-destructive switch-on by placing a 30Ω, 10W resistor in the mains lead to the transmitter and then bridging it with a mains on-off toggle switch which can be mounted conveniently—in G2BY's case on his mains distribution panel adjacent to his left hand.

Then it is only a question of remembering to switch the resistor into circuit with his left hand; switching on the transmitter with the right hand, and about 0.5s later closing the toggle switch and so short-circuiting the resistor. Should one notice a smell of burning bacon then it probably means that one has forgotten to short-circuit the resistor; but even if once in a while the whole procedure is forgotten, then it just means an occasional (instead of a regular) switch-on surge.

By coincidence, a basically similar but fully automatic surge reduction arrangement was published recently in *Electronic Design* (No 8, 12 April 1979). This is shown in Fig 11, but note that the component values are intended for 110V mains supplies and would need modification for 240V.

The designer points out that the switch-on surge with some

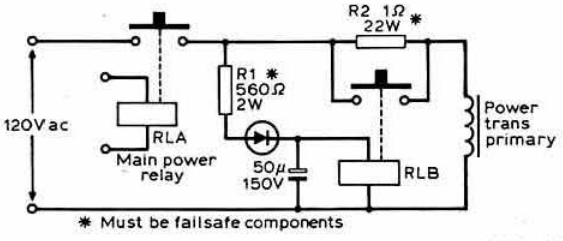



**Fig 11. Automatic mains surge reduction system as published in Electronic Design for 110V ac mains supplies. Component values will need changing for 240V mains supplies**

American stereo af amplifiers can go as high as 200A and may blow the fuses. His arrangement is claimed to reduce a 200A surge to two 80A surges. Series resistor R2 is automatically short-circuited after a time delay of about 50ms.

## Practical antenna guidance

For many months, Les Moxon, G6XN, has been carrying out a series of detailed investigations into hf antenna performance in support of a book which he is preparing for the RSGB. The aim is to provide amateurs with practical guidance that should enable more of us to achieve optimum results *in sites typical of those available to many amateurs.* While there are of course a number of mostly excellent books that outline antenna fundamentals and provide representative designs, almost everybody who has ever sought antenna information from them will have come rapidly to the conclusion that there are still many unresolved questions that often underline the difference between the professional situation (with tall masts and plenty of space) and the situations with which most of us have to contend. There are, as we have frequently noted in *TT*, many myths and ambiguities when it comes to such questions as miniature arrays, choice of array and the actual (as opposed to the theoretical) gain that is likely to be achieved, choice of polarization and the effects of poor ground conductivity, the effects of bending and folding elements in various ways, the question of proximity to houses, roofs and trees, trade-offs between gain, side-lobes, bandwidth, influence of nearby resonant and non-resonant elements, etc.

The projects which G6XN has been tackling recently have shown how many gaps there are in our knowledge when it comes to these practical questions, and together they look like forming an ambitious and almost certainly unique book. But before completing the manuscript, G6XN would be interested to receive suggestions and comments on just what questions readers would like to see answered in such a book. So if readers have come up against problems caused by sites or by apparent contradictions and ambiguities in existing sources of antenna information, please drop a line to Les Moxon, G6XN (1 Stoner Hill House, Froxfield, Petersfield, Hants GU32 1DX).

But could I make a suggestion? Do not divert G6XN from the task at hand: ie let him have comments but please do not bombard him with urgent antenna queries. His own investigations have already shown that there is considerable room for improvement in hf antenna design for those of us with restricted sites, so it is important not to delay the good work.

## Dipole insulators

From V. J. Ludlow, G3JLZ, comes the suggestion that when erecting wire dipoles a reasonably effective set of insulators may be to hand in the form of three sections of those "chocolate blocks" used by electricians when jointing cables. Fig 12 shows how a two-section piece can be used for the dipole feed-point, with the dipole inner ends anchored under one screw in each metal insert, and the coaxial cable or twin balanced feeder ends fixed under the remaining screws. As outer insulators, again using a two-section block, the dipole wire ends can be taken right through the metal inserts and then twisted round, before the two screws are tightened down; a similar approach can be used for the anchor guys/halyards, using the second insert in each block. Nylon monofilament rated at 50 to 80lb breaking strain makes useful insulated guys without being too obtrusive, he adds.

G3JLZ wonders whether there is likely to be any difference in the performance of the clear as opposed to the chocolate-coloured versions.

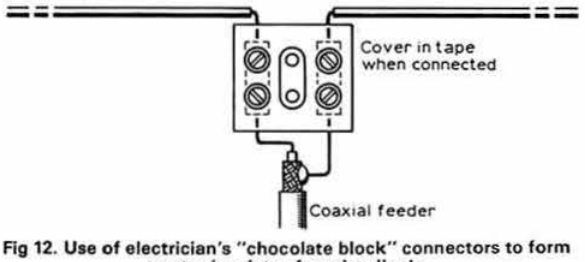



**Fig 12. Use of electrician's "chocolate block" connectors to form centre insulator for wire dipole**

## Tips on heavy current supplies

Just too late for the July *TT* round-up of heavy-current 12V power supplies, Arnold Pittock, G2CDB, sent along some further useful suggestions. He uses an NE550 regulator with four 2N3055s, a "brute" of an 18V 30A transformer (cost £18 from Samsons of Edgware Road, whom he considers are a good source) and "rally" components such as heat-sinks. He believes that a respectable 20A supply with short-circuit protection and excellent regulation can be put together for roughly £25; this, he points out, is not so much more than a good battery at about £20; and batteries, he feels, are not well suited to erratic use.

Among his tips are:

**(1)** One needs at least 18V into the rectifier unit to ensure a regulated 13·6V out.

**(2)** At heavy currents, terminal tags and screwed connections are better than soldered joints.

**(3)** Limiting wirewound resistors of around 0·01Ω are hard to come by (he bought 10 0·1Ω resistors at a rally), and a good answer is to buy an electric fire element at Woolworths and then cut off a suitable length.

## More significant snippets

**Plug problems:** P. Beehlar, GM3ZCT, has discovered to his cost that Japanese equipment (eg Yaesu FT221) uses multi-pin power plugs with ¼in flat blades which are mechanically and electrically interchangeable with British plugs of the "Painton" or "Miniature Jones" types. Well, what is wrong with that? Simply that *the pin numbering is not the same.* GM3ZCT feels it may save others a lot of work on the power units if they know the relationship of the four-pin version: *Japanese* pins 1, 2, 3, 4 correspond to *British* pins 1, 3, 2, 4 (ie numbering of 2 and 3 are interchanged).

**HB9ABO keyer:** John Ellis, G2FNK, is convinced that the difficulty LA8AK experienced on one model of the HB9ABO cmos keyer (*TT* June 1979) could be traced to key (switch) bounce. No switch is perfect, he notes, as computer operators have found, and cmos devices will toggle at rates up to 2MHz. The solution that LA8AK adopted successfully, viz decoupling at higher frequencies, is a pointer to the validity of the contact bounce theory.

**Drake TR7:** Steve Rawlings, G4ALG, has recently made a number of useful small modifications to his Drake TR7 transceiver, and he would be happy to send a copy of these to readers already having the TR7 handbook. Stamped addressed envelope to: 3 Hunt Road, High Wycombe HP13 7RE. □

# 4-2-70

Graham Knight, GM8FFX*

## South African vhf news

RSGB member Garry Howarth, ZS6ASO, is known to readers of *4-2-70* as the beacon keeper for ZS6VHF which operates on 50·040MHz. ZS6ASO has introduced new operating hours for this interesting beacon, which is now on the air between 1500gmt and 2000gmt. He will be keeping a frequent watch on 28·333MHz in case any UK stations are able to copy the 50MHz beacon and wish to try for cross-band 28/50MHz contacts. ZS6ASO is also very interested in trying to establish cross-band contacts with UK stations operating in the 70MHz band. During these tests ZS6ASO will monitor 70·050MHz and reply on the beacon frequency of 50·040MHz.

ZS6ASO is also building a 100W transmitter to power another beacon, but this time on 432·080MHz. The antenna will consist of a group of four 16-el Yagis beaming north for one hour a day between 1500 and 1600gmt. This beacon is intended to further the research into transequatorial propagation on the 432MHz band.

Not content with the work involved in the beacon projects, ZS6ASO is rapidly nearing completion of eme equipment for the 144MHz band. The eme antenna system is a 30ft tower supporting four 15-el Hy-Gain Yagis which are fed by a KLM power divider. The transmitter has a pair of Eimac 8874 grounded-grid triodes running 1kW on cw, and the transceiver is a modified Yaesu FT221R. Many eme operators need a 144MHz contact with the continent of Africa to complete their applications for the Worked All Continents Awards on moonbounce. ZS6ASO will certainly be very much in demand from eme vhf operators around the world, and those wishing to get in touch with him can write to Garry Howarth, PO Box 311, Kempton Park 1620, South Africa.

## DX rtty on 144MHz

Jonathan Perkins, G8MLY, of Norwich, read the August *4-2-70* story about LA3EQ with interest, as he had contacted LA3EQ on rtty a few days prior to receiving his copy of *Radio Communication*. G8MLY was beaming east at the time and heard weak signals from LA3EQ, but these soon peaked up to S8 after repositioning the beam. Contact was first established on ssb, and then both stations changed modes to frequency shift keying, and the rtty contact continued for several minutes. G8MLY used a Creed 7B teleprinter, a Creed 6S auto-transmitter and an 85R reperforator. This system feeds a Liner 2 transceiver running 10W output to an 8-over-8 slot-fed Jaybeam Yagi which is 135ft asl. G8MLY wonders whether this contact, which took place on 13 July, was a G to LA first on rtty.

Quite a number of amateurs in the Norwich area are interested in rtty, and G3OGE and G3RQY both have systems incorporating the G3PLX designs which were detailed in *Radio Communication*. G8QR is building the ASCII terminal which was described in the December 1978 issue of *Elektor*, and should be on the air soon. The Norwich group of rtty enthusiasts are always active on Monday evenings at 2000gmt and they monitor 144·600MHz and 145·300MHz. G8MLY is willing to maintain rtty schedules with anyone who needs to contact Norfolk on rtty or ssb, and can be contacted at 14 Lowther Road, Eaton Rise, Norwich NR4 6QW.

## "Backyard moonbounce" part 2

In view of the many queries received from amateurs throughout the world about the Chris Bartram, G4DGU, eme system, it was decided to describe the system in detail in *4-2-70*. Last month we described the G4DGU moonbounce antenna system which Chris has been able to fit in to an 8-by-16m back garden, and this month we give details of the receiver system.

Next to the antenna, the most important system component in any 432MHz eme set-up is the front-end of the receiver. To avoid the severe degradation in the receiver caused by what would be considered trivial feeder losses on a lower band, the preamplifiers are mounted at the feed point of the antenna system. The preamplifiers are protected from the weather by a box which also houses the antenna transfer and receiver protection relays. The original design for the preamplifier used an NEC64535 device, and this was quickly succeeded by an NEC65835 which gave improved performance. Using the noise temperature measuring techniques which were recently described by G3WDG in *Radio Communication*, G4DGU measured a receiver noise temperature of between 100 and 120°K. The importance of a low-noise second stage should be stressed, as with modern devices it does not take too much in the way of a high second-stage noise contribution to double the system temperature.

At the end of 1978 G4DGU obtained a British-made Plessey GAT5 gasfet transistor. Gasfets are "magical" devices which are used professionally as low-noise amplifiers, oscillators and power amplifiers in the range of 2 to 30GHz. They have not been employed too much in the vhf/uhf range, and it has been left to radio amateurs to develop their use in the region around 400MHz. G4DGU installed a GAT5 preamplifier on the antenna over Christmas. A large improvement in performance was immediately noticed on moonbounce QSOs, and this was confirmed by subsequent tests. The receiver noise temperature had fallen to between 50 and 60°K, and the received echo rate rose from perhaps 10 to nearly 40 per cent. The G4DGU preamplifier had the distinction of being the first gasfet unit in use on 432MHz eme in the UK, although three other moonbounce operators are now using the same devices.

Some further improvements can probably still be made to the receiver front-end, and rebuilding the input matching network in distributed (stripline) form should remove some of the losses associated with radiation from the input matching circuitry. Specialized cooling of the transistor would also make an improvement which would be very significant. If any reader of *4-2-70* has a small Peltier junction (Frigistor) which they would be prepared to donate, G4DGU would be very pleased to hear from them.

G4DGU follows the special preamplifier with a conventional converter which feeds signals to either the station FT101 and audio filter, or to a special wide-band square-law receiver which is used for measurement purposes and also for some casual real-time radio astronomy.

The transmitter is quite conventional, with a Yaesu FT101 driving a home-made transverter which produces a very linear 3W on 432MHz. Great care has been taken to ensure that the frequency stability is above that of the average commercial

*PO Box 49, Aberdeen AB9 8JA

unit. The 3W signal is amplified to 20W using an old DET24 valve in a coaxial cavity, and power from this drives a pair of 4CX250Bs in a K2RIW type amplifier. Using high-quality valves and the proper Eimac bases has paid dividends for G4DGU, as this amplifier has been running satisfactorily for some time now, thus proving that the design and components are reliable.

The results obtained with the G4DGU "backyard moonbounce system" have been detailed in many previous *4-2-70* pages, and to date Chris has worked over 20 stations in five continents on 432MHz. Stations using antennas as small as 20ft dishes have been copied, and one or two firsts have been achieved. The most significant was probably the first conventional contest QSO made via 432MHz eme in Europe. This happened when SM6CKU came back to a CQ call during a Swedish monthly uhf activity contest when RST reports and QTH locators were exchanged via the moon. G4DGU feels that there will soon be increased European eme in ordinary contests, which would encourage more real communication via the moon. G4DGU certainly has a point there, and with some operators already using 160-el arrays for 144MHz contests, eme contacts may soon be made by several contest entrants on both 144 and 432MHz. G4DGU is to be congratulated on his "backyard eme" activities, and thanked for making these details of his system available to *4-2-70*—thus replying to a very large number of readers who have been intrigued and inspired by his exceptional success with such a small antenna space.

## Repeater channels

The item which appeared in the August *4-2-70* pages about Continental repeater channels has stimulated a response from 16 RSGB members who live outside the UK. All of these members have given fuller details of repeaters which are operational in Austria and France which do not comply with the IARU Region 1 band plan. Some letters have also been received from UK vhf operators who are concerned that some of these new repeaters have outputs in the all-mode section of the band plan.

The views of the Continental operators are best summed up by a long and detailed letter from Peter Frey, HB9MQM, the editor of *Old Man,* the journal of the Union of Swiss Short Wave Amateurs. As the editor, and as a well-known vhf operator, HB9MQM has closely followed the development of the repeater scene across the eastern and western borders of Switzerland, and he makes the following points: France (or REF to be exact) has obviously not fully deferred the plans for new repeater channels with inputs between 144·725MHz and 144·875MHz. As a matter of fact FZ6THF is operational on the so-called channel "R8b", with an input on 144·725MHz and an output on 145·325MHz. This repeater is located on the Petit Balon d'Alsace about 800m asl, and is producing an S9+ signal at HB9MQM's QTH in EH42a. The FZ6THF repeater has been on the air since July and runs 50W.

An Austrian repeater, OE9XVH, has been operational for six months, and can be heard and worked practically everywhere in north-eastern Switzerland. The input frequency of OE9XVH is 144·875MHz, and the output is on 145·475MHz. The input frequency of the Austrian repeater is also the frequency of a special low-power beacon which is situated on the roof of the Federal Institute of Technology in Zürich. The beacon has the callsign HB9W, and it has been specially designed to assist amateurs in measuring antenna gain, front-to-back ratios, etc. The beacon has been programmed to transmit its call followed by 25 dashes, with each dash being transmitted with exactly 3dB less power than the preceding one. Operators working via the OE9XVH repeater interfere heavily with other amateurs who wish to use the HB9W beacon for circuit adjustment and measurement purposes.

OE7XZI is the callsign of another Austrian repeater which is located at one side of the border on Zugspitze mountain. The German repeater DB0ZU is on the German side of the border and it operates on channel R2. The OE7XZI repeater is a linear transponder with an input passband from 144·350 to 144·390MHz, and its output is also broadband, being between 145·550MHz and 145·590MHz. HB9MQM remarks that this particular repeater has been operational for a number of years and has always caused some controversy between amateurs. The ssb operators get annoyed by fm operators who transmit fm via the linear transponder, and ordinary simplex fm operators are annoyed by their simplex frequencies being interfered with by the output of the repeater.

HB9MQM has also closely followed the arguments put forward by OeVSV and REF for setting up repeaters on these non-standard channels. The Austrians argue that they have put their repeaters on the highest locations possible to get good coverage. But since repeaters on these locations would interfere with existing German and Swiss repeaters if set up on any of the existing IARU channels they had no choice but to violate the IARU Region 1 band plan.

The French argue in a similar way, pointing out that France was a late-comer to the repeater scene and found all the existing channels were occupied by repeaters in the neighbouring countries. Furthermore REF puts forward the view that R8 and R9 cannot be used any more because of satellite use. In an attempt to avoid existing repeaters the French have introduced seven new channels outside the IARU Region 1 band plan, with the inputs occupying 25kHz slots between 144·725MHz and 144·875MHz. The outputs are 600kHz higher.

Mike Dennison, G3XDV, of Whitstable, reports that FZ2VHF at Nurlu, which used to operate on R9, now has the input on 144·750MHz and the output on 145·350MHz. This repeater is clearly audible in east Kent at all times, as is the Boulogne repeater, FZ2VHF, which is operational on R5. G3XDV is concerned that the new French input frequencies fall within the all-mode section and that some of these channels are allocated in the UK for emergency use. The new French output frequencies are also popular simplex frequencies in the south-east of England—the area which will hear the repeaters most frequently. G3XDV wonders why seven new channels are required to replace the loss of R8 and R9.

In Britain we are fortunate that the VHF Committee and its Repeater Working Group foresaw some of these problems and did not allocate R8 and R9. It is also interesting to note that the UK has twice as many vhf repeaters as France and has managed to fit all of them into seven channels. Tim Hughes, G3GVV, the chairman of the RSGB IARU Committee, recently visited the REF Assembly at Strasbourg, and discussed this problem with F2MM, who is responsible for REF repeaters, and with F9FF, the president of REF. It was again discussed at a Friedrichshaven DARC meeting, when representatives from Belgium, Luxembourg, Germany, Switzerland, Holland, Italy and Sweden expressed their concern to the REF president, F9FF.

As a whole, these developments in Austria and France are to be regretted. Both national societies put their plans into effect

without consulting the other national societies or the IARU VHF Working Group. Their decision to operate these independent plans disregard decisions taken democratically at IARU conferences at Scheveningen 1972, Warsaw 1975 and Miskolc-Tapolca 1978. It can only be hoped that the coming meeting of the VHF Working Group of Region 1 can find a solution to this problem.

## New 433MHz repeater proposals

Fourteen further proposals have been received by the RSGB for the establishment of uhf repeaters on the following proposed channels: GB3GF RB13 (output 433·325MHz, input 434·925MHz) Guildford; GB3HD RB2 Huddersfield; GB3HN RB11 (output 433·275MHz, input 434·875MHz) Hitchin; GB3HO RB14 Horsham; GB3HW RB13 Gidea Park; GB3LC RB13 Louth; GB3MW RB10 Leamington Spa; GB3SH RB11 Stockland Hill; GB3TH RB13 Tamworth; GB3UL RB2 Northern Ireland; GB3WN RB0 Wolverhampton; GB3YL RB14 Great Yarmouth; GB3YS RB2 Yeovil; and GB3ZI RB11 at Tamworth.

Full details of all operational and proposed repeaters are available in print-out form from RSGB HQ for 23p, postage included. Repeater enthusiasts who want to keep up-to-date should order a print-out about every three months, as the information is being continuously updated.

## Aberdeen uhf repeater on the air

The Aberdeen repeater GB3AB on Ch RB14 is now operational using a modified Pye U450 base station and a Modular Electronics pa stage. Output is 7W, and the repeater is located at the Aberdeen Technical College with the antennas being significantly closest to the rooms used to train marine radio operators. The logic uses the well-proven Tony Whitaker, G3RKL, circuitry, with the repeater being built by Bob Cook, GM4BYT, and Norman Hendry, GM8CBQ. This is the second repeater which comes under the wing of the Grampian Repeater Group, and its committee acknowledges the tremendous amount of assistance it received with cavity filters from Mike Foster, G8AMG. Further information about GB3AB, and GB3GN (R7), can be obtained from the group secretary, GM8HGD, 41 Skerry Drive, Peterhead.

## Tests with VE on 144MHz

In a six-hour test which started at 2100gmt on 12 August 1979, an attempt was made to contact VE1ASJ by meteor scatter propagation. Members of the Lizard Expedition Group (G3SEK, G4ANB, G4ASR, G4DEZ, G4DGU, G8HDR, G8KQB and G8AOC) operated as G4DGU/P from a site at Predannack Head on the Cornish coast in QTH locator XK74d. The test was an attempt to contact Andy McLellan, VE1ASJ, who is located in Saint John, New Brunswick—a distance of 4,470km.

Signals were received in both directions although no positive identification was made at the time. It is considered unlikely that the signals came from any source other than the co-operating stations. This is the highest frequency that radio signals have crossed the Atlantic other than via a satellite. The signals copied in the UK exhibited noticeable de-correlation, with spectral spread and doppler shift being observed at the UK end. The maximum burst length observed during this extended meteor scatter test was 750ms.

Analysis of the tape recordings which were made of the received signals may reveal further information.

On a less exotic but nevertheless important note for those operators needing contacts with XK square, the expedition also worked 350 stations via normal tropospheric propagation and 35 stations via meteor scatter. QSL cards for this expedition should be sent to 10 Duke of York Avenue, Milton Heights, Abingdon, Oxfordshire.

## St Kilda on 144MHz

Barry Titmarsh, GM8SAU, made his promised expedition to the island of St Kilda, and his visit, which was well publicised on GB2RS, coincided with good tropospheric and auroral conditions. Running 180W from a site 2,000ft asl, GM8SAU/P was an outstanding signal giving many stations their first-ever contact with the extremely rare QTH square of VR18g. GM8SAU/P particularly mentions G8BMJ in far-away YN79c as a strong ssb signal on the island. He had such a good take-off from the site that contacts were made with Edinburgh on the simplex frequencies. GM8SAU is sending a special QSL card in the shape of a St Kilda tee-shirt to the station he works at the greatest distance. GM8SAU is also investigating the possibilities of putting a beacon on this site. A beacon on St Kilda would certainly be useful and assist in the investigation of the recent auroras which have peaked to the north-west.

## Meteor scatter

The August Perseids came and went, and many operators thought they were not as good as last year. Clive Penna, G3POI, did manage to test his new antenna system of four 16-el Tonnas at 65ft, and he was pleased with the results, especially in the shape of EA6AR—a new country. GM5CSY enjoyed operating in his first meteor shower during his stay in the UK, and he was very pleased to work OE3LBC on ms ssb in a contact which included a 55s burst.

GM4COK arranged a special holiday break from his duties as a ship's radio officer to coincide with the Perseids meteor shower. His first completed contact was on ssb on 10 August with F1EIT in YG05J. Next day two contacts were completed, one with OE5KE (HI17g) which took five pings, 11 bursts and 40min, and the other with YU2RGK (HF64j) which was completed with the assistance of 15 pings, eight bursts and took 90 min. MS QSOs on 12 August included F6CJG (BF21J, SM0HJZ (JT), YU3CAB/ (HG), and OH3YW. GM4COK's last QSO of the Perseids took place on 21 August, and a contact was made with GU5CYN/P (YJ), and this late-in-the-shower QSO took 65min to complete with 12 bursts and 10 pings.

## Borders vhf repeater

The *4-2-70* pages in August reported interest in establishing a repeater in the border region on the east coast of Scotland. Two groups have carried out site evaluation tests, one from near Berwick on the southern side of the border, and the other from a site near Hawick. The two groups have since decided to join forces and have formed the Border Repeater Group. G3HDT was elected chairman, and GM8MJV was appointed secretary at the inaugural meeting on 29 August. The group already has its eyes on two possible sites and has a considerable amount of the hardware required, including the transmitter, coaxial cable and the antennas. The Central Scotland Group has long had thoughts about extending repeater coverage to the border and have offered to assist with equipment and expertise. Many summer visitors are surprised at the large gaps in repeater coverage between the northern English vhf repeaters and the area covered by GB3CS from Central Scotland; this would be rectified by new repeaters to cover the border region.

## Hebrides expedition

A large contingent from the Edinburgh & D ARC, assisted by GM3JIJ, GM3SWK and GM8NCM, put GB2HEB on the air on 144MHz and 432MHz as planned. At one point in the proceedings GM3JIJ had to rescue a vehicle which was sinking in a bog with his Land Rover. The group were lucky in being on the site during ms, tropospheric and auroral openings. The gear used consisted of Icom transceivers feeding Microwave Modules transverters and MM linear amplifiers for 144 and 432MHz, with Tonna antennas being used on both bands. One of the best contacts on 432MHz was with G8GXP/P in the Isles of Scilly in locator WJ09E.

The main reason for the group deciding to go to the Hebrides was to give as many operators as possible the chance to work WS square. They certainly achieved this object and the expedition was well publicised in *Radio Communication* and on the GB2RS news bulletins. The expedition was particularly successful on meteor scatter, with contacts being completed with DL7QY (FJ), DM2BYE (HM), HB9AXT (DH), SM2CKR (KX), SM3FGL (IW), SP2DX (JO) and, best of all, UC2AAB in square NN18c.

## Auroral reports on 144MHz

There was a large number of auroral events during August, ocurring on 1, 4, 7, 13, 18, 20, 25, 29 and 30th. During almost all these events GM3JIJ, operating from his holiday home on the island of Skye, worked through huge pile-ups of stations all calling to get WS square contacts in the log. GM3JIJ's call features in almost all the auroral reports received, and he picks out G4DSC, G6NB and EI3CA as the most outstanding signals. GM3JIJ says the event on 13 August lasted from 1330 until 2100gmt and that he was completely tired out after working stations on cw non-stop for the whole period. GM5FM and GM4HDL, also located on Skye, have had their share of auroral dx, but this time on ssb.

It is interesting to compare large scale events with much smaller auroral openings. On 20 August GM8FFX noted an auroral opening on the 50MHz band television carriers from stations in Scandinavia at 1800gmt, but at this time no auroral signals could be heard on 144MHz. At 1820gmt SK4MPI, the Swedish beacon on 144·960MHz, appeared at S3, and at 1826gmt GM4COK was copied on cw working SM3DCX in square IV63b. The Swedish beacon peaked up to S5 at Aberdeen by 1835gmt and, much further south in Leeds, listener Kevin Jackson logged auroral television transmissions from BBC transmitters at Bressay, Ch B3, and Meldrum, Ch B4. These auroral television signals lasted for a short period around 1842gmt and then faded out without returning. Although a weak visual aurora was seen from the Shetlands later in the evening, auroral conditions did not return to the vhf bands.

A bright visual display accompanied the large-scale aurora which occurred on 29 August, and the visual display was seen by members attending the Border Repeater Group meeting at Kelso. GM4EZJ reports a very bright display equal to many he has seen from Aberdeen, and he found it possible to work stations via the aurora with his mobile equipment. This aurora was first noticed by GM4COK at 1430gmt, continued until 1900gmt, with a second phase starting at 2300gmt and continuing weakly until 0120gmt. GM4COK in Edinburgh worked 110 stations on cw, including 14 countries and 28 QTH squares. His best dx contacts were DM2GKN/A (GK17a), DM2CPA (GO61f), DL1MF (GH12a), SP2DX (JO43c), SP2FWF (JN74e) and OH0JN in JU70d square. GM4BYF in Edinburgh worked 50 stations, including DK5AIA (FL33b), F6DRO (BJ20e), F9EA/P (AJ36j) and F6EOQ (YI34j). On ssb GM8PUM in Aberdeen worked dozens of Continental stations with his new rig, and GM8MBP at Belhelvie worked many G, LA and SM stations. Several Scottish stations report strong ssb auroral signals from G8LYD, G8JVM (ZL31c), G8OPR and GW8JLY, with G3XDV being prominent from the south coast on cw. Mike Dennison, G3XDV, was very pleased to be able to participate in this aurora. Earlier in the month he heard his first aurora and spent all the time of the event listening to auroral signals from GM3JIJ in WS69c and from SM4GGC in GT80c. Having familiarized himself with the strange-sounding notes, G3XDV was ready for the next aurora which affected the Kent area. During the large-scale opening on 29 August Mike worked many new QTH squares, and he mentions GM3UU as a strong signal in Kent. GM3UU also reports G3XDV as a good signal during the event, and GM3UU worked 30 stations on cw—including operators in 11 countries. GM3UU's dx included G3AWZ, G4FAB (YN37c), GI5SJ, ON5GF (FK55H), SP2DX, OZ3ZW (FO18e), F6DWG (BJ41j), and GW3JXN/A in rare locator XM78a.

This event at the end of August was very interesting as many stations well to the south were able to participate in the opening. Contacts as far into France as YI square were made by a number of operators, and the GM4COK contact with DL1MF (GH12a) appears to be the farthest distance covered during the event. It is interesting to note that no contacts with any Russian country have been reported to *4–2–70*. GM3UU rightly points out that cw operators work far more dx during auroras, but he is full of admiration for those who do it the hard way on ssb!

## New hf/vhf transceiver

Although GM8FFX does not claim to be able to read Japanese very well, he was intrigued to read in a Japanese radio magazine that there is a transceiver on the market in Japan which operates on the hf and vhf bands. It has digital read-out, covers 1·8, 3·5, 7, 14, 21, 28, 50 and 144MHz, and operates on a.m., fm, cw and ssb with 10W output. This multi-band transceiver weights 14kg and operates from mains or 12V and is made by the Sugiyama Corporation. It does not appear to be on sale in any European country; perhaps one of *4–2–70*'s readers in Japan can give further details of this unusual transceiver?

## Late news

During the large-scale auroral event on 29 August G4CJG/M was able to work stations while driving along the M1 motorway. During the same opening Jim Martin, GJ3YIZ, worked several stations from Jersey and heard a station from Spain. Attempts by the Oxford University Group, GM3OUR/P, to work on 432MHz via the aurora proved unsuccessful. Considerable progress has been reported with the GB3AS vhf repeater; the receiver, transmitter and cavity filters having been tested. UHF repeater GB3NY near Scarborough is now operational on Ch RB0 with antennas on top of an 80ft mast—reports would be welcomed by G4EEV, QTHR. Several good 144MHz tropospheric openings occurred during the first two weeks of September, with G8OPR in Hampshire being a particularly good signal in Aberdeen on both ssb and fm. GM8SAU/P in VR18g on the island of St Kilda worked more than 60 stations during his visit, including G8BMJ (YN79c), G4CBW (YN50d), G8ISR (ZN33e), and G8LHT (ZN32c), and GI, GD, GW and EI. □

# the month on the air

John Allaway, G3FKM *

DX columns depend on an adequate supply of incoming information from all over the world, and it was a severe blow to your scribe to learn that the *West Coast DX Bulletin* was to cease publication. Its author, Hugh Cassidy, WA6AUD, after producing more than 600 issues since May 1968, decided it was no longer possible for his wife and he to cope with the results of their success. *WCDXB* was the source of many exclusive news items and will be difficult to replace. Your scribe is certain that readers would wish to join him in thanking Virginia and Cass for a first-class job well done.

## DX news

DL2DN reports that the information given in July *MOTA* concerning QSL cards for TY9ER was incorrect. The address published was that belonging to K4YT's brother, and K4YT made about 1,000 contacts from TY9ER in May 1979. However, it has been decided that DL8DC should answer all requests for QSLs (see "QTH Corner").

Further information on the new GDR callsign system comes from *DX'press*. It seems that calls with 0 as the second number will be issued for special celebrations. The first letter in the suffix will indicate the kind of operator in club stations—Z will be the first operator, Y the second, and so on. The letter A will indicate a training station. Reciprocal licences will be Y9/own call.

A51PN in Bhutan is reported to be active regularly on Tuesdays, Thursdays and Saturdays between 1200 and 1400 on 14,268kHz, and also in the Asian Net on 21,320kHz at 0100. S2BTF has been on holiday but will be back on the air at the end of this month. W5RU has logs for the period since 3 March 1979.

More activity by 4W2AA was forecast for the September/October period. If not already past it should last for four or five days. QSLs should be sent via I2MQP.

ST0RK in South Sudan closed down and has returned to Germany. It is thought that he left on 19 August and that he is unlikely to return.

G3GIQ has kindly supplied a photocopy of what appears to be a certificate of competence issued by the Ministry of Posts & Telecommunications in Bangui, Central African Empire, to John Montague. The call letters TL8JM appear on this and it is dated 31 May 1979. *Canadx* reports that a remote vfo unit is being sent to John. TN8BL QSLs are not being accepted for DXCC credit, and correspondence addressed to his Mbinda address is being returned to sender.

VK4OQ contacted HQ recently to say that he has now left Malaysia where he was 9M2DS. He has also previously held the call VK2AOZ.

G. V. Sulu, who once operated as VU7GV, is now in Botswana and has the callsign A2CGV. His wife is A2CGW.

*10 Knightlow Road, Birmingham B17 8QB


**Sam Morris, G4FQM, works mostly on 14 and 21MHz with his FT200B, KW107 and 14AVQ antenna**

He has all his VU7GV logs with him. Other Botswana stations currently active include A2CDK who is often to be found around 21,250kHz at 1600, and A2CRK who has been on 14,130kHz at 1900.

XJ3TBC operated during August and celebrated the centennial of Bancroft, Ontario. QSLs should be sent to VE3TBC.

Franz Josef Land activity may be augmented soon by the appearance of UK1PGO. UK1PAA seems to operate from 0300 on 14,025kHz, and at 1500. At 1500 he has been on 14,160kHz answering ssb calls with his cw—in this case UA1MU has been supervising. Reports have also been received of similar activity on 14,140kHz at 0500, 0700 and 1500 with UB5UAT helping. The station may have ssb facilities by now.

VP8SU, in S Georgia, should be active on 14, 21 and 28MHz cw and ssb this month. There is now a second operator who is called John and whose callsign is VP8VN.

ZL5MC is now on the air from Ross Is (Antarctica) and is Maurice, ZL1FK.

Mario Lumbau, IS0LYN, has written to say that 3V8AA returned home on leave at the end of August but should be back for the first two or three weeks of October. Mashil uses 3,515, 7,005, 14,025, 21,050 and 28,050kHz (or nearby) around 0030, 0530, 1330 and 1700. All QSLs go to IS0LYN.

ZD8TC is now being worked on all bands 3·5 to 28MHz, cw and ssb. He seems to use 7,004kHz from 0200 and 3,510kHz from 0300 on most days, and is prepared to arrange schedules. Another Ascension Is station, ZD8AI, is frequently around 21,275kHz at 1930.

A group of UN organization stations using the prefixes IK7, IK0, IO0, IP5, IP7, IP0, IQ0, IR1, IR7, IR9, IR0, IY1, IY2, IY9, IY0, IZ7 and IZ0—using the suffix ONU—were active early in September, as was 3V8ONU. All QSLs for the Italian stations should be sent to I0AMU. Other unusual prefixes were used by CL0NA (active from Havana during the conference of non-aligned countries), and 4N0MP, which was a special callsign marking the 125th anniversary of the birth of the Yugoslav electronics pioneer Michael Pupin (QSL via YU1BCD).

BV2B is now allowed to operate on 14,025, 14,218, 14,225, 21,320, 28,030 and 28,530kHz.

W3HNK expects to be on Anguilla from 20 October to 3 November and using his VP2EY call. During the CQ WW DX Contest he will become VP2E. VP8SB (Adelaide Is) has been worked on 28MHz cw using about 500mW to a 1,320ft long V-beam!

Congratulations to G3WW who has now reached a total of 100 countries worked on two-way sstv.

## News from overseas

A letter from Jim Smith, P29JS, gives the good news that the source of the deliberate interference which has plagued the operation of his net for some years has at last been tracked down and dealt with. The offending station seems to have been located in Eire, and the close-down followed good work by SM5BBC and at least three official tracking stations. Previous complaints by countless amateurs (and the RSGB) appeared to have been ignored by the responsible authority in Eire. Jim says that a recent check showed that stations in over 200 countries had already taken part in the net on 14,220kHz, and that as a European he welcomes European stations joining in, although his prime purpose is to help rare dx stations to work each other! He says that stations who attract a pile-up whenever they appear find it very difficult to do this. Finally, he wishes to thank all those who have checked in to his net and been subjected to the QRM—and also to the countless amateurs who wrote to the Irish authorities without receiving any response.

**C5AAP at Sapu in The Gambia, last year's overseas winner of the RSGB 21/28MHz Telephony Contest. Andrew, who is also G3LZZ, has previously operated from 9Y4LZ, 7Q7LZ and 9G1LZ in the period since 1966**

Andrew Pomfret, C5AAP, is located at Sapu, 176 miles up-country from the capital of The Gambia, Banjul, on the south bank of the River Gambia. It is an agricultural station, and facilities at C5AAP cover all bands 1·8 to 432MHz. The receiving set-up consists of an FR101 receiver with Datong up-converter and frequency-agile audio filter, and the transmitter is an FL101 with FL2100B linear. Antennas consist of a G5RV and Hy-Gain TH3 beam. Operation is mostly on 14, 21 and 28MHz ssb, and should shortly be via satellite as well.

Alf Wilson, who was EP2TW (and is now G3PGG), closed down on 13 February after almost nine years' activity. His departure was hastened by the revolution, and all his equipment and logs were left behind. However, log copies up to the end of January are held by his QSL manager GI3HXV, QTHR, who also has a supply of cards. Those still needing EP2TW cards are asked to apply, with sase, as soon as possible please.

## Dxpeditions

A group of New England amateurs, possibly 15, will be operating from Sint Maarten and St Martin during the CQ WW DX Contest on 27/28 October. From Sint Maarten they will use the callsign K1CO/PJ7; their call in FS0 is not yet known. The PJ7 entry will be multi-operator multi-transmitter and the FS0 multi-operator single-transmitter. Activity should cover the period 23 to 31 October, and some may use their own calls /PJ7 or /FS0 outside the contest period.

K5VT has already been heard as K5VT/SV5 and 5H3VT. From Tanzania he was expected to move to Liberia, The Gambia and Sierra Leone before returning to the John Hopkins Hospital in Baltimore. Another African tour, involving some of the former French-administered areas, is due at the end of 1979 or early in 1980.

F0CGP has received permission to visit FH and FR in December and is planning transport to Glorieuses Is, Juan de Nova and Tromelin. He also hopes to be on the air from D6, 3B7, 3B8 and 3B9. Emphasis will be on 3·5MHz, on which band he will have 2kW input to phased verticals. K5CO will act as QSL manager and will accompany David to /G and /J to do the 14, 21 and 28MHz operating. The whole operation may last for three months, and the target is 100,000 contacts. David himself will be in Djibouti (J28) between 20 and 30 November, and will be on 14, 21 and 28MHz as well as 3,789kHz.

Phil, G3YBH, and Al, G4CVZ, will be active from 26 to 29 October on 14, 21 and 28MHz cw and ssb from the Isle of Man as GD3YBH and GD4CVZ. During the CQ WW DX contest they will operate single-band on either 21 or 28MHz. QSLs (plus ircs) should be sent to their home addresses (QTHR).

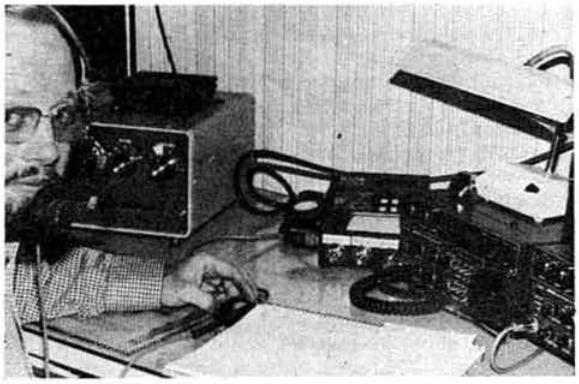
According to *Long Island DX Bulletin* a team of 10 UA0 operators will be in Tuva (Zone 23) from 10 October to 20 November. The station callsign will be U0Y and it will be heard on all bands 1·8 to 28MHz on cw and ssb. During the CQ WW DX contests the team will be aiming for top scores.

VE3HRS will be in Mali (TZ) and the Congo Republic (TN) sometime this month, and is hoping to obtain operating permission.

CE0XEA is the callsign which has been issued to a combined group of RCC and URE operators for an expedition to the San Felix Is. URE vice-president EA5TD is involved and has been in Santiago arranging transport and landing permission. The trip should take place in September or October. (Information on this expedition was received too late to include in the September issue.)

Seven operators will be visiting Kingman Reef (KH5K) and Palmyra Is (KH5) early in November. They hope to operate four stations on all bands 1·8 to 30MHz, using both cw and ssb. As there is a possibility that Palmyra Is may be used as a nuclear waste dump in the future this could be the last operation from there. Donations to expedition funds would be welcomed and should go to: Jay Kobelin, WA2FIJ, 8 King Arthurs Court, St James, NY, 11780, USA.


**Mike Holley, G4EHQ, a regular contributor to *MOTA***



Tony Green, VS6EZ

## Morokulien—continued

SM7COS has pointed out that the information given in June *MOTA* was not quite correct as he does not have problems with ircs. However, he considers them a very expensive way of transferring cash and is happy to receive payments in British mint stamps. Erland says that he has been a member of RSGB for 22 years. The Morokulien leaflet costs 20p, and QSLs for contacts with LG5LG and SJ9WL are 50p each. These are minimum prices, and all net income goes to handicapped Norwegian and Swedish amateurs. Enthusiasts may apply for a "Certificate of Citizenship" to SSA, Ostmarksg.43, S-123 42 Farsta, Sweden—this costs £2.25.

## Beacons

An update of the list which appeared in July *MOTA* has been received from IARU beacon co-ordinator Alan Taylor, G3DME. He says that N4RD is now off the "non-operational" list and has been heard in the UK. VK2WI is not yet on, and is believed not to have been on at any time; efforts are being made to install a beacon in Perth. ZL2MHF is active and working well, but has a problem—although on a hill top it has hills on each side and these shield it from both long and short paths to the UK. Alan says that EA2OIZ has now become EA2HB and has a better keying cycle but still with its characteristic "bloop". Work is actively progressing on the 9J2 beacon, and 9J2KL will supervise it when ready, but no date is available yet.

## BYLARA

The British Young Ladies ARA has now grown to nearly 90 members, and G4EZI points out that interested ladies (and oms) are welcome to join as associate members. The club net is at 7.15pm (local) on Mondays on about 3,605kHz. An informal get-together will take place at the Leicester Exhibition (in the tea-room) at 2pm on Saturday 10 November.

## Welcome

The following licensed amateurs joined the Society during August: A4XIJ, C31YF, EA1AIS, EA6DF, EA7RU, EI2CA, N6AXY, ON1AK, SV1KU, SV4LG, VE3BMZ, VK5BS, VP9CP, VU2ID, VU2KZ, WA5MLT, W6ATC, WB6STU, WB7JDR, ZB2FA, ZD8TC, ZS6VQ, 4X4SK, 5B4BS and 5B4CV. Overseas listener members include Messrs C. Azubuike (I), V. Hlavac (VE), D. Harrison (EA), and A. W. Boles (EI).

## Awards

**Gemfields Centenary Award**

To mark the 100th anniversary of the discovery of sapphires in Central Queensland. Requirement is to contact (or hear) any Gemfields Radio Group station betwen 2000 15 August and 1800 31 December 1979 in the following band segments: 3,525-3,625kHz, 21,125-21,200kHz and 28,100-28,600kHz. Eligible stations include VK4s NMJ/ZHI, NJN, NJI, NIX, and club station VK4WIQ. Send QSO details and four ircs (or US $1) to Gemfields Radio Group, c/o Post Office, Rubyvale, Queensland, 4702, Australia. No QSLs are required.

**Five Band WAZ Award**

Applicants require proof of contact with all 40 *CQ* zones on all five bands 3·5 to 28MHz since 0000 1 January 1979. Only mixed-mode certificates will be issued. This will be a difficult award to achieve, and to encourage those working towards it an interim award will be made to those who reach the 100 zones confirmed mark. These may cover any bands, and after the 100 is reached further stickers will be issued for each additional 10 zones. An honour roll of those who have reached 150 zones will be started. Applications must be made on the appropriate form which is available from the WAZ Award Manager, 1044 SE 43rd St, Cape Coral, Fla, 33904, USA, in exchange for an sase and two ircs. Completed application forms plus QSLs must be sent, together with US $3 or 15 ircs, to the same address. Please note that forms cannot be obtained from G3FKM, and that QSLs *must* be sent to the USA.

**The Morokulien Award**

European applicants need to have made contact with LG5LG and SJ9WL on two different bands and on different days (a total of four contacts on four different days) since July 1968. Others need only one contact with each station. Send list of QSO details, plus a minimum of £1.50, to LA2ZN, Ulf A. Strandberg, Konglev 3, N-2200 Kongsvinger, Norway.

## QRP

Congratulations to G4BUE who has been awarded QRPP DXCC Trophy No 8 by *CQ*. This is the first to be won by a European station. The requirement is to confirm contact with at least 100 DXCC countries using an output of less than 5W. The Milliwatt DXCC Trophy is very similar, but in this case output must not exceed 1W; GM3OXX acquired No 2 using home-built equipment.

**Chris Page, G4BUE, with his QRPP DXCC Trophy (No 8) issued by K8EEG on behalf of *CQ* magazine. This fine trophy is the first to be awarded to a European and was for confirming contact with 100 DXCC countries using an output of 5W or less**

## Contests

Results of the sixth **ARRL 10 Metre Contest** have been published. UK scores were as follows:

| Callsign | Points | Callsign | Points | Callsign | Points |
|---|---|---|---|---|---|
| **G3FXB** | 366,758 | G5CRF | 49,086 | GM4CHX | 13,144 |
| G4BYB | 293,944 | G3DME | 43,120 | G2AJB | 10,560 |
| **GU5CIA** | 170,488 | G3HRY | 27,872 | GM4FSA | 10,388 |
| G5CMX | 123,662 | G3ESF | 22,176 | GM3RAO | 5,320 |
| **GM3YOR** | 101,200 | G3TKR | 21,172 | G3CWL | 3,234 |
| G2RD | 87,932 | **GI4FUM** | 19,716 | G4CSB | 2,300 |
| G4COA | 61,462 | G4DLB | 19,184 | G3TCP (multi-operator) | 53,280 |

**Radiotechnika (HA) QRP Contest**
0000 1 November to 2359 7 November

3,500 to 3,600kHz, cw only. Call "CQ Test QRP". Exchanges consist of callsigns, RST, QTH and name. The time difference indicated in participants' logs must not exceed 3min. Every complete QSO with own country counts one point, and with other countries two points. A station may only be worked once during the contest. There are single- and multi-operator categories. Final score is QSO points multiplied by the number of different DXCC countries worked. The pa of the transmitter used must have less than 5W input power. Logs should show date, time, callsign, QTH, name of operator, and also include details of the pa. They should be posted before 21 November to Radiotechnika szerkesztosege, Budapest, Pf603, H-1374, Hungary. All participants will receive a special award, with outstanding scorers receiving the magazine *Radiotechnika* free for one year.

**The VK/ZL/Oceania Contest**
1000 13 October to 1000 14 October (CW)

Rules of this contest were given in August *MOTA*.

**WADM DX Contest**
1500 20 October to 1500 21 October

Celebrates the 30th anniversary of the founding of the GDR. All bands 3·5 to 28MHz but not using the first 10kHz and the last 25kHz of the 3·5 and 14MHz bands. The same station may be worked on each band for credit, and the multiplier is the sum of DM districts worked on each band (districts are identified by the last letter of the suffix, A to O—a total of 15). DM7, DM8 and DM0 may be substituted for missing districts. Listeners score one point per DM station reported, and two if they log both ends of the QSO. Use separate log for each band and include summary sheet showing scoring, name and address, and the usual declaration that rules and regulations have been obeyed. Post within 30 days to: DM Contest Bureau, RKDDR, Hosemannstr 14, DDR 1055 Berlin, German Democratic Republic.

VP9AD has very kindly supplied full results of the **1979 Bermuda Amateur Radio Contest.** UK scores were as follows: **GU5CIA** (329,120), **G4DSE** (328,925), **G3VPW** (263,625), G4GI (257,850), **GM3VEY** (23,520), G4FJT (4,240), G4CNY (4,165), G3ESF (3,950), G3TKR (3,480), G4AEM (2,520), G4FB (1,400), G4HLN (280) and **GD4HOX** (110). Stations in bold type were area winners. There were 45 entrants from Germany, and top scorer was DK5WL with 301,595 points. North American entrants totalled 36 and were led by N1GL with 268,025 points.

The results of the **1979 PACC Contest** show that **G3ESF** (2,548 points) led the UK entry. **GM3KLA** (2,730), G4FDC (1,071) and G2HLU (418) as well as G3JRM (494) in the multi-operator section also took part. In the listener category **BRS 15822** (2,325), BRS32525 (912) and BRS34310 (850) were listed.

## QTH CORNER

| | |
|---|---|
| **A2CGV** | G. V. Sulu, PO Box 10017, Gaborone, Botswana. |
| **DF4NW/A7** | W. Rass, Box 3967, Doha, Qatar. |
| **C31SE** | DA1GF, Lynn Igou, Flanaganstr 27-16, 1000 Berlin 33, FR of Germany. |
| **HK0EEA** | PO Box 484, San Andres Is, Colombia. |
| **TY9ER** | via DL8DC, Rudolf Lux, Lindenweg 16, 6613 Eppelborn/Wisbach, FR of Germany. |
| **VK9CGR** | via VK5QX, I. J. Hunt, 8 Dexter Drive, Salisbury East, 5109, S Australia. |
| **YJ8NGD** | via VK4UA, D. R. Clark, Box 27, Woody Point, 4019, Queensland, Australia. |
| **ZK1AM** | via W0WP, T. R. Lindgren, 1260 13th Av, Marion, Ia, 52302 USA. |
| **ZK1MB** | via ZL1AIA, PO Box 41066, St Lukes, Auckland, New Zealand. |
| **XK2CQ** | PO Box 83, Niue. |
| **3D6BW** | via K2IJL, L. J. Moreno, 315 Riverside Blvd, Long Beach, NY, 11561, USA. |
| **3V8ONU** | via OZ1CID, H. Nielsen, Hvidovrevej 468-1, DK-2650 Hvidovre, Denmark. |
| **5N0DOG** | via W4FRU, L. V. Deisner, Star Rte-Box 97, Elberta, Ala, 36530, USA. |
| **5T5AY** | via W4LZZ, C. W. McGrath Jr, 4664 Brunning Ct, Dunwoody, Ga, 30338, USA. |
| **8P6KK** | via DK3NG, J. Groeger, Nindorf 53, 2116 Hanstedt Nordheide 4, FR of Germany. |
| **9M6PCM** | via DJ9ZB, F. Langner, C. Kistnerstr 19, 7800 Freiburg Breisgau, FR of Germany. |
| **9X5PP** | PO Box 863, Kigali, Rwanda. |

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

## Band Reports

This month G8KG writes: "The provisional Zurich sunspot numbers for July and August were 159·6 and 143·5, so that the three-month means centred on June and July were 148 and 151. Plotting these on Fig 1 on page 834 of September *Radio Communication* shows that Cycle 21 is still rising and is just ahead of Cycle 18. The slow decline in mean 2,800MHz solar flux seems to have reversed in August, the average for the week 21-27 August being 219 sfu, compared with 143 sfu for the period 27 days earlier. There was considerable activity and several major flares towards the end of the month, and the daily value of 232 sfu on 25 August was only a little below the February and June peaks. It remains to be seen whether the daily peaks in excess of 300 sfu to be expected with a high cycle will in fact materialize. There is still uncertainty as to when the peak will occur. A steep rise this autumn is clearly among the possibilities, but all that can be usefully said is that solar activity is likely to be at least as high during the coming winter as it was in January and February this year, and that those who are looking for exceptional F-layer communication on 21MHz and above should keep close watch on the WWV indices. It is worth noting that WWV usually carries the current day's data from the 1918 bulletin onwards."

The following very kindly sent in logs and other information from which this section has been compiled: G2HKU, G3s AAE, AAM, DME, GIQ, GVV, IMW, KSH and LPS, GM3LYY, G4s DSE, EAN and EHQ, G5JL, and BRSs 17567, 31301 and 38934.

Stations listed in italics were using cw.

**1·8MHz. 2100** *SP9DH, UC2AAK, UC2AAW.* **2200** *UP2PAP, RQ2GGS.* **2300** *C31OE.*

**3·5MHz. 0300** PT2WWV, PY3CRD. **0400** ZS6DW. **2200** C31FO. **2300** U stations on 3,646kHz.

**7MHz. 0000** *FY7BF, UA9UJP, UL7, VU2GO.* **0400** *7X4AN.* **0500** *C6TOQ, CO, EA9EO, HH5HS, XE, W6-W7, ZL.* **0600** *AA7C* (SP), *VK, ZK1BD, ZK1MB,* ZL. **2300** *HS1ABD, N2KA/SV9, UW0AF, ZB2EO, ZD8TC.*

**14MHz. 0400** HC8GI. **0500** YI1BGD. **0600** FO8DT, VK, ZL, 3D2CS. **0700** AJ60/KH0, H44WH, KH6, KX6PP, P29JS, T2AAA, YJ8PD, *ZD8TM,* 5W1AU. **0800** AH8A, BV2B, CL0NA (Box 1, Havana), HK0EEA, *VK0PK,* ZK1AM, *ZK1MB,* ZK2VE, 9V0TK. **0900** FK8CR, *VP2MM,* 3D2BM. **1000** KH6CFX/MM (off FO8), VQ9GS. **1100** 5A1AA. **1600** S79WHW. **1700** 9M6VW. **1900** JA3KWJ/A2, *UK1PAA,* 4N0MP. **2000** *KG6RT, VS5XK,* YI1BGD, *9M6PCM,* 9M6DW. **2100** *TA1NAG,* VP8s QI, SB, 3V8ONU. **2200** W2EMN/C6A. **2300** W6-W7, XT2AV.

**21MHz. 0600** *JA8AQN/JD1* (Minami Torishima), *3B8FA.* **0700** M1C, VK, ZL. **0800** JT1KAA, *KH6, KL7,* T2AAA, TR8DX, VK0JM. **0900** H44s JP, LW, YJ8PD, *ZK1MB.* **1000** D4CBC, JA, KL7, VK0PK, ZK1MB, ZK2VE. **1100** HL, JA, VK, VU, ZL. **1200** *J28CA, P29GC.* **1600** KG6SW/KC6, YB8BV, *3B8CF.* **1700** JL1FFL/JD1 (Ogasawara), YB0ADW (PO Box 3994, Djakarta). **1800** HS1ABD, J7DAY, VP8SB, VQ9TR, VQ9WJ, 3B6CD. **1900** KH6JTY, KH6WF/KH8. **2000** OK3TAB/D2A, HS1WR, W6-W7, XT2AT. **2100** FM0EVT (QSL to F6BFH), VQ9DS, ZK1AM. **2200** VK, ZL. **2300** HK0BKX, VE4CF/VE1, ZL.

**28MHz. 0700** *C5AJ* (QSL via DARC). **0800** *EA9EO, JA,* VK, VU, YB0ADW. **1000** H44s, CB, CF, JD, PT, P29NDU, S8AAP, VS6FI, 9X5PP. **1100** JA, VS6FI, ZD7BW, 3B6CD. **1200** CE3AUL, HC1JX, KG6SW, VS6AG, W1-W5. **1300** A4XID, JY5ZM (QSL to WB4RRJ), VE6CKS/SU, VU2LQA. **1400** OK3TAB/D2A, VP2MAB (QSL to W1YNT), 5T5AY. **1500** CX, LU, PY, ZP. **1600** SU1AL, 3B6CD. **1700** VP8s PU, SB, 3D6BW, 5N0DOG. **1800** XE1LCH. **1900** CE, HC, LU, OA, PY, VP2MM, ZL2RE, ZP, ZS3. **2000** CE, HI, XE, XT2AW. **2100** CE, C5AAP, KZ, LU, PJ, PY, VP2MAB, W1-W5, W6MJE, YV, ZD8FP. **2200** W1-W4.

This month's list of acknowledgements to information sources contains the name of the newly established *DX Bulletin* (which has taken over from the *West Coast DX Bulletin)* edited by **K1TN,** and also the *Long Island DX Bulletin* **(W4UL/W2IYX).** Thanks are also due to *DX News Sheet* **(Geoff Watts),** *Long Skip* **(VE3FRA),** *DX'press* **(PA0TO),** *CQ Magazine* **(W1WY),** and the *Ex-G Radio Club Magazine* **(W3HQO).**

Please send all items for **December** issue to reach G3FKM no later than **2 November. Please note this very early closing date.** □

# HF propagation study

**Predicted hpf + luf in megahertz for October 1979**

| | 00 | 02 | 04 | 06 | 08 | 10 | 12 | 14 | 16 | 18 | 20 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Suva (s) | 1600 | 1800 | 1700 | 2000 | 2900 | 3600 | 3800 | 3600 | 2900 | 3000 | 2500 | 2100 |
| Wellington (s) | 1900 | 1800 | 1700 | 2400 | 3200 | 3500 | 3200 | 3000 | 2600 | 2400 | 2300 | 2100 |
| Osaka | 1810 | 1711 | 1711 | 2512 | 3313 | 3912 | 3211 | 2310 | 2009 | 1908 | 1708 | 2009 |
| Hong Kong | 1708 | 1411 | 1613 | 3214 | 4115 | 4714 | 4012 | 3109 | 2506 | 2405 | 2005 | 1807 |
| Sydney (s) | 1712 | 1415 | 1618 | 3219 | 4018 | 3415 | 3310 | 3106 | 2903 | 2504 | 2006 | 1809 |
| Moscow | 1503 | 1202 | 1203 | 2304 | 3406 | 3907 | 4007 | 3905 | 3303 | 2603 | 1903 | 1603 |
| Bangkok | 1808 | 1610 | 1613 | 3715 | 4516 | 4816 | 4713 | 4509 | 3706 | 2705 | 2105 | 1907 |
| Singapore | 1808 | 1710 | 1713 | 3916 | 4618 | 4817 | 4314 | 4509 | 3805 | 2704 | 2104 | 1906 |
| New Delhi | 1803 | 1706 | 1709 | 3911 | 4613 | 4813 | 4512 | 4008 | 3104 | 2403 | 2103 | 1903 |
| Perth | 1910 | 1813 | 1917 | 4020 | 4121 | 4119 | 3815 | 3410 | 3006 | 2804 | 2205 | 2007 |
| Teheran | 1903 | 1804 | 1905 | 4008 | 4710 | 4810 | 4410 | 4407 | 3004 | 2703 | 2203 | 2003 |
| Colombo | 1904 | 1807 | 1911 | 4014 | 4716 | 4816 | 4514 | 4510 | 3005 | 2804 | 2304 | 2004 |
| Bahrain | 2103 | 2004 | 1906 | 4009 | 4811 | 4812 | 4411 | 4408 | 4004 | 2903 | 2403 | 2103 |
| Cyprus | 2003 | 1903 | 1704 | 3306 | 4408 | 4509 | 4208 | 4207 | 4005 | 3004 | 2303 | 2103 |
| Aden | 2404 | 2205 | 2008 | 4010 | 4913 | 5014 | 4514 | 4511 | 4407 | 3205 | 2604 | 2304 |
| Seychelles | 2400 | 2200 | 2000 | 3900 | 4300 | 4400 | 4500 | 4200 | 3800 | 3300 | 2700 | 2500 |
| Mauritius | 2500 | 2300 | 2000 | 3900 | 4100 | 4100 | 4100 | 3900 | 4000 | 3400 | 2800 | 2600 |
| Nairobi | 2503 | 2403 | 2005 | 3609 | 4912 | 5014 | 4613 | 4610 | 4606 | 3504 | 2903 | 2702 |
| Malta | 1703 | 1602 | 1402 | 2004 | 3507 | 3808 | 3608 | 3507 | 3406 | 2704 | 2103 | 1803 |
| Salisbury | 2703 | 2603 | 2005 | 3410 | 4114 | 4115 | 4215 | 4113 | 4209 | 3706 | 3103 | 2802 |
| Cape Town | 2800 | 2700 | 2100 | 2900 | 4100 | 4300 | 4200 | 4400 | 4500 | 3900 | 3300 | 2900 |
| Lagos | 2904 | 2703 | 2303 | 2406 | 4811 | 5113 | 4814 | 4713 | 4711 | 4007 | 3404 | 2904 |
| Suva (I) | 2900 | 2800 | 2300 | 2300 | 3500 | 3100 | 2600 | 2600 | 2400 | 3000 | 3400 | 3100 |
| Gibraltar | 1502 | 1502 | 1402 | 1302 | 2804 | 3205 | 3105 | 3005 | 2904 | 2603 | 2002 | 1702 |
| Ascension | 2904 | 2703 | 2403 | 2107 | 4512 | 5014 | 4815 | 4716 | 4615 | 4209 | 3404 | 2904 |
| Wellington (I) | 2800 | 2700 | 2400 | 1900 | 2700 | 2300 | 2100 | 1900 | 1900 | 2800 | 3100 | 2900 |
| Dakar | 2700 | 2600 | 2300 | 2200 | 4310 | 4912 | 4812 | 4612 | 4511 | 4308 | 3405 | 2900 |
| Las Palmas | 2303 | 2202 | 2002 | 1704 | 3706 | 4408 | 4308 | 4109 | 4108 | 3906 | 2903 | 2503 |
| Falklands | 2806 | 2604 | 2305 | 1908 | 2813 | 4118 | 4421 | 4622 | 4521 | 4417 | 3412 | 2909 |
| Rio de Janeiro | 2805 | 2604 | 2304 | 1907 | 2811 | 4515 | 4618 | 4119 | 3718 | 3914 | 3510 | 2907 |
| Buenos Aires | 2705 | 2504 | 2304 | 1805 | 2809 | 4214 | 4519 | 4320 | 4519 | 4416 | 3512 | 2908 |
| Sydney (I) | 2613 | 2412 | 2211 | 1708 | 2907 | 2612 | 2418 | 2222 | 1923 | 2122 | 3018 | 2815 |
| Lima | 2600 | 2400 | 2200 | 1700 | 2400 | 2500 | 4600 | 4500 | 4400 | 4300 | 3500 | 2800 |
| Barbados | 2503 | 2202 | 2102 | 1703 | 1905 | 3809 | 4613 | 4515 | 4414 | 4412 | 3509 | 2806 |
| Bogota | 2400 | 2200 | 2100 | 1600 | 1900 | 2600 | 4500 | 4500 | 4500 | 4300 | 3600 | 2800 |
| Jamaica | 2300 | 2000 | 1900 | 1600 | 1900 | 2300 | 4500 | 4400 | 4400 | 4400 | 4300 | 3500 | 2700 |
| Bermuda | 2300 | 2000 | 1900 | 1600 | 1700 | 3500 | 4400 | 4400 | 4400 | 4300 | 3400 | 2600 |
| New York | 2206 | 1906 | 1706 | 1606 | 1606 | 2508 | 3512 | 4213 | 4213 | 4111 | 3309 | 2507 |
| Mexico | 2200 | 1900 | 1700 | 1600 | 2000 | 1700 | 2500 | 4200 | 4100 | 4100 | 3300 | 2400 |
| Montreal | 2208 | 1908 | 1708 | 1608 | 1609 | 2611 | 3912 | 4114 | 4114 | 4112 | 3210 | 2409 |
| Denver | 2200 | 1900 | 1700 | 1600 | 1600 | 1600 | 2100 | 3400 | 3900 | 3900 | 3100 | 2400 |
| Los Angeles | 2200 | 1900 | 1700 | 1600 | 1600 | 1600 | 1600 | 2700 | 3900 | 3800 | 3000 | 2300 |
| Vancouver | 2100 | 1800 | 1700 | 1700 | 1600 | 1600 | 1600 | 2300 | 2800 | 3200 | 2700 | 2200 |
| Iceland | 1408 | 1208 | 1108 | 1207 | 1908 | 2708 | 3108 | 2909 | 2909 | 2708 | 1908 | 1508 |
| Honolulu | 2100 | 1800 | 1700 | 1700 | 2300 | 1900 | 1800 | 1500 | 1800 | 3400 | 2700 | 2200 |
| Fairbanks | 2000 | 1800 | 1700 | 1600 | 1800 | 1800 | 1800 | 1900 | 2300 | 2700 | 2600 | 2200 |

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

# Propagation predictions

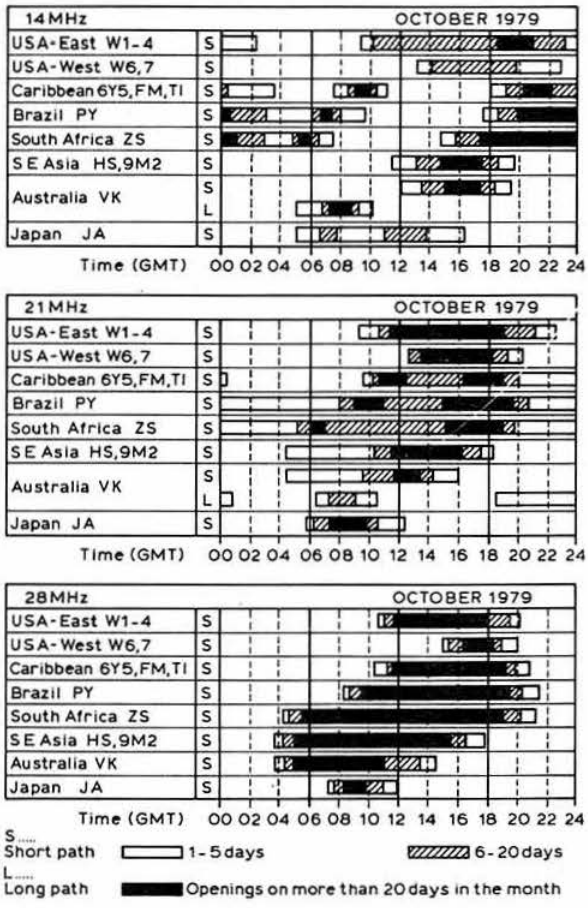
Experience has proved that October is the most favourable month for the radio amateur. The daytime mufs, which reach a low during the summer, are high enough in October for the **28MHz** band to be usable again, with the days still long enough for traffic to be possible until the evening on that band and on **21MHz.**

On **28MHz** all continents will be open, but because of the good conditions there will be considerable QRM. During daytime, absorption will be quite noticeable on **21MHz.** DX will therefore tend to fade away at times when the longer part of the path lies in daylight.

The **14MHz** band will be best for dx after 2100gmt, and for parts of the latter half of the night. During daytime, traffic with the Continent will be possible. On some days the dead zone will disappear around midday.

Distances covered will lengthen on **7** and **3·5MHz.** Local traffic could be interrupted by static during the latter half of the night.

The provisional sunspot number for July 1979 from the Swiss Federal Observatory was 159·6. During the period 3-8 July the daily numbers exceeded 200. The predicted smoothed monthly numbers for November, December and January 1980 are 151, 149 and 147 respectively.



# swl news

Bob Treacher, BRS32525 *

AS the summer has now faded into the distance and holidays are just memories, it is time to look forward with interest to the traditional dx season one associates with the coming of autumn. In recent years activity seems to have increased in October; it is the start of the contest season; and a number of dxpeditions are normally available for the hungry multitudes. Several contests are available for the swl—13-14 October, VK/ZL CW; 14 October, RSGB 21/28MHz Phone; followed by the 21MHz CW event on 21 October. The last weekend of October sees the "big one"—CQWW. Unfortunately, there is no listeners section, but with the great activity which it promotes everyone should hear something new. Your scribe will be logging at G6UW during that event, certainly good practice at speed writing. Other listeners should try to embark on contest activity to improve their listening techniques during high activity periods.

## RSGB AGM

The Society's AGM is to be held this year at the IEE on Saturday 8 December. Last year your scribe had the pleasure of meeting Dave Whitaker, BRS25429, at the AGM, and Dave has since remarked that it would be pleasant if other swls made an effort to come along and exchange "eyeball" QSOs. After all, the Society tries to cater for listeners interests, and the AGM is the culmination of the year's work. Why not make the effort to come along and find out at first hand what has been happening during the year and meet some fellow swls at the same time.

## DX traffic

At the time of writing, many were awaiting the September expedition to CE0X by a group of Chilean and Spanish amateurs. The Chilean members had apparently arranged landing permission, so all seemed set for what would rank as a very rare expedition. Because of transport difficulties on 3B8, the 3B9 expedition may be active at about the time this is read.

Two expeditions to Manahiki Is enlivened the bands towards the end of August. First, ZK1MB was heard, and soon afterwards ZK1AM was audible on 14MHz. VK9CGR was also reported as active from the Cocos Keeling group, which was so thoroughly activated by P29JS and F6CYL last summer. VK9CGR was asking for QSLs via VK5QX.

There have been several dubious "dxpeditions" active during August. Malpelo Is (HK0) was obviously a phoney, and the "8Z4DX" who appeared on 21,200kHz for 10min one Saturday had many fooled, but he was so incredibly strong he just could not have been "real"! These should not be claimed for any credits unless a QSL card appears!

The 21MHz band has been producing useful signals from west coast USA, Alaska and the Pacific around 0700. ZK2VE, JA7JT/JD1, H44JP, KL7H, KL7EO plus numerous KH6s (the strongest being KH6M, AH6I and KH6SP), have all been reported.

*79 Granby Road, Eltham, London SE9 1EH.

### 1979 hf countries table

| Station | 28 | 21 | 14 | 7 | 3·5 | 1·8 | Total | Mode |
|---|---|---|---|---|---|---|---|---|
| BRS25429 | 175 | 202 | 237 | 102 | 87 | 23 | 826 | ssb |
| BRS25901 | 165 | 182 | 231 | 82 | 75 | 17 | 752 | ssb |
| BRS35943/GM | 151 | 173 | 211 | 101 | 103 | 7 | 746 | ssb |
| ARS8841 | 149 | 167 | 236 | 78 | 82 | 8 | 720 | ssb/cw |
| ARS41426 | 108 | 129 | 124 | 69 | 82 | 26 | 538 | ssb/cw |
| A9191 | 69 | 103 | 155 | 64 | 49 | 9 | 449 | ssb |
| BRS40293 | 71 | 69 | 125 | 40 | 36 | 7 | 348 | ssb |
| BRS34740 | 86 | 94 | 81 | 33 | 38 | 7 | 339 | ssb |
| ARS41386/GJ | 56 | 109 | 108 | 45 | 15 | 1 | 334 | ssb |
| BRS39161 | 59 | 78 | 126 | 18 | 19 | 2 | 302 | ssb |
| BRS20185 | 73 | 70 | 110 | 24 | 23 | 1 | 301 | ssb |
| ARS39784 | 77 | 57 | 83 | 26 | 23 | 2 | 268 | ssb |
| BRS41333 | 73 | 87 | 52 | 18 | 35 | 2 | 267 | ssb/cw |
| BRS40814 | 58 | 59 | 84 | 34 | 17 | 0 | 252 | ssb |
| BRS35121 | 22 | 42 | 102 | 19 | 36 | 6 | 227 | ssb/cw |
| BRS40634 | 18 | 96 | 89 | 8 | 5 | 0 | 216 | ssb |
| ARS41554/GM | 29 | 57 | 65 | 23 | 37 | 3 | 214 | ssb |
| BRS41136 | 60 | 59 | 60 | 23 | 8 | 0 | 210 | ssb/cw |
| BRS40705 | 61 | 56 | 49 | 24 | 14 | 1 | 205 | ssb |
| BRS40292/GU | 42 | 42 | 58 | 19 | 30 | 2 | 193 | ssb |
| BRS27421 | 0 | 22 | 102 | 8 | 21 | 1 | 154 | ssb |
| ARS40133 | 28 | 31 | 34 | 7 | 14 | 0 | 114 | ssb |
| A9107 | 32 | 27 | 35 | 0 | 13 | 0 | 107 | ssb |

The Mount Athos expedition seems to have been reported by many; likewise W2TDQ/SV5 operating from the Dodecanese Is.

The 1·8MHz band ssb seems to be producing a number of Russians around 1,875kHz. As the lower frequency dx season unfurls, it will be interesting to monitor this band, as more countries have allowed amateur radio on it since last year.

The 14MHz band has continued to provide its usual amount of dx; notable callsigns heard include 9M6VW, JT0LAJ, ZK1CQ, 9V1SY and YB0WR. The Canadian expedition to Sable Is, VE4CF/1, was active in July, and although your scribe heard about the trip a little too late to take advantage of it, a number of others reported good signals.

## RTTY swling

Ted Double, G8CDW, is a keen 144MHz operator but is also very much involved with rtty reception on the hf bands. Receiving rtty signals is a growing facet of amateur radio, and many of the awards which are available can now be endorsed "all rtty". Of course, to receive rtty one needs a teleprinter; the most popular seems to be the Creed 7B. The bulk of rtty dx stations are on 14MHz, but 21 and 28MHz produce good signals when open. The 3·5MHz band is often usable after dark, and it is often worth looking on 7MHz early in the day before stations on the other modes become too numerous. In general, all the other "rules" applying to swling are the same. If any listener feels keen enough to take up rtty listening, Ted will be only too pleased to provide any further detailed information on receipt of an sae. He is QTHR.

## Other news

Ian Le Breton, ARS41386, has again sent his monthly report on a picturesque postcard depicting the view from his QTH. Robert Small, ARS8841, is continuing to enjoy tuning 1·8MHz, and recently logged stations from PA0, OK and DL. Ken Sketheway, BRS20185, was listening on 144MHz for much of August, and reports several interesting callsigns. He also reports receiving a letter from ZL3NE who asked him to QSP details of G2ACK's 7MHz signals back to that station. It seems that the ZL had poor copy of G2ACK's signals due mainly to one-way skip conditions prevailing in the ZL's favour.

One new correspondent this time—Chris McMahon. He uses

a Trio JR310 receiver to a long wire antenna, and is at Newcastle University for most of the year. He provided some useful dx information, and also reported hearing that VE3ICR was scheduled to visit TN8 via EA8, and another VE is reported to be activating TT8 soon. J6LGK is located in VP2L, St Lucia. Your scribe has no details on UK9OAA/U8V, but 7SK7HW emanates from Sweden.

Eric Hall, RS27421, has acquired an Eddystone 840A receiver, and is now able to tune all six hf bands. Ian Le Page, BRS40292, has been involved with diy, which curtailed his listening habits, but is expecting to be equipped in time for Cray Valley's Listeners Contest, which he hopes may bring him his first ZL station.

Dave Stewart sent an interesting list of dx heard on 14, 21 and 28MHz. CR9AJ, A2CBW and YB0ADW being his best catches on 28MHz. Frank Bowles, ARS41554, reported rig trouble, and had to content himself with rag-chews on 7MHz and some bc listening. Dave Hawes, A9191, remarked on a prompt QSL return from VP2AVE, plus the logging of C31 and HB0 expeditions and a station signing ID8ON on Salina Is off the coast of Italy.

### Finale

Keep the news coming. Deadline for the December issue is 21 October. □

## MICROWAVES

*(Continued from page 935)*

### 1·3/2·3/3·4GHz news

G4BYV has been active recently on 1·3 and 2·3GHz. On 12 July he had contacts with DC0HW (DN), DK3UC (FN) and DC1XC (FN) on 1·3GHz. During a QSO with LA6OI (ES) on 432MHz an attempt was made to cover the path on 1·3GHz, but unfortunately no signals were heard either way. G3AUS (Devon) was heard making contacts with several PA stations, and was receiving S9+ reports over 500km plus! On 28 July G4BYV worked PE1AWY (CL) on 2·3GHz with 57 reports. G3ZEZ also managed a contact with PE1AWY on 2·3GHz. G4BYV has now worked 178 stations on 1·3GHz, but complains of poor QSL returns, particularly from contest stations. He still has not got 100 stations confirmed.

G3LQR (Suffolk) recently worked DK7LJ and DB4LN (FO) on 2·3GHz. Tests have also been carried out with PE0DOL on 3·4GHz and G3LQR's signals copied at 15dB over noise, but PE0DOL's signal was too weak to copy at G3LQR.

### Beacon news

From G4FSG comes information that the high-power 1·3GHz beacon GB3BPO at Martlesham Heath (AM77j) has now received its licence, and it is hoped to complete the equipment in time for the October UHF/SHF Contest. The beacon will run 400W erp from each of two antennas. The frequency will be 1,296·83MHz.

The beacon keeper of GB3IOW, G3KSU, reports progress in getting the 1·3GHz and 10GHz beacons back on the air. The 1·3GHz beacon is only awaiting final inspection by the primary user of the site before being switched on. Some work remains to be done on the slotted waveguide antenna for the 10GHz beacon, but this should not take too long. No doubt many people are eagerly awaiting the return of these most useful beacons.

## sstv scene

P. Burnett, G4BLL*

Judging by the correspondence received in response to *SSTV scene* July, interest in the Japanese pcbs for a 400-type scan converter is considerable. It was hoped that positive information regarding availability, price etc would be forthcoming for inclusion in this month's column—but, alas, no! Several copies of the negatives are now in circulation and some boards have been produced, but it is not known at the time of writing if further supplies will be available for general release. Perhaps these few comments will spur someone into action!

Syd Horne, VE3EGO, reports that he intends to build the G3OQD image processing circuits (see *SSTV scene* July) into his home-built 400-type scan converter and that he is visiting the UK on business in late September; he hopes to find time to meet and talk with any active sstvers.

G3LEE has already built G3OQD's circuits and is using them in his Robot 400. Gordon has a Z80-based microcomputer producing slow-scan patterns and sync, and can also simulate W9NTP's 2-frame/s mstv. G3LEE also forwarded information received from swl Michael Bird of Winchester who reports hearing a programme for amateurs and swls called "Club Forum" on Radio Australia. A Mr Geoff Glover talked about slow scan and made an appeal for anyone able to receive sstv to contact Radio Australia, PO Box 428G, Melbourne 3000, Australia. Apparently they are thinking of putting out a burst of sstv over their short-wave transmitters on Saturdays and Sundays, frequencies 21,270, 11,750 and 9,570kHz, time 0840gmt. *SSTV scene* would like to hear from anyone taking part in this.

In July your scribe stated that ". . . if a scan converter can be built for anything even approaching £25, *SSTV scene* would be very pleased to hear about it." So he was pleased to hear from G3PTD, who states that his home-built unit using 170 ics, had cost him £27.46 to build, although he does admit that this does not include the cost of the cabinet! This is good news in that at least it proves that if one is willing to search around for surplus ics etc, then a slow-to-fast converter need be very little more expensive than a P7 tube monitor.

G3WW sent a photostat copy of a QSL card received from VR6TC, Pitcairn Is, representing that operator's first two-way sstv contact with any UK station. Richard reports that his countries score to date now stands at 99, with 1,251 different stations worked. G4GIZ, who has been an active slow scanner for only 10 weeks, has now worked 20 countries and over 79 different stations, including ZF1GC, LU4DGN and PJ2FR. World-wide slow-scan activity continues to grow even if local activity on 3·5MHz leaves something to be desired.

G4GOZ is another very welcome newcomer to the slow-scan scene with an above-specification W6MXV monitor.

The 1979 9th World Wide SSTV Contest results are now to hand, showing SM5EEP a clear winner with 32,032 points from 154 contacts. The British placings were: 7th, G3WW; 12th, G3GRJ; and 14th, GM3WIL.

W9NTP continues to forge ahead with his mstv experiments and reports that his second memory (colour) board for the Robot 400 is available for $30. The board comes already drilled with plated-through holes. If anyone is interested in obtaining this board write to Dr Don C. Miller, W9NTP, Box 95, RR1 Waldron, Indiana, 46182, USA.

A letter received from Aero & General Supplies states that notwithstanding the recent 14½ per cent increase in the price of the Robot 400 in the USA, and the VAT increase in this country, the UK inclusive price will remain at £666. This means that the UK price has not increased in three years so, to quote A & G, "In view of inflation it must be getting cheaper!"

Finally, sstvers may find the new RSGB *Amateur Radio Operating Manual* of interest. It contains a chapter devoted to slow-scan television, with particular emphasis on the "down to earth" aspects of operating sstv equipment.

* 12 Standroyd Drive, Colne, Lancashire BB8 7BG.

# your opinion

### HF ANTENNAS

The Editor
*Radio Communication*

Sir—It is not often that I feel compelled to put pen to paper, but the letter in your August issue from Mr J. J. Wilkins, GW4GEA, really did strike near to my own feelings where hf antennas are concerned.

After moving some years ago, it did not take long to discover that my three-element beam could not be put up at the new location due to the geography of the garden, the height of the house and the turning radius involved. At first this did not matter, and vhf/uhf, coupled with house decorating, occupied most of the available hours. But with the current sunspot cycle causing a renewed interest in hf, it was soon apparent that a long wire left much to be desired.

Having decided that an hf antenna must, for a time, replace the vhf arrays on the mast, I found it most difficult to discover, at first, where hf antennas could in fact be purchased, let alone looked at and given the attention that their price deserved.

The last time that I remember seeing hf antennas properly displayed at an exhibition was way back in the pre-ssb days, when such items tended to attract as much attention as the latest "black box" does at our present-day events. It would certainly be nice to see such displays again. If any dealer would take the trouble to provide this, with suitable technical salesmanship, I feel sure that several amateurs, like myself, could be persuaded to stop dreaming and actually part with money that otherwise will probably stay in the bank.

M. Pharaoh, G3LCH

### FMD AWARDS

The Editor
*Radio Communication*

Sir—I too was sorry to read that the Countries and Counties scheme for Four Metres and Down Certificates is being phased out in favour of the rather mundane collection of QRA locator squares.

To my mind, the prerequisites for the new scheme are an antenna farm and a couldn't-care-less attitude to neighbours and fellow radio amateurs. As a result, most operators who live in suburbia are virtually precluded from the scheme.

The C and C scheme provides plenty of incentive to all types of operator, and of course the activity and excitement increases when a dxpedition opens up a virtually "non-radio-active" county. However, I would suggest that the scope of the C and C scheme should be widened to incorporate the following:

(a) each band to have junior and senior awards for specific modes of transmission, thereby promoting alternatives to ssb;
(b) the qualification for a Supreme Award to be three senior awards on different bands using a common mode of transmission;
(c) awards to be given to a specific callsign rather than a name or QTH. Currently a G8-plus-3 who achieved junior or senior awards, could not receive the same awards when he or she becomes a G4-plus-3.

I believe that the C and C scheme with the above additions will provide more than enough interest and incentive to the less-experienced radio amateurs, and at the same time add another degree of difficulty for those who have "done it all".

Brian Povoas, G4FZL

### SOLVING TVI PROBLEMS

The Editor
*Radio Communication*

Sir—May I, through the medium of your letters column, thank the Society for its assistance recently in the matter of a complaint brought against me in the local registrar's court.

The case was brought by a neighbour who was experiencing breakthrough of my hf band transmissions on his audio and television equipment. Despite advice from the Post Office investigators that my station was being operated in accordance with the licensing regulations, and that the problem lay in the design and/or construction of his equipment, the neighbour decided to claim reimbursement for the necessary modifications to his equipment, or alternatively, compensation for alleged nuisance caused.

In view of the possible implications for other amateurs, had the plaintiff been successful, I contacted RSGB HQ to seek their advice. I was promptly put in touch with John Swinnerton, a member of the Interference Committee. A short time later I had a telephone call from David Evans, the general manager, who told me that the Society had briefed a solicitor. This was followed shortly by a visit to my home by David Evans and John Swinnerton.

I am pleased to report that the submissions made by the solicitor engaged by the Society, at no cost to me, resulted in the plaintiff withdrawing his complaint.

The support given to me by the Society in this case must surely serve to reassure all amateurs of the Society's concern for its members and of the distinct advantages of membership.

May I also record here my appreciation of the enlightened attitude of the Post Office investigators towards the amateur in this case. Mr C. H. Ford, from the Winchester office, and his colleague from the Southampton office, while maintaining an impartial attitude, impressed me very greatly by their professionalism and patience.

It is probably worth mentioning here that the plaintiff's Ferguson music centre has now been cleared after a simple modification carried out by a Thorn technical liaison officer, Colin Turner, G3VCT, who was approached by the plaintiff's wife while he was in the area in answer to a request from another neighbour on advice from me. I should also mention that I gave the same advice to the plaintiff in the very first instance but he chose to ignore it.

Tom Drake, G4GYC

# Special event stations

**GB3NBH, 18-20 October**
A special event station will operate as part of the North Bristol Model Railway & Hobby Exhibition, Horfield Baptish Church, Gloucester Road, Bristol, in aid of church funds. Further details from G4IJW, G8BKR QTHR, tel Bristol 621498.

*The following special event stations will be operated during the 1979 Jamboree on the Air, taking place on 19-21 October:*

**GB2LE**, 20-21 October only, by the 2nd Leytonstone Scout Group as part of its 70th anniversary celebrations, at the group's headquarters, Malvern Road, Leytonstone, London E11; **GB2ADS**, 20-21 October only, by Alderbourne District Scouts, at "Benbow", Widecroft Road, Iver, Bucks; **GB2BBS**, 0800 20 October-2400 21 October only, at 27th Forth Valley Scout Hall, Bonnybridge, Stirlingshire; **GB2BTS**, 1200 19 October-2400 21 October, by Bournemouth RS on behalf of Bournemouth Town Scouts, at Bournemouth Scout Camp Site, Butcher's Coppice, Hollaway Avenue, Bournemouth; **GB2CSR**, at "The Quest" Scout Headquarters, Beulah Road, Thornton Heath, Surrey; **GB2CUG**, at Carlisle Upperby Guides HQ, St John's Vicarage, Upperby, Carlisle, Cumbria; **GB2DBS**, 20-21 October only, at Denny Boy Scouts HQ, The Scout Hall, Duke Street, Denny, Stirlingshire; **GB2DDS**, 20-21 October only, at Dagenham District Scouts HQ, Rectory Road, Dagenham; **GB2DVS**, 20-21 October only, at First Presbyterian Church, High Street, Donaghadee, Co Down, N Ireland; **GB2FBS**, 20-21 October only, on behalf of the Scout movement in Braintree and District, at The Scout Hut, John Ray Street, Coggeshall Road, Braintree, Essex; **GB2FGS**, 20-21 October only, by the 1st Gornal Scouts, at the Fiddlers Arms, Straits Road, Lower Gornal, Dudley, W Midlands; **GB2HKO**, 20-21 October only, by Thurrock District Scouts, at Alf Lowne Centre, Richmond Road, Grays, Essex; **GB2HSG**, at All Saints Church, Uxbridge Road, Hanworth, Feltham, Middx; **GB2JAM**, 20-21 October only, by Overchurch Upton Scout Group, at Salacre Lane, Upton, Wirral, Merseyside; **GB2JOT**, 0001 20 October-2359 21 October only, at 95 Cavendish Road, Hazel Grove, Stockport, Cheshire SK7 6JQ; **GB2OSH**, 20-21 October only, by the 6th Stourbridge Scouts and Old Swinford Hospital School RS, at Old Swinford Hospital School, Hagley Road, Stourbridge (visitors welcome); **GB2VSS**, at Valance School, Westerham, Nr Sevenoaks, Kent; **GB3AVS**, by Ardnavally Venture Scouts, at Pathfinder Pavilion, 109 Milltown Road, Belfast, N Ireland; **GB3CBS**, at Chesham Bois Scout Group HQ, Pioneer Hall, Bois Lane, Amersham, Bucks; **GB3HSA**, 20-21 October only, by Harlow Scouts Association, at the Harlow & D ARS HQ, Mark Hall Barn, First Avenue, Harlow, Essex; **GB3KVS**, 1730 19 October-1730 21 October, at Warmley Scout Site, Warmley, Nr Bristol; **GB3RSR**, 20-21 October only, at 2nd Rotherham Scouts HQ, Sandy Lane, Thurcroft, Rotherham; **GB3TON**, at Tonbridge Castle, Tonbridge, Kent; **GB3WCS**, by Watford Central Scouts' at Phasels Wood Scout Camp, Rucknells Lane, King's Langley, Herts.

**GB3ARE, 7-10 November**
A special event station will be in operation during the Amateur Radio Retailers Association National Amateur Radio Exhibition, and will be located within the Granby Halls, Welford Road, Leicester. Further details from G3TED, QTHR.

# council proceedings

**A brief report on the Council meeting held on 7 June 1979**

Present: Mr J. Bazley (President, in the chair), Mr D. Adams, Dr E. J. Allaway, Messrs D. J. Andrews, J. Anthony, P. Balestrini, R. Bellerby, P. F. D. Cornish, L. N. G. Hawkyard, Dr D. S. Evans, Messrs G. I. Knight, W. F. McGonigle, B. O'Brien, C. H. Parsons, R. F. Stevens, G. M. C. Stone (members of Council), D. A. Evans (general manager/secretary), A. W. Hutchinson (editor) and Mrs H. M. Allin (minutes secretary).

Apologies for absence were received from Messrs T. P. Douglas and C. J. Thomas.

**General manager's report**

The general manager circulated a report which dealt with various aspects of headquarters administration, the QSL Bureau, *DX News Sheet*, and exhibitions, and various items were discussed.

Late delivery of the *DX News Sheet* was being experienced, and it was agreed that an official complaint be made to the chairman of the Post Office.

The Alexandra Palace exhibition was agreed to have been a success, particularly the much improved RSGB stand. Arrangements for next year's exhibition were already in hand.

An assembled mini display stand for use at functions throughout the country was examined by members of Council, who expressed their enthusiasm for its design and purpose.

**Financial report**

Mr Cornish reported that the accounts at the end of April showed a small surplus over budget. The auditors had commenced work on the annual audit, and the budget for the 1979-80 financial year was being prepared.

Several points arising from the report were discussed. It was agreed to decline a legacy offered to the Society because of the administrative complexity of the conditions attached to it.

**Committee minutes**

*Education* (24.3.79, 21.4.79)
Dr Evans and Mr Andrews asked about the current situation regarding the RAE Advisory Committee. Mr Anthony said he intended to prepare a paper on this subject and was awaiting further information from City & Guilds.

*Finance & Staff* (19.4.79)
Council approved the attendance of a member of the HF Contests Committee at a meeting to be held in Germany at the end of June to discuss the harmonization of HF NFD rules.

*HF* (31.3.79)
These were accepted without comment.

*HF Contests* (12.4.79)
The use of GB callsigns in contests was raised by Dr Evans. It was agreed that the committee would prepare a paper on the subject for further discussion.

*IARU* (22.2.79, 24.5.79)
Council approved recommendations:
(a) to invite Mr C. E. Godsmark to join the committee;
(b) that the RSGB, on behalf of Society members residing in British possessions in Region 3, should seek membership of IARU Region 3;
(c) that RSGB should, if requested, be prepared to act as host society to the IARU Region 1 Conference in 1981.

*Membership & Representation* (9.3.79)
The committee had suggested that the next regional representatives conference be held on 20 October 1979. After considerable discussion it was agreed to hold the conference on the suggested date.

*Microwave* (21.4.79)
Approval was given to the recommendation to invite Mr J. Gannaway, G3YGF, to join the committee.

*Mobile & Exhibition* (20.3.79, 24.4.79)
Council expressed its congratulations to all those involved with the organization of the Alexandra Palace Exhibition.

*Propagation Studies* (3.5.79)
These were accepted without comment.

*Raynet* (24.2.79, 24.3.79)
Mr Balestrini reported that the scheme of allocating specific tasks to various committee members was working well.

*Technical & Publications* (14.3.79)
Mr Hawkyard raised the question of rates paid to *Radio Communication* contributors, and Mr Knight referred to a technical error which appeared in a recent issue.

*Telecommunications Liaison* (22.3.79, 17.5.79)
Mr Bellerby asked for an explanation on the Home Office ruling that Raynet may provide an emergency link to the shore in conditions of operational oil pollution incidents in emergencies only. Mr Balestrini replied that it was impossible to answer this but the Home Office had stressed that such permission did not apply during exercises.

Mr Andrews enquired about the latest position of the three proposed additional repeaters for the London area. Mr Stevens replied that the proposals were still with the engineers in the Home Office and that representatives from the groups involved would be aware of the current situation.

*VHF* (31.3.79, 19.3.79)
Mr Bazley reported that Mr Douglas, G3BA, was willing to stand as the Society's new vhf manager, and his appointment was approved unanimously.

Mr Knight queried the possibility of obtaining the lower part of the 50MHz band. Mr Stevens explained that a draft application for a 50MHz beacon had been prepared by Mr Bower, G3COJ, but had not yet been submitted to the Home Office.

*VHF Contests* (21.3.79, 25.4.79)
Accepted without comment.

**Membership and representation**

Council noted and approved that:
(i) reduced subscriptions had been granted to two members;
(ii) waived subscriptions had been granted to three members;
(iii) life membership had been granted to three members;
(iv) Lt Cdr H. G. Cunningham had been elected regional representative for Region 17;
(v) the following area representatives had been appointed: Mr A. T. Hamilton, GI4HVI (North Ulster); Mr J. Brooker, G3JMB (Crawley, Cuckfield and Horsham); Mr G. C. Fermor, G8RCZ (East Devon); Mr E. A. Lomax, G4DGR (Fylde district of Lancashire), and Mr E. A. Thorne, G3ART (South-west Cumbria);
(vi) affiliation had been granted to Caradon Hill Repeater Group, Cornwall; NW Repeater Group, Skipton; Merchant Navy College ARC, Greenhithe; Radio Amateur Old Timers Association; and North Kent RS, Orpington.

**Election of 1980 President**

Dr Allaway proposed and Dr Evans seconded that Mr Balestrini be RSGB President for 1980. This was approved unanimously.

**Honorary officers**

The appointment of honorary officers was approved (See list on page 923).

**Representatives on outside bodies**

CCIR Study Group 2 (Space research and radio astronomy), M. Sweeting, G3YJO; Group 5 (Propagation in non-ionized media) and Group 6 (Ionospheric propagation), R. G. Flavell, G3LIP; Group 8 (Mobile services and amateur service), D. A. S. Dryborough, G8HEV.

CCIR General Purposes, R. F. Stevens, G2BVN.

BSI Committee GEL 1/5 (Broadcast and tv terminology), GEL 1/30 (Radio communication terminology) and EEL 25/6 (Equipment for mobile services), R. S. Roberts, G6NR; GEL 1/9 (propagation and media terminology sub-committee), R. G. Flavell, G3LIP.

RAE Subject Committee, G. C. Oxley, G8MW; L. E. Newnham, G6NZ, and W. A. Scarr, G2WS.

BREMA Interference Sub-Committee (when requested), J. Anthony, G3KQF.

Dr Evans agreed to consult the T & P Committee regarding representation on EEL 25/1 (Radio receiving equipment), 25/2 (Radio receiver safety requirements) and 25/3 (Radio transmitting equipment). Mr R. O. Phillips, G8CXJ, was suggested for EEL/23 (Radio frequency radiation induced ignition and detonation).

**Correspondence**

The President reported that much correspondence had been received as a result of a Zone G meeting recently held in Stirling. Mr Knight then gave a full report of the meeting's proceedings and of events leading up to the meeting. Mr Knight had called this meeting of Scottish representatives, and some ill-feeling was caused because certain members felt it should have been open to all Scottish RSGB members.

It was agreed that the President should handle this matter personally.

# RSGB SLOW MORSE PRACTICE TRANSMISSIONS

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

| Clock time | Callsign | MHz | Mode | Town |
|---|---|---|---|---|
| **Mondays** | | | | |
| 1045 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1830 | G3NCZ | 145·525 | F2 | Blackburn, Lancs |
| 1830 | G3ZQS / G4CGT | 1·930 / 145·525 | A1/A3J (usb) / F2 | Darwen, Lancs |
| 1900 | G3ZRZ | 1·975 | A1/A3 | Blackpool, Lancs |
| 1900 | G4BNV | 144·250 horizontal east/west | A1/A3J | Ottery St Mary, Devon |
| 1900 | GM4HIG | 144·250 horizontal to south-west / 145·550* vertical | A1/A3J / A1/A3J | Aberdeen |
| 1930 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1930 | GI3SXG | 144·100 | A1/A3J | Newtownards, Co Down |
| 2000 | GM4ELV | 3·570 | | Arrochar, Strathclyde |
| **Tuesdays** | | | | |
| 1045 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1830 | G4CWN | 144·100 | A1/A3J | Stoke-on-Trent, Staffs |
| 1830 | G3NCZ | 145·525 | F2 | Blackburn, Lancs |
| 1830 | G3ZQS / G4CGT | 1·930 / 145·525 | A1/A3J (usb) / F2 | Darwen, Lancs |
| 1900 | G4RS | 3·565 / 144·110 to NNE | A1/A3J / A1/A3J | Catterick, N Yorks |
| 1930 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1930 | G3ZYY | 145·550 vertical to east | F2/F3 | Saltash, Cornwall |
| 2030 | G3IRM | 1·975 | A1/A3 | Bury St Edmunds, Suffolk |
| 2030 | G4FFC | 144·390 horizontal to south | A1/A3J | Pertenhall, Beds |
| 2030 | G3OHM/A | 144·180 | A1/A3J | Birmingham |
| 2030 | G3KGU | 1·915 | A1/A3 | Theydon Bois, Essex |
| 2200 | G3AWL | 144·110 to south | A1/A3J | Peterlee, Co Durham |
| **Wednesdays** | | | | |
| 1045 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1830 | G3NCZ | 145·525 | F2 | Blackburn, Lancs |
| 1830 | G3ZQS / G4CGT | 1·930 / 145·525 | A1/A3J (usb) / F2 | Darwen, Lancs |
| 1900 | G2ABC | 145·250 | F2/F3 | Truro, Cornwall |
| 1900 | G3ULY / G4EXD | 1·826 | A1/A3J | Culgaith, Cumbria |
| 1930 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1930 | G3ZYY | 145·550 vertical to east | F2/F3 | Saltash, Cornwall |
| 2000 | G3SWP | 144·180* | A2/A3J | Doncaster, South Yorks |
| 2015 | G3WVJ | 1·845 | A1/A3 | Staines, Middlesex |
| 2100 | G3HVI | 144·750* | A2/A3 | Stoke-on-Trent, Staffs |
| **Thursdays** | | | | |
| 1045 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1800 | G2ACZ | 1·808 | A1 | Maplethorpe, Lincs |
| 1830 | G3NCZ | 145·525 | F2 | Blackburn, Lancs |
| 1830 | G3ZQS / G4CGT | 1·930 / 145·525 | A1/A3J (usb) / F2 | Darwen, Lancs |
| 1900 | G4BNA | 3·590 | A1 | Swindon, Wilts |
| 1900 | G3BLS | 1·960 | A1/A3 | Osney, Oxford |
| 1900 | G3ZRZ | 1·975 | A1/A3 | Blackpool, Lancs |
| 1900 | G4RS | 3·565 / 144·110 to NNE | A1/A3J / A1/A3J | Catterick, N Yorks |
| 1930 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1930 | G3ZYY | 145·550 vertical to east | F2/F3 | Saltash, Cornwall |
| 2030 | G3ZDW | 144·220 horizontal, omni-direct | A1/A3J | Swinderby, Lincs |
| **Fridays** | | | | |
| 1045 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| 1830 | G4CRI | 3·525 | A1 | Helston, Cornwall |
| 1830 | G3NCZ | 145·525 | F2 | Blackburn, Lancs |
| 1830 | G3ZQS / G4CGT | 1·930 / 145·525 | A1/A3J (usb) / F2 | Darwen, Lancs |
| 1900 | G4FIM | 145·550 | F2/F3 | Leeds, Yorks |
| 2000 | G3WQK | 144·750 | F2 | Hailsham, Sussex |
| 2030 | G3ZDW | 144·220 horizontal, omni-direct | A1/A3J | Swinderby, Lincs |
| 2200 | G3AWL | 144·110 to south | A1/A3J | Peterlee, Co Durham |
| **Saturdays** | | | | |
| 0915 | G3LEQ | 144·250 / 145·250 slant polarized to west-north-west / 1·950 / 29·250 | A1/A3J / F2/F3 / A2/A3 / F2/F3 | Knutsford, Cheshire |
| 0930 | G2FNK | 1·930 | A1/A3 | Staines, Middlesex |
| 1045 | G3RAF | 3·550 / 144·025* | A2 / A2 | Locking, Avon |
| **Sundays** | | | | |
| 0900 | G3WNR | 1·975 | A1/A3J | South Shields, T & W |
| 0915 | G3LEQ | 144·225 / 145·525 slant polarized to west-north-west / 1·950 / 29·250 | A1/A3J / F2/F3 / A2/A3 / F2/F3 | Knutsford, Cheshire |
| 1015 | G3CGD | 1·875 | A1/A3 | Cheltenham, Glos |
| 1030 | G3OHM/A | 144·180 | A1/A3J | Birmingham |
| 1100 | G2FXA | 1·910 | A1/A3/A3J | Stockton-on-Tees |
| 1100 | G3XJJ | 3·535 | A1/A3J | Northampton |
| 1130 | G3BLS | 1·960 | A1/A3 | Osney, Oxford |
| 1200 | G3HVI | 144·750* | A2/A3 | Stoke-on-Trent, Staffs |
| 1800 | G3WNR | 144·725* | F2/F3 | South Shields, T & W |
| 1815 | G4DVZ | 1·915 | A1/A3J | Leeds, Yorks |
| 1815 | G3LEQ | 144·250 / 145·250 slant polarized to west-north-west / 1·950 | A1/A3J / F2/F3 / A2/A3 | Knutsford, Cheshire |
| 1830 | GM4HIG | 3·560 | A1/A3J | Aberdeen |
| 1930 | G3LDW | 144·160* | A1/A3J | Halesowen |
| 2030 | G3ZDW | 144·220 horizontal, omni-direct | A1/A3J | Swinderby, Lincs |

* Omni-directional

# obituaries

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

**Mr H. Jones, G3GBH**

Harry Jones, who died on 1 September, had been active mainly on 144MHz since his retirement. He was a past president of the Scarborough ARS.

**Mr C. I. Pearce, G3FUO**

Charles Pearce died on 6 July, aged 68. His active interest in radio ranged from the days of cats' whiskers and bright emitters to solid-state. In the years of his retirement, despite disability, he was a "bright emitter" himself whose operating was always exemplary.

**Mr V. Sims, G5VS**

Vic Sims, who died on 3 July, had been licensed since 1928. He was an operator in the Royal Navy during the war, and many owed their ability in morse to his teaching.

# VHF National Field Day 1979 results

**LEADING STATIONS**

| | |
|---|---|
| **Winner** | Martlesham RS & Ipswich RC |
| **Runner-up** | Bracknell RS & G4ERP |
| **Leading GW group** | Bracknell RS & G4ERP |
| **Leading GI group** | Lagan Valley ARS |
| **Leading GM group** | South Scotland CG |
| **Leading GD group** | Isle of Man ARS |
| **Leading GU/GJ group** | Guernsey ARS |
| **70MHz leader** | G3KFN (Plymouth) |
| **144MHz leader** | G3PMH (March) |
| **432MHz leader** | G4CFI (Martlesham) |
| **1·3GHz leader** | G3XDY (Martlesham) |

**EQUIPMENT OF LEADING STATIONS**

| | |
|---|---|
| **Martlesham RS & Ipswich RC** | |
| 70MHz (G4GPO) | 2×BLY90 pa, 120W out, SD306-rf, 6-el at 55ft. |
| 144MHz (G4BPO) | 2×4CX250B pa, 400W out, BFT66 rf, 4×14-el at 85ft. |
| 432MHz (G4CFI) | 4CX250B pa, 250W out, NE21935 m'head, 25QL at 80ft. |
| 1·3GHz (G3XDY) | 4×7289 pa, 150W out, NE64535 rf, 4×25QL at 75ft. |
| **Band leaders** | |
| 70MHz (G3KFN) | 4CX250B pa, 130W out, 4-el at 50ft. |
| 144MHz (G3PMH) | 2×4CX250B pa, 400W out, 3N204 rf, 2×16-el at 80ft. |
| 432MHz (G4CFI) | |
| 1·3GHz (G3XDY) | As above |

For the first time this year, the VHF Contests Committee appears to have chosen the right weekend. Weather conditions for VHF NFD 1979 in most parts of the country were fine and bright, with occasional welcomed showers to disperse the greenfly. However, some groups did not feel quite at home without the accustomed mud and rain, and found site access unbelievably easy! Many groups actually commented that they enjoyed the event and took the opportunity to do some sunbathing in the quieter periods.

With good and uniform band conditions extending to most contestants, EU contacts were logged in large quantities on both 144 and 432MHz, and nearly half the entrants on 1·3GHz made QSOs with either PA0 or ON. The leading station on 144MHz, G3PMH/P, made over 300 QSOs with EU stations and worked 57 QTH locator squares.

Many groups had the usual "tales of woe" to tell, about equipment catching fire and antennas falling down, under the pressure and lack of manpower that such a major event as VHF NFD produces. The Stockport RS were one of the unlucky groups to have problems, and they wish to express their gratitude to GW4GSS, a local to their site, who came to the rescue with the loan of a transformer, capacitors and diodes to allow them to rebuild their 1·3GHz equipment.

Log keeping was found to be of a reasonable standard, in general, which always helps to speed the publication of the results. The committee would like to remind groups that they must ensure that all operators are members of the RSGB, as all contest entries in future will be being carefully checked with the aid of the HQ computer.

### 70MHz

The Plymouth RC, G3KFN, operating from Dartmoor, were the winners, and the South of Scotland VHF CG, GM3WOJ, were the runners-up.

**G4FUU/P the Surrey Radio Contact Club's 70MHz VHF NFD station**

The only specific bad signal complaint was made against GM3WOJ; it was not substantiated by any other stations, so no action will be taken.

Entries were a few per cent down again, as they were last year, with perhaps the most significant fact on this disappointing band being that the eventual winner received serial No 051 for his first QSO. A break during the night, now taken by many stations, will, as requested by a number of operators, be included in the 1980 rules. This should help the smaller groups who may have manpower problems.

What other changes can the committee make in view of the comment "boring" made by a number of contestants? Eight hours only? CW only? Drop the band in favour of 2·3GHz? The suggestion that entries be accepted only from stations who have entered a 70MHz contest in the preceding 12 months is not likely to increase activity. Your comments gentlemen, please!

### 144MHz

As usual this band produced good activity, although the number of entries was down on last year.

The conditions were described as average to good, which provided continuous activity, with the leading station making good dx scoring contacts with most parts of Western Europe, but there were no Scandinavian stations logged. The best peak in conditions appeared during early Sunday morning, with a number of stations working EA1CR/P in the XD locator square. Another interesting contact was made by G3PMH/P, who worked a PA0 located on an oil rig in the BN80 square.

Once again few complaints were received about stations with poor-quality signals; perhaps contestants have made considerable improvements to their equipment, or are they just suffering without making comments on the 427 form? Monitoring, however, showed at least 10 stations with poor quality, no doubt from overdriven linears.

### 432MHz

The 89 entries in this section were six fewer than last year. The radial scores, however, were generally up, and in the case of the six leaders, by over 50 per cent.

Conditions were only slightly above the normal summer-time average, with few openings good enough to extend the majority of best dx beyond 650km. On Saturday evening and Sunday morning, several stations reported the occasional lift into France, but by afternoon any dx there had been was tailing off.

432MHz contestants are generally very reticent in their comments, and this year's VHF NFD was no exception. The VHF Contests Committee received no complaints about the weather! Neither were they asked to take any action against the very few stations whose signals did not always measure up to the high standard normally found on the uhf bands.

The now familiar pattern of 144MHz is being repeated on 432MHz. Higher output power, larger antenna arrays and more sophisticated systems have extended the typical average ranges so that it is possible to cover most of the country from any good site in England, Wales and SW Scotland. Success now depends more than ever upon forecasting the propagation conditions, choosing a site to suit and blasting away with all one has got.

It is perhaps significant that stations with the highest averages were located in areas remote from adjacent QRO stations and heavy QRM,

## OVERALL RESULTS

| Posn | Group | Total score* | Band position 70MHz | 144MHz | 432MHz | 1·3GHz |
|---|---|---|---|---|---|---|
| 1 | Martlesham RS & Ipswich RC | 3,357 | 33 | 6 | 1 | 1 |
| 2 | Bracknell & G4ERP GP | 3,111 | 9 | 13 | 2 | 2 |
| 3 | March & D RAS | 3,100 | 30 | 1 | 3 | 3 |
| 4 | Wulfrun CG | 3,049 | 8 | 2 | 7 | 4 |
| 5 | Stockport RS | 2,907 | 11 | 4 | 4 | 9 |
| 6 | Plymouth RC | 2,337 | 1 | 23 | 5 | – |
| 7 | Leicester & Melton Mowbray RS | 2,135 | 35 | 8 | 14 | 8 |
| 8 | South of Scotland VHF/UHF CG | 2,123 | 2 | 22 | 12 | 21 |
| 9 | Martlet CG | 2,057 | 23 | 18 | 8 | 17 |
| 10 | South Staffs CG | 1,976 | 12 | 7 | 16 | – |
| 11 | Vectis WG and Southampton URC | 1,960 | 14 | 11 | 23 | 20 |
| 12 | Sutton & Cheam RS | 1,951 | 40 | 14 | 10 | 15 |
| 13 | Cray Valley RS | 1,919 | 25 | 19 | 11 | 22 |
| 14 | Ebor Gp | 1,887 | 5 | 38 | 17 | 23 |
| 15 | AERE Harwell ARS | 1,821 | 44 | 17 | 19 | 13 |
| 16 | Salop ARS | 1,816 | 29 | 39 | 22 | 5 |
| 17 | Westmorland VHF Gp | 1,804 | 7 | 45 | 33 | 18 |
| 18 | The "Hillbillies" | 1,755 | 46 | 37 | 13 | 7 |
| 19 | Weymouth & Dorchester VHF/UHF Gp | 1,736 | – | 9 | 6 | 10 |
| 20 | Northern Heights ARS | 1,726 | 22 | 41 | 22 | 16 |
| 21 | Reading ARC | 1,717 | 33 | 28 | 9 | 33 |
| 22 | Bridgwater & Coventry CG | 1,715 | 24 | 16 | 32 | 28 |
| 23 | Victory CG | 1,674 | 47 | 21 | 15 | 24 |
| 24 | South Birmingham RS | 1,639 | 35 | 56 | 30 | 6 |
| 25 | Great Lumley RS | 1,586 | 21 | 27 | 18 | 52 |
| 26 | Newquay & D ARS | 1,564 | 4 | 44 | 35 | – |
| 27 | Norfolk VHF/UHF CG | 1,556 | 20 | 24 | 28 | 51 |
| 28 | Crawley ARC | 1,553 | 32 | 53 | 31 | 14 |
| 29 | Bedford ARC CG | 1,530 | 49 | 25 | 21 | 31 |
| 30 | Horsham ARC | 1,519 | 35 | 32 | 29 | 29 |
| 31 | Cornish RAC | 1,422 | 10 | 42 | 43 | – |
| 32 | Hastings E&RC | 1,421 | 66 | 5 | 41 | – |
| 33 | Hornsea ARS | 1,369 | 26 | 50 | 25 | 45 |
| 34 | Lagan Valley ARS | 1,334 | 16 | 35 | 49 | – |
| 35 | Worthing & D ARC & Romford ARS | 1,312 | 19 | 48 | 42 | 43 |
| 36 | RS of Harrow | 1,292 | 50 | 33 | 38 | 36 |
| 37 | Brighton & Mid-Sussex ARS | 1,287 | 55 | 29 | 36 | 42 |
| 38 | Maidenhead & Thatcham, Rhiw M CG | 1,285 | 13 | 52 | 47 | – |
| 39 | Surrey RCC | 1,283 | 45 | 57 | 27 | 37 |
| 40 | Isle of Man ARS | 1,280 | 3 | 30 | – | – |
| 41 | Hull & D ARS | 1,262 | 39 | 47 | 46 | 32 |
| 42 | Southgate RC | 1,236 | 41 | 51 | 45 | 30 |
| 43 | Guernsey ARS | 1,227 | 6 | 36 | – | – |
| 44 | Crystal Palace & Socom CG | 1,226 | – | 3 | 52 | – |
| 45 | Guildford & D RS | 1,200 | 31 | 63 | 34 | 44 |
| 46 | West Kent ARS | 1,169 | 67 | 20 | 56 | 34 |
| | Norfolk ARC | 1,169 | 42 | 46 | 51 | 41 |
| 48 | ARC of Nottingham | 1,162 | 54 | 49 | 39 | 38 |
| 49 | Albright & Wilson ARS | 1,131 | 28 | 15 | – | – |
| 50 | Doncaster Inst Higher Education ARS | 1,105 | 51 | 67 | 44 | 25 |
| 51 | Ayrshire ARG | 1,084 | 27 | 54 | 63 | 49 |
| 52 | Shefford & D RS | 1,078 | 42 | 66 | 37 | – |
| 53 | Maidenhead & D ARC | 1,059 | 59 | 61 | 57 | 19 |
| 54 | Cheltenham ARA | 1,058 | 57 | 26 | 62 | – |
| 55 | Glenrothes & D ARC | 1,026 | 14 | 69 | 72 | – |
| 56 | Bolton & D ARC | 996 | 18 | 83 | 60 | – |
| 57 | Berwick & D ARS | 994 | 17 | 70 | 80 | – |
| 58 | Newbury & D ARS | 938 | 56 | 34 | 75 | – |
| 59 | G3TAL Gp | 918 | 38 | – | 40 | 40 |
| 60 | Torbay ARS | 877 | 60 | 58 | 55 | – |
| 61 | Chelmsford ARS | 875 | – | 81 | 26 | 11 |
| | Vange ARS | 875 | – | 91 | 20 | 12 |
| 63 | Barking R&ES | 868 | 62 | 43 | 61 | – |
| 64 | Silverthorn RC | 866 | – | 10 | 53 | – |
| 65 | Medway & Bexley VHF/UHF Gp | 847 | 68 | 62 | 65 | 27 |
| 66 | Bournemouth RS | 844 | – | 12 | 68 | 35 |
| 67 | Mid-Cheshire ARS | 810 | 61 | 58 | 59 | – |
| 68 | Grafton RS | 774 | 53 | 79 | 67 | 50 |
| 69 | Telford & D ARS | 719 | 52 | 72 | 79 | – |
| 70 | Hereford CG | 714 | – | 31 | 58 | – |
| 71 | Dunstable Downs RC | 667 | 48 | 68 | – | – |
| 72 | Mansfield RS | 634 | 64 | 85 | 76 | 39 |
| 73 | Clifton ARS | 569 | 65 | 77 | 77 | – |
| 74 | Edgware & D RS | 510 | – | 87 | 58 | – |
| 75 | Banbury ARS | 487 | – | 60 | 50 | – |
| 76 | Kingsway Technical Coll ARC | 443 | 63 | 88 | 85 | – |
| 77 | Nunsfield House ARG | 423 | – | 71 | 54 | 46 |
| 78 | Solihull & Chelmsley Wood Raynet Gp | 405 | – | 64 | 64 | 47 |
| 79 | Havering & D ARC | 391 | 70 | 90 | 66 | – |
| 80 | Mid-Ulster RSGB Gp | 387 | 73 | 40 | – | – |
| 81 | Milton Keynes & D RS | 384 | 69 | 89 | 88 | – |
| 82 | Rhyl & D ARC | 300 | – | 75 | 70 | – |
| 83 | Coulsdon ATS | 285 | 72 | 82 | 78 | – |
| 84 | Humberside VHF Gp | 278 | – | 55 | 86 | – |
| 85 | Preston ARS | 265 | – | 84 | 69 | – |
| | Malvern Hills RAC | 265 | 71 | 74 | – | – |
| 87 | Northumbria RC | 255 | – | 65 | 81 | – |
| 88 | South Manchester RC | 241 | – | 86 | 74 | – |
| 89 | Hemel Hempstead Gp | 218 | – | 92 | 73 | – |
| 90 | Basingstoke ARC | 173 | – | 94 | 71 | – |
| 91 | Bury St Edmunds ARS | 162 | – | 73 | 89 | – |
| 92 | G3WDG | 155 | – | – | – | 26 |
| 93 | Kidderminster & D ARS | 154 | – | 76 | 86 | – |
| 94 | Lincoln Short Wave Club | 151 | – | 78 | 83 | – |
| 95 | White Rose RS | 146 | – | 80 | 84 | – |
| 96 | Denby Dale & D ARS | 127 | – | 93 | 82 | 48 |

$$\text{*Total score} = \frac{\text{70MHz score} \times 1{,}000}{\text{70MHz leader's score}} + \frac{\text{144MHz score} \times 1{,}000}{\text{144MHz leader's score}} + \frac{\text{432MHz score} \times 1{,}000}{\text{432MHz leader's score}} + \frac{\text{1·3GHz score} \times 1{,}000}{\text{1·3GHz leader's score}}$$

*G4BEL*

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and they were not necessarily in favourable situations for working Continental dx. It is also interesting to reflect, therefore, upon the trend towards higher erps, and to question whether the advent of universal QRO will not be self-defeating in the long term.

### 1·3GHz

Activity was good, with the leading station making over 60 QSOs, and the committee receiving four more entries than last year for the band.

Conditions were described as normal-to-average, with few stations reporting very good. This was highlighted by many stations working PA0. The best dx worked was the contact between GW4BRK/P and PA0EZ at 569km.

Continental activity was also good, with DL and ON's being worked by some of the more easterly located stations.

Comments made were few and mostly concerned talk-back. G8LM said, "What about no talk-back band or bonus points for not using one." and G4CMU said, "Time for a change of rules to make 1·3GHz more independent".

The committee feels that the day when 1·3GHz can stand on its own is rapidly approaching, but it is concerned that some of the longer-distance QSOs might be lost, due to the very large and narrow antenna arrays some groups are using, and that in these circumstances the full potential of the 1·3GHz band would not be revealed.

*G4BEL*

**G8GNE operating the 144MHz station of the March & District Radio Amateur Society**

## 70MHz BAND RESULTS

| Posn | Callsign | Points | QSOs | QRA | Best dx | Km |
|---|---|---|---|---|---|---|
| 1 | G3KFN | 1,283 | 115 | YK21 | GM4HPO/P | 658 |
| 2 | GM3WOJ | 1,169 | 92 | XO26 | GU4ASO/P | 580 |
| 3 | GT3YEO | 1,098 | 91 | XO67 | GU4ASO/P | 539 |
| 4 | G4ADV | 1,096 | 90 | XK28 | GM4CXP/P | 565 |
| 5 | G3UUT | 1,081 | 105 | ZO55 | G4DWB/P | 549 |
| 6 | GU4ASO | 1,079 | 87 | YJ48 | GM3WIL/P | 610 |
| 7 | G3JYP | 1,037 | 93 | YO29 | GU4ASO/P | 570 |
| 8 | GW3XBY | 1,020 | 123 | YM44 | GM4HPO/P | 463 |
| 9 | GW3SNN | 1,007 | 123 | YN75 | GU4ASO/P | 397 |
| 10 | G4DWB | 998 | 69 | XK63 | GM3YOR/P | 653 |
| 11 | GW4CBW | 988 | 122 | YN75 | GU4ASO/P | 399 |
| 12 | GW6SW | 977 | 121 | YM14 | GM4HPO/P | 410 |
| 13 | GW4EZT | 953 | 93 | XM17 | GM4HPO/P | 430 |
| 14 | G3WIE | 917 | 103 | ZK24 | GM4HPO/P | 662 |
| | GM3YOR | 917 | 65 | YQ64 | G4DWB/P | 653 |
| 16 | GI4GDV | 896 | 67 | WO40 | GU4ASO/P | 619 |
| 17 | GM4CXP | 882 | 66 | YP18 | G4DWB/P | 610 |
| 18 | G8WY | 856 | 101 | YN38 | GU4ASO/P | 459 |
| 19 | G4KF | 855 | 111 | ZK09 | GM3YOR/P | 624 |
| 20 | G3ZIG | 852 | 88 | AM06 | G4DWB/P | 540 |
| 21 | G4DWM | 828 | 76 | ZO22 | G4DWB/P | 552 |
| 22 | G3UGF | 821 | 97 | ZN11 | G4DWB/P | 460 |
| 23 | G4AOL | 816 | 103 | AK11 | GM3YOR/P | 636 |
| 24 | G2ASF | 811 | 94 | YL75 | GM3YOR/P | 570 |
| 25 | G4EGU | 788 | 92 | AL65 | GI4GDV/P | 596 |
| 26 | G3TEU | 786 | 86 | ZO78 | G4DWB/P | 600 |
| 27 | GM3WIL | 780 | 67 | XO10 | G4DWB/P | 520 |
| 28 | GW3UEY | 762 | 96 | YM54 | GM3YOR/P | 430 |
| 29 | G4AZS | 750 | 109 | YM48 | GM4HPO/P | 450 |
| 30 | G4FES | 741 | 101 | AM51 | GM4HPO/P | 507 |
| 31 | G3PJX | 731 | 110 | ZL69 | GM3YOR/P | 585 |
| 32 | G3TIR | 728 | 99 | ZK07 | GM3YOR/P | 618 |
| 33 | G3WGV | 716 | 112 | ZL54 | GM3YOR/P | 563 |
| | G4GPO | 716 | 90 | AM67 | GM3WOJ/P | 492 |
| 35 | G3NPF | 711 | 98 | ZK08 | GM3YOR/P | 621 |
| | G4EYD | 711 | 107 | YM50 | GM3YOR/P | 433 |
| | G4FOX | 711 | 105 | ZM26 | GM3YOR/P | 427 |
| 38 | G3TAL | 709 | 71 | ZO56 | G4DWB/P | 558 |
| 39 | G3AMW | 700 | 81 | ZN18 | G4DWB/P | 513 |
| 40 | G3DCZ | 690 | 96 | ZN71 | GU4ASO/P | 406 |
| 41 | G3ZVW | 681 | 95 | ZL42 | GM4HPO/P | 571 |
| 42 | G4ARN | 677 | 80 | AM05 | GI4GDV/P | 487 |
| | G4GJM | 677 | 107 | ZM79 | GM3YOR/P | 492 |
| 44 | G5RP | 670 | 102 | ZL33 | GM3YOR/P | 492 |
| 45 | G4FUU | 656 | 102 | AL51 | GM3YOR/P | 587 |
| 46 | G3ZTZ | 640 | 100 | ZL15 | GM3YOR/P | 510 |
| 47 | G4DII | 630 | 96 | ZK06 | GM3WOJ/P | 490 |
| 48 | G4ENA | 616 | 97 | ZL18 | GM3YOR/P | 515 |
| 49 | G4FEV | 609 | 100 | ZM68 | GM3YOR/P | 477 |
| 50 | G3MLS | 608 | 88 | ZK10 | GM3WOJ/P | 530 |
| 51 | G3KPU | 605 | 81 | ZN44 | GU4ASO/P | 440 |
| 52 | G3UKV | 595 | 80 | YM28 | GM4HPO/P | 420 |
| 53 | G3ZKE | 594 | 97 | ZL26 | GM3YOR/P | 535 |
| 54 | G4EKW | 586 | 88 | ZM04 | GM3YOR/P | 410 |
| 55 | G4GNX | 577 | 85 | ZK10 | GM3WOJ/P | 513 |
| 56 | G3WUW | 549 | 81 | ZL53 | GM3WIL/P | 436 |
| 57 | G3ZKN | 530 | 82 | YL20 | GI4GDV/P | 385 |
| 58 | G3PSP | 508 | 90 | ZL29 | GM4CXP/P | 470 |
| 59 | G3TWG | 505 | 89 | ZL37 | GM4CXP/P | 490 |
| 60 | G3LHJ | 497 | 53 | YK33 | GM3WOJ/P | 464 |
| 61 | G4CAX | 429 | 61 | ZN65 | G4DWB/P | 380 |
| 62 | G4FKI | 428 | 79 | AL21 | GM3WOJ/P | 465 |
| 63 | GM4HPO | 423 | 33 | YQ36 | G3WIE/P | 662 |
| 64 | G4HCD | 415 | 61 | ZN65 | GM3YOR/P | 356 |
| 65 | G3WMR | 413 | 65 | AL52 | GM3WOJ/P | 475 |
| 66 | G3WQK | 405 | 60 | AK03 | G3JYP/P | 460 |
| 67 | G4BWH | 403 | 66 | AL73 | G3JYP/P | 447 |
| 68 | G5MW | 395 | 58 | AL43 | G3JYP/P | 392 |
| 69 | G4AFN | 356 | 62 | ZM77 | G4DWB/P | 390 |
| 70 | G4GDG | 152 | 38 | AL22 | G3UUT/P | 310 |
| 71 | G4GOA | 136 | 26 | YM79 | G3UUT/P | 285 |
| 72 | G4FKK | 66 | 20 | ZL60 | GW3SNN/P | 286 |
| 73 | GI4FME | 30 | 4 | WO80 | G4AWB/P | 400 |
| **70MHz Listeners** | | | | | | |
| 1 | BS15822 | 62 | 18 | ZL40 | GW4CBW/P | 265 |
| 2 | BRS34310 | 28 | 14 | ZL80 | G4FEV/P | 120 |

Check logs received from G3FME and G4ERX. *G5HD*

## 144MHz BAND RESULTS

| Posn | Callsign | Points | QSOs | QRA | Best dx | Km |
|---|---|---|---|---|---|---|
| 1 | G3PMH | 7,730 | 645 | AM51 | F1IYD/P | 874 |
| 2 | GW8BHH | 7,670 | 708 | YM44 | EA1CR/P | 1,034 |
| 3 | G3VCP | 7,580 | 619 | AL45 | F1IYD/P | 757 |
| 4 | GW6UQ | 6,817 | 641 | YN75 | DL0EE/P | 946 |
| 5 | G6HH | 6,190 | 589 | AK03 | F1IU/P | 875 |
| 6 | G4BPO | 6,180 | 589 | AM67 | DF6NA | 665 |
| 7 | GW3WAS | 5,554 | 564 | YM14 | EA1CR/P | 1,060 |
| 8 | G3LRS | 5,541 | 529 | ZM26 | F1NTY | 913 |
| 9 | G8DJW | 4,986 | 461 | YK28 | F1KKH/P | 870 |
| 10 | GW8CSA | 4,811 | 501 | YL15 | EA1NC | 923 |
| 11 | G3KMI | 4,650 | 510 | ZK24 | GM8FFX | 710 |
| 12 | G4ERO | 4,510 | 451 | YK19 | EA1CR/P | 887 |
| 13 | GW4ERP | 4,276 | 508 | YN75 | DJ0JW/A | 719 |
| 14 | G4CQR | 4,177 | 510 | ZN71 | EA1CR/P | 1,115 |
| 15 | GW3OXD | 4,152 | 493 | YM54 | DJ0JW/A | 680 |
| 16 | G4EBU | 4,132 | 398 | YL75 | EA1CR/P | 896 |
| 17 | G3PIA | 4,080 | 488 | ZL33 | DL2AQD | 682 |
| 18 | G4DZO | 4,076 | 388 | AK11 | F1IU/P | 890 |
| 19 | G4FAM | 4,070 | 401 | AL65 | F1DYD/P | 731 |
| 20 | G3WKS | 4,045 | 396 | AL73 | DB2RR | 396 |
| 21 | G3SED | 3,960 | 441 | ZK06 | F1DYD/P | 805 |
| 22 | GM4IGS | 3,891 | 326 | XO26 | F1DUZ | 887 |
| 23 | G3PRC | 3,642 | 371 | YK21 | DJ4AX | 781 |
| 24 | G8AUN | 3,638 | 332 | AM06 | DL0VW | 625 |
| 25 | G8MNX | 3,612 | 387 | ZM68 | F1DYD/P | 882 |
| 26 | G5BK | 3,515 | 460 | YL20 | F1DYD/P | 885 |
| 27 | G4EUZ | 3,500 | 343 | ZO22 | ON8IC | 680 |
| 28 | G3ULT | 3,347 | 454 | ZL54 | F1BYM | 740 |
| 29 | G3ZMS | 3,307 | 336 | ZK10 | F1DYD/P | 738 |
| 30 | GT3FLH | 3,277 | 340 | XO67 | PA0CKV/P | 685 |
| 31 | GW4GMO | 3,129 | 332 | YL05 | EA1NC | 950 |
| 32 | G4HRS | 3,121 | 423 | ZK08 | F9LT | 707 |
| 33 | G3EFX | 3,060 | 387 | ZK10 | GI4GTY/P | 577 |
| 34 | G3WOI | 3,043 | 357 | ZL53 | F1KFH/P | 625 |
| 35 | GI4GTY | 3,006 | 203 | WO40 | F1AAM | 1,115 |
| 36 | GU3HFN | 2,980 | 288 | YJ48 | PA0NYM/P | 640 |
| 37 | G4APA | 2,952 | 384 | ZL15 | DK0BN/P | 653 |
| 38 | G3JFO | 2,906 | 316 | ZO55 | F6APE | 755 |
| 39 | G3SRT | 2,864 | 428 | YM48 | F1KBE | 860 |
| 40 | GI4BAC | 2,817 | 206 | WO80 | F1FJM | 900 |
| 41 | G2SU | 2,786 | 329 | ZN11 | F1KNZ | 575 |
| 42 | G4CRC | 2,738 | 216 | XK63 | F1DRT | 594 |
| 43 | G3XBF | 2,649 | 363 | AL21 | F6FHP/P | 755 |
| 44 | G3VGO | 2,623 | 237 | XK28 | PA0CKV | 670 |
| 45 | G3FDW | 2,617 | 260 | YO29 | F1FIS | 716 |
| 46 | G8DYA | 2,564 | 263 | AM05 | F1COF | 627 |
| 47 | G4HYD | 2,530 | 343 | ZN18 | G4CRC/P | 525 |
| 48 | G3WOR | 2,408 | 401 | ZK09 | GM3KJF | 816 |
| 49 | G6CW | 2,319 | 310 | ZM04 | — | — |
| 50 | G5GX | 2,317 | 267 | ZO78 | F1DRT | 800 |
| 51 | G3SFG | 2,299 | 342 | ZL42 | GM8FFX | 621 |
| 52 | GW8KBW | 2,241 | 208 | XM17 | F1DLZ | 790 |
| 53 | G3WSC | 2,204 | 303 | ZK07 | F6DKQ/P | 857 |
| 54 | GM3KJF | 2,177 | 189 | XO10 | F1ENH/P | — |
| 55 | G4ERG | 2,131 | 238 | ZO65 | F6APE | 753 |
| 56 | G8OHM | 2,118 | 335 | YM50 | DJ0JW/A | 632 |
| 57 | G4DDY | 2,111 | 343 | AL51 | DK0BN/P | 555 |
| 58 | G3NJA | 2,072 | 230 | YK33 | DJ0JW/A | 736 |
| | G3ZTT | 2,072 | 334 | YN67 | F6APE | 660 |
| 60 | G8OCT | 1,860 | 296 | ZM73 | PA0NYM/P | 520 |
| 61 | G3WKX | 1,738 | 287 | ZL39 | F1KBF | 570 |
| 62 | G8MWA | 1,647 | 229 | AL43 | GM8FFX | 656 |
| 63 | G6GS | 1,590 | 304 | ZL69 | GM4AAF | 610 |
| 64 | G4FPN | 1,582 | 264 | ZM42 | F1FHI | 540 |
| 65 | G4AAX | 1,572 | 172 | ZP62 | PA0WRC/P | 705 |
| 66 | G3FJE | 1,535 | 234 | ZM79 | F1DRT | 550 |
| 67 | G3UER | 1,484 | 232 | ZN44 | PA0NYM/P | 515 |
| 68 | G4DDC | 1,448 | 249 | ZL18 | DJ4AX/P | 529 |
| 69 | GM4GRC | 1,423 | 130 | YQ64 | DK9HE/P | 870 |
| 70 | GM8IIO | 1,377 | 144 | YP18 | G3CHN | 600 |
| 71 | G3EEO | 1,306 | 193 | ZN71 | PE1CZQ | 568 |
| 72 | G3ZME | 1,293 | 202 | YM28 | F6APE | 595 |
| 73 | G3IRM | 1,241 | 144 | AM54 | DJ4AX | 455 |
| 74 | G4BVY | 1,230 | 255 | YM79 | F6APE | 522 |
| 75 | GW4ARC | 1,186 | 160 | YM04 | F6CRP/P | 725 |
| 76 | G4GXP | 1,175 | 189 | YM47 | EA1CR/P | 1,029 |
| 77 | G3GHN | 1,145 | 197 | AL52 | DJ4AX/P | 500 |
| 78 | G3IXH | 1,103 | 211 | ZN78 | F6APE | 632 |
| 79 | G3AFT | 1,095 | 213 | ZL26 | DJ4AX/P | 562 |
| 80 | G3XEP | 1,072 | 192 | ZN22 | PA0CKV/P | 496 |
| 81 | G8MKX | 1,069 | 129 | AL14 | DK0BN | 533 |
| 82 | G4FUR | 1,054 | 196 | ZL60 | GI4GVS | 543 |
| 83 | G8PRH | 1,013 | 160 | YN38 | ON7DV | 512 |
| 84 | G3KUE | 971 | 126 | YN18 | GJ4ICD/P | 458 |
| 85 | G3GQC | 939 | 157 | ZN65 | — | — |
| 86 | G3FVA | 889 | 151 | YN60 | F1ENH/P | 415 |
| 87 | G3ASR | 884 | 174 | ZL29 | GI4BAC/P | 559 |
| 88 | GM4AAF | 831 | 79 | YQ36 | G3KMI/P | 662 |
| 89 | G8MKC | 808 | 144 | ZM77 | DJ4AX/P | 535 |
| 90 | G8HRC | 766 | 144 | AL22 | F6GEU/P | 491 |
| 91 | G4GKH | 738 | 168 | AL33 | DB4ET | 468 |
| 92 | G8KUM | 705 | 174 | ZL27 | GI4BAC/P | 450 |
| 93 | G4CDD | 559 | 108 | ZN32 | G4CUS | 330 |
| 94 | G3TCR | 310 | 92 | ZL55 | G4EUZ | 380 |
| **144MHz Listeners** | | | | | | |
| 1 | BRS32525 | 752 | 176 | AL41 | GI4GTY/P | 534 |
| 2 | BRS15822 | 676 | — | ZL40 | — | — |
| 3 | BRS34310 | 617 | 105 | ZL80 | F1KBF/P | 646 |
| 4 | BRS26003 | 530 | 64 | YO23 | G4CRC/P | 500 |

Check logs received from G3RWL, G4EYL, G8CDW, G8EFA, G8LUV, G8LVM, G8NQP and GT3AHD/P. *G8ACJ*

### 432MHz BAND RESULTS

| Posn | Callsign | Points | QSOs | QRA | Best dx | Km |
|---|---|---|---|---|---|---|
| 1 | G4CFI | 1,930 | 205 | AM67 | DK0OX | 633 |
| 2 | G4BRA | 1,881 | 209 | YN75 | F1ETW/P | 804 |
| 3 | G4BEL | 1,774 | 210 | AM51 | F6APE | 564 |
| 4 | GW8SRS | 1,738 | 205 | YN75 | F1DRT | 667 |
| 5 | G5HD | 1,672 | 142 | YK21 | F1BMB/P | 790 |
| 6 | G8LKP | 1,486 | 138 | YK28 | F1DPX/P | 896 |
| 7 | GW3UBX | 1,427 | 174 | YM44 | PA0NYM/P | 627 |
| 8 | G4GZO | 1,208 | 146 | AK11 | F6FHP | 673 |
| 9 | G3AKF | 1,176 | 161 | ZL54 | F6EAC/P | 936 |
| 10 | G3LCH | 1,152 | 161 | ZN71 | F1ETW | 765 |
| 11 | G8AYN | 1,136 | 142 | AL65 | G4BHC/P | 470 |
| 12 | GM4DIJ | 995 | 86 | XO26 | F1CRP/P | 775 |
| 13 | G3YTE | 984 | 158 | ZL15 | GM4SFG/P | 510 |
| 14 | G3TQF | 983 | 147 | ZM26 | F1CRP/P | 524 |
| 15 | G3VXM | 981 | 121 | ZK06 | F1ETW/P | 536 |
| 16 | GW3SNC | 959 | 123 | YM14 | PA0CKV/P | 560 |
| 17 | G8SFI | 945 | 109 | ZO55 | F1CRP/P | 690 |
| 18 | G4GBF | 934 | 92 | ZO22 | F1DBN/P | 508 |
| 19 | G3NNG | 917 | 142 | ZL33 | DL9GS | 600 |
| 20 | G4FUF | 904 | 130 | AL33 | GM4DIJ/P | 494 |
| 21 | G8FMG | 889 | 142 | ZM68 | F1CRP/P | 475 |
| 22 | G3VZG | 871 | 132 | YM48 | F1CRP/P | 514 |
| 23 | G4EMW | 868 | 110 | ZN11 | F1CRP/P | 630 |
| 24 | G8IDZ | 835 | 106 | ZK24 | PA0NYM/P | 518 |
| 25 | G4EKT | 832 | 98 | ZO78 | G4BHC/P | 600 |
| 26 | G3VPK | 812 | 104 | AL14 | GM4DIJ/P | 490 |
| 27 | G3ZPB | 807 | 137 | AL51 | GM4DIJ/P | 488 |
| 28 | G8ECN | 806 | 86 | AM06 | DF7UX/P | 525 |
| 29 | G3WZT | 799 | 118 | ZK08 | DF1EQ | 533 |
| 30 | G3OHM | 795 | 116 | YM50 | F6APE | 569 |
| 31 | G3GRO | 790 | 112 | ZK07 | PA0NYM/P | 464 |
| 32 | G4DSF | 771 | 97 | YL75 | F6CWO | 674 |
| 33 | G3SPJ | 770 | 69 | YO29 | F1CRP/P | 772 |
| 34 | G3TLM | 765 | 132 | ZL69 | DL9GS | 527 |
| 35 | G3XC | 716 | 73 | XK28 | GM3THI/P | 460 |
| 36 | G4GQR | 712 | 105 | ZK10 | G4GBF/P | 413 |
| 37 | G3OXG | 677 | 112 | ZM79 | F1CRP/P | 450 |
| 38 | G3HBR | 655 | 109 | ZK10 | G4GBF/P | 435 |
| 39 | G3EKW | 630 | 100 | ZM04 | F1CRP/P | 575 |
| 40 | G8CLY | 620 | 68 | ZO56 | F1CRP/P | 694 |
| 41 | G8FEJ | 587 | 81 | AK03 | DL9GS | 460 |
| 42 | G4AOC | 582 | 100 | ZK09 | G4GBF/P | 436 |
| 43 | G4BHC | 560 | 45 | XK63 | G3SPJ/P | 548 |
| 44 | G4BZD | 548 | 80 | ZN44 | F1CRP/P | 618 |
| 45 | G4ASR | 540 | 92 | ZL42 | PA0NYM/P | 520 |
| 46 | G8GBY | 516 | 78 | ZN18 | F1CRP/P | 654 |
| 47 | GW4HIF | 487 | 51 | XM17 | F1CRP/P | 589 |
| 48 | G4FRS | 486 | 95 | ZL66 | PA0NYM/P | 520 |
| 49 | GI8JPG | 477 | 41 | WO40 | G4BEL/P | 485 |
| 50 | G4DLB | 475 | 89 | ZM73 | F1CRP/P | 448 |
| 51 | G8LUA | 474 | 63 | AM05 | G5HD/P | 411 |
| 52 | G4BWG | 473 | 61 | AL45 | GT8EXI | 485 |
| 53 | GW8FTG | 471 | 71 | YL15 | F6APE | 499 |
| 54 | G8KGC | 444 | 78 | ZN71 | PE0MAR/P | 448 |
| 55 | G8JTJ | 429 | 51 | YK33 | F6EAS | 548 |
| 56 | G8KPZ | 427 | 77 | AL73 | G8SFI/P | 386 |
| 57 | G3LVW | 416 | 86 | ZL37 | PA0NYM/P | 450 |
| 58 | GW8HZK | 403 | 64 | YL05 | ON7DV/A | 428 |
| 59 | G8PWY | 401 | 69 | YN67 | G8AYN/P | 346 |
| 60 | G4HYG | 383 | 53 | YN38 | G8AYN/P | 361 |
| 61 | G8GPK | 369 | 72 | AL21 | GM4DIJ/P | 465 |
| 62 | G8JAY | 367 | 69 | YL20 | F1CRP/P | 435 |
| 63 | GM3THI | 361 | 33 | XO10 | F1CRP/P | 825 |
| 64 | G8RZX | 337 | 63 | ZM42 | ON7DV/A | 320 |
| 65 | G8BIS | 336 | 78 | AL43 | G5HD/P | 320 |
| 66 | G4HRC | 335 | 63 | AL22 | F1CRP/P | 428 |
| 67 | G3MCD | 319 | 87 | ZL26 | F1BEG/P | 390 |
| 68 | G4EKE | 306 | 46 | YK19 | F6APE | 407 |
| 69 | GW8ACG | 283 | 46 | YM04 | G8KPZ/Z | 283 |
| 70 | G8SIV | 268 | 40 | YN18 | G8LKP/P | 325 |
| 71 | G8JYN | 257 | 51 | ZL55 | G8SFI/P | 340 |
| 72 | G8INP | 246 | 62 | ZL27 | PA0NYM/P | 449 |
| 73 | GM4IFG | 245 | 27 | YO64 | G3YTE/P | 495 |
| 74 | G3UHF | 244 | 50 | YN60 | EI9D | 320 |
| 75 | G2CPM | 223 | 48 | ZL53 | F1CRP/P | 375 |
| 76 | G4AAH | 218 | 42 | ZN65 | F1CRP/P | 560 |
| 77 | G3WMR | 191 | 50 | AL52 | G3XC/P | 350 |
| 78 | G4FIT | 190 | 60 | ZL60 | GW4BRA | 286 |
| 79 | G4EIX | 170 | 32 | YM28 | ON7DV/A | 455 |
| 80 | GM8BDX | 153 | 17 | YP18 | GW3UBX/P | 500 |
| 81 | G3BLE | 100 | 18 | ZN62 | G4CFI/P | 385 |
| 82 | G3SDY | 89 | 27 | ZN32 | GM4DIJ/P | 240 |
| 83 | G3IXH | 15 | 5 | ZN78 | G3VZG/P | 149 |
| 84 | G8LVQ | 14 | 12 | ZN22 | G8FEK/P | 75 |
| 85 | GM3ZXE | 10 | 4 | YO36 | GM8MNG/P | 101 |
| 86 | G8EPR | 4 | 4 | YM47 | G4HDQ | 45 |
| | G8FEK | 4 | 2 | ZO65 | G8LVQ/P | 70 |
| 88 | G8ORA | 3 | 3 | ZM77 | G8HWJ | 40 |
| 89 | G3IRM | 2 | 2 | AM54 | G4BEL/P | 40 |

Check log acknowledged from G4DGU.

**432MHz Listeners**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | BRS32525 | 221 | 59 | AL41 | GI8JPG/P | 534 |
| 2 | BRS34310 | 121 | 33 | ZL80 | G8CLY/P | 360 |

*G2HIF*

### 1·3GHz BAND RESULTS

| Posn | Callsign | Points | QRA | Best dx | Km |
|---|---|---|---|---|---|
| 1 | G3XDY | 14,821 | AM67 | DK1VCA | 436 |
| 2 | GW4BRK | 11,828 | YN65 | PA0EZ | 569 |
| 3 | G3DY | 8,936 | AM51 | GM4BYF/P | 416 |
| 4 | GW3ONP | 7,749 | YM44 | G3XDY/P | 305 |
| 5 | G3UQH | 6,055 | YM48 | G3XDY/P | 261 |
| 6 | G4GZI | 5,917 | YM50 | G3GNR | 230 |
| 7 | G4HWA | 5,392 | ZL15 | PA0EZ | 430 |
| 8 | G8LM | 5,260 | ZM26 | GM4BYF/P | 349 |
| 9 | GW4HGI | 5,250 | YN75 | G3RCV/P | 344 |
| 10 | G8HVY | 4,764 | YK28 | PE0MAR/P | 492 |
| 11 | G4CUE | 4,681 | AL14 | PA0EZ | 310 |
| 12 | G8PUB | 4,625 | AL33 | PA0EZ | 332 |
| 13 | G4CXJ | 4,380 | ZL33 | PA0EZ | 467 |
| 14 | G3JKF | 4,329 | ZK07 | PA0EZ | 428 |
| 15 | G4CMU | 4,090 | ZN71 | PE0MAR/P | 425 |
| 16 | G3TQA | 4,084 | ZN11 | PE0MAR/P | 449 |
| 17 | G3YKI | 3,971 | AK11 | PA0EZ | 340 |
| 18 | G3SPJ | 3,819 | YO29 | G3TDG | 418 |
| 19 | G3VCT | 3,316 | ZL37 | ON7DV/A | 295 |
| 20 | G3IW | 3,111 | ZK24 | G4FXW | 296 |
| 21 | GM4BYF | 2,866 | XO26 | G3DY/P | 416 |
| 22 | G3RCV | 2,797 | AL65 | GW4HGI/P | 344 |
| 23 | G8FIS | 2,638 | ZO55 | PE0MAR/P | 423 |
| 24 | G3ZBP | 2,415 | ZK06 | PA0EZ | 436 |
| 25 | G4BZD | 2,326 | ZN44 | GM4BYF/P | 326 |
| 26 | G3WDG | 2,304 | ZM66 | G8HVY/P | 203 |
| 27 | G8BIS | 2,253 | AL43 | GW4BRK/P | 305 |
| 28 | G4HRY | 2,206 | YL75 | G4CUE/P | 278 |
| 29 | G3SWC | 2,175 | ZK08 | GW4BRK/P | 299 |
| 30 | G4AEZ | 1,897 | ZL42 | G4BZD | 221 |
| 31 | G3WTP | 1,887 | ZM68 | PA0EZ | 364 |
| 32 | G3PQY | 1,815 | ZN18 | GW3ONP/P | 237 |
| 33 | G4CDJ | 1,738 | ZL54 | G3XDY/P | 197 |
| 34 | G4GTN | 1,652 | AL73 | GW4BRK/P | 328 |
| 35 | G4GTH | 1,506 | YK19 | G3XDY/P | 283 |
| 36 | G3HBW | 1,228 | ZK10 | PI1AME/P | 251 |
| 37 | G8TB | 1,203 | AL51 | G3DY/P | 116 |
| 38 | G4IJL | 1,171 | ZM04 | G3TDG | 202 |
| 39 | G3XWZ | 1,144 | ZN65 | G3SPJ/P | 193 |
| 40 | G3SHK | 1,091 | ZO56 | GW4BRK/P | 212 |
| 41 | G4DYC | 929 | AM05 | GW4HGI/P | 263 |
| 42 | G3RXJ | 597 | ZK10 | G3VCT/P | 91 |
| 43 | G3YIQ | 457 | ZK09 | G3VCT/P | 84 |
| 44 | G4ECF | 414 | ZL69 | G3RCV/P | 93 |
| 45 | G3TLI | 375 | ZO78 | G3SPJ/P | 155 |
| 46 | G3ZBI | 355 | ZN71 | GW4BRK/P | 89 |
| 47 | G8RCE | 352 | ZM42 | G4HWA/P | 85 |
| 48 | G4AHJ | 140 | ZN32 | G3SHK/P | 110 |
| 49 | GM3YDN | 106 | XO10 | GM4BYF/P | 45 |
| 50 | G3MCD | 66 | ZL26 | G3WBN | 63 |
| 51 | G4GRT | 47 | AM06 | G4BYV | 29 |
| 52 | G4GBF | 23 | ZO22 | G3SPJ/P | 23 |

**1·3GHz Listener**

| | | | | | |
|---|---|---|---|---|---|
| 1 | BRS15822 | 67 | ZL40 | G3TDG | 33 |

*G3FZL*

## Looking ahead

**12–14 October**—World Association of Christian Radio Amateurs and Listeners Conference, Willersley Castle, Derbyshire. Details from: WACRAL Secretary, 13 Ferry Road, Warme, Hull HU7 5XU.
**13 October**—EI/GI Convention, Ballymascanlon Hotel, Dundalk, Eire.
**8–10 November**—Amateur Radio Retailers Association National Amateur Radio Exhibition, Granby Halls, Leicester.
**8 December**—RSGB AGM, IEE, Savoy Place, London.
**27 April 1980**—South East Raynet Symposium, Crawley, Sussex.
**9–10 May 1980**—RSGB National Amateur Radio Exhibition, Alexandra Palace, London.

# contest news

## Second 1·8MHz Contest 1979 rules

*Attention is drawn to rules 3 and 12(e) which contain important changes from previous contests.*

**1.** The general rules for RSGB hf contests, published in the January 1979 issue of *Radio Communication,* will apply.

**2. Eligible entrants.** Single-operator stations only. British Isles entrants must be members of the RSGB.

**3. When.** 2100gmt Saturday 10 November to 0100gmt Sunday 11 November.

**4. Sections**

**(a)** British Isles stations.

**(b)** Overseas stations including EI.

**5. Contacts.** CW (A1) only in the 1·8-2·0MHz band.

**6. Exchange.** RST and serial number commencing at 001. British Isles stations must send their appropriate county/region code, as published in the February issue of *Radio Communication.*

**7. Scoring**

**(a) British Isles section.** Three points for each completed QSO, with a bonus of five points for the first contact with each county/region or country outside the British Isles.

**(b) Overseas section.** Three points for each completed QSO with a British Isles station, with a bonus of five points for the first contact with each county/region.

**8. Logs.** RSGB hf contest log sheets, written on one side only; or A4 sheets with seven columns headed: date/time gmt, callsign, RST/serial number sent and received, code received, bonus and points.

**9. Declaration.** Each entry must be accompanied by the following declaration: "I declare that my station was operated strictly in accordance with the rules and spirit of the contest and I agree that the decision of the Council of the RSGB shall be final in all cases of dispute". The declaration must be signed and dated.

**10. Address for logs.** RSGB HF Contests Committee, c/o D. S. Booty, 139 Petersfield Avenue, Staines, Middx TW18 1DH, England.

**11. Closing date for logs.** Logs must be postmarked no later than 26 November 1979.

**12. Awards**

**(a)** The Victor Desmond Trophy will be awarded to the leading British Isles entry.

**(b)** The Maitland Trophy will be awarded to the Scottish station scoring the highest aggregate number of points in this contest combined with the First 1·8MHz Contest 1980.

**(c)** Certificates of merit will be sent to the first three stations in the Overseas section and to the leading station in each overseas country.

**(d)** Certificates of merit will also be sent to the first three stations in the British Isles section.

**(e)** A certificate of merit will be awarded to the highest placed entry from a station which has not entered a Second 1·8MHz Contest before. Candidates for this award should mark their logs "First time award".

## RSGB HF Contests Championship 1979–80 rules

**1.** RSGB hf contest general rules do not apply.

**2.** No entries for the championship are required.

**3.** The championship will be decided on the basis of RSGB hf single-operator contests held between 1 October 1979 and 31 July 1980.

**4.** Points will be awarded to the leading 10 UK stations in the results published in *Radio Communication,* as follows:

| Contest | Position | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 21/28MHz Telephony | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 15 | 10 | 5 |
| 7MHz CW | 70 | 60 | 50 | 40 | 30 | 25 | 20 | 15 | 10 | 5 |
| 7MHz Telephony | 70 | 60 | 50 | 40 | 30 | 25 | 20 | 15 | 10 | 5 |
| 2nd 1·8MHz | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | 0 |
| 1st 1·8MHz | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | 0 |
| Commonwealth | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 |
| Low Power | 30 | 25 | 20 | 15 | 10 | 5 | 0 | 0 | 0 | 0 |
| R Round-up CW | 60 | 50 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 |
| R Round-up Telephony | 60 | 50 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 |
| Summer 1·8MHz | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | 0 |

**5.** Points gained by stations using the same basic callsign (with or without suffixes) and entering two or more of the 10 individual contests will be totalled and a table published in *Radio Communication.*

**6. Club stations.** To be eligible for inclusion, a club station must be operated by the same single operator during each contest. In the event of a club station meriting an award, the award will be made to the operator concerned and not to the club.

**7. Awards.** The winner will receive the G2QT Trophy. A certificate will be awarded to the runner-up.

## 144MHz CW Contest rules

**0800–1600gmt 5 November 1979**

All entries and check logs to: VHF Contests Committee, c/o Mr G. M. C. Stone, G3FZL, 11 Liphook Crescent, Forest Hill, London SE23 3BN.

The following general rules, published in the January 1979 issue of *Radio Communication,* will apply: 1, 2, 3, 4a, 5a, 6b, 7a, 8, 9a, 10a, 11a, 12–22.

## HF NFD inspections

In addition to the stations marked as being inspected in this year's results, Cray Valley RS and Hartlepool and Easington ARCs were also inspected.

*G3KKQ*

## Commonwealth Contest 1979 results

**AWARD WINNERS**

Senior Rose Bowl..... L. Sawkins, VE7CC
Junior Rose Bowl..... R. Nash, VE3KZ
Col Thomas Rose Bowl..... A. J. Slater, G3FXB
Receiving Rose Bowl..... R. W. Thomas, BRS15822

**BAND LEADERS**

| | | | |
|---|---|---|---|
| 3·5MHz overseas | ZL2BCO | 21MHz home | G4AZN |
| 7MHz overseas | VE6APN | 21MHz overseas | VE7BS |
| 14MHz home | G3PVA | 28MHz home | GU3MBS |
| 14MHz overseas | VK3AYQ | 28MHz overseas | ZE3JO |

This year's Commonwealth Contest again produced a satisfactory entry, with the total number of logs received increased by eight per cent over 1978. Many comments reflected the unique nature of this contest, with, perhaps, G3DYY summing up the overwhelming view: "The friendly contest—that's what it should be called". Without doubt, it is one of the most demanding of events in terms of strategy and experience, but also requiring a high degree of efficiency in equipment and a comprehensive range of antennas.

Band conditions were generally good throughout the contest, although the lower frequency bands, and 7MHz in particular, were not as good as in 1978. Conditions on the day seem to have favoured western Canada and the Pacific area, as reflected in the number of those stations high in the table.

After two years in the runner-up position, Lee Sawkins, VE7CC, took top honours. The good trans-Pacific openings enabled him to build up a total of 207 bonus QSOs which put him in a commanding position ahead of Bob Nash, VE3KZ. Al Slater, G3FXB, continued his dominance of the UK side of the contest, notching up his seventh successive win of the Col Thomas Rose Bowl.

The Receiving Section continued to be a tussle between Ron Thomas, BRS15822, and Eric Trebilcock, BCRS195; with the Receiving Rose Bowl going to the former this year. This was Eric's 38th "BERU" and he must join the list of those eligible for long service awards!

The 14MHz band again attracted most single-band entries, with VK3AYO taking the lead position overseas, with 109 QSOs and 50 bonuses, using a TS820 and 18AVT vertical antenna. At home, on this band, G3PVA's FT401/quad combination produced 108 QSOs and 53 bonuses.

There was a considerable amount of comment on various aspects of the rules. The overall concept of the contest came in for discussion in a number of logs, with the suggestion that its format should be changed to the style of the Commonwealth versus the rest of the world. This would clearly be a major change and not one to be made lightly. It would put the Commonwealth Contest in a very similar position to many other contests, removing what, to many people, are the unique features of

"BERU". However, it would obviously also vastly increase the potential activity and the size of the entry. Somewhat related to this issue is the question of the system of bonus points. There is some feeling, notably in VK and ZL, that the present arrangement is very unfair to UK stations, and that the different G call areas should count separately, with the implication that G stations would be able to work one another. The scoring was changed some years ago to allow bonus points for the first three contacts with each call area. The main reason for this change was to try to even up the inequality between the UK and the rest of the world. It is open to debate just what weighting the various factors have on how close to the top of the table a particular station comes. Apart from the scoring system, the relative abilities of the operators involved, the phase of the sunspot cycle and the actual band conditions on the day, all play their part. In very recent years the top of the table has been dominated by western Canada and Oceania, but anyone who feels that this is an unchangeable situation should look at the results for 1975 when the leading G station was only 26 points behind the leader, and the top VE7/VK/ZL could only achieve seventh place.

The other area of the rules mentioned in logs is the actual duration of the contest, with a number of suggestions that it should revert to 48 hours, or that it should be 24 hours out of 36 or 48. About an equal number of entrants would like it to stay at 24 hours. The rules are reviewed each year, and the HF Contests Committee would be pleased to receive comments and suggestions at any time.

The committee has taken substantial steps in recent years to improve publicity for the Commonwealth Contest. Advance copies of the results and rules are sent to the major magazines, such as *QST* and *CQ*, and to the hf contest managers in VE, VK and ZL for publication in their local journals. These are sent out in late September, and they should receive adequate coverage well before the following year's event.

Next year sees the 50th anniversary of the first BERU contest, and the committee hopes that there will be bumper activity, and that many stations who took part in the first event in 1930 will be able to make an appearance.

### Comments

"Atmosphere much better than in other major contests—back next year"—*GM3PPE.*
"Thankful it is only 24 hours"—*G2HLU.*
"Beam put out of action by storm at 0400z"—*9H1CH.*
"Because of the bonus points system, I consider it impossible for a G station to win, and any VK or ZL (and possibly VE) that sets his mind to it can win this contest with very little effort"—*VK6HD.*
"You'll never change the BERU call, whatever you call the contest!"—*ZE3JO.*
"Why not Commonwealth versus the rest of the world some time?"—*VE7IQ.*
"37°C in my tin shack in the garden!"—*VK2BDU.*
"After my squeeze keyer went astray and the borrowed keyer's batteries had run down, yours truly relieved his feelings with a string of words he thought he had forgotten years ago!"—*ZB2CJ.*
"1977/78 entries were made under home call of ZL1AIZ. Will be in 5W1 until mid-1980. CU next year"—*5W1BZ.*
"Tend to interfere with ship's public address system, and some QRM from public asking questions"—*G4HMS (G3HZL—HMS Belfast).*
"9H1CH and 9J2BO should receive long service medals"—*G3JKY.*
"Twenty-third consecutive entry. Merely one of the hundreds that enable the leaders to do well"—*G2BLA.*
"A microprocessor was programmed to transmit standard messages and to increment the serial number of each QSO"—*VE1EP.*
"Congrats on another fine 'BERU'"—*VK2BPN.*
"First time in the contest. QRP 5W—but still had a lot of fun"—*VE5JQ.*

### How the leaders made their scores

| | QSOs/bonus | | | | | TX | RX | Antennas |
|---|---|---|---|---|---|---|---|---|
| | 3·5 | 7 | 14 | 21 | 28 | | | |
| VE7CC | 31/23 | 106/42 | 144/54 | 158/45 | 78/43 | TS820 +L4B | TS820 | 80: delta loop<br>40: 2-el beam<br>HF: tribander<br>10: 4-el mono |
| VE3KZ | 34/12 | 94/38 | 196/51 | 149/26 | 114/24 | 32S1 +30L1 | 75S1 | 80: slopers<br>40: 2-el beam<br>HF: 5-el beams |
| VE5RG | 18/15 | 98/42 | 197/47 | 131/40 | 62/41 | FL101 +SB220 | FR101 | 80: dipple<br>40: 2-el beam<br>20: 5-el KLM<br>15/10: CL36 |
| G3FXB | 11/8 | 66/40 | 121/59 | 86/48 | 66/35 | T4XC | R4C | 80: dipole<br>40: 4-el beam<br>HF: quad |
| G3MXJ | 15/9 | 51/30 | 114/54 | 96/53 | 65/32 | SB401 | SB301 | 80: slopers<br>40: slopers<br>HF: TH6DXX |

### TRANSMITTING SECTION

| Posn | Callsign | Points |
|---|---|---|
| 1 | VE7CC | 6,613 |
| 2 | VE3KZ | 5,796 |
| 3 | VE5RG | 5,646 |
| 4 | VE3BVD | 5,527 |
| 5 | G3FXB | 5,516 |
| 6 | G3MXJ | 5,251 |
| 7 | VE7CMK | 5,078 |
| 8 | VE6KW | 4,888 |
| 9 | VE5RA | 4,840 |
| 10 | 5W1BZ | 4,736 |
| 11 | ZL2BR | 4,519 |
| 12 | VK2BPN | 4,400 |
| 13 | VE2WA | 4,205 |
| 14 | VK4XA | 4,093 |
| 15 | 9J2BO | 4,080 |
| 16 | G4CNY | 3,926 |
| 17 | 9H1CH | 3,910 |
| 18 | G5RI | 3,873 |
| 19 | VK3MR | 3,786 |
| 20 | G3DYY | 3,741 |
| 21 | G2QT | 3,708 |
| 22 | G6CJ | 3,688 |
| 23 | VK2AFG | 3,635 |
| 24 | VE1AIH | 3,543 |
| 25 | VK5MD | 3,405 |
| 26 | G4BWP | 3,320 |
| 27 | VK4KX | 3,160 |
| 28 | VK2GW | 3,090 |
| 29 | VK7BC | 2,900 |
| | ZL1HV | 2,900 |
| 31 | ZL2TX | 2,860 |
| 32 | VE1EP | 2,765 |
| 33 | G4DUW | 2,735 |
| 34 | G3NOM | 2,725 |
| 35 | G4HMS | 2,635 |
| 36 | GM3OXC | 2,490 |
| 37 | G2HLU | 2,480 |
| 38 | VK3ZC | 2,348 |
| 39 | G3TMA | 2,330 |
| 40 | VK7RO | 2,320 |
| 41 | G3ESF | 2,186 |
| 42 | G3GC | 2,140 |
| 43 | G3VDL | 2,060 |
| 44 | VK3AEW | 2,059 |
| 45 | G5MY | 2,033 |
| 46 | G2DU | 2,030 |
| 47 | G3KSH | 2,020 |
| 48 | VK7RY | 1,955 |
| 49 | VE3XJ | 1,889 |
| 50 | G3AGF | 1,875 |
| 51 | VK3XB | 1,850 |
| 52 | VK3CM | 1,813 |
| 53 | G3JKY | 1,810 |
| 54 | ZB2CJ | 1,795 |
| 55 | VE6LB | 1,755 |
| 56 | VP1KG | 1,695 |
| 57 | VK6RU | 1,685 |
| 58 | VO1HP | 1,665 |
| 59 | G3VW | 1,553 |
| 60 | †VK3AYO | 1,545 |
| 61 | G3SJJ | 1,535 |
| 62 | ††VE7BS | 1,524 |
| 63 | †G3PVA | 1,513 |
| 64 | GW2DPD | 1,466 |
| 65 | G4FHF | 1,445 |
| 66 | †VK5SW | 1,425 |
| 67 | P29EJ | 1,385 |
| 68 | VO1KO | 1,365 |
| 69 | G3HRY | 1,305 |
| 70 | G8QZ | 1,295 |
| | VU2GO | 1,295 |
| 72 | VK7CH | 1,280 |
| 73 | VS6EJ | 1,250 |
| 74 | VK3YK | 1,218 |
| 75 | †GW3MPB | 1,215 |
| 76 | G2AJB | 1,205 |
| 77 | VK7JB | 1,175 |
| 78 | G3XTT | 1,135 |
| 79 | VK8GG | 1,095 |
| 80 | VK4LV | 1,090 |
| 81 | †GM3PPE | 1,070 |
| 82 | †G5ND | 1,063 |
| 83 | †9V1TL | 1,023 |
| 84 | †††ZE3JO | 1,013 |
| 85 | VK4UR | 1,008 |
| 86 | VK3RJ | 1,005 |
| 87 | VE5JQ | 1,003 |
| 88 | GM3WRN | 996 |
| 89 | *ZL2BCO | 995 |
| 90 | G3ZDW | 978 |
| 91 | VK2BDU | 948 |
| | VK3CG | 948 |
| 93 | ††G4AZN | 915 |
| 94 | †G3ICH | 873 |
| 95 | G6NK | 866 |
| 96 | †††GU3MBS | 805 |
| 97 | VK5KL | 780 |
| 98 | VK5RG | 770 |
| 99 | VE4MF | 758 |
| 100 | **VE6APN | 754 |
| 101 | †††VK8DB | 740 |
| 102 | *ZL1AZE | 730 |
| 103 | AX61E | 655 |
| 104 | †††G6RC | 645 |
| 105 | †VK3YL | 620 |
| 106 | VK8SU | 610 |
| 107 | VE2CBG | 606 |
| 108 | †VK3BDH | 565 |
| 109 | VE2QS | 558 |
| 110 | VK5FG | 555 |
| 111 | G3AWR | 510 |
| | †VE7IQ | 510 |
| 113 | †††VK4XJ | 505 |
| 114 | VK2GT | 490 |
| 115 | ††G2BJY | 461 |
| 116 | ††ZL2MM | 423 |
| 117 | VE6CGY | 405 |
| 118 | †VK5DL | 400 |
| 119 | VK7ZO | 358 |
| 120 | †††GW3SB | 331 |
| 121 | VK3CT | 275 |
| 122 | VK5HO | 200 |
| 123 | †††VE1BNN | 110 |
| 124 | ††G2BLA | 75 |
| | ††VK3ABA | 75 |
| 126 | †††VE2WW | 55 |

*3·5MHz single band
**7MHz single band

### RECEIVING SECTION

| Posn | Callsign | Points |
|---|---|---|
| 1 | BRS15822 | 2,950 |
| 2 | BCRS195 | 2,830 |
| 3 | BRS34310 | 1,005 |

†14MHz single band
††21MHz single band
†††28MHz single band

Check logs from G3SYL, GW3HCL, GW3JI, VE3DVB, VE3EK, VK6HD and ZL1BLJ are acknowledged with thanks.

## DF Qualifying Event Coventry results

Sixteen teams assembled at the start of this event at Chesterton, approximately seven miles SE of Warwick. Although both signals were heard at the start many competitors experienced Radio 3 breakthrough when trying to sense the direction of transmitter "B".

Transmitter "A", G2ASF/P, was located in Lighthorne Rough, approximately three miles SW of the start. The bearing conveniently passed through a nearby disused railway line, which enticed some competitors to "beat-it-up" before the second signal at 2pm. However, as far as the organizers know, no one actually stayed until that time.

Station "B", G4CFG/P, was hidden in Swalcliffe Common, approximately 14 miles S of the start. This bearing passed through Edge Hill,

the site of one of last year's stations, and it was hoped that competitors might be lured to this site again for the 2pm signal. Competitors had a three-quarter-mile trek along a footpath before reaching the transmitter site, and those going for this station first had to run the three-quarters of a mile back to their cars.

Paul Tyler won the Rugby Radio Club Cup, and Derek Newman won the Rugby Radio Club Shield.

| Posn | Name | Club | Time of arrival Station "A" | Station "B" |
|---|---|---|---|---|
| 1 | P. T. Tyler | Mid-Thames | 1417 | 1504½ |
| 2 | C. D. Plummer | Coventry | 1505 | 1429½ |
| 3 | M. P. Hawkins | Chelmsford | 1434 | 1514 |
| 4 | R. J. Parsons | Burton | 1434½ | 1516 |
| 5 | D. Holland | South Manchester | 1440 | 1518 |
| 6 | J. R. Vickers | Slade | 1520 | 1443½ |
| | P. J. Yeates | Salisbury | 1440½ | 1520 |
| 8 | A. Simmons | Mid-Thames | 1522½ | 1429 |
| 9 | P. M. Lisle | Mid-Thames | 1533 | 1450 |
| 10 | T. C. Gage | Mid-Thames | 1456 | 1553 |
| 11 | B. M. Bristow | Mid-Thames | 1439 | 1556 |
| 12 | C. Merry | Dartford Heath | 1443 | 1557 |
| 13 | P. Woollett | Dartford Heath | 1441 | 1604 |
| 14 | D. Witts | Dartford Heath | 1441½ | 1610 |
| 15 | D. Newman | Rugby | 1617 | 1435 |
| 16 | R. Goodearl | Mid-Thames | 1617½ | 1447 |

P. Tyler and R. Parsons qualify for the National Final.

## DF Qualifying Event Salisbury results

Twenty-three teams assembled at the start on Odstock Down, three miles south of Salisbury. The weather was perfect for the annual ramble over the beautiful chalk downs of southern Wiltshire!

Most competitors, attracted by the strong signals from transmitter "A", G2FIX/P, headed off along the obvious track—by far the worst! The 144MHz control station, set high up in a prominent place near the Mizmaze, seemed to worry several teams. In contrast, G3FKF/P, transmitter "B", was 15 miles to the west, hidden on the slopes of thick coniferous woodland. Screening on two sides caused some odd radiation patterns!

The contest was won by Arthur Butcher from Chelmsford, who registered his first success in a qualifying event after eight years of strenuous effort. His win was achieved without the benefit of a supporting team.

| Posn | Name | Club | Time of arrival Station "A" | Station "B" |
|---|---|---|---|---|
| 1 | A. Butcher | Chelmsford | 1429½ | 1550½ |
| 2 | B. Bristow | Mid-Thames | 1552 | 1442 |
| 3 | P. Tyler | Mid-Thames | 1429 | 1553½ |
| 4 | P. Woollett | Dartford Heath | 1444 | 1602 |
| 5 | P. Lisle | Mid-Thames | 1604½ | 1500 |
| 6 | D. Newman | Slade | 1449 | 1607 |
| 7 | I. Butson | Chelmsford | 1430 | 1607½ |
| 8 | C. Plummer | Mid-Thames | 1444½ | 1613½ |
| 9 | T. Gage | Mid-Thames | 1438 | 1614 |
| 10 | W. North | Mid-Thames | 1614½ | 1501 |
| 11 | C. Wells | Mid-Thames | 1614½ | 1512½ |
| 12 | G. Whenham | Coventry | 1616½ | 1501½ |
| 13 | E. Mollart | Mid-Thames | 1417 | 1620 |
| 14 | C. Merry | Dartford Heath | 1620½ | 1459 |
| 15 | A. Lisle | Mid-Thames | 1456 | 1630 |
| 16 | J. Everist | Dartford Heath | 1422 | — |
| 17 | G. Taylor | Ariel Radio Gp | 1454 | — |
| 18 | R. Goodearl | Mid-Thames | 1455 | — |
| 19 | P. Yeates | Salisbury | 1457 | — |
| 20 | A. Simmons | Mid-Thames | — | 1512 |
| 21 | M. Easterbrook | Dartford Heath | 1520 | — |
| 22 | P. Homer | Dartford Heath | 1521 | — |
| 23 | A. Horton | Mid-Thames | 1552½ | — |

A. Butcher and P. Woollett qualify for the National Final.

## DF Qualifying Event Mid-Thames results

The Mid-Thames event this year ventured into the previously unchartered territory of the Dorking, Reigate and Crawley OS map, the start being at Bletchingley, near Redhill.

Although both stations were audible at the start, strong interference caused some competitors difficulty in obtaining a bearing on the "A" transmitter, and thus most competitors chose to approach the "B" transmitter first. This station, G5CRN/P, was situated in dense undergrowth at the top of a steep hillside mid-way between Leatherhead and Dorking, with a ¼-mile antenna running down the hillside before being suspended in trees overhanging the river Mole. Several teams succeeded in finding the wrong end of the antenna, not a pleasant task without Wellington boots! Transmitter "A", G3MDC/P, was situated in a large forestry area near Holmbury St Mary, SW of Dorking, and was equipped with another long and confusing antenna.

This did not prevent Brian Bristow from storming in to win the event in a very quick time, obviously fully recovered from literally somersaulting in to the "B" station in spectacular style!

| Posn | Name | Club | Time of arrival Station "A" | Station "B" |
|---|---|---|---|---|
| 1 | B. Bristow | Mid-Thames | 1524 | 1423 |
| 2 | M. Hawkins | Chelmsford | 1527 | 1426 |
| 3 | W. North | Mid-Thames | 1449 | 1539 |
| 4 | T. Gage | Mid-Thames | 1554 | 1453 |
| 5 | I. Butson | Chelmsford | 1555 | 1422 |
| 6 | C. Plummer | Mid-Thames | 1556 | 1510 |
| 7 | M. Easterbrook | Dartford Heath | 1557 | 1447 |
| 8 | C. Wells | Mid-Thames | 1528 | 1608 |
| 9 | C. Merry | Dartford Heath | 1622 | 1509 |
| 10 | J. Everist | Dartford Heath | 1623 | 1456 |
| 11 | E. Mollart | Mid-Thames | 1522 | 1625 |
| 12 | P. Tyler | Mid-Thames | 1532 | 1630 |
| | A. Lisle | Mid-Thames | 1630 | 1530 |
| 14 | P. Woollett | Dartford Heath | — | 1454 |
| 15 | P. Homer | Dartford Heath | — | 1512 |
| 16 | A. Horton | Mid-Thames | — | 1516 |
| 17 | D. Newman | Slade | — | 1517 |
| 18 | G. Whenham | Coventry | — | 1532 |
| 19 | W. Blanchard | — | — | 1558 |
| 20 | G. Foster | Mid-Thames | 1602 | — |
| | P. Sharman | Dartford Heath | 1602 | — |
| 22 | R. Goodearl | Mid-Thames | — | 1621 |

M. Easterbrook and C. Wells qualify for the National Final.

## YLs-run Colchester df

Two yls, who have previously taken part in df as a ladies team, organized a local df event on 18 May 1979. The event was run for the Colchester Radio Amateurs by Pat Hawkins, G8RWB, and Pat Butson, G4HKB. The girls found the site and set up the hidden station entirely on their own, and managed to keep contestants on the run (including their oms) for an hour before the first teams arrived. An encouraging total of nine teams took part in the event.

The results were: 1, G4HKC; 2, G8NDU; 3, G3WMM; 4, G8PUI; 5, G4YK; 6, G4CUE, and 7, G3PFP. G8PXT and G3XGS got close, but apparently found more interesting sites!

After the event a post-mortem was held in a nearby hostelry, appropriately called "The Compasses".

The yls claim to be the first women's df team and hidden station—unless of course you know better . . .

*G4HKB*

# Contests calendar

| | |
|---|---|
| **October 1979–January 1980** | 432MHz Cumulative *(Rules in September issue)* |
| **13–14 October** | VK/ZL Oceania DX CW *(Rules in August issue)* |
| **14 October** | 21/28MHz *(Rules in May issue)* |
| **21 October** | 70MHz Fixed *(Rules in September issue)* |
| **21 October** | 21MHz CW *(Rules in July issue)* |
| **November 1979–January 1980** | 1,296MHz Cumulative *(Rules in September issue)* |
| **3–4 November** | 144MHz CW |
| **10–11 November** | 2nd 1·8MHz |
| **10–11 November** | Esperanto Contest (ILERA). *(Details from G4MR, QTHR)* |
| **17 November** | All Austria 1979 |
| **24–25 November** | BATC SSTV |
| **2 December** | 144MHz |
| **1980** | |
| **2–3 February** | 7MHz Phone *(Rules in June and July issues)* |
| **23–24 February** | 7MHz CW *(Rules in June and July issues)* |

# members' ads

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB. They must be submitted on the Members' Ads order form printed in alternate issues of *Radio Communication*, or on a postcard similarly laid out. Each **must** be accompanied by a **recent** *Radio Communication* mailing label addressed to the advertiser, as proof of membership, and a remittance by postal order or cheque for 75p (stamps not accepted) for every 40 words or part thereof. They will not be acknowledged. Those not clearly worded or punctuated will be returned. No correspondence concerning this service can be entered into.

Closing dates in 1979; **25 Oct, 22 Nov, 27 Dec.** No guarantee of inclusion in a specific issue can be given, other than the first possible issue after receipt.

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.

Advertisements for 27MHz equipment will not be accepted.

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

**Do not post to RSGB HQ or Advertising Representative**

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## FOR SALE

**FT101/SP101,** exc, £425. Shure 444, £15. Quartz 16, R2-7, R3R, S0, S20-23, £120. Type 71 Airmec sig gen, 8-300MHz calibration curves, £20. Storno Viscount, 6ch, R3, S20-22; unconverted unit for spares; the pair, £20. G3ZIF, QTHR. Tel 0484 863936.

**LA106** 2m linear, 200W p.e.p. i/p, £150. Telescopic mast, 30ft, incl guys, £20. Technical Associates BP2 filter, £20. Jaybeam, 8-over-8, 70cm, £5. Jaybeam, 6-over-6, 2m, £5. G3KEQ, QTHR. Tel 01-657 1847, after 6pm.

**Yaesu 901DM,** used under one hour, mint, £850. Ham-M3 rotator, boxed, Asahi 4-E mono beam, £20. Versatower tower-head, heavy-duty, £15. Extra R4C xtals, 160m, 10m (three); 1·5 filter; £35. Comdel processor, £30. Turner +2 transistorized mic, £10. G3DAM, QTHR.

**KW Vespa Mk2,** late model, as new, manual, drawings, new spare pa valves, relay; exch FR50B, FL50B, mint cond, manuals etc; cash adjustment. High voltage capacitor, split stator 0·0005 each section, £4.50. Dipole traps, £3.50. G3FK, QTHR. Tel 07257 436.

**Trio 9R59DS** rx, matching spkr, spare valves, no mods, nice cond, £50. G4HED, QTHR. Tel Stevenage 62829.

**"Practical Wireless",** '74 to '78, £2 year. *SWM,* '75 to '77, £2 year. *Radio Electronic Constructor,* '74 to '75, £1.50 year. *Radio Communication,* '74 and '78, £2 year. Buyers must collect. G. Thompson, G8KLI, 6 Kendal End Road, Birmingham B45 8PY.

**FT101B,** fan, 600Hz filter, exc cond, Yaesu mic, 160 thru 10 WWV, fine performer, recently fitted new pas, not used mobile, £300. G3UAZ, QTHR. Tel Wokingham (0734) 782378, evenings and weekends.

**TS520,** int dc psu, absolutely mint, used as rx only, orig packing, accessories, £425. Racal RA37, I/f converter, MA197B preselector, exc cond, £50 the pair. Imhof cabinet for 19in equipment, 22in high, 16in deep, new, £25. All items collect. G3GUU, QTHR.

**Drake TR4-C,** AC4 psu, DC4 psu, MN4, d load, lp filter; Heath electronics course EE3101-2-3 trainer, ET3100 records, player; Advance PP5 spsu; BNRS course, 2½in 'scope; Heath code osc, HD16; RF1U gen; various books, ssb, antennas; offers half current price. (For SK). G3XKB, QTHR. Tel Bedford (0234) 870526.

**Racal RA117,** in case, superb reception, comp cov, 1-30MHz, offers over £350. G4EJJ, QTHR. Tel Dronfield (Sheffield area) 412775.

**FT7,** less than six months old, comp with plugs, cradle, etc, in orig packing, manual, £260. G4GAV. Tel Maidstone (0622) 30892.

**901-DM,** new, cw and a.m. filters fitted, all modes, speech processor, digital read-out, memory, audio peaking, filter, everything as spec, going microprocessor, so £200 off, £850 ono. G3JMY, QTHR. Tel 0454 772384, evenings or weekends.

**IC202,** 144-144·6, 145·8-146, as new, boxed; Microwave Modules 25W linear amp/preamp, suit IC202; the two, £175. GW3VBC, QTHR.

**FDK Palm 2,** 6ch fitted, R0, R3-7, also supplied S0, S20, S22, comp with toneburst, nicads, charger, helical whip, leather case, £110. G8CZM, QTHR. Tel 021-422 2986, evenings.

**Emigrating:** HW101, psu, £160; Standard 146A, ch S0, S20-22, R7, ext mic and charger, £95; HW32A, psu; fet voltmeter; Sinclair af and fm kit; 10-2m converter; preselector; large 24V nicads; components; offers. G3ZRD, QTHR. Tel Iain, 01-724 2467, work.

**FDK Multi 7,** 24ch, nine fitted, 10W, 2m, fm, high and low power outputs, mobile mount, vgc. G8GMU. Tel 0203 611101, after 6pm.

**TR2200G,** nicads, auto toneburst, charger, case, h/b leads, etc, orig packing, exc cond, fitted R5, R7, S0, S20-22, S24, £115. *Wanted:* mains transformer, 1500/0/1500, 500mA. G3JEQ, QTHR. Tel Bookham (Surrey) 52459.

**Hallicrafters Skyrider Defiant SX24,** vgc, £35, or w.h.y.? Tel Reading 861421, day; or Henley 4424, evenings.

**TS700,** £290. Heathkit 'scope IO18U, probe, 5MHz, £40. 14 reels tty tape, £4. Deviation meter M1 TF791D, 1GHz, £60. Some pieces 3-5GHz microwave gear. G8JSD. Tel Chelmsford 66776.

**Heathkit SW717** gen cov rx, Joystick, Stephen-James atu Mk2, sale or exch, will split. *Wanted:* electric welder, paint spray unit, small or cheap motorcycle/car, w.h.y.? Tel 0225 742943, evenings.

**Heathkit HW17A** 2m tx/rx, fm conversion kit, manuals, needs realigning, £30. G4GOF, QTHR.

**HW100** tx/rx, SB600 ps/spkr, HG12A mic, Datong clipper, £195; Heathkit Apache tx, SB10 ssb adapter, £70; OS2 'scope, £35. RF1U sig/gen, £18; Trio JR60 rx, 2-160m, phones, £30; Asahi T33 3-el triband beam, £50; all manuals. G3PZT, QTHR. Tel Tirley 462.

**Mizuho** 144MHz ssb tx/rx, four extra xtals, £135. MM 50MHz cvtr, new, £18. Microtronics cw/rtty interface 8k Pet, well-built, smart metal case, £45. 432MHz pa, 4CX250B, brass cavity, matching psu, 19in panels, £100. G3NSM, QTHR. Tel 0865 56321.

**IC202** xtals for 144·0-144·8, £135. Heathkit Mohican rx, factory built, £25. 240V ac, 12V dc, 0·5A psu, fully reg, £1.50. G3WWT, QTHR. Tel 01-898 2417.

**Belcom FS1007P** scanning 2m fm tx/rx, 10W, 14 popular channels incl inputs R6, R7 and two spare, priority scan, 230V ac/12V dc, centre zero meter, looks civilized, xyl approves, £125. G3DNQ, QTHR. Tel Bishop's Stortford (0279) 51776.

**IC202E,** vgc, fitted 144·0-144·6 and 144·8-145·0, £145 ono. Heathkit Mohican GC1-U, wkg but needs tweaking, £25. G4IJW, G8BKR, QTHR. Tel Bristol 621498, after 6pm.

**'Scope,** Heath 10-17, as new, £35 ono. G3WAU, QTHR. Tel 045 282 3315.

**FRSDX400,** all options, FLDX400, spare valves, £325. Lafayette HE73 preselector/converter, £18. Codar PR30, £8. Geloso vfo 4/102, £6. 6KD6s, new, boxed, £4. 5B/254Ms, £3. 832As with PTFE bases, £4. Sentinel auto hf preamplifier, £7. AEC swr-10, £5. TT21 and TT22 valves, new, £4 ea. Prefer collect, inspect. Carr extra. G6FB, QTHR. Tel Cosham (Hants) 370087.

**Pye Compact,** 70cm, fm, xtalled 433·2, plus set for RB10, £30. Western DX31 triband rotary dipole, £20. Collect or carr at cost. Green, 6 Celia Crescent, Beacon Heath, Exeter, Devon. Tel Exeter 68314.

**Trio 7200G** fm mobile tx/rx, S0, S20-24, R3-7, perf wkg order, £100. G8MOO. Tel Erith (03224) 48977.

**Trio R300** comm rx, vgc, no mods, £105, plus Securicor at cost. Paul Bishop, 73 Holcombe Green, Weston, Bath BA1 4HY.

**ASCII** keyboard, model 753, 53 keys, ASR-33 format, ABS plastic enclosure, mint cond, £40 ono. *Wanted:* to buy, borrow or copy, manual for Drake FS-4 synthesizer. K. Arasu, 21 Chelverton Road, Putney, London SW15 1RN. Tel 01-785 6712, evenings.

**9MHz** xtal filter, YF90F2·4, with both sideband xtals, unused, £14. G4BEZ, NOT QTHR. Tel Wellington (Somerset) (082347) 6114.

**TS700G,** auto tb, sidetone, mint cond, £300. Buyer collect or carr extra. G3UEN, QTHR. Tel 0262 850258.

**AR88,** exc cond, spare valves, manual, £65; BC221, charts, separate power unit, £25; Two Codar preamps, £10; Telequipment Serviscope, type S42, portable, manual, exc, £50; Japanese 3-el hf Yagi, balun, manual, rated full 2kW, £60; all ono, part exch or swop. *Wanted:* small mobile hf tuning unit, preferably metered but will consider any. Tel Kettering 760336, after 6pm.

**FT75,** ac/dc, G-whip, £135; Dentsu electronic keyer, £18; Akai model 1721L stereo r-r t/r, £45; little used, unmarked. G3DCF, QTHR.

**FT101E,** cw filter, mint cond, £450, incl Securicor. FT227R, scan mod, £190. GM8BOV, QTHR. Tel 031-331 2755.

**Trio 2200GX,** fitted 9ch, R3-7, S0, S20-22, nicads, charger, £110 ono. EMI TR52 open reel recorder, £20. Pye Vanguard, £5. G3KTL, QTHR. Tel 061-436 1381.

**Marconi TF1041C** vtvm rf millivolts to uhf, good cond, £22. DL6HA 2m transverter, 28MHz i/p, 3W o/p, boxed, to match mod, elect units, £30. G8JCA, QTHR. Tel Southend 528402.

**Tektronix 545** oscilloscope, c/w dual trace type CA plug-in dc-24MHz, superb cond, £170 ono. IC22, fitted S12, S20-22, R6-7, mic, mobile mount, handbook, perf wkg order, £120. *Wanted:* Creed 7E/RP silence cover; G3ZVC ssb tx/rx. G8JGT, QTHR. Tel Medway 74544.

**Trio 2200G**, case, nicads, charger, 5ch, xtalled, 5/8 whip, magnetic mount. £95 ono. G4CBE. QTHR. Tel St Albans 55542.

**Homebrew 400W** linear passive grid parallel TT21, integral 1,200V psu, fan cooling, smart looking, well built, all bands 80-10, £50. Eddystone 898 dial, £5. R1132 dial, £2. Two 813s, £2 ea. Woden 750/0/750 250mA transformer, £5. 500/0/500 transformer, 200mA H7RS, £4. Various large chokes, £2 ea. HRO coils, low frequency only, £1.50 ea. HRO dial, gang, £4. Buyers collect or carr extra. 5CP1 crt, shield, hood, collect, £5. G3GOT, QTHR. Tel Terling (Chelmsford) 229.

**Microwave Modules** transverter, 144/28, mint, £60; CDE rotator, AR40, £25; 2m 14-el Parabeam, £15; all ono. Can deliver reasonable distance. G8EKZ. Tel Bristol 793296, evenings.

**AR240**, synthesized, hand-held, 144-148MHz, repeater shift, toneburst, circuit, £150; IC215, fully xtalled, 15ch, R2-9, S0, S19-24, £125; both perfect, unmarked, with telescopic and helical whips, carrying cases, nicads, chargers. East, G8PKD. Tel 01-486 8286.

**FDK Multi 2700**, 2m, all mode, £350. Shibaden SV700E vtr, requires new heads, £80. Buyer collect. G8BBH, QTHR. Tel John, Hatfield 64342.

**Atlas 210X**, 180W, 10-80m, noise blanker, console psu, Shure 444 mic, £425. G3JYT. Tel 01-850 7881.

**IC22A**, 4ch, orig packing, instruction booklet, all perfect, mobile mount, etc, £120. Cobra transverter, £40. CT1024 visual display terminal, home-made from kit, will display 1,024 characters on tv set, scrolls, comp with data, £50 ono. G8CGX, QTHR.

**Monitorscope**, Heath SB614, monitors transmit patterns 80-10m or audio signals from rx, has limited use as ordinary oscilloscope, £100. G8IBV, QTHR. Tel 0452 36119.

**Headphones** low Z Telephonics (USA), very comfortable, £7.50. Pair SG Brown type C, £4.50. Tel Sheffield 394515.

**Yaesu FL50B**, FR50B, the pair, £120 ono. Eddystone 940, £100 ono. G2KV, QTHR. Tel Fontmell Magna 273.

**TH3Jr** Hy-Gain hf beam, 20, 15, 10m, 600W p.e.p., good cond, prefer buyer inspects and collects, £90. Henderson, GM4HKW, 53 Dumyat Drive, Falkirk FK1 5PA. Tel 0324 25559.

**TR2200GX**, 4ch, incl R7, nicads, charger, £120; Trio VFO30G, for 2200GX or TR7200G, £50; STE Milan AL8 2m linear, 10W, output meter, switched, on air lamp, etc, £20; power supply, 240V input, 13·8V at 15A dc out, crowbar protection against over voltage or short circuit, continuous monitoring, volts and amps, blower-cooled on higher amps, £35; NR56V 2m fm rx, 12V, 3ch fitted, vfo, nicads, telescopic antenna, shoulder strap, charger, £40; Nova Pal direction finding rx, marine/broadcast/beacon bands, comp with yachting and technical handbook, suit yachtsman, £20; Codar CP50 coil pack, 1·5-30MHz, tested but unused, cost £10, £5; Labgear vhf/uhf distribution amplifier, E5165, two inputs, six outputs, internal psu, £5; Labgear medium wave-160m converter, £6; all equipment 100 per cent good, with handbooks. G3VCJ, QTHR. Tel 042 43 4726.

**Rough** old BC348, £12 ono. Buyer collects. G3EJF, QTHR.

**Yaesu FT7** hf tx/rx, in perfect cond, only a few months old, little used, comp with all accessories as supplied, plus 10A xtal for cw section of 10m, £285. G3KLF. Tel Fareham 236906, weekends or evenings please.

**Trio TS900** hf-band tx/rx, immac cond, new bottles, £500 ono. Trio TV502 2m transverter, nearly new, still boxed, fits TS520 and TS820 series, £100 ono. G4BQE, QTHR. Tel Rotherham 893575.

**RTTY** terminal unit type CV89A, as described in RSGB *Teleprinter Handbook*, for operation from 110V ac and 150V dc, 50mA. G4BAL, QTHR. Tel 01-302 4062.

**KW Vespa Mk2**, psu, revalved incl pa, vgc, exc performer, no mods, handbook, circuits, servicing data, £80. Trio JR310 rx, matching spkr, 160m fitted, £75. G3FWU, QTHR. Tel Medway (0634) 35261, evenings.

**FT101EE**, SP101B spkr, immac cond, mic, leads, manual, never used mobile or portable, £400. Pye a.m. Cambridge, unmodified, £15. New and unused QQVO6-40 valves, £10 ea. G3TKN, QTHR. Tel Waterlooville 53621.

**Garex Two** mobile 2m tx/rx, 6ch, good cond, £60. Buyer collects. Heathkit digital multimeter, IM1212, £30. GM3ULP, 12 Airbles Drive, Motherwell. Tel Motherwell 53394, after 6pm.

**FT2F** tx/rx, very clean cond, comp with all xtals, ideal 2m mobile rig, ex G3PWM (silent key). £100 ono. Mrs Martin. Tel 01-445 9772.

**505A** rf comms rx, synthesized, 100Hz steps, 15kHz-30MHz, and 1kHz continuous, u/lsb, lsb, etc, 100/260V ac, 10/40V dc, large quantity spares, leaflet available, handbook, £250. Delivered 100 miles. G8PB, QTHR. Tel 024366 3584.

**Comp** vhf cw/a.m. stn, 4m, 2m, 70cm, separate high-power tx each band, psus, modulator; AR88LF, manual, converters; many spares; this heap won the FMD Supreme Award so must be worth £50. G5NU, QTHR. Tel Reading (0734) 81200.

**IC211E**, three weeks old, £500. Mobile mount, £10. RM2 key pad, £70. IC240, latest model, £160. IC202, £95. 2m 30W pa, £15. *Wanted:* Henry 3K-A linear; Johnson T-R switch. G3XVF. Tel Norwich 56782.

**Liner 2**, matching psu, mint cond, £120. Trio JR310 hf rx, fitted ssb filter, 100kHz calibrator, full 28-30MHz cov, £90. G4HZV, NOT QTHR. Tel Camberley (0276) 63728.

**Eddystone** rx S680X, £75. Marconi sig gen TF144G/4, circuit, leads, £15. Electroniques i.f. strip IFA 1·6 Mk3, data, £8. Philips 3586/15 portable tape recorder, £5. G3NXT. Tel King's Lynn 828339, evenings.

**Equipment of deceased amateur.** Yaesu: FL2100, £240; FV101, £40; FR101, £300; spkr, £5. Codar tx, 1·8/3·5, £20. Or nearest sensible offers. G8NDJ, QTHR. Tel Ropley 3253, Or G8MVY, QTHR. Tel Alton 62597.

**Table model** HRO, comp, full cov 50kHz-30MHz, all coils, psu, spkr, handbook, exc cond, £40. Dish antenna, 4ft dia, £10. Microwave converter, 1,296/28, £20. ATU w/s condensers, roller coaster inductance, £10. G3CGQ, QTHR. Tel 0582 25519.

**Linear** amplifier, Trio TL911, 2kW p.e.p. input, comp with manual, £200. Carr or delivery extra by arrangement. G3RDG, QTHR. Tel 01-455 8831, evenings/weekends; or 01-921 9252, office hours.

**Scanning** monitor rx, Heath GR110, 7ch, plus priority, designed for 146-174MHz but is tuned to 2m, uses 44MHz xtals, £40. G8IBV, QTHR. Tel 0452 36119.

**Drake T4XC**, R4C, with AC4 psu, fitted top band and 500Hz cw filter, manuals, £700 ono. GW4BCF, QTHR. Tel Porthcawl 5173, after 6pm.

**Liner 2**, no mods, 6-el cubical quad, £115. Codar AT5, hb psu, £15. Wein mains eight-track cartridge player, tapes, £10. Two PM44 0-15V at 1A fully stabilized psus, £5 ea. Atlanta tx/rx, o/b vfo, good, £270. G3UXH, QTHR. Tel Medway 250562.

**Clearing shack:** surplus USA comms and test gear, send sae for lists. G3FOQ, QTHR.

**38ft** telescopic tower, two-section lattice type, comp with winch, £45. Buyer collects. G4GSE, QTHR. Tel Swanley 64486.

**Trio TR2200G**, charger, helical, toneburst modification, S20, S22, R6-7, orig packing, no nicads, £100. G4ASZ, QTHR. Tel Newmarket 2392.

**"QST"**, *CQ, SWM, Ham Radio, 73, Radio Communication*, mostly 1966-78, long runs, almost comp, £2 per year, or offers any mag or the lot. Buyers collect. Johnson. Tel Ipswich 713152.

**Liner 2**, £95 ono. G8HRK, QTHR. Tel 0424 84262.

**Comdel** speech processor CSP11, in-built psu, £45. Optomax zoom lens, 80/250, F45, £50. Barrett, 9 Henbury Close, Torquay. Tel Torquay 37050.

**FT202**, hand-held, three months old, price incl nicads, charger, extra channels, £105. G4GKX, 4 York Road, Broadstone, Dorset. Tel Broadstone 696929.

**Rex DG100** tx/rx, 160-10, all mode, digital readout, approx 200W p.e.p., hand mic, circuit dgs, instrs, carton, etc, used less than 12 months, new pas, very efficient stn, £400. G4HKE, 19 Lambourne Avenue, Huntley, Glos GL19 3HW. Tel 830762.

**Oscilloscope**, large sb measuring 'scope, separate psu, calibrated delay etc, circuit, wkg, £20. *Wanted:* Storno 500 or 600 parts, on non-wkg sets, any cond. Adamson, "Woodend", Victoria Road, Kingsdown, Deal, Kent. Tel Deal 3788.

**4CX250** cavity prof machined for 70cm, £49. Creed 7E, plus silencing enclosure, £35. 6S5×2, £15. PF1, RB14, £32. DEC disc drive RK8, manuals, 3MHz storage, new, £160 ono. Tel 0206 45099, after 7pm.

**Ham-M** rotor and control, £60. Hy-Gain 18HT tower, Mosley trapped vertical, both dismantled on site; lots of quality coaxial; offers. Johnson. Tel Ipswich 713152.

**VDU board**, *PE* October 1978, wkg, £45; Creed 75RP 5-bit binary output, £15; Truvox R102 mono reel-to-reel tape recorder, £10; Wurlitzer electronic organ, two manual, plus pedal board, rhythm unit, mint cond, £399; all ono. Impending house move forces sale of above items. G3XIB, QTHR. Tel Lye 4064.

**Heath** frequency display model SB-650, wkg but requires attention, counter and handbook in new cond, £19. Heath reflected power meter model AM-2, 50/75Ω, £5. Heath oscilloscope model O-12U, handbook, buyer collects, £15. G3HSW, QTHR. Tel Wylam 3676.

**Ten-Tec Argonaut** 5-band 5W tx/rx, new, two months old, exc performance, £220. Ten-Tec 247 antenna tuner, new, £40. Datong audio/audio rf clipper, as new, £40. AEC swr meter, £10. 5ft deluxe rack, £30. G3VZJ, QTHR. Tel Reading (0734) 413891.

**Codar CR70A** Mk2, 5-30MHz rx, mint, £45. 19 set, psu, £10. 2m tx, 20W, £15. G8AEV 2m conv, £10. TC7, tun i.f., £20. Approx 200 radio mags, *PW, EE*, etc, all diff, £10. 160m tx, dsb, cw/a.m., 10W, £4. G4IJI. Tel 0532 822968.

**"Radio Communication"**, March '76-July '79, except February, March, June '77, February, October-December '78, and January, February, June '79; *VHF/UHF Manual*, 3rd edn; *Radio Communication Handbook*, 4th edn; 8ft by 1·5in steel pole; the lot, £12 ono. G8MEN, QTHR. Tel 01-733 8878.

**TR7500,** PS6, £250; SSM Z match, £20; Pye Europa solid-state low band fm tx/rx, 50W, rx needs alignment, all details, £30; 18AVT, £30; only few months old. Buyer collects. G4GUO, G8LXJ QTHR.

**Oscilloscope** Cossor 1049 Mk3, double beam, handbook, old but vgc, for quick sale, £15. Buyer collects. G3HHR, QTHR. Tel Lancaster 823523.

**National Panasonic** all wave communication rx, in mint cond, type DR48, £275. Carr paid. Coombe Cottage, Pitchcombe, Stroud, Glos. Tel Stroud 3081, evenings.

**FT2** auto, S0, S20–22, R5–7, xtal toneburst, preamp, £130. KP202, S0, S20, S22, R5–6, xtal toneburst, R chs only, case, nicads, charger, helical ant, £110. G4AEU, QTHR. Tel Southampton 23458, day; or 772812, evenings.

**Motorola MEK6800D2** microcomputer, incl hex keyboard/display, cassette interface, fully built, tested, full complement of ram, documentation, mains psu, £120. G3TXQ, QTHR.

**Yaesu FTDX401,** FV401 vfo, very good dx stn, spare pa valves, £330. *Wanted:* Trio TS820. G4EKG, QTHR. Tel Evesham (0386) 41105.

**Yaesu FTDX401,** FV401 vfo, spare valves, good cond, buyer collect; SP401, HM11U, HM15, swr meters by Heathkit; offers. Securicor extra. G3BRT, QTHR. Tel 0272 657997, after 7pm or weekends.

**IC202,** £120. FT227, scan, 25kHz shift, £220. 4BT 5-band vertical, Newtronic Corp, better than 18AVT/WB, £40. SB200, £200. QM40 40W 2m linear amp, £35. G4EMG, QTHR. Tel 01-534 3460.

**QRT mobile:** comp stn, FT7, purchased May, £250; G-whip helical, 10–160m, exten rod, £15; bumper mobile mount, £8; mobile match atu, £8; twin swr meter, £7; or the lot, £275. AR240 hand-held tx/rx, £150. All mint. G4FPK, QTHR.

**FT227R,** scan, auto toneburst, £210 ono. Pye Westminster, 70cm, 2ch, £110. Microwave Modules 432/28 transverter, £90. G8LUP, QTHR (Essex). Tel Billericay (02774) 4386.

**Microwave** tunable converter, 1–2GHz type TN-128/APR-9, mint cond, comp with circuit details, £30. Buyer to collect. Tel Bolton 52384.

**SMC 73** comm rx, mint cond, £90. Buyer to collect from London. G3LMV. Tel 01-607 8159, evenings.

**KW204/KW202,** exc cond, prefer not to split, £360. G8IPW, QTHR. Tel Brookwood 2251, evenings; or Camberley 62791, days.

**Heathkit** O-12U, 5MHz, 5in oscilloscope, cond perfect, manual. G4GOF, QTHR.

**Uniden 2020** 80–10m tx/rx, ext vfo, all accessories supplied by manufacturer, 100–240V ac, 13·8V dc, as new cond, £420. G4EBL, QTHR. Tel 021-777 4901, after 8pm.

**Yaesu FT227R** 2m tx/rx, mint cond, little used, orig packing, £180. Buyer collects. G3WYU, 35 St Augustine's Park, Ramsgate, Kent CT11 0DF.

**TS700G,** vox unit, SD306 preamp, mint cond, in orig packing, £350. Tel 0995 40387.

**FRDX400** rx, ssb, a.m., fm, handbook, exc cond, £130 ono. G3MCL, QTHR. Tel Winchester 65814.

**HW7** QRP tx/rx, vgc, no mods, £35 ovno. Storno Viscount, 2m, fm, dual-gate mosfet preamp, wkg, £10. Pair new 813s, bases, £12. Doram keyer, £6. 813 heater transformer, 4 × 5V at 10A ea, potted, £6. G4DJX, QTHR. Tel 0727 54190.

**Trio TS700G,** in orig packing, fitted preamp, xtals S19–23, R5, vgc, separate vox unit (Trio), £350 ovno. G4HUX, G8OKG QTHR. Tel 0632 482798.

**Nascom 1** microcomputer, professionally built, psu, keyboard, B-bug, buffer board, 8k dynamic ram, 2k basic (eprom), Kansas City interface, all literature, four months old, offers around £325. G4AAI, NOT QTHR. Tel Bourne End (Bucks) 22269.

**UHF mobiles,** ITT M5, 5W output, wkg on business channel, one multi-channel, other single; Burndept BE448, wkg on 2m, 25W output, xtalled R3, R6, S20, S22, solid-state; offers. N. Robertson, 15 Tofts Crescent, Dalry, Ayrshire. Tel Dalry 2857.

**Storno CQP612/7205,** logic no good but tx/rx thought ok, suit 2m, incl enormous manual, all circuits, £25. Stornophone CQM600 mobile radio telephone, comp, wkg, £400 ono. Stephenson. Tel Newcastle (0632) 610210, day; or 682401, evening.

**FT101B,** double balanced ic first rx mixer, MD108 second rx mixer, FV101B, SP101, spare pair 6JS6Cs and 12BY7A driver, manuals, service manual, cables, etc, £400. G4CZR. Tel 051-625 6393, evenings; or 051-645 2060, office.

**FT221R,** immac, rx preamp, pip-tone, rptr access mod, 10 extra channel xtals, £325. 5-el Xed Yagi, rotator, control box, cables, £35. H/B 40W p/a for FT221R, int p/s, £52. Comp stn, £400. G3VRT, QTHR. Tel Chippenham 50409.

**C146,** 5ch; Liner 2 Mk1; 144 PA2-45 QM70 pa; Eurocat ES80TR synth; Labgear CM6022 conv; ELC 2000S tuner; any offers; or will swop for anything tx/rx. G8KEH, QTHR.

**Yaesu FT221** 2m multimode, perfect cond, no modification, £275. Pye PF1 Compact, xtalled, wkg RB10, rechargeable batteries, £35. G4EMK, QTHR. Tel Bourne (07382) 2649, evenings and weekends.

**Heath Two'er** with mobile psu; Knight Tubetester; Yaesu FR50B; offers? *Wanted:* rotary inductor. GM3RKO, QTHR. Tel 0592 756504.

**IC215** 2m tx/rx, channels R1–9, S0, S20, S22, helical antenna incl, vgc, boxed, orig packing, £140 ono. G8IRJ, QTHR. Tel Steyning (0903) 814089.

**Standard C146A,** 2m, hand-portable, fitted S0, S20, R5–7, toneburst, nicads, charger, leather case, ext mic, whip and helical antennas, £90. G3VKQ, 18 Oak Tree Dell, London NW9. Tel 01-200 1373, evenings.

**Complete** uhf contest system: homebrew 23cm transverter; 2C39A mixer, 3W out; 144MHz split i.f.; 40673 masthead preamp; four antiphased quad loops, h/b power combiner UR47 coaxial, Tonna collapsible mast; 70cm MM transverter, low dynamic range; 2C39A buffer into unstable parallel; pair K2RIW 2kV psus; two 21-el F1BZNs; two 4-el 4m beams, 5ft phasing harness; two 16-el, damaged, good for spares. GW6UQ. Tel 061-792 2697.

**IC22A,** 14ch, incl five repeaters, rev R6, tx/rx, £125. Hy-Gain 14AVQ, 80m loading coil, £30. Hy-Gain 14AVQ, hardly used, £30. Oscilloscope and wobbulator, £10. Xtal calibrator, 100kHz, a.m., £5. Cassette dictating machine, £15. Smith-Corona portable typewriter, very little used, £25. Cine camera, projector, portable screen, Standard 8mm, £30 the lot. Army 62 set, comp with headphones and mic, £15. B2, tx/rx/pp, comp, £30. Pair hf hand-held tx/rxs, new, £30 ea. G3LXX, QTHR. Tel 0625 828526.

**Hammarlund HQ100A,** full cov, rx in exc cond, clock timer and S-meter, incl handbook, £60. Buyer collects. G3RRR, QTHR. Tel 029 34 6631.

**KW2000A,** ac psu, ptt mic, lp filter, KW Q-multiplier, handbook, circuit, good cond, serviced by KW September '78, £165. Buyer collects. Late G3POB, QTHR (Thirsk). Tel 22307, after 6pm.

**FDK Multi-2000** 2m multi-mode mobile/base stn, fair cond; sell for cash; or swop for 2m fm mobile, TR7500, IC240, w.h.y.? D. Morley, 30 Glastonbury Road, Astley, Tyldesley, Manchester. Tel Atherton (0942) 878618.

**TR2200G,** 7ch, plus four reverse repeater receive, helical, nicads, auto toneburst, £100. G3YQV, QTHR. Tel Cheltenham 513776.

**FT221,** xtals for S21, S23, R5, best offer over £250. U450L, coaxial relay, £20 ono. TR2200 xtals, 144·72, £3. Clearing shack, many useful items, sae for list. G8DLT, QTHR. Tel Broadstone 695370.

**FT101B,** immac, fitted cw filter, £350 ono. FDK Quartz 16, 10ch fitted, orig packing, also incl ASP 5/8λ antenna, £130 ono. G4BPU, QTHR. Tel Basildon (0268) 416067.

**Sell or swop:** DS-1A dc inverter for TS820, brand-new, never used, still in poly bag and orig box; swop for 500Hz cw filter for TS520S. GM4FDM. Tel 0505 22749.

**FTDX401 560W** p.e.p., fan, cw filter, mic, spkr, FV401 vfo, as new cond, orig packing, manuals, £325. KW107 Supermatch atu, £70. 40m dipole with coaxial, tuning capacitors and coils for atu; RSGB magazines. G4BKZ, QTHR. Tel 061-445 5703.

**Yaesu FT101E,** superb, as new cond, £470 ono. Swan 100MX mobile tx/rx, in equally superb cond, £450. G3MIN, 2 Mill Lane, Shoreham-by-Sea, West Sussex. Letters only please, first instance.

**Atlas 210X,** fitted noise blanker, mobile mount DMK, spare boards, spare 12V power lead, Hustler bumper mount, tilt-over mast, resonators for 80, 40, 20, 10, lapel mic, gear stick t/r switching, all exc cond, £450. G3ZDV, QTHR.

**Cambridge AM10D,** fitted R0, R5, S20–23, toneburst, preamp, £50. Codar AT5 incl ac supply, £25. Realistic rx, £65. Xtals, HC6U: 8·06527 (R7 tx); 45·025 (R7R); 11·19166 (S0R); £1 ea. G4ENG, QTHR. Tel Cheslyn Hay 417477.

**KW103** swr power meter, £18. KW dummy load, £20. KW E-Zee match, £28. G3GTX cmos keyer, £15. MJF cw audio filter, £10. Codar PR40 preselector, £15. Heathkit coaxial switch, £6. G4CQK, QTHR. Tel Walton-on-Thames 27199.

**FT101E** incl mic, plugs, power lead, as new, never used mobile, £440. IC202E, mic, non-standard nicad pack, £140. Jaybeams: 5Y/2M, £6; Q4/2M, £14; antennas used indoors only. G3WVW, QTHR. Tel 01-529 8550.

**Trio TS820,** mint, £625. Trio TR7500, mint, £185. Trio TR7010, vg, £150. No mods, orig cartons. Buyer collects and tests. R. J. Rotherby. Tel 021-772 4917, after 6.30pm.

**18AVT/WB** vertical trapped antenna, vgc, offers around £40. Tel 061-865 0456 (Manchester).

**DR48** all band rx, digital readout, as new, £225. Zenith model 3000 all-band rx, instruction book, circuit, £40. Armstrong, 1 Watkin Street, Conwy, Gwynedd. Tel 0492 63 2759.

**Hammarlund HQ170A Mk2** amateur bands rx, all bands 160–6m, matching spkr, orig handbook, in exc cond, £150. Buyer collects. Tel Newbury (0635) 49395 evenings.

**Pye PF5** uhf Pocketfone, xtalled SU8, comp with leather case, charger, spare battery, ¼ whip, service sheet, £60. *Wanted:* Stolle rotator, through shaft type, any cond considered. Also 70cm XY antenna, 8- or 12-el. G8OOW, QTHR. Tel Louth (0507) 602220, after 6pm.

**Versatower W60**, HD head, AR40 rotator, 14E Parabeam, plus 88-el 70cm Yagi, two 100ft lengths of UR67, £270. Yaesu YO100 monitorscope, £90. Standard C828 10W 2m mobile tx/rx, fitted nine channels, £90. New Fritzel PB53 Jumbo 5-el Yagi beam, 10/15/20, 2kW power handling, £135. ASP 12dB 70cm colinear antenna, unused, £55. IC215 portable with helical, plus 15ch fitted, £125. Kyokuto SX144 15W 2m 400ch digital tx/rx, with xtal t/b, £155. Drake DC4 12V dc mobile psu, £48. Burn SD11 xtal frequency standard, locks to Droitwich, £75. G4HYQ, tel 01-904 2104, after 10 October.

**Yaesu FT221R**, SD306 preamp; YD844 desk mic; log amp processor; Katsumi electronic keyer; Standard C146A hand-held tx/rx, base charger, nicads, xtals, leather carrying case, £300 the lot. Will consider as separates. Further details available. Tel Ilbury, Camberley 62121, ext 4123, day time.

**Trio 7200G**, xtals for eight IARU channels, £135 ono. Trio VFO30G, £65 ono. Icom IC2F 144MHz tx/rx, xtals for seven IARU channels. Groves. Tel King's Langley (09277) 62201, after 7pm.

**FDK Multi 800D** synthesized 2m fm tx/rx, 1-25W o/p, mic, frequency up down count, control, external display, comp, boxed, still under guarantee, £245. Hudson FM208, handbook, extras, tx on 2m, £25. G8EKO, QTHR. Tel South Benfleet 50781.

**Yaesu FT101E**, fitted cw filter, four months old, mint, £460. Prefer buyer collects. G3SYL, QTHR. Tel Tonypandy (Mid Glam) 2563.

**Trio JR310** rx, 160-10, vgc, matching spkr, manual, £80 cash. Buyer collect. G4EOI, QTHR. Tel 01-648 6117.

**Heathkit SB102**, SB600, HP23A, handbooks, spare 6146s, wkg order, good appearance, £230. G4BDW, QTHR. Tel Swanton Morley 291, ext 471, working hours.

**Westminster W15U** 70cm tx/rx, 6W rf o/p, channelled on RB0, RB2, RB4, RB6, SU8, RB10, RB14, SU20, comp with control box, mic, toneburst, spkr, long harness cable, £140. G3KLF. Tel Fareham 236906, weekends or evenings only, please.

**FL2100B**, new; Collins KWS-1 tx, has greater power; 75A-4 rx, perfect; all three items to be sold, offers please. TS900. VFO900. £100. 4CX250B, new, boxed, £18 ea or £30 pair. Datong Clipper plus YD844, £40. GM4AGS, QTHR.

**Standard C432**, 70cm, hand-portable, xtalled RB0, RB2, RB14, SU8, 435·00, comp with nicads, leather case, helical whip, manual, auto toneburst, bargain, £110 ono. Can deliver between Cambridge and Preston by arrangement. Lorek, G4HCL, QTHR. Tel Preston (0772) 25108.

**Daiwa SW-110** swr/power meter, new, £27; TM198 micro-fiche reader, £15; 4CX250Bs, new, £6; commercial transistorized pa on 2m, 1-2W i/p for 10W+ 13·8V, £10; plus carr. G8ENI, 14 Julian Close, Great Wyrley, Walsall. Tel Cheslyn Hay (0922) 415374.

**Trio TS820**, as new, boxed, £599 ono. BC221, 240V psu. Marconi pwr meter TF1152/1. G3SMT, NOT QTHR. Tel 061-439 6746.

**Excellent** 25W 2m ssb and cw tx/rx, £175. IC202E, 144·0-144·4, 145·8-146·0 for satellites, £150. Matched 25W pwr amp MEL202-25, auto switched, £25. G3DNQ, QTHR. Tel Bishop's Stortford (0279) 51776.

**Yaesu FRDX400** all-band rx, equipped with fm discriminator, filters, 2m and 4m converters, vgc, £160. GW8SLF, 12 Hydrangea Close, Cyncoed, Cardiff. Tel Cardiff 734346, evenings.

**Blaupunkt Frankfurt** car radio, lw/mw/sw/fm, push-button/manual tuning, cassette i/p provided, comp, exc cond, over £200 new, accept £90. *Wanted:* suitcase type sets, miniature tx/rxs, etc, damaged/incomp items welcome. Letters. Taylor, G3UCT, c/o 31 Willow Walk, Culverstone, Gravesend, Kent.

**PF1** tx/rx, RB14, nicads, Pye charger, £35. AR88D, matching spkr, manual, spare valves, fitted discriminator, squelch, 2m converter, £55. UHF Storno Viscount, RB14, £35. F27AM tx, low band, £10. Tradipper gdo, 120MHz, £10. Can deliver locally, G4CQS, QTHR. Tel Bromsgrove (0527) 33111.

**HW101**, HP23A psu, SB600 spkr, cw filter SBA301-2, handbooks, many spare valves, £200; Codar AT5, ac psu, £25; all vgc. BC221, charts, mains psu, £25. Dumont oscilloscope, old but wkg. G4AWS, QTHR. Tel 0923 22687.

**Creed 75ROMK4**, silenced, £25. Creed 6S6M reader, £10. ST6 for two printers and two readers, off-air/local loops, £110. Creed Envoy ASR, ASCII, V24, immac, £350. IC22A, usual xtals, £125. Heath SB300 rx, revalved, aligned, £80. G4GRT. Tel Watton (0953) 882110.

**FT101E**, £425; YO100 monitorscope, £95; YC601 digital display, £45; all as new, mint cond, still in guarantee. G3KAS, 73 Rawcliffe Lane, York. Tel 27123.

**TR7200G** mobile tx/rx, S20-24, R2-7 xtals fitted, in orig packing, incl mic, mobile mount, handbook, £140. Purchased TR7500. G3NGD. Tel 061-748 2238.

**Trio TS515**, 80-10m, 100W p.e.p. o/p, good cond, incl cw filter, £175. Liner 2, clean, vgc, preamp, £100. Eddystone 640, £25. MM 2m conv, 4-6MHz i.f., £15. HS-4 'phones, £7.50. Pair 6146Bs, new, boxed, £9. Various bits and pieces. G4HAO, G8LYH QTHR. Tel Bob, 051-724 1209.

## WANTED

**Circuit**, handbook, info, on modifications and improvements for rx type HRO-MX, photocopy and return, or purchase, all postal expenses paid. L. Coussens, 22 Drake Street, Gainsborough, Lincs DN21 1DG.

**SSB filters**, XF9B or similar. GM4DMI, QTHR. Tel 031-445 1343.

**Good quality** ASCII keyboard. Datong UC1 converter, single or twin paddle. Modules for Bird thru-line. G4HYQ. Tel 01-904 2104, after 10 October.

**2·5V** fill transformer. 1131 tx or parts. BC610 tx or parts. SB220. R216. Eddystone 770R. S440. KWS1. 30L1. SSB tx/rx for rebuilding. Gen cov rx. Collins ls cabinet. Cabinet for 19 by 10½in panel. DET12s. CV187S. QVO4-7. Metal valves. *QST* and *CQ*s. TF144, HRO, pu, valves. 19in rack and panels. Lists tx etc. Components. ARRL *Handbook*, 'sixties. 2m fm tx/rx. SR4 and TH4 valves. *For sale:* KW2000, ac pu/ls; KW1000; all vgc; offers around £150 and £300. Glanyrafon, Bontnewydd, Aberystwyth. Tel 097 421 608.

**Heathkit HW101** tx/rx, comp with psu; HW100 would be considered; must be in really nice cond. G3WY, QTHR. Tel Evesham 45497.

**RCA** valve type 229. G3UFZ, QTHR. Tel Bishop's Stortford (0279) 723088.

**Portable** American valve tester for testing valves up to 1974, must be mint, guaranteed perfect, price required, full details please. *For sale:* Copal 601 Callender clock, £10. Hy-Gain on-the-air indicator, £5. HRO dial, £3. SB220 linear motor, fan. G3DAM, QTHR.

**Microwave Modules** 28-144MHz transverter. Jaybeam C8/70cm colinear. ITT Starphone hand-held charger unit. Brown, G8CXV, 2 Tilstock Court, Woodhead, Watnall, Notts. Tel 0602 384956, home; or 786123 ext 37, work.

**HC6U** xtals: 48·5333MHz; 48·700MHz; 48·558MHz; 4,343·75kHz. Valves: X81; W81 series. *For sale:* rxs 770R, 770U, 730/4, 750, BRT402; sae list of prices and other gear. G3DVF, QTHR. Tel Alnwick 2487.

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| **Yaesu FT 227RB** | | **Yaesu FRG 7000** | | **Yaesu CPU 2500RK** | | **Yaesu FRG 7** | | **Yaesu FT 207R** | |
| Cash Price | £268.04 | Cash Price | £377.00 | Cash Price | £356.00 | Cash Price | £216.00 | Cash Price | £199.48 |
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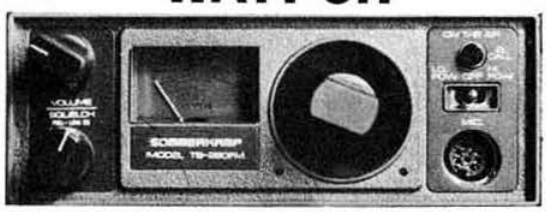

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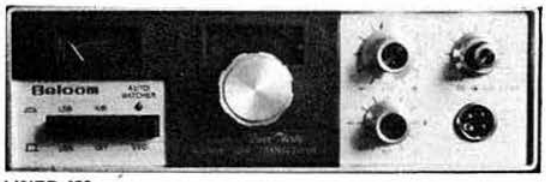

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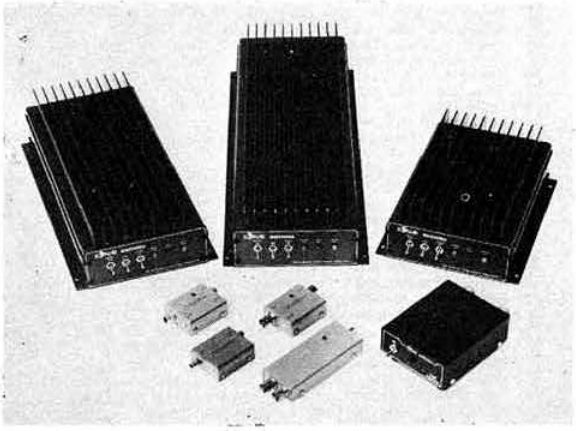

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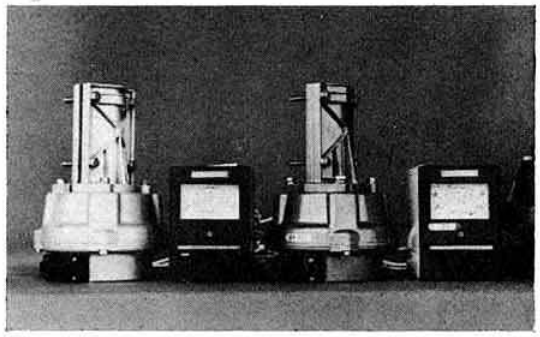

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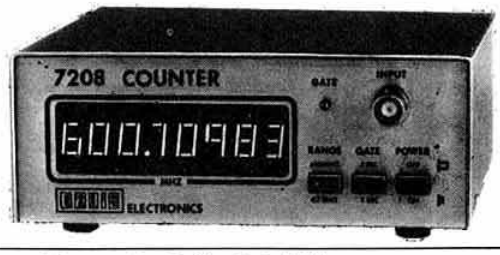


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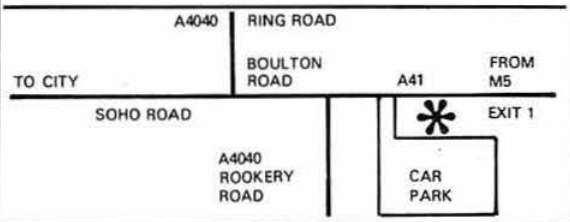


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| | |
|---|---|
| MMT144/28 Transvertor | £79.00 |
| MMT 28/144 Transvertor | £79.00 |
| MMT 432/28S Transvertor with Oscar shift | £119.00 |
| MMT 432/144R Transvertor | £151.00 |

**VARACTORS**

| | |
|---|---|
| MMV 1296 23cm Tripler | £30.00 |

**FREQUENCY COUNTERS**

| | |
|---|---|
| MMD 050/500Mhz Counter | £63.89 |
| M500P 10 Prescaler | £25.00 |

**LINEAR AMPS**

| | |
|---|---|
| MML 144 25W | £39.11 |
| MML432 100W | £220.00 |
| MML144 80W | £120.00 |

**CONVERTORS**

| | |
|---|---|
| MMC 432/28S for Oscar | £26.58 |
| MMC 432/144S for Oscar | £26.58 |
| MMC 70 4m convertor | £18.00 |
| MMC 70 LO 4m convertor | £20.00 |
| MMC 144 2m convertor | £18.00 |
| MMC 144 LO 2m convertor | £20.00 |
| ATV435/51 convertor | £26.58 |
| MMC1296/144/28 | £30.00 |
| MMC156/28 Marine | £20.00 |
| MMC28/144 up convertor | £18.00 |
| MMA 144/28 Pre-amp | £13.00 |

All 2m converters can be supplied with IF outputs of 2-4-12-14-18-28MHz 70cm models with IF outputs of 28-14-18- or 144MHz.

## YAESU MUSEN (FULL RANGE AVAILABLE) FREE DELIVERY IN UK

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FT901DM | £853.00 | FT101E | £515.00 | FL2100 | £311.00 | FRG7 | £187.00 |
| FT901D/DE | £737.00 | FR101D | £525.00 | CPU2500RK | £308.00 | FRG7D1G | £227.00 |
| FT101Z | £500.00 | FL101 | £453.00 | FT225R | £487.50 | FRG7000 | £327.00 |
| FT101ZD | £575.00 | FT7 | £244.45 | FT225RD | £535.00 | FT301 | £515.00 |
| FC901 | £115.00 | FT7B | £375.00 | FT227R | £213.00 | FT301D | £588.00 |
| FTV901 | £232.00 | FL110 | £130.00 | FT227RB | £229.00 | YH55 | £8.75 |
| FV901 | £232.00 | FP4 | £35.00 | FT227RX | £250.00 | YD844 | £19.50 |
| YO901 | £236.00 | FP12 | £67.00 | FT202 | £88.00 | OTR24 | £16.00 |

All prices subject to 15% VAT

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

| | | | | | |
|---|---|---|---|---|---|
| Asp201 ¼W 2m mobile | £3.50 | Asp393 ¼W 3dB 2m mobile | £17 | Asp E462 70cm 3dB mobile | £7.23 |
| Asp2009 ½ 3dB 2m mobile | £8.20 | Asp no hole boot mount | £3.70 | Asp E667 70cm 5dB mobile | £16.90 |
| Asp629 ¼W 3dB 2m mobile | £7.60 | Asp magnetic mount | £8.95 | Asp A659 UK 70cm 5dB, base antenna | £22.00 |
| Asp677 ½ 3dB 2m mobile | £14.25 | Asp cutter with cable | £6.75 | | |
| Universal cutter clip | £4.50 | | | | |

Post & Package £1.00 + VAT 15%

## POCKET MONITOR

This small receiver has 12 xtal-controlled channels. Fitted with 9—S0, S20, S22, S23, S24, R4, R5, R6 and R7, and comes complete with ni-cads, charger and carry case, etc.

**£57.95** + 15% VAT
Extra channels available at £2.50 + VAT

## ICOM RANGE

| | |
|---|---|
| IC701 transceiver and power supply | £792.00 |
| IC215 2M portable | £141.33 |
| IC202S 2M SSB | £176.89 |
| IC402 70cm SSB | £256.00 |
| IC240 2M Transceiver | £168.00 |
| IC245 2M FM/SSB | £354.62 |
| IC211E 2M FM/SSB | £481.77 |
| Xtals for 215/22 p/pair | £4.50 |
| Cases 202/215/402 | £6.75 |
| Mobile mounting bracket 202/215 | £10.75 |

**LUNAR LINEAR AMPLIFIERS**

| | |
|---|---|
| 2M10-80P 2m 10W input 80W Output with 9dB gain pre-amp | £120.00 |
| 2M10-150P2M 10W input 150W Output with 9dB gain pre-amp | £182.50 |
| 2M3-150 2m 3W input 150W Output with 9dB gain pre-amp | £182.50 |
| 2M25-150P2M 25W input 150W Output with 9dB gain pre-amp | £160.00 |

## STANDARD RANGE

C146A 2m 2W hand-held transceiver fitted S20 and S23 complete with T/burst and carrying case £125.00. C432 70cm 2·2W hand-held fitted 433·20, 433·50 with carrying case, etc, £169.00.

**SST ANTENNA TUNERS**

| | |
|---|---|
| SST1 Random Wire Tuner | £22.00 |
| SST2 Coax Wire Tuner | £26.75 |
| SST3 Impedance Match unit | £13.50 |

**SWR25** This ever popular twin SWR & power meter covers 3·5-150MHz at £10.50 + VAT and 25p P & P.

**UH74** SWR & power meter switchable HF, 2M & 432MHz with remote head at £14.25 + VAT & 25p P & P.

## ★ NEW ★ ROTATORS

AR3000E is an excellent new rotator with disc brakes and carries 250kg of balanced weight. Only £79.95 + VAT. TR-1 low cost rotator for TV, FM and small beams, fully automatic at only £26.75 + VAT

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Px402 13·8V output, 3A continuous 4A max. Fully protected cutout. Only £19.95 + VAT.

## ★ NEW ★ RANGE OF KEYERS

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## ★ NEW ★ 2m MOBILE COLINEAR

6·5dB gain. Optional mounts available. £32.95 + VAT.

## JAYBEAM

ALL MODELS IN STOCK

**HELICAL ANTENNAS**

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|---|---|
| 2m with BNC | £3.85 each |
| 2m with PL259 | £3.85 each |
| 2m for IC215, Trio 2200 Gx, standard C146A | £3.50 |

All + post 25p + VAT

**ROTATORS**

| | |
|---|---|
| AR22 | £43.00 |
| CD44 | £95.00 |
| AR40 | £47.50 |
| HAM 11 | £129.00 |
| KR400 | £85.00 |

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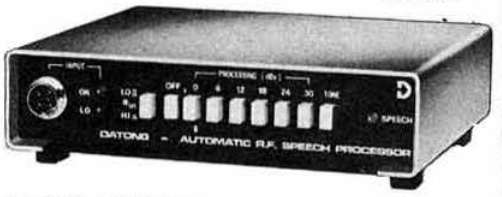
BARCLAYCARD VISA

# DATONG ELECTRONICS LIMITED

## IMPROVE YOUR DX POTENTIAL!

Model ASP adds 'punch' to your signal and helps your signal stand out from the crowd. Its famous r.f. clipping technique helps in two ways. **Firstly** it allows your transmitter to radiate more useful average power and **secondly** it improves the intelligibility of your speech in difficult conditions.
What's more, unlike other processors Model ASP is automatic. Simply push a button for the amount of processing you want. No input level control is required. Instead Model ASP's "intelligent" circuitry adapts automatically to your voice and microphone level. Model ASP, like all Datong r.f. clippers, installs in series with your microphone and works on any rig, with any speech mode, at any power level, and on any band. Don't just hear them, work them!
Prices: ASP – **£65.00** plus VAT (**£74.75** total); RFC – **£40.00** plus VAT (**£46.00** total); RFC/M – **£21.50** plus VAT (**£24.73** total).
***FULL DATA SHEET AVAILABLE FREE ON REQUEST.**

**Model ASP**




**Automatic Speech Processor**

## MORSE TUTOR

**Model D70**

Morse Tutor has a calibrated speed control **plus**, and this is vital, a separately adjustable delay between letters. Start at, for example, 12 words per minute but with a two second delay and just reduce the delay as you improve. It delivers five character groups of letters, numbers, or both together. The sequence is random so the supply is unlimited!

All this plus portability, built-in loudspeaker, personal earpiece and key jack. Only **£37.00** plus VAT (15%), inclusive price **£42.55**. Full data sheet free on request.

### Model UC/1 Up converter

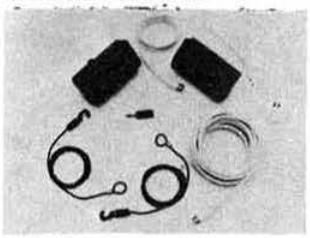
If you already own a good quality ten-metre or two-metre receiver or transceiver you are only £118 away from a really high performance general coverage receiver. Just add the magic ingredient, MODEL UC/1 from DATONG!
You get full coverage in thirty synthesised 1MHz segments from 60kHz (Rugby MSF) to 30MHz, at high sensitivity and with all the facilities and high performance of your existing rig!
For good measure UC/1 also adds two-metre coverage to ten-metre receivers. Price: **£105.00** plus VAT (**£120.75** total).

### Model FL1 Frequency Agile Audio Filter

**AS REVIEWED IN AUGUST ISSUES OF *"QST" and "73"***

A versatile add-on unit for communications receivers which helps to extract wanted signals from background interference. It connects in series with the loudspeaker or headphones. The effect is similar to "I.F. passband tuning" for SSB/or RTTY reception, and bandwidth down to 20Hz (with limited a.f.c.) gives an amazing capability for pulling weak CW stations out of the QRM. MODEL FL1 is unique in being able to tune itself when notching out unwanted whistles.
Price: **£53.00** plus VAT (**£60.95** total).

### Model AD170 Active Antenna



For sensitive reception right through from MSF at 60kHz to Band 1 TV DX around 50MHz, without the need for an antenna farm, MODEL AD170 is ideal. Designed for loft mounting, MODEL AD170 has no adjustments and needs no external tuning units.
Although only three metres long, MODEL AD170 has the same directional properties as a full size dipole, even at 60kHz.
Price: **£29.50** plus VAT (**£33.93** total); Special price complete with mains power unit: **£33.00** plus VAT (**£37.95** total).

★ **ALL PRICES QUOTED INCLUDE POST & PACKING** ★ **NEW SHORT FORM CATALOGUE AVAILABLE FREE ON REQUEST (QUOTE REF. RC8)** ★

## DATONG ELECTRONICS LIMITED

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# S.E.M.

P.O. BOX 6, CASTLETOWN, ISLE OF MAN. TEL: MAROWN (0624) 851277

## NEW RANGE OF SENTINEL POWER AMPLIFIER/PRE-AMPLIFIERS

**The secret of our new range is the very latest technique of PRINTED AIRLINES—these give lower losses and thus higher gain than other inductances e.g. striplines. They are used with the latest CQ (controlled Q) transistors. All feature straight through switching when OFF—a transistor bias circuit, rather than the usual diode, for better linearity and use on any mode. An R.F. switch which operates at 0·1 Watt with a delay for SSB use, and a socket for direct operation from the transceiver. Connectors are SO239s.**

### NEW SENTINEL '100' 2 METRE POWER/PRE-AMPLIFIER

**TRANSMIT** Eight times power gain e.g. 12W IN—96W OUT. Linear amplifier for use on all modes. Size only 6½" × 4" front panel, 3" deep plus heatsink on the back.
**RECEIVE** Same pre-amp as the Sentinal and Sentinal Auto 2 meter. See below for its performance. Price: **£126.50**

### NEW SENTINEL '30' 2 METRE POWER/PRE-AMPLIFIER

**TRANSMIT** 10 times power gain e.g. 3W IN-30W OUT. All modes. Size only 6" × 2¼" front panel, 4½" deep.
**RECEIVE** Uses the same well known circuit as our Sentinel range of 2 metre pre-amps. Read all about the performance below. Price: **£60.00**

### NEW SENTINEL '40' 2 METRE POWER/PRE-AMPLIFIER

This is our re-designed four times power gain unit e.g. 12W IN-48W OUT. Size: 6" × 2¼" front panel, 4½" deep. Price: **£66.70.**

### SENTINEL PRE-AMPLIFIERS

Our Sentinel range of pre-amplifiers use a J FET selected for a 1dB noise figure and 18dB gain. A typical N.F. for a 2 metre transceiver is 7-8dB. To overcome this noise and maintain the low noise for the Sentinel, 18dB gain is required. Our tuned circuits are 18 s.w.g. (1.22mm) air spaced to give high Q for selectivity. The owner of a very popular 'multimode' says not only has his Sentinel Auto made a big difference to wanted signals but it also removed the Police from 2 metres!

### SENTINEL AUTO 2 METRE PRE-AMPLIFIER

Connects straight into transceiver lead and the r.f. switch changes over automatically between transmit and receive—any mode. See above for spec. 12V nominal, size 2¼" × 1½" × 4". **£17.83*** Ex stock. 70cms version **£20.90*** Ex stock.

### SENTINEL STANDARD 2 METRE PRE-AMPLIFIER—

Same performance but without the r.f. switching. **£13.22***. 70cms version **£16.00***. Both Ex stock.

### PA3

Miniature 2 metre PRE-AMPLIFIER. Size 1 cu inch to fit inside your transceiver. N.F. 2dB GAIN 18dB. 9-15V. **£8.00** Ex stock. 70cm version **£10.00** Ex stock.

### S.E.M. Z MATCH

The updated unit uses much more reliable slow motion drives, which make adjustment and re-setting easy. It will match aerials of 15-500 ohms, to your equipment. BALANCED or UNBALANCED at up to 1kW. SO239 and 4mm terminals for co-ax or wire aerials. **£45.00** Ex stock.

### SENTINEL H.F. WIDEBAND PRE-AMPLIFIERS

2-40MHz 15dB gain. Ideal units for pepping up receivers on 15 and 10, for OSCAR reception and as an ACTIVE AERIAL. 9-12V supply-size 2½" × 1½" × 3". We make the following two versions.

**SENTINEL STANDARD H.F. PRE-AMPLIFIERS** Performance as above. **£10.00*** Ex stock.

**SENTINEL AUTO H.F. PRE-AMPLIFIERS** Same performance as above with a changeover relay operated by your transceiver relay for direct connection in your aerial co-ax. **£14.95*** Ex stock.

### S.E.M. FORWARD/REFLECTED POWER METER

F.S.D. 500W ½ scale 100W $\frac{1}{10}$ scale 1W 1-30MHz. Separate pick-up unit **£29.17** Ex stock.

### S.E.M. EUROPA C 2 METRE TRANSVERTER

200W input. 2dB N.F. Plugs straight into Yaesu equipment for any mode 2 metre use. **£126.65.** Repeater shift **£12.80.**

### CPS 10

for use with other equipment **£57.57.** Ex stock.

### CONVERTERS

**SENTINEL** 2 metre converter: IFs: 28-30MHz, 4-6MHz, 2-4MHz, 2dB N.F. 30dB gain. **£23.00.**
**SENTINEL X** 2 metre converters—same as above with internal mains supply!—**£26.50**
**SEM 70** 70cms to 2 metres—**£23.00**
**SENTINEL 70** 70cms to 28-30MHz **£28.00**
**SENTINEL TOP BAND** converters **£20.80.** All converters Ex stock.

*Prices include VAT at 15%. *Belling Lee sockets standard SO2385, £1.73 extra. Please ring or write for any information. 12 month guarantee. To order: C.W.O. or credit card. Phone your credit card number for same day service.*

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**RTTY ON NASCOM 1.** Auto letters/figs/RY/ test message/CQ/Selective call/PSE K. All on 2708 to fit spare Nascom socket. Full information on hardware mods. Programmed to your call sign. £21.00. J. Dalton, 67 Bargate Close, New Malden, Surrey.

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**BREDHURST ELECTRONICS**
**The High Street, Handcross, Haywards Heath, West Sussex**

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As a reader of Radio Communication you probably already know our product range and our attitude to product design: "Innovation and quality".

We are looking for a skilled Test Engineer who can work to the same exacting standard as the rest of the Datong team. In return we offer an excellent salary, very good working conditions including flexitime, plus job satisfaction.

Please write with details of your qualifications and experience to Dr. David Tong, Managing Director.

**DATONG ELECTRONICS LIMITED**
SPENCE MILLS, MILL LANE, BRAMLEY, LEEDS LS13 3HE

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| TRIO TS 520S | £542.00 |
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| YAESU FT 101ZD WITH DFC | £825.00 |
| TRIO TS 180S | £712.00 |
| TRIO TS 820S | £832.00 |

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| YAESU FRG 7 | £215.00 |
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| ADONIS AM 502 | £39.95 |
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| YAESU 148 | £22.95 |

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| ALL ASP MOBILE VHF | P.O.A. |
| MICROWAVE MODULES | P.O.A. |
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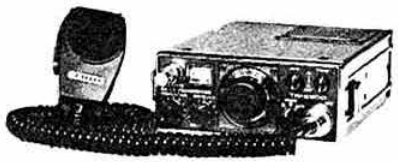

### 2 METRE FM

**THE TRIO TR-2300 £199** inc VAT & Carriage

combines all the advantages of a portable station with those of a sophisticated mobile rig. It is a fully synthesised 25kHz channelled 144-146MHz with facilities of reverse repeater and auto tone burst. The dial is directly calibrated in frequency and has switched illumination for use at night. External power and antenna sockets allow use as a fixed station when required. Complete with charger, carry case, shoulder strap, ex. power cord, etc for only **£199.00**. Nicad set **£10** extra.

**TS-120V (15W) only £408** inc VAT & Carriage

### MOBILE HF TRANSCEIVER

A superb, compact, lightweight, mobile transceiver equally suitable for home use. The front panel provides easy operation for all users. The digital readout gives accurate frequency display. The IF shift system is a powerful aid to removing adjacent channel interference. To truly appreciate this rig it should be seen and tried—no words can do it justice. For further information, or to order your transceiver, contact us at the above address. TS-120S (100W) **£495.00**.

**ACCESS • BARCLAYCARD**
**INSTANT HP • PART EXCHANGE**

### 2 METRE F.M. MOBILE

| | |
|---|---|
| ICOM IC 240 | £193.00 |
| FDK MULTI 700E | £229.00 |
| TRIO TR 7600 | £247.25 |
| YAESU FT 227R | £244.00 |
| TRIO TR 7625 | £273.70 |
| YAESU FT 227RBS | £295.00 |

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|---|---|
| YAESU FT 202R | £99.00 |
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| FDK PALMSIZER | £159.00 |
| ICOM IC215 | £162.00 |
| TRIO TR 2300 | £199.00 |
| AOR AR 240 | £199.00 |

### 2 METRE MULTIMODE

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|---|---|
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| FDK MULTI 3000 | £519.00 |
| TRIO TS-770 | £770.00 |
| ICOM IC 211E | £549.00 |
| YAESU FT 225RD | £615.00 |

### 2 METRE SSB

| | |
|---|---|
| MIZUHO SB 2M | £165.00 |
| TRIO TR 7010 | £193.00 |
| ICOM IC 202S | £199.00 |

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| | |
|---|---|
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| FDK TM 56B | £106.00 |
| BELCOM AMR 217B | £120.00 |
| HF 12 POCKET | £79.95 |

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|---|---|
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| SEARCH 9 | £59.00 |
| SR 11 | £87.00 |
| HF 12 | £79.95 |

### 70cm EQUIPMENT

| | |
|---|---|
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| TRIO 3200 | £189.00 |
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