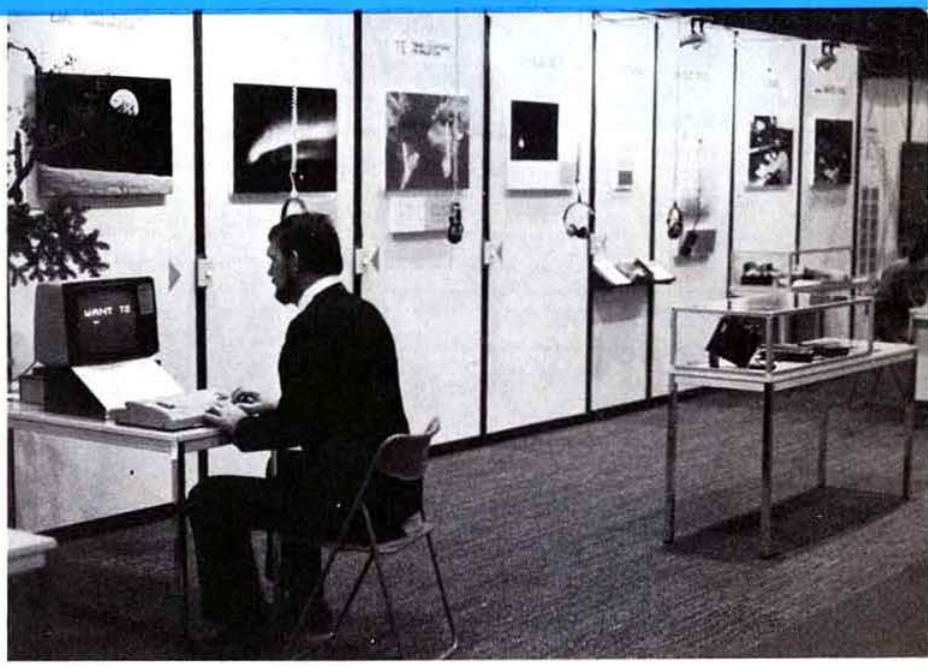
November 1979

radio communication

journal of the Radio Society of Great Britain

TELECOM 79

Photographs of the amateur radio stand



General view of the stand showing the taped introduction to moonbounce, aurora, transequatorial scatter and meteor scatter

German sstv, fstv, and a demonstration of the German narrow band tv

The microwave section

TRIO IN SOUTH LONDON
CATRONICS FOR TRIO
TRADE UP TO TRIO AT CATRONICS

TS520S
160m–10m TRANSCEIVER

TS520S Brief Specification

Frequency range:	160m to 10m Amateur Bands
Mode:	CW, USB, LSB
RF Input Power SSB:	200 watts PEP
CW:	160 watts DC
RX sensitivity:	10dB S/N at 0·25μV
Price:	**£542**
or	**£661** with dig. readout DG5

THE CENTRE FOR

TS770
ALL MODE 2M + 70CM

TS770 Brief Specification

Frequency Range:	144–146MHz 430–440MHz
Mode:	SSB (USB, LSB), CW, FM
RF Output Power:	10 watts Only for FM: 10W (Hi)/Approx. 1W (LOW)
Sensitivity:	SSB/CW 0·5μV for 10dB (S + N)/N FM 1μV for 30dB (S + N)/N
20dB quieting (FM):	Less than 0·4μV
Price:	**£775**

Catronics

The message we are trying to say is that Catronics Ltd is an authorised Trio dealer with the full service and spares organisation backed by Lowe Electronics Ltd

COME TO

SECOND HAND EQUIPMENT

We always have a selection of used equipment in stock, currently as follows:

SSR1	£115
TR2200GX	£115
SWAN 500	£310
TS700	£290

etc.

SEE US AT LEICESTER—STAND 3

TS120V
MULTUM IN PARVO

TS120V Brief Specification

Frequency Range:	80m to 10m Amateur Bands
Mode:	CW, USB, LSB
RF Power output:	10W PEP
RX sensitivity:	10dB S/N at 0·25μV
Power requirements:	Max. 4A at 13·8V DC
Price:	**£408**

AMATEUR RADIO

TR3200
PEAK PORTABLE PERFORMANCE

TR3200 Brief Specification

Frequency range:	432–436MHz
Channel spacing:	25kHz
Repeater shift:	−600kHz
Power output:	2W (HI) or 0·4W (LO)
RX sensitivity:	1·0μV for 20dB S/N
Tone burst:	1750Hz tuning fork (Automatic)
Price:	**£190** inc. charger

APPROVED TRIO DEALER

BARCLAYCARD VISA

We are 300 yards from Wallington Railway Station (London Bridge or Victoria). Frequent buses from Croydon and Sutton. Three large car parks within 100 yards. **Hire purchase facilities available on all equipment. Credit cards accepted.** Mail orders—normally dealt with on day of receipt. Securicor delivery arranged. All prices include VAT.

Access

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20 WALLINGTON SQUARE, WALLINGTON, SURREY SM6 8RG. Tel: 01-669 6700.
Shop/showroom open Monday–Friday: 9.00–5.30, closed for lunch: 12.45–1.45. Saturdays: 9.00–1.00.

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radio communication

November 1979 Volume55 No11

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PAUL
G3VJF

ICOM®

IC-211E IC-245E IC-701

THE LEADERS IN ALL SOLID STATE SYNTHESIZED RIGS

THE ONES WITH THE *FINAL* WARRANTY

2m
BASE
←IC-211E

IC-245E
MOBILE →

These three transceivers all use the patent Icom LSI chip to generate the operating frequency *digitally*—this gives you the stability of a crystal in a tunable rig. Coupling between the tuning knob and the logic controlling the synthesizer is optical. This is what gives the unhampered 'feel' to the large weighted flywheel knob used on the 211E and 701. The rate of tuning is varied electronically to provide rapid transit to the part of the band you want while maintaining superb fine 100Hz control for tuning in that SSB signal—this is equivalent to 5kHz per revolution at the slow rate. Being digitally controlled beasts all can be controlled remotely—either by using the RM3 (Icom's 'Computer' key pad), your own 'home brew' keypad or even your home computer. Thus it is much easier to add scanning etc at a later date.

All three transceivers employ broadband techniques which mean there is no pre-selecting, tuning and loading at all—giving instant transmit facility which means you get the Dx while the other chap is twiddling knobs—and this is achieved without loss of performance. The solid state PA's are protected against bad VSWR—but you won't get far with a rotten antenna! They are so reliable that we GUARANTEE THEM AGAINST FAILURE for 12 months. This same warranty applies to all components and labour costs on new equipment bought from us providing there has been no unauthorised tampering.

YOU CAN'T GO WRONG WITH ICOM

—SIMPLY THE BEST

IC-701
HF
£899

SEE THE WHOLE RANGE AT LEICESTER—Stand 7

ICOM®

DAVE
G4ELP

NOW YOU HAVE A CHOICE OF THREE ICOM SYNTHESIZED FM MOBILE RIGS FOR 2 METRES AS WELL AS THE IC-245E—WHICH COVERS FM AND SSB! SEE THEM ALL AT LEICESTER—Stand 7

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. **£193 inc. VAT**

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.

£250 inc. VAT **£260 with scanner**

IC-255E THE NEW ONE

We will have a demo model on show at Leicester and hopefully a few to sell. Features 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.

£255 inc. VAT

WHICHEVER YOU CHOOSE YOU CAN'T GO WRONG WITH ICOM

FROM **THANET ELECTRONICS** OF COURSE

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. And of course you can SEE IT ALL AT LEICESTER.

AGENTS (PHONE FIRST—All evenings and weekends only, except Yorkshire 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**—Don (022678 5031)

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YOUR SOLE AUTHORISED UK IMPORTER FOR ICOM

BARCLAYCARD VISA

THANET ELECTRONICS

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

Access

SEE THE ICOM® RANGE AT LEICESTER

(Stand 7)

1 IC-215

The highly popular portable which gives out a healthy 3 watts of RF and runs from sensibly sized batteries. With 15 channel capability it comes fitted with 12 pairs of crystals—All 10 repeaters + S20 and S22.
Less VAT = £140.87 Inc VAT = £162.00

---

2 IC-202S

The popular little SSB/CW portables which make the ideal rigs for portable or /A use when used barefoot with 3W out, or alternatively, as the signal from them is so clean, can be used as a prime mover for something bigger. The IC-202E ran USB and CW only, while the new IC-202S runs USB, LSB and CW.
IC-202S Less VAT = £173.03 Inc VAT = £199

---

3 IC-402

ICOM's new portable in the same style case as the IC-202 which runs 3 watts of SSB on 70cm! Again ideal as either a portable or as a prime mover for the base station. Continuous tuning of the second oscillator gives coverage over ranges 432·0-432·2 and 432·2-432·4 using a stable VXO circuit—see page 560 of July RADCOM for specs.
Less VAT = 255.65 Inc VAT = £294

---

4 IC-701

The ultimate in HF base station transceivers which is becoming very popular across the whole world. It uses a synthesizer to produce one of the nicest signals to be heard on HF. All solid state, with 200w DC input and complete with an electret desk mic. The ideal mobile rig—see our separate advertisement on page 561 of July RADCOM.
Less VAT = £695.65 Inc VAT = £800

---

5 IC-701PS

Mains PSU for the IC-701 complete with extra forward facing matching speaker.
Less VAT = £86.09 Inc VAT = £99

---

6 IC-SM2

A superb quality electret desk mic with a built-in pre-amp. Can be powered without modification from all ICOM equipment having a four-pin mic socket. Can also be used with other makes of equipment.
Inc VAT = £26

---

7 IC-211E and IC-245E

The fully synthesized two metre multimode which is now well known and very popular. Using the ICOM patent LSI chip, this rig, and its mobile partner the IC-245E can be interfaced with the microprocessor-controlled IC-RM3 to provide facilities just not possible with other rigs.
IC-211E Less VAT = £477.39 Inc VAT = £549 IC-245E Less VAT = £346.96 Inc VAT = £399

---

8 IC-RM3

The new and very popular remote controller for the IC-701, IC-211E and IC-245E. Using a microprocessor it provides facilities for scanning (the whole band or user selectable portions of it) and has four memories for frequency storage. Sorry about the waiting list, demand is greater than supply at the moment.
Less VAT = £86.09 Inc VAT = £99

---

9 IC-280E

The mobile transceiver introduced by ICOM for the man who wants the best and finds it difficult to mount most mobile rigs in his car. Gives full coverage of 2m in 25kHz steps with digital readout of frequency. Has all the qualities and virtues expected of ICOM equipment. The front panel can be removed and mounted elsewhere in the car using the special remote mounting kit which is available as an extra. Also available with scanner for £10 extra.

---

10 IC-255E

The new 25W super mobile to beat them all using the latest microprocessor technology to provide full band coverage, 5 memories, memory or user selectable band sections. See our separate ad for more details.
Less VAT = £221.74 With VAT = £255.00

Phone—or put a message on the ansafone for a colour catalogue and price lists

ALSO AVAILABLE FROM OUR SHOP IN HERNE BAY

MICROWAVE MODULES **ANTENNA SPECIALISTS**

J-BEAM **YAESU MUSEN** **FDK**

HP AND PART EXCHANGE WELCOMED

PAUL
G3VJF

ICOM®

IT'S HERE!! (OR SHOULD BE BY THE TIME YOU READ THIS)

THE MOBILE OF CHOICE FROM THE WORLD FAMOUS

ICOM STABLE — THE IC-255E

25 Watts—5 Memories—Scanning—600kHz AND User Selectable Repeater Shift—Full Coverage in 5kHz or 25kHz Steps

We have had a poke around one of these little beauties and are certain that ICOM, yet again, have come up with a winner. As you can see it has the expected smart ICOM appearance. Features include:-

- ★ Crystal controlled Tone Burst
- ★ Full band coverage—extendable to 148MHz if required
- ★ Four digit LED display
- ★ 25 Watts output or 1W low power.
- ★ A superb receiver using grounded gate FET front end
- ★ Scanning over a user programmable range
- ★ Memory scan
- ★ Stop on empty or busy channels
- ★ Tuning in 25kHz or 5kHz steps
- ★ 5 Memories—retained while the power is connected to the rig
- ★ Built-in 600kHz Repeater Shift
- ★ Alternative programmable shift
- ★ Reverse Repeater facilities
- ★ RIT (±3kHz) for those off channel stations
- ★ Scan control from the microphone (an optional mic available shortly
- ★ Good loud audio
- ★ Optically coupled tuning between control knob and CPU
- ★ Multiway 24 pin socket on back for touchpad, computer, or external control (note the current RM3 cannot be used but a new version is to be introduced)
- ★ Rugged modular PA (Guaranteed of course!)
- ★ Mobile mount which can be padlocked

At £255 including VAT these are such value for money that demand may exceed supply for a while—but they are worth waiting for! (Delivery is free of course by Registered First Class Letter Post.)

FROM THANET OF COURSE

ICOM®

DAVE
G4ELP

INTRODUCING A SELECTION OF OTHER PRODUCTS AVAILABLE FROM

THANET

"NEW" 747 AIRCRAFT BAND SCANNING RECEIVER

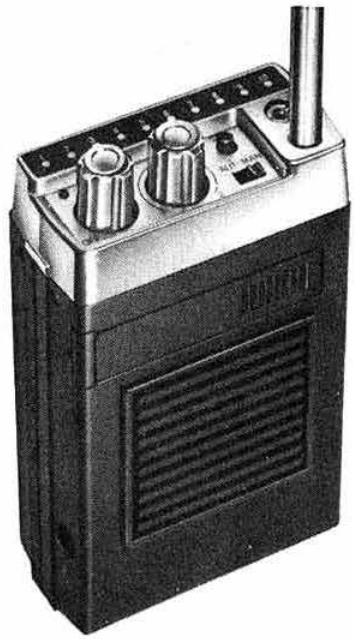
Features:
16 channel capability
Scanning or manual selection
Operates from either 240V ac or 13·8V dc
Includes built-in swivel telescopic antenna. Socket for connections to external antenna
Built-in speaker and jack for connection to external speaker
Delay facility to ensure that the whole of the conversation is received
Swivel car mounting-bracket supplied

Price £119.00 including VAT fitted with 4 channels.
Additional channels **£2.00** each.

"NEW" TSI VHF FM AUTO SCANNER

Features:
10 channel capability
Covers Marine or Amateur or High Band—state which
Very small pocket sized
Telescopic antenna (removable)
External antenna socket
Earphone that can serve as an antenna too
Nicad rechargeable batteries 4·8V included
Carrying case

Price £51.10 inc. VAT. Charger and holder/antenna coupler available **£9.20**
Crystals Marine and Amateur **£1.84**



LESON MICROPHONES

TW23 Desk mic ceramic 0-30dB variable compression £25.00
DH18 500 Ohms Hand mic moving coil £5.10
CH229 Hand mic ceramic 0-35dB. var. compression..... £15.40
DH233 Hand mic moving coil 0-15dB preamp £9.20
Vicom noise cancelling mic, moving coil very effective..... £8.00

MORSE KEYS

BK semi-automatic bug key..... £20.35
HK706 Hand Key..... £12.15
MK704 Manipulator Key..... £12.25
GB Key..... £10.00

TYPE APPROVED MARINE EQUIPMENT

ICOM ICM25D Synthesized 24 channel 25 Watt ..... £299 incl.
SMC Mariner 1 Watt portable 6, 8, 16 fitted + nicads and base charger .. £199.00
V8001 1 Watt portable 6-16 nicads, charger + H.D. case..... £189.75

BARCLAYCARD VISA

THANET ELECTRONICS

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

Access

LOWE at LEICESTER

NEW! 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.

ASK ABOUT OUR NEW CREDIT CARD—

LOWE at LEICESTER

NEW! TR2400

The TR2400 is a futuristic 2 metre FM handheld transceiver incorporating a large LCD frequency display, 800 channel operation from 144–148MHz, 10 memory channels and a host of frequency control systems (including scanning) all designed around a microcomputer. The sophisticated design makes the TR2400 the ideal handheld to meet all repeater or simplex operation for the 2 metre man.

FEATURES

1. Large LCD digital frequency readout. Clearly readable even in direct sunlight, with back illumination for night use. Virtually no current drain (unlike LED displays) so display stays on all the time. Shows RX and TX frequencies and memory channels. Also included in display are indicators for "an air", "memory recall", "battery status" and "lamp".

2. Frequency control functions. Keyboard entry of any frequency from 144–148MHz in 5kHz increments. Up/down manual scanning from 143·9 to 148·495 in single or fast continuous 5kHz steps.

3. 10 memories (retained by battery backup), one of which can be used as a non-standard repeater shift. Automatic scanning of all ten memory channels is provided, and scanning can be for a busy channel or the next free channel.

4. Full repeater operation and also instant reverse repeater operation at the touch of a switch.

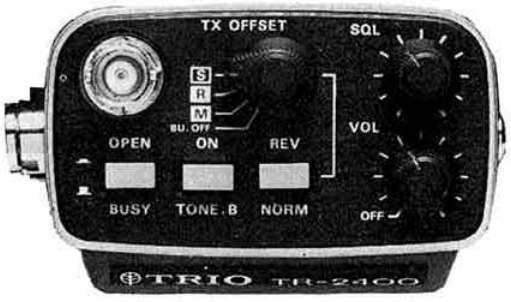
5. Built-in 16 key touch tone encoder for the advanced repeater systems.

6. Lock switches are provided to prevent misoperation of the keyboard and also to disable the press to talk switch.

7. Power output of over 1·5 Watts to a BNC aerial connector (flexible whip supplied as standard).

8. Superb mechanical design in the Trio tradition of top engineering, based on a die cast frame for real drop proof performance.

The TR2400 is the best available; would you expect less than the best from Trio?



THE INSTANT WAY TO GET THAT NEW RIG!

LOWE at LEICESTER

TRIO TS120V £408 inc. VAT

Measuring only 9¼" × 3¾" × 9¼"—which is about the size of a packet of cornflakes, the TS120V can best be described as a miniature TS820. The rig covers all bands 80-10 metres—and all of 10 metres 28-30MHz so it's ideal for transverter driving, has digital readout built in, vox, break-in CW, RIT, noise blanker and the unique Trio passband tuning system used in the 820. The power output is 10W and a matching linear will be along shortly.

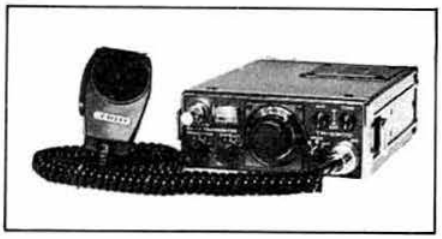
The TS120V is clearly a winner for mobile operation but is equally attractive at home and is perfect for the VHF/UHF enthusiast who requires a high performance I.F. system for his transverters.

The transceiver is based on an advanced PLL system and the digital readout gives you the *correct* operating frequency at all times unlike many other rigs. Remember my previous comments about Trio attention to detail!

For ease of operation, the TS120V is unsurpassed; simply select the band required, tune the VFO to the frequency you want and there you are; no preselector or PA tuning to worry about, and a distinct safety feature for the mobile operator.

OR MAYBE EVEN LOOK AT THE NEW TS120S WITH 200 W PEP TS120S £495; PS30 £98 inc. VAT

TS120V—TS120S THE SYSTEM APPROACH FROM TRIO



TRIO TR2300 £199 inc. VAT

The TR2300 is a remarkable package which combines all the advantages of a portable station with those of a sophisticated mobile set. With the TR2300, you get full band coverage from 144-146MHz in fully synthesized 25kHz channels together with 600kHz repeater shift (and reverse repeater if required) with automatic 1750Hz tone burst.

The dial is directly calibrated in frequency and has switched illumination for ease of use at night.

The transmitter puts out a very clean signal at a power of one watt, and the receiver is very sensitive, in fact better than many big rigs. The external power and external antenna sockets allow one to use it as a fixed station when desired.

The TR2300 is amazingly small, much smaller than its predecessor the TR2200GX and uses a more sophisticated case design and modular construction making a really rugged rig. It comes complete with carrying case, shoulder strap, battery charger, external power cord, etc. Needless to say, you don't need any crystals!

TR 7600/25

The TR7600 is the newest 2 metre FM transceiver from Trio and is equally at home in mobile or fixed station use. Using up to the minute techniques, the TR7600 offers full coverage of the 2 metre band in 5kHz steps together with a built-in memory channel, repeater shift, tone burst and the very best engineering in the business.

The transmitter uses a power module instead of the usual PA transistor and this removes the need for PA and driver alignment thus ensuring peak performance at all times. The receiver uses the latest devices in the front end and mixer stages together with a ceramic discriminator for better than ever performance.

The new RM76 microprocessor controller plugs into the back of the TR7600 and extends the transceiver facilities even further. Some of these facilities are:

1. Key in any frequency in the 2 metre band.
2. Call up a permanently programmed calling channel.
3. Scan the entire band in 5kHz steps with the option of finding a busy channel or a clear channel.
4. Set lower and upper scan limits, e.g. set to scan between 145·5 and 145·6 only.
5. Put up to six frequencies into memories.
6. Scan the memorised channels.
7. Use the last memory channel as a non-standard repeater shift, e.g. 1·6MHz.
8. Select + or − 600kHz repeater offsets.

Clearly it's semiconductor magic at its best and makes a winning combination with the TR7600.

Final note—there is a high power version of the TR7600 having 25 Watts output—so naturally it's called the TR7625. Now for prices.

TR7600—£247.25 TR7625—£273.70 RM76—£74.50

and as always, our prices include VAT at the current rate.

LOWE at LEICESTER

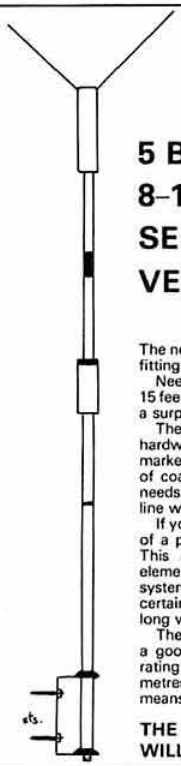
TS 770

We are truly sorry that the home market demand for the TS770 has delayed delivery of this exciting new rig to the British market. However, by the time you read this, supplies may well be on the way.

It's worth waiting to see this all-mode 2 metre/70cm dual bander which has every possible facility including the ability to work crossband.

Microprocessor control gives not only fully synthesised operation (in 20Hz steps so you can't tell it from a VFO) but also up to eight memories which can be selected or scanned; twin VFO system; scan mode in 5kHz steps for FM and search mode in 200Hz steps for SSB and so much more.

See it at Leicester (and see the new Trio receiver there).



HF5

5 BANDS
8–10 METRES
SELF-SUPPORTING
VERTICAL

The new HF5 vertical aerial is a real answer to the problem of fitting a five-band aerial in a small space.

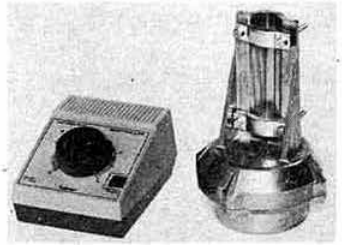
Needing only a metal ground post, and being only around 15 feet high, the Lowe HF5 gives you real DX performance at a surprisingly low cost.

The HF5 is made from strong alloy tubing with stainless hardware and unlike some other verticals currently on the market, gives a 50 ohm match at the base so that any length of coaxial feeder may be used. Beware the vertical which needs a critical feeder length, it's simply a disguise for a feed line with a high SWR.

If you need to mount the HF5 up at roof level or on the top of a pole, a matching five-band radial system is available. This system comprises a loading coil and alloy radial elements so as to reduce the space taken up by the aerial system. The cost of this radial kit is lower than the HF5 and certainly a lot more convenient than trying to stretch out long wire radials across the roof.

The HF5 system gives you coverage from 80 to 10 metres, a good 50 ohm feed impedance and a reasonable power rating of 200W on 80 and 40, rising to 500W on 20, 15 and 10 metres. Weight of the assembled aerial is around 3kg (which means that you can lift it with ease).

THE HF5, A WINNER ALL ROUND (IF YOU WILL EXCUSE THE PUN) £41.40 inc VAT



ROTATOR FU200

£40.39 inc VAT

The FU200 is a low-cost rotator designed expressly for the VHF/UHF enthusiast. Capable of turning most VHF/UHF aerial systems, the FU200 uses a fully automatic controller to allow "hands off" operation. The control knob is turned to the direction desired, the "operate" button is pressed and the rotator quickly and quietly takes up the new direction, automatically switching off when the chosen direction is reached.

The FU200 is housed in a rugged die-cast case and is supplied complete with upper and lower mast clamps and all fixing hardware.

Rugged, reliable and not expensive, the FU200 is the ideal rotator for the dedicated VHF/UHF operator.

SUNDRY GOODIES YOU CAN'T BE WITHOUT

		PRICE inc VAT £	P&P £
ME221	Station multimeter 20K/V	16.49	0.75
RA144	2 metre receiver preamp	9.05	0.15
P.S.U.	Regulated 13·5V dc 3·5 amp	18.40	1.00
P.S.U.	Regulated 13·5V dc 700 mA	10.93	0.75
FC-5M	5 digit 50MHz counter with I.F. offset.	41.40	0.30
FC6-A	250MHz counter. Switched gate time.	66.70	0.30
DX-008	Fully programmable counter for any rig	115.00	1.25
LCM-1	500MHz counter 240V/12V	115.00	1.25
Tool kit	Complete eight piece kit in case	8.49	0.75
Punch kit	Set of five chassis punches and reamer	8.63	0.75
Pearl catch	For picking up small nuts, etc	0.98	0.15
Microphone clip	Screw fixing	0.21	0.15
Microphone clip	Self adhesive	0.25	0.15
Microphone clip	Magnetic	0.31	0.15

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AR240	synthesised 2 metre handheld	**£165 inc VAT**
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alda 105

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This Includes:
- Mobile Mounting Bracket
- Hand Microphone
- Noise Blanker
- Calibrator

BRIEF SPECIFICATION OF THE ALDA 105

Bands: 80-10 metres. Input Power (p.e.p.): 250W (200W on 10/15m). Power required: 13·8v DC (nominal) at 15A (receive 5·5W, transmit 260W). Dimensions: 3¼"(82·5mm)H × 9"(228·5mm)W × 12½"(317·5mm)D. Weight: 8¼lbs(3·66kg).

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NEW! **EMOTO 502 SAX**

The EMOTO 502

is now available with a new-style control unit featuring:

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8-way control cable **36p**/metre *plus* **£1.50** carr *plus* VAT

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PEAK READING (PEP) WATTMETERS NOW—BRITISH PATENT PROTECTED!
PM-2000 (HF) £51.75 **PM-2001 (VHF) £51.75**

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DX-103	3-el 10m beam	**£69.00**
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DX-32	2-el tribander	**£80.50**
DX-33	3-el tribander	**£121.90**
DX-34	4-el tribander	**£161.00**

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BA-1	1:1 Balun	**£9.20**
BA-4	4:1 Balun	**£9.20**
AT-40	40m traps (per pair)	**£9.20**
DC-1	Dipole centre kit	**£5.75**

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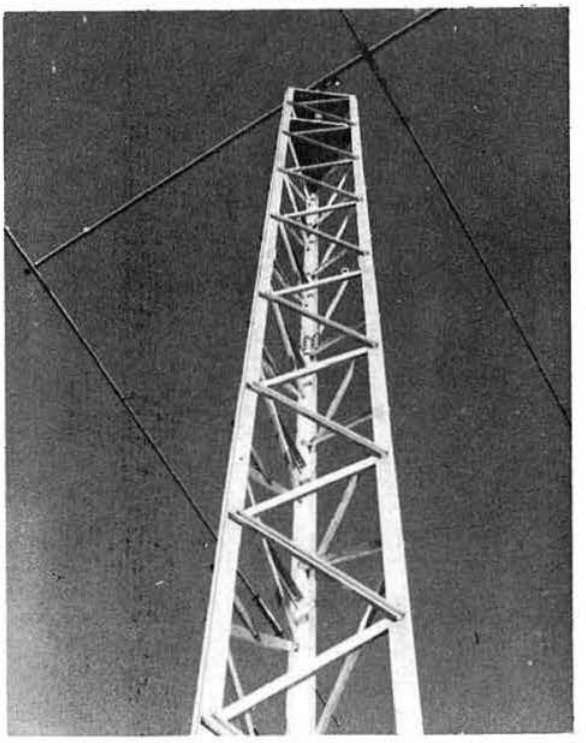
Price list on request

The UNIQUE ALUMAST LIGHTWEIGHT ALUMINIUM MAST



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★ Guyed models to 250ft ★ Built-in climbing rungs
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* Carriage extra on accessories not bought with mast

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TS-180S

ALL SOLID-STATE HF SSB TRANSCEIVER

The TS-180S with DFC (Digital Frequency Control) is an all solid-state HF SSB/CW/FSK transceiver with every operating feature a DXer, contest operator or any amateur would desire for maximum flexibility on the 160 to 10 metre bands. Its highly attractive and functional design will enhance the appearance and efficiency of any shack. Operating directly from a 13·8V DC supply, this compact, lightweight, high-power (up to 200w PEP input) transceiver is also suitable for mobile operation. Even with its advanced functions, the TS-180S with DFC is very easy to operate, thanks to sophisticated digital technology and two built-in microprocessors.

DFC Expands Frequency Control Function. The TS-180S with DFC provides more operating flexibility than any other HF Amateur transceiver. DFC is much more than the frequency memory function found in other transceivers (which just memorizes and recalls desired frequencies). DFC is designed around a dual-circuit PLL composed of a 4-bit microcomputer and four memories, usable in transmit and/or receive modes. Memory-shift paddle switches allow any of the memory frequencies to be tuned in 20Hz steps up or down one step at a time, or at slow scan speed, or fast scan speed, while retaining the original stored frequency for recall. After the memory frequency is tuned, the new frequency can be memorized if desired, simply with the touch of a button. It's like having four remote digital VFOs, in addition to the built-in analog VFO (with digital readout). Three of the four memory frequencies can be retained with the memory backup system (using an owner-supplied silver-oxide battery) when the supplied power is turned off. Even with the 20Hz shift function, oscillator (VCO) output has good linearity and purity because of a carefully designed dual-PLL system and crystal filter. RIT (receiver incremental tuning) is available on all memory frequencies, on the one fixed frequency, and with the VFO. The memories allow split-frequency operation (common with some DX pileups) with the TS-180S VFO or with the VFO-180 remote VFO. The digital display shows the memory frequency being used, whether in receive or transmit mode, or the TS-180S VFO frequency, or the fixed-channel frequency, or the remote VFO frequency, whether or not RIT is utilized. The microprocessor-controlled digital display shows the actual VFO frequency. When that frequency is stored in the "M1" memory, the digital display can be switched to indicate the stored frequency and the difference between the stored and VFO frequencies (with signs to show VFO above or below stored frequency).

Western PRICE £795 **PS-30 PSU £89.00**

ACCESSORIES INCLUDE: VFO180 VFO; AT-180 ATU; SP-180 SPEAKER

TS-120S and TS-120V

TWO OTHER COMPACT WINNERS FROM TRIO

- ★ Big rig features in a compact package
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- ★ 10-80 metres SSB/CW
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- ★ 200 Watts PEP input (TS-120S) or 25W PEP input (TS-120V)
- ★ A mere 12·3lbs (11·7lbs for 120V) of compact efficiency.

TS-120V £399 **TS-120S £485**

Accessories available:

MB-100	Mobile Bracket	£16.85	PS-20	(PSU for 120V)	£49.00
SP-120	Remote Speaker	£23.50	PS-30	(PSU for 120S)	£89.00
VFO-120	Remote VFO	£91.00	AT-120	Antenna Tuner	£68.00

TRIO TS-820S

The pacesetting 10-160m Transceiver for the amateur who wants to keep up-to-the-minute! Loaded with features to make your operating even more enjoyable; among these are:

- ★ Advanced PLL circuitry and ultra-stable VFO for accurate and spurious-free frequency control
- ★ Factory-fitted digital readout of TRUE frequency—NOT just a "VFO counter" like some others
- ★ Speech processor gives true RF compression; front panel controlled and fully metered
- ★ IF shift to combat QRM on a busy band

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- ★ Built-in telescopic antenna, helical whip available extra
- ★ Built-in battery pack for nicads (10 × AA) or dry cells (9 × HP7)
- ★ Battery charger, carrying case, DC supply lead included
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Yes—The Yaesu FT-901DM is all of this . . .
Superb performance and state-of-the-art features makes the '901 a dream to own and operate under today's conditions.

- ★ Digital frequency display and memory circuit for transmit and receive frequency control giving the ultimate in versatility
- ★ Variable IF bandwidth, tunable rejection notch and audio peak frequency tuning for optimum receiver performance under all conditions
- ★ Efficient RF speech processor for enhanced transmission efficiency
- ★ Built-in Curtis electronic keyer
- ★ All-mode operation—including FM
- ★ Built-in AC and DC (12v) power supplies

YAESU FT-7B £415

A High-Performance HF mobile transceiver at a realistic price.

- ★ Small size, lightweight
- ★ All solid-state 50 watts output
- ★ 80-10 metres SSB/CW/AM
- ★ Audio peak filter for CW
- ★ Single knob peaking of all circuits
- ★ Optional YC-7B digital display

YAESU FT-101ZD £639

- ★ Latest in a famous line of HF transceivers
- ★ Digital frequency readout
- ★ QRM-beating Variable IF Bandwidth
- ★ High performance RF processor
- ★ Rugged 6146B PAs with RF negative feedback
- ★ Full band coverage 160-10 metres
- ★ Compatible with all '901 accessories

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PS-7	Power supply for TR-7	**£159.85**
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L-7	Linear160-10m 2kW	**£747.50**
MN-7	ATU/CSWR/RF Wattmeter 250 watts	**£115.00**
MN-2700	ATU/CWSR/RF Wattmeter 2kW	**£184.00**
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TR-4CW	(RIT) Last version of the famous Transceiver	**£496.80**
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TS820	160-10m transceiver 200W PEP	710.00	3.75
DG1	Digital readout to 100Hz	122.50	1.00
SP820	Speaker	39.00	1.50
VFO820	External VFO	123.50	3.75
YG88C	CW filter 8 pole	38.00	.50
DS1A	12V dc inverter	43.00	1.00
R820	The ultimate matching receiver to the TS820	790.00	3.75
YG455C	CW filter 500Hz	61.50	.50
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SP520	Speaker	18.00	1.25
VFO520S	External VFO	103.00	3.75
YG3395C	8 pole CW filter	40.00	.50
DG5	Digital display/counter	119.50	1.50
DK520	Conversion for older TS520	10.50	.75
TS120S	80-10m mobile transceiver 200W PEP	495.00	3.75
TS120V	80-10m mobile transceiver 20W PEP	408.00	3.75
PS20	AC power supply for TS120V	52.00	3.75
MB100	Mobile mounting bracket	17.00	.75
YK88C	500Hz CW filter	29.00	.50
SP120	External speaker	25.50	1.25
VFO120	External VFO	93.00	3.75
AT120	Antenna tuner (100W)	69.00	1.50
PS30	AC PSU for TS120S	98.00	3.75
AT200	1·8-30MHz antenna tuner	95.00	1.50
SM220	Monitor scope	246.00	3.75
BS5	TS520 scanboard for SM220	49.50	.50
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TL992	HF linear amplifier 160-10m/2kW PEP 2×3-500Z tubes	797.50	3.75
MC50	De luxe desk microphone dual impedance PTT locking bar	27.50	1.50
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MC30S	500 ohm fist microphone	13.30	.50
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SP70	Matching speaker	20.50	1.00
VFO700S	External VFO	92.00	3.75
TS770	2m/70cm all mode dual bander	t.b.a.	
TR7500	2m FM mobile 10W transceiver PLL with all 80 FM channels	240.00	3.75
TR7600	2m synthesised mobile/fixed transceiver 10 watt	247.25	3.75
TR7625	2m synthesised mobile/fixed transceiver 25 watts	273.70	3.75
RM76	Microprocessor control unit	74.50	1.00
PS6	AC PSU for TR7500/7600	59.50	3.75
TR2300	2m FM portable transceiver PLL with all 80 FM channels	199.00	3.75
VB2300	10W booster	59.30	1.00
MB2	Mobile mount	18.90	1.00
RA1	Helical rubber antenna	6.90	.25
VB2200GX	10W PA for TR2200G/GX	46.00	1.00
PS1200	Power unit and charge TR2300/3200/2200GX	29.50	1.00
TS180S	160-10m solid state transceiver	712.00	3.75
TS180S	As above but with digital frequency control	825.00	3.75
VFO180	External VFO	120.75	1.00
SP180	Speaker	42.70	1.00
DF180	Digital frequency control	t.b.a.	
AT180	1·8-30MHz antenna tuner	t.b.a.	
PS30	AC power unit for TS180S	98.00	3.75
TR8300	70cm FM mobile 10W transceiver fitted 4 channels	250.00	3.75
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B7-7E	Battery pack	34.50	1.75
The above five scopes are complete with matching probes.			
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AG202	Sine/square audio generator. 20Hz-200kHz	82.80	3.75
AG203	Sine/square audio generator. 10Hz-1MHz	132.00	3.75
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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.

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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.

36p IN STAMPS BRINGS YOU THE LATEST YAESU GLOSSY CATALOGUE WHICH GIVES FULL SPECIFICATIONS TOGETHER WITH DETAILS OF THE EVER-GROWING YAESU RANGE—AND AS AN ADDED BONUS YOU WILL GET OUR CREDIT VOUCHER VALUE £3.60—A 10-1 WINNING OFFER!

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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.

NEW TRIO TS770 £TBA

If you're a VHF or UHF enthusiast, this must be the transceiver for you. The Trio TS770 is the ultimate, all-in-one station for 144-146 and 432-440MHz operation. A complete "state of the art" package, embodying many unique features, including digital readout, dial braking, dual speed tuning, dual VFO control, split frequency working, electronic band changing, eight memory channels, scanning of 1MHz segments or the eight memory channels, 100kHz search switch for CW/SSB, frequency lock switch, plus all the more usual features that you have come to accept as standard from Trio. The net result is a one package station that costs little more than 2 metre base station plus 70cms transverter – but it is a lot more flexible. No wonder everybody has been waiting for this one – it's simply the ultimate!

NEW TRIO R-1000 £TBA

At last the Trio R1000 has been announced – a real purpose-built receiver for the serious short wave listener. 200kHz to 30MHz in 30 bands. This receiver has many features that are not available on other models and, of course, has the technical backing of the world's largest manufacturers of amateur communications equipment. Features include: 1kHz digital readout and separate analogue dial, large high quality speaker, digital 12 hour clock – AM and PM, three separate filters for razor sharp selectivity, noise blanker (try finding this on any other receiver!), automatic preselector tuning via the 1MHz band switch, three-stage attenuator, dimmer control, tone control, timer circuit, and all this in a diminutive package measuring $12\frac{1}{2} \times 4\frac{1}{2} \times 8\frac{1}{2}$ in. Trio have now solved the problem of choosing a receiver – there is no choice – it's got to be Trio!

TRIO TR7500 £240

THE MOBILE RIG WITH 80 CHANNELS

Also new models TR7600 **£247.25**
TR7625 **£273.70**

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

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

ALSO 2 metre Palmsizer **£149**
2 metre Palm II **£99**
Sae for details

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.

DenTron

HF200A
80–10m
Transceiver
£395
PSU £95

WATERS & STANTON ELECTRONICS

NEW PREMISES!

When you read this, our new premises should be fully operational and we will have on show the largest selection of new and used amateur radio equipment in the South East. And if you are a Trio fan, don't forget that we not only stock their amateur products but also their Hi-Fi. In fact, if you are at all interested in electronics, we have probably got something to interest you; so why not pay us a visit and see everything that's good in amateur radio. And remember, there's no parking problems—we have a large car park at the rear. Whether you're new to amateur radio or an old timer, we'll be happy to assist and advise you as to your needs. We don't employ high pressure sales techniques so if you simply want to come and browse or show the XYL what you want for Christmas, you'll be more than welcome.

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	£496.00 (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	£96.00 (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-7000 Digital readout receiver	£375.00 (N/C)

LOWE RECEIVER

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

ICOM

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)
MML 432/50w	£113.75 (N/C)

SEM

2m converters	£23.00 (N/C)
70cms converters 144 IF	£23.00 (N/C)
2m pre-amp	£14.95 (N/C)
2m auto switching pre-amp	£19.50 (N/C)
70 cms auto switching pre-amp	£22.63 (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)

All pre-amps fitted SO239 sockets

HF auto pre-amp 2-40mHz	£16.68 (N/C)
HF pre-amp 2-40mHz	£11.73 (N/C)
HF Z-MATCH ATU 80-10m	£45.00 (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 (New PII price!)

Multi 3000 2m All mode	£495.00 (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	£99.95 (N/C)
M-11/Q16 xtals £5.00 Palm II xtals £3.00	
Multi-Palmsizer 2m synthesised 40 channel hand-held	£149.00 (N/C)
Palm IV 70cms	£159 (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	£165.00 (N/C)

MIZUHO (NEW LOW PRICE!)

2m SSB 1 watt portable	£135.00 (N/C)
Extra xtals	£3.00

NAIGAI (NEW LOW PRICE!)

2200 2m 500w PIP linear	£429.00 (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	£120.75 (2.50)

All prices include VAT at 15%
Coming soon! 16 and 20 amp power supplier £69 and £95. Phone for details

Mustang 2Kw 20-15-10m	£149.50 (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	£31.00 (1.00)
Mosley RD5 SWL ham dipole	£36.30 (1.00)
EL-40X 80-40 Mini dipole	£39.50 (1.00)
HF5 5 band vertical	£41.50 (1.00)

VHF ANTENNAS (JAYBEAM)
PRICES INCREASE 19th NOVEMBER

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)
Stolle 2050	£39.95 (1.50)
SWL ATU	£16.50 (0.75)
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	£271.40 (15.00)
PNAM-2 Telescopes to 14¼m	£331.20 (16.00)

SAE for details.

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YAESU

FT101ZD

TOP PERFORMANCE BASE STATION DESIGN

FT1012D Digital & Analogue Readout
FT101Z Analogue Readout Version

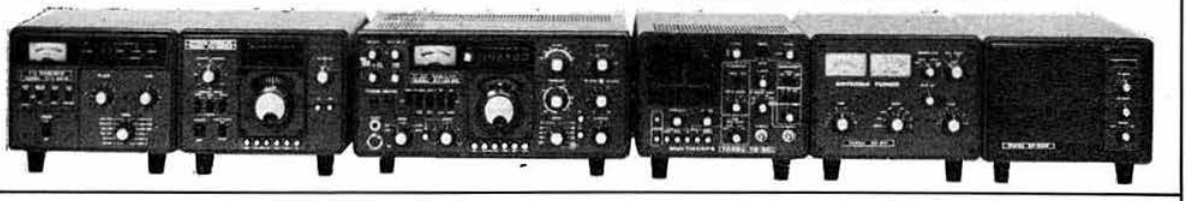
The "Z" series is base station design at its best, a no compromise, go anywhere unit of the highest quality. The FT101ZD is an all new design using today's technology backed with the 101 name—The name of the world's most popular amateur transceiver.

A remarkable list of accessories is available to complement the FT101ZD, part (reading from left to right) is shown below. The FTV901 transvertor, a single box covering 70, 144 and 432MHz repeater shifts Oscar etc; the FTV901DM external VFO—40 memory channels ±50Hz stability AWU; the FT101ZD itself; the YO901 monitorscope which in addition to AF, IF and RF monitor provides panoramic (spectrum analyser) facilities with a FT901DM; the FC901 Antenna tuner and power/SWR meter; the SP901P external speaker with phone patch (normal speaker SP901) available. Not shown is the YR901 morse/RTTY decoder/interface, the YVM-1 video display unit or the FL2100Z linear amplifier.

For further details of this exciting new unit please contact any of our authorised sales outlets, for a free colour brochure.

- ★ 160–10 metres plus WWW plus auxiliary band
- ★ Variable IF bandwidth 2.4kHz down to 300Hz
- ★ 8 pole filters for razor edge selectivity
- ★ Selectable CW fixed bandwidth CW-W and CW-N*
- ★ Semi-break in with sidetone for excellent CW
- ★ Digital ≙ plus analogue frequency displays
- ★ 6146B PA's with 6dB of negative feedback
- ★ 180W PIP and -31dB 3rd order intermodulation
- ★ RF speech processor fitted—adjustable level
- ★ VOX built in and is adjustable from the front panel
- ★ Wide dynamic range for big signal handling
- ★ High usable sensitivity, for those weak ones
- ★ Superb noise blanker—adjustable threshold
- ★ Attenuator; 0–10–20dB, front panel switch
- ★ AGC; slow-fast-off, front panel switchable
- ★ Clarifier (RIT) switchable on TX, RX or both
- ★ Diecast front panel and heavy duty case
- ★ Heater switch for battery conservation
- ★ Low level transvertor drive output facility
- ★ Ergonomic design and position of controls
- ★ Universal power supply 110–234V AC and 12V DC*
- ★ Int/Ext VFO and 2 crystal control frequency
- ★ 345W × 157H × 326D mm and 15kg

≙ *options on Z.* * *option on Z and ZD.*



WORKING FOR OUR COMMON INTERESTS—at Yaesu Musen Amateur Radio equipment is not a sideline but the only business. Over 130 licensed amateurs proudly produce the most diverse product line available, SSB, CW, AM or FM for mobile, portable or base use.

DEPEND UPON

ASCOT ANTENNAS

This is a complete range of mobile antennae and accessories developed and manufactured in the United Kingdom.

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

NB: *Complete aerial consists of base plus whip plus mount.*

PICK THE TYPE ($\frac{1}{4}\lambda$ 0dB, $\frac{5}{8}\lambda$ 3dB, $\frac{1}{2}\lambda$ 3dB)

$\frac{1}{4}\lambda$ (4/2/70)	340	STANDARD BASE :	60–550MHz	£2.10
	310	SWIVEL BASE :	55–500MHz	£3.50
	344	SPRUNG BASE :	50–120MHz	£5.55
$\frac{5}{8}\lambda$ (2m)	440	STANDARD BASE	140–200MHz	£3.50
	330	SWIVEL BASE	137–200MHz	£4.45
	341	SPRUNG BASE	132–200MHz	£6.65
$\frac{1}{2}\lambda$ (2m)		STANDARD BASE	135–175MHz	£4.80
	350	FINE TUNE BASE	130–175MHz	£7.15
	351	SPRUNG 350 BASE	125–175MHz	£8.25

SELECT THE WHIP (Stainless steel)

057	127cm TAPERED: $\frac{1}{2}$, $\frac{5}{8}$, & $\frac{1}{4}$ 70MHz	£1.95
056	63·5cm PARALLEL: $\frac{1}{4}\lambda$ 144–432MHz	£0.95

CHOOSE THE MOUNT

(Magnetic Mount & Assemblies c/w 4·5m Coax)

$\frac{1}{4}$ OR $\frac{5}{8}$	085	STANDARD CABLE ASSEMBLY MOUNT	£2.80
	095	FIBREGLASS MOUNT TO SO239	£2.10
	092	MAGNETIC MOUNT	£8.95
$\frac{1}{2}\lambda$ ONLY	084	STANDARD CABLE ASSEMBLY MOUNT	£4.15
	088	COWL MOUNT TO SO239	£4.95
	091	MAGNETIC MOUNT	£9.80

ADD AN ACCESSORY *(if required)*

(Mounts fit both the standard cable assemblies)

098	GUTTER CLIP ADAPTOR	£4.75
093	BOOT LIP ADAPTOR	£2.90
031	BLANK OFF COVER $\frac{1}{4}\lambda$ and $\frac{5}{8}\lambda$	£0.80
044	BLANK OFF COVER $\frac{1}{2}\lambda$ only	£0.45

LIKE THE PRICES? THEN:

ADD VAT 15% and p&p. (Antennas £1.00, accessories only £0.50).

Ascot antennas are available; mail order from SMC HQ in Totton, personal callers to any branch (Leeds, Chesterfield, Woodhall Spa), SMC agent or reputable amateur radio dealers throughout Britain.

SOUTH MIDLANDS COMMUNICATIONS LTD

OSBORNE ROAD, TOTTON
SOUTHAMPTON SO4 4DN

Telex: 477351 SMCOMM G
Tel: Totton (0703) 867333 (3 lines)

THE ORIGINAL

VERSATOWERS

TELESCOPIC & TILTOVER

STRONGER

WINDSPEEDS UP TO 117mph

Twelve years of continuous development has produced a range of over 50 models, all of which conform to the current B.S.S., requiring *minimum* designed wind speeds of 85mph and up to 117mph.

Available between heights of 25–120ft post, base plate, wall, fixed base or mobile on high-speed trailers.

Before purchasing a Tower, we strongly recommend consulting one of our engineers for advice regarding the most suitable combination for an installation. *It would be incorrect to nominate a specific headload as this is dependent upon load distribution, geographical location and siting.*

P40ft £276.75 +VAT 15%

P60ft £335.90 +VAT 15%

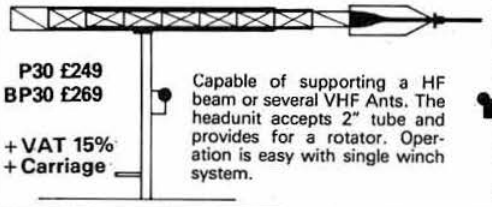
STANDARD SERIES POST MOUNTING

P40HD £416.20 +VAT 15%

P60HD £472.50 +VAT 15%

HEAVY DUTY SERIES POST MOUNTING

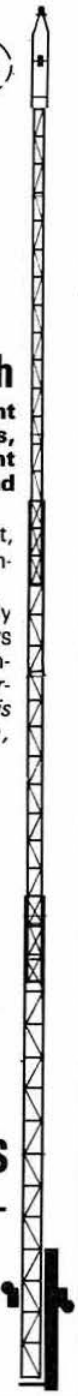
NEW '30ft': 10ft SECTIONS



P30 £249
BP30 £269

+VAT 15%
+Carriage

Capable of supporting a HF beam or several VHF Ants. The headunit accepts 2" tube and provides for a rotator. Operation is easy with single winch system.



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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**

SMC

SOUTH MIDLANDS COMMUNICATIONS LTD

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SMC's STAND AT THE LEICESTER EXHIBITION (Granby Halls, Leicester, 10am–6pm, 8, 9 10 NOV) SHOULD BE THE BEST, AND BIGGEST, EVER

WE HAVE INTRODUCED MANY NEW LINES DURING THE YEAR

FT101Z, FTV901, YR901, B108, MP2, 2050, QTR24D

★ HF5, HF5R, SMC78, SMC258, CX420, YC7B, MML432/50 ★

HAVE YOU SEEN THEM ALL YET?

VHF LINEARS

HF TRANCEIVERS — VHF HANDHELDS

PEP WATTMETERS — NEW — HF ANTENNAS

VHF TRANSVERTERS — VHF ANTENNAS

CONNECTORS RELAYS

We will launch (if at all possible) at the Show FT207R Synthesised Hand Held, FT107 HF Transceiver, FL2100Z Linear Amplifier, YVM1 Video Monitor, amongst other new items

AS LEICESTER IS THE HAUNT OF THE GREATER BARGAIN HUNTER WE HAVE BEEN COLLECTING FROM OUR AGENTS AND BRANCHES

INVENTORY RATIONALISATION

EX-DEMONSTRATION — STOCK CLEARANCE

EVALUATION SAMPLES — BARGAINS — SHOP SOILED

DISCONTINUED LINES — PACKAGE DEALS

OBSOLESCENT OBSOLETE

FT101E, YC221, FF50DX, QTR24, SMC73, RT75D, T203, FTV250, FT101EX, FV101B, FL2100B, FL101, FP2AC, FT301SD, Multi U11, LINER 2, APB57A, FR101DD, FP301D, YO100, LL301, AR22, AR30, AR33, HAM 11, 2010, 2030, 2021, SP101PB, KP202, Dig II, LINER 430, ME521, PA10-160BL, YC601, YO301, should, with others, be available. This is the opportunity to pick up these accessories at

UNREPEATABLE PRICES

REMEMBER: When you buy from SMC, you have the assurance of dealing direct with the importer. Spares and service back-up, free Securicor delivery and a Two-Year Guarantee on New Yaesu*. The convenience (as at the show) of using Access and Viza. The speedy arrangement of Hire Purchase and a whole host of benefits you never think about—until you need help

SOUTH MIDLANDS COMMUNICATIONS LIMITED.

OSBORNE ROAD, TOTTON
SOUTHAMPTON, SO4 4DN
Hours of business
9-5.30 Monday-Friday
9-1.30 Saturday

Head Office, Showrooms
Cables: Aerial Southampton
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	GM8GEC	Jack	Edinburgh	(031665) 2420
	GI3WWY	Mervyn	Tandragee	(0762) 840656
	GW3TMP	Howarth	Pontybodkin	(035287) 846/324
	GW4GSW	Alan	Swansea	(0792) 24140

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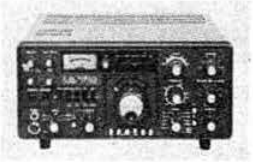
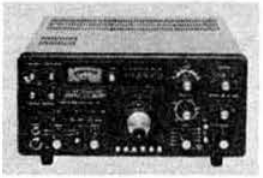
YAESU MUSEN FOR THE RANGE OF EQUIPMENT

FT901DM Ultimate HF Tx/Rx **£853.50**
FT901D £737.50 **FT9010E £737.50**



FT101Z HF Tx/Rx **£500.00**

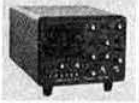


FT101ZD Digital HF Tx/Rx **£575.00**

FT7B Mobile HF Tx/Rx **£375.00**
YC7B Digital Readout **£61.00**

FC901 £115.00
Antenna Tuner

SP901P £44.50
SP901 £24.00



YO901 £236.00
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Circa £365

NEW
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VIDEO MONITOR
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FRG7000 0·25-30MHz Rx **£327.00**

FRG7 0·5-30MHz Rx **£187.00**

CPU2500RK 25W 2m FM **£308.00**

FT202R 1W 2m FM
6 chn **£103.50**

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FT227RXS £258.00
2m scanning FM Tx/Rx

FT207R £173.00
2m Synthesized 12·5kHz

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Desk Microphone

YD148 £18.50
Desk Microphone

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25kHz conversion
for FT227RB

SMC
SCANNER £45.00
For FT227R
with lock out, etc

YM21 £12.00
Noise cancelling Mic

FP4 £35.00
4Amp 12V PSU

YP150 £58.50
Wattmeter/Load

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"THE COMMUNICATORS"

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	⅝λ	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 & ¾	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 ½ 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, ½ λ Gutter clip	£17.15

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

4Y/4M	4 element yagi	£14.95	5XY/2M	5 element crossed	£18.00
PMH2/4M	2 way harness	£10.60	8XY/2M	8 element crossed	£22.50
D15/23	15 over 15 slot	£26.90	10XY/2M	10 element crossed	£29.80
UGP/2M	Ground Plane	£8.15	PMH2/C	Circular harness	£5.90
C5/2M	Vert Colinear	£34.80	PMH2/2M	2 way harness	£7.80
5Y/2M	5 element yagi	£8.90	PMH4/2M	4 way harness	£18.70
8Y/2M	8 element yagi	£11.50	C8/70	Vert. Colinear	£39.50
10Y/2M	10 ele long yagi	£24.70	D8/70	8 over 8, slot fed	£17.80
14Y/2M	14 ele long yagi	£31.50	PBM18/70	18 ele. Parabeam	£21.50
PBM10/2M	10 ele Parabeam	£29.20	MBM48/70	48 ele. Multibeam	£24.50
PBM14/2M	14 ele Parabeam	£35.50	MBM88/70	88 ele. Multibeam	£32.60
Q4/2M	4 element quad	£18.70	8XY/70	8 element crossed	£27.00
Q6/2M	6 element quad	£24.80	12XY/2M	12 element crossed	£33.50
D5/2M	5 over 5, slot fed	£15.90	PMH2/70	2 way harness	£6.75
D8/2M	8 over 8, slot fed	£21.60	PMH4/70	4 way harness	£14.30

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	GQCK11	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 braid, c/w 75ft feeder	£32.50
HP1K	High Power – 14 SWG	£29.00			

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, ⅛"	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	8¼" polyprop. ribbed	£1.85	IP3	3" Porcelain ribbed	£0.48

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

WTS	Standard – White	£9.85	WHTB	"Space Saver", 3-5MHz resonance, for 1-8MHz	£7.50
WTHP	High Power – Blue	£8.25			

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
UG176/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	UG491	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 1⅝"	£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, ⅛" 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%

⅛"	BS150 lbs (circ.)	yd £0.07	¼"	BS1250 lbs (circ.)	yd £0.14
¼"	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 copper wire	£0.44
¼"	Bulldog, galv.	£0.16			

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

¼"	D galvanised	£0.24	⅜"	D galvanised	£0.33
⅛"	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	1¾"	Galv. for steel	£0.15

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

	4" × ⅛" pressed	£0.75		6" × ⅜"	£2.85
TPR933	4½" × ⅛"	£1.65		Miscellaneous	P.O.A.

GUY STAKES (Carriage £1.00) + VAT 15%

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

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%

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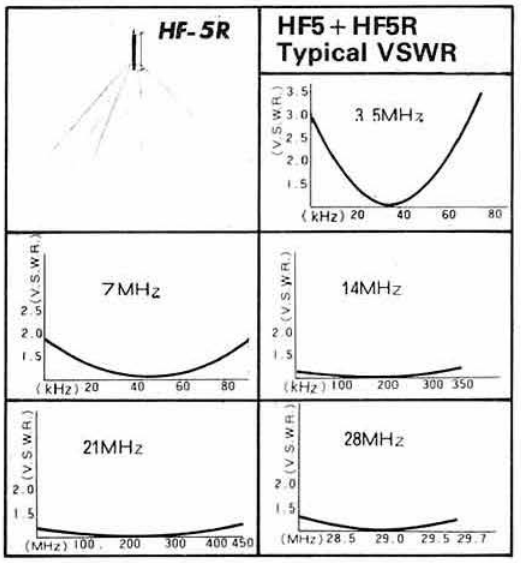

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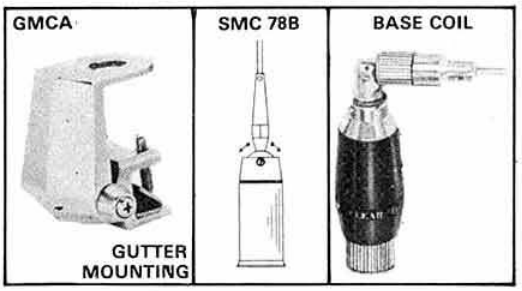

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BAND	21MHz	28MHz	28MHz	144MHz	144MHz	144MHz	432MHz
TYPE	(¼λ)	(¼λ)	(¼λ)	⅝λ	⅞λ	⅞λ	⅝λ + ⅝λ
GAIN				3dB	4·5dB	4·5dB	5·5dB
POWER	130W PEP	100W PEP	200W PEP	100W PEP	100W PEP	150W PEP	100W PEP
LENGTH	1·72m	1·27m	1·72m	1·30m	1·75m	1·72m	0·94m
WEIGHT	430gm	360gm	430gm	220gm	400gm	440gm	190gm
PRICE	£11.00	T.B.A.	£11.00	T.B.A.	£10.00	£11.00	£10.00

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RSGB NEWS BULLETIN 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	G3MCF	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

QTC
amateur radio news

Region 2 ORM

The Region 2 ORM, which took place on 29 July at Scarborough Technical College, proved that an ORM held during a rally can be a success—a substantial number of members attending. Those present heard reports from, and addressed questions to: Dr Dain Evans, G3RPE, immediate past-President; Basil O'Brien, G2AMV, zonal manager; David Evans, G3OUF, general manager; David Pratt, G3KEP, Observation Service organizer; and Dave Smith, G4DAX, regional representative.

Following the various officers' reports, and a description of headquarters' services by G3OUF, G3KEP gave a description of the Observation Service, and said that he was pleased to report that the number of actual repeated licence contraventions was very low.

A discussion period ensued, with many members' opinions noted for consideration by Council, covering such topics as: *Radio Communication* delivery; elections; late contest results; equipment and component costs, and possible monopolies and profiteering; WARC, and publicity. On the last subject the meeting decided that recent cb publicity necessitated greater publicity for amateur radio, to educate the public in the differences between amateur radio and cb, and to move away from the "Hancock image".

The meeting closed with a vote of thanks to the officers present.

Telecom 79

Amateur radio was represented at this event, the 3rd World Telecommunications Exhibition, by a stand almost 100ft long illustrating every technical aspect of amateur radio. The organizers were the CERN ARC, which devoted considerable effort to producing the display. The RSGB contributed some recently-produced publicity material, a display featuring the University of Surrey satellite project, and demonstrations of wide-band fm and narrow-band fm on 10GHz. (See front-cover photographs)

In connection with the exhibition, which was held in Geneva from 20 to 26 September, prior to the opening of WARC 79, an amateur radio seminar was held at which Dr D. S. Evans, G3RPE, gave a lecture on microwaves. The seminar was opened by M. M. Mili, secretary-general of the ITU.

"An inexpensive high-Z accurate transistor voltmeter"

The author of this article, published in the May 1979 issue of *Radio Communication,* has supplied the following information:

The method of calibration described could give rise to some inaccuracies depending on the instrument used to check the 1·5V cell. Therefore the following setting-up procedure should be used, and this will ensure that on the 100mV range the meter will be calibrated to 100mV±1·25 per cent.

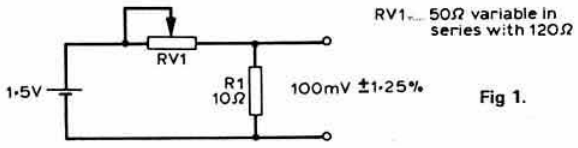

Fig 1.

Connect an Avo 9SX on its 50μA range across R1 (10Ω) in Fig 1. This Avo will read 125mV on this range. Adjust RV1 until the Avo reads 100mV. Remove the Avo, and the voltage across R1 will be 100mV±1·25 per cent. Note, if a meter other than a 9SX is used then check that it reads 125mV on the 50μA range. Now proceed as in the article but calibrate the meter on the 100mV range instead of on the 10mV range. Hence one can be certain that the maximum error is 1·25 per cent on the 100mV range, and amps are also calibrated to this error on this range.

In addition, the value of R13 should read 2·4kΩ, not 2·4kΩ in series with 100Ω.

JUST PUBLISHED

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Obtainable from RSGB Publications (Sales)

Stolen equipment

The following equipment was stolen from the Decca ARG Portakabin on the Decca Sports Ground, Tolworth, Surrey, on 27/28 September: Yaesu FT221R, serial number 7E100283D; Yaesu FT101, serial number not known, fitted with two fixing screws and knurled nuts on case for mobile mounting, and RS Components headphone jack; KW103 swr/power meter, serial number not known. Any information to DC Pierce, Surbiton Police Station, tel 01-399 7310.

The following equipment was stolen in September from the car of Mr P. S. Duncan, G3TKA, 18 Pickering Road, Hull HU4 6TL: Icom IC22A, serial number 4823; has tubular wax-coated capacitor of unknown value mounted on the toneburst board but not connected.

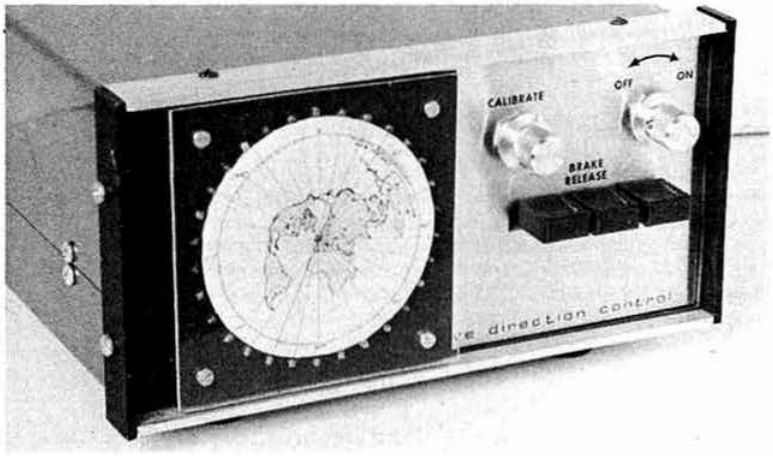
G5 Amateur Radio Club

This club is being formed by a group of G5 amateurs in East Anglia, its purpose being to enable foreign amateurs to obtain the necessary information on licensing in the UK without delay or difficulty. In addition the G5 ARC will start an awards programme, have vhf and hf nets, and possibly organize dxpeditions. The G5 club will be integrated with other UK clubs, and will be open to all G5 licensed amateurs.

Any G5 wishing to obtain more information about the club should contact Mr R. H. Arland, G5CSU, 10 Apple Close, Lord's Walk Estates, RAF Lakenheath Camp, Brandon, Suffolk IP27 9PJ.

Simple beam-heading display

by G. N. FARE, G3OGQ*



ONE of the difficulties of using a beam antenna is knowing which bearing to use to contact a particular dx country. The RSGB *Amateur Radio Operating Manual* contains a list of countries with beam headings, but it takes time to look up and a simpler and quicker way is to take a great circle map and read off the bearing.

The author's display combines the great circle map with leds, which light up to indicate the heading of his beam, spaced around the circumference. It is designed for use with a CD44 or Ham 2 rotator, but can no doubt be used with other rotor control systems which normally use a meter to display the heading.

The great circle map may be of any size, but in the interests of space saving and convenience, a display occupying the position on the control box normally occupied by the meter is very convenient and neat. It has the disadvantage that the map is necessarily small, but several months' use has proved that it is nevertheless quite adequate.

It is very much easier to read than a meter and, although some accuracy is sacrificed, it is well within the beam width of the average amateur antenna.

*"Cobblestones", Walton Old Hall, Walton, Warrington, Cheshire, WA4 6SZ.

Circuit

The design uses only two low-cost UAA170 ics and 30 miniature leds. This number of leds will give a spacing of 12°, although it is quite possible to interpolate the reading to give 6° by turning the beam until two adjacent leds are equally illuminated.

The UAA170 is designed to drive a led display line when an analogue control voltage is applied. Two are connected in parallel to drive 30 leds. A dc voltage applied to pin 11 determines which discrete led is illuminated, and therefore by

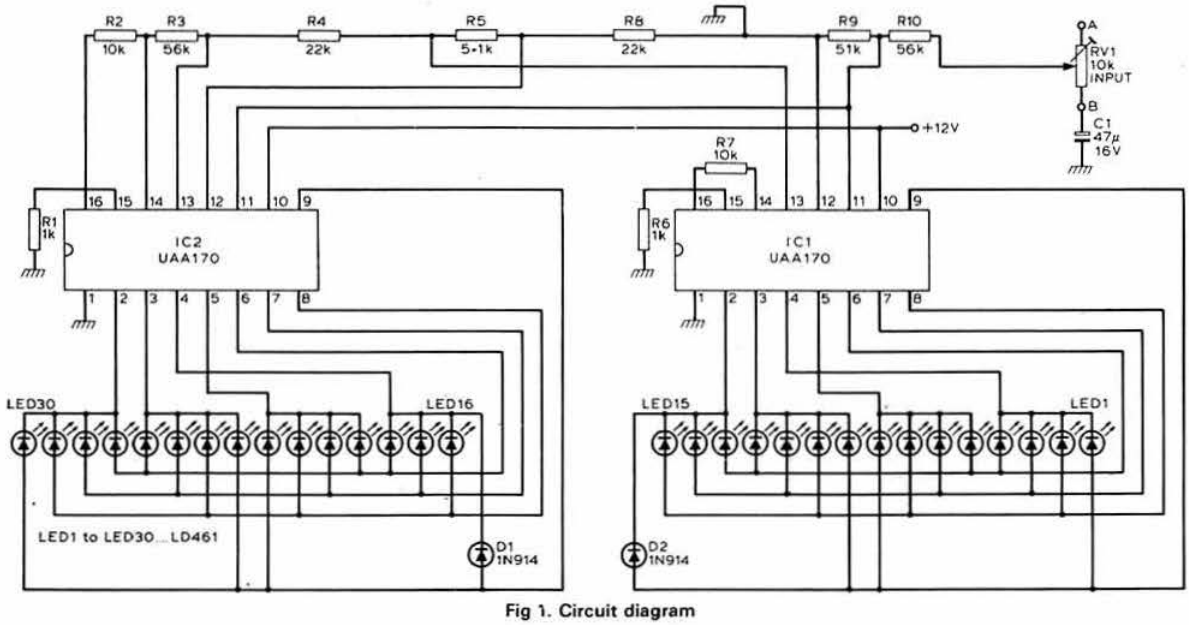
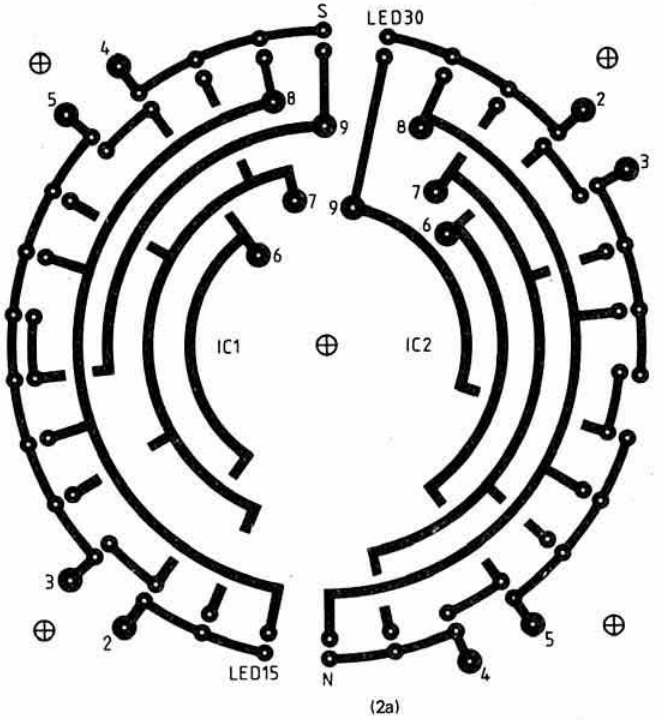
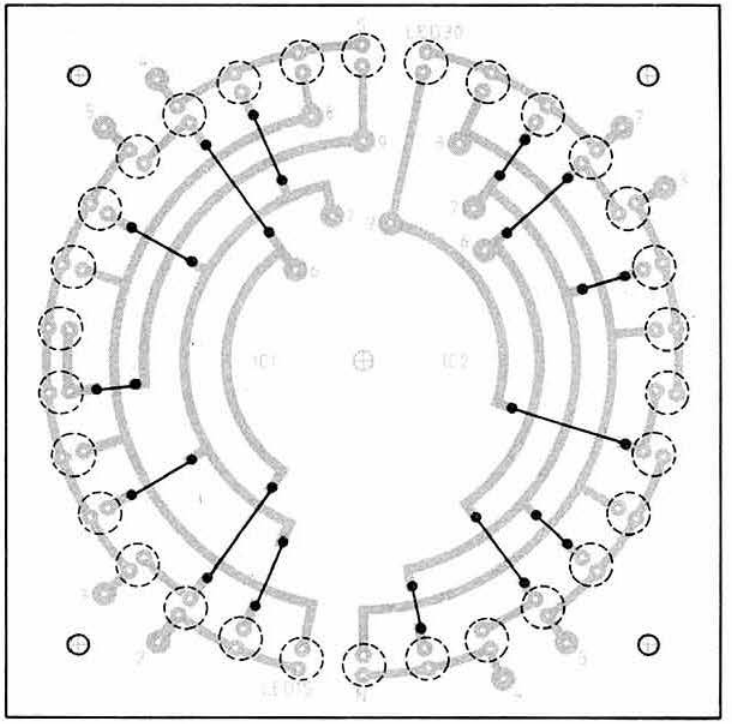
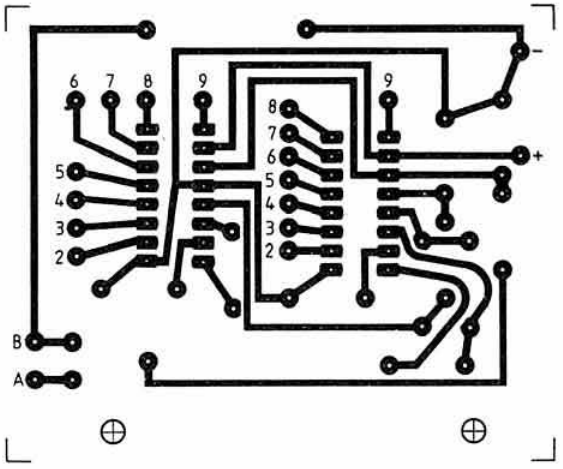


Fig 1. Circuit diagram







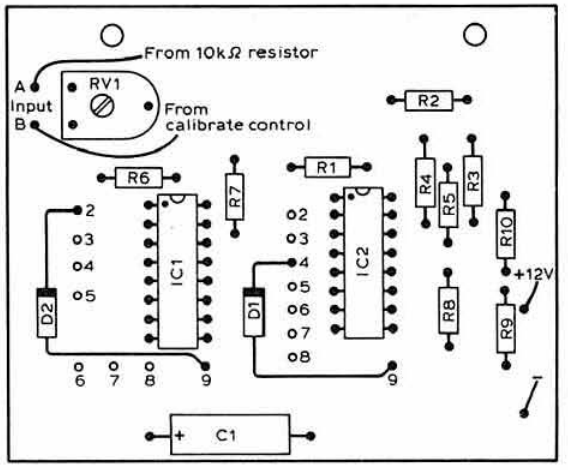
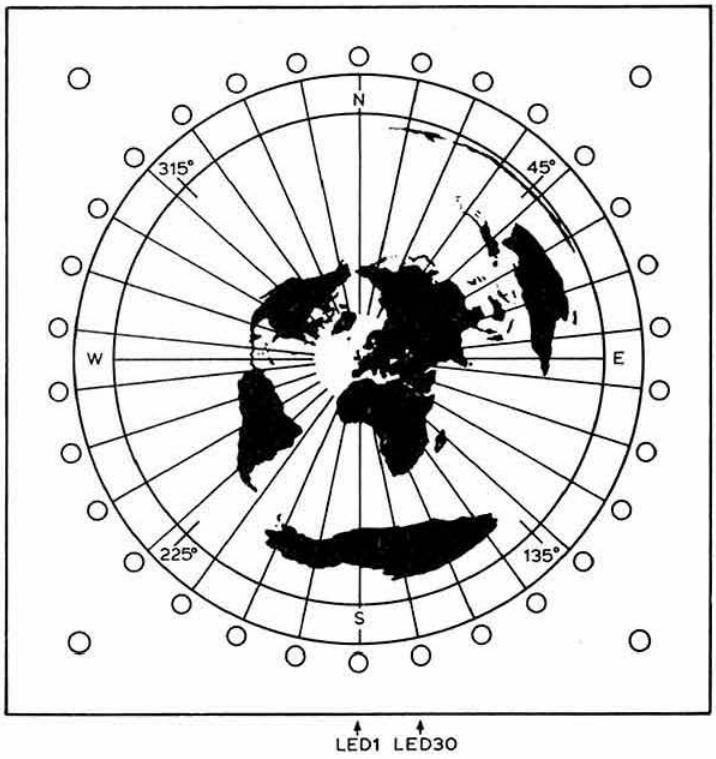


Fig 2. PCB display board, actual size. (a) top side, (b) showing links

Fig 3. Logic pcb (copper side, actual size) (left) and component layout (right)



Components list

R1, 6	1kΩ	0·25W 5%
R2, 7	10kΩ	
R3, 10	56kΩ	
R4, 8	22kΩ	
R5	5·1kΩ	
R9	51kΩ	
RV1	10kΩ	
C1	47μF 16V electrolytic	
C2	2,200μF 16V electrolytic	
D1, 2	Silicon IN914 etc	
IC1, 2	Siemens UAA170 (Electrovalue Ltd)	
LED1-30	LD461 0·1 matrix (Electrovalue Ltd)	
T1	Mains transformer 12V 50mA	
Bridge rectifier	40PIV 1A	

Fig 4. Front panel display, actual size

varying the dc voltage a line of leds can assume the function of an indicator scale.

The range of control voltage for two ics is 0 to 5V, and this is obtained by means of a potentiometer fitted in place of the meter. The voltage range of the indicator in the CD44 or Ham 2 unit is 0 to 13V, and the potentiometer is tapped to give 0 to 5V. The existing calibration control is retained, and all other functions of the rotator are unchanged.

A single UAA170 can drive a string of 16 leds, but normally, when using only one ic, the last diode remains illuminated when the control voltage exceeds the range of the ic. This necessitates an overlap of the control ranges of the ics so that LED16 and LED17 (Fig 1) can be removed from the normal scale indicator and replaced with silicon diodes, leaving 30 leds in the display. This is achieved by choosing the reference resistors between pins 12 and 13 so that LED18 is illuminated simultaneously with LED16 as the next highest led after LED15, and similarly LED15 as the next lowest led after LED18.

Construction

The display and logic are mounted on two separate single-sided printed circuit boards.

The display board measured $3\frac{1}{4}$ by $3\frac{1}{4}$in (95 by 95mm) and a full-size template is shown in Fig 2. Links are made with insulated wire soldered in the positions shown and pressed flat against the board. All the diodes are mounted on the plain side with the cathode pin on the outer circle.

The logic board measures 3 by $2\frac{1}{4}$in (75 by 56mm), a full size template being shown in Fig 3. Connections between the two boards are made with colour coded wire.

The great circle map is shown full size on the drawing of the front of the pcb (Fig 4). This is mounted on thick card which is in turn glued to the front of the pcb. It helps easy recognition if the land masses are coloured green. A piece of perspex $\frac{1}{16}$ in thick is fixed to the front by four bolts to improve the appearance and keep the map clean. The meter and lamp are removed and the display is fixed in its place on the front panel.

In the author's case, to avoid drilling the front panel, the display pcb was fixed by means of a piece of 0·5 by 0·5in aluminium angle 4in long placed on the inside of the front panel and fixed with a bolt through the centre of the display pcb (before mounting the great circle map). This angle is also drilled to take the logic board, which is mounted horizontally. The two wires which were originally connected to the meter are now connected to RV1 on the logic board; the wire coming from the calibration control being connected to terminal B.

Power supply (Fig 5)

It was not possible to make use of the existing power supplies, so a new 12V supply was fitted underneath the chassis. There is plenty of space to fit a miniature transformer and the other

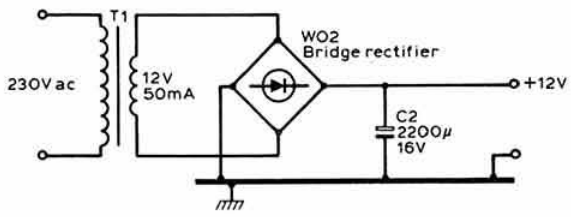


Fig 5. Power supply circuit

components. The rectifier and smoothing capacitor are mounted on a tag strip fixed to the bolts holding the small existing transformer in place. Positive and negative supplies are taken to the logic circuit board.

Testing and calibration

The easiest way to check the operation of the circuit is to mount a temporary potentiometer of between 500Ω and 5kΩ between terminals 3 and 7 of the connection strip at the rear of the unit, with the rotor grounded to pin 1.

Switch on the control box and rotate the potentiometer to one end of its travel. Adjust RV1 on the logic board until the most southerly led is illuminated and the one next to it is just extinguished. Rotating the temporary potentiometer will cause the leds to illuminate sucessively until south is reached again, which should be at the end of its travel. If this is not so, leave the temporary potentiometer at the end of its travel and again adjust RV1 until the most southerly led is illuminated, as described above. The unit should now work correctly.

Problems

Capacitor C1 on the logic board was introduced to bypass induced ac voltage on the control wires when the motor is running, which causes more than one led to be illuminated at a time. If this problem arises try reversing the wires to RV1 or increase the smoothing capacitor in the indicator power supply.

The value of R5 determines the changeover point from IC1 to IC2. If the transition is not smooth, try changing the value of this resistor. A temporary 10kΩ potentiometer can be inserted in its place and adjusted for a smooth changeover between leds 15 and 18 (due north). A fixed resistor should then be inserted after measuring the resistance of the potentiometer.

Conclusion

In use there is no difference between this display and the meter it replaces as far as controls and calibration are concerned. However, the ease by which a beam can be set makes one wonder how one managed without the display before. The cost is minimal, all parts are readily obtainable, and one will be well rewarded for the couple of evenings' work it takes to construct the display. □

Third overtone ladder crystal filters

by J. A. HARDCASTLE, G3JIR*

Introduction

Crystal filters, both ladder and lattice, are usually designed to operate at the fundamental frequency of the constituent crystals, which tends to limit the operating frequency to the range below 20MHz. However, it was recently suggested to the author by Akira Kobayashi, JA1JIX, that the overtone modes might also be used, enabling even higher frequency filters to be constructed. To support his suggestion he enclosed a quantity of 34·16MHz miniature crystals which were used to obtain the following results.

Crystal measurements

Before attempting to make a ladder filter it was considered to be desirable to check the frequency difference between the series and parallel resonance at the third overtone. If this is less than 3–4kHz, approximately, it is unlikely to be possible to make a filter with a 2·4kHz, −3dB bandwidth.

The crystal test circuit is shown in Fig 1. Fortunately a sufficiently high frequency signal generator was available, but the 34·16MHz filter output had to be converted to 4·16MHz to allow an hf wave analyser to be used as a calibrated detector.

The crystal's series resonant frequency may be found by tuning the signal generator for maximum output, and the parallel resonant frequency, which is slightly higher, is indicated by a sharp dip in output. However, the series resonance peak is relatively broad and a more precise indication can be obtained by comparing the phase of the signals at the input and output. This is done by connecting two test probes from a double-beam oscilloscope to either side of the crystal. It is now possible to tune for the frequency at which the two signals are in-phase, which is the series resonant frequency. Using this test method the resonance is well defined and the measurements are readily repeatable.

Typical results of these measurements are:

Fundamental mode:

f_s 11,383·5kHz; f_p 11,404kHz; $f_p - f_s$ 20·6kHz.

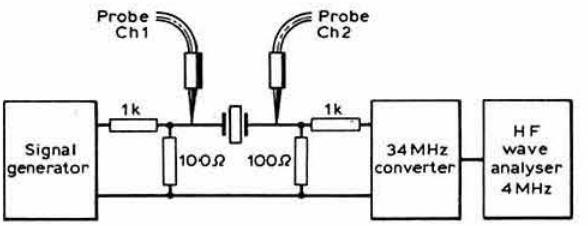


Fig 1. Crystal test circuit. High impedance (1MΩ) oscilloscope probes are used to measure the phase difference between input and output

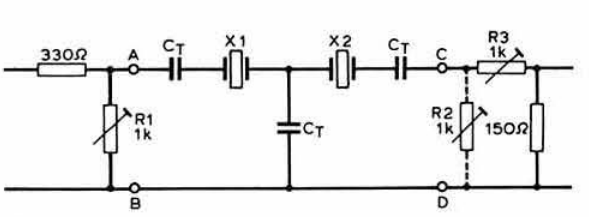


Fig 2. Two-crystal test circuit. The variable resistors are set to the required terminating impedance while measuring across A–B and C–D with an ohmmeter. For impedances below 100Ω R3 is replaced by 100Ω fixed resistor and R2 is fitted. R2 is omitted above 100Ω

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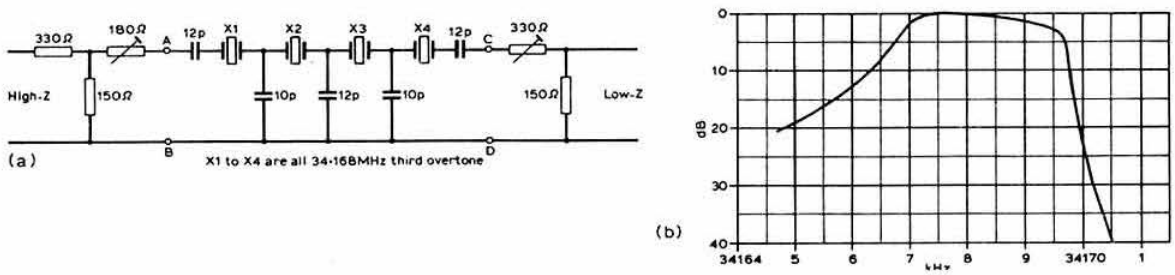


Fig 3. Four-crystal filter: (a) circuit, (b) frequency response. The input and output impedances are 330Ω

Third overtone:

f_s 34,166·3kHz; f_p 34,171·5kHz; $f_p - f_s$ 5·2kHz.

It should be noted that the frequency spacing of the series and parallel resonance is much less at the third overtone than at the fundamental, although it is still adequate for ssb reception.

Preliminary measurements

Using the two-crystal test circuit, Fig 2, the −3dB bandwidth, measured for several impedances, is as follows:

C (pF)	R(Ω)	−3dB bandwidth (Hz)
33	86	1,442
22	130	1,747
10	285	2,184

The desired 2·4kHz, −3dB bandwidth cannot be obtained using any practicable impedance, but the −6dB bandwidth is 2,988Hz in the last test, so it was decided to proceed with the tests on the assumption that the smallest capacitor in each filter would be 10pF.

Six-crystal filter

The circuit and frequency response of a six-crystal filter are shown in Fig 4. The passband ripple is much greater than the desired 1dB and could not be reduced below 2·3dB, even after trimming both input and output series capacitors. Initially this was thought to be due to the spread of the series resonant frequency of the individual crystals, and a further batch of crystals was loaned by JA1JIX so that six carefully matched crystals could be selected, but no improvement could be obtained. It was therefore concluded that the excessive ripple is due to the stray capacitance having an overriding influence, because of the relatively high frequency and impedance at which the filter is operating. Possibly further improvements could be made by trimming the other capacitors while observing the response on a wobbulator.

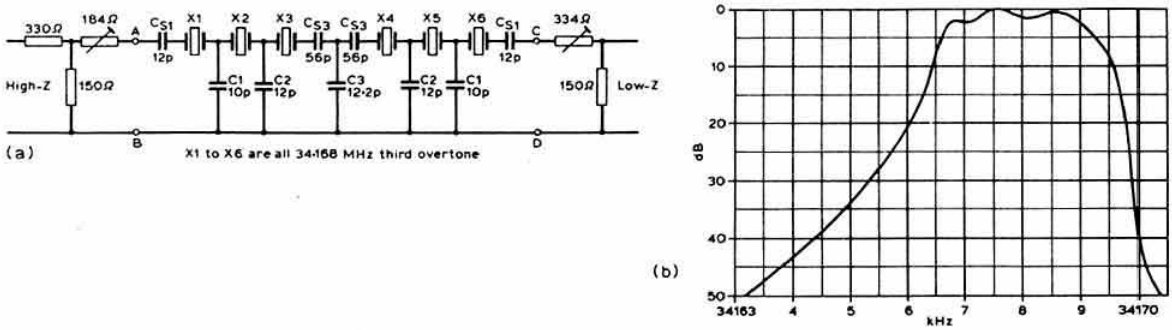


Fig 4. Six-crystal filter. The insertion loss in the passband, measured between A-B and C-D is 2dB. Input and output impedances are 334Ω

Four-crystal filter

A rapid assessment of the feasibility of making a 34MHz filter may be made by testing the four-crystal filter shown in Fig 3(a).

If C1 is made 10pF, then $$R = \frac{0{\cdot}712 \times 10^6}{2\pi \times 34{\cdot}168 \times 10} = 332\Omega$$

and $$C2 = \frac{0{\cdot}827 \times 10^6}{2\pi \times 34{\cdot}168 \times 332} = 11{\cdot}6\ \text{pF}$$

The frequency response is shown in Fig 3(b). The −3dB bandwidth is 2,650Hz, and the passband displays a smooth curve with negligible ripple. As expected for a lower-order filter, the If band edge has a poor rate of cut-off. However, the results are sufficient confirmation that the usual design procedure is applicable to crystals used on their third overtone.

Conclusion

As shown in the frequency response curves, the rate of stopband cut-off of these filters is relatively slow, which precludes their direct use as ssb filters, but their performance is sufficiently good for use as "roofing filters" in up-converters; further selectivity being achieved by lower frequency filters in subsequent stages.

These tests have been confined to the third overtone because of lack of vhf test equipment, but it seems probable that at least the fifth overtone could also be used.

Finally, the author is greatly indebted to Akira Kobayashi, JA1JIX, for suggesting these tests and for providing the materials for carrying them out. □

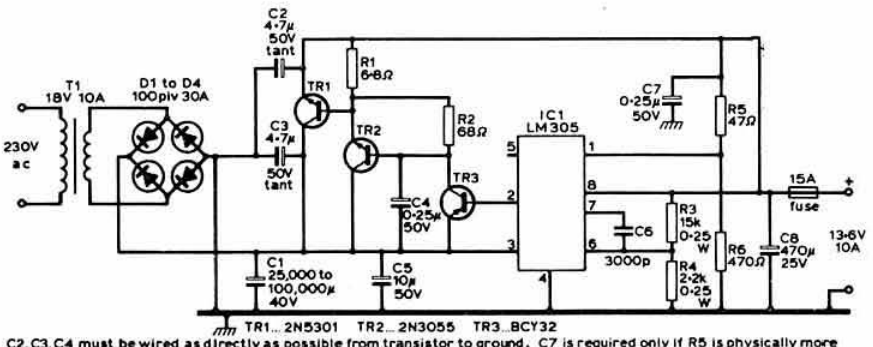
High-current 12V power supply

by W. BLANCHARD, G3JKV*

THE average 10W fm transceiver can easily be powered when out of the car by almost any decent 12V stabilized power unit that can supply 2A or thereabouts, but to use a power amplifier with it creates a real problem. Rather surprisingly no designs are given in any of the current handbooks for a really hefty 12V power unit capable of at least 10A. The design to be described can supply 10A all day long, the voltage variation between zero and maximum load does not exceed 1V, and it does not create any noticeable rfi. Nor is its stabilization affected by strong rf fields—a fault present in quite a few commercial units.

Of course good stabilization is not really necessary; all the pu has to do is look like a well-charged car battery and not vary much more than 1V either side of 13V. But it is important to get rid of as much ripple as possible—some pas are remarkably sensitive to it—and since that can only be done at these high current levels by using a good stabilization circuit, the stability comes free, as it were. Try calculating how big a reservoir capacitor one needs to keep hum down to 0·1V or so while pulling 10A!

It is not intended to specify components in detail since many amateurs will have bits lying about that can be used—at this year's Alexandra Palace exhibition, a five-minute tour of the surplus stalls showed that all the components needed could have been picked up for under £5. Instead, the considerations needed to decide whether a component is going to work or not will be given.



C2, C3, C4 must be wired as directly as possible from transistor to ground. C7 is required only if R5 is physically more than 1 to 2 inches from junction of R1, C2.

Fig 1. Circuit diagram

Construction

Is that big transformer being used as a door-stop big enough? If it has a secondary marked 12V at 10A forget it. The regulator used in this unit, IC1, needs an input voltage no less than 3V above output, and this has to be maintained even at the trough of the ripple when on load. Although nominally 12V, aim to get about 13·5V or so on load, being a bit nearer average car battery conditions, so the transformer has to be able to hold up to at least 16·5V at the trough of the ripple on full load. This will in turn be a function of secondary winding resistance, the actual diodes used and, most importantly, the size of reservoir capacitor. This is where one can do a trade-off. If one has a big 100,000μF capacitor, a transformer with a slightly lower voltage secondary can be used than if only a 25,000μF capacitor is available. In practice an 18V ac secondary, with 25,000–50,000μF will do nicely. Off load this will give 25V dc across the capacitor, so use one rated at 40 or 50V to be safe.

Do not try to cut corners with the diodes—the switch-on surge into the capacitor will be hundreds of amps if the transformer is any good, so choose a really good high-current diode. The author's were 1N1184s picked up at a junk sale for 10p each. These are 100piv, 35A items, capable of dealing with a 500A surge. In use, they do not even get warm at 10A continuous, and do not need any protection against spikes or surges. Use even bigger ones if available, but do not try putting in BY100s! Get the mounting kits and bolt them to the chassis, not forgetting a bit of silicone grease, and there will be no problems with heat.

One now has a 25V supply—dc off load, but a mixture of ac and dc on full load, carrying several volts of hum. The transceiver certainly will not like it, so a regulator must be added. Luckily, the days when it was necessary to build one up from discrete components have gone, so one can use the well-tried LM305, made with slightly different coding by several manufacturers, as the basic regulator. The exterior component values given in Fig 1 will provide about 13·6V out; to change it, change R3 up or down a few hundred ohms. On its own, the LM305 will only give about 45mA of current, so a suitable booster circuit has to be added to bring it up to 10A, a current gain of about 200 which is easily obtained. When the author built this unit he had a lot of BCY32s and 2N3055s, so he used them. Almost any similar transistors could be used—the 2N3055 in particular is overkill, and a smaller device would work quite well—but whatever is used get the mounting kit and bolt it to the chassis or a small heatsink, just in case.

On its own, the 2N3055 is just not quite good enough in this application—although rated at 115W and 15A it would be working right on its limits, and using only two boost transistors would make the regulator a bit marginal on gain. An excellent transistor to use as the last link in the chain is the 2N5301. This is rated at 30A and 200W and has given no trouble at all in practice. It needs a fairly good heat-sink, which could either be the chassis itself, or about a six-by-four piece of finned heat-sink. (Inches not feet!)

(Continued on page 1032)

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A high-performance jfet preamplifier for 144MHz

by F. OGDEN, G8SNW*

DESPITE fervent advertised claims that Japanese "black boxes" represent the ultimate in receiver performance, a few simple checks on front-end noise levels indicate that this is usually far from the true case. The very nature of mass-production techniques prevents designers from making use of optimum circuit approaches; anything other than a dual-gate mosfet or cascode rf stage takes fairly careful trimming to realize full performance.

Following a series of lengthy tests on rf preamplifiers using all the common (and some not so common) circuit configurations, the commonly-available dual-gate mosfets used in the vast majority of commercial black box and amateur-constructed equipment for 144MHz operation come out a very definite second best to the neutralized jfet preamplifier running in the common-source mode. Dual-gate mosfets scrutinized in a carefully adjusted test rig included the BF900, the ever-popular 40673 and the 3N204. Where possible, several samples were looked at.

The very best produced an estimated noise figure of around 2dB with reference to the thermal noise equation:

$$E^2 = 4R.kT.dF \text{ where}$$

E = equivalent noise voltage,
R = circuit input resistance (normalized to 50Ω),
kT = Boltzmann's constant multiplied by the absolute temperature of the circuit (normalized to a value $4f \times 10^{-21}$ for the purposes of the tests),
dF = measured bandwidth of 25kHz.

By contrast the Siliconix J310 (and U310) single-gate jfets produced an average noise figure of around 1dB against a reference noise floor when operated in a carefully-adjusted common-source test jig with neutralization. Altogether, five samples have been tried. Against this the dual-gate mosfets operating optimized circuitry produced a noise figure of something over 3dB on average.

All very theoretical, but what is it like in practice? When used with the author's homebrew synthesized transceiver, the weakest signals were lifted from two to three S-points when switched from mosfet to jfet front-end. Other amateurs in the area with commercial gear who have built the preamplifier report similar signal to noise improvements.

Circuit operation

The input signal is tapped into a low-loaded Q input tank which transforms the 50Ω antenna into the 3,000Ω of the fet. For optimum performance, an air-spaced input trimmer is recommended for minimum signal loss. The head-to-tail diodes protect the fet against rf leakage from the transmit-receive changeover switch. Even precision coaxial relays can provide enough energy coupling into the gate circuit of the J310 to cause a permanent deterioration of its noise characteristics. For receive applications only, the diodes are not necessary.

*2 Railway Cottages, Lindfield Road, Lywood Common, Ardingly RH17 6SW.

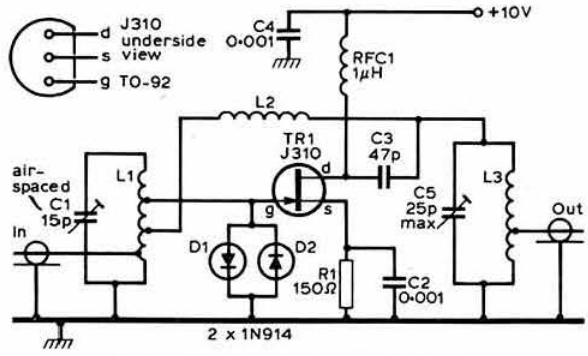

Fig 1. Circuit diagram of the preamplifier

Coil winding details

L1. 7t 18swg wire wound with an inside diameter of 0·25in. Tapped at 1t from earthy end for antenna, 2t from earthy end for neutralizing coil, and 4t from earthy end for fet gate. Total coil length approximately 0·75in.
L2. Approximately 22t 26swg wire self-supporting with an inside diameter of 0·125in. This is stretched out as shown in Fig 2 (see text).
L3. 8t 18swg wire wound with an inside diameter of 0·25in. Tapped at 1·5t from earthy end.

It is suggested that all coils are formed on drill shanks of the appropriate diameter; in this way it is easier to quote an inside diameter for the coil than an external one. The precise number of turns on L2 will be decided during the setting-up procedure.

L2 is the neutralization coil, and the stability and overall performance depends on its precise adjustment. The J310 is a relatively large chip with a fairly high drain-to-gate capacitance of the order of 5pF. This is resonated with the inductance of L2 at signal frequencies to tune out the unwanted reactance. When L2 has been trimmed correctly the circuit will remain unconditionally stable at any position of either C1 or C5. Since the quality of the inter-electrode capacitance is not very high (it has a low Q factor when resonated) it is necessary to tap the feedback connection into the input tank coil below the gate for complete neutralization.

To adjust L2, commence with a coil of 24 turns and proceed to remove one turn at a time until a point of unconditional stability is reached. Compressing or pulling out the turns on L2 will provide fine adjustment. The average number of turns required is 22.

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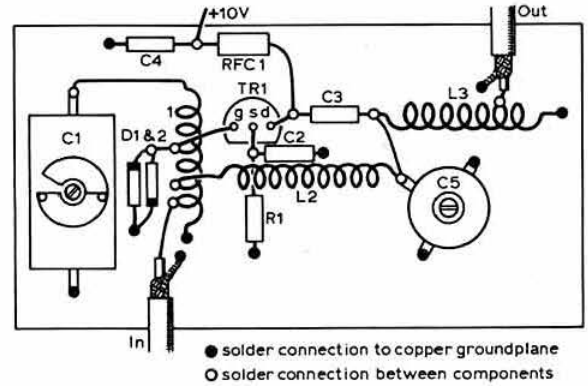

Fig 2. Suggested layout of the preamplifier

A 7/21MHz space-saver antenna

by V. C. LEAR, G3TKN*

Introduction

This antenna came about from the need for a 7MHz dipole for inter-G working which would give a higher angle of radiation than the vertical antenna which was normally used. Unfortunately, only a 54ft horizontal span was possible, and it was not convenient to bend a normal dipole to fit the space available.

It became apparent that the shortened dipole was also an extended double zepp on 21MHz, so an attempt was made to assess its performance on both bands.

Operation

The operation of the antenna can best be understood by considering a normal $\lambda/2$ dipole cut for 7MHz. On its design frequency, the impedance at the centre will be around 70Ω. At three times its design frequency, in this case 21MHz, it will be $3\lambda/2$ long, and will have a centre impedance of around 90Ω. The actual impedances will vary to some extent with the height of the antenna above ground. However, if the antenna is fed using 75Ω coaxial cable, a good match will result on both bands.

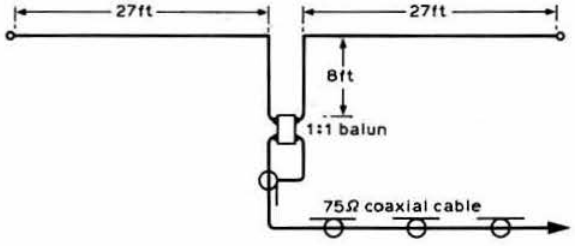

Fig 1. If no balun is available, the 75Ω coaxial cable could be connected directly to the base of the stub

The antenna is, in effect, a 7MHz dipole with its middle portion folded up, as will be seen from Fig 1. Its centre occurs 8ft down the open wire stub.

When used on 21MHz, each leg is $5\lambda/8$ long. Both legs operate in phase, and form a two-element colinear system, with its two outer $\lambda/2$ sections in phase, but having a $\lambda/4$ separation between their inner ends. The section in the centre carries a current of opposite phase to that which is in the two outer $\lambda/2$ sections, but as this section is only small—and, in fact, carries a small current, as will be seen from the current distribution

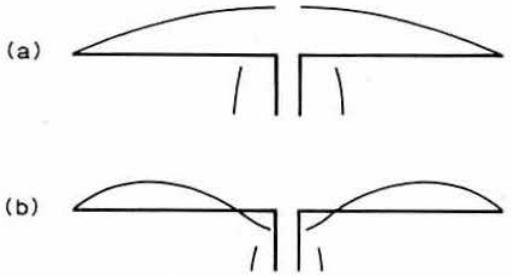

Fig 2. The current distribution on the antenna when used (a) on 7MHz and (b) on 21MHz. On 21MHz each outer half-wave section is in phase

diagram in Fig 2a—there will be little radiation from it. The currents flowing in each side of the stub will have equal magnitudes, but opposite phase, so these currents will, of course, cancel, and no radiation will occur from the stub.

The radiation pattern for an extended double zepp can be seen in Fig 3.

Matching

Initially the stub section was made up from 300Ω ribbon feeder, but it was found difficult to get a good match on both bands using this arrangement. However, if a good swr was required on one band only, the 300Ω ribbon could be trimmed for that band at the expense of the other. It is important to remember that if the system does need pruning, it is the stub that is pruned and not the outer ends of the antenna.

After some experimentation an 8ft stub made from open wire line, with 6in separation between the wires, was found to give good swr figures on both 7 and 21MHz. SWRs of no greater than 1·2:1 were obtained on both bands, after adjustment, when feeding the system with 75Ω coaxial cable.

A commercial 1:1 balun was used at the base of the stub to give the balanced to unbalanced conversion. It must be remembered that this is a balanced antenna, and a balun is worth incorporating. However, the antenna was used without the balun and appeared to perform quite successfully, although a balun is to be preferred if one is available.

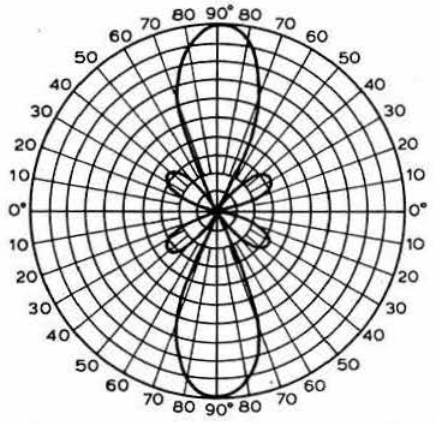

Fig 3. Free-space directive diagram for the extended double zepp. A gain of approximately 3dB can be expected in the broadside directions

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An alternative method to preserve the balance of the antenna without using a balun, would be to feed the base of the stub with 75Ω twin feeder and then couple this via a Z-match in the shack to obtain the balance to unbalanced conversion.

There is also no reason why the open wire stub could not be continued into the shack, and coupled into a Z-match or other suitable balanced atu. The open wire line, or 300Ω ribbon feeder if used, is operating as a tuned feeder in this condition, and its length is unimportant provided it is realized that the impedance it presents at the atu or Z-match will be affected by its length. It is preferable to use a length of open wire or ribbon feeder that will offer a reasonably low impedance on the frequencies on which the antenna is to be used.

If the antenna is to be used in this way, it could be tuned additionally on both 14 and 28MHz, provided a suitable Z-match is used. On 14MHz each leg is 6ft short of a half-wave but will be in phase. As both legs are in phase, they should offer a slight gain over a dipole, although the gain will be less than that obtained on 21MHz because the optimum separation between the in-phase sections has been lost. On 28MHz each leg is just over 3λ/4 long. Although both legs are fed in phase, a more complex load pattern will result, which will not be broadside to the wire.

Construction

The 6in spreaders for the open wire feeder were made up from ⅜in diameter wooden dowelling, painted for weather protection, and drilled at their outer ends. The wire was passed through these holes and held in place by twisting short lengths of 22swg wire about the dowelling and the wire passing through it. However, light plastic curtain rail would probably be a better choice for making the spreaders, as it is light and does not need weather protection. The spreaders were placed at 18in intervals on the stub.

As in any installation, a good watertight connection should be made between the stub and the coaxial cable, so that any rain water running down the stub cannot enter the cable.

Results

It is at this point that the author would like to thank near neighbour G3NKO, who assisted in numerous tests and erected the antenna at his own QTH.

With the antenna at 30ft, and running approximately NW-SE, not a lot of difference was found between it and a full-sized λ/2 dipole on 7MHz. Some stations reported the "space-saver" as being one S-point down on the dipole, while others could not detect any difference. It seems reasonable, therefore, to assume that the antenna offers a good compromise on 7MHz.

Results on 21MHz were extremely good in the broadside directions. However, the directivity of the system was quite noticeable, as stations in PY/LU and VK/JA were nearly always consistently better than stations in VE/W.

Many S9 reports were received from VK/JA/PY etc; and judging by reports that other Europeans who were using beam antennas were receiving, the extended double zepp compared very favourably. In many cases when using the zepp reports received were the same as those which other Gs and Europeans who were using three-element beams also received.

The dual-band "space-saver" has shown itself to be a very useful and effective antenna, and is worth consideration by those with limited space and no facilities to erect a full-size 7MHz dipole or a 21MHz beam. □

High-current 12V power supply

(Continued from page 1029)

C2,3,4, must not be omitted. They are rf decouplers, and without them the whole thing may oscillate and/or become unstable in high rf fields. If, after building the unit, the regulation is not as good as hoped for, and changes unpredictably, oscillation is probably the cause. A 'scope is the best way of tracing it, and trying a few small-value decoupling capacitors in various places is as good as any other method of stopping it.

The LM305 has provision for connecting a resistor to provide a sense voltage for automatic current limiting, but for 10A one needs a 0·16Ω, 15W resistor. Try finding one of those at the local surplus shop! The best way is simply to put a fuse in the line; there is enough "beef" in the system to hold up for a few milliseconds while the fuse blows if the output is short-circuited, and the 5301 will not be damaged. The regulation will suffer a bit because of the resistance of the fuse, but it does not really matter very much in this application.

Use heavy wire to get this hard-won power to the pa. Many an amateur who wondered why his allegedly 50W pa was only giving 30W out found it was only getting 10V from a 14V supply! Less than half an ohm resistance in the connecting wires can do that. □

A high-performance jfet preamplifier for 144MHz

(Continued from page 1030)

For optimum performance the circuit, which should be built in self-supporting bird's nest style on a piece of copper laminate, should have the input and output coils set at right angles to each other. Screening of one from the other is not necessary since residual coupling tends to be cancelled out through the neutralizing coil, L2. However, the source decoupling capacitor C2 should be soldered as close as possible to the fet and taken directly to the ground plane. This also increases the mechanical rigidity of the assembly.

Once L2 has been correctly trimmed (a sensitive absorption wavemeter is ideal for this purpose to detect any oscillation) C1 and C5 can be trimmed as for any other two-port rf amplifier. A weak repeater or some other low-level signal source is ideal for this purpose. Although satisfactory operation is absolutely dependent on L2, the setting of this coil is certainly not critical because of the low Q of its resonant pole.

It is worth remembering that the amplifier provides in the region of 15 to 20dB of gain, which has to be subtracted directly from the dynamic range of the receiver with which it is used. Unless another amateur is operating in the house next door, this is of little consequence. However, strong signals which come into the basic receiver at 40 over 9 will cause mixer cross-modulation when passed through this preamplifier. Some users may find it necessary to place an attenuator pad between the preamplifier and the receiver, allowing through just enough gain to mask the intrinsic receiver noise.

The author's original J310 transistors were purchased at a cost of about 25p each. Substitutes such as the BF256 have been tried but yielded a performance no better than a dual-gate mosfet. It is strongly recommended that the Siliconix device is obtained. The U310 is an identical device from the same company, but housed in a metal can. The performance of this latter device is totally satisfactory although the pin-out is different. □

technical topics

Pat Hawker, G3VA

THERE have been times, while preparing this month's copy, when it has crossed my mind that the column is in danger of becoming known as "Medical Musings", and I have been acutely aware of the problems of a layman straying into an unknown jungle. However, it is increasingly important that we should all try to keep up with questions that are a matter of public concern and which could affect our hobby.

In recent years we have seen great changes in public thinking on what were once such commonplace and respectable commodities as cigarettes, lead and asbestos; now media and public interest is growing significantly in the health and environmental aspects of all forms of electromagnetic radiation, whether ionizing or non-ionizing (how easily these two may be confused was shown recently in the Kensington Fire Station incident when, apparently, a geiger counter was affected by hf transmissions from a nearby embassy). Already one notes the bitter opposition in the USA not only to elf antennas hundreds of miles long but even to a model antenna testing range.

Nothing that I have read has indicated that there is any real danger to the public at large, or to a prudent operator, from amateur radio radiation—but if we may increasingly be called upon to convince the public of this, we need to understand at least what the debate is all about.

Exposure to rf

During the past few years many people with a professional interest in radar, microwaves, microwave ovens, broadcasting and, indeed, transmitters from high-power to hand-held, have become increasingly aware of the problems set by the very different "safe levels" of exposure to rf used in different parts of the world. At present this subject is again the centre of a number of research projects, as well as of much speculation in the media; this is often of a sensational nature (eg the controversial "zapping" book and many other reports) and has already led to one USA proposal to ban radio installations in residential areas. It is thus clearly a sensitive subject for radio amateurs, and one which could lead to social problems not unlike those associated with tvi. It is also an area where we need to step carefully and not be provoked into making rash statements that we may later regret.

At the heart of the problem is the question of how safe is the safe limit (for continuous exposure) of 10mW/cm^2? This is the officially recommended standard used in the UK, USA and many other countries. Although set many years ago, and based rather pragmatically on the thermal effects of hf/vhf/uhf radiated energy, the vast majority of engineers working in this field are satisfied that it has, in fact, provided entirely effective protection against all biological damage resulting from localized heating, even of sensitive organs such as the eyes. However, again many years ago, the USSR and some Eastern European countries adopted a figure lower by a thousand times, 0·01mW/cm^2, following the publication of a number of reports suggesting that exposure to non-ionizing radiation of a relatively low level appeared to be capable of causing a whole range of effects of a non-thermal nature: headaches, inability to make decisions, general tension, sense of anxiety, inhibition of sex drive, as well as some rather more measurable symptoms such as asthma, fast or slow pulse rates, high or low blood pressures, etc. Attempts in western countries to repeat the experiments singularly failed to come up with any really convincing evidence of such biological effects in humans, although some experiments on small mammals etc did show some unexplained effects (for instance hens were found to lay fewer eggs). Resonance effects in small animals differ from those of humans, because of the difference in size.

It has been pointed out that unlike the situation with ionizing radiation (X-rays, nuclear radiation etc) there is no satisfactory "unit of absorbed energy" comparable to the "rad" and which might be expected to form a better guide than power flux at the surface of the skin. Microwave-oven engineers also complain that the media confuse *exposure* (average power density to which the body is exposed over some period of time) with *emission* (the localized power density near a source of diverging microwave radiation such as a leaking oven door). With hf radiation there is also the problem of the near-field (in which the wave will not be coherent) and the far-field (where it is possible to consider radiation as being from a point source). The case for the safety of microwave ovens has been argued at some length recently in "A review of microwave oven safety" by J. M. Osepchuk of Raytheon in *Microwave Journal* May 1979, pp25–37, although not everyone is likely to be fully convinced by statements and articles stemming from within the industry, no matter how cogently argued.

A less-committed survey, covering many aspects of this complex and difficult subject, is "Exposure to radio-frequency generating equipment—is it safe?" by Steve Kraman, MD, WA2UMY in *Ham Radio* September 1979, pp26–32. This is particularly good in its analysis of the evidence for and against eye cataracts, effects on the brain, white blood cells, effects on the reproductive system, behavioural effects, etc. He makes it very clear that much of the past research in this field has raised more questions than it answers; that really convincing evidence, one way or the other, of any biological effects on humans from extended exposure to a power flux below 10mW/cm^2 is still lacking. Yet at the same time few engineers would today feel able to dismiss entirely the possibility. Of course, one must emphasize that by the time the radiation from most amateur antennas reaches a living area or the operator, it is well below even the Russian limit of 0·01mW/cm^2; although this lower limit would be exceeded, for instance, with hand-held equipment, where the antenna is often close to the face and eyes.

WA2UMY comes up with what appears to be balanced and sensible advice to amateurs:

(1) Avoid high-frequency, high-power equipment with antennas in the shack within 3m (10ft) of living areas.

(2) Avoid direct radiation to the eye by a transmitter in the microwave region (looking into a horn antenna or down a waveguide etc).

(3) Avoid prolonged close contact with any antenna radiating more than minimal amounts of energy.

(4) Women in early months of pregnancy, or those who may become pregnant, should avoid contact with strong hf, vhf and uhf fields.

It could, perhaps, be argued that these recommendations are over-protective or that they are vague in not laying down

precise power levels etc. Nevertheless one feels that they reflect the current uncertainty and would avoid any possible future recriminations from the public. As WA2UMY says: "These are reasonable precautions that should cause no one much hardship, while allowing continued enjoyment of amateur radio equipment."

Allergic to soldering?

While effects of radio wave exposure remain an area of some uncertainty, the same cannot be said for the growing list of industrial gases and chemicals that have been shown to be potentially harmful.

Dr Gerard Bulger, G3WIP, has drawn attention to an editorial "Fluxes and wheezes" in the authoritative medical journal *The Lancet* (25 August 1979, pp397–8). This reviews recent evidence that fumes given off by the fluxes used for soldering can be the cause of troublesome asthma among a significant proportion of those employed in electronics assembly factories. While these reports concern employees exposed to fumes over long periods, the editorial does specifically raise the question of how many radio-construction enthusiasts, television repairers and the like may be suffering from this form of asthmatic condition without realizing the cause, and without taking the precaution of ensuring adequate ventilation.

It has apparently been recognized since the mid-'sixties that "hard soldering", including soldering of aluminium cables, using high temperatures (about 700°C) and amino-ethyl-ethanolamine as flux, can have a dual reaction on some persons inhaling fumes from the flux: an acute response affecting a few individuals within 20min of exposure (prevented by sodium cromoglycate inhalations); and a more common delayed reaction, some 4–8h later, sometimes accompanied by fever.

Of more concern to amateurs, however, are the results of a series of investigations carried out in the past two or three years; these show that conventional soft soldering can also produce a form of asthmatic condition, with coughing, wheezing and tightness. Soft soldering with lead/tin alloys at 250–450°C generally involves non-corrosive fluxes such as the common cored solder-flux. These contain colophony which is the solid material remaining after turpentine has been distilled off pine resin.

The investigations show that an appreciable percentage (of the order of 20–25 per cent) of those exposed to flux fumes, whether or not actually doing the soldering, develop asthmatic symptoms. The editorial states: "While a few had symptoms within months of first exposure to solder-flux fumes, most did not get the symptoms for several years; cough, wheezing and tightness came on just after starting a shift in some, but after several hours in most." The fumes seem to have a dual reaction similar to that of the hard soldering flux; an immediate reaction which can be prevented with inhalations, and a later, less preventable, reaction.

The connection between colophony and pine resin suggests, the editorial says, a possible link between colophony asthma and "woodworker's asthma" caused by dust from red cedar, iroko and other hardwoods. The editorial points out that "efficient exhaust ventilation is a first step, and a search for a safer flux will be a long-term objective". Since most factory assembly areas are large compared with an amateur shack, it would seem that quite small concentrations of the fumes can be troublesome to those who have become sensitized to them over a long period. The symptoms disappear after a day or two of non-exposure, although the editorial does not explain whether persons who have once become allergic or sensitized continue to remain susceptible to flux fumes, even if not exposed regularly to them.

Noise blanking for mobile nbfm

While it is always better to suppress electrical noise at source rather than in the receiver, a mobile operator will wryly recognize this advice as an ideal rather than a practical solution. Even if his own vehicle is completely "clean", it is highly unlikely that all passing vehicles will be. Unfortunately, really good noise suppression circuits for nbfm receivers are by no means common or simple.

Bob Eldridge, VE7BS, has sent along a copy of an article by John Oblak of RCA Mobile Communications Systems ("Techniques for reducing impulse noise interference for mobile communications", *Communications News* September 1979, pp62–3). This sheds considerable light on the practical problems of achieving effective noise reduction; stressing the desirability of applying blanking early enough in the receiver to avoid the worst effects of pulse stretching, and the necessity of incorporating additional protection circuits to overcome the inability of most noise blankers to work in the presence of strong adjacent-channel signals.

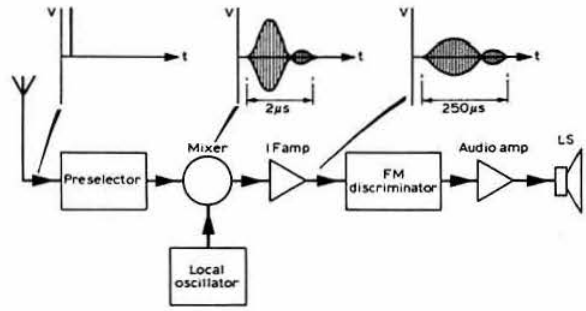

Fig 1. How a narrow pulse is changed and stretched in passing through a receiver

A high-amplitude but very narrow pulse applied to the input of a receiver will have stretched to about 2μs at the mixer stage but will be as long as 250μs after passing through the narrow-band i.f. selective filter: Fig 1. Although it might appear that an fm receiver should be insensitive to pulses, which are a form of a.m., in practice a high-amplitude pulse tends to take control over the wanted signal and the resultant phase of the discriminator input waveform shifts from that of the signal to that of the pulse. This phase change "looks" to the discriminator like a sudden change of modulation, and a loud click or pop is generated and amplified in the output stage.

Noise blanking involves gating the receiver off during the noise pulse. While blanking can be applied at rf, early i.f., late i.f. or even at af, clearly if the blanking is applied after the main i.f. filter it needs to be of much longer duration, and has to be limited to low pulse rate operation or it will result in significant loss of the wanted signal. On the other hand a much higher repetition rate can be effectively dealt with if blanking is applied before the main filter.

Fig 2 shows a form of noise blanking that is currently used in commercial mobile radio. The noise amplifier is an rf bandpass

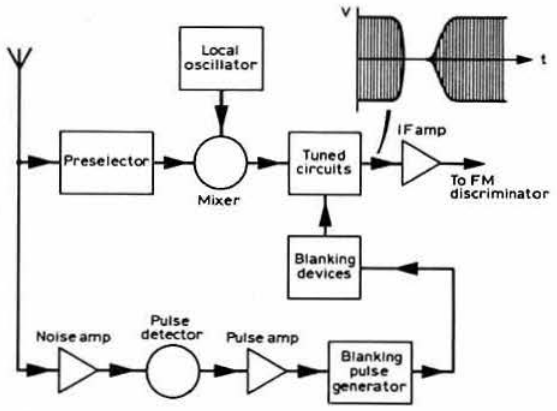

Fig 2. Receiver with noise blanking applied at an early stage in the i.f. amplifier before the selective filter has stretched the noise pulse. This can be very effective except in the presence of strong adjacent-channel signals

amplifier tuned to a frequency slightly different from the signal frequency; output from the a.m. detector ("pulse detector") is amplified and used to generate a blanking pulse (typically by using a single-shot multivibrator) and this is used to gate the receiver by shunting tuned circuits, employing diodes or fet devices. The pulse delay in the early signal path has to be sufficiently long to ensure that the blanking pulse acts slightly ahead of the noise pulse as it passes through the receiver; it is also necessary to continue the blanking until the stretched pulse has ended. Fig 2 indicates the type of blanked waveform that is fed into the i.f. amplifier, although subsequently the ringing or stretching of the selective filter will fill the gap.

While such noise suppression systems have proved very effective in removing impulse noise when used in areas of limited activity, they give rise to a form of interference problem, not found in standard receivers, that reduces the effectiveness of noise suppression if there should be a strong signal

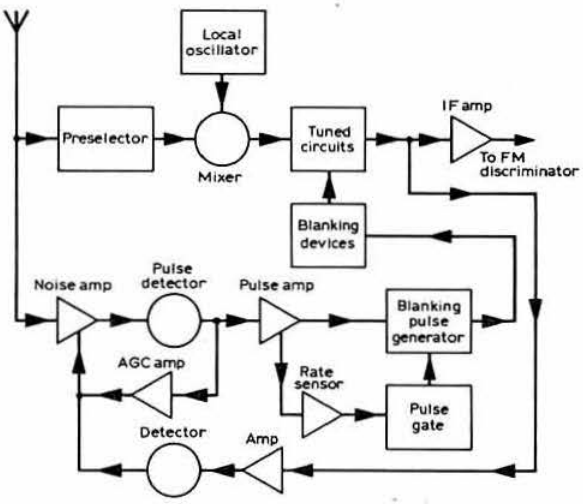

Fig 3. Noise blanking arrangement with a combination of three protection circuits that protect the noise suppression circuits in the presence of interference, as suggested by John Oblak of RCA

in an adjacent channel. With the noise clipper in operation, sidebands from the adjacent channel will fall in the i.f. passband and give rise to what appears as regenerated noise impulses. Thus whenever such a signal is present a form of impulse noise will be heard in the receiver, even though the noise suppression circuits are still working efficiently and suppressing the original electrical pulses.

John Oblak notes that for this reason it is desirable to switch off the noise blanking when a strong adjacent-channel signal appears. While this can be done manually it is useful to do so by means of protection circuits that automatically sense the presence of such signals. He writes:

"The level of the i.f. signal is monitored at the output of the blanking tuned circuits. These circuits are wide enough to pass the desired signals as well as the adjacent channel signals. When either the desired signal or any adjacent channel is above a prescribed level, the resulting detected signal is fed into the noise clipper amplifier. This detected signal is used to drop the gain of the noise amplifier, effectively disabling the noise clipper.

"Clippers (as mentioned earlier) have a maximum limit to their blanking rate. Beats, therefore, may create blanking pulses of much higher rate than the permissible maximum. It is possible that during the presence of beat tones, the receiver may be rendered completely inoperative. It is useful, therefore, to have provision in the noise clipper to sample the blanking pulse rate and to disable the clipper when this becomes excessively high.

"The presence of single interfering carriers in the noise channel can, as we have noted, cause degraded performance. Large signal levels can drive the noise amplifier into saturation, thus preventing the amplification of noise pulses. Even the presence of smaller signals can cause degraded performance due to the mixing of the interfering signal with the noise pulse. It is therefore advantageous to add an agc loop around the noise amplifier to drop the amplifier gain during periods of strong interference.

"Fig 3 shows a block diagram of a noise clipper with all three of these forms of protection. This combination should protect the noise clipper from the interference that plagues this type of noise-elimination circuitry."

Voltage controlled amplifer

Lionel Sears, G3PPT, writing from Saudi Arabia, reports some interesting experimental work on a limiting amplifier that led in turn to the development of a voltage controlled amplifier that can be used, for example, in conjunction with remote control of gain or frequency. He writes:

"Some time ago when I needed a limiting amplifier I hit on the arrangement shown in Fig 4. At dc, feedback is high and the dc level of the output is very close to zero; but for ac the feedback is decoupled by C1 and the gain becomes very high.

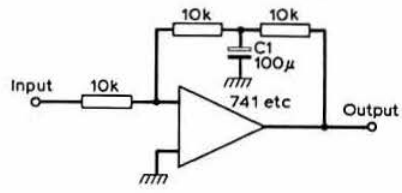

Fig 4. Limiting amplifier using op-amp with feedback heavily decoupled to ac but providing very little dc output

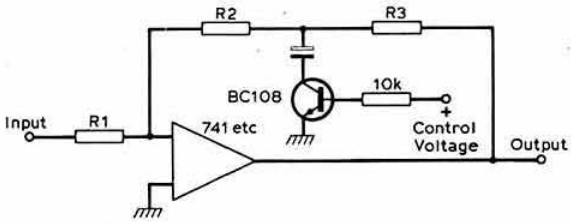

Fig 5. G3PPT's voltage-controlled amplifier developed from the circuit of Fig 4 by the addition of a transistor in series with the electrolytic decoupling capacitor

While there is nothing magical about it, it does save the bother of an external level-setting potentiometer, etc. There will be some frequency sensitivity but, with C1 sufficiently large in value, this is relegated to very low frequencies.

"The next development came when a BC108 transistor was put in series with the electrolytic capacitor as in Fig 5. I then found I could control the ac gain of the circuit by varying the control voltage on the base of the BC108 from zero upwards: in other words it formed a voltage controlled amplifier! While the gain/control voltage was by no means linear, nevertheless it represents a useful circuit where remote control of gain is required. The swing in gain is set by R1, R2 and R3. With R1 high it can swing all the way from attenuation through to gain.

"Next I tried applying the control to the emitter decoupling capacitor of an rf amplifier (Fig 6(a)). This gave excellent control of gain from near unity to near full circuit gain. While probably unsuitable for modulation or mixing purposes (on account of non-linearity) there seems no reason for not using it for agc or oscillator level control. A fet might be used instead of a bipolar transistor, provided that it has a sufficiently low 'on' resistance. I also had some success using the arrangement in conjunction with a Colpitts oscillator (Fig 6(b)). It was found possible to swing a 5MHz oscillator about 300kHz, and to achieve fm with millivolt levels of af, although for this application the circuit probably offers no advantage over a conventional varicap diode."

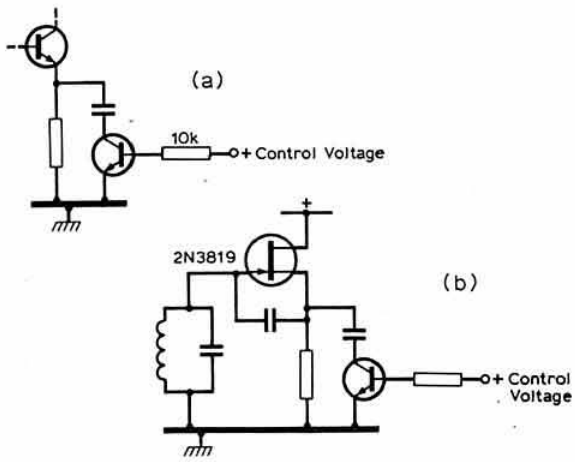

Fig 6. (a) How the voltage-controlled amplifier can be used to control gain of an rf stage; (b) the voltage-controlled amplifier used to tune a Colpitts oscillator over a limited range

For remote tuning, the voltage controlled amplifier might prove suitable for use with the "turns-cancellation" system outlined below.

"Turns-cancellation" vco

Several years ago Brian Bradshaw, then GW3JNA, before emigrating to New Zealand, drew attention to the value of a little-known technique, originally devised by Ken Johnson in 1949, which provides a voltage-controlled oscillator by effectively varying the inductance of a bifilar-wound transformer on a toroid core. Such a system has a number of advantages compared with the more conventional voltage-variable-capacitance tuning diodes, and can be readily applied to such applications as wobbulators, panoramic receivers and remote-controlled oscillators.

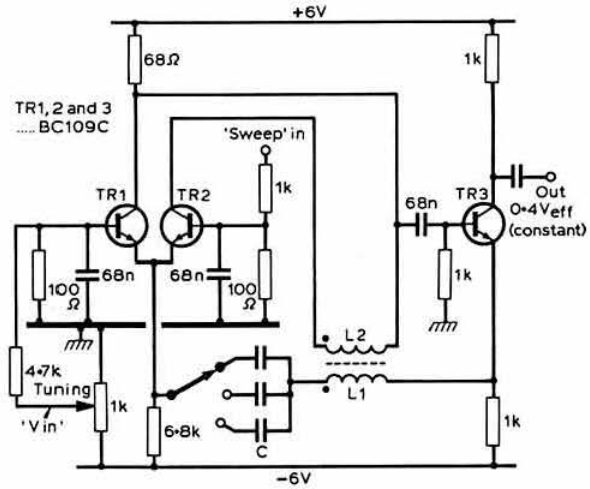

Fig 7. How PA0CX uses the "turns-cancellation" form of variable oscillator in conjunction with a panoramic receiver (it represents in effect a tunable wobbulator). L1 and L2: 200t 0·2mm enam, each bifilar wound on Amidon iron powdered toroid type T-80-3

Although the system was praised at the time, and subsequently appears in *ART* (*ART6*, pp148-9), it continues, I suspect, to suffer much the same neglect as in its first 25 years or so! However, PA0SX in a contribution to *Reflecties door*

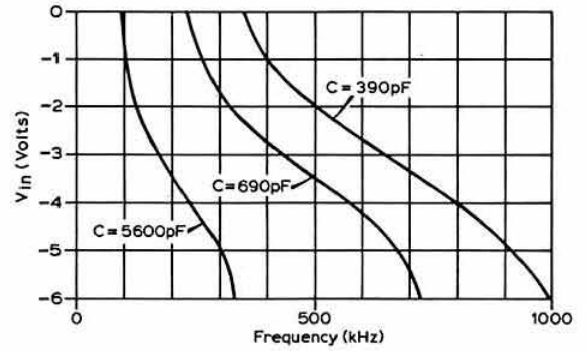

Fig 8. Tuning ranges achieved by PA0CX. Three switched capacitors (C) tune the centre frequency from 100 to 900kHz

PA0SE (*Electron* No 4, 1979) shows how he is using the system in a panoramic receiver (Figs 7 and 8) and indicates that the approach can be used not only at mf but also for hf oscillators. Unlike the earlier circuits, PA0SX indicates how the two devices in the differential amplifier can be used to provide a means of injecting the frequency sweep, and can be voltage tuned by a pot or similar arrangement over the required tuning range. And even my limited Dutch tells me that PA0SX writes very appreciatively of the value of this "turns-cancellation" approach.

Valve problems

Recently we made a passing reference to the growing scarcity (and consequent rising cost) of many once-familiar valve types. With new television receivers (the last mass market for valves) now virtually entirely all-solid-state, only the replacement market remains. It is noticeable that some hf transceivers that formerly fitted valves which were intended for use as line (horizontal) output valves in colour tv sets, are now using 6146B etc, types specifically intended for transmitters and correspondingly more costly.

Harry Leeming, G3LLL, technical director of Holdings, has dropped me a note on this subject, as follows:

"Valves for colour tv sets, such as the 6KD6 and 6JS6C used in the FT401 and FT101 rigs, are going to be in very short supply in a few years' time.

"These valves were not designed for rf applications, and some brands will not neutralize satisfactorily if used as replacements. Originally Yaesu fitted Toshiba valves, but these are no longer available, although it has been found that those made in Japan by NEC are quite satisfactory.

"On average, two pa valves for the FT401 last two to three years, and about four to five years for the FT101. We are suggesting to our customers that they should stock sufficient valves, while they are still readily available, to cover the anticipated life of the equipment.

"Anyone who does this, however, is strongly advised to test the spare valves in the equipment, since otherwise there is always the possibility that in perhaps five years' time they will find that they have stocked up with valves which are unsuitable for their purposes.

"Driver valves such as the 12BY7A are still freely available, although again we find that there is a tendency for only Japanese-made valves to work satisfactorily in Japanese equipment. In the case of the FT401 it is essential to replace the driver valve with the same brand as originally fitted; interelectrode capacitances seem to vary widely between different brands, and fitting a different brand commonly results in either the driver stage oscillating or maximum gain on transmit not coinciding with that on receive, resulting in low drive, tending to make valve replacement more complex than it need be.

"Retailers cannot tie up more than a limited amount of cash in spare valves, so that it is likely that in a few years' time it will be a case of retailers being willing to supply spares, if at all, only to those who bought the equipment from them.

"I hope these comments do not sound as though I am trying to create panic for purely commercial reasons. The situation is not critical at the moment, but, in 18 months or so, it may be a different story—and finding and fitting substitutes may not prove an easy or rewarding experience."

It is rather sad that valve equipment is becoming obsolete less for reasons of technical performance than from the simple logistics of locating suitable spares at reasonable cost.

Car electronics interference

Chris Rees, G3TUX, noted the car instrument regulator using a three-terminal ic which G8CCV found useful in reducing electrical interference to his car radio (*TT* September 1979, p833). However, he raises the reverse-coin of this increasing use of semiconductors in car electrics; is there not a possibility, he asks, that rf from mobile transmitters may affect the often unscreened electronic systems? He writes:

"I wonder whether, with the increasing use of semiconductor devices in new vehicles, this may not become a major headache for mobile operators? Or is it possible that, since so many of the devices being fitted in cars originate in the USA and Japan, where there are so many vehicles fitted with two-way radio (including cb equipment), the manufacturers have already taken this into account?

"My particular experience relates to the flasher unit (direction indicators) fitted to my Volvo 343. Operating the indicators while transmitting (40W output on 144MHz) was found to produce a variety of effects, ranging from no flashing to flashing at two or three times the normal repetition rate.

"The flasher unit is a transistor driven relay, rather than the more familiar bi-metal strip type of unit. It is 'potted' in a plastic can and simply clipped on to the bulkhead behind the dash, then connected into the wiring loom by some 2ft or so of cable to each of the three terminals (positive rail, pulsed output, earth).

"Firmly bonding the earth terminal to the shell of the car only emphasized the rfi problem (as the relay is unscreened, on reflection I should have predicted this). However, a 100 per cent effective solution was achieved by interlinking the three terminals with 1,000pF disc ceramic capacitors. This apparently equalized the rf potential on each line and inhibited any rectification within the unit.

"While I cannot pretend that this particular experience and its cure is likely to be of interest to many of the /M operators, it may cause others to wonder what semiconductors in vehicle electrics holds in store for us all."

There have already been some warnings that if this question of rf interference to car electronics is disregarded, there could be a very real risk of rf-induced accidents. *TT* July 1976, p519, drew attention to a Pye engineer's warning of the risk to truck drivers represented by the possibility of rfi to electronic fuel-injection systems and anti-skid devices.

Variation on multiband dipoles

C. C. Alger, G6AU, raises an interesting point about the design of parallel multiband dipoles, and in so doing draws attention to the attractive radiation patterns of centre-fed long-wire antennas with radiating elements 3λ/2, 5λ/2, etc, long.

Fig 9 shows the significant differences between the standard

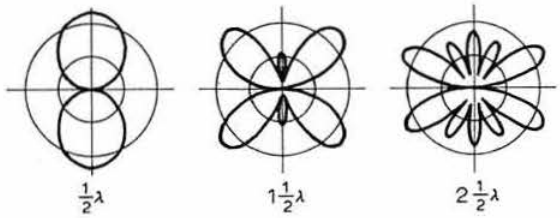

Fig 9. Horizontal radiation patterns of centre-fed antennas with λ/2, 3λ/2 and 5λ/2 elements

radiation patterns of centre-fed $\lambda/2$, $3\lambda/2$ and $5\lambda/2$ horizontal dipoles erected well clear of the ground. It should be noted that any dipole close to the ground in terms of wavelength (as most amateur antennas tend to be on 7MHz and below) will have a virtually omnidirectional radiation pattern. The useful feature of the longer dipole radiators is that the four major lobes (not unlike those of a full-wave radiator) enable UK amateurs to put signals towards all the main dx areas from antennas running either east-west or north-south, with, in addition, minor broadside lobes that roughly match the pattern from the standard $\lambda/2$ element.

G6AU notes that he has never seen a reference in any of the handbooks to the fact that when erecting parallel multiband dipoles it may well be advantageous to consider using longer elements on several of the higher frequncy bands, since these can be accommodated within the span of the lower-frequency elements. It is, of course, common practice already to use a 2 by 33ft span on both 7MHz and 21MHz, but he notes that the 28MHz element could be made 2 by 25ft, and the radiation pattern on that band would then line up with that on 21MHz.

He adds: "Where a top span of $\lambda/2$ on 3·5MHz can be erected, then the possibilities are even greater with $3\lambda/2$ on 14MHz, $5\lambda/2$ on 21MHz and $7\lambda/2$ on 28MHz, all accommodated within the 135ft or so span. Lengths of the parallelled elements could be chosen to provide the most desirable radiation pattern in the particular circumstances; it might also be feasible to use 'even' numbers of $\lambda/2$ elements provided there were an odd number of quarter-wavelengths on each side of the feedpoint, though this might tend to unbalance the system. Possibly the radiation patterns of the parallelled elements might be more affected than with the standard design, due to the increased coupling between the various wires resulting from the greater lengths of the higher-frequency elements, but even so the idea seems worth considering."

G6AU can only manage a 68ft span (and that with difficulty) but he has been trying a multiband system with 7/21MHz, 14MHz and 28MHz ($3\lambda/2$) wires. Meter indications suggest a reasonable match on all bands, although it still remains to be seen whether the results will show the anticipated radiation patterns on the various bands over a period of time.

Intermodulation and 144MHz equipment

In *TT* (December 1975) and subsequently in *ART6* (p132) a composite diagram was given showing the 7MHz intermodulation (non-linear) characteristics of six popular hf transceivers and receivers. This was based on measurements made by DK5ML and, although variations in performance between individual equipments must be expected, and measurement tolerances may need to be taken into account, this form of presentation provides a most useful way of comparing this aspect of a number of receivers, enabling imd performance to be visualized much more readily than by trying to compare tabulated data.

Accordingly, Jan Martin Noeding, LA8AK/G5BFV, has prepared a similar diagram (Fig 10) for some 144MHz equipments, based on data published by DL1BU in *CQ-DL* No 10, 1977, and subsequent issues. LA8AK has also included reference curves for imaginary high-performance receivers (0, +5, +10dBm), and for a TS700G when using a preamplifier with 20dB gain. The curves represent third-order intermodulation products with relative spurious level referred to receiver input plotted against input signal level at the signal frequencies resulting in the imd.

D-I-Y spray painting

Tom Walshaw (one-time G2PI and "Tubal Cain" of *The Model Engineer*) was a little surprised at the suggestion (*TT* July) of using vinyl sheet as an alternative to having front panels spray painted at commercial rates. He feels that most amateurs should have little difficulty in tackling this job themselves and achieving very satisfactory results. Indeed it is pointed out by G3OMK in *A Guide to Amateur Radio* that "spray painting is now within the realms of the home constructor, particularly with aerosol paints".

Tom Walshaw provides the following useful and eminently practical advice: "Procedure (for aluminium) is first to abrade the surface with, say, No 240 silicon carbide paper (dry) and very slightly to round the sharp edges, since spray paint tends to peel off from a sharp-filed edge or corner. Wash with hot water containing washing-up liquid and thereafter hold only with tissue paper or similar protection to keep finger marks off of it.

"Stand the material on four corks and spray the back with a couple of coats of universal primer and at the same time coat the panel edges. Allow to dry (10min) and then turn it over. If any paint has run through the holes or over edges, remove these blobs with a penknife.

"Apply two coats of the same primer to the front of the panel, and then examine carefully, since at this stage any marks will show clearly (scriber marks, for example). Fill these with

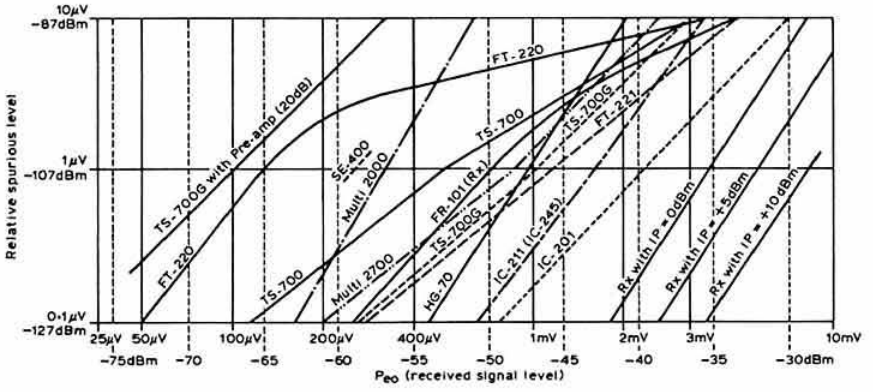

Fig 10. Third-order intermodulation performance of a number of 144MHz equipments, a TS700G fitted with a 20dB preamp and calculated performance of receivers with wide dynamic range

primer by spraying a little into a tin lid and applying by brush, repeatedly. Now rub down with No 360 or finer silicon carbide paper applied wet—I do it under the tap. The abrasive should be held over a flat wooden block and care taken not to over-abrade at the edges: use very light pressure, and stop as soon as the metal begins to show.

"Apply another coat of primer, and then one or two coats of colour—any colour. Rub down again, and stop as soon as the primer shows (use the worn silicon carbide paper from the previous exercise).

"Apply the final colour coat(s)—I usually put on three thin ones, but if the panel is flat it is safe to use one thicker coat if in a hurry. Suitable colours are Rootes 'Thistle Grey' (also known as 'Island Mist') and the general-purpose 'Matt Black'.

"Normally one aerosol can of primer and one of colour (each costing about 85p) should do two or three full-size rack panels; although personally, having many jobs to paint in my workshop, I use the large size cans. It is *important not to mix brands:* Carplan colour will lift Duplicolor primer, for example. I find Holts the best, Duplicolor a close second, and Carplan a poor third as to quality although, to be fair, Carplan is much cheaper.

"If any electrical contact is needed at the back of the panel, stick on a piece of gummed paper tape and then wash this off after painting."

Tom Walshaw continues: "I used my first metal panel in 1928 when I could not afford ebonite, but now often use *wood*, with aluminium kitchen foil backing, because aluminium panels are getting so costly! Painting procedure is similar, but after the primer coats apply 'Primer Surfacer' by brush and then rub down until the wood starts to show. Respray with primer and then carry on as before. The plywood must be well dried before starting with the paint. There is no need to 'etch abrade' wood, but a preliminary sanding with garnet paper smooths things appreciably.

"In using aerosol paints, the trick is to keep the cans at least 10in away from the panel and to spray 'longways' rather than across the short width of the panel; and always keep the panel flat to avoid runs. The can must be shaken for at least 2min before its first use; it is best to warm the cans under a hot tap first: about 20°C is the best operating temperature, both for paint and job."

Tom Walshaw is one of the significant number of members who still like to use "hot cathodes", partly because he finds it much easier to predict their performance. He sends along a copy of a diagram from a paper on reliability, by Professor Carter of The Royal Military College of Science, which lists failure modes in Army communication radios, and which shows "transistor internal fault" as being very much more frequent than "emission low" in the pecking order of failure modes. Certainly in the field of domestic radio one finds that the life-expectancy of a modern transistor radio is very much less than one used to expect with valve models, though in my experience the majority of faults can be traced to the use of very thin wires and poor switch contacts rather than the active devices.

Mobile whip matching transformer

Ray Gauntlett, G3VLL, believes that readers welcome follow-up information on items previously published in *TT*. For instance he has been using a bifilar-wound, step-down rf matching transformer for mobile hf whip antennas, originally contributed by Phil Zeid, 9M2CP, in July 1972. He confirms that it does all that 9M2CP claimed and adds:

"The core used was a Mullard FX1588, although two taped together can be used just as well. The right-hand section of Fig 11 has been amended to make the tappings rather more clear; the feed from the transmitter should be to points 0 and 20, with the antenna tapped in between points 10 and 20 to give the correct match. I find that with my antenna tuned at 14,040kHz to obtain a unity swr the variation is only from 1·12 at 14,000kHz to 1·27 at 14,100kHz for cw operation. On the lower frequency bands the tuning is much sharper but the match is still very good. The system has been used all over the UK with a KW2000A and two FT101 models with Tavasu and Hustler antennas. On hf bands the addition of this matching unit helps one to move over a reasonably broad section of the band without the need for retuning the antenna while still retaining low swr."

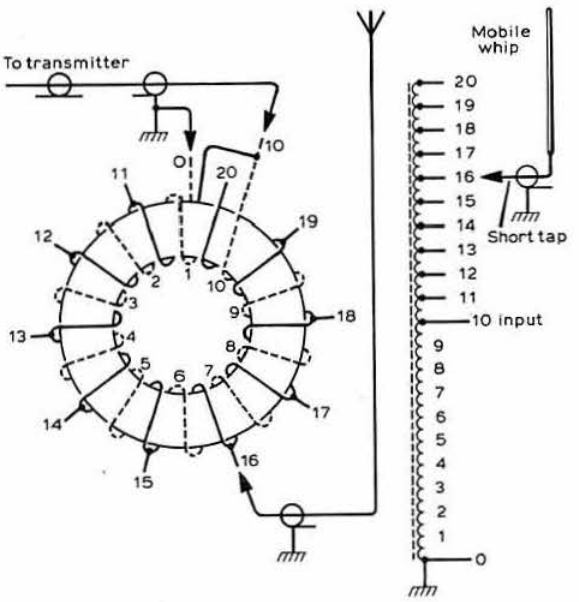

Fig 11. Ferrite broad-band bifilar-wound step-down matching transformer for use with mobile hf whip antennas as described in 1972 (amended drawing). Approximately step-down ratios for the various tap positions: 20, 1·0; 19, 0·90; 18, 0·81, 17, 0·72; 16, 0·64; 15, 0·58; 14, 0·49; 13, 0·42; 12, 0·36; 11, 0·30; 10, 0·25

In 1972 the following advice was given by 9M2CP: "Keep earth point of the coaxial shield near the base of the whip to a good chassis earth. A 1:1 swr can be obtained only at the resonant frequency of the antenna. Adjust antenna to the approximate frequency (or accurately with a noise bridge). Use tap giving lowest swr. Check the frequency giving lowest swr. Readjust length of antenna. Repeat if necessary. Tuning is very sharp on low-frequency bands."

Feedback

In connection with the October item on a battery-stabilized supply (Fig 2, p936), this was contributed by Peter Smith, G4HWL, not G3HWL as stated. The text also refers to a 5V supply; this should, of course, be 5A.

4-2-70

Graham Knight, GM8FFX*

New vhf products

Two new vhf products made their British debut at the recent Scottish AR Convention at Dundee. One was a new type of vhf mobile antenna, and the other was a new 432MHz transverter. Perhaps the mobile antenna was the most revolutionary as it allows amateurs to install external $\lambda/2$ antenna systems without resorting to magnetic mounts or to boring holes in the car. The antenna, which is made by Avanti of the USA, adheres directly to the glass using a special adhesive, and a special coupling unit is attached to the inside of the glass to feed the power from the transceiver. This means that there is no external connection to the antenna, thus eliminating the problems of corrosion and poor connections due to water etc. The antenna itself is a $\lambda/2$ design which does not require radials, and the whip can be adjusted through 180° on the chrome window mounting bracket.

The manufacturers claim it exhibits some gain over more conventional antennas and that the adhesive used to mount the antenna really works. Your scribe has long had a dislike for drilling holes in cars and has, until now, preferred to use magnetically mounted whip antennas for mobile use. Consequently he purchased one of the new 144MHz antennas and so far it has stayed on his car without any problem at speeds up to 70mph. A smaller version is also available for the 432MHz band and it uses the same adhesive system, which the manufacturers claim to be as strong as a standard 0·25in bolt. The advantages of the 180° tilt adjustment became apparent soon after the antenna was fitted, as GM8FFX received a warning of an aurora from a station operating on the Grampian repeater, GB3GN, and, simply by moving the whip to horizontal and changing to ssb, stations could be worked via the aurora while mobile. A change of about three S-points was noticed on the mobile received signal from SK4MPI when the antenna was changed to horizontal. This on-glass antenna system has had extensive commercial use in America, and certainly is a most interesting development in a field where there has been little change in the last 10 years.

The new transverter, which attracted considerable attention at the convention, was a solid-state unit which has been introduced by Sota Communications. Dave Jarrell, GM5CSY, purchased one and has been having fun putting it through its paces on both eme reception and satellite working. The transverter operates from 12V and changes signals from 28MHz. Two separate crystal oscillators are incorporated to allow operation over the range 432 to 436MHz, and these are individually selectable by front panel switches for both the transmit and receive functions. GM5CSY is particularly pleased with the receiver noise figure which he measured at better than 2dB on his sophisticated work test equipment. The power output measured on GM5CSY's unit was 18W and he is very pleased with the performance at the eme section of 432MHz. The new transverter for 432MHz matches the style of the existing Sota 1,296MHz unit and, by stacking them above a 28MHz transceiver, dual-band operation is possible with a single power supply and just one 28MHz source. GM5CSY intends using the new transverter to monitor 432·050MHz for auroral openings using his antenna system which incorporates four of the KLM 16-el long Yagis.

New London vhf repeaters

The RSGB has now been given the go-ahead to provide three additional repeaters for the Greater London area, which will then be served by four vhf repeaters located in north, south, east and west London with the following callsigns and channels: GB3NL(R7), GB3SL(R2), GB3EL(R0) and GB3WL(R1). The present London repeater on R7 at Crystal Palace will be closed down and GB3SL on R2 will commence operation from the same location.

Auroral operation

The number of letters received enquiring about the best methods for working auroral openings on the 144MHz bands is increasing with each batch of mail. Many of the newly-licensed operators have read about the auroral dx worked on 144MHz but are unsure of how best to operate in an opening. The first essential is to listen to the GB2RS news bulletin broadcasts to obtain the latest news of the events which have occurred in the previous week and for the solar activity forecast. The IARU Region 1 auroral co-ordinator, Charlie Newton, G2FKZ, prepares this information at the last minute before the bulletin is sent out to the newsreaders, so that the information broadcast on Sundays about solar flares and other disturbances is as up-to-date as possible. Operators who note this information then know when auroral events are likely to occur, and they can then check the 50, 70 and 144MHz bands for auroral signals on commercial television transmissions and on amateur beacon signals. The most useful beacons on 144MHz at the present time are DL0PR on 144·910MHz from Germany, and SK4MPI on 144·960MHz; while the Scottish beacons are off the air these two are the first signals to go auroral on 144MHz.

Once it has been established that there is an auroral event in progress it is best to just listen for a few hours before making any transmissions—no matter how good signals appear to be on the band. Time is needed for new operators to familiarize themselves with the strange-sounding Tone A cw signals, and the very distorted whispering sounds of auroral ssb. The best recommendation is to listen to an experienced local operator in an aurora and learn from his operating technique the special procedure so essential for successful auroral dx operating. The *RSGB Amateur Radio Operating Manual* contains a large section dealing with the various ways of forecasting and operating in auroral events, and is available from RSGB Publications (Sales).

Auroral reports

Many letters comment on the outstanding signal heard during the 29 August event from Dave Redman, G4IDR, in Leeds. During that opening he worked 11 countries on 144MHz, with his best dx being F6CRP in ZG65g, EI6BD (WN59c), G2WS (YL56h) and OH1FA in far away LU42d square. Despite this outstanding success G4IDR heard GM4COK working many stations, via the aurora, who could not be heard further south in Leeds. As he had already decided to attend the Scottish AR Convention he carefully studied his auroral prediction calendar and decided to go to Scotland one week in advance in the hope of working an aurora from northern Scotland. G4IDR's

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predictions were correct and he was able to participate in the two large events which occurred in the month on 18 and 20 September. The first event started at 1435gmt and, operating from locator YR80j GM4IDR went on to work 30 stations in the next two hours. His best dx included SM6IHF (GS23g), SM7GT (HR05f), SM7GWU (HS75c), SM0DJW (IS10d), DL7TY (GM48j), SP5JC (KM56f) DM2PL (GL78e), DM2CFG (FM69g) and DM2BYE (HM53a). The loudest UK signals were heard from G3NSM at Oxford and G3CHN in Devon, with the Cornish beacon GB3CTC being heard very strongly during the event.

The aurora on 20 September was also mainly an afternoon event, with SK4MPI on 144·960MHz starting to come through aurorally at 1500gmt on a beam heading of 45°. This event lasted until 1703gmt, and during the opening GM4IDR worked 23 stations, including SM1HJZ (JT57j), SM3FGL (IV53g), OZ1AZL (EQ65d), OZ8GP (GQ72b), OY5NS (WW75f), OH3AWH (LV50b) and, best of all, UR2EQ in NT61c. All stations peaked around 45°, with the bearing moving more to the south towards the end of the first phase. A second phase started at 2154gmt and continued weakly for about an hour, but this phase did not regain the strength of the afternoon opening.

All GM4IDR's contacts were made on cw, and it is interesting to compare his results from Aberdeen with the report from G3XDV in Kent, who heard the 20 September event but was unable to work any station. At G3XDV's location in Whitstable, Kent, he heard several stations including GM4IDR, whom he reports as being the loudest station in that part of the country. Further north, in Banff, Sandy Duncan, GM3SVB, took part in his first aurora by just being at home in time to catch the end of the event and to work LA3WU with just 10W of ssb. Steve Richards, GM4HWS, in Sauchen, used 2W from an IC202 to complete an auroral cw QSO with GM4BYF, thus giving GM4HWS his first auroral contact.

VHF demonstration at Telecom '79

A special display of panels explaining the amateur use of the vhf and uhf bands was prepared by Bengt Sagnell, HB9BCU/SM5ABC, for use at the Telecom '79 exhibition in Geneva. The display illustrated how amateurs communicate on the vhf/uhf bands using meteor scatter, eme, aurora and transequatorial propagation methods to contact each other over distances far exceeding those achieved by professional users sharing the same frequency spectrum. PA0DAB/F0AAL set up a number of cassette recorders alongside the display panels, each with 3min message explaining the mode and giving examples of the type of contact made by amateurs. The recordings of the various exotic vhf/uhf dx contacts were collated by GM8FFX, and included: the first 144MHz transequatorial contact between 5B4WR and ZE2JV; an extremely strong ms ssb contact on 144MHz between GM5CSY and OE3OBC; auroral cw and ssb signals; and, as the exhibition took place in Switzerland, a recording of HB9RG working KP4BPZ on ssb moonbounce. PA0DAB arranged the recorders so that the visitors to the exhibition could listen to the tapes on headphones while following the text and diagrams on the display panels. The visitor could then move to the next section, press another button, and hear the next 3min recording. It was anticipated that many professional visitors would be pleasantly surprised to see that frequencies they use for short range transmissions are used by amateurs for world-wide vhf contacts.

GJ4ICD heard by EA8AK

Geoff Brown, GJ4ICD, has received a report from EA8AK that signals from Jersey were heard 5/3 in the Canary Islands during an Es opening in July. F6CTT has also confirmed that GJ4ICD was the only UK station worked by him during his expedition to Corsica. GJ4ICD continues to increase his number of QTH squares worked on 144 and 432MHz, and he was especially pleased to work 10 stations during the Perseids meteor shower. During the recent Spanish vhf contest GJ4ICD worked EE1EH in QTH locator square YC79b on 144MHz, and another extremely rare square worked was BC on the 432MHz band. F1AVG/P often operates from this rare square, and Geoff reports him as a very good signal, with his 3W signal being generated by an Icom IC402 transceiver. GJ4ICD has now taken delivery of one of the new Trio TS770 transceivers which operates on 144 and 432MHz. He likes the way eight beacon frequencies can be programmed into the memory and then scanned to give a guide to propagation conditions, and, along with his normal television viewing, GJ4ICD hopes to get advance warning of even more vhf/uhf openings.

Amateur Radio Operating Manual

The RSGB book editor, Ray Eckersley, G4FTJ, has produced a new operating manual which contains a mass of information for vhf operators. Large sections of this excellent book are devoted to mobile and portable operation, and road maps are included for the RSGB vhf and uhf repeaters. DX operating is discussed in detail, with sections on tropospheric, sporadic E and auroral propagation. A large amount of space is given over to meteor scatter propagation on the vhf bands, thus reflecting the growing number of amateurs now participating in contacts via this once exotic mode. Full details are given of the equipment required for successful ms contacts, and the flow chart showing the ms QSO procedure together with the meteor shower information make up an outstanding section of this new book.

The sections on contest operating and slow-scan television have been written by the acknowledged experts in the field. The *Amateur Radio Operating Manual* has something for every vhf operator, whether he is just starting on vhf or whether he has been on it for 30 years. The book is highly recommended and is obtainable from RSGB HQ.

Magnetometer experiments

Brian Howie, GM4DIJ, read the section on predicting auroras in the above-mentioned manual with interest, as it describes how changes in the earth's magnetic field can be recorded and the information used to give a warning of impending auroral events which will probably affect the vhf bands. Professional observers have noticed that the angle of declination between geographic and magnetic north changes sometimes two hours before an auroral event can be monitored on 144MHz. GM4DIJ has now built a magnetometer to a design published in *Electronics,* November 1977. A two-transistor circuit employing a saturable core reactor is used to detect small changes in the intensity of a magnetic field which cuts through the reactor's windings. The oscillator uses core hysteresis in order to generate a change in the frequency when there are changes in the magnetic field along the inductor's axis. GM4DIJ promises to let *4-2-70* know the results of these experiments, and asks meantime if a special look-out could be kept for himself and GM3YOR on 70MHz during auroral events.

Swedish vhf operators

RSGB member SM7FJE has worked 41 countries on 144MHz and is now up to 316 different QTH locator squares. Recent additions, which must be hard to come by now, were SM0FSK (FY square), YU1ADN (KD), 4U1ITU (DG), F6ETI (YH) and I7DS in square HB. SM7FJE also mentions the following as being well-equipped stations in Sweden who are on the look-out for UK stations and are all willing to keep meteor scatter schedules: SK7CE (GP square) runs 100W to four 16-el antennas and usually operates 144·059MHz for cw and 144·333MHz for ssb; SK7MW runs 500W to four 10-el antennas and operates on 144·044 and 144·222MHz; SM7AED runs 500W to four 16-el antennas, and operates on 144·037 and 144·312MHz; SM7FJE runs 500W to two 16-el antennas and operates on 144·027 and 144·272MHz; SM7WT completes this list of stations, he runs 500W to four 8-el antennas and prefers to operate on 144·073 and 144·155MHz.

Moonbounce on 432MHz

Charles Suckling, G3WDG, has now worked 35 different stations using his 432MHz eme system. Recent new contacts were completed with K4QIF, DL9KR, and an ssb contact with SM6CKU. Further ssb contacts have been made with JA6CZD, VE7BBG, TI2NA/P/W5 and I5MSH. G3WDG recently had a visit from K0TLM, whom he has often worked on eme, and was able to show him his system and take him over to inspect G4DGU's backyard eme array.

Julian Gannaway, G3YGF, now has a permit for eme experiments, and started well with 519 cw contacts with SM6CKU and ZE5JJ. Julian has now worked more stations, and K4QIF, ZE5JJ and DL9KR all came back to a single CQ call. G3YGF is now temporarily off the air as he is busy getting the large quad loop Yagi system fully operational for the Oxford University expedition to Scotland.

In America W0YZS has just completed the very first Worked All States on 432MHz via moonbounce. The ARRL has decided to give bronze plaques to the first 10 stations to complete WAS on 432MHz. W0YZS worked his last state by contacting an expedition station which had gone portable to Wyoming especially for the contact. Can a 432MHz Worked All States be achieved by a British station?

Isle of Man expedition

The recent expedition to the Isle of Man was very successful, and the operators, G8JHL, G8GAJ and G4CBW, are to be thanked for being there and operating at the times promised despite the weather conditions. Next time they go on an expedition they have agreed to choose a site which is less than 1,000ft asl, as this trip was marred by the weather. At a lower altitude the trio would not have had to suffer from the late-night damp fog and cloud. Special care was taken with the equipment for 144MHz, which consisted of a TS700 with an SD306 preamplifier, a home-built 4CX250Bs linear amplifier, and Andrew heliax cable to feed the pair of stacked 16-el Tonna antennas. Stations in 27 countries and in 66 different QTH locator squares were contacted by the expedition, which was fortunate in being able to participate in an auroral opening.

Schedules had been made with 62 meteor scatter operators, and 45 contacts were completed 100 per cent via this mode. An auroral opening started just as G4CBW completed 28h of continuous cw operation on meteor scatter. The thought of a long auroral opening was too much for him, and he promptly went to bed, leaving G8JHL and G8GAJ to struggle through the aurora on ssb. Although some dx including LA3WU and G stations were worked, the Class B operators happily admit they could have worked many more stations on cw.

The best dx worked by tropospheric propagation was F1EIT/P in YG10e, and the best on ms was UR2EQ in NT16c. Contacts were established with all the UK countries, all the near Continental countries, and with stations in CT, DM, HB9, I1, OE, OH, OH0, OK, SP and Estonia. The long telex received about the expedition concludes with a tongue-in-cheek apology to the operator who kept on calling them on rtty on 144·117MHz—they eventually had to tell him on ssb that they were sending high-speed ms cw and that they were not on teletype.

American repeater scene

Ian Abel, G3HZI, of Rotherham, has just returned to the UK from an extended visit to America where he was able to make use of several new types of repeater. During a visit to Los Angeles he was amazed to receive a demonstration of a vhf/hf repeater. A group of 20 amateurs in the Beverley Hills area have the facility on their private repeater to access on vhf with a special code on a touch-tone pad, enter the 14MHz frequency, and their transmissions are then relayed on the hf band. This particular repeater is located high in the hills near the famous Hollywood sign which overlooks Sunset Boulevard. As the hf beam antenna is also located at the repeater site, the performance on the hf bands is very competitive with other Californian stations. G3HZI was rather taken aback by this new type of repeater, which enables some Los Angeles amateurs to walk around with small vhf hand-held rigs yet relays their transmissions on the international dx bands. The system demonstrated to G3HZI used a fixed hf beam at the repeater site, but plans are in hand to fit another touch-tone decoder which will enable the vhf operator to dial-in the desired beam heading.

G3HZI also liked the facilities in America which allow telephone calls to be made via repeaters. This is very popular in America, and G3HZI was shown several demonstrations on repeaters in the Washington and New York areas. To link into the telephone service via a repeater the amateur presses the touch-tones necessary to obtain the dial tone and then simply enters the telephone number on his transceiver's key pad. At the end of his telephone call a single button on the keypad gives the clear down signal—these telephone calls are usually local, but long-distance and international calls are possible on some of the repeaters, with the operator being subsequently billed to his home for the cost of these calls. G3HZI was told that all calls using a phone-patch must be tape recorded in accordance with FCC rules, and that all the USA repeaters of this type must have a control station which can switch the repeater off should any illegal transmission come up on the input frequency.

G3HZI also comments favourably on the new American information repeaters. These give out six prerecorded 2min tapes of information about amateur radio in the area. Access is again gained by use of special tones, and operators new to the area would first dial the information tape. This then lists the types of information available and gives the access tones required to hear the local club news etc. G3HZI notes the introduction to the UK of touch-tone equipped transceivers with interest, and wonders if there is any possibility of new facilities being offered to repeater users in this country.

Graham Miller, GM8JIP, has just returned home to Glasgow after his second holiday in America. While there he

met W2BXA, the well-known Oscar and vhf operator, and Graham too was intrigued by some of the facilities offered by the American repeaters. GM8JIP liked the friendliness of the operators using the repeaters, and found them to be free from some of the problems associated with repeaters in Europe. He was also shown newspaper cuttings of stories which praised amateurs and their use of repeaters during emergencies when normal communications had broken down. However, GM8JIP has reservations about repeaters which have outputs on the hf bands, and he feels this will make the task of checking DXCC awards even more difficult than it has been in the past. There are at present no UK repeaters with dual inputs or outputs, but it is interesting to note that members of the GB3ED Repeater Group have been investigating the possibility of adding another input on the 1,296MHz band.

More cw on 144MHz

Jan Noeding, LA8AK/G5BFV, the well-known beacon constructor and Norwegian vhf operator, has written to *4-2-70* asking for more British stations to go on cw during auroral events. LA8AK has already worked 71 different QTH squares in the last 12 months on cw via aurora. LA8AK wonders if the reason he hears so few stations is that most operators are running low power. He runs a QVO6-40 in his final 144MHz stage, and he finds the results on cw are much improved over those obtained with just a 10W transceiver. LA8AK uses a 6-el quad antenna, and is located in square ES44j with a clear take off in all directions except to the east. He has worked ZM square during aurora, and is looking forward to many more contacts as the winter auroral season gets under way.

Jan also mentions the following stations as being active on cw from rare QTH locator squares: LA1TN (DX), LA4ZC (DW), LA8SJ (GU), LA2PT (EU), and LA3WU, LA6U and LA9FB who are all in CU square. LA8AK listens on 144MHz at the cw end on Monday nights, and stations wishing to contact him can write to Jan Noeding, Brattasen 53, Hisoy, N 4800 Arendal, Norway.

Robert Ferguson, G4IAN, of Birmingham, recently operated from Scotland and reports being very pleasantly surprised by the large response he received to cw CQ calls on 144·050MHz. He too had a share of auroral contacts and found it much easier to work dx on cw while operating from Scotland. He managed to work stations on the south coast of the UK on tropospheric cw while operating from YR and YS locators.

Amateur television on medium wave

Listeners to the programme "Start the week" on Radio Four heard presenter Desmond Wilcox discussing the Independent Television strike which caused many programmes to be withdrawn from the entertainment available on tv. After discussing this loss with a number of celebrities he then introduced his listeners to "G8GON independent television". The discussion which followed was of a light-hearted nature, but G8GON did manage to get across a few commercials of his own. He described how his amateur television station had been received as far away as France, and he even managed to plug the British Amateur Television Club by saying its sales department sold very good test cards. Amateur radio has recently had very good press and television coverage, and G8GON is to be congratulated on being able to present amateur television in a proper way on what was basically a "chat show" rather than on a more serious programme. The fact that he was able to describe vhf trophospheric propagation on the 432MHz television band proves that even ordinary radio shows can present amateur radio and television in a positive manner.

Calling frequency for a.m.

Due to the imminent use for space communication of 145·8MHz, the VHF Committee has given careful consideration to the question of recommmending a calling frequency for those wishing to use a.m. on 144MHz. The committee received many letters about the choice of frequency following publicity in these pages and on the GB2RS news bulletin. Taking these letters into account, and bearing in mind the allocations already made to specialist groups, the committee decided that a frequency of 145·650MHz would be the most satisfactory choice for an a.m. calling and monitoring frequency. Once contact has been established on 145·650MHz, operators should then move to a clear frequency within the all-mode section, taking care to avoid those frequencies which have been recommended for other specialist use, such as Raynet, rtty, fax, data, and especially the beacon frequencies.

Awards

The first operator to gain the new QTH Squares Award was John Hunter, G3IMV, of Bletchley. The first operator to earn a sticker to go on the award is—yes—G3IMV. He has succeeded in collecting the cards for working 15 countries and 60 squares on 144MHz. No fewer than 14 of the last 20 cards submitted were for meteor scatter contacts, proving that G3IMV has not only the necessary cw skill but also a high degree of patience extending over some hours before the final "R" is received to complete the contact. To quote a typical example, a contact made with OH0JN began at 0800gmt and did not finish until 0940gmt, taking 12 bursts and 18 pings before completion. Sticker No 1 has now gone to G3IMV to add to his certificate No 1.

Bryn Llewellyn, G4DEZ, has now received QTH Squares Award No 4, close behind Mike Lee, G3VYF, who successfully claimed No 3 a few days earlier. G4DEZ's claim included several ms and auroral contacts, and Mike Lee's included many long-distance Es contacts.

Copies of the QTH Squares Award claim form may be obtained from the RSGB vhf awards manager, Jack Hum, G5UM, QTHR. He reports that the QTH Squares Award concept has caught on so effectively that it is rare for a card to be submitted which does not carry the required locator information. Where the locator details have been left off by the card's sender, the claimant can note the square separately on his award claim form.

Late news

Members of the Oxford University expedition group have been successful in completing 432MHz moonbounce tests from a portable site at the Mull of Galloway in Scotland. GM8OXQ and G3WBQ both forecast good conditions on the 50MHz band for the next few months—they have already been hearing the Gibraltar beacon ZB2VHF on a regular basis. Further auroras on 18, 24 and 25 September. GM4FZH, who is very active on 144MHz cw from YS33d in Caithness during auroras, also operates all modes for tropo contacts. During a 144MHz tropo opening at the beginning of October GM8FFX worked F79WARC—a special call issued to F2YT. □

microwaves

Charles Suckling, G3WDG *

Expedition reports

Two microwave expeditions have recently returned home, and both report some very interesting results.

The annual family holiday in France gave G3JHM, as F0AKD, the opportunity to do a good deal of 10GHz operating. This year both wide- and narrow-band equipment was taken, the latter mainly for tests with G3JVL. The receivers benefited from a two-stage gasfet preamplifier built by G3JVL using Plessey GAT5 devices, which has improved their sensitivity very considerably.

Tests with G3JVL were made over the non line-of-sight path, 134km long, from Hayling Island to the northern tip of the Cherbourg peninsula. Signals were received on 17 of the 28 days of operation, and at many different levels, indicating very varied propagation conditions over the all-sea path. Under "normal" conditions no signals could be heard.

The enhancements seemed to fall into three categories: weather front ducting, k-factor improvements and super-refraction ducting. Frequently the signal levels exceeded 30dB above noise, sometimes with, and sometimes without fading, depending on the propagation conditions.

The most spectacular opening took place on 29 August, the last day of operation, with G3JVL's signal reaching 42dB above noise at 1755gmt. At 1810 G3RZD/P at Shoreham-by-Sea was worked, his site being 300ft asl and 2km inland. G8PMT/P was also heard from this site by F0AKD/P. At 1835 G2DSP/P was worked at Bognor beach with stronger and more stable signals than those of G3RZD/P. At that time, G4ETU/P (7km north of Chichester and 16km inland) could not be worked, but at 1914 signals appeared and a QSO was made. A few minutes later G3JVL was contacted again.

This opening was especially interesting as the stations further inland could not be worked until later in the evening. When G3JVL was first heard a strong visible duct was evident at the sea-land interface, with no sea-sky horizon visible. When G4ETU/P was worked, however, it was possible to see the sea-land interface, and the sea-sky horizon with the visible duct elevated above the horizon. Work is in progress to attempt to correlate the observed signals with the prevailing weather conditions.

In addition to the contacts detailed above, F0AKD/P also achieved QSOs with the following stations during the expedition: F8WN/P, G3IW/P, G4CNV/P, F6DLA/P, GJ8KNV/P, F1BQ/P and F1DPC/P.

Another annual expedition, that of the Oxford University RS, also spent much time operating 10GHz equipment. The site used was 800ft asl, 10km east of Wigtown (XO19A). The usual G3YGF 10GHz equipment was used, consisting of a 4ft dish, 8W twt, with wide- and narrow-band transmitters and receivers.

The first period of operation was during the 10GHz Cumulative Contest on 26 August, resulting in GM3YGF/P being heard by G8AFC/P and G8AXE/P on Winter Hill (185km), GW3FNQ/P on Anglesey (168km), and G4HUP/P near Macclesfield (238km). A two-way QSO was made with G3NKL/P at Winter Hill. Deciding that a two-way contact ought to be made with the expedition, G8AFC and G8AXE travelled to Snowdon on 29 August. A good contact resulted, with 58 reports being exchanged both ways on low power over the 206km path. G8AFC and G8AXE noticed doppler beats on GM3YGF/P's signals, from a light aircraft which was flying over the path. They have noticed this effect before at other sites, from hang-gliders!

The 4ft dish at GM3YGF/P was calibrated initially using the setting sun as a reference, which agreed to within 1° with the compass-derived headings. All beam headings were determined by calculation from site national grid references.

During the first week of the expedition, tests with G3JVL were disappointing, with no signals being heard either way, despite frequency setting with a Droitwich-locked reference. It was decided to improve the equipment in the Hayling Island to Scotland direction, so as to attempt the path one way with some chance of success. To this end the transmitter power at G3JVL was increased somewhat with the commissioning of a new twt, and a preamplifier, built specially by Plessey (Caswell) Ltd, was sent up to the expedition. This used three GAT5 devices, and produced 20dB of gain with a noise figure of 3·5dB.

These modifications were only completed two days before the end of the expedition but, on restarting the tests, signals were heard almost immediately. Initially G3JVL's signal was very weak, but grew to solid copy at 3dB above noise after about an hour. The note of the signal showed the usual troposcatter burble. On two occasions the signals peaked very briefly to about 10dB above noise, and the note also went T9; these were interpreted as being due to reflections from aircraft. Similar effects have been noticed before by G3JVL over the Oxford-Hayling Island path. A second test was carried out on the following day, and similar signals were received.

Bad weather was the main problem for the expedition. For much of the time the hill was covered with low cloud, which led to a lot of problems with damp getting into the equipment. Despite this the results were very encouraging, showing that this 505km path is about the limit for non-enhanced troposcatter propagation, even with the rather exotic equipment in use. Congratulations to all those involved: G3YGF, G8RHI, G4GFX, G8KRD, G8LYB and G8RPV.

Beacon news

Two new microwave beacons have recently come on the air: GB3LDN, which is operating on 2,304·05MHz, from south-east London (AL41A); and GB3SWH, at Bushey (ZL29F), on 10,368MHz. Reception reports of these beacons would be very welcome, and can be sent to the writer who will forward them to the respective beaconkeepers.

OTS reception

G8AGN has recently been receiving good signals from the orbital test satellite on 11·7GHz. His system consists of a modified G4ALN feed in a 4ft dish, a cross-coupler based receiver using a modified G8APP type Gunn oscillator as the local oscillator, and a 6·5dB noise figure tunnel diode preamplifier. The signal has been very consistent, at 10dB above noise in 250kHz bandwidth. G8AGN would be very happy to pass on further details to anyone interested in receiving the satellite. □

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

swl news

Bob Treacher, BRS32525 *

DX news

It would be pleasant to think that dxpeditions are planned after the organizers read *SWL news;* a thought arising from the suggestion, in the July issue, of activity from VX9 and VY0. Within three months both islands were activated; VE1AIH/1 and VE4CF/1 from Sable Is, and VE1CR/1's splendid expedition to St Paul Is. The latter was reported on all bands with good signals, and it seems hard to believe that on some occasions they were even able to rag-chew on 28MHz.

LU3ZY had also been reported on 21MHz at more reasonable times. Now that this "country" is definitely valid for DXCC credit—even though the island lies outside Antarctica and therefore legally requires specific British Government approval to be a valid station—it seems that a few more will be able to add this "bonus" country to their heard/worked lists.

For some, going on annual holiday can mean missed countries! Several reports this time of "wonderful holiday but I needed that rare one". Early September holidays this year meant missing ZS6AF/T4 from Vendaland, 3V8ONU and TN0HL. The VK9Y expedition by VQ9JJ had to QRT early, and although some VKs worked the trip, no reporters mention signals audible in G-land. FW0XR, however, was reported on 14MHz ssb. It seems that HB7OP was in 5R8 during late September, signing 5R8TV. 5R8AL is active again but he prefers cw operation. D68AI has been heard from the Comoro Is; it seems that the policy at present may be to issue short-term licences only. KZ5 (Canal Zone) ceased to be a separate country on 30 September as it is now administered by Panama. There are rumours that a group led by EA8AK are to activate 3C0 and 3C1 in the near future.

21MHz CW SLP

Dave Whitaker sent details of this slp which took place on 4 August. Band conditions were poor but seven listeners sent in logs. Forty-eight countries were heard in all six continents. The majority of countries logged were European, but 12 countries were copied from Asia, three each from North and South America, and one from Africa and Oceania. Eric Trebilcock again sent a log from VK, but the slp was badly timed as the band was dead during the two hours of the event. A report on the 28MHz ssb slp, which clashed with SSB Field Day (and the 144MHz Open), will appear in due course.

More mail

The 1·8MHz band seems to have been stealing the limelight from the 14MHz band recently; VP2KAD (QSL via K1PBW), FC6CNI and numerous Russian countries being reported. On 21MHz, in addition to the expeditions mentioned above, VR3AR, W4PYH/KH8, ZK1CX, VS5DD, OK2TAB/D2A, YJ8PD, VP8QG and 5H3FW were all mentioned. More dx stations seem to be using 21 and 28MHz now that those bands are showing more signs of life, but 14MHz still seems to be everyone's favourite, and the majority of reporters appear to think that it is the band to monitor first. It is a fallacy which costs many a rare entry in the log. It would be pleasant if more reports would favour 21 and 28MHz by day and 7 and 3·5MHz by night. In the long run those that do will be the ones to benefit. The best reported dx on 28MHz was AH8A (US Samoa). Other notable dx mentioned included H44WH, HS1ABD (59+), YB0WR plus JAs and W6s.

Keith Kerr, BRS35943, now has an xyl as well as his rig to look after. Unfortunately his FR100B "blew up" with clouds of smoke pouring from the power transformer. This meant reverting to the stand-by rig—an HA500. Keith reports this was poor for morale, as everyone in Europe seemed to be hearing XF4MDX except him! Even though newly married, he had recently purchased a new FR101S with a few built-in extras, ie 1·8 and 144MHz, but was soon confronted with another problem—no one in Edinburgh seemed to stock PL259s. However, everything came good four hours before the CVRS event, and Keith is hoping for even more time at his rig—exams (and xyl) permitting!

Dave Whitaker, BRS25429, reports the Manihiki trip and VE1CR/1 as new countries for him and, somewhat surprisingly, so was a UJ8 on 21MHz—it has taken him 18 years to hear this country on that band! It is amazing what a close scrutiny of one's records can show; your scribe's indicate that, on 14MHz, EI was country No 186, and GD No 214, while rarer countries such as KS6 and 5R8 appear as Nos 46 and 55! When the bands seem slightly poor, a look through one's records to see what has escaped may reveal some surprises.

Steve Casey, A9107, heard JA6HOZ/BY in 14MHz. Ian Marquis, RS41426, reports his all-time 1·8MHz score has now reached 39, and having found room for another lf antenna, he is keenly awaiting the lf dx season. Paul Corrigan, BRS35121, passed the May RAE, but despite his G8 call he intends to continue monitoring the hf bands.

Receiver problems on 14MHz have meant poor sensitivity and such unwanted signals as "Radio Moscow" and "Voice of America" for Frank Bowles, ARS41554.

Copy deadline for January 1980 issue is 20 November. □

1979 HF countries table

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS25429	182	211	244	106	91	23	857	ssb
BRS35943/GM	162	198	233	110	106	10	819	ssb
BRS25901	165	182	231	82	75	17	752	ssb
ARS8841	149	168	239	78	82	8	724	ssb/cw
ARS41426	129	146	137	79	96	28	615	ssb/cw
A9191	69	103	155	64	49	9	449	ssb
BRS40293	90	75	136	51	42	7	401	ssb
ARS41386/GJ	76	127	120	48	20	2	393	ssb
BRS34740	86	94	81	33	38	7	339	ssb
BRS20185	85	75	113	24	23	1	321	ssb
BRS39161	59	78	126	18	19	2	302	ssb
BRS41136	74	75	79	27	17	0	272	ssb
ARS39784	77	57	83	26	23	2	268	ssb
BRS41333	73	87	52	18	35	2	267	ssb/cw
BRS35121	23	47	113	24	38	7	252	ssb/cw
BRS40814	58	59	84	34	17	0	252	ssb
ARS41554/GM	40	73	67	31	34	4	252	ssb
BRS40634	18	96	89	8	5	0	216	ssb
BRS40705	61	56	49	24	14	1	205	ssb
A9107	65	42	72	5	15	2	201	ssb
BRS40292/GU	42	42	58	19	30	2	193	ssb
BRS27421	0	40	103	24	21	1	189	ssb
ARS40133	28	31	34	7	14	0	114	ssb

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

the month on the air

John Allaway, G3FKM*

THIS month's column is being written not long after the weekend scheduled for the Society's cancelled HF Convention. The writer feels very sad that this once-in-a-lifetime chance to meet so many distinguished members of the international amateur radio fraternity (who are now working on behalf of all of us at the World Administrative Radio Conference in Geneva) received such minimal support. He is also very sorry that the chance to meet many old and new friends from the UK was missed. However, plans are already under way to try again in 1980, but sadly (from the viewpoint of many provincial members) it will most likely be in London, and, even more sadly, without the guests who would have honoured us with their presence in 1979.

G3UOL has drawn attention to the fact that he held the callsign ON8IT from May 1970 until 1974 and that the address in July "QTH Corner" suggests that it may have been re-issued.

News from overseas

Roger Western, formerly EP2IA, has returned to his home in the UK and is now to be found as G3SXW. He operated from Teheran for about 18 months using a Ten-Tec Triton IV with TA33 beam at about 70ft above ground and slopers for the lf bands. Some 22,000 contacts were made, mostly on cw, and logs are still available—Roger's QSL manager, W4YE, will be pleased to deal with confirmation requests.

Ted Collins, ZD8TC, wrote in mid-July to say that at that time only two ZD8s were active—Kent Goddard, ZD8KG, and himself. Ted is active on most bands, mainly on cw, and lives at Two Boats Village, about four miles from Georgetown. Kent Goddard is situated close to Wideawake Airstrip and active mostly on ssb and sstv. Ken Marshall, ZD8KM, was due to become active by the end of July and was expected to be heard initially on 21MHz cw until the arrival of more gear enabled him to cover other bands. Tommy Moyce, ZD8TM, was awaiting the arrival of new equipment and spending the time filling in QSL cards! When he received the gear he expected to be on all bands, cw only. ZD8WB and ZD8CD were also waiting for equipment and would also be cw-only when this arrived. ZD8MM (in Ted's words "an attractive yl") was due back from the USA in August. Ted concluded his letter with the following plea:

"There is no doubt that using what, to some, is a rare dx callsign does have its obvious advantages. What is not so obvious is the many disadvantages the user of the rare callsign suffers. For example, many other hams tend to forget that we also wish to contact other rare calls, and often wish to have an in-depth QSO rather than a contest-style contact. While the majority of hams all over the world are most courteous, there are a few that can make absolute nuisances of themselves and create chaos on the pile-up frequencies. I myself always look either side of the pile-up for the station who has used his or her noddle and moved up or down a kilohertz or two. When conditions are good on 21 and 28MHz the lengthy caller can create havoc. It really is only necessary to send the transmitting callsign once or twice. Like many other users of the rare dx callsign I feel a duty to give as many opportunities for QSO with other stations as is humanly possible, but please allow me my turn to work a rare station before jamming the frequency and creating a double pile-up—all I ask is to be given the same chance as everyone else on the frequency!"

*10 Knightlow Road, Birmingham B17 8QB

Roger Western, EP2IA, at his station in Teheran (see text)

DX news

The ssb equipment for the station on Franz Josef Land should now be in use. Three stations seem to be on from the island group. UA1PAL, who has been worked on 14MHz cw, is asking for QSLs via UA1OSM. UK1PGO is located on Heise Is and is also often found at the low end of the 14MHz cw band after mid-night—activity on 21 and 28MHz is expected soon.

ZL2UW/C on Chatham Is is appearing regularly near 14,220 and 14,265kHz between 0600 and 0800. VK2AGT/LH should be found on Mondays, Wednesdays and Fridays on 14,212kHz between 1030 and 1230. Another rare Pacific dx station—WD9QGQ/KH7 (on Kure Is) appears near 14,285kHz from 0845, and has also been worked on 14MHz cw a little later. VK0PK, on Macquarie Is, seems to be a regular occupant of the 14,220kHz area at 0700, especially on Thursdays and Fridays.

Bill Belcher, K2KVX, of Hicksville, NY

Fred, HS1ABD, may now have left Thailand for the USA embassy in Tchad where he hopes to obtain a TT call. At the time of writing, TN0HL was active and asking for QSLs via DM2XLO.

A51PN works stations from lists taken by AP5HQ and I0MPF at 1430 to be run the following day. Pradhan has been noted on 14,265kHz and 14,208kHz, and on 21,320kHz and 28,004kHz.

A group of stations operated from a new South African homeland—Vendaland—and used the T4 prefix during the independence celebrations. QSLs should be sent as follows: T4A (ZS6AK), T4VEN (ZS6RS), ZS6AF/T4 (ZS4MG) and ZS6ZS/T4 (ZS4MG).

The prefix blocks H8 and H9 have been issued to Panama.

The Africana net has resumed its meetings on 21,355kHz at 1700, and on Mondays, Wednesdays and Fridays at 2100. Another dx net is the USSR DX net which meets on 14,250kHz from 1800 to 2000 with UA3DEA in control.

New Kiribati callsigns will follow the pattern T3K for former VR1A, T3P for VR1P, and T3L for the fomer VR3 prefixes. VR1AF is now T3KA.

ZS2MI should now have new equipment. He has a schedule with WA2IZN on Mondays, Wednesdays and Fridays, at 1130 on 14,240kHz. On the 25th of each month he uses cw only. Good ssb signals have been received in the UK on 21MHz in the early evening.

Stations in Botswana are changing their callsigns—the A2 will become A22, the second 2 replacing the first letter of the existing suffix, thus the former A2CBX is now A22BX.

Guy, FR7ZL, expects to be on Glorioso Is from mid-January until mid-March as FR7ZL/G. QSLs will be dealt with by N4NX.

F79WARC will be on the air for the duration of the WARC.

VO6ONT celebrated the 60th anniversary of the telephone service in Newfoundland.

C5AAS keeps a schedule with his QSL manager, G3LQP, on 21,030kHz on Tuesdays and Thursdays at 1600 (G3LQP is also QSL manager for C5ABK).

Dxpeditions

L1DXA says that there is a possibility that there will be more activity from Bouvet Is in January and February 1980. QSLs for contacts with 3Y1VC have been received in the UK.

OE3GEA and three other West African Communications Research Society members plan a trip which will take in CN, 7X, 3V, 5U, XT, 5N, C5 and other countries. It will start this month and continue until February 1980. Those wishing to be informed of fuller details are invited to send a donation to PO Box 20, A-4023 Linz, Austria. QSLs will be sent out by OE3GBB.

N2KK should be /FR7G on Glorioso Is for the cw section of the CQ WW DX Contest this month. Other possible countries to be visited include Djibouti, Somalia, Mayotte, Reunion and Juan de Nova. He will be accompanied by N5AU in these areas, but will be alone when he goes to Mauritius, St Brandon and Rodriguez Is.

W4MGN expects to join C5ABK for some operation from Guinea-Bissau (CR3) commencing 11 December.

The *DX Bulletin* says that tentative dates for the N2KK/F0CGP trip are as follows: FR7, 24 November; FR7/T, 1 December; FH, 10 December; FR7/G, FR7Z/G, 15 December; FR7/J, 1 January; 3B8, 10 January; 3B9, 12 January; 5R8, 20 January; and then, hopefully, 6O from 30 January.

Iris and Lloyd Colvin of YASME fame are expected to be on their travels again by the time this reaches readers. Their destination was not known at the time of writing but, as before, QSLs should be sent to the address in "QTH Corner".

I2FGP may be in TL, TN and TT for a three-month tour commencing early in December. He will try to obtain operating permission and may possibly confine most of his activities to cw.

Northern California DX Foundation

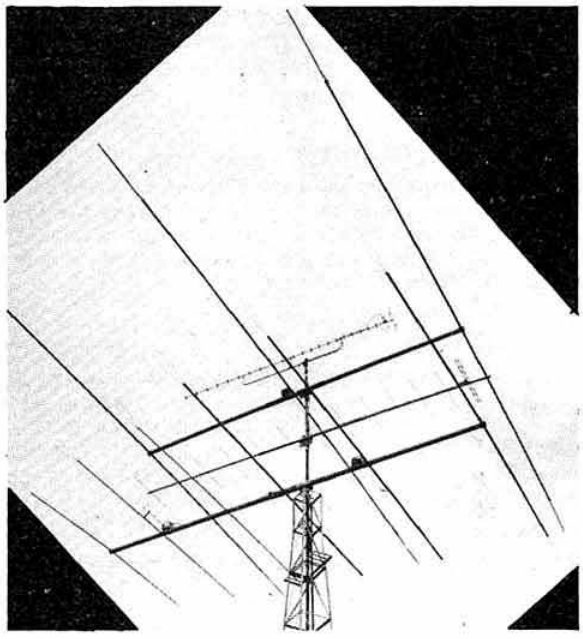
This foundation has sponsored about three dozen dxpeditions in the past five years or so. The organizers are particularly anxious to receive donations of working equipment or cash, and a gift of US$5 makes the donor a member. Please write to PO Box 717, Oakland, Cal, 94604, USA.

Welcome

First an apology to W3QPP whose callsign was missed from the list of those joining the Society last January. The list of new members during September includes: DL2DN, F2MA, N4OL, SV8KS, VK3ABA, W3VTK, ZL1BKE, ZR6AW, ZS5NX, ZS6BQE and 9X5PP, with O. O. Daramola (5N) and J. M. Turnbull (VP9) becoming listener members.

Fernando-Juan Fernandez, EA8CR/8AK, president of the Union de Radioaficionados Españoles (URE), photographed during a visit to RSGB HQ (left). At his home in Santa Cruz de Tenerife he uses the fine array of equipment shown on the right

George Pearson, G3AWZ—one of Britain's best-known dx operators, with the equipment (top) and beams (below) which have enabled him to contact all the best dx for many years. (*Photo:* G4FYS)



Awards

The Flanders Field Award

The Belgian station ON7FF (club station at Ypres) will operate from the site of one of the most famous battlefields of the first world war, Passendale, in Flanders, for 48 hours commencing 1900 on 9 November. Those making contact with ON7FF during this period may apply for the Flanders Field Award by sending log details and seven ircs to: ON7FF, PO Box 32, 8900 Ypres, Belgium. Listeners may also apply.

The Gold Sardinia Award

This is granted to any licensed amateur (or listener) who has made contact with or heard stations in IS0 since 1 January 1976. European applicants need 20 points and others 15. Each contact with IS0 counts one point on the hf bands and two on vhf. QSOs with members of the URS club count four and five respectively, and with IS0LYN six points. There will be a "jolly" station which counts six and seven points. The same station may be worked on the same band on different days or on the same day on different bands for credit. Reports must be better than RST338/RS43. Send certified copy of log extract (by two other amateurs), own QSL, and 15 ircs (or US $4) to URS Club, via Sardegna 16, 07100 Sassari, Sardinia.

Worked All Gozo Award

Open to licensed amateurs and listeners with no band/mode limitations. Only contacts/reports after 1 August 1972 are valid. Europeans must work and confirm eight Gozo Is (9H4) stations. Others need only five. Applications consisting of a certified list (signed by two other licensed amateurs) and 12 ircs (or US$3) or equivalent international currency, should be sent to Mr Joe Cauchi, 9H4L, 20 P.P.Hili St, Victoria, Gozo, Malta. The certificate is free to blind and handicapped applicants. (G3DOG has just received certificate No 1 and says that it is very well presented in black and gold with colourful scroll surround.)

Contests

September *CQ* contained the results of the **1978 CQ WW DX Phone** Contest. UK scores were as follows:

SINGLE-OPERATOR

Callsign	Band	Points	Callsign	Band	Points
G3FXB	(All band)	3,520,445	G4DRT	(28MHz)	160,680
G3HTA	..	1,748,112	**GM3LYI**	..	123,840
GU3YIZ	..	511,290	**GW3GHC**	..	87,087
G3VOF	..	487,672	G3XFW	..	6,216
GM4GPN	..	375,608	**GU5CAA**	(21MHz)	1,123,380
G3DYY	..	318,000	**G3TXF**	..	345,344
G4CVZ	..	240,130	**GM5AIW**	..	9,758
G5COP	..	189,156	GU5CIA	..	1,300
GM3BCL	..	129,091	**G3RRS**	(14MHz)	472,099
G3TKR	..	96,096	G3ZHL	..	75,440
G5CMX	..	51,150	G4HLN	..	27,714
G2AJB	..	44,821	G3RAM	..	16,254
G3MWZ	..	37,948	**G4DBL**	(7MHz)	4,059
G3MXJ	(28MHz)	829,584	**GW3SLA**	(3·5MHz)	10,080
G3ZQW	..	771,498	**GM3ZSP**	(1·8MHz)	4,197
G4CNY	..	769,350	**G3XWZ/A**	..	2,180
GU4EDN	..	721,995	**GU3HFN**	..	1,764
GM4GRC	..	245,794	**GW3UCB**	..	1,638

Certificate winners are listed in bold type. In the multi-operator single-transmitter section **G6UW** led with 3,286,192 points. G8JC scored 1,575,912, G6CW 1,477,782, G3KMI 1,124,788, and G4BRA/P 984,300.

Congratulations to GM3ZSP who was world first on 1·8MHz. G3FXB was world eighth all-band entrant, GU5CAA third on 21MHz, and G3XWZ/A sixth on 1·8MHz.

The TOPS CW Club Contest

1800 1 December to 1800 2 December.

3·5 to 3·6MHz—use lf end for dx. USA novices use 3·7 to 3·75MHz. Contacts with own country count one point, in same continent two points, and in other continents five. Each call area in W, VE, VK, UA etc counts as a country for this purpose. QSOs with GW8WJ and GW6AQ count 25 points and there may be other special stations (perhaps GB2TAC) which also attract 25 points per QSO. Total score is QSO points × number of different prefixes worked. Exchanges consist of RST plus serial QSO number (from 001). Send logs to Peter Lumb, G3IRM, 14 Linton Gardens, Bury St Edmunds, Suffolk IP33 2DZ, not later than 31 January 1980.

QTH CORNER

C5AAS	via R. Brown, G3LQP, 32 Albert Rd, Sutton, Surrey SM1 4RX.
C31GY, C31HA	G4FTF, C. Eley, 3 Adelaide Road, Ipswich, Suffolk IP4 5PR
FB8XV, FB8XW	via F5VU, J. Brunner, Savigne, 86400 Civray, France.
FK8DD	BP 3040, Noumea, New Caledonia.
FK0XN	via DK7XN, R. Ulrich, Hummelsbuettelerweg 68, D-2000 Hamburg 63, W Germany.
FK0XR	via DK6XR, PO Box 323222, D-2000 Hamburg 13, W Germany.
FO0XN	(see FK0XN).
FO0XR	(see FK0XR).
FW0XN	(see FK0XN).
FW0XR	(see FK0XR).
HZ1HZ	PO Box 1999, Jeddah, Saudi Arabia.
TA2FM	PO Box 669, Istanbul, Turkey.
VE1CR/1	via VE7BTV, H. D. Hickey, 15415 Victoria Av, White Rock, BC, V4B 5A7, Canada.
VK9YJ	via K9IL, R. Miles, 620 Belmont, Romeoville, Ill, 60441, USA.
VK9YN	via WA3HUP, Mary Crider, RFD 2, Box 5-A, York Haven, Pa, 17370, USA.
VK9YR	via K9IL (see VK9YJ).
VS6BF	QSL via G3KDB, P. A. Miles, 28 Scotch Orchard, Lichfield, Staffs.
YJ8XN	(see FK0XN).
YJ8XR	(see FK0XR).
ZD8 QSL Bureau	ZD8AR, Ascension AR Radio League, PO Box 4308, Patrick AFB, Fla, 32925, USA.
ZD8TC	Ted Collins, c/o GPO Georgetown, Ascension Is, South Atlantic.
3V8ONU	(correction) via DK6NF, Florian Hell, Trewstr. 11, 8500 Nuernberg, W Germany.
YASME Foundation	PO Box 2025, Castro Valley, Cal, 94546, USA.

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

In the 1978 contest the top UK station was G4HMS who scored 47,288 points, others listed include G4CHH (18,752), GM4ELV (15,368), GW3HCL (12,749), G3ZDW (11,682), G3PKS (10,878), G2GM (9,792), G3LCG (5,187), G3MCK (2,392), G3AWR (1,050) and G3ILO (102).

The All Austria Contest

1900 17 November to 0600 18 November 1979.

CW only, call "CQ OE". Exchange RST and QSO number from 001, and confirm by repeating to sender. Each complete contact counts one point. A multiplier of two for each Austrian prefix (OE1-OE9) and one for each other prefix may be counted. Listeners should log full QSO details, and a station may be logged consecutively only three times and again after five other log entries. A signed declaration that licence and contest rules have been obeyed should be included with the entry which should be posted (before 15 December 1979) to: OVSV, "AOEC 1979", c/o Mr Fritz Schlommer, OE6SFG, Klaus 131, A-8970 Schlaiming, Austria.

Results of the **1979 ARRL DX Contests** have been received and UK acores were as follows:

PHONE SECTION
SINGLE OPERATOR

Callsign	Band	Points	Callsign	Band	Points
GU5CIA	(All band)	2,910,064	G4AHO	(High band)	87,174
G3ZQW	..	2,088,891	**GM4EIW**	..	81,144
G4BWP	..	664,548	G3ZHL	..	74,700
GW3SLA	..	47,637	G2MI	..	54,000
G3ZAY	(High band)	517,449	GM3RAO	..	40,425
G3TTJ	..	506,709	G3NT	..	29,682
G3TXF	..	449,580	G3XFW	..	15,660
G3UFY	..	394,212	G4HLN	..	13,500
G2QT	..	315,186	GM4CHX	..	11,187
G3CAZ	..	242,136	G3RAM	..	7,452
GU3YIZ	..	89,784	**GW3SJX/M**	..	7,296
G4CVZ	..	87,780	**G5CMX**	(Low band)	16,218

MULTI-OPERATOR, SINGLE-TRANSMITTER

Callsign	Points	Callsign	Points	Callsign	Points
G3OUR	1,861,416	G3SSO	1,172,358	**GW6GW**	953,676
G3RRS	1,793,376	G4GXL	678,672	G3XWZ/A	11,676

MULTI-OPERATOR, MULTI-TRANSMITTER
G4ANT 3,628,047 points

CW SECTION
SINGLE OPERATOR

Callsign	Band	Points	Callsign	Band	Points
GU5CIA	(All band)	2,463,300	G3SYL	(High band)	199,376
G3FXB	..	2,012,052	**GM3LYY**	..	160,740
G3UFY	..	628,446	GU4CHY	..	114,162
G2QT	..	566,100	G3YBH	..	98,982
GW3JI	..	536,136	G4DDL	..	89,010
G3ESF	..	372,243	**GM3NHQ**	..	79,560
GW3NYY	..	192,786	GM4EJI	..	26,082
G3APN	..	48,555	G6NK	..	8,667
G2AJB	..	26,100	G4CSB	..	7,980
G3TBK	(High band)	434,280	**G5CMX**	(Low band)	65,340
G3MZV	..	423,741			

MULTI-OPERATOR, SINGLE-TRANSMITTER
G3OUR 1,792,815 points G3TXF 1,232,448 points

Certificate winners are listed in bold type.

UK scores in the **1978 USSR "M" Contest** have been received from GM4ELV. In the all-band category **GM4ELV** led with 22,160 points, other leading scorers being GM3MQO (9,264), **G3TXF** (8,288), GM4BFX (7,848), **GI4GDV** (7,396) and **GW3LYI** (5,738). On 14MHz **GM3MBP** scored 18,260 points, **G4AEM** (2,480) and **GW2BOU** (192). The 21MHz leader was **G3VOF** (6,156), and in the listener category **BRS34658** scored 220 points. In all, some 40 UK stations entered but limited space precludes the inclusion of the complete score table.

Band reports

The latest offering from G8KG, received just before deadline, reads as follows: "By the time this appears in print the official peak of the cycle will very probably be imminent and could even have passed, although this will not be known for certain until at least the middle of next year because of the way that the data is smoothed. In this situation it is only useful to comment on short-term behaviour and this is currently quite promising.

"Mean solar activity continued to rise throughout September and preliminary data suggests that the mean sunspot number for the month will be about 175 and the mean solar flux about 202 afu. If confirmed, these will be the highest monthly means so far reached during Cycle 21, although they are only marginally above those recorded during the subsidiary peak at the beginning of the year, and there has still been no day with the solar flux above 250 afu.

"The three-month mean sunspot curve continues to follow the shape of Cycle 19 quite closely with its amplitude averaging 0·8 of the latter. If this pattern continues, the present cycle is on course for a peak in the three-month mean of around 180-200 at the turn of the year. There is, however, still time for surprises which, unfortunately, could be in either direction!"

This month the following kindly provided the contents of this part of *MOTA:* Gs 2CDT, 2HKU, 5JL, 3AAE, 3GVV, 3IMW and 3LPS, GM3LYY, G3UOL, GM4CHX, G4EAN, G4EHQ, and BRSs 17567, 31301 and 38934.

Last month under 21MHz, the PO Box No for YB0ADW was given as 3994; we are now informed that this should have been PO Box No 3394.

As usual, stations listed in italics were using cw.

1·8MHz. 2200 *FC6CNI, UA1BQM.*

3·5MHz. 0300 VP2KAD. **0400** HP3FL, W0MJ. **0500** *ZL.* **0600** W, VE. **2200** UA9FGZ, UF6FER. **2300** UK6FAA.

7MHz. 0000 *VQ9KK.* **0500** *CO7HC, VK, 3V8ONU.* **0600** *W6-W7, ZL.* **0700** *FO8DW.* **2200** *VU2UH, ZB2EO, 5Z4CW.* **2300** *HI3PC, UA0AG, VK9YN, ZD8TC, 3V8AA.*

14MHz. 0100 J6LIR, PJ4CR, VP5GT. **0200** *AP5HQ.* **0600** KH6, M1C, VQ9KK. **0700** *CN8CG* (QSL to F6ETL), FK8DE, T2AAA, T3KA, VK0PK,

WD8QGQ/KH7, YI1BGD, ZK1BD. **0800** C21AM, *FO8AK,* FW0XR, JD1YAA, KC4USC, PY2GWP/PY0, VR6TC, VY1AC, YJ8PD, ZK2VE, *7D7Z, 9V1CP.* **1000** FK8CR, VK0PK. **1300** JT1BG, *ZB2EY.* **1500** FO8FC, 9M2AR. **1600** JA, JT1BF, KH2GDL, 3B9CF. **1700** *VK9YN.* **1800** *G6ZY/CN, FR7BU,* ZL, *4K1A.* **1900** *UK1PAA.* **2000** FR7ZN, ZS2MI. **2100** *HM1EJ, P29EJ, VO6ONT,* 5R8TV. **2200** KC4AAC. **2300** HV2VO, KC4AAD, VP8s MA, NU, XT2AT, ZS6AT/T4.

21MHz. 0700 *KH6.* **0800** JA, TR8RG, VK. **0900** *FB8W* (?), FW0XN, VS5CW. **1000** JA, KL7, VK, VK9SP, ZL. **1100** P29GC (QSL to VK2BSM). **1300** 7X2FIA (=7X2CA). **1500** DU6AYL, VQ9JJ, W6-W7. **1600** TN0HL, 3V8ONU. **1700** VS5DD. **1800** FH8CL, FR7BI, S79MC, *VP2MFL,* 6B9CF, 5R8TV. **1900** SU1PM, *VE1CR/1.* **2000** VP8s SB, QI, W6-W7, 3B8CF. **2100** *XE2HL, 3B9CF.* **2200** VK, W6, 5N4ROF. **2300** VK, W6-W7, ZD7BW, ZL.

28MHz. 0700 *A9XC, T4A,* VK, *VQ9KK.* **0800** A4XID, D4CBS, HZ1AB, JA, VK, VS6HG, ZL. **0900** HS1ABD, 9X5PP. **1000** C5ABK, JA, VK, 3D6BW. **1100** 5T5AY. **1200** AP2SA, P29s JC, NBR, VQ9JC, 9X5AL. **1300** *FB8XV,* HH2JR, KH2AD (QSL to W6TPC), P29, VE1CR/1, VK. **1500** A7XQ, *TA2FM,* W6, YB0ADW, *OE2SPW/YK,* 3B8CF. **1600** *HS1ABD, JY9KP,* VQ9JC, *5H3KS.* **1700** CE3XE, ZS6AF/T4, W5-W6-W7. **1800** *HZ1HZ, ZD8TC.* **1900** CE, CX, W7YX. **2000** KH6BOG, VP2VJ (QSL to VE3MJ), W6. **2100** W1-W6, W8-W0.

Very many thanks to everyone who has contributed to this month's offering, and also to the authors of the following for items extracted: the *Long Island DX Bulletin* **(W4UL/W2IYX),** *DX News Sheet* **(Geoff Watts),** *Long Skip* **(VE3FRA),** *DX'press* **(PA0TO),** *CQ Magazine* **(W1WY),** the *Ex-G Radio Club Magazine* **(W3HQO),** and *DX Bulletin* **(K1TN).**

December deadline will already have passed but please send all items for the **January** issue **to reach G3FKM** by **30 November.** □

HF propagation study

Predicted hpf + luf in MHz for November 1979

	00	02	04	06	08	10	12	14	16	18	20	22
Suva (s)	2100	2100	1900	1800	2100	3300	4100	3600	2800	2000	1900	1900
Wellington (s)	2100	1800	1800	1800	2900	3400	3400	3000	2500	1900	1600	1900
Osaka	1809	1810	1710	1911	3312	3110	2209	1708	1708	1708	1608	1609
Hong Kong	1409	1410	1412	2614	4414	4112	3709	2705	2303	1904	1405	1407
Sydney (s)	1412	1414	1417	2618	3717	3513	3408	3204	2902	1904	1407	1409
Moscow	1203	1202	1202	1703	3305	4206	4405	3904	3102	1902	1403	1203
Bangkok	1507	1509	1512	3114	4915	5314	5211	4507	3304	2104	1605	1506
Singapore	1507	1509	1512	3315	5116	5115	5012	4707	3403	2303	1704	1606
New Delhi	1503	1505	1507	3310	5012	4912	4410	3706	2802	2102	1703	1603
Perth	1610	1513	1616	3318	4020	3718	3614	3208	3103	2603	1805	1807
Teheran	1703	1603	1604	3306	5309	5309	5208	4805	3502	2502	1803	1803
Colombo	1704	1607	1610	3313	5315	5315	5313	4808	3704	2603	1804	1804
Bahrain	1803	1703	1605	3208	4910	5111	4910	3806	3602	2803	2003	1903
Cyprus	1703	1602	1502	2705	4808	5009	5008	4606	3904	2703	2003	1804
Aden	2004	1805	1706	3210	5013	5014	5013	4509	4105	3104	2304	2104
Seychelles	2000	1900	1700	3200	4700	5000	4900	4800	4300	3200	2500	2200
Mauritius	2100	1900	1700	3100	4400	4700	4500	4300	4100	3200	2600	2300
Nairobi	2103	2003	1705	3009	4912	4913	4913	4709	4605	3403	2703	2403
Malta	1503	1302	1302	1604	3706	4107	4107	3806	3705	2504	2003	1603
Salisbury	2303	2103	1805	2809	4313	4614	4914	4712	4909	3505	2903	2502
Cape Town	2300	2100	2100	2300	3900	4300	4700	4600	4600	3700	3100	2700
Lagos	2404	2203	2003	2106	4910	4912	4914	4613	4611	3807	3204	2804
Suva (l)	2500	2300	2100	1900	3200	3100	3100	2600	2300	2900	3200	2800
Gibraltar	1302	1202	1202	1102	2603	3504	3404	3304	3204	2602	1802	1502
Ascension	2504	2203	2103	1906	4411	5013	4915	4715	4614	4109	3304	2804
Wellington (l)	2400	2100	2100	1800	2500	2200	2000	1900	1900	2200	2500	2600
Dakar	2500	2200	2100	1900	4400	5000	4900	4500	4500	4100	3300	2800
Las Palmas	2003	1703	1702	1503	3304	4706	4608	4409	4508	3705	2903	2303
Falklands	2406	2104	2105	1707	3112	3717	3921	4322	4421	4417	3313	2809
Rio de Janeiro	2405	2104	2104	1706	3309	4614	5017	4818	4817	4414	3410	2807
Buenos Aires	2405	2004	2104	1704	3007	4112	4418	4819	4818	4415	3412	2808
Sydney (l)	2315	1913	2011	1708	2307	2611	2317	2021	1823	2022	2519	2717
Lima	2300	1900	1900	1700	2100	3000	5100	4900	4900	4500	3400	2700
Barbados	2303	1803	1902	1702	1702	3307	5112	4914	4614	4511	3308	2705
Bogota	2200	1700	1800	1800	1700	2400	4900	5000	4800	4400	3300	2700
Jamaica	2100	1600	1600	1700	1600	1900	4500	4900	4800	4500	3000	2500
Bermuda	2100	1700	1600	1700	1600	2600	4600	5000	5000	4500	3100	2500
New York	1806	1706	1606	1805	1606	1808	3510	4711	4812	4310	2808	2207
Mexico	1800	1700	1600	1700	1600	1600	2200	4500	4800	4200	2700	2100
Montreal	1808	1708	1708	1808	1608	1910	3511	4612	4813	4111	2610	2109
Denver	1800	1700	1700	1800	1600	1700	1800	3200	4400	3900	2400	1900
Los Angeles	1900	1800	1800	1800	1600	1600	1500	2400	4000	3400	2300	1900
Vancouver	1900	2100	2100	1900	1700	1800	1700	1800	2600	2900	2000	1800
Iceland	1208	1208	1208	1207	1407	2707	3308	3308	3108	2108	1508	1208
Honolulu	1900	2100	1900	1900	1900	1700	1500	1400	1400	2800	2000	1900
Fairbanks	1900	2100	2000	1900	1900	1900	1900	1900	2000	2200	1900	1900

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

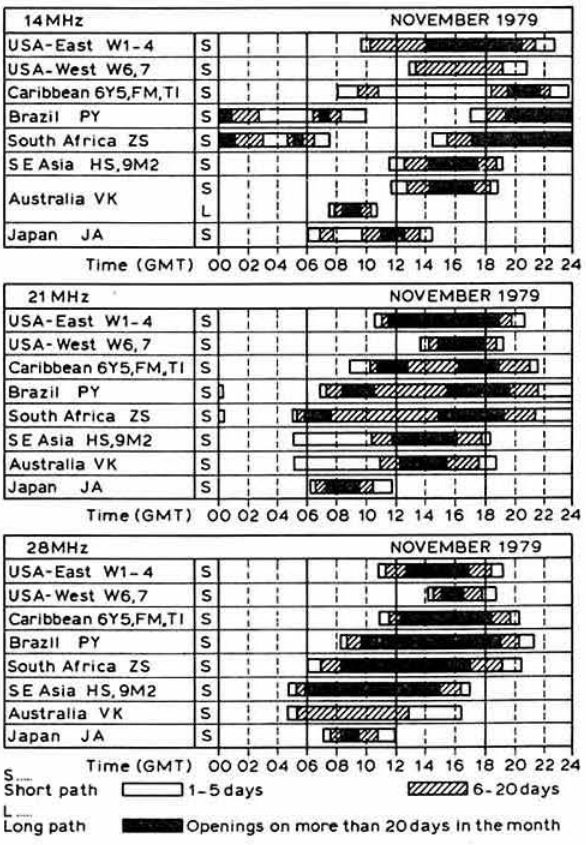
Propagation predictions

The present high level of solar activity, combined with the seasonal high f2 mufs in October and November, will lead to optimal conditions on the **21** and **28MHz** bands. On **28MHz** traffic with eastern and western North America, as well as with all other continents, will be possible. Times will be slightly later than the previous month because of the approaching winter in the northern hemisphere. On favourable days listeners who are QRV on 50MHz should be able to hear northern and especially southern American stations during the afternoon. There will be no basic changes on **21MHz**, except for seasonal changes, which means that traffic will start later and cease earlier than in October.

The **14MHz** band still offers dx, even at night, and, because of the earlier nightfall, dx conditions will begin earlier than before. There will be ideal conditions during daytime for local and European traffic, often even without interruption by the dead zone.

There will be no noticeable changes on **7** and **3·5MHz** compared with the previous month.

The provisional sunspot number for August 1979 from the Swiss Federal Observatory was 143·5. On 21-25 August the daily number rose above 200. On the other hand there were several days during the first half of the month when the number was below 100. The predicted smoothed monthly numbers for December 1979, and January and February 1980 are 141, 139 and 137 respectively.



council proceedings

A brief report on the Council meeting held on 11 August 1979

Present: Mr J. Bazley (President, in the chair), Dr E. J. Allaway, Messrs J. Anthony, P. Balestrini, R. Bellerby, T. P. Douglas, Dr D. S. Evans, Messrs L. N. G. Hawkyard, G. I. Knight, W. F. McGonigle, B. O'Brien, R. F. Stevens, G. M. C. Stone (members of Council), D. A. Evans (general manager/secretary), A. W. Hutchinson (editor).

Apologies for absence were received from Messrs P. F. D. Cornish, C. H. Parsons and C. J. Thomas.

General manager's report
The general manager commented on items in his circulated report regarding the annual audit, the *DX News Sheet*, Leicester exhibition, membership statistics and headquarters administration. A discussion on many of the points raised took place.

Review of committee business

Committee HF
The President announced that it was with much regret that the committee had been forced to cancel the HF Convention due to lack of support.

Finance & Staff
A letter from a member at the University of London to the President queried the age limit for student subscription. This was considered and Council requested that the committee consider the financial implication of any change and report back.

HF Contests
No matters for discussion.

Interference
The committee had suggested that reprints of the interference feature in the May 1975 issue of *Radio Communication* be made available to members. Mr Hutchinson said that artwork masters of those pages were available, and Dr Evans said this could be looked at by the Technical & Publications Committee.

Membership & Representation
Mr O'Brien reported that the Home Office had approved the revised GB2RS arrangements. Mr Stevens suggested that a coverage survey should be conducted at a later date.

Microwave
Dr Evans commented on the progress being made with microwave repeaters.

Mobile & Exhibition
Mr Hawkyard commented on the success of the Woburn Rally and noted how easily the Society's Marler Haley stand had been utilized. A brief discussion followed on other exhibitions.

Propagation Studies
No business to discuss.

Technical & Publications
Dr Evans reported that the new *World Prefix Map* would be centred, unusually, on the Pacific Ocean.

The committee was considering reviewing advertised kits, and was also considering special articles on constructional projects which could be undertaken by amateurs without special skills or test equipment.

VHF
Council agreed that Messrs Bate, G8AMD; Morcom, G3VEH; and Suckling, G3WDG, should serve on the committee.

VHF Contests
Mr Hawkyard said that the committee was looking for new recruits, preferably with knowledge of microwave bands.

Raynet
Mr Balestrini referred to the issue of 145·8MHz which had been raised again by some members of the committee. After much discussion it was agreed that the President would write to the committee chairman.

Membership and representation
Council approved:
(i) reduced subscriptions for two members;
(ii) waived subscriptions for three members;
(iii) the appointment of Mr A. J. Masson, G3PSP, and Mr R. M. Grant, GM4DQJ, as area representatives for Edgware and district, and Perth & District Radio Club, respectively;
(iv) the granting of affiliation to AMSAT UK, London; Anglo Scottish Repeater Group, Cumbria; Eden Valley Radio Society, Cumbria; 1st Newport (The Old Guard) Isle of Wight Scout Group; Jewish Lads and Girls Brigade, London; Malvern Hills Radio Amateurs Club, N Malvern; Stirlingshire Amateur Radio Group; Victoria Disabled Citizens Association Radio Amateur Group, Victoria, Australia; and Wigston Radio Club, Leicestershire.

HF awards manager
Dr Allaway explained that Charles Emery, G5GH, very reluctantly, after many years service to the Society, must relinquish the office of hf awards manager due to ill health. Council wished to record its appreciation of the work carried out by Mr Emery. Mr P. Miles, G3KDB, had volunteered to take over these duties from 1 January 1980.

IARU member societies
Council voted in favour of the admission to the IARU of the Fiji Association of Radio Amateurs and the Cayman Radio Society.

World Administrative Radio Conference
Mr Stevens outlined the scale of the conference and stressed that there were three stages of decision making and that it would only be at the end of the conference that the final outcome would be known.

Dr Allaway said that he thought that very few people realised the vast amount of work which had been done by Mr Stevens on behalf of radio amateurs world wide and particularly in Region 1. A vote of thanks to Mr Stevens was carried unanimously.

Phase 3 satellite news bulletins
Mr Stevens reported that in principle the Society could use GB2RS for satellite news bulletins and that he and the general manager were in contact with AMSAT.

VAT
Mr Knight raised the question of the increased VAT payments on Society subscriptions and asked if the subscriptions were going to be raised as a result. The general manager said that any subscription rise had to be planned well in advance and that it had already been agreed that subscriptions would in future be reviewed annually.

Scottish regional meeting
The President said that he had sent out 65 letters and had received 46 replies. Of those, 42 would welcome a meeting with the President in Scotland, and it was agreed to hold such a meeting.

Novice licences
The Society had a sub-committee investigating this.

Correspondence
The President reported that he had been invited to visit ARRL headquarters. An invitation to attend the "Day of the Amateur" in Holland had also been received, and he and the general manager would attend on behalf of the RSGB.

obituaries

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

Mr J. Bonser, G3GRL
John Bonser, who died on 10 March, aged 47, had been an amateur for 30 years. He was a keen cw and contest operator, and received one 7MHz and two 1·8MHz awards in the CQ WW contests. He was a member of FOC, TOPS, and Mansfield ARC, and built numerous pieces of equipment for the local club's contest activities.

Mr J. Bull, GW3DIH
John Bull, who died on 30 August, aged 58, became completely paralysed by polio during the second world war, and in the five years he spent forcing his limbs back to near normal he took up amateur radio, and qualified for his licence—the spirit of amateur radio being his major interest in the hobby. He subsequently became chief engineer at British Forces Broadcasting Service offices in Egypt, Cyprus and Germany, and finally moved to the head office in London.

Mr N. C. Henderson, GM3LYI
Neil Henderson, who died on 3 August, was a very enthusiastic amateur and fine operator. His interest in radio dated from experience in the Signals Regiment, mainly acquired in India. He was secretary of the Greenock & D ARC, and was well known for his enthusiasm during NFDs.

Mr S. G. Hoare, G8OUF
Geoff Hoare died on 28 July, aged 63. He had only been licensed since 1978 but made many friends on the air, both in the UK and abroad, using 144MHz ssb and fm. He also gave up many of his evenings to help youngsters learn about basic electronics, and encouraged many into amateur radio.

Mr T. W. Horsley, G2FLR
Thomas Horsley, who died earlier this year, had been an amateur for many years and obtained much of his enjoyment from constructing his own equipment.

Mr P. D. Lucas, G3JDN
Mr Lucas died on 8 July, aged 51. He was a member of Reigate ARC.

Mr C. Spreyer, G3OCC
Chris Spreyer, or "Old Chris of Chislehurst" as he liked to be called, died on 10 August. He was a leading light at Cray Valley RS, well known for his freely given help and advice. He was active mainly on 1·8 and 70MHz.

Mrs E. Thomas, GW4BTT
Esther Thomas, who died on 28 September, was licensed in 1972, four years after developing paralysis, and was believed to be the first bedridden yl amateur in South Wales. She had contacts in over 57 countries, helped by connection to a possum unit, and derived tremendous pleasure from a hobby which she would have been unable to pursue without the much appreciated assistance of other amateur radio enthusiasts.

We have also been advised of the deaths of:

Dr A. P. Balthasar, VK2IH;
Mr E. J. Bayliss, G2MU, on 26 July;
Mr A. C. G. Brown, RS35020, on 11 July;
Mr G. F. Browne, G3JMF, on 14 September;
Dr C. J. Evans, G3EIL, on 29 March;
Mr K. L. Gillespie, VK3GK, in September 1978;
Mr F. G. Holt, G3XQT, on 11 July;
Mr V. H. T. Inman, JP RS82, on 13 June;
Mr H. G. A. Lammerzahl, 9H1DZ, on 4 August, aged 46;
Mr W. G. May, RS19735, in December 1978, aged 73;
Mr S. Moule, RS26418, on 26 August.

your opinion

BAND PLAN
The Editor
Radio Communication
Sir—Having read the letters concerning the 144MHz band plan in your May issue, my own view is that there are only five popular fm frequencies S20–24. If an amateur buys a hand-held fm transceiver with S20–24 and two repeater frequencies, where does he go if these frequencies are all in use?

The old system of calling on any frequency and tuning enabled any station to have a chance of working any other. Also the *whole* of the band was in use, not just a few specific frequencies.

Bill Kitchen, G4GHB

EQUIPMENT COSTS
The Editor
Radio Communication
Sir—With the pound sterling's recent improved value against the USA dollar and Japanese yen, may we now expect importers to adjust their prices downwards? After allowing an extra 2½ per cent for VAT at the new rate, about £100 reduction on a £500 Japanese rig might be about right.

Who will be the first honest broker to stand up and be counted?

John P. Wilson, GW3BGP

BOOK REVIEW

CB'ers Guide to Ham Radio, by G. W. McCarthy. Published by Van Nostrand Reinhold Company Ltd. 306 pages, 180 by 235mm, cloth bound. Price £11.20.

After a conventional introduction chapter, this book comprises a further 19 sections written in a conversation question-and-answer format. The purpose of the book, as its title indicates, is to provide North American cb operators with information concerning amateur radio. The information provided is comprehensive, but is of course based on conditions and regulations experienced in the USA; there is little applicable to the UK. The production quality of the book is good, but what is the purpose of providing an expensive publication which can have little interest for those outside the country of origin?

R.F.S.

Special event station

GB2EHS, 16–17 November
A special event station will be set up at The Scout Hut, Bagshot Road, Bracknell, Berks, to celebrate the 21st anniversary of the formation of the 1st Easthampstead Scout Group. Operation will be on 3·5, 14, 28 and 144MHz, from 8–10pm on 16 November and from 8.30am to 6pm on 17 November.

Mobile rallies calendar

1980
1 June—Hull & D ARS Mobile Rally, Hull University. Would traders please contact G8EAH, QTHR, for details of discounts for advanced booking. Further details nearer the date.

contest news

144MHz Fixed Contest rules

0900–1700gmt, 2 December 1979

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

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

144MHz CW Contest

In the rules for this contest published in the October issue, the date was incorrectly given as 5 November. This should have been 4 November.

3·5MHz Field Day 1979 results

Perhaps it was the fine weather, or maybe it was due to the growing interest in QRP operation, but, whatever the reason, we were pleased to receive a bumper pile of entries for the 1979 3·5MHz Field Day. The RSGB's QRP contests have always attracted a regular but small band of supporters, and we now hope that, with the appearance of more QRP rigs on the air, these contests will continue to receive more widespread support.

The leading station—repeating its 1978 success—was G3FJE/P, operated by G4BWP and G4DRS from Henlow in Bedfordshire. The operators used a modified FT150 transceiver with an inverted-V dipole, 35ft high at the centre. The runner-up was G3GQC/P from Mansfield, Notts, with a dipole 35ft high "over water" energized by a TS120V; the operators were G3XWZ and G4HCD.

The inverted-V dipole was the most popular antenna, with half-wave long-wires or inverted-Ls a close second. A number of competitors would like to see the transmitter rating based on power output rather than power input, and the introduction of multiple power classes with a sliding points scale—as is used in the Low Power Contest—has also been proposed. Both these suggestions will be considered by the HF Contests Committee before next year's 3·5MHz Field Day; further comments and suggestions are invited, and these should be forwarded to the HF Contests Committee c/o RSGB HQ.

Subject to Council approval, the Houston-Fergus Trophy will be awarded to G3FJE/P, and certificates of merit will be sent to G3GQC/P and G3RTE/P.

Comments from competitors

"Good to see an increase in the number of portable stations on the band"—G3RTE.

"G3GQC/P was the best signal of the day in Sussex"—G3YIQ/P.

"Spent first 1½h wondering why we weren't getting out, so changed antennas, and still no contacts . . . then discovered keyer was not compatible with FT7, and went on to straight key for the rest of contest"—G3XEP/P.

"Suggest 0800-1500gmt"—G3RJV.

"We operated until our nicads went flat!"—G3VTT/P.

G3NKS

Posn	Callsign	TX/Pwr input	QSOs	Points
1	G3FJE/P	FT150/10W	85	680
2	G3GQC/P	TS120V/10W	81	645
3	G3RTE/P	Triton 2/10W	77	605
4	G3YIQ/P	TS120V/10W	70	600
5	G3WVG/P	FT7/10W	69	580
6	G4RS/P	VXO/BD123pa/9W	56	555
7	G4BTJ/P	FT301S/10W	64	550
8	G3IFF/P	Homebrew/8W	56	510
9	G4DDX/P	Argonaut/5W	56	505
10	G3UFY/P	TS120V/10W	61	500
11	G4CDD/P	FT7/10W	51	465
12	G4CZB/P	FT301S/10W	51	450
	G6ZG/P	VFO/PA(EL91)/5W	50	450
14	G3XEP/P	FT7/10W	45	435
15	G3FRN/P	HW8/3W	39	400
16	G8IB/P	HW8/3W	28	330
17	G3RJV/P	Argonaut/5W	26	315
18	GM3OXX/P	Homebrew/2W	35	280
19	G3VTT/P	HW8/3W	26	255

Disqualified: G3BBC/P (rule 8).

Check logs from G3ZDW, G4GIK/M, GW3NYY/P and GW8PG/P are acknowledged with thanks.

Summer 1·8MHz Contest 1979 results

This year's event attracted 55 entries, an increase of six compared with last year. Conditions were generally fair, with some stations working PY1RO. Traditionally, activity in this contest is lower than in the 1st and 2nd 1·8MHz contests and this is reflected in the number of contacts made by the leading stations. Logs were generally very good, although errors in callsigns took their toll. One entrant in particular lost over 15 per cent of his score due to simple logging errors.

The winning station was G3XVF/A, with a score of 583 points gained from 112 contacts and 50 bonuses. Equipment used was a Drake T4XC/R4C combination and a dipole at 80ft. Second place went to G3GRS/A, a multi-operator station using Yaesu FT560/Trio JR599 and an inverted-V dipole at 75ft to score 554 points from 115 contacts. In third place was G3SYM/A, with 548 points.

The overseas section was won by Gunter Schwarzbeck, DL1BU, with a very creditable score of 418 points. In second place was PA0LOU, and third was OK1DWF.

Certificates of merit go to G3XVF/A, G3GRS/A, G3SYM/A, DL1BU, PA0LOU and OK1DWF.

Thanks to G3KTF, OK3KFO and HA5-007 for their most useful check logs.

G3WPF

UK SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	G3XVF/A	583	18	G3LCH	410
2	G3GRS/A*	554	19	G4ALG/A	402
3	G3SYM/A	548	20	G3LHJ	398
4	G3XUD	545	21	G3JKB	393
5	G4FNL/A	538		G3XTT	393
6	G3MYI/P*	521	23	GM3OXC	384
7	G4BWP	513	24	G3IFF	383
	G3SJJ	513	25	G4EBK	374
9	G3PDL	505	26	G3KDB	369
10	G3XTJ	503	27	G3PJX	365
11	G3FCW	464	28	G4ASH	319
12	G3YMC	450	29	G2VJ	299
13	G4DDL	449	30	G4ELZ	292
14	G3DCZ	445	31	G4HSD	284
15	GW3KOR	437	32	G4HYU	251
16	G3VIP/P	427	33	G3ILO	37
17	G2MJ	413			

OVERSEAS SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	DL1BU	418	12	OK1MGW	194
2	PA0LOU	293	13	OK2PAW	184
3	OK1DWF	266	14	OK2BUV	175
4	OK1KPU*	262	15	OL3AXS	154
5	DK6PB	255	16	OK1KTW/P	147
6	DJ9MH	249	17	OL5AXU	142
7	DL0FJ/P*	247	18	SP5IXI	138
8	PA0LVB	246	19	OL9CJB	118
9	DJ3ZX	232	20	OL8CKB	112
10	DK4ZH	219	21	DF2PI	91
11	OL8CJO	196	22	OE3IBW	75

*Multi-operator

August 70MHz Contest results

Opinions on conditions during this contest varied from poor to good, with the majority finding them better than normal. Some fixed stations thought that single-operator portable stations had an unfair advantage in a short contest. Most entrants made no comment on the duration of the event, but GM3XBY/P would have preferred two days.

Congratulations go to GM3XBY/P, G3UKV, G3FDW/P, GM3WOJ/P and BRS15822, who will be awarded certificates. As overall leader G3FDW/P will receive the VHF Manager's Trophy.

G3XDY

SINGLE-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QRA	Best dx	Km	Ant
1	GM3XBY/P	790	56	XO10	GJ3YHU/A	640	4x6Y
2	G3UKV	416	52	YM28	GJ3YHU/A	390	4Y
3	GM4ERX/P	390	30	XO19	GJ3YHU/A	630	4Y
4	G3PFM/P	330	47	YK09	GM3XBY/P	462	4Y
5	G4APL	289	47	ZL60	GM3WOJ/P	485	4Y
6	G3BOC	288	37	YM16	GJ3YHU/A	395	4Y
7	GD2HDZ	240	24	XO68	G4DZO/P	475	4Y
8	G3PWK	239	41	AM42	GM3WOJ/P	422	4Y
9	G3LVP	228	45	AL33	GM3WOJ/P	501	4Y
10	G4HRY	222	34	ZM43	GJ3YHU/A	366	4Y
11	G3OHC	205	29	ZM31	GJ3YHU/A	385	D
12	G3PBV	142	14	YK32	G3FDW/P	468	4Y
13	G4FKI	107	31	AL31	GM3XBY/P	460	3Y
14	G5DF	99	11	ZO51	G4DZO/P	440	4Y
15	G3EKP	91	15	YN29	G3PFM/P	330	4Y
16	GM3YOR	42	6	YQ65	G3UKV	380	4Y

Disqualified: G3MPN, general rule 20.

MULTI-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QRA	Best dx	Km	Ant
1	G3FDW/P	819	67	YO29	GJ3YHU/A	617	8QY
2	GM3WOJ/P	721	54	XO26	GJ3YHU/A	630	7Y
3	GJ3YHU/A	480	37	YJ69	GM3XBY/P	651	4Y
4	G3AMW/P	468	49	ZN18	G3PBV	412	8Y
5	G4DZO/P	416	58	AK11	GM3WOJ/P	539	4Y
6	G3JEQ/P	370	56	ZL77	GM3WOJ/P	485	8Y
7	G3VER/P	354	61	ZM80	GM3WOJ/P	435	8Y
8	G4EGU/P	309	53	AL51	GM3WOJ/P	504	4Q
9	G3PJX/A	220	44	ZL58	GM3WOJ/P	470	4Y
10	GW4ENA/P	177	19	XM17	G4DZO/P	399	2Y
11	G3PGN	108	33	AL22	GM3WOJ/P	480	4Y

LISTENER SECTION

Posn	Callsign	Points	QSOs	QRA	Best dx	Km	Ant
1	BRS15822	140	34	ZL40	GM3WOJ/P	465	3Y
2	BRS34310	48	23	ZL80	G3MPN	–	D

Y = Yagi, D = Dipole, QY = "Qagi", Q = Quad.

144MHz QRP Contest results

The portable stations experienced rain, electric storms and high static levels, and some were like GW3NNG/P, high up in the clouds having used a wheelbarrow to get the gear on to the Brecon Beacons. Despite the weather, remarks indicate that this was an enjoyable contest, with many already planning for next year. The multi-operator section was virtually all portable, and the single-operator section mixed. Therefore, the committee has decided that an award should be given for the first fixed station, G8LEF, in addition to the usual winner and runner-up awards.

Entrants who did not use the required 427 form omitted to give full information, ie which section they entered and operators, so they may be listed in the incorrect section. Comments were made on specific contest station(s) causing splatter at 60km, and remarks such as "better to have fixed and portable sections" were made. Also an interesting diary of events was received from Cliff Sharpe, G2HIF, operating /P near Corfe Castle. Mention must also be made of the lowest QRP 10mW to $4 \times \lambda/2$ in vertical polarization, by G3ILO.

G8ACJ

SINGLE-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	G4ERG/P	935	134	YL62	PA0RDY	653
2	G8DVK/P	780	179	ZL33	GM8DVD/P	432
3	G8LEF	654	87	ZN21	PA0FHG/A	475
4	GJ8SBT/P	619	66	YJ59	G8CFM/P	460
5	G3PQY/P	618	94	ZN18	G4BEL/P	416
6	G8DTQ	616	138	ZL60	GM8MJV/P	475
7	G8NRP/P	599	143	ZL54	PA0FRE	406
8	G8NEY/P	569	97	YL62	ON5NY	462
9	G8GII/P	500	117	ZM56	GJ3YHU/A	360
10	G3NAQ	479	109	ZL34	PA0RDY	440
11	G3XWZ/P	465	108	ZN62	G4CIK/P	260
12	G8MMF/P	410	110	AL51	PA0RDY	351
13	G8GGP	437	134	AL52	G3SPJ/P	465
14	G4CLR/P	390	110	YL19	–	–
15	G4GTH/P	383	80	YK19	G3JFO/P	–
16	G8OCT	364	81	ZM74	GM8MJV/P	415
17	GM8DVD/P	350	43	YP66	G8FAT	–
18	G4CRC	344	65	XK63	G3SPJ/P	535
19	G3XBY	330	85	ZM52	GJ8SBT/P	–
20	G8FMC/P	320	88	ZL26	GW5CZJ	297
21	GW3BPM/P	240	36	XM17	G8AUN/P	–
22	G4FVP/P	241	33	ZO01	G8KLV/P	430
23	G4ANB	185	59	ZL34	G3PQY/P	249
24	G3UFB	152	44	ZL19	G3SPJ/P	355
25	G3XEU/P	111	25	YK23	G8CFM/P	195
26	GW4BUO/P	91	17	XL27	GJ3YHU/A	331
27	G8HHQ/P	70	29	YK43	G4HRO/P	310
28	G8LXY	43	31	ZL09	G8NRP/P	91
29	G3ILO	12	4	YL29	G4ERG/P	–

MULTI-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	GW4EZT/P	1,590	223	YM04	ON5UI	535
2	G3SPJ/P	1,360	138	YO29	ON5UI	595
3	GW3NNG/P	1,280	193	YL03	ON5UI	500
4	G4DDN/P	1,230	204	YL57	PA0FHG/A	563
5	GW3WRA/P	1,135	201	YL05	PA0FHG/A	525
6	GW4GZP/P	1,067	175	YM55	ON5UI	502
7	G4CQZ/P	970	212	ZM80	GM8MJV/P	398
8	G8RZO/P	920	217	ZL26	GM3FUS/P	600
9	G8EAH/P	764	106	ZO77	GJ3YHU/P	551
10	G3VRE/P	725	176	ZL52	PA0FHG/A	460
11	GW3OUR/P	722	124	YN64	G3DAH	361
12	G4HRO/P	685	161	ZN71	GJ8SBT/P	425
13	G8PNX/P	671	134	ZN52	G4CRC	442
14	G8AUN/P	658	74	AM06	GM8FUS/P	480
15	G8MLO/P	624	170	AL51	GM8MJV/P	471
16	G3JFO/P	614	99	ZO55	G4GTH/P	385
17	G3FJE/P	583	161	ZM79	GD2HDZ	363
18	G4ILI/P	570	142	ZL11	ON5UI	402
19	G8AMD/P	554	134	ZM64	PA0RDY	417
20	GW8KPZ/P	512	103	YM75	GM8MJV/P	380
21	G3ZQM/P	502	66	YO30	G3TDG	406
22	G3FKF/P	437	85	YK10	PA0FHG/A	492
23	G8LVS/P	423	101	ZN61	ON5UN	447
24	G3UUP/P	419	140	ZL26	GJ8SBT/P	284
25	G2HIF/P	412	78	YK30	ON5UN	390
26	G8RAE/P	394	28	ZL29	GD3TNS/P	390
27	G4CIK/P	385	90	ZK10	G8CFM/P	344
28	G4DZO/P	381	81	AK11	G3SPJ/P	460
29	G8MWA/P	342	100	AL43	G3SPJ/P	400
30	G8EFS/P	331	128	ZL60	PA0RDY	360
31	G8KOM/A	305	87	ZL36	G3SPJ/P	350
32	G8MKC/P	278	75	ZM65	GJ8SBT/P	320
33	GW4DPT/P	258	46	YM75	F1EBG	463
34	G4FAI/P	222	60	ZL30	PA0RDY	340
35	G4CLB	216	74	ZL37	PA0FHG/A	377
36	G8ODR/P	185	108	ZL29	GJ8SBT/P	260
37	G4ICF/P	174	38	ZN13	–	–
38	G8KGI/A	61	21	ZK15	F6AID	189

Thanks for check logs from G2CWY, G3JKS/P in ZL19, and G5CMX.

Slade Radio Bert Simmonds Memorial Trophy 1979

The following are the final placings in the competition at the conclusion of the eighth RSGB df qualifying event on 19 August, the results of which are printed below.

Posn	Competitor	Club	Points
1	B. M. Bristow	Mid-Thames	39
2	M. P. Hawkins	Chelmsford	21
3	T. C. Gage	Mid-Thames	16
	E. L. Mollart	Mid-Thames	16
5	W. J. North	Mid-Thames	13
	C. D. Plummer	Coventry	13
	P. T. Tyler	Mid-Thames	13
8	C. Merry	Dartford Heath	10
	J. R. Vickers	Slade	10
10	A. W. Butcher	Chelmsford	9
11	I. R. Butson	Chelmsford	8
12	R. J. Parsons	Burton-on-Trent	7
13	P. H. Lisle	Mid-Thames	6
14	D. Holland	South Manchester	5
15	D. E. Newman	Slade	4
16	B. J. Mahony	Rugby	3
	P. Woollett	Dartford Heath	3
18	A. Simmons	Mid-Thames	2
	C. M. Wells	Mid-Thames	2
20	M. Easterbrook	Dartford Heath	1
	P. Yeates	Salisbury	1

DF Qualifying Event Slade results

Healthy signals from both hidden stations were received by the 15 hopeful competitors who assembled at Kingswood Common, near Wolverhampton, for the start of the last df qualifying event of the year. Their optimism was soon to turn to frustration as they encountered the challenging layouts which the organizers had provided for their delectation at the station sites.

Station A was 12½km away to the north-east, in the corner of a wood bounded by the M6 and A5. Several hundred metres of fine wire antenna had been suspended in the trees, but the final length had been tacked under the horizontal rails of a fence, leading to some particularly prickly gorse bushes in which the operator had concealed himself. The competitors were mystified when they found their sets consistently leading them to a wooden fence, with no sign of a transmitter.

Station B was at Little Dawley, 15km west of the start. The site here was an old slag heap which had become overgrown with scrub. Another long antenna had been arranged, coupled into a web of power lines which criss-crossed the area, and the resultant radiation pattern caused considerable difficulty to those trying to df in to the station. Thus many competitors spent quite some time running round in circles, and eventually nine teams converged to descend upon the operator almost simultaneously in the final stages of the event.

After a splendid tea at Walsall, the winner, Brian Bristow, was congratulated on his performance. The chairman of the Slade RS also presented him with the Bert Simmonds Memorial Trophy, which he had won convincingly as best overall performer in the series of qualifying events. Subject to confirmation, Colin Merry and Peter Lisle qualified for the National Final.

Posn	Competitor	Club	Time of arrival Station A	Station B
1	B. M. Bristow	Mid-Thames	1533	1449
2	C. D. Merry	Dartford Heath	1552	1500
3	P. H. Lisle	Mid-Thames	1504	1604
4	T. C. Gage	Mid-Thames	1435	1616
5	D. E. Newman	Slade	1432½	1618
6	E. L. Mollart	Mid-Thames	1454	1619
7	I. R. Butson	Chelmsford	1432	1619+
8	G. A. Whenham	Coventry	1434	1619++
9	G. H. Taylor	Ariel	1522	1620
10	D. C. Holland	South Manchester	1622	1504
11	A. Simmons	Mid-Thames	1433	1626
12	A. W. Butcher	Chelmsford	1630	1538
13	C. D. Plummer	Mid-Thames	–	1534
14	P. M. Williams	Slade	–	1621
15	P. Woollett	Dartford Heath	–	1622

Verulam ARC Transmitting and Receiving Contest 1979 rules

Section 1: 144MHz 0900–1300gmt Sunday 25 November.
Section 2: 1·8MHz 2000–2400gmt Saturday 8 December.

Contacts. To consist of an exchange of reports, serial numbers beginning at 001 and name of county (new county boundaries) or country (if outside UK), using any permitted mode. Contacts via repeaters will not count for points.
Entrants. The contest is open to all licensed operators and swls. Portable, mobile and fixed stations may take part.
Scoring. 1 point per contact. 10 points per contact with G3VER, the Verulam ARC station. The total score in each section of the contest is to be multiplied by the number of UK counties worked in that section. Countries outside the UK count as additional counties. Only one contact with a specific station in each section of the contest will count for points.
Logs. Logs must include the following information: date; time; callsign; RS(T) and serial number sent; RS(T), serial number and county received; points claimed. Any convenient log sheet containing the above information may be used.
The location of the entrant's station, if different from his normal address, must be stated.
SWL entries. Scoring etc, will be as for the transmitting section, but the following differences should be noted:
(i) Only contacts made by stations taking part in the transmitting sections of the contest will count for points.
(ii) Logs must include: date; time; callsign of station heard; report RS(T) by swl on station heard; report, serial number and county sent by station heard; callsign of station being worked; points claimed. A particular station must only appear once in the "station heard" column.
Awards. Specially-endorsed certificates will be awarded to the winners, and second, third and fourth placed in each section of both the transmitting and swl classes. Certificates for all entrants are available, provided a stamped-addressed envelope of minimum size 9 by 6½in is included with the entry.
Post separate logs for each section of the contest to B. Pickford, G4DUS, 130 The Drive, Rickmansworth, Herts, post-marked not later than 20 December 1979. Telephone enquiries to Rickmansworth 77616, after 6pm.

Contests calendar

October 1979–January 1980	432MHz Cumulative *(Rules in September issue)*
November 1979–January 1980	1,296MHz Cumulative *(Rules in September issue)*
10–11 November	2nd 1·8MHz *(Rules in October issue)*
10–11 November	Esperanto Contest (ILERA), *(Details from G4MR, QTHR)*
17–18 November	All Austria 1979 *(Rules in November issue)*
24–25 November	BATC SSTV
25 November	Verulam ARC Transmitting and Receiving 144MHz *(Rules in November issue)*
1–2 December	TOPS CW Club *(Rules in November issue)*
2 December	144MHz Fixed *(Rules in November issue)*
8 December	Verulam ARC Transmitting and Receiving 1·8MHz *(Rules in November issue)*
1980	
7, 15, 23, 31 January	1·8MHz Cumulative
6, 12, 20, 26 January	3·5MHz Cumulative
13 January	AFS
20 January	70MHz CW
2–3 February	7MHz Phone *(Rules in June and July issues)*
3 February	432MHz Fixed
9–10 February	First 1·8MHz
23–24 February	7MHz CW *(Rules in June and July issues)*
1–2 March	144/432MHz and SWL
8–9 March	Commonwealth
12 April	1,296MHz Trophy
13 April	Low Power
13 April	432MHz Trophy and SWL
3–4 May	144/432/1,296MHz and SWL
4 May	Regional Round-up CW
18 May	Regional Round-up Phone
1 June	70MHz and SWL
7–8 June	NFD
28–29 June	Summer 1·8MHz
5–6 July	VHF NFD
20 July	3·5MHz Field Day
3 August	144MHz QRP and SWL
11–12 August	Meteor Scatter
17 August	70MHz Trophy and SWL
6–7 September	SSB Field Day
6–7 September	144MHz Trophy and SWL
4–5 October	432/1,296/2,304MHz and SWL
12 October	21/28MHz
19 October	21MHz CW
19 October	70MHz Fixed
2 November	144MHz CW
8–9 November	Second 1·8MHz
November–December	432/1,296MHz Cumulative
7 December	144MHz Fixed

The presentation of the G8HPC Memorial Trophy to Tom Abrahams, G4AKJ, by North Bristol ARC for his successful work on RAE courses

club news

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

Items of news and dates of forthcoming events should reach RRs by 15 November for the January 1980 issue.

Club secretaries are QTHR unless otherwise stated.

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

Ainsdale (AARC)—Thursdays, fortnightly; 8, 22 November, 6, 20 December. Ainsdale Scout HQ. Full details from G2CUZ.

Blackburn (East Lancs ARC)—First Thursday in each month, 7.30pm. New venue: YMCA, Blackburn. Sec N. Jenkin, G4CGT, 5 Minster Crescent, Darwen.

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

Bolton (B&DARS)—First Wednesday in each month. Horwich Leisure Centre, Victoria Road, Horwich, Bolton. Sec John Debney, G8RWY, 2 Coverdale Avenue, Heaton, Bolton.

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

Bury (BRS)—Tuesdays, 7.30pm. Second Tuesday in each month (Main meeting); 13 November (Surplus equipment sale), 11 December (AGM, and wine and cheese party). Mosses Community Centre, Cecil Street, Bury. Publicity officer, Mike Bainbridge, G4GSY, tel 061-761 5083. Visitors always welcome.

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

Chester (C&DARS)—Tuesdays, 8pm, except first Tuesday in each month. YMCA, Chester. New sec, from whom further details can be obtained, D. Cutts, tel Gresford 3344.

Douglas (IoMARS)—Mondays fortnightly. "Keppel Hotel". Cregny-Baa, Nr Onchan. Sec GD4FWQ, tel Douglas 22295.

Eccles (E&DARC)—Tuesdays, 8.30pm. "White Swan", Worsley Road, Swinton. CW class each week. Sec Chris Harrison, G8KRG, tel 061-789 3538.

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

Liverpool (L&DARS)—Tuesdays, 8pm. Conservative Association Rooms, Church Road, Wavertree. Sec G4CVZ, tel 051-220 5470.

Liverpool (North Liverpool RC)—For details of meetings please contact R. Porter, G3VXK, 11 Cranmore Avenue, Crosby, Liverpool L23 0QD; tel 051-928 1610.

Liverpool University (UoLARS)—Meetings each lunchtime. Membership open to Polytechnic members and associated colleges. Shack in the Reilly Building, open anytime. Prospective members should contact Geoff Plucknett, G4FKA, UoL, 2 Bedford Street North, Liverpool L7 7BD.

Macclesfield (M&DRS)—Second Tuesday in each month, 7.45pm. For details of venue and programme contact Mary Roberts, 15 Park Brook Road, Macclesfield, tel Macclesfield 24383.

Manchester (M&DARS)—Wednesdays, 7.30pm. Morse practice most evenings, lecture on third Wednesday in each month. Newton Heath Community Centre, 203 Droylsden Road, Newton Heath, Manchester. New sec John Dent, G8OWY, 76 Lynwood Grove, Audenshaw, Manchester. Club station G3HOX active on hf and vhf.

Manchester (South Manchester RC)—Fridays; 9 November (Annual dinner), 16 November ("Microprocessor fundamentals" by Dr J. Smith), 23 November ("Loudspeakers" by R. V. Heaton, G3JIS), 30 November (Discussion evening), 7 December (Mini-lecture contest), 14 December ("Resistors" by T. Cook), 21 December (Club party), 28 December (No meeting), 4 January 1980 ("Lasers and holograms" by D. Bolton and T. Bootyman), 8pm. Mondays (Informal), 8pm. Sale Moor Community Centre, Norris Road, Sale. Sec David Holland, G3WFT, 32 Woodville Drive, Sale, Cheshire M33 1NF, tel 061-973 1837. Visitors always welcome.

Manchester (UMISTRS)—Wednesday afternoons, cw classes if required; Thursday evenings. The radio shack. UMIST Union bar. Prospective members please contact M. P. Doig, G4CQZ,UMIST RS, UMIST Union, PO Box 88, Sackville Street, Manchester M60 1QD. G3CXX/G8FOT active on 1·8/144MHz and, in the near future, on 432MHz/1·3GHz.

North Western Repeater Group—Informal meetings on the third Thursday in each month, 8pm. "Globe Club", Willows Lane, Accrington, Lancs. Details from sec. G3RXH.

Ormskirk (OARC)—Wednesdays, 8pm. Members' QTHs. New sec Kevin Higgins, G4IGX, 8 Delph Top, Greetby Hill, Ormskirk L39 2DX.

Penrith (Eden Valley RS)—Third Thursday in each month. Two Lions Hotel, Great Dockray, Penrith, Cumbria. Sec G4HYJ, *Herald* office, 14 King Street, Penrith, Cumbria. Full programme. Visitors welcome.

Preston (PARS)—Thursdays, fortnightly; 1, 15, 29 November, 13, 27 December. Windsor Castle, St Paul's Square, Preston. Sec John Loftus, 14 Fishergate Hill, Preston, tel 53508.

Salford (Dial House RS)—Wednesdays, 5.30—9.30pm. Dial House, 21 Chapel Street, Salford, Lancs. Net channel 145·25MHz fm—the club station G3WDH monitors this frequency every club night for any other station. Details from sec G8JCL, c/o M43 at above address.

Stockport (SRS)—Second, third and fourth Wednesdays in each month; 14 November (Meteor scatter), 21 November (Natternight), 28 November (Construction contest and book sale), 12 December (AGM), 19 December (Natternight), 26 December (No meeting), 8pm. Blossoms Hotel, Buxton Road, Stockport. Sec G3FYE. Club net Sundays 11am 3,692kHz. The club now has the additional callsign G8SRS.

An antenna arch for Chris Lorek, G4HCL, and his bride Sheila, after their wedding on 14 July. The guard of honour was formed by (l to r) G8OCY, G8IAY, G8HED, G8MSA, G4FZN and G3TZM

Thornton Cleveleys (TCARS)—First and third Wednesdays in each month, 8pm; morse practice from 7.30pm. St John Ambulance Hall, Fleetwood Road North (next to "Gardner's Arms"), Thornton. Details from sec G8MKQ.
UK FM Group (Western)—First Thursday in each month, 8pm. Grappenhall Community Centre, Grappenhall, Nr Warrington. Sec G3LEQ, tel Knutsford 4040.
Warrington (W&DARS)—Tuesdays, 7.45pm. Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington. Sec G3MMD, tel Lymm 3533.
Wigan (Douglas Valley ARS)— First and third Thursdays in each month. Shevington Conservative Club, Shevington, Wigan. Details from G4EHK, tel Appley Bridge 3320.
Winsford (Mid-Cheshire ARC)—Wednesdays. RAE class 7pm to 8pm. Morse class every third Wednesday. Technical Activities Centre, rear of Verdin Building, Verdin Comprehensive School, Grange Lane, Winsford. Net nights 1·8MHz Monday, 8pm; 144MHz (fm) Tuesdays. Hon sec G3JWK.
Wirral (WARS)—First and third Wednesdays in each month, 7.45pm. Sports and Recreation Centre, Grange Road West, Claughton, Birkenhead. Hon sec G3DLF.
Wirral (W&DARC)—Second and fourth Wednesdays in each month, 8pm. Sports Concourse, West Kirby, Wirral. Hon sec Malcolm Mackintosh, G8NMG, tel 051-334 1027.

REGION 2—RR D. S. Smith, G4DAX, Red Roof, Goathland, Whitby, North Yorks YO22 5AN. Tel Goathland 333.

Bradford (UBARS)—Thursdays, 7.30pm. N10, Main Building. Sec G8GOV, 30 Moorfield Drive, Baildon, Shipley, West Yorks. Net frequency 145·275.
Denby Dale (DD&DARS)—Second and fourth Wednesdays in each month, 7.30pm. Pie Hall, Denby Dale. Sec G3FQH. Visitors always welcome.
Doncaster (Doncaster Metropolitan Institute of Higher Education ARC)—Details from sec Robert Lane, G4AWU, Kelston, Doncaster Road, Bawtry, Doncaster, S Yorks. Club call G3UER.
Goole (G&DARS)—Fridays, 7.30pm (during school term only). Goole Grammar School. Details from chairman G3VBI.
Halifax (Northern Heights ARS)—7 November (Talk and questions with RR2, G4DAX), 14 November (Junk sale), 28 November (Talk by Dr A. Bailey of Bradford University), 12 December ("144MHz transceiver design and construction" by G8BTR), 16 January (Film night), 7.45pm. New venue, Bradshaw Tavern, Bradshaw, Nr Halifax. 5 December (Pie and pea supper). White Rose RS, Leeds. Sec G8NUC.
Hornsea (HARS)—Wednesdays, 8pm. New venue, The Mill, Mill House, Attic Road, Hornsea. New sec Mrs J. Heathershaw, G4CHH.
Hull (H&DARS)—Fridays; 9 November (Talk by G8PSE), 16 November (Films), 23 November ("Batteries" by G3PQY), 30 November (Talk and questions with RR2, G4DAX), 7 December (DF hunt), 14 December (Construction competition), 21, 28 December (No meeting), 8pm. RAE classes are held at 9pm each Friday. Kingston Community Centre, Fountain Road, Hull. Sec G8GLM, 27 Trafford Road, Willerby, Hull HU10 6AJ.
Hull (Hull University R&ES)—Tuesdays, 1.15pm. Room 313B, University Union Building, Cottingham Road. Enquiries to G8RPZ. All amateurs welcome.
Leeds (White Rose RS)—Wednesdays, 8pm. Moortown Rugby Football Club, Moss Valley, Alwoodley, Leeds 17. Sec G4DZI.
Leeds (LUUARS)—Tuesdays, 8pm. Union Annexe (second floor), Woodhouse Lane. All new students welcome. Sec G4CNG, QTHR, or at "E" block, Lupton Flats, Alma Road, Leeds 6, during term.
Otley (OR&ES)—Tuesdays; 27 November (Surplus equipment sale), 11 December (Construction contest—Leeds Amateur Radio will have a components stall at this meeting), 8pm. 14 Back of Court House Street, Otley. Sec G8DFZ.
Pontefract (P&DARC)—Details from sec G4AAQ, 1 Balmoral Drive, Ferrybridge, Nottingly WF11 8RQ.
Scarborough (SARS)—Mondays, 7.30pm. Scarborough Cricket Club, North Marine Road, Scarborough. Sec G4EDR. All visitors welcome. Talk-in by arrangement. Thirty club members who were unable to attend the Region 2 ORM, on 29 July, invited Basil O'Brien, zonal manager and Council member, to be the "main event" at their club meeting on 30 July.
Sheffield (SARS)—Third Monday in each month, 8pm. Sheaf House Hotel, Bramell Lane, Sheffield. Sec G4APV, 321 Fulwood Road, Sheffield S10. Visitors and swls particularly welcome.
UK FM Group (Northern)—2 December, 7.30pm. Royal Hotel, Barnsley. Sec G8PLJ. Do you use GB3NA? Your subs or donations would help support the service provided by this repeater.
Wakefield (W&DARS)—Second and fourth Tuesdays in each month. 7.30pm. Holmfield House, Thornes Park, Wakefield. Sec Andrew Walker, G4ARH, tel Horbury 274607.
York (YARS)—Fridays (except third in each month), 7.30pm. United Services Club, 61 Micklegate, York. Sec G3WVO.

REGION 3—RR H. S. Pinchin, G3VPE, 61 Cole Bank Road, Hall Green, Birmingham B28 8EZ. Tel 021-777 1320.

Birmingham (Midland ARS)—20 November (Surplus sale), 11 December (Christmas social and presentation of awards), 8pm. Room 118, University of Aston, Gosta Green, Birmingham. Sec G8BHE.
Birmingham (Slade RS)—First Friday in each month, 7.45pm. The Committee Room, Church House, Erdington, Birmingham. Sec G4FGF.
Birmingham (South Birmingham RS)—Thursdays (HF night on the air), Fridays (Construction and morse classes), 7.30pm. 5 December (Christmas party and presentation of awards), 9 January (Surplus sale), 8pm. Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Sec G4GZI.
Birmingham (University of Birmingham ARS)—Tuesdays during term, RAE and morse class fortnightly, 7pm. Students' Union (above stage). Club stations G3IUB and G8IUB. Sec G8HTH.
Bromsgrove (B&DARC)—14 December (Cheese and wine evening), 11 January (Members' five minute talks), 8pm. Avoncroft Art Centre, Bromsgrove. Sec G4HFP, tel Stourport (02993) 3818.
Burton-on-Trent (BonT&DARS)—Wednesdays, 8pm. Stapenhill Institute, Main Street, Stapenhill, Burton-on-Trent. Sec G3ACR.
Cannock Chase (CCARS)—First Thursday in each month (Formal), other Thursdays (Informal), 8pm. Bridgetown War Memorial Club, Union Street, Bridgetown, Cannock. Sec G8FWZ. Visitors and new members welcome.
Coventry (CARS)—Fridays, 8pm. Baden Powell House, 121 St Nicholas Street, Radford, Coventry. Sec G8OMB. Visitors welcome.
Coventry Technical College (CTCARS)—Mondays, 7pm. Winfray Annexe of the college. Sec G8ISJ.
Coventry (University of Warwick ARS)—Wednesdays during term, 7pm. Cryfield Farm, University of Warwick. Talk-in on S20, or contact G4BXI or G4DCW, Hurst Flat 40, Cryfield Village, University of Warwick.
Dudley (DARC)—Second and fourth Tuesdays in each month, 7.45pm. Central Library, Dudley. Sec Norman Rock, 28 Conway Close, High Acres, Kingswinford, Brierley Hill DY6 8PT.
Hereford (HARS)—First and third Fridays in each month, 8pm. Civil Defence HQ, Gaol Street, Hereford. Sec G4CNY.
Lichfield (Chad RC)—Alternate Wednesdays, commencing 21 November, 8pm. The Naval Club, Burton Old Road, Lichfield. Sec G4ESK.
Lichfield (LARS)—First Monday and third Tuesday in each month, 8pm. "Swan" (bar), Lichfield. Sec Ted Bowen, RS33003, tel Ibstock (0530) 60396.
Malvern Hills (MHRAC)—Second Tuesday in each month, 7.30pm. The "Star", Cowleigh Road, North Malvern. Sec G3IPY.
Mid-Warwickshire (MWARS)—First and third Mondays in each month, 8pm. 61 Emscote Road, Warwick. Sec G8CXL.
Redditch (RRC)—Second and fourth Thursdays in each month, 8pm. WRVS Centre, Ludlow Road, Redditch. Sec G3EVT.
Rugby (RATS)—Wednesdays, 7.30pm. Cricket pavilion entrance to B Building, Rugby Radio Station, A5 trunk road, Hillmorton, Rugby. Sec G4ECO.
Shrewsbury (Salop ARS)—Thursdays, 8pm. Albert Hotel, Smithfield Road, Shrewsbury. Sec G3UDA. New members welcome.
Solihull (SARS)—20 November ("Amateur radio astronomy" by Christopher Reed, G8MFP), 18 December, 7.30pm. The Manor House, High Street, Solihull. Morse classes available. Sec G4BBT. New members and visitors welcome.
Stoke-on-Trent (North Staffs ARS)—First and third Mondays in each month (Lectures, etc), other Mondays (Natternights, Raynet and club station, G4BEM), 7.30pm. Harold Clowes Community Centre, off Dawlish Road, Bentilee, Stoke-on-Trent. Sec G8ORU. New members welcome.
Stoke-on-Trent (SonTARS)—Thursdays, 7.30pm. 2a Racecourse Road, Oakhill, Stoke-on-Trent. Sec G4CWN.
Stourbridge (StARS)—19 November (Annual surplus sale), 3 December (Constructional evening), 17 December ("RTTY" by K. J. Walker, G8DIR), 7 January (Constructional evening), 7.45pm. Library, Longlands School, Brook Street, Stourbridge. Sec G4IEB.
Stratford-upon-Avon (SuponA&DARC)—Every third Friday, commencing 30 November, 7.30pm. The Clubroom, Swimming Pool, Bridgefoot, Stratford. Sec G4EXR, tel Stratford (0789) 5638, weekends only. New members welcome.

Sutton Coldfield (SCRS)—Second and fourth Mondays in each month, 7.30pm. Central Library, Sutton Coldfield. Sec G8LTW.
Tamworth (TARS)—Second and fourth Mondays in each month, 7.30pm. White Lion, Lichfield Street, Tamworth. Other Mondays (Informal). Club shack. Sec G4FZN, tel Tamworth (0827) 60708. Club net Wednesdays 145·375MHz 9pm. Visitors welcome.
Telford (T&DARS)—Wednesdays, 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G3UKV, tel Telford (0952) 5541[illegible]. Visitors welcome.
Walsall (WARC)—Alternate Wednesdays, commencing 14 November, 8pm. Forest Community Centre, Forest School, Hawbush Road, Leamore, Walsall. Sec G4GKC, tel Walsall 31675.
Willenhall (W&DARS)—Alternate Wednesdays, commencing 14 November. Little London Community Centre, Bloxwich Road South, Willenhall. Sec M. P. Batchelor, 19 Newlands Close, Willenhall, West Midlands WV13 2DQ. New members welcome.
Wolverhampton (WARS)—19 November (VHF/uhf night on the air), 3 December ("VHF contest operating", talk), 10 December (Natternight), 17 December (Christmas refreshments at The Anchor), 7, 14 January, 8pm. Neachells Cottage, Danescourt Road, Stockwell End, Tettenhall, Wolverhampton WV9 9PH. Sec G8EDG.
Worcester (W&DARC)—3 December ("Is your rig up to spec?", test gear demonstration by Roger Allen, G3TQZ), 7 January, 8pm. Old Pheasant, New Street, Worcester. Sec G4EKG, tel Evesham (0386) 41105. New members and visitors welcome.

REGION 4—RR N. J. H. Grassby, G4CPY, 22 St Cuthberts Avenue, Great Glen, Leicester. Tel 053 759 3387.
Following information is latest received.
Derby (D&DARS)—Wednesdays, 7.30pm. Tuesdays and Fridays (Morse classes), 7pm. 119 Green Lane, Derby. Sec Jenny Shardlow, G4EYM.
Derby (NHARG)—Fridays, 7.30pm. Nunsfield House, Boulton Lane, Alvaston, Derby. Sec Ian Cage, G4CTZ.
Glenfield (Leicestershire Raynet Group)— Monthly. County Hall, Glenfield. Further details from M. G. Barker, G8CAC.
Grimsby (GARC)—First and third Thursdays in each month, 8pm. Alexandra Club, Cleethorpes.
Leicester (LRS)—Mondays, 7.30pm. Club House, Gilross Estate Cottage, off Groby Road, Leicester.
Leicester (LPARS)—Mondays, Wednesdays, Thursdays and Fridays, lunchtime during term. Leicester Polytechnic. Sec R. Newstead, G3CWI, 24 Richmond Road, Leicester.
Lincoln (LSWC)—Second and fourth Wednesdays in each month. Lincoln Corporation Social Club, Waterside South, Lincoln. Sec R. Shaw, G3VRD.
Mansfield (MARS)—First Friday in each month, 7.30pm. "New Inn", Westgate, Mansfield.
Matlock (Derwent Valley ARS)—First Monday in each month, 7.30pm. "The Royal Oak", Tansley, Nr Matlock. Guest speakers each month.
Melton Mowbray (MMARS)—Third Friday in each month, 7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray. Sec Richard Winters, G3NVK.
Nottingham (ARCON)—Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. Sec M. Shaw, G4EKW.
Nottingham (Trent Polytechnic RS)—Wednesdays. Newton Building, Room 105. Further information from the chairman Paul Robinson, via Students' Union, Trent Polytechnic.
Nottingham University (NURC)—Tuesdays. Contact R. Dixon, G4BVY, c/o Students' Union, Nottingham University.
Scunthorpe (SARC)—Tuesdays, 7.30pm. The Hobbies Centre, Franklyn Crescent, Scunthorpe. Sec J. Stace, G4FUH.

The RR would be pleased to hear from all club secretaries in the region, either by post or telephone.

REGION 5—RR R. E. G. Kendall, G8BNE, 19 Willow Green, Needingworth, Huntingdon PE17 3SW.
Following information is latest received.
Bedford (B&DARC)—Wednesdays, 8pm. Ravensden. Sec G4FFC.
Cambridge (C&DARC)—Fridays, 7.30pm. Air Training HQ, Newmarket Road. Sec G4BAO, 20 Guest Road, Cambridge CB1 2AL.
Cambridge (CUWS)—Mondays; 5 November ("Microwaves" by G3YGF), 19 November ("UOS-AMSAT" by G3YJO or G4CWH). Queen's Bar. Details from Adrian Langford, G8PQP, St John's College.
Corby (CARG) Fridays, 7.30pm. Hightrees Scout Centre, The Nook, Corby. Sec G8MLA.
Dunstable (DDRC)—Fridays, 8pm. Chews House, 77 High Street South, Dunstable. Sec G8ASP.
March (M&DRAS)—Tuesdays, 7.30pm. 2 Grays Lane. Sec G8GNE.
Northampton (NRC)—Thursdays, 8pm. Kingsthorpe Community Centre, Thornton Park, Kingsthorpe, Northampton. Details from sec I. P. A. Scott-Iversen, 35 Milverton Crescent, Abmington Park, Northampton.
Peterborough (GPARC)—Fourth Thursday in each month, 7.30pm. Southfields Junior School, Stanground, Peterborough. Sec G4FDF.
Peterborough (PR&ES)—For details contact G3EEL.
Shefford (S&DARS)—Thursdays, 8pm. Church Hall. Hon sec G4DAQ.
St Neots (Foster Cambridge RC)—Tuesdays, 8pm. Foster Cambridge Ltd, Howard Road, Eaton Socon, St Neots. Details from P. Dineen, 5 Reynolds Drive, Little Paxton, St Neots.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 7EA. Tel Penn (049481) 4240.
Following information is latest received.
Banbury (BARS)—Last Friday in each month, 7.30pm. St Paul's Church Hall, Warwick Road, Banbury. Sec G. Reason, G4EBF, tel Croughton (0869) 810794.
Bracknell (BARC)—Mondays, 8pm. Coopers Hill Centre (adjacent to station). For meeting details please contact sec D. Williams, G4CVN, tel Windsor 56096.
Burnham Beeches (BBRC)—First Monday in each month, 8pm. Hedgerley Scout Hut, Hedgerley, Nr Slough, Bucks. Sec G8DAY. New members, visitors and swls welcome.
Harwell (Atomic Energy Research Establishment RC)—Fridays, lunchtime. The Shack, AERE Harwell, Didcot, Berks. For further meeting details contact sec G8DVK.
High Wycombe (Chiltern ARC)—8pm. John Hawkins Ltd, Victoria Street, off Oxford Road (A40), High Wycombe. Further details from sec G4FRL, tel Kingston Blount 52006.
Maidenhead (M&DARS)—First Thursday and third Tuesday in each month. Red Cross Hall, The Crescent, Maidenhead. Sec P. J. Patich, G3TWG, tel 06285 25275.
Mid-Thames RDF Club—For competition details, please contact sec T. C. Gage, 28 Aldbourne Road, Burnham, Bucks SL1 7NJ, tel Burnham 63363.
Newbury (N&DARS)—Second Tuesday in each month. Newbury Technical College. Details from sec G8LTD, tel Newbury 46078.
Newport Pagnell (Milton Keynes ARS)—8pm. Lovatt Hall, Newport Pagnell, Bucks. For further details contact F. Walters, Staff Residence, Milton Keynes College of Education.
Oxford (O&DARS)—Second and fourth Wednesdays in each calendar month, 7.30pm. Civil Service Social Club, Marston Road, Oxford. New sec J. G. Bright, G4HJL, 22 Westfield Road, Long Wittenham, Abingdon, Oxon OX1 4RF.
Oxford University (OURS)—Please contact sec M. Evans, G8LTE, Worcester College, Oxford, for meeting details.
Reading (RARC)—Details from sec Chris Young, G4CCC.

REGION 7—RR D. A. G. Pedder, G3LFX, 97 Elgar Avenue, Tolworth, Surbiton, Surrey KT5 9JS.
Following information is latest received.
Addiscombe (AARC)—Tuesdays, 9.15pm. "Spreadeagle", Portland Road, South Norwood. Sec G3SJX, tel 01-656 9054. New members and visitors most welcome.
Ashford (Echelford ARS)—Second Monday and last Thursday in each month, 7.30 for 8pm. The Hall, St Martin's Court, Kingston Crescent, Ashford, Middx. Sec G3TDR, tel Staines 56513.
Bexley Heath (North Kent RS)—8pm. St Mary's Institute, 2 North Cray Road, Bexley. Sec G3VFD.
Coulsdon (CATS)—Sec A. R. Bartle, G6HC, tel 01-684 0610.
Cray Valley (CVRS)—First and third Thursdays in each month, 7.30 for 8pm. Christchurch Centre, High Street, Eltham, London SE9. For details of morse classes run by the club contact sec. Sec G4FUG.
Croydon (Surrey Radio Contact Club)—First and third Wednesdays in each month, 7.30pm. TS Terra Nova, 34 The Waldrons, Croydon. Sec G4FFY.
Crystal Palace (CP&DRS)—Third Saturday in each month, 8pm. Emmanuel Church Hall, Barry Road, London SE22. First Tuesday in each month (Open house). Members' QTHs. Sec G3FZL.
Guildford (G&DRS)—Second and fourth Fridays in each month, 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec G4BHQ.
Guildford (University of Surrey E&ARS)—Informal meetings, lunchtimes during term. Lower Bar, Union House, G8AHK is active on vhf, and G3IGQ on hf. Skeds and QSOs always welcome. Sec G8MIO, tel Guildford 71281.

Kingston (K&DARS)—Second Wednesday in each month; 14 November (AGM), 12 December (Surplus equipment sale), 8.15pm. Berrylands Scouts and Guides HQ, Stirling Walk, Raeburn Avenue, Surbiton. Sec G4APG, tel 01-399 8113.
New Cross (Clifton ARS)—Fridays, 8pm. 225 New Cross Road, London SE14. Details from R. A. Hinton, 42 Sutcliffe Road, Welling.
Redhill (Reigate ATS)—Third Tuesday in each month, 8pm. Constitutional Centre, Warwick Road, Redhill. First Tuesday in each month. "Marquis of Granby", Hooley Lane, Redhill. Sec G3XSZ.
Sutton & Cheam (S&CRS)—16 November ("Slow-scan tv" by G3HSK), 19 December (Christmas social). For meeting venues contact hon sec G. W. Brind, G4CMU, tel 01-225 4497.
Thames Ditton (Thames Valley ARTS)—Giggs Hill Green Library, Giggs Hill Road, Thames Ditton. Sec G3ZNW.
Tolworth (Decca ARG)—New club! First Thursday in each month, 8pm. Decca Sports and Social Club, Kingston Road, Tolworth. Sec G3NFV, tel Leatherhead 72587.
Wimbledon (W&DRS)—Second and last Fridays in each month, 8pm. St John Ambulance HQ, 124 Kingston Road, Wimbledon. Sec J. W. Todd, tel 01-540 9031.

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

Brighton (B&DRS)—8pm prompt. Catholic Church Hall, Bristol Road, Brighton. Details from N. Hewitt, G8JFT.
Burgess Hill (Mid-Sussex ARS)—Alternate Thursdays, 7.30pm. Marle Place Further Education Centre, Leylands Road, Burgess Hill. Details of future events from G3JMB or G4HHB.
Canterbury (East Kent RS)—6 December (Cheese and wine), 10 January 1980 (Grand junk sale). Further details from G3MDO.
Chichester (C&DARC)—Details of future events from J. Chinn, 5 Shrubbs Drive, Middleton-on-Sea, Bognor Regis PO22 7SL, tel 2335.
Crawley (CARC)—Details of future events from G3MGL, tel 0293 20986.
Dartford (DHDFC)—Second Friday in each month. Scout House, Broomfield Road, Dartford. Details from Jeanette Maggs, 25 Leybridge Court, Eltham Road, Lee, London SE12.
Dover (South East Kent YMCA ARC)—Wednesdays, 7.30pm. Further details from G8PZA or G8KEN.
Eastbourne (Southdown ARS)—First Monday in each month. Details from R. Jeffries, G8KQN, 84 Mill Road, Hailsham, Sussex BN27 2HU; or pro G3LFZ.
Gravesend (GRS)—Mondays, 7.30pm. Windmill Tavern, Shrubbery Road, Gravesend. Details from G4GML.
Hastings (HE&RC)—Fridays. 479 Bexhill Road, St Leonards-on-Sea, Sussex. Third Wednesday in each month, 7.30pm. West Hill Community Centre, Croft Road, Hastings. Details of events from G4FET.
Horsham (HARC)—First Thursday in each month. Parish Rooms, The Causeway, Horsham. Details of future events from A. C. Wadswirth, G3NPF.
Kent Repeater Group—Details of membership from G3XDV.
Maidstone (MYMCAARS)—Fridays; first and third in each month devoted to the beginner; 7.30pm. Y Sports Centre, Melrose Close, Loose, Maidstone. Details of events from sec J. A. Hastie, tel Medway 251387.
Medway (MARTS)—Details of events and venue from G4EVY.
Sussex Repeater Group—Information from G8HVV.
Tunbridge Wells (West Kent ARS)—Alternate Fridays. Adult Education Centre, Monson Road, Tunbridge Wells. Tuesdays following the Fridays (Informal). Drill Hall, Victoria Road. Details from Brian Castle, G4DYF.
Worthing (W&DARC)—Tuesdays, 8pm. Adult Education Centre, Union Place, Worthing. Details from G8MSQ.

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

Camborne (Cornish RAC)—First Thursday in each month, 7.30pm. SWEB Clubroom, Pool, Camborne. Full details from G3VGO, tel Devoran 864255. Cornish net each weekday 10am on 3·715MHz, and on Sundays 11am on 3·682MHz. Visitors always welcome at club meetings.
Exeter (EARS)—Second Monday in each month, 7.30pm. Community Centre, St Davids Hill, Exeter. Full details from Jack Bawden, 232 Exwick Road, Exeter EX4 2BA.
Exeter University (EUARS)—Sundays, 2.30pm. Full details from Julian Corben, G4EXT, c/o "Devonshire House", Stocker Road, Exeter EX4 4PZ.
Exmoor (ERC)—Second and fourth Thursdays in each month, 7.30pm. "Loughrigg", East Street, South Molton. Full details from Dave Stone, tel North Molton 377.
Exmouth (EARC)—Alternate Wednesdays, 7.30pm. Rolle College, Exmouth. Full details from Dave Hanson, 67 Carter Avenue, Exmouth, tel 75482.
Newquay (N&DARS)—Alternate Wednesdays, 7.30pm. Treviglas School, Newquay. Full details from new sec Ted Warne, G3YJX, tel Wadebridge 2772.
North Devon (NDRC)—Second Wednesday in each month, 7.45pm. Pilton Community College, Barnstaple. Fourth Wednesday in each month. QTH of G2FKO, 38 Clovelly Road, Bideford. Full details from G4CG. Tel Barnstaple 3683.
Plymouth (PRC)—Alternate Mondays, 7.30pm. Whitleigh Methodist Church, Budshead Road, Whitleigh, Plymouth. Further details from John Butcher, G4GWJ.
Plymouth (Plymouth Polytechnic ARS)—Future events include df hunt, quiz with local clubs and minibus trip to Leicester rally. For further

The wedding of Ken Hughes, GW3SUH, a member of the Rhondda RS, and his xyl Margaret. The ceremony was performed by the Rev P. Griffiths, GW8PNE. Left to right: (back) GW4HEO, GW8HF, GW3ITQ, GW3PHH; (front) GW4BUZ, swl Brian, GW4DRN, GW3SUH and his bride, GW3YBN, G4FJZ and GW4FRU

information contact R. Taylor, G4HZA, Amateur Radio Society, Plymouth Polytechnic Students' Union, Drake Circus, Plymouth. Club station is G3TCP, with listening facilities available on 3·5-28MHz, 144 and 432MHz, for 24 hours every day in term time.
Saltash (S&DARC)—First and third Fridays in each month, 7.30pm. Burraton Toc-H Hall, Saltash. New sec D. Bunce, 47 Hobbs Crescent, Saltash, tel 2839.
Torbay (TARS)—Fridays, with special meeting on last Saturday in each month, 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay. Full details from Mrs Ged Coker, c/o G4FCN, tel Ipplepen 812117. Visitors always welcome at club meetings. Torbay net Mondays, Wednesdays and Fridays 10.30am on 3·756MHz, and Saturdays 10am. 144MHz net Mondays 8pm on S22.

A very happy Christmas to all—*RR9.*

REGION 10—RR R. G. Barrett, GW8HEZ, 23 Carshalton Road, Beddau, Pontypridd, Glam.
Barry (BCoERS)—Thursdays, 8pm. In addition, special events are arranged every fortnight. New venue: Weycook Cross, Five Miles Lane, Barry. Details from new sec M. E. Woodberry, GW8OPK, 60 Pen-y-Graig, Rhiwbina, Cardiff, tel 613635.
Blackwood (BARS)—Fridays, 7pm. Oakdale Community Centre, Oakdale, Blackwood, Gwent. Details from GW4BLE, 10 Llanthewy Road, Newport, Gwent.
Bridgend (B&DARC)—Second Wednesday in each month, 7.30pm. NCB Social Club, Tondu, Bridgend. Details from sec GW4BDV.
Cardiff (CRSGBG)—Second Monday in each month; 12 November (Quiz "Amateur radio challenge"), 10 December (Film), 7.30pm. Pantmawr Inn, Pantmawr Estate, Cardiff. Details from GW3GHC.
Merthyr (Hoover ARS)—Mondays, 7.30. Hoover Social Club, Pentrebach, Merthyr. Details from GW3RNC.
Newport (NARC)—Mondays, 7pm. Adult Education Settlement, Brynglas Road, Newport. Details from GW8MER.
Pembroke (PRSGBG)—Last Friday in each month, 7.30pm. Defensible Barracks, Pembroke Dock, Dyfed. Details from sec GW3XJQ.
Port Talbot (British Steel Corporation ARS)—Thursdays, 7.30pm. BSC Sports and Social Club, Margam. Port Talbot. Details from GW4BDV.
Rhondda (RARS)—Every other Thursday, 7.20pm. Transport Employees' Club, Porth. Details from GW3PHH.
Sully (S&DSWC)—Mondays fortnightly, 7pm. Sully Bowls and Social Club, 58 South Road, Sully, Cardiff. Details from David Hughes. 13 Nailsea Court, Sully.
Swansea (SARS)—Tuesdays fortnightly, 8pm. Sketty Sports and Social Club, Aneurin Way, Sketty, Swansea. Details from GW4GRI.
Swansea (University College of Swansea RS)—Mondays, 7.30. Room 801, Applied Science Building. Details from sec J. Morris, 1 Hadland Terrace, West Cross, Swansea, tel 68675.

REGION 11—RR P. H. Hudson, GW3IEQ, "Silhill", Dinas Dinlle, Caernarvon.
Following information is latest received.
Bangor (UCNWARS)—Thursdays, 7.30pm. Small Lecture Theatre, School of Engineering Science, Dean Street, Bangor.
Conway Valley (CVARC)—Second Thursday in each month, 7.45pm. The Quaries, Llandulas, Colwyn Bay.
Rhyl (R&DARC)—Fourth Thursday in each month. Ambulance Station, Coast Road, Rhyl. Other Thursdays (On the air on 144·00MHz), 8pm. Newcomers and visitors welcome.

REGION 12—RR F. Hall, GM8BZX, 45 Priory Cottages, Lunanhead, Forfar, Angus DD8 3NR.
Aberdeen (ARS)—Fridays, 7.30pm. 80 Guild Street, Aberdeen (next to Station Hotel immediately adjacent to railway station). Sec GM4BKV. The club now has a print board service from your own artwork.
Dundee (Kingsway Technical College ARC)—Tuesdays; 6.30pm morse practice, 7-8pm arranged lectures, 8-8.15pm coffee, 8.15-9pm any other business and discussion. Kingsway Technical College, Old Glamis Road, Dundee. Sec GM8RDU, 132 Ancrum Drive, Dundee. Club officials for the 1979/80 session are: chairman, GM4CUZ; secretary, GM8RDU; treasurer, GM4AQM; committee, GM3ZBE and GM2CPC: NFD committee, GM4AGS, Harry Munro, GM8RTI, GM4FSP and GM8TAJ; VHF committee GM8BZX, GM8TDR and GM4IFZ.
Elgin (Moray Firth RS)—Wednesdays, 7.30pm. Elgin Technical College. Sec GM8OVN. The club extends a warm welcome to all licensed amateurs and swls in the area who may be hesitant in coming along. Non-members will be asked to pay a donation of 50p per meeting, with a limit of two attendances before joining the club.
Invergordon (Easter Ross RC)—Every second Tuesday. 100 High Street, Invergordon. Details from sec GM4DKL.
Inverness (Technical College ARC)—Every second Wednesday, 6.45pm. Room C30. Sec W. Lee, 36 Old Mill Road, Inverness.
Kirkwall—Members now meet on a few occasions during the year to discuss various aspects of amateur radio. Information from GM3IBU, tel Kirkwall 3232.
Perth (P&DARG)—Tuesdays, 7pm. Perth Technical College. Sec GM4DOJ.
Shetland (Lerwick RC)—Wednesdays, 7.30pm. "Annsbrae House". Information from sec GM4BBL. Visitors always welcome. It is anticipated that a move will be made to new premises in Lerwick sometime during the coming year.

RR12 would be pleased to hear from club secretaries regarding club programmes.

REGION 13—RR A. B. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. Tel Kirkcaldy (0592) 200335.
Berwick-upon-Tweed (B&DARS)—First and third Fridays in each month, 7.30pm. Avenue Hotel, 122 Marygate, Berwick-upon-Tweed. Details from sec GM8IIO.
Dalgety Bay (Marconi Space & Defence Systems ARC)—Open to employees and ex-employees of the company. Tuesdays, 7.30pm. MSDS Social Club, Hillend Industrial Estate, Dalgety Bay, Fife. Details from GM3YND, tel Dalgety Bay 822678.
Dunfermline (DARS)—Second Wednesday in each month, 7.30pm. CCTV Studio, Pittencrieff School, Maitland Street, Dunfermline. Details from GM3CIG.
Edinburgh (E&DARC)—Tuesdays, 7.30pm. City Observatory, Calton Hill, Edinburgh. Details from sec GM8MJV, tel 031-663 2033.
Edinburgh (Ferranti Recreation Club AR Section)—Membership is restricted to company personnel. Details from GM8JKG, tel 031-441 5684. Visits by other clubs by prior arrangement.
Edinburgh (GB3ED Repeater Group)—GB3ED is a 432MHz repeater situated at Napier College, Edinburgh, and operating on channel RB14 (output 433·350MHz, input 434·950MHz). Details of group meetings from GM3GBX, tel 031-447 2611.
Edinburgh (Heriot Watt University ARC)—Open to persons attending any of the city's universities or colleges. Wednesdays, 2pm. Aerial Laboratory, Top Floor, Mountbatten Buildings, 31-35 Grassmarket, Edinburgh. Informal get-togethers, 7.30pm. University Bar, Riccarton Campus, Currie, Midlothian. Details from GM4EAU, tel 031-443 5061.
Edinburgh (Leith Nautical College ARC)—First and third Thursdays in each month, 7.30pm. Leith Nautical College, 24 Milton Road East, Edinburgh 15.
Edinburgh (Lothians RS)—Details of programme from GM8BJF, tel 031-447 5527.
Glenrothes (G&DARC)—Third Sunday and every Wednesday in each month; 18 November, 16 December, 20 January, 7.30pm. Old Nursery School Building, Provosts Land, Douglas Road, Leslie, Fife. Details from GM4HBG, tel Glenrothes 771057. Club nets Sunday, 3·630MHz 1100 local, and S22 1200 local.
St Andrews (University of St Andrews R&ES)—Details from Physics Department, North Haugh, St Andrews.

REGION 14—RR I. L. McKechnie, GM8DOX, 42 Newton Crescent, Dunblane FF15 0DZ.
Following information is latest received.
Ayr (AARG)—Community Centre, 24 Wellington Street, Ayr. Sec GM3THI.
Dumfries (D&DARG)—Details from GM3WOJ.
Falkirk (Stirlingshire ARG)—Details from GM4DGT.
Glasgow (West of Scotland ARC)—Try GM4FDM for information.
Greenock (G&DARC)—Tuesdays and Fridays, 7.30pm. 22 Inverkip Street, Greenock. Details from sec GM3LYI.
Helensburgh (HARC)—Try GM4FEO for information.
Motherwell (Mid-Lanark ARS)—Alternate Fridays, commencing 2 March, 7.30pm. Wrangholm Hall Community Centre, Jerviston Street, Motherwell. RAE and morse classes every Friday. All details from sec GM4FKD.
Stevenson (Ardeer RCARS)—Details from GM3SUL.

Stirlingshire (SARG)—New group! Starting up initially to put a 70cm repeater on the air. Anyone welcome to join including members of the diminished Falkirk & District RC, to enlarge club activities. Details from sec GM3POK, or GM4CXF.

All secretaries please note the closing date for items for insertion in the next *Club news* at the beginning of this feature. RR14 has an Ansaphone available for their use. Tel Dunblane (0786) 822212.

REGION 15—RR I. J. Kyle, GI8AYZ, 2 Galgorm Gardens, Ballymena, Co Antrim BT42 1BA.

Following information is latest received.

Ballymena (BRC)—Tuesdays, (RAE and morse classes), 7pm. Fridays (Club night). Sundays (Special projects), 3pm. 86 Old Cullybackey Road, Ballymena. Sec GI4HCN.

Bangor (B&DARS)—First Friday in each month, 8pm. Redcliffe Hotel, Bangor. Sec GI4AAM.

Belfast (BRSGBG)—Third Wednesday in each month. 90 Belmont Road, Belfast. Details from GI3USS.

Belfast (CoBYMRC)—Tuesdays, 7pm; Saturdays, 2.30pm. 12 Wellington Place, Belfast. Sec GI8MQR.

Belfast (Queen's University of Belfast RC)—Tuesdays during term, 8pm. Queen's University, 37 Fitzwilliam Street, Belfast 9.

Dromore (Lagan Valley ARS)—First Monday and third Tuesday in each month, 8pm. Scout Hall, Mossvale Road, Dromore, Co Down. Details from AR GI4GDV.

Mid-Ulster (MURSGBG)—First Sunday in each month. GI4BAC's QTH. Details from AR GI8RJW, tel Armagh 524453.

North Ulster (NURSGBG)—Now reconstituted. Details of meetings from GI4HVI, GI8JTS QTHR.

REGION 16—RR M.S. Appleby, G3ZNU, 45 Cedar Avenue, Kesgrave, Ipswich IP5 7HA.

Bury St Edmunds (BStERS)—Third Tuesday in each month, 7.30pm. Red Cross Headquarters, Mustow House, Eastgate Street, Bury St Edmunds. Details from John Munro, 29 Angel Hill, Bury St Edmunds.

Chelmsford (CARS)—First Tuesday in each month, 7.30pm. Marconi College, Arbour Lane, Chelmsford. Details from R. Brocks, 30 Rowan Drive, Heybridge, Maldon.

Colchester (CRA)—Thursdays, fortnightly, 7.30pm. Main Block, Colchester Institute, Sheepen Road, Colchester. Details from Frank Howe, G3FIJ.

Felixstowe (FARC)—Tuesdays (Informal). Felixstowe Golf Club. Details from John Hobin, G3XIX.

Great Yarmouth (GYRS)—Last Thursday in each month, 7.30pm. 67 Southdown Road, Great Yarmouth. Details from Tony Besford, G3NHU.

Harlow (H&DRS)—Tuesdays, 8pm. Mark Hall Barn, First Avenue, Harlow. Details from sec Dan Evans, G4HFR, 17 Alsa Gardens, Elsenham, Bishop's Stortford, Herts CM22 6HD, tel 0279 812300.

Harwich (H&DRA)—Thursdays, 7.30pm. Harwich Adult Education Centre. Details from sec Tony Free, G4EYE.

Haverhill (H&DRS)—Fridays, 7.30pm. Steeple Bumpstead Road, Haverhill. Further details from Chris Kitchener, G8IMI, tel Haverhill 2852, evenings.

Ipswich (IRC)—Second and last Wednesdays in each month during school term; 14 November (Talk and demonstration of model submarine by Jim Goulty, G8BBV), 28 November (Illustrated talk), 12 December (Initial planning for ESWR 1980), 26 December (Closed), 8pm. Hadford House, Ranelagh Road, Ipswich. Morse classes also available. Details from Jack Tootill G4IFF, 76 Fircroft Road, Ipswich.

Loughton (L&DARS)—Fridays, fortnightly, 8pm. "Loughton Hall", Rectory Lane, Loughton. Further details from sec John Ray, G8DZH, tel 01-508 3434, evenings.

Lowestoft (L&DARC)—Fridays; 9 November ("Ship to shore" and "Voices in orbit", PO telecommunications films), 23 November ("Making pcbs by photographic methods", practical demonstration by Paul Godfrey, G8JBD), 7 December (Schools evening), 7.30pm. North Suffolk Teachers' Centre, Lovewell Road, Lowestoft. Details from Paul Godfrey, G8JBD.

Martlesham (MRS)—First Wednesday in each month; 7 November ("Rechargeable batteries" by a representative of Chloride Batteries), 5 December (Topic to be arranged), 7.30pm. Visitors always welcome but must first contact Simon Garrett, G4EVN, PO Research Centre, Martlesham Heath, Ipswich.

Norwich (Norfolk ARC)—Wednesdays; 7 November ("Modern air defence" by F/O P. Griffiths, RAF Neatishead), 14 November (Committee meeting and morse), 21 November (Informal and morse), 28 November (Question time—RAE pre-exam), 5 December (Junk sale), 12 December (Question time—RAE pre-exam), 19 December (Informal and morse), 26 December (Closed), 7.45pm. Crome Community Centre, Telegraph Lane East, Norwich. Details from Peter Forster, G3VWQ.

Southend (S&DRS)—Fortnightly, 8pm. Church Hall, Sir Walter Rayleigh Drive, Essex. Contact sec G3YOA.

Stowmarket (S&DARS)—First Monday in each month, 7.30pm. Red Cross Hall, Stowmarket Railway Station. Details from Ray Preston, G8MYE.

Thurrock (TARC)—First and third Tuesdays in each month, 8pm. Grays Park Hall, Orsett Road, Grays. Morse tuition available. Details from sec G3KMD. Club net on 144MHz S21/22, on second and fourth Tuesdays in each month, 8pm. New members and visitors welcome.

Vange (VARS)—Thursdays, 8pm. Main Hall, Barstable Tenants' Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 976018.

Basingstoke (BARC)—Third Wednesday in each month, 7.30pm. Chineham House, Popley Way, Basingstoke.

Basingstoke (UK FM Group Southern)—First Wednesday in each month. Chineham House, Popley Way, Basingstoke. Details from pro Chris Jackson, G8POB, 69 Buriton Road, Harestock, Winchester.

Bournemouth (BRS)—First and third Fridays in each month, 7.30pm. Dolphin Hotel, Holdenhurst Road, Bournemouth. Sec Bill Coombes, G4ERV, 32 North Road, Boscombe. Visitors welcome.

Chippenham (C&DARC)—Tuesdays, 7.30pm. Sheldon School, Hardenhuish Lane, Chippenham, Sec P. J. Tuck.

Fareham (F&DARC)—First and third Wednesdays in each month, 7.30pm. Porchester Community Centre, Room 9. Sec David James, G8GRV, tel Titchfield (03294) 45977.

Members of the Jersey group which visited the Mont St Michel convention in France in May. Among them are GJ8EZA and xyl, GJ3RAX, GJ4ICD, GJ8KNV and GJ3YLI, together with F8OP, Dept 35 president, and his xyl, and G3XQM.
Photo: GJ8KNV

Farnborough (F&DRS)—Second and fourth Wednesdays in each month, 7.30pm. Railway Enthusiasts' Club, Access Road, off Hawley Lane, Farnborough. Sec G3TMQ, 103 Hawley Lane, Farnborough.
Guernsey (GARS)—Tuesdays and Fridays, 8pm. Details from sec GU8ITE, PO Box 100, St Peter Port, Guernsey.
Horndean (H&DARC)—Second Thursday in each month, 7.30pm. Merchiston Hall, Horndean. Net Thursdays, 7.30pm 28·4MHz; and 8pm S16. Sec V. Lear, G3TKN, 18 Alten Road, Waterlooville, Hants.
Jersey (JAEC)—Details from sec, tel 0534 23249.
Jersey (JARS)—Sundays, 10.30am, and Fridays, 8pm. Le Hocq Tower, St Clement, Jersey. Sec R. H. Ford, "Sanaldi House", Plat Douet Road, Bagot, St Saviour, tel 0534 31131.
Poole (PARS)—Last Friday in each month, 7.30pm. Poole Technical College. Sec Phil Ciotti, G3XBZ, 214 Rossmore Road, Parkstone, Poole.
Portsdown Hill Repeater Group—Activity night on GB3PH (RB2), Mondays, 8.30pm. All stations welcome to the net. Details from G8GNB.
Portsmouth (P&DRC)—Wednesdays, 7.30pm. Portsmouth Community Centre, Malins Road, Buckland, Portsmouth. Sec A. C. Cake, G3CNO, 7 Wheatstone Road, Southsea.
Salisbury (SR&ES)—Tuesdays, 7.30pm. Salisbury Activity Centre, Wilton Road. Sec G2FIX, 74 Victoria Road, Wilton, Salisbury.
Southampton University (SUARC)—Tuesday evenings. Also informal meetings every lunchtime in the clubroom, Old Union Building. Sec A. C. Talbot, The Radio Club, JCR Post, The University, Southampton.
Southampton (SRSGBG)—First Monday in each month. Lanchester Building, Southampton University. Wednesdays. The Clubroom, Kent Road. Both at 7.30pm. AR J. R. Compton, G4COM, Aysgarth, Beech Corner, Durley Brook Road, Durley, Southampton.
South Dorset (SDRS)—Lecture Hall, South Dorset Technical College, Newstead Road, Weymouth. Sec R. D. Cridland, G3ZGP, 13 Clarendon Avenue, Redlands, Weymouth.
Swindon (S&DARC)—Alternate Wednesdays, 7.45pm. Clubroom, Oasis Leisure Centre. Sec K. Clinch, G8OQY, 13 Pound Piece, Ashbury, Swindon.
Winchester (WARC)—Third Saturday in each month. The Scout Log Cabin, Stockbridge Road, Winchester. First Friday in each month (Informal). Crown Hotel, North Walls, Winchester. Both at 8pm. Sec Peter Simpkins, G3MCL, Lawn End, Park Road, Winchester.

REGION 18—RR W. A. Ricalton, G4ADD, 4 South Road, Longhorsley, Morpeth, Northumberland.

Following information is latest received.
Durham (DURES)—During term. Physics Dept, Science Site, Durham University. Details of events from G3ZJY, G4FOP, or sec I. P. Jefferson, BRS41816, Grey College, Durham. External members especially welcome.
Easington (EAR&EC)—Tuesdays and Thursdays, 7.30pm. Easington Village Workmen's Club. RAE and morse tuition if required (the club has a good pass record). Details from sec G4GXI. All welcome.
Great Lumley (GLAR&EC)—Alternate Wednesdays, 7.30pm. Great Lumley Community Centre. RAE and morse tuition if required. Sec G4DWM.
Hartlepool (HRC)—Mondays, 7.30pm. Methodist Church Hall, Grange Road. Sec G3NWU.
Middlesbrough (Post Office ARC)—All amateurs welcome, but first contact sec G8CDP.
Middlesbrough (Teesside Repeater Group)—Last Tuesday in each month, 7.30pm. 196 Marton Road, Middlesbrough, Cleveland. All amateurs and swls invited but first contact sec G8MBK.
Morpeth (Northumbria RC)—Thursdays (Informal). "Queens Head", Morpeth. Sec G8GVN.
Newcastle Upon Tyne (Tyne & Wear Repeater Group)—5 December, 7.30pm. Arts Common Room, Claremont Tower Block, Newcastle University. Sec G4DOB, tel Newcastle 744444.
South Shields (SS&DRS)—Fridays, 7.30pm. Trinity House. Old and new members welcome. Sec G8BQF, 67 Lauderdale Avenue.
Tyneside (TRS)—Mondays, 7.30pm. The Community Centre, Vine Street, Wallsend. Morse tuition can be arranged. Sec G8OFA, 69 Rectory Lane, Blaydon-on-Tyne. New members welcome: club equipped for multiband operation.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ.

Barking (BR&ES)—Every weeknight (Mondays to Fridays); 20 December (Christmas party), 7.30pm. Westbury Road School, off Ripple Road, Barking, Essex. All welcome at any meeting.
Central London (Post Office HQ ARG)—Third Thursday in each month (Lectures), 5.30pm. Location varies. First Thursday in each month (Bar socials), 12–2pm. Central London. For specific details of this group, for members of PO only, contact P. H. J. Houseago, G8SGB, tel 01-388 6161 ext 202 or 204.
Cheshunt (C&DRC)—Wednesdays; 7 November ("An amateur's view of 10GHz" by G4BGP), 21 November (AGM), 5 December (Junk sale), 19 December (Social evening), 26 December (No meeting). Church Room, Church Lane, Wormley, Herts. Sec Roger Chastell, G8LNM.
Chingford (Silverthorn RC)—Fridays, 7.30pm. Friday Hill House, Simmonds Lane, Chingford E4. Sec G4AJA, tel 01-529 2282. All visitors welcome.
Chiswick (Acton, Brentford & Chiswick RC)—20 November (432MHz demonstration by G8BBE), 18 December (HF antennas), 7.30pm. Chiswick Trades and Social Club, 66 High Road, Chiswick W4. Hon sec G3GEH, tel 01-992 3778.
Ealing (E&DARS)—Tuesdays, 8pm. Northfields Community Centre, Northfields Road, London W13. Hon sec E. Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston Upon Thames. All welcome.
East London (ELRSGBG)—Third Sunday in each month, September to May; 18 November ("Lower power communications" by Rev G. Dobbs, G3RJV, G-QRP Club), 16 December (AGM and junk sale), 20 January 1980 ("Radio and astronomy" by Dr K. Smith, G3JIX, ex-ELRSGBG), 3pm. Wanstead House, The Green, Wanstead, London E11 (near Wanstead underground station). Further information from Rod Holmes, G3PKQ, tel 01-558 2928, or G3AMF, tel 01-989 9224. All are welcome.
Edgware (E&DRS)—Second and fourth Thursdays in each month; 8 November (Informal chat on technical matters), 22 November (Film show), 30 December (Junk sale), 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. For details contact hon sec Denis Lisney, G3MNO, tel 01-907 1237. This club also has a fine newsletter. (All licensed members of this club are also RSGB members—can other Region 19 clubs boast the same record? — *RR19.)*

Members of the Southgate RC at a meeting addressed by Mr Constable of the Bristol Vintage Wireless Society. L to r: G8RCH, G3LZE, G3MWF, G8KRF and Mr Constable

Harrow (RSH)—Fridays, 8pm. Harrow Arts Centre, High Road, Harrow Weald. (Bar, car park—park neatly.) Hon sec G4AUF, tel 01-868 5002.
Havering (H&DARC)—Wednesdays, 8pm. Fairkytes Art Centre, Billet Lane, Hornchurch (opposite New Queens Theatre). Details from A. G. Negus, G8DQJ, tel Upminster 24059.
Holloway (Grafton RS)—Fridays, 8pm. Holloway Institute, Archway Annexe, Highgate Hill, London N19. Details from sec B. Bond, G3ZKE.
Ilford (IRSGBG)—All meetings are informal. 50 Mortlake Road, Ilford, Essex. Sec. G3LRE, tel 01-500 7196.
St Albans (Verulam ARC)—Fourth Thursday in each month; 22 November ("Intruder Watch" by S. A. G. Cook, G5XB), 7.30 for 8pm. 20 December (AGM; social event of the year—the chairman *might* buy a barrel of beer). Jubilee Centre, Catherine Street, St Albans. Second Thursday in each month, October to April, (Informal). RAFA HQ, Victoria Street. Hon sec A. Clarke, G8MAE, tel 0442 64751. All welcome.
Shelburne (SRC)—Thursdays, 7pm. Shelburne Youth Centre, Hornsey Road, London N7. RAE courses available. Hon sec T. C. Clark, G4BZW, tel 01-249 1843. Sec would be pleased to hear from any prospective members. The club has a 2000E transceiver, and G5RV for licensed members to use.
Southgate (SRC)—Second Thursday in each month; 8 November (Construction trophy and films by G6QM), 13 December (AGM and election of committee), 10 January 1980 ("Microprocessors"), 7.45pm. The Scout Hut, Wilson Street, Winchmore Hill, London N21. Hon sec G8EWG, tel 01-440 7353. For further details of club events contact pro I. R. Selby, G4DRI.
South West Herts UHF Group—The building of GB3BH (1·3GHz/beacon/repeater) is progressing, and the group's 10GHz beacon, GB3SWH, is now operational. Reports are requested from as many amateurs as possible to evaluate GB3SWH's catchment area. Talks can be arranged for interested groups. Contact hon sec G8BBE.
Stevenage (S&DARS)—First and third Thursdays in each month, 8pm. Morse 7.30pm. Plant B staff canteen, British Aerospace, Gunnels Wood Road, Stevenage. Hon sec Ted Godfrey, 94 Common View, Letchworth. FM net, Mondays 1930, 145·550MHz.
UK FM Group (London)—Second Tuesday in each month, 8pm. It was announced in September "Club news" that the club has had difficulty in finding a new venue. Apparently this is still the case, so, for information, members and others should contact sec Chris, G4EVA.
West Drayton (LT District Line ARC)—Thursdays, 6pm. DLAA Sports Ground, Park Place, Gunnersbury Avenue W3. (Bar). This club requires the attendance of former members, who lost interest, to enable the club to survive. It would also like the assistance of local amateurs who could give talks on any radio topic. Hon sec R. Ball, G8JEB, tel 01-422 0414. Club net 144·250 ssb, 2000-2100 local.

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

Bridgwater (HPSSARS)—Second Monday in each month, 7.30pm. YMCA, Nr St John Ambulance Hall. Further details from G4ETN.
Bristol (BARC)—Tuesdays, 7.30pm. The University Settlement, Barton Hill, Bristol 5. Sec G8KGE.
Bristol (BRSGBG)—26 November ("Home construction"), 17 December (Christmas party), 28 January (AGM), 7-9.30pm. Small Lecture Theatre, Queens Buildings, University Walk, Clifton, Bristol. Hon sec G4FRG.
Bristol (North Bristol ARC)—Tuesdays (with RAE instruction), 7pm. Lockleaze Community Association, Romney Avenue, Lockleaze, Bristol. Hon sec G2BSU.
Bristol (Shirehampton ARC)—Fridays, 7pm. Twyford House, Shirehampton. Hon sec G4GTD. HF and vhf station all modes, lectures and films, df hunts etc, planned for 1979. RAE and more classes in progress. New members welcome.
Cheltenham (CARA)—First Thursday and third Friday in each month. "The Old Bakery", Chester Walk, Cheltenham. Hon sec G8MZV.
Gloucester (GARS)—Thursdays; first Thursday in each month (society business followed by a talk), remaining Thursdays (activity nights with G4AYM in operation), 7pm. Chequers Bridge Centre, Painswick Road, Gloucester. Hon sec G3MA.
North Avon Repeater Group—Provisionally GB3AA at Alveston, Avon. Group meets on an *ad hoc* basis. Further information from G8NNU.
Weston-super-Mare (WsMARS)—Second Monday in each month, 7.30pm. Lewis Block, Worle Comprehensive School, Redwing Drive, off Mead Vale, Weston-super-Mare. Hon sec Irvin Barr-Sim, The Old Dairy, Eastertown, Lympsham, Somerset.
Yate (Y&DARC)—First Friday in each month, 8pm. G3RQN QTH. Further details from G8LGC. All welcome including swls.
Yeovil (Y&DARC)—Thursdays. Building 101, Houndstone Camp, Yeovil (off A3088). Hon sec G3NOF. Club net 10.30am Sundays, 3·660MHz.

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: **22 Nov, 27 Dec.** No guarangee 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

FOR SALE

FTDX560, in good cond, all valves renewed except pa, vr, and one other, £250 ovno. Pye Pocketfones, xtalled 433·2, £20. Buyer collects or arranges transport. A. Dalziel, GM4FGD, c/o Simpson, 24 Dryden Street, Edinburgh EH7 4PN. Tel 031-554 1675.
Eagle cardiod dual impedance mic, UD50HL, boxed, £10. Shure 401A, mic, £5. Large quantity of meters, from £1; state requirements. Murata ceramic filters CFM455H, £5. Morganite type 7101 80Ω dummy load, £5. *Wanted:* cr tube SE5F/31. G3IDW, QTHR.
FT225 rd, as new, few months old, orig packing etc. (QRK required for hf rig.) Tel 0270 216751.
FT401B, in mint cond, £320 ono. G4AEI, QTHR. Tel Reading 883508.
Multi Palm, 4-70cm, hand-held, hardly used, 6ch, SU8, 20, RB0, 6, 10, 14, nicads, charger etc, two months old, £150, post paid. G8LGE, QTHR. Tel 0924 825025.
KW204, recently overhauled by Decca, £150. Buyer to collect or pay carr. G4GTS, QTHR. Tel Hemel Hempstead 42603.
Yaesu FR101 rx, all bands, all modes, broadcast, mint cond, available after 20 November '79. Tel Cheltenham 580352.
Belcom LA106 2m linear amp, 100W ssb, cw, 50W fm, a.m., cooling fan, exc cond, little used, £150. Buyer collects or carr extra. G4GEL, QTHR. Tel Reg, 0707 51351.
BLX15 rf power transistors, unused, data, suitable *Radio Communication* 100W broadband linear, offers. G3ZVC type tx/rx, Plessey ics, Bricom board, cmos switching, QC1246 AX filter, presently set up 160m rx, Eddystone dial, no pa, offers over £50. G4EJJ, QTHR. Tel Dronfield 412775.
Solid-state Modules 2m converter, 28-30 i.f., £14. G4GHB, G8JJC QTHR.
Trio 9R59D, comp with Trio spkr unit, £48. "Teleton", eight bands, five sw bands, vhf-fm, £40; will exch Teleton or Trio for good AR88. "Europa B", spare valves, £75. Trio JR310, 10-160m, as new, £110. G3TSL, QTHR. Tel Blackpool (0253) 52453.
FR101S, with broadcast bands, xtals, mint cond, used few hours only, £350 ono. Will deliver reasonable distance. Redman, G4HBP, Ploughman's Piece, Thornham, Norfolk.
QM70 transverter, 1W 28/30 to 10W 432/4, £75. QR666 batt/mains rx, £95. Speech processor KW2000B, jacks, £12. EK9X electronic keyer, £10. Portable rx, med, 1·6-12·2, 30-50, 87-175MHz, £15. G4ALV, QTHR. Tel 01-460 3852.

FRDX500, FLDX500, YD844, cw/fm filters, Sentinel 2m converter, £250. FT7 tx/rx, FP4, G-whip flexi, 10-80m, hardly used, £300. SB104A, factory aligned, HP1144, £350. YO100 'scope, £75. EK121 keyer, unused, £20. Prefer buyers collect. Carr extra. G4BGE, QTHR. Tel Bracknell 21502, after 6pm.

G-whip 20-15-10 plus 80m coil and whip, £20. Shure 444 mic, £20. Junker precision key, £25. EK108A electronic keyer, £30 ono. KW107, atu section modified to tune long wire 160-10, offers. *Radio Communication Handbook*, as new. G4EJJ, QTHR. Tel Dronfield 412775.

TS510, good cond, £225. Polaroid camera, as new, £10. Meakin, Stoneleigh Ramshorn, Oakamoor, Stoke-on-Trent ST10 3BT. Tel Oakamoor (0538) 702518.

TS820S, absolutely mint, orig boxes, genuine reason for sale, £675. GI3ZCK, QTHR. Tel Ward, 0232 56221 ext 36, business hours.

HP430C/477B thermocouple power meter, £80. Weir 500 Mk2 dvm, £20. 2·7kV 750mA transformer, £25. 2μF 5kV paper capacitors, £4 ea. G8HCK, QTHR.

FTDX401, vgc, £275. Marconi H4000 100W mobile tx/rx, ac and dc psu, £100. BC221, charts, £15. 18AVT, new cond, £38. FET multimeter 11MHz i/p imp, new, £14. G4BG. Tel Salisbury 5379.

Uniden 2030, 2m, fm, 12ch, 10W, £115. *Wanted:* circuit or manual for Heath GC1U Mohican rx, beg, borrow, buy or copy. Jackson, G4HYY, Castle Lodge West, Halifax Road, Todmorden, W Yorks. Tel 5342.

7200G fm tx/rx, fitted five repeater, seven simplex channels, mobile mounting bracket, good cond, £130. KW Vanguard tx, a.m./cw, 160-10m, £35. G4HPX, 5 Starbeck Close, New Marske, Cleveland TS11 8AY. Tel Redcar 476387.

IC202E, extra xtals, as new, £135. Matching 25W linear and preamp, £35. 8-el crossed Yagi, £14. G8NPK, QTHR. Tel 01-422 2100.

Drake line, consisting MS4 psu/spkr, T4XC 160/10 tx, R4C with noise blanker, all filters, 15 additional xtal ranges, comp with plugs, leads, manuals, unmarked, immac, orig boxes, packing, £795. Tel Hornchurch 55733.

Gem quad, 3-el, new, boxed, only £147. Heathkit SB104 tx/rx, SB640 spkr, new, unopened kits, £437. Used but tested 4CX250Bs, £4 ea. G3RJS. Tel Stourbridge 76570; or 01-878 5442.

TS520S, mint, £450. MC50 mic, mint, £20. MEL202-25-P linear/preamp, exc, £30. FT221R, exc, £300. AR40 rotator, £25. 4-el 2m quad, £10. Emigrating W6. Write or call early evenings. G8EYU, 6 McDonalds Alms Houses, West Street, Farnham, Surrey.

Redifon marine rx, mod R50M, rack mtg, lf/hf, 13·5/26kHz and 95kHz-32MHz, full wkg order, requires minor alignment, maker's manual, loads spare valves, full spec, sae, offers, cash or gear. R. Sharp, 8 Broom Road, Rosneath, Helensburgh G84 0RY. Tel Bob, 0436 83 765.

El-bug, mains psu, £5. Auto keyer, plug-in program boards, useful ms/contests, £20. 2m Jaybeams: 8/8 slot, £12; 10-el, £10; or incl matching harness; pair, £18. Buyer collects or carr extra. G3XDY, QTHR. Tel 0473 44601.

Barlow Wadley XCR-30 rx, used little, £95. G4ALV, QTHR. Tel 01-460 3852.

HW8, modified with RIT, as new, £75 ono. G3ZWH, 16 Hollow Lane, Snodland, Kent. Tel Medway 240520.

RTTY, Info-Tech M300 keyboard, M100E tri-mode converter, both new 1979, will not separate; Kleinschmidt composite set, printer, reperf-tx, £80. Buyer collect. Tel Ted Sloan, 0232 661748, evenings; or 0232 666926/662058, days.

FL200B hf tx, 80-10m, u/lsb, cw, £90. H/B valved 2m tx psu, modulator (as 4th edn *Radio Communication Handbook*), £7.50. Amstrad 8000 Mk2 10+10 amp, almost unused, £25. Codar CR70A, £15. G4EGG, QTHR (Bolton).

Microwave Modules transverter, 28-432MHz, vgc, handbook, spec, sheet circuit, plugs, etc, £65. Whalley, G4DVN, QTHR, Tel Stoke-on-Trent 643354.

LED 160-10m tx/rx, with KW linear, £250; or separately. Pye 60W 2m fm, £50. Pye 25W 2m a.m., £25. Used but good 813s, £6 ea. Carr extra or buyer collects. G2PU, QTHR. Tel 0223 870454.

Jaybeam 14Y/2M long Yagi, £15. Buyer collects. Ryall, Drayton Lodge, Vicarage Lane, Dunston, Stafford. Tel Penkridge 4606.

Equipment of silent key swl: JR310, £70; 9R59D, spkr, £35; 840C, spkr, £35; Codar CR70A, £15; T28, spkr, £15. G3SKV, QTHR.

Electrolytics, TCC/Plessey, of recent manufacture, 400μF 325V wkg; pack of 10 to make 3,000V supply, use two rows for best regulation on ssb, £3.50. G3FNJ, QTHR.

FRDX400, FLDX400, 2m, 4m, fm, cw filters, handbooks, mint cond, £330; Heathkit HW32 20m tx/rx, comp with ac and dc psus, worked VK, VU, PY, mobile, £110; top band h/b transverter for FLDX400. £25; all ono. GW4DJW, Tel 035 287 877.

FT221 rd, fitted 3N204 preamp, immac cond, for quick sale, £300. G3XFA, QTHR. Tel 04352 2189, evenings or weekends.

Pocketfones, Pye PF1 rx and tx, on SU8, good cond, comp with nicads, charger, £38, incl carr. G8ODG, QTHR.

Liner 2, mains psu, rx preamp, transmits cw, £110; QM70 Scorpion 2m high power transverter, £70; Mullard E805 oscilloscpe, spare tube, £8; Microwave Modules 4m converter, £6; all ono. G4HPY. Tel Luton 27567.

Emsac nuvistor 2m converter, £8. TU2 swl atu, 1·5-30MHz, £4. TX2 2m a.m./fm/cw 20W tx, with psu, £10. EMU 8MHz vfo, £4. G8FOJ, QTHR. Tel Coventry 661264.

ASCII Creed 75 teleprinter, fitted keyboard and perf, 5-bit ASCII not Murrey code; prefer swop for 45·5 baud Murrey/Baudot coded Creed 75; or offers. G3OGX, QTHR. Tel Gerry Kennedy, Chilbolton (Hants) 391 ext 50, after 6.30pm.

Sinclair DM235 digital multimeter, slight use, four months guarantee, £48. H. Hina, 24 Parkway, Stevenage, Herts.

Trio TS520, club tx/rx, used little, vgc, £400 ono. G4CNY, QTHR. Tel 0432 3237.

Ex-government collection for disposal, incl many unusual items, mostly vgc, send sae for two-page list. G3LST, 7 Coptfold Road, Brentwood, Essex.

Padded headphone, 50k boom mic, £10. Tandy tie-clip condenser mic, amplifier, new, £7.50. PF1 rx, less xtal, £10. LP filter for KW2000 or similar with SO259s, £5. HP filter L1425, £1.50. TW 2m vfo, 24MHz output. G2ATM, QTHR.

P60 tower, two auto winches, £250; SB200, £225; TH3 Mk3, £120; 898 dial, £10; all items exc cond. G3LEZ, QTHR. Tel 0702 230489.

Drake TR4C, AC4 psu, new March '78, kept as spare rig, few hours use only, £350. Buyer collects. Drake TV3300 low pass filter, £14. *Amateur Radio Techniques* by Hawker, 5th edn, £1.40. P/P extra. G2UZ, QTHR. Tel Leeds 784074.

FRDX400, FLDX400, both clean, mint cond, little used, plastic panel covers still in place, delivered in orig packing, buyer invited to inspect and air test, the pair, £325. G3OFK, QTHR. Tel 0734 733674.

"Radio Communication", July '77 to August '79, less February '79, vgc, buyer collect if possible, offers. Stephenson, 9 Trinity Grove, Bridlington, Yorks YO15 2HB.

FR101 digital rx, £350; YO100 monitorscope, £120; Scopex 4D10 double-trace oscilloscope, £150; KDP audio oscillator, £100; all as new. Grundig 2000 rx, ssb adapter, £100. Grundig amateur rx, ssb adapter, £75. G3TFW, QTHR. Tel 01-686 0747.

BC221 wavemeter, charts, mains psu, £10 ono. *Wanted:* any ex-WD suitcase tx/rx sets, B2 (type 3 Mk2), type A Mk3, Mk119, Mk122, Mk128, Mk217, etc; accessories, manuals, keys, headphones, leads, etc; incomp, any cond. Tel 01-949 2317.

TTY Creed 7B, silent cover, ST5 tu, No45 tape perforator, auto tx, spare paper rolls, tape, all good wkg cond, £50. Buyer collects. G4GXF, QTHR. Tel Tilbury (03752) 2089.

SSB filter xtals, three pairs in B7G vacuum mounts, 457·2, 455kHz, together with comp set Electroniques i.f. transformers, all as specified for G2DAF rx, all items new, £20. HRO MX illuminated S-meter, £2.50. G3GOT, QTHR. Tel Terling 229.

Heathkit 32ft tower, dismantled, good cond, comp with rag bolts for erection, £50. Hayes, 32 Debdale Road, Northampton. Tel 0604 401800.

KW Vespa Mk2 tx, £85. G3JAX, QTHR. Tel 0243 572522.

Marconi rf sig gen, up to 30MHz, variable mod, £20; Marconi vhf wobbulator, £15; both comp with manuals. Tel Cranleigh 6400.

Yaesu FT225RD, brand-new, boxed, guarantee, mic etc, hp could be arranged, £520. Tel 0360 312472, between 6 and 8pm.

Yaesu linear amplifier, FL2100B, £250; Yaesu monitorscope, YO100, £120 ono; or the pair, £350. G3OUX, QTHR. Tel 0293 23890, after 5pm.

Racal RA117, RA63, RA237, effective tuning range 10kHz-30MHz, all modes, not military or commercial disposal, housed in desk mounting cabinet, pristine cond, superb performer, buyer inspects/collects, £650. Northcott, G8SZK, NOT QTHR. Tel 0734 732218.

Hewlett Packard HP97 advanced scientific card programmable calculator, £250. HP65 advanced scientific card programmable calculator with spare nicad charger, £100. G8LLB, QTHR. Tel Vince Yelland, 01-553 7094, day time; or 01-531 0716, evenings.

Yaesu FLDX400 80-10m tx, FRSDX400 160-2m all-mode rx, matching spkr unit, also containing Microwave Modules 2m transverter, mains psu, all exc cond, incl manuals, cables, ptt mic, comp, £390. G8MGD, QTHR. Tel Tewkesbury 294082, after 7pm.

Racal RA117E, in cabinet, exc cond, offers around £300. HF5 vertical antenna, HF5R radial kit, £40. RAE correspondence course, ICS, cost £58, produced distinction pass, £20 ono. Blake, 52 Sothall Green, Beighton, Sheffield. Tel 486876.

Standard SRC146A, fitted 145, 145·15, 145·5, R6, nicads, charger, 1/4 whip, helical, case, £90. Heathkit RA1, Q multiplier, £45. 10·7MHz filters, suitable Echelford fm rx, in partly assembled paging rx, £5 ea. Colour tv 18in Pye, ok, £80. G8GON, QTHR. Tel Budleigh Salterton (03954) 3735.

Late G3OHN: KW2000, ac psu, 12V psu, £150; 40ft tilt-over mast, rotator, winch, G4ZU beam, £95; large selection radio items to be sold as a lot, incl tx, wavemeter, electronic keyer. Tel Sedgley 78897.

IC240, two years old, £150. QY4. 500 valves, used, £10 ea. Pair Celestion Ditton 120 spkrs, £25. Pair Pye Pocketfones, aligned, SU22, £25. 20 assorted miniature xtals, 40-80MHz, 50p ea. Multitudinous odds and ends (mostly odds). G. Barnes, G4GRF. Tel Stockbridge 851, evenings.

Magnum Two transverter, all leads, plugs, for FT101, ready to go, trial operation at this QTH if desired, £85; with p&p UK address, £2.50 extra. G4AVT, QTHR (Wigan). Tel Parbold 2412.

Pye Bantam, fm, hi-band, 12·5kHz, no mods, mic, batts, good cond, £25 ono. G4DHK, QTHR. Tel Bristol 553767.

TS700G, mint cond, orig packing, £350. Adman Grandstand colour video game, programmable, four cartridges, £95. Prefer buyer collects. G8EFQ, QTHR (Southport). Tel 0704 68385.

Trio TS820, digital, seldom used, unmarked, new cond, £600. KW2000B, mint cond, mains psu, manual, Shure 201 mic. G4EMG. Tel Bill, 01-534 3460, evenings; or 01-471 1762, days.

IC240, latest version, £160. 6-el quad, 108ft super low loss, £25. FDK TM56B scanning 2m monitor, £60. Mobile whips, Slim Jim, swr meter. G4AAS, QTHR. Tel Grange-over-Sands (04484) 3081.

KW2000B, psu, Shure 201 mic, vgc, £200. *Wanted:* FV101B ext vfo for FT101E. G3MKH, QTHR. Tel 051-334 2313.

IC215, 3W, portable, 2m, fm, fitted 15ch, nicads, charger, helical, telescopic antennas, £145 ovno. Tel Lea Valley (Enfield) 719058, after 6pm.

FT101, with 160m hbk, mic, spkr, spare valves, £270. VFO for KW Atlanta, £35. BC453, diagram, £5; psu to fit, £3. All fb cond. Collect or carr extra. G3SAX. Tel Bishop's Castle (Salop) 556.

Philips record deck, type GA427/15Z, comp with plinth, perspex cover, as new, £35. Buyer collects. G3EKA, QTHR. Tel 04252 71036.

Liner 2, mains psu, used little since overhaul (at Lowe's), exc cond, £105. Cambridge P60 hi-fi amplifier, 30W/ch, very versatile, as new, £80 ono. G8LHV, QTHR. Tel 0788 810999.

Pye PF1s, 433·200, nicads, Pye chargers, manuals, incl one new charger, two comp sets, £60 and £50 ono. Eddystone 770U, orig cond, 150-500MHz, £75 ono. Prefer buyers collect. G8JET, QTHR. Tel Gainsborough 890768, evenings.

70cm KF430 3/10W tx/rx, £160 ono. IC202, £135. U450L 70cm base stn, wkg on RB4, £60. Creed 54 teleprinter, £25. 7bRP keyboard, £5. Buyers collect. G8NMW. Tel Bedford (0234) 45908, after 6pm.

FRG7, with fine tune, no mods, vgc, QM70, 2m converter, all, £130. Evetts, 63 Checketts Lane, Worcester. Tel 0905 426323, day time.

Emotator 102LBX, only used indoors, £35. Cowl Gill motor, £10. Lionel bug key, £5. Shure desk mic, £12. Building a linear?: blower, 27V dc, £2; National RFC R175, £2; filament choke, B&W FC15, £2; 0-15V ac meter, £2; 0-150 mil, £2. Collect or carr extra. G3DOG, QTHR. Tel Walton-on-Thames 26076.

3in moving coil milliammeters, Western Electric 0-2, 0-200, 0-1, Ferranti 0-50, 0-100; ac moving iron voltmeter, 0-20; 2-832 valves; the lot, £2.50. Carr extra. G6MN, QTHR.

SEM Europa C 2m transverter, exc cond, £90. Delivery extra. G4IDO,, G8LKR QTHR. Tel Hitchin 730550.

FRG7 rx, dust cover, absolutely as new, in orig carton, £170. Will deliver up to 50 miles. *Wanted:* FDK Quartz 16; 2m fm tx/rx. R. Looker, 91 Station Road, Amersham, Bucks. Tel 02403 7671, after 6pm or weekends.

Trio TS510D tx/rx, 80/10m, 160W i/p, cw/ssb, with PS510 ps/spkr, both vgc, incl manuals, £185. G3WYA, 229 Buxton Road, Disley, Stockport, Cheshire. Tel Disley 5669.

Magnavox three motor tape deck, fitted 1/2-track valve type heads, 1/4-track transistor heads incl, used only for testing, £15. Collaro two motor tape deck, suitable for spares, £5. Buyer pays carr or collects. Chelmsford area. G3GOT, QTHR. Tel Terling 229.

Mast, timber box construction, 20ft ground post for fixed or tilt-over use, fittings to take steel tube, but tube not in sale, buyer collects, £50. G4AVT, QTHR (Wigan). Tel Parbold 2412.

Marconi TF801D/1 sig gen, manual, offers. Hanimex MC1202, 12-digit, mains, desk top calculator, £10. 19in b/w tv, £15. G8EZT, QTHR. Tel 01-749 2584.

HQ170A, incl 2m conv, £140. Datong RFC/M, boxed, £20. MFJ CWF-2, £10. 11-pin acc plug for Yaesu tx/rx, 50p. Tape reader, Elliot, 500cps, £50. 2MHz ssb filters, £5. Tel Chelmsford (0245) 66776.

Realistic DX160 gen cov rx, two months old, mint, £85 ono; or exch for Eddystone 770R, cash adjustment; similar to 770R will do. L. D. Ireland, 16 Cathebedron Road, Carnhell Green, Camborne, Cornwall TR14 0NA. Tel Praze 236.

TR2200GX, mint, S0, S20-24, R4-7, RR6-7, £140. RTTY terminal unit, CV89, mains psu, manual, Creed 75 teleprinter, £100. APR4Y rx, 38-1,000MHz, £50. GW3IGG, QTHR. Tel 0437 890759.

Grand clearout: Creed 7E teleprinter, ST5 terminal unit, exc, £60 pair; Creed 75R receive teleprinter, £25; Creed 7TR reperforator, 6S5 reader, £10; Creed 75 with reperforator, £20; telegraph distortion set, 5ABV4, £5; new 23cm converter, MMC 1296/28, varactor tripler, relay switched, in die-cast box for remote mounting, 10W 70cm in for 4W 23cm out, £60; Marconi test antenna, 23cm, £5; 23cm Yagi, £5; 2m Europa B transverter, worked Spain this year!, £60; Cossor C303 fm 2m mobile tx/rx, 6ch xtalled, incl handbook, £30; HRO rx, incl psu, coil packs, £25; atu, incl roller coaster, £8; T21 tx, incl roller coaster, £5; variables for atu, £1 ea; sig gen, 45-90MHz, £3; USSR 'scope, C1-5, £25; STC low band, solid-state, £5; 70cm pa unit, £5; Pye PTC8710 tx/rx, 70cm, fm, £15 pair; two No 19 sets, £5 pair; Lumoprint photocopier, £35. R. Elliott, G4ERX, QTHR. Tel 01-480 5633 ext 154, day; or Brentwood 225736, evening.

AR240, hand-held, synthesized, 144-148MHz, helical, telescopic whips, charger, £180. Belcom FS1007P, 2m, 16ch, scanner, 1, 10W output, swr/S- meter, £100. PF1s on RB2, car adapter, mobile colinear whip, unit charger, tx and rx slot-in units can be used while charging, spare nicads, handbook, £60. Will deliver Bristol to Swansea areas. *Wanted:* low band fm/a.m. portables and mobiles. Tel John, Hengoed 813607, 5-6pm.

FT7, bargain, little used, fb cond, £220. Will deliver 100 miles. G3WNR, QTHR. Tel South Shields 561761, after 6pm.

KW202, **KW204**, vox fitted, immac, fb, pair, £380. G4FXI, QTHR. Tel Aylesbury 21542.

HAL devices DKB-2010, dual mode k/board, 128k memory, RVD-1005 video control unit; 12in monitor; all as new, unused, manuals, offered at over £200 below list price, £500. J. Barry, 10a Henbury Close, Torquay, Devon. Tel 0803 312879.

FRG7000, as new, boxed; exch good hf rig, cash adjustment. *Wanted:* FT101E, hf linear; beam, tower, etc. G4IQT, NOT QTHR. Tel 0582 881323.

Trio TS700 2m multimode tx/rx, fitted SD306 preamp, unmarked, £295. G4CEC, QTHR. Tel Rushden (09334) 58488.

Datong D70 morse tutor, £34 ono. Western DX32 2-el tribander, boxed, as new, £54 ono. G4HQY. Tel Leicester (0533) 866723.

AW43-80 Mullard b & w picture tube, 17in, base scan coils, mask, safety glass, chassis fixing lugs, offers. Buyer collects. G2DMR, QTHR. Tel Burgh Heath 58729.

Denco coils: red (3T); yellow, white and blue (3T and 4T); 70p ea. *Wanted:* dual 1k log pot. G8EDG, QTHR. Tel 763617.

FT101E, 12 months old, orig packing, £475 ono. Matching Europa B, 2m transverter, two new pa valves, all leads, £80 ono. G4HIF. Tel Maidenhead (0628) 21631.

SWL selling: FR101D rx, all options, £300; MM 70MHz converter, 28 i.f., £13.50. D. Taylor, 25 High Brow, Harborne, Birmingham. Tel 021-426 5271.

FT101 Mk2, fitted fan, a.m. filter, FV101 ext vfo, SP101P patch spkr, Kenwood KP12 rf clipper, FT101 maintenance manual, spare valves, comp stn, unmarked, exc cond, £425 ono. G4CCZ. Tel Walton-on-Thames 40688.

FT101 Mk2, 10-160m, cw filter, fan, matching ext vfo and ext spkr, mint, orig packing, £400. Drake SSR1, vgc, instruction and service manuals, £145. Europa B, 2m, unused, £100. FT101, 10-160m, cw filter, fan, matching ext spkr, ext vfo, vgc, £350. YO100, as new, £130. Icom IC2F, 6ch, £100. Icom IC20, 12ch, £120. Avo valve characteristic tester, manual, £110. Solartron CD1212, two plug-in preamps, wideband and dual, manual, £120. FT101 service manual, £10. Carr extra. Tel 0873 5380.

Xtals, HC25U, 30pF, 45·00800, 44·96000, 44·80800, 45·06830, 44·91660MHz, two of ea frequency, all brand-new, never used, suit DC3NT 2m tx/rx, £1.50 ea. G4FAE, QTHR.

FDK Multi U11 tx/rx, as new; Storno CQL632, unmodified; KW swr meter; offers. C. J. Adams, G3YNC. Tel Romford 49175.

TR44 CDR ham rotor, manual, buyer collects, £45. Mains oil-filled transformer, 1,185V-0-1,185V 360mA, £9.50. Carr extra. Gestetner 260 automatic duplicator stencils, ink, manuals, buyer collects, £45. SAE enquiries. G4DFE, QTHR.

TS820, £600. HQ1, £40. 2m linear, £50. QM70 tx vert, £20. Spkr cabinet, £3. TDA1022, £5. MC1035P, £1. 572B, £22. Keyer and filter, £20. Coaxial switch, £8. Two 4CX250Bs, £8. UHF base, £8. ICs and spares. G3XFW, 124 Chelston Avenue, Yeovil, Somerset.

Five Bantams, high band, four operational a.m. 169·625, mostly maintained by Pye, the lot, £175 ono. G8GBT, QTHR. Tel 07535 64451.

Trio TS515 tx/rx, forced sale, immac cond, unmodified and original, best offer around £260 secures. Prefer buyer to inspect. G4HSB, 14 Grasmere Avenue, Acklam, Middlesbrough, Cleveland. Tel Peter, 0642 86608, evenings.

Heathkit 'scope OS1, £15. Homebrew double-beam switch, £5. *Practical Television*, 1955-69; *Practical Wireless*, 1950-77; offers. Vox single manual organ, needs attention, offers. Mullard valve tester, £12. Buyer collects. G3JKN. Tel Denham 2229.

Yaesu FRG7 rx, comp with batteries, Joystick variable frequency antenna, headphones, little used, as new cond, fine tuning, £200. Mitchell, 53 Yew Tree Rise, Langley Hill, Calcot, Reading. Tel Reading 414638, evenings.

FT202R, S20-22, R3, nicads, charger, only three months old, £100. FT200, FP200, all 10m, £250. G3UMH. Tel Leeds (0532) 681961.

Storno Viscount, preamp, 4ch, fitted S0, S20, S22, £35. 1/4 and 5/8 whip, mag base, £10. MFJ cw filter, £10. G4FXI, QTHR. Tel Aylesbury 21542.

U450L 19in rack units, £35; four pairs PF1 Pocketfones, comp with nicads, £20 per pair; one multi PF1 charger, £15; or the lot, £125. G8DKC. Tel Frome (0373) 61286.

Yaesu psu, FP4, 13·8V 4A, new 13 August '79, cost £38, accept £25 plus post, unless collected. G8CN, QTHR. Tel Cleethorpes 67882.

FT101E, as new, £420. IC202E, as new, £140. G3WVW, QTHR. Tel 01-529 8550.

JR599, 2m converter, £160. Creed 75 teleprinter, reader, parallel input, £50. Homebrew 10/4 audio mixer, £200. ICL disc drive, £30. Pedal steel guitar, £350. Stereo amp and spkrs, £50. G8EUP. Tel 0788 87324.

Comp hf stn: Sommerkamp FLDX400 tx; KW202 rx; vgc, both comp with manuals, £275. Cowl Gill motor, position indicator, will handle TA33Jr beam, needs 24V dc supply, £50. Buyer collects. G3UZN, QTHR. Tel 026 371 3238, weekends only.

SSTV monitor, set of finished MK boards, scan coils, 5FP7, in nice case, £40. RTTY and cw Macrotronics hardware/software for 8k Pet, £40. MM 2m converter, 28 out, £10. Active filter and notch, Technical Associates, £10. Shure mobile no-hands mic, preamp, foot switch, £35. Beams: double 8 for 70cm, £10; 4-el quad for 2, £10; both newish. Calculators, various. Collection preferred. G4IBK. Tel 01-346 5841.

KW Viceroy Mk3 tx, 160 converter, little used, vgc, £65. G3LYV, QTHR. Tel Coventry 0203 41348.

Heath SB650, digital freq display; DX40 tx, 117V; TEK 543B transformer, new; offers. Buyer collects. G4EFJ, QTHR. Tel 0293 21668, after 5pm.

Yaesu rx, FRDX400 Super, 160 2m, a.m., fm, cw, ssb, comp with manual, orig carton, £165. Matching Yaesu tx, FLDX400, 80-10m, 240W p.e.p., comp with manual, spare valves, etc, £150. G3WCY, QTHR. Tel Ruislip 32341.

Liner 2, unmolested, £100. AC psu for FT75, mint, £17.50. Codar RQ10 Q-mult, £7.50. 2m 10-el long Yagi, good cond, £12.50. GW3VFZ, QTHR. Tel 0248 2893.

Two GEC Courriers, 3ch, high-band, hand-held, in individual leather cases, overall carrying case, incl telescopics, helicals, spare antennas, spare nicads, car adapter, charger for eight nicad packs, other odd spares, £135 ono. G8NPZ. Tel Reading 53107.

SSB i.f. board, Bricom, 9MHz SEI filter, mint, wkg, data, buying black box, £50 ono. Vivitar zoom lens for Nikon 85-205mm f3.8, nine months old, mint, with UV filter, £100 ono. G4CVA. Tel Southwold 723977.

Q-multiplier, Codar RQ10, built-in mains transformer, slow motion dial, will work into KW2000, 455/470kHz, £15. Xtal for KW2000, 21·300-21·500MHz, £2.50. Gardners transformer, 3-phase, low volts, £3. G3MBL, QTHR (N London). Tel 01-445 4321.

FRG7, fine tuner, Yaesu narrow ssb filter, new cond, £145. Pair Pocketfones, xtalled SU8, rx needs adj, spare tx battery, £18. Sig gen, 5-175MHz, ex-USN mains valve, £7. Buyers collect. G3IMI, QTHR. Tel 01-863 4029.

Philips 1Hz 100kHz gen, PM5121, manual, £20. Eddystone 898 dial, £7. Westminster W15FM manual, £2. Electricity meter, useful power consumption tests, £3. Chilmead sweep gen data, £5. VHF broadcast tuner head, varicap, £3. Accurate h/b rf sig gen, *WW* April '68, £10. 3-el 4m beam, £2.50. KW 52Ω filter, £3. Pye base mic, £3. Uniradio 95 5OR, 10p/metre. Silver mica 5pF, 10pF, 4p. Hermese Ambassador typewriter, £25. Electroniques 1·6MHz ssb i.f. strip, £4. Carr extra. G3XKA, QTHR. Tel Woking 73620.

Storno Viscount, fm, boot mount, control box, etc, exc, on S20-22, R3-4, £50. 20m Zygi beam, £15. QM70 transverter, 2m, £25. *Wanted:* rotator. G4BHM, QTHR. Tel 0532 664833.

FT101E, immac cond, spare finals, driver, workshop manual, cw filter, orig packing, £450. GM3UCH, 460 Main Street, Stenhousemuir, Larbert. Tel Larbert (03245) 3205.

Icom IC211E, 2m, multimode, exc cond, one year old, £470. FT202R hand-held, fitted S20-22, 144·875, nicads, NC1 base charger, as new, £95. Must sell both, going hf. Trio JR500S rx, 80-10m, vgc. G8LFP, QTHR.

Eddystone 730/4 rx, a.m./cw/ssb, 15 valves, 0·48-30MHz, xtal filters, xtal calibrator, S-meter, variable selectivity, af filter, noise limiter, etc, handbook, £130. Davis, 88 Goring Road, Worthing. Tel Worthing 41109.

Linear kit, Parmeko trans 1,440V 375mA, rect 3,200V 1·5A, Cs 130uF 2,100V, anode output grid lines, two SK600 bases, chimneys, £40. Two free 4X150As. Valve kit, £25. Free 4X150A. Pair 4CX250B Sk6209, b and c, £20. G3TCG, QTHR. Tel Fairseat 822043.

BC348, wkg, internal mains psu, £15. Matching spkr, £4. Sphinx 160/80/20m tx, ssb, a.m., cw, 6146B pa, int psu, handbook, Delta control unit, £20. Buyers collect. G3IMI, QTHR. Tel 01-863 4029.

Liner 2, preamp, usual access, good cond, clean output, £100 ono; will exch for IC202, with cash adjust. G3VYE, QTHR. Tel Poynton 4364.

Cambridge AM10B, converted to fm, 2ch, R6 and S22 fitted, toneburst, supplied comp with all leads, control box, spkr, etc, manual, details of mods incl, £35. GM4FBX, 25 Craigs Avenue, Edinburgh EH12 8HS. Tel 031-334 4162.

Versatower, type P-40, without base, £140 ono. G4BWW. Tel Southport 29036.

Pocketfones, on R80, nicads, SU8, SU20 xtals, £30. QQVO6/40s, unused, £3.50. 6146Bs, unused, £5. New ex-commercial amp/tripler, 4W 2m in, 12W 70cm out, £15. Bantam handbooks: HP1AM, £1; HP1FM, new, £2. N. Taylor, G4DYN, 6 Hunter House Road, Sheffield S11 8TW.

Adonis compressor mic AM502G, unused, advertized at £39.95, accept £29. 23yd 300Ω ribbon, £2; 26yd 75Ω coaxial, 0·306in, £4; both new, unused. 3in Sangamo desk mA meter, 0-1mA, sloping bakelite case, new, boxed, £4. G5FH, QTHR. Tel 0425 25974.

WANTED

Suitcase type sets, miniature tx/rxs, etc. Any parts for B2 (type 3 Mk2) tx/rx, particularly suitcase, psu, manual, spares container, antenna and former, key, phones, mains plug adapters, etc. Letters only. Taylor, G3UCT, c/o 31 Willow Walk, Culverstone, Gravesend, Kent.

B40 rx, prefer model D but others considered, comp or for parts. Details please. O. English, 9 Cowley Road, Ilford, Essex.

Two pairs of Pye Pocketfones (tx/rx), or two high-band Cambridges or similar, with or without xtals, reasonable cond and price. GM8ACC, QTHR.

Manual, circuit Racal SA520; counters 815R; counters Venner TSA/3336/1; counters Advance TMC1; GEC tube, LD924E; Mullard valve tester, cards, only; Redifon circuit for an R475; R1155 case; R1155 switch beval gear. Griggs, 5 Collingwood Avenue, Muswell Hill, London N10 3EH.

Dummy load, KW or similar. Low cost rx for newcomer to amateur bands. G4ILA. Tel 051-652 1309.

Two stations, South Sheffield area, would like to contact any yls interested in forming a 2m ssb net on Sunday evenings, 6.15pm local time; if interested, write to I. R. Green, 90 Foljambe Avenue, Chesterfield, Derbys S40 3EX.

FT101E or similar good hf rig, by recently licensed member. ATU, linear, beam, etc. Will pay cash and collect. Davies, 54 Sharpenhoe Road, Barton, Beds. Tel Luton 881323.

AR88, unmoded, in first class wkg order, required for b/cast reception, will collect reasonable distance. Maddox, G3JBA, QTHR. Tel Reading (0734) 23088.

To complete B40 restoration, and finish turning shack into the *Belfast*, the following units: antenna selector switch, AP62149, 3-way, with AP62.23 connectors; control unit r/t, AP65244. D. Sheen, G4CCW, QTHR. Tel 01-651 1410.

HF ssb or hf cw equipment; vhf ssb or fm equipment; any cond considered. Scott, 91 School Road, Meethill, Peterhead, Aberdeenshire. Tel 0779 6062.

Yaesu FV401 remote vfo, details and price required. *For sale:* high pass tvi braid break filters, *Radio Communication* February '74 design, £1 ea; pcb plus photocopy *ARRL Handbook* '76 speech processor, £1, plus p&p. G3IZJ, QTHR. Tel 0252 48561.

Radio tuner for Dynatron Mk1 stereo record player; flat-topped screw-in 30W bulbs for Christmas candle lamp set; cheap communication rx, morse practice set, w.h.y.? Help novice RAE candidate. L. F. Fernett, New Carlbury, Piercebridge, Darlington. Tel 0325 74 464; or 60155 ext 366, office.

Eddystone EC10 rx. G3NHM, QTHR. Tel 021-358 2841.

Collector wants vintage wireless and xtal radios; Marconi V-2; Gecophone xtal sets; Horn spkrs; pre-1930 *Wireless World;* best prices. A. Nolf, 7 Cambrian Way, Ewloe, N Wales CH5 3RE. Tel Hawarden 534329.

KW2000 tx/rx, hinge-up lid, must be vgc electrically and mechanically, give details of any mods and accessories, prefer to inspect and collect. G4CTE, QTHR. Tel 05213 7156.

VFO, model 508, for Swan 500CX. Plug-in vox, VX-2. CW filter, AF800. Europa B or C, with psu. Tower, tribander. WHY hf? *For sale:* Eddystone 840C; other swl bits. G4HZI. Tel Warren, 0908 77479, evenings; or 71222, work.

HRO Senior, with gc coils, must be in good cond. G4DLN, QTHR. Tel 04012 4233.

Redifon MRT12B manual, buy, copy, or w.h.y.? Xtals, 12·53-12·69MHz, 14·3-14·49, HC25/U. G3XVL. Tel Chesham 4883.

20m BS HRO coil. DX40 and VF-1 handbooks, buy or borrow. G4CIB, QTHR. Tel 0452 830540.

Handbook or instructions for using a Simpson 260 series 6P test meter. L. James, 89 Johnson Road, Cannock, Staffs WS11 2BA. Tel Cannock 71029.

HF linear, Heath, Dentron, etc, consider homebrew or parts. FT101, KW2000, Galaxy. HF beam and accessories. Dipper, atu, etc. WHY? Davies, 54 Sharpenhoe Road, Barton, Beds. Tel Luton 881323.
Collins 516F-2 power unit, 312B-4 stn control, 62S-1 vhf converter, 180S-1 antenna tuner, DL-1 dummy load, Frederick model 1200 fsk demodulator. GW3IGG, QTHR. Tel 0437 890759.
ATU, or components for same; Z match or similar, 75Ω, 150W, around £15; hbs ok if reasonable. Coyne, 84 Andover Street, Sheffield S3 9EH. Tel Graham, 0742 26170.
Keen collector seeks: Vintage xtal sets, xtal detectors, xtals in tin boxes, headphones, dull and bright emitter valves, components, horn spkrs, ST100, ST300, ST400, 1927 orig Cossor Melody Maker rxs, valve tester, best prices. N. Richardson, 2 Edna Road, Maidstone, Kent ME14 2QJ.
KW107 Supermatch, or 50Ω non-ind 250W dummy load plus 4-way antenna switch with SO239 sockets; exch for British Institute Radio Engineers' journals, 1945-57 bound vols, plus 1958-70 unbound but comp; with cash either way; accept reasonable offer for journals. G3ZDO, QTHR.
Drake 2B, plus Q-multiplier, must be in good cond. G3POX, 22 Glebe Lane, Buckden, Huntingdon, Cambs. Tel 0480 811549.
Ampex video head for VR5100 series vtr, and handbook if possible. G4BEL, QTHR. Tel Ely 740355, evenings.
Pye Compak 8 hf man pack ssb tx/rx pcbs, as recently advertised by AJH Electronics. GU8GGC, 5 Platte Saline, Alderney, Channel Islands. Tel Alderney 2650.
KW107; E-Zee match; 12AVQ or KW trap dipole; required by keen amateur to get going on hf bands, fair prices paid. G4HXE, 6 Crabble Close, Dover CT17 0LX. Tel 03047 7079.
Conversion details on getting the JRC model JAA-5011 marine walkie-talkie on to 2m. Also any tips on reducing the amount of cross mod on the Trio QR666 rx. G8KEH, QTHR.
70cm converter. Instruction manual, Standard C146A hand-held, copy and return. Pre-1960 *RSGB Bulletins*. G4BVC, 61 The Fairway, Oadby, Leicester.
Manual for Pye PF1 Pocketfone rx, information to convert PF1 rx to operate on SU8. Neil Burrows, 32 Red Lion Road, Chobham, Woking, Surrey GU24 8RG. Tel Chobham (09905) 8268, evenings.
Yaesu FL50B. KW Supermatch 109 or 107. C.L. Call, 38 Mongleath Avenue, Falmouth, Cornwall. Tel Falmouth 313688.

Looking ahead

8-10 November—Amateur Radio Retailers Association National Amateur Radio Exhibition, Granby Halls, Leicester.
8 December—RSGB AGM, IEE, Savoy Place, London, commencing at 2pm.
12 January 1980—RSGB Presidential Installation to be held on a vessel on the River Thames. Details next month.
8 March 1980—RSGB National VHF Convention, The "Winning Post", Twickenham, Middx.
27 April 1980—South East Raynet Symposium, Crawley, Sussex.
9-10 May 1980—RSGB National Amateur Radio Exhibition, Alexandra Palace, London.

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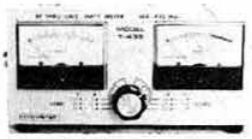

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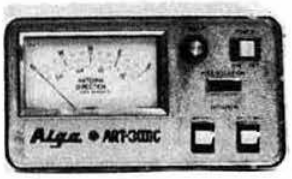

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On testing our sample unit in July we were staggered at the output power of this fantastic hand-held transceiver. Typical ouput power on the internal nicad pack was measured as 7·5 watts. On a 13·8 volt supply we noted an increase to 9 watts of R.F.

The concept of a fully synthesised 2 metre hand portable is so 'Old Hat' now that some equipment is now being designed to include many unnecessary gimmicks, which have to be included to give a product appeal when introduced into a market which has already been satisfied with a satisfactory product.

We have realised, at the design stage, that it is not gimmicks that make for good contacts, but the traditional requirements of power and sensitivity. Power, sensitivity, compact size and value for money add up to one thing, the Z5800, the hand-portable designed to carry you into the 1980s.

Frequency coverage	144–148MHz
System	PLL frequency synthesized
Channels	800 channels, 5kHz steps
Transmit conditions	Simplex or repeater shift
Tone Burst	1750Hz auto selected when on repeater shift
Dimensions	41 × 64 × 165mm
Weight	530grm with battery pack
R.F. output power	5 watts (min) in high power position, 1 watt (internally variable in low power positition)
Receiver Sensitivity	0·2uV for 10dB SINAD
Audio Output Power	500mW at less than 10% distortion

This unit is available in early November, at a special introductory offer price of **£199** VAT incl. This introductory offer includes the desk mount charger and remote microphone.

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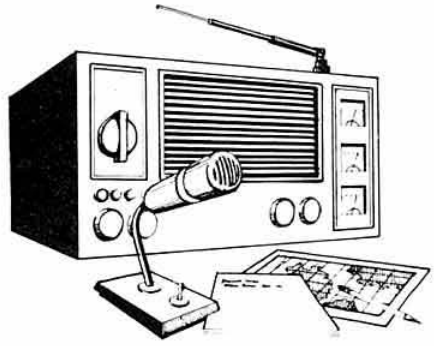

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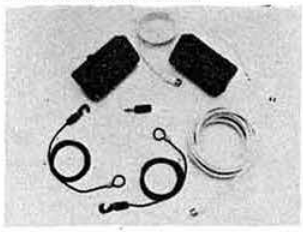

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2N5591	25W	4·4dB	13·6V	175MHz	£6·80
2N5944	2W	9dB	12V	470MHz	£5·40
2N5945	4W	8dB	12V	470MHz	£7·60
2N5946	10W	6dB	12V	470MHz	£9·50
SD1136	10W	5·5dB	12V	470MHz	£6·40
SD1088	25W	6·8dB	12V	470MHz	£16·45
SD1089	40W	4·3dB	12V	470MHz	£19·50
2N5179 Gen. purpose amp. FT = 900MHz					£0·72
2N918 General purpose amp.					£0.40
BFY90 UHF amp FT 1000MHz TO72					£1·00
40290 2W out 144 near equiv BLY33					£1.00

LOW NOISE DISCRETE SEMICONDUCTORS

TRW TP393 2dB @ 500MHz. T pack	£2·00 +
TRW TP491 1·6dB @ 500MHz. T pack	£3·10 +
MUL BFR90 3·2dB @ 1·2GHz. T pack	£3·25 +
MUL BFR91 2·5dB @ 1·2GHz. T pack	£3·90 +
SIG SD306 1·5dB @ 144MHz. "D" MOS	£2·00 +
SIG SD201 4·5dB @ 1·0GHz. "D" MOS	£2·00 +
NEW BF900 MOSFET 2dB @ 200MHz	£1.11 +
BFR34A 4dB @ 2GHz. T pack	£1.70 +
3N204 2nd generation MOSFET	£1·10 +
40673 MOSFET	£0·75 +

ALL ABOVE ADD VAT

TBA120 Int CCT IF amp/disc **65p** + VAT
MC7812 12V reg TO3 1·5A with our info for 6A 13·8V PSU application **£1.00** + VAT.
Plas rect Bridge, 2·5A 400PIV **25p** + VAT.
Diodes ZS276 1·5A 600V **8p** + VAT.
2N5947 CATV amp Stud 1·2GHz 5W diss RF rep
PT4166c Man/Code only **£1.00** + VAT.
Dual VHF/UHF FET E420 (Dual E300) in-house No. Ideal for Mixers etc. With Data **£1.00** + VAT.

ANTENNA RELAYS. Mag. Dev. 951-170-12V 50ohm good to 1296MHz. RG43 cable entry. **£7.00** + VAT.

HEATSINKS. Single sided. REDPOINT. + VAT.
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R.S. Mica 4-40pf good RF power **22p.**
FERRITES. FX1115 1 hole **4p.**
FX1898 6 hole **10p.** FX2049 2 hole **10p,** all + VAT.

PLUGS AND SOCKETS. (Coline) all + VAT.
BNC 50ohm Plug **58p.** BNC 1 hole Socket **55p.**
4 hole 50Ω ohm BNC Socket **50p.**

Min. RF CHOKES 0·22μh, 0·33μh, 20μh and 1000μh, all **15p** + VAT.

INTEGRATED CIRCUITS + VAT.
Motorola MC12013-10 prescaler with TTL output 5V supply with data/input amp CCT. **£10·50.**
Mc1495L **£1·75.** MOS 4001 **18p.**

CAPACITORS + VAT. 1000pf disc, 200pf disc, 33pf disc, all **4p.**
Feedthr Solder 1000pf, 50pf, all **8p.**
U.H.F. Micadisc 33 and 22pf all **12p.**

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2 METER RF AMPLIFIERS (in line) 13·8V supply.
ME.202-25 for ICOM 202/215 25w out **£37** +
PA.1. Superpreamp 3N204 MOSFET **£8·50**
2 METER RF POWER MODULES (tested) 13·8V.
PM2-10 10w for 0·4w 13·5dB **£15** +
PM2-15 15w for 1·3w 10·5dB **£16** +
PM2-25 25w for 3·3w 8·5dB **£17·5** +
70 Cm RF POWER MODULES (tested) 13·8V.
PM70-4 0·4w for 4w 10dB **£16·75** +
PM70-10 2·5w for 10w 6dB **£16·75** +
PM70-10a 1·6w for 10w 8dB **£17·75** +
PA-U2 70cm Preamp. 12dB with Nf 2·0dB **£7·50** + 55mm square.
FINISHED Prescaler Board. 50mv at 432MHz. Max freq 500MHz + 5V – Ve earth **£20** + VAT
NEW In-line RF modules 144MHz with RF Changeover. 80 × 100mm. SAE for details.
2N5642 1W = 10W @ 13·8V; 2W = 13W @ 13·8V; 1W = 20W @ 28V. CCT data **£3·25** + VAT.
BFR15 (BFR34 TO72) 2·5dB NF **£1·75** + VAT.
ITT 024DC 10·7 xtl Filt. 7·5kc B/W 910Ω/25pf **£5** + VAT.
ITT 024BG 10·7 xtl Filt. 15kc B/W 820Ω/10pf **£6** + VAT.
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HP5082-2800 P/C Diodes **90p** + VAT
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AGENTS FOR: Sprague/Goodman Trimmers, equivalent to ARCO range. UNELCO cased mica caps. PTFE sheeting.

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IT PAYS TO READ THE SMALL PRINT

That's why we've chosen it to present our new deal knowing you'll read it and hoping our competitors won't. If you're in the market for a new rig and planning to see your bank manager—DON'T! Ring us first, we'll offer you a H.P. deal to save you a bomb!

For example—looking for an FT 101ZD? You may need to borrow around £670, your bank manager will be looking for repayment over 12 months of around £742, £72 on top, fair enough but expensive enough!

Try Mr Average Dealer, he'll ask you for a deposit of around £134 and the Average Finance Company Limited will require 12 monthly payments of £52.48, you'll pay a total of £763 and be charged around £93 for the privilege.

Here's where reading the small print pays off—on the FT 101ZD we'll ask you for a deposit—a little more than Mr Average Dealer—to be precise, £200, followed by 12 monthly payments of £39.17!... Go on work it out for yourself—didn't we say it?

IT PAYS TO READ THE SMALL PRINT

O.K! So you don't want an FT 101ZD—maybe you've already got one and are looking for an FT 227, FT 225 or even Yaesu's latest cracker the FT 207R—look at the rest of our small print, we've listed 10 star deals for you—as we said

IT PAYS TO READ THE SMALL PRINT

Yaesu FT 901DM		Yaesu FT 101ZD		Yaesu FT 225RD		Yaesu FT 7B		Yaesu FT 101Z	
Cash Price	£985.00	Cash Price	£670.04	Cash Price	£600.08	Cash Price	£432.88	Cash Price	£575.00
Deposit	£325.00	Deposit	£200.00	Deposit	£200.00	Deposit	£145.00	Deposit	£200.00
12 monthly repayments of	£55.00	12 monthly repayments of	£39.17	12 monthly repayments of	£33.34	12 monthly repayments of	£23.99	12 monthly repayments of	£31.25
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
Deposit	£80.00	Deposit	£142.00	Deposit	£122.00	Deposit	£75.00	Deposit	£82.00
12 monthly repayments of	£15.67	12 monthly repayments of	£19.58	12 monthly repayments of	£19.58	12 monthly repayments of	£11.75	12 monthly repayments of	£9.79

Above offers subject to status report

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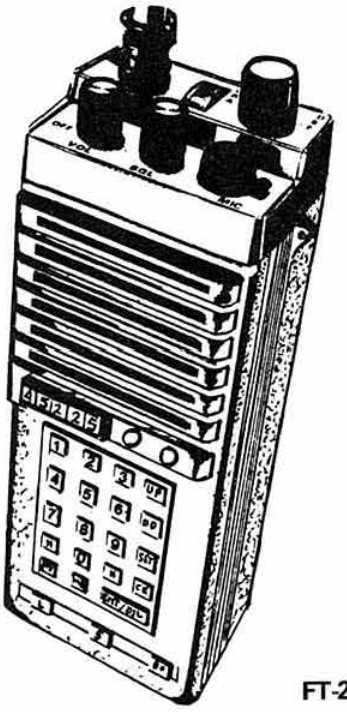
As all our customers know, we carry extensive stocks of new equipment by all the leading makers, Yaesu, Icom, Trio, Standard, Swan etc. So, on our stand at Leicester, you will find full ranges including, for example, the fantastic new Yaesu FT-207R handheld fully described last month; the latest Icom and Standard 2m transceivers, respectively the powerful IC-255E with dual VFO and the sophisticated C8800 with built-in Micro Computer giving two-speed scanning, full-band or on five memories; and the amazing Swan 'Astro 150' HF SSB transceiver with Variable Rate Scanning and Microprocessor Control and Memory.

Those of you who have been to our shop also know that we display about the widest selection of secondhand gear you'll find anywhere, ranging from, say, a KW2000 transceiver at £120 up to a complete Drake line-up at £800. In other words, taking your old rig in part-exchange is not something we do as a rather grudging favour. It is just a perfectly normal aspect of the way we do business.

IC-255E



FT-207R

So, look around, chat to the other exhibitors, see what deals you are offered. Then come to our stand . . . you might just do better. The only thing our regular customers will miss will be Brenda's coffee, but ask for our special Rally-time D-I-Y kit when you buy something!

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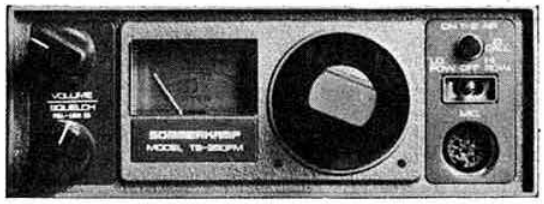
no—not where boy scouts go in summer—where amateurs go for fine equipment at competitive prices. For example:



TS280FM 2M 50 Watts output and 80 channels with auto repeater shift, direct reading LED display tone burst etc. **£177.00** + VAT

AND NOW IN STOCK:

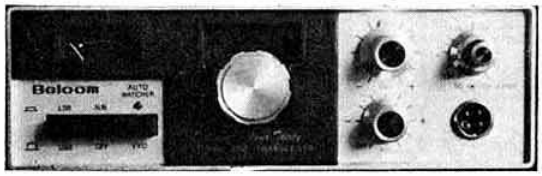
FT101ZD (Sommerkamp FT277ZD) Prices including CW filter and blower (extras elsewhere!) **£575.00** + VAT

FT7B Yes the Sommerkamp version of this fine high power mobile rig 50 Watt out on 80-10M SSB/CW/AM **£373.00** + VAT

FRG-7 New low price for this fine receiver. Analog readout. ONLY **£173.00** + VAT

Also available from Sommerkamp, transverter for FT277ZD RTTY converter, 20kW Linear, Antenna Tuners, even solar panels. Send large SAE for **FREE** colour catalogue.

LINERS



Not just the **LINER 430** (SSB Mobile 70cm at only **£185.00** + VAT) but **LA106** Linears for 2M at **£220** + VAT (200W PEP Input for that money can't be bad and it has a built-in 13.8V supply so you can use it with your mobile rig). The **LS707** all-mode 70cm (price on request) and the unique **Liner 15** for SSB mobile on 21MHz (work em mobile while it's good!) Lovely mod they said as we worked 4 countries in a hour mobile recently!! **£146.00** + VAT

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PLUG IN's for CD1212 'scope. 40 Mc/s wide band or 24 Mc/s twin beam. Either type, complete, untested, **£20.**
MARCONI KESTREL TRANSMITTER, crystal controlled 1.6 to 4.5 Mc/s. 80 watt PA matching pair TT21 modulated by pair TT21, AM or CW, **£26.** 24V PSU **£6** extra.
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TS820S	160-10m transceiver 200W P.E.P. (with DG1)	832.00	3.75
TS820	160-10m transceiver 200W P.E.P	710.00	3.75
DG1	Digital readout to 100Hz	122.50	1.00
VFO820	External VFO	123.50	3.75
DS1A	12V dc inverter	43.00	1.00
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SP820	Speaker	39.00	1.50
SM220	Monitor scope	246.00	3.75
BS8	TS820 scan board for SM220	49.50	50
AT200	1-8 to 30MHz antenna tuner	95.00	1.50
TL922	HF Linear amplifier 160-10m/2kW P.E.P. 2×3-500Z tubes	797.50	3.75
TS520S	1-8-28MHz SSB transceiver 200W P.E.P.	542.00	3.75
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SP520	Matching speaker	18.00	1.25
DG5	Digital display/40MHz frequency counter	119.50	1.50
DK520	Conversion kit allows use of DG5 with TS520	10.50	75
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BS5	TS520 scanboard for SM220	49.50	50
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SP120	Matching speaker	25.50	1.25
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TS700S	2m all mode digital readout transceiver simply the best	549.00	3.75
VFO700S	External VFO	92.00	3.75
SP70	Matching speaker	20.50	1.00
TR7010	2m SSB/CW mobile transceiver 10W output	193.00	3.75
TS770	2m/70cm all mode dual bander	t.b.a.	
TR7500	2m FM mobile 10W transceiver PLL with 80 FM channels	240.00	3.75
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TR2300	2m FM portable transceiver PLL with all 80 FM channels	199.00	3.75
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RA1	Helical rubber antenna	6.90	25
TS180S	160-10m solid state transceiver	712.00	3.75
TS180S	As above but with digital frequency control	825.00	3.75
VFO180	External VFO	t.b.a.	
SP180	Speaker	t.b.a.	
DF180	Digital frequency counter	t.b.a.	
AT180	1-8-30MHz antenna tuner	t.b.a.	
YK88S	SSB crystal filter	t.b.a.	
PB10	Pack of 10 ni-cad batteries (Ever Ready)	14.00	50
TR7600	2m synthesized mobile/fixed transceiver	270.00	3.75
	Spare power lead	1.30	15
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AMR217B	Scanner with 8 crystals. The best and most popular Mains/battery	120.75	1.50
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	'G' whip multimobile 20/15/10	26.45	1.25
	L.F. coils for the above whips (specify whether tribander or multimobile)	6.56	75
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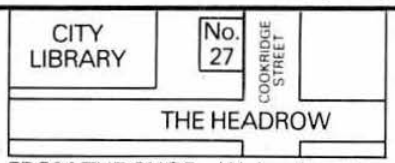

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144.4 (433.2)	b	e	b	e	e	b	e	e	e	e	e	e	e	e
144.480	e	e	e	e	e	e	e	e	e	e	e	e	e	e
144.800	c	e	e	e	e	c	c	c	e	c	c	e	e	e
144.850	e	e	e	e	e	e	e	e	e	e	e	e	e	e
145.000/R0T	a	b	a	c	c	a	b	b	c	a	a	c	b	e
145.025/R1T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.050/R2T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.075/R3T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.100/R4T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.125/R5T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.150/R6T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.175/R7T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.200/R8T	a	b	a	e	e	a	b	b	e	a	a	e	b	e
145.300/S12	e	e	e	e	e	e	e	e	e	e	e	e	e	e
145.350/S14	e	e	c	e	e	c	c	c	e	c	c	e	e	e
145.400/S16	e	e	e	e	e	e	e	e	e	e	e	e	e	e
145.425/S17	e	e	e	e	e	e	e	e	e	e	e	e	e	e
145.450/S18	a	e	a	e	e	a	b	b	e	a	a	e	e	e
145.475/S19	a	e	a	e	e	a	b	b	e	a	a	e	e	e
145.500/S20	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.525/S21	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.550/S22	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.575/S23	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.600/R0R	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.625/R1R	e	e	e	e	e	e	b	e	e	a	a	e	b	e
145.650/R2R	e	e	e	c	e	e	b	e	e	a	a	e	b	e
145.675/R3R	e	e	e	c	c	e	b	e	e	a	a	e	b	e
145.700/R4R	e	e	e	c	c	e	b	e	e	a	a	e	b	e
145.725/R5R	e	e	e	c	c	e	b	e	e	a	a	e	b	e
145.750/R6R	e	e	e	c	c	e	b	e	e	a	a	e	b	e
145.775/R7R	e	e	e	c	c	e	b	e	e	a	a	e	b	e
145.800/R8R	a	b	a	c	c	a	b	a	e	a	a	e	c	e
145.950/S38	a	e	e	a	e	e	e	e	e	a	e	e	e	e

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Holders—Low frequencies HC13/U or HC6/U dependent on frequency.
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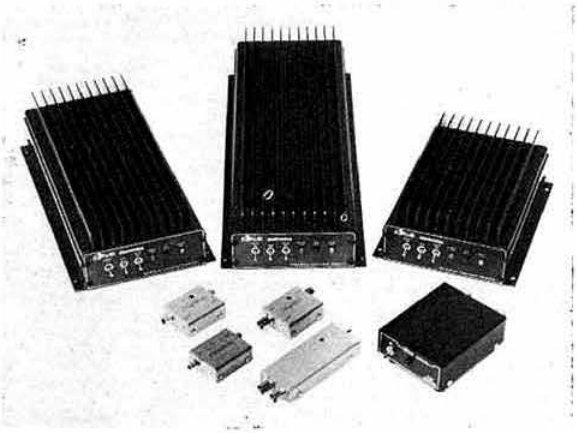

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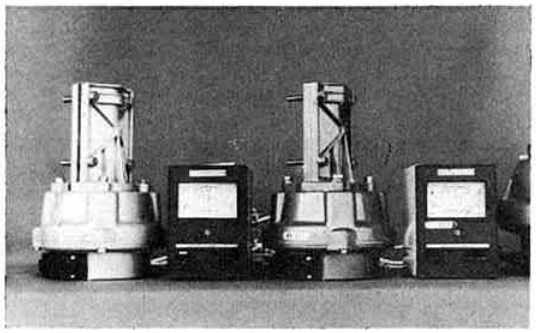

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R1	4·0284	8·0569	12·0854	14·9916	18·1281	44·9750
R2	4·0291	8·0583	12·0875	14·9944	18·1312	44·9833
R3	4·0298	8·0597	12·0895	14·9972	18·1343	44·9916
R4	4·0305	8·0611	12·0916	15·0000	18·1375	45·0000
R5	4·0312	8·0625	12·0937	15·0027	18·1406	45·0083
R6	4·0319	8·0638	12·0958	15·0055	18·1437	45·0166
R7	4·0326	8·0652	12·0979	15·0083	18·1468	45·0250
S10	–	–	12·1041	14·9500	18·1562	44·8500*
S15	–	–	12·1145	14·9638	18·1718	44·8916*
S16	–	–	12·1167	14·9667	18·1750	44·9000*
S17	–	–	12·1187	14·9694	18·1781	44·9083*
S18	–	–	12·1208	14·9722	18·1812	44·9166*
S19	–	–	12·1229	14·9750	18·1843	44·9250*
S20	4·0416	8·0833	12·1250	14·9777	18·1875	44·9333
S21	4·0423	8·0847	12·1270	14·9805	18·1906	44·9416
S22	4·0430	8·0861	12·1291	14·9833	18·1937	44·9500
S23	4·0437	8·0875	12·1312	14·9861	18·1968	44·9583

SR = Series Resonance *HC25 only

Also in stock R0 to R7 for FT221 R0 to R7 and S10, S15 to S23 for following: Belcom FS1007, FDK TM56, Multi 11 Quartz 16 and Multi 7, Icom IC2F, 21, 22A and 215, Trio Kenwood 2200, 7200. Uniden 2030 and Yaesu FT2FB, FT2 Auto, FT224, FT223 and FT202.

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455kHz		7·000MHz
1000kHz		10·700MHz
5·000MHz		48·000MHz
10·000MHz		100·00MHz

PRICES ARE EX VAT **PLEASE ADD 15%**

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	3	200 (total)	30 to 99.999 kHz	–	£10.50
	4	200 (total)	100 to 999.999 kHz	–	£6.00
	5	50	1.00 to 1.499 MHz	£9.00	£6.00
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	9	10	4.00 to 20.999 MHz	£4.55	£3.60
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Any orders received for A delivery when it is not available will automatically be placed on B delivery and a credit note issued for the difference in price.

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REVIEWED IN THIS ISSUE

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JUNKER PRECISION HAND KEY, £37.89

BAUER SINGLE-PADDLE KEY UNIT, £11.92

88mH TOROIDS for rtty, cw, sstv, filters **£1.08** each

SSB 90° AUDIO PHASE SHIFT NETWORKS, octal based.

All prices postpaid and include 15% VAT. Please send stamp with all enquiries.

SPACEMARK LTD.

THORNFIELD HOUSE, DELAMER ROAD, ALTRINCHAM. CHESHIRE (Tel: 061-928 8458)

J. BIRKETT

25 THE STRAIT, LINCOLN Tel: 20767

WIRE ENDED TRANSMIT/RECEIVE SWITCHING PIN DIODES with data 1 MHZ to VHF @ **40p**, UHF type @ **60p**.
MICRO-STRIP PIN DIODES up to 15 GHz Passive Limiters for Receiver Front Ends with data @ **£2.50** each.
X BAND GUNN DIODES with data @ **£1.65**.
X BAND DETECTOR DIODES like SIM 2 @ **15p**, 1N 23 @ **25p**.
DUAL GATE MOS FETS like 40673 @ **33p**, 4 for **£1.10**.
SOLDER-IN FEED THRU's 6·8pf, 300pf, 1000pf. All **20p** doz.
VHF POWER 10 WATTS 13 VOLT 175 MHz TYPE R 5174 @ £2.50.
WIDE SPACED 30 + 30pf TRANSMITTING VARIABLE @ £2.20.
BF 256C VHF 800 MHz @ 4 for **75p**.
MINIATURE VARIABLE CAPACITORS 25 × 25 × 25pf @ **75p**.
250 + 250 + 20 + 20 + 20pf @ **75p**, 5pf @ **75p**, 10pf @ **75p**.
DUAL GTE MOS FETS like 40673 @ **33p**, 4 for **£1.10**.
FREQUENCY COUNTERS HFC 600 8 Digit 600 MHz, S.A.E. Leaflet, @ **£123.**
ASSORTED CRYSTALS 10XAJ 30 for **£1.20**, FT 241A 20 for **£1.20**, FT 243 20 for **£1.60**, 10X Type 25 for **£1.60**.
Please add 20p for post and packing on U.K. orders under £2. Overseas orders, postage charged at cost.

Tecknowledgey for sale.

The Mark III FM Tuner

DIY Hi-Fi will never seem the same again. Ambit's Mark III tuner system is electrically & visually superior to all others. Some options available, but the illustrated version with reference series modules: £149.00 + £18.62 VAT

With Hyperfi Series modules £185.00 + £23.12

ALL TUNER KITS £3 carriage

Features of the system:

- Precision construction & design of all parts
- Time/frequency display
- State of the art performance with facilities for updates, using modular plug in systems.
- Deviation level calibrator for recording
- All usual tuner features

Digital Dorchester All Band Broadcast Tuner: LW/MW/SW/SW/SW/FM stereo

A multiband superhet tuner, constructed using a single IC for RF/IF processing - but with all features you would expect of designs of far greater complexity. The FM section uses a three section (air gang) tuned FET tunerhead, with ceramic IF filters and interstation mute; AM employs a double balanced mixer input stage, with mechanical IF filters - plus a BFO and MOSFET product detector for CW/SSB reception. Styled in a matching unit to the Mark III FM only tuner, employing the same degree of care in mechanical design to enable easy construction. MW/LW reception via a ferrite rod antenna.

Electronics only (PCB and all components thereon)	**£33.00 + £4.95 VAT**
Complete with digital frequency readout/clock-timer hardware	**£99.00 + £14.85 VAT**
Complete with MA1023 clock/timer module with dial scale	**£66.00 + £9.90 VAT**

Hardware packages are available separately if you wish to house your own designs in a professional case structure. Please deduct the cost of electronics from complete prices.

LW/MW/FM LCD Digital Frequency Display - July PW feature

Update your old radio, or build this into a new design. Or use it as a servicing aid - this low power unit with LCD display reads direct frequency in kHz/MHz, or with usual AM/FM IF offsets for received frequency. Low power LCD means no RFI - 15-20mA at 9v even with the divide by 100 prescalar. FM resolution is 100kHz, AM 1kHz. Sensitivities better than 10mV

Complete kit £19.50 + £2.93 VAT, built and tested module £27.00 + £4.05VAT

Ambit stocks and distributes a wide range of frequency counter LSI for all types of DFM- part two of the catalogue contains details of the MSM5523/4/5/6 range, and the versatile MSL2318 divide by ten or hundred prescalar IC. The DFM1 combined counter for AM,FM SW and direct/clock/stopwatch/timers - details available, but SAE please !

PW SANDBANKS PI METAL LOCATOR

Maintaining our professional approach to home constructor kits, we offer the pulse induction 'Sandbanks'. Now with injection molded casing for greatly improved enviromental sealing. **£37.00+£5,55vat**

VHF MONITOR RX WITH PLESSEY IC

4/9 channel version of the PW design - but **using standard (fundx9) crystals**, and **TOYO 8 pole crystal filter** with matching transformers. Coil sets from our standard range to cover bands from 40 to 200MHz. **Complete module kit £31.25 +£3.90vat .**

MICROMARKET   OSTS overflow:

6800P	650p	8212	230p	2102	170p
6820P	600p	8216	195p	2112	340p
6850P	275p	8224	350p	2513	754p
6810	400p	8228	478p	4027	578p
6852	365p	8251	625p	2114	1000p
8080	630p	8255	540p	+15% VAT	

RADIO and AUDIO MODULES : Consistently the most advanced

FOR FM

EF5801-3-4 series: 6 stage varicap tuning, all with oscillator output

5801	Dual gate MOSFET RF stages, bipolar mixer	£17.45 + 2.61VAT
5803	Dual gate RF/mixer stages, amplified LO out	£19.75 + 2.96VAT
5804	'Hyperfi' series, with internal PIN diode agc, and ultra wide range tuning system	£24.95 + 3.74VAT
EF5402	4 stage varicap tuner with TDA1062 and LO output. Uses FET/IC input. PIN agc	£10.75 + 1.61VAT

FOR 30-200MHz

The EF series are available on special order to cover bands (usually approx 20% of the centre frequency) in the range described. Details in our price list.

FOR FM IFs at 10.7MHz

7030	single 6 pole linear phase filter IF with HA1137	£10.95 + 1.64VAT
7130	two 6 pole linear phase filter IF with CA3189E	£16.25 + 2.44VAT
7230	Hyperfi IF, switched bandwidth, AGC IF preamp, linear phase ceramic filters with diode switched narrow filter	£24.95 + 3.74VAT

DECODERS for MPX (STEREO)

Various types, guaranteed the world's biggest and best ranges

LARSHOLT FM TUNERSETS

7252	MOSFET front end combined with CA3089 IF	£26.50 +3.97VAT
7252	JFET front end, combined with IF and decoder	£26.50 +3.97VAT

FM/AM tuning synthesiser, see details elsewhere in th is advertisement

COMPONENTS FOR RADIO/COMMUNICATIONS/AUDIO/TV etc.

As usual, Ambit brings you the latest and best, a small selection of which is shown in this advertisement. The Ambit catalogues contain information on most of the devices mentioned here - and an order for the new part three will ensure you stay up with latest developments. Data photocopying service described in pricelist info.

RADIO ICs for FM		vat
CA3089E	1.94	29
CA3189E	2.45	37
HA1137W	2.20	33
HA11225	2.20	33
SN76660N	0.75	11
RADIO ICs for AM/FM		
TDA1090	3.35	50
TDA1083	1.95	29
TDA1220	1.40	21
IF AMPLIFIERS		
KB4406	0.50	07
MC1350	1.20	18
see comms ics also		
COMMUNICATIONS		
KB4412	2.55	38
KB4413	2.75	41
SD6000	3.75	56

SL1600 series		
SL1610	1.60	24
SL1611	1.60	24
SL1612	1.60	24
SL1613	1.89	28
SL1620	2.17	33
SL1621	2.17	33
SL1623	2.44	37
SL 624	3.28	49
SL1625	2.17	33
SL1626	2.44	37
SL1630	1.62	24
SL1640	1.89	28
SL1641	1.89	28
SL6640	2.75	41
SL6690	3.20	48
MC3357	3.12	47
MC1496	1.25	19
NE544	1.70	25

Audio preamps		vat
LM381N	1.81	27
LM382N	1.65	25
KB4436	2.53	38
KB4438	2.22	33
TDA1028	3.50	53
TDA1029	3.50	53
TDA1074	3.75	56
Audio power		
TBA820M	0.75	11
TBA810AS	1.09	16
LM380N	1.00	15
ULN2283	1.00	15
TDA2002	1.95	29
HA1370	2.99	45
TDA2020	2.99	45

FETs, MOSFETs, bipolars, and various others: see PL

2SJ133/2SJ48 £10.00 + £1.50 pr. various high voltage drivers etc. from correctly matched Hitachi series transistors. (All 120v types)

OSTS; Remember all OSTS stocks are obtained from BS9000 approved sources - your assurance that all devices are very best first quality commercial types. Some LPSN TTL is presently in great demand, so please check by phone before ordering .

TTL:Standard AND LP SchottkY

All prices listed in pence ✱

	'N'	'LSN'
7400	13	20
7401	13	20
7402	14	20
7403	14	20
7404	14	24
7405	18	26
7406	38	
7409	17	24
7410	15	24
7411	20	24
7412	17	
7413	30	
7414	51	
7415		24
7416	30	
7417	30	
7420	16	24
7421	29	24
7423	27	
7425	27	
7426		27
7427	27	29
7428	35	32
7430	17	24
7432	25	24
7437	40	24
7438	33	24
7440	17	24
7441	74	
7442	70	99
7443	115	
7444	112	
7445	94	
7446	94	
7447	82	89
7448	56	99
7449		99
7451	17	24
7453	17	
7454	17	24
7455	35	24
7460	17	
7463		124
7470	28	

	'N'	'LSN'
7472	28	
7473	32	38
7474	27	38
7475	38	40
7476	37	38
7478		38
7480	48	
7481	86	
7482	69	
7485	104	99
7486		40
7489	205	
7490	33	90
7491	76	110
7492	38	78
7493	32	99
7494	78	
7495a	65	99
7496	58	120
7497	185	
741XX series		
74107	32	38
74109	63	38
74110	54	54
74111	68	
74112		38
74113		38
74114		38
74116	198	
74118	83	
74120	115	
74121	25	
74122	46	
74123	46	
74124		137
74125	38	44
74126	57	44
74128	74	
74132	73	78
74136		40
74138		60
74139		60
74141	56	

	'N'	'LSN'
74142	265	
74143	312	
74144	312	
74145	65	97
74147	175	
74148	109	191
74150	99	
74151	64	84
74153	64	54
74154	96	
74155	54	110
74156	80	110
74157	67	55
74158		60
74159	210	
74160	82	130
74161		78
74162		130
74163	92	78
74164	104	130
74165	105	
74167	20	
74169		200
74170	230	200
74172	625	
74174	87	120
74175	87	110
74176	75	
74177	78	
74181	165	350
74183		210
74184	135	
74185	134	
74188	275	
74190		92
74192	105	180
74193	105	180
74194	105	
74196	99	110
74197		110
74198	150	
74199	160	
74247		90
74253		105

	'LSN'
74257	108
74260	153
74273	124
74283	120
74293	95
74365	49
74366	49
74367	43
74368	49
74373	77
74374	77
74377	124
74379	130
74393	140

VOLTAGE REGS:

7800 series 1Amp pos	95p
7900 series 1Amp neg	100p
78M series ½Amp pos	90p
78LCP 100mA	35p
78MGT2C variable	175p
79MGT2C variable	175p
723CN variable IC	65p
NE550	73p
L200 variable V and I	195p

MAINS EMI FILTERS
(BS etc approved types)

1 Amp in IEC chassis connector	4.83
6 Amp in IEC	5.83
5 Amp wirein	3.87

(Toroid cores in Cat no. 2)

MISC. Counter/timer, scalar devices..........

NE555 30p NE556 78p NE558 180p
LM3909 72p

95H90DC divide by 10/11 to 320MHz	780p
11C90DC divide by 10/11 to 650MHz	1400p
8629 divide by 100 to 175MHz min	420p
MSL2318 divide by 10/100 to 175MHz min	420p
ICM7216BIPI : 8 decade 10MHz DFM counter and full function timer, with direct drive for an LED display (mpx). Uses 10MHz xtal	1982p
ICM7217AIBI : 4 decade programmable counter with direct LED drive	950p
ICM7207 clock pulse generator	495p
ICM7208 : 7 decade counter display	1495p
ICM7106CP : LCD DVM (3½ digit)	955p
ICM7106CPK : evaluation kit for 7106	24.80
ICM7107CP : LED DVM (3½ digit)	955p
ICM7107CPK : LED DVM kit for 7107	20.65
OKI MSM5523/4 : LED/Fluorescent display driver IC for time/timer/stopwatch/ AM/FM received frequency display and direct counter (use MSL2318 prescalar) inc Crystal	1400p
MSM5525 : AM/FM frequency only couner, for fluorescent displays (6LT06) inc xtal	1100p
MSM5526 : as MSM5525 but for LCD	1100p
4 digit LCD for ICM7106 or MSM5526	1100p
10 LED (2½×5mm) bar graph driver PCB for LOG or LIN (specify). Kit ex leds	300p

IMPORTANT : ALL PRICES SHOWN EXCLUDE VAT - WHICH MUST BE ADDED AT 15% OVERALL.
PLEASE NOTE THE REDUCED CMOS/LPSN TTL RANGES DUE TO CURRENT SUPPLY SHORTAGE

CD4000

4000	17
4001	17
4002	17
4006	109
4007	18
4008	80
4009	58
4010	58
4011	17
4012	17
4013	55
4014	95
4016	52
4017	80
4018	80
4019	60
4020	93
4021	82
4022	90
4023	17
4024	76
4025	17
4026	180
4027	55
4028	72
4029	100
4030	58
4035	120
4040	83
4042	85
4043	85
4044	80
4046	130
4048	60
4049	55
4050	55
4051	65
4052	65
4053	65
4055	135
4059	563
4060	115
4063	109
4066	53
4068	25
4069	20
4070	20
4071	20
4072	20
4073	20
4075	20
4076	90

4522	149
4528	102
4529	141
4532	125
4538	150
4539	110
4543	174
4549	399
4554	153
4558	117
4560	218
4562	530
4566	159
4568	281
4569	303
4572	25
4584	63
4585	100

LINEARS

CA3130E	84
CA3130T	90
CA3140E	
CA3140T	72
LM301AH	67
LM301AN	30
LM339N	66
LM348N	186
LM3900N	60
709HC	64
709PC	36
710HC	65
710PC	59
723CN	65
741CH	66
741CN	27
747CN	70
748CN	36
NE531N	105

7 SEG DISPLAYS

HP5082 series.......

Red	7650	233p
	7653	233p
Yell	7660	233p
	7663	233p
Grn	7670	233p
	7673	233p
Fairchild FND 500/507		150p

MORE FROM THE GENERAL AMBIT CATALOGUE RANGES:

Varicap tuning diodes for AM/FM/TV :
1-9 v AM tuning (Cr 15:1) from TOKO--

KV1211	double matched	175p	26p vat
KV1210	triple matched	245p	37p vat
KV1215	triple snap-apart	245p	37p vat
MVAM115	single 15v	105p	16p vat
MVAM125	single 25v	105p	16p vat
MVAM2	double 25v	148p	22p vat
BB204/104	double FM	40p	6p vat
BA102	single AFC etc	30p	4p vat
BA121/ITT210	single afc	30p	4p vat
BB105B	single UHF	40p	6p vat
PIN DIODES, BANDSWITCH types			
BA479	PIN attenuator	35p	5p vat
TDA1061	Pi-form atten.	95p	14p vat
BA182	Bandswitch	21p	3p vat

All RF semiconductors stocked in depth. Please ask for quantity pricing details.

MPU controllable digital freq. synthesiser PCB. Preliminary:
Serial data controlled, with the standard swallow count system for maximum speed of operation. Multiple time constant filters, suitable for AM/FM and other communications/generator applications. Not for beginners. Full preliminary data package £1 + SAE. **No phone enquiries answered on this system for the time being. Watch this space........**
Projected cost of the controller PCB less than £30: comprises the two modulus counter, prog.div., phase detector, multiple TC loop filter/integrators.

TOP GRADE LEDS by AEG: PRICES ARE EXC. VAT (add 15%)

SIZE	Red	Green	Yello	Orang
5mm	14p	16p	15p	20p
3mm	13p	15p	18p	19p
2½×5	17p	20p	20p	24p

Quantity discounts for LEDs:
10 per type - less 10%
100 per type - less 30%
100 mix in 10s - less 25%

FUTABA FLUORESCENT VACUUM DISPLAYS for CLOCKs etc

5LT02	clock display (static drive) with AM/PM flags	£9 + 1.35
5LT03	DFM display for MSM5525 LSI counter	£9.45 + 1.42 vat
6LT06	5 digit DFM display (GI AY58100) mpxed	£9.75 +1.46 vat

TOKO COILS, FILTERs, CHOKES, etc for AM/FM/TV comms-- (please add VAT @15%)

TYPE	Size: 5mm	7mm	10mm	
AM IF	55p	33p	30p	Various for ICs, transistor etc.
FM IF	55p	33p	33p	Various for ICs, transistor etc.
SW coils			33p	Two impedance series
OSC coils	55p	33p	33p	For LW/MW/SW
TV vif/sif			35p	

Various coils in the range 20kHz to 300MHz - see TOKO catalogue

CERAMIC and MECHANICAL FILTERS (inc MURATA TYPES)

CFT455B/ CFT455C 60p; CFX014 -180p; CFU455C - 85p
CFT470C - 60p; CFU470C -65p
MURATA CFU455H and CFU455F cermic block filters 1.95ea
MURATA CFM455 series ladder filters. D,E,F,G,H bandwidths available now (20,16,12,8,6 kHz) £8.35 ea (metal encapsulated)
SFD455B, SFD470B, SFD472B 85p ea
CFM2 series mechanical elements types A,B,C,D (4-10kHz bandwidth) 65p ea. (As used in RCME feature)

MULTIPLEX/PILOT TONE FILTERS, FM IF FILTERS (see cat and:)

CFSE10.7/SFE10.7 - stereo FM IF ceramic filters (sim FM4 etc)	50p
CFSB10.7/SFE10.7MJ - mono bandwidth ceramic FM IF filters	50p
SFE10.7ML - ultra linear phase stereo ceramic IF filters	70p
CDA10.7 - 10.7MHz ceramic discriminator (for CA3089 etc)	70p

Current news: A PCB for the Mullard DC tone and volume control system is now available £3 + 0.45 VAT. HMOS PA modules for 60-100W - kit £14 +£2.10VAT, heatsink £4.10+0.61. FM radio control system crystals £3.75 pair inc VAT (Sept. on). MK50366N: static drive clock/timer IC £3.78 + 0.57 VAT. 12½kHz channel spacing 8 pole 10.7MHz XTAL filter by TOYO type H4402 £15.50 + £2.32VAT. A further updated pricelist is now available, and we would like to remind you that enquiries can only be answered if accompanied either by an official business letterhead, or an SAE. STOP PRESS: TOKO's new split-apart triple AM tuning diodes are in stock £2.45 + 37p VAT, (KV1215). S BL1 diode DBM 1-500MHz - £4.25+0.64p.

Terms: CWO please. Account facilities for commercial customers OA. Postage 25p per order. Minimum credit invoice for account customers £10.00. Please follow instructions on VAT, which is usually shown as a separate amount. Overseas customers welcome - please allow for postage etc according to desired shipping method. Access facilities for credit purchases.

Catalogues: Ambit. Part 1 45p. Part 2 50p 90p pair. TOKO Euro shortform 20p. Micrometals toroid cores 40p. All inc PP etc. Full data service described in pricelist supplements.

Hours/phone: We are open from 9am -7pm for phone calls. Callers from 10am to 7pm. Administrative enquires 9am to 4.30pm please (not Saturdays). Saturday service 10am to 6pm.

AMBIT catalogues are guaranteed to contain the most up-to-date and best informed comment on modern developments and advances in the field of radio and audio. There is no competetive, publication that even approaches the broad range of parts/information on modern techniques.

ambit ® international 2 Gresham Road, Brentwood, Essex.

MICROCOMPUTER COMMUNICATIONS

Sell all that expensive hardware in your shack (Not your rig). Buy a Microcomputer and use it to send SSTV (Only Apple II/ITT), Morse, RTTY and ASCII as well as learning to program, bring the whole family in on the fun and education of Micro's.

Communications Packages available for the following Computers;

Apple II – Tandy TRS80 – Pet's – ITT2020 – Sorcerer.

Apple II/ITT2020: Software packages + Documentation for sending and receiving Slow Scan TV (**£18.00**) and Communications (Morse, RTTY and ASCII) (**£15**). Slow Scan does not require any external hardware, just uses cassette port. Communications requires simple interface details included.

PET – TRS80 – Sorcerer: Marcotronics Software/Interface packages with documentation. Available for Pet 8, 16, 32K, TRS80 Level II 16K RAM, Socercer 16K RAM. Buy an Apple II from us and we give you the Slow Scan TV and Communications programs free.

Amateur Radio Software: Apple II/ITT/PET: Locator: Great Circle: Code: Eurocator on cassette or disk prices between **£3.50** to **£8.00**.

For Apple II Disk users VHF Contest Logging/Scoring system – requires Applesoft, 32K & Single Disk – Logs up to 2000 contacts, checks for duplicate contact on logging – prints out contest log, works out ITU & RSGB scores, totals up scores and finds furthest contact on log. Supplied on disk with documentation. **£35.00.**

Clubs and Societies make use of our Comprehensive mailing list system. Have your club members circulated or a selective run on age, membership renewal date etc. Cost depends on members and runs per year, ask for detailed information.

Official West Country dealer for Apple II Computer and range of accessories.

Apple II Plus, 16K Ram b/w modulator **£830.00,** Floppy disk drive **£425.00** please ask for further detailed information on the most versatile Microcomputer on the market.

Coming soon; Nicomtach Terminal Interface Unit for use with the Apple II/ITT Communication package or on any Microcomputer/Hardware set up. Consists of three units, AFSK generator, Demodulator & P.S.U sold assembled and tested. Also on sale C10 cassette tapes special offer **£4.88** for 10 (includes VAT & P&P)

For any further information please call or write,

NICOMTECH (N. R. HUNTLEY) G4CDU
212 St Stephens Road, Saltash, Cornwall PL12 4NL. Tel: 075 55 2066

REG. WARD & CO. LTD.

G2BSW
G8CA

YAESU					
FT901D	..	£737.50	YP150	..	£58.50
FT301D	..	£585.00	FC301	..	£108.00
FP301	..	£98.00	FT225R	..	£487.50
FT101E	..	£515.00	CPU2500RK	..	£308.00
FT2008/FP200	..	£420.00	FT227RA	..	£229.00
FT7B	..	£375.00	FT227R	..	£213.00
FT7	..	£265.78	FT202R	..	£88.00
			FP12	..	£67.50
FL2100B	..	£311.00	FP4	..	£35.00
FL110	..	£130.00	YC601	..	£113.00
FR101DD	..	£615.00	SP101B	..	£19.00
FR101D	..	£525.00	YD148	..	£18.50
FR101S	..	£395.00	YD844	..	£18.00
FRG7000	..	£327.00	YD846	..	£7.50
FRG7D	..	£240.00			
FRG7	..	£187.00	SHURE		
YO100	..	£145.00	444	..	£28.20
YC500J	..	£168.50	201	..	£12.60

Please add 15% VAT to all prices

VALVES Most types kept. All valves for Yaesu in stock, valves for K.W. also.

WANTED: FR50B's in good condition and good working order, with handbook.

S.E.M. Equipment. Most items held. K.W. Ancilliary Equipment
Agents for G2DYM, J Beam 2m, and Ascot Antennas
Aerial Wire, Insulators, Co-ax Cable, Twin Feeder
WIGHTRAPS CO-AX SWITCHES
HP available. Carriage extra
Please check prices and availability before ordering
ACCESS/BARCLAYCARD
GEORGE ST, AXMINSTER, DEVON EX13 5DP
TELEPHONE 33163

GET THAT QRM OFF YOUR BACK!

Add the **G3JKF Antenna Vector Processor** to your Monoband or Triband Beam to give optimum Front-to-Back Ratio on reception.

Rear directivity may be electronically controlled to null QRM from the back without changing the Forward Pattern.

Normal Parasitic Beam operation on transmit or receive augmented by switching in the **G3JKF Processor** when QRM occurs.

The system consists of an 8" × 8" × 3" Processor in the Shack, and a single coaxial cable to a 5" × 4½" × 2½" Antenna Unit wired to the modified Reflector Element of your HF Beam Antenna.

Processor and Antenna Unit UK Price £110 plus VAT. Carr. inc.

For more information and export enquiries send SAE to:

RADMIC SYSTEMS LTD, 10 WEALD DRIVE
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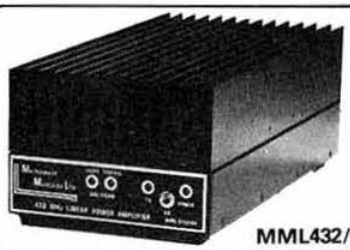

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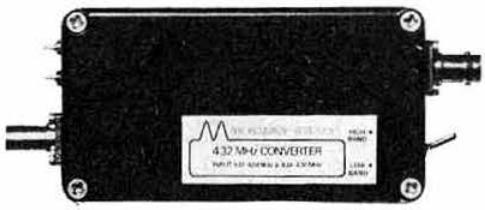
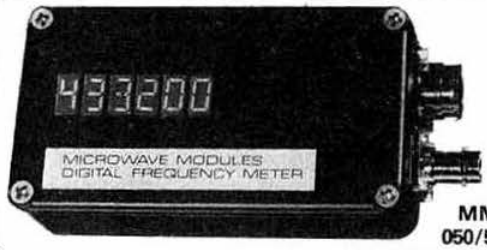


MMC432/28-S



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FDK MULTI 800D synthesized 25W 2m rig. Very good condition. £215 ono. Richard, 0376 21869 after 6pm.

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This month shews the value of the Vertical.

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MICROWAVE MODULES	P.O.A.
VHF LINEARS	P.O.A.

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Handcross is a small rural Sussex village with good pubs, an excellent teashop, a National Trust Gardens, and of course us—all with no parking problems or traffic congestion.

We have what is possibly the largest showroom in the country devoted to Amateur Radio and we are fully authorised and approved stockists for ALL leading makes of equipment including TRIO, YAESU, ICOM and FDK. We have full service facilities and a staff of professional electronic engineers. We deliberately do not concentrate on or favour any particular make of equipment but stock the best of each in our (we hope reasonably informed) opinion. We can therefore give you impartial advice when you are trying to sort out the maze of specifications and rival claims of different manufacturers.

If you are satisfied with your purchase from us—tell your friends, if not PLEASE TELL US—we regard our reputation as of paramount importance and will use our best efforts to preserve it.

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ICOM IC215	£162.00
TRIO TR 2300	£199.00
AOR AR 240	£165.00

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ICOM IC 211E	£549.00
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MIZUHO SB 2M	£165.00
TRIO TR 7010	£193.00
ICOM IC 202S	£199.00

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SEARCH 9	£59.00
FDK TM 56B	£106.00
BELCOM AMR 217B	£120.00
HF 12 POCKET	£79.95

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KR 400 MEDIUM H.F.	£97.75
STOLLE 2050	£42.50

RADIO SOCIETY OF GREAT BRITAIN

REPORT AND ACCOUNTS

and

THE YEAR IN REVIEW

for the year ended

30 JUNE 1979

Radio Society of Great Britain

35 DOUGHTY STREET, LONDON WC1N 2AE

1 November 1979

NOTICE IS HEREBY GIVEN that the FIFTY-THIRD ANNUAL GENERAL MEETING of the Society will take place at the Institution of Electrical Engineers, Savoy Place, London WC2, at 2pm on Saturday 8 December 1979 for the transaction of the undermentioned business:

1. To receive and, if approved, confirm the minutes of the fifty-second annual general meeting circulated with the November 1979 issue of *Radio Communication.*

2. To receive and consider the accounts for the year ended 30 June 1979, and the reports of the Council and the auditors thereon.

3. To announce the names of members to serve on the Council for the year 1980, and, in the event of Mr G. R. Jessop having been successful in the ballot, to have his appointment, and that of Mr W. F. McGonigle, who has been returned unopposed, confirmed by the meeting as they are both over 70 years of age.

4. To resolve that Messrs Edward Moore & Sons be reappointed auditors of the Society for the ensuing year, and that their remuneration be fixed by Council.

5. To transact any other business which may be properly transacted at an annual general meeting.

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

By order of the Council
D. A. EVANS
Secretary

Notes

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

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

Radio Society of Great Britain

35 DOUGHTY STREET, LONDON WC1N 2AE

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R. F. Stevens, G2BVN
G. M. C. Stone, G3FZL
C. J. Thomas, G3PSM

Retired on 22 July 1978
***Co-opted on 22 September 1978, retired on 31 December 1978*
†*Retired on 31 December 1978*

Secretary & General Manager: D. A. Evans, G3OUF

Auditors: Edward Moore & Sons, Chartered Accountants

Bankers: Barclays Bank Ltd

FINANCIAL REPORT OF COUNCIL TO MEMBERS OF THE SOCIETY

Council has pleasure to present the audited accounts of the Society and its subsidiary for the year ended 30 June 1979. The accounts set out in pages iv to viii show that before taxation the Society had a surplus of income over expenditure of £20,777. Corporation tax provisions absorb £4,668, leaving £16,109 to be added to the accumulated fund.

A number of changes in presentation of the consolidated income and expenditure account have been made this year. They are designed to show the gross revenue of the Society and to highlight the principal categories of expense incurred in running its operations. In particular the groupings of expenditure under the heading of "Membership services" shows the total cost of providing services directly connected with amateur radio.

Subscriptions income

Subscriptions income reflects the growing membership during the year. For VAT purposes 60 per cent of a member's subscription is zero-rated. VAT payable represented approximately three per cent of the gross sums due, and in this way members contributed nearly £5,000 to the national exchequer during the year. The increase in VAT rate to 15 per cent will mean that this contribution will increase by approximately £4,500 in 1979–80. As far as the Society is concerned this is a compulsory reduction in income.

Other income

Sales of books showed the expected reduction compared with 1978. Export sales during the year were £32,183 (1978: £40,496). These accounts show the costs of staff directly engaged on book production, and handling and despatch. Book sales continue to make a vital contribution towards meeting the expenses of the Society.

Advertising income showed a significant increase during the year, due partly to an increase in rates charged but also to an increase in the volume of space taken. The costs involved are included under *Radio Communication* expenses.

Other income is detailed in note 5 to the accounts, and includes commissions and other receipts in addition to investment income.

Expenditure

Expenditure continues to rise—inflation is well known. Council's policy of engaging qualified staff at headquarters, and the effects of a general increase in salary levels, had the result of increasing staff costs by £18,000 in the year.

Increases in other expenses will be apparent from comparison with the figures for 1978.

The grouping of membership services expenditure has entailed some adjustment of the 1977–8 figures, and some of the comparative figures will not compare directly with those which appeared in the 1978 accounts. Increases in expenditure will be evident from the accounts, but some items require an explanation because of the changes in analysis and presentation.

Radio Communication expenses are shown in total and not after deduction of advertising revenue as in past years. Overall, the increase in gross costs is 11 per cent. Certificates, awards and trophies reflect the growing interest in this area—as well as the increasing membership.

Beacons, repeaters and satellites includes £500 contributed towards the University of Surrey satellite project. Council has authorized a total contribution of £2,000 spread over two years.

IARU contributions have gone up because of an increase of 50 per cent in the levy for this year only, to meet additional costs associated with WARC.

Rallies, exhibitions and Society publicity is a new heading this year, and is explained in more detail in Note 7 to the accounts. The overall cost is reduced by the surpluses arising on the Society's own events at Alexandra Palace, Woburn and the VHF Convention.

The year under review has seen a considerable increase in committee activity. The wider spread of representation on committees, reported on last year, coupled with greatly increased costs of travelling, has meant additional costs of £4,763.

The future

The Society's overall financial position is sound, but the future, despite the increase in subscriptions at 1 July 1979, depends upon many factors, including future inflation and, not least, the continuing active interest of members throughout the country as voluntary workers or supporters of Society events.

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)
AND ITS WHOLLY-OWNED SUBSIDIARY COMPANY

CONSOLIDATED INCOME AND EXPENDITURE ACCOUNT
for the year ended 30 June 1979

1978 £	1978 £		Notes	1979 £	1979 £
		INCOME			
161,109		Subscriptions	(1)		167,642
72,518		Advertising	(1)		88,529
150,649		Book sales			131,505
3,901		Other income	(5)		6,699
£388,177		**Total income**			£394,375
		EXPENDITURE			
		Book sales			
	69,452	Cost of printing		55,817	
85,452	16,000	Costs of editing and despatch staff		16,750	72,567
		Headquarters			
	6,810	Rates, lighting, heating and cleaning		8,762	
7,151	341	Repairs and maintenance		1,487	10,249
		Administration			
	53,018	Staff costs		71,138	
	300	Pension		300	
	22,201	Telephone, postage, printing and stationery		25,802	
	731	Insurance		816	
	786	Repairs and maintenance of equipment		303	
	6,931	Equipment hire		9,746	
	3,326	Depreciation of equipment	(1)	4,628	
	5,185	Audit fees		5,073	
	2,874	Legal and professional fees		1,730	
95,806	454	General expenses		1,474	121,010
		Finance			
	1,145	Bank charges		1,068	
		Debentures of Lambda Investment Company Limited			
	1,082	Interest (gross)		1,010	
	—	Issue expenses written off		481	
2,567	340	Bad debts		500	3,059
		Membership services			
	119,009	*Radio Communication*	(6)	132,453	
	1,669	Certificates, awards, trophies, etc		3,187	
	5,145	QSL Bureau		5,668	
	1,015	Beacons, repeaters, satellites and Intruder Watch		1,992	
	4,641	IARU Region 1 contribution and levy		6,944	
	810	Rallies, exhibitions and publicity	(7)	2,826	
	7,538	Cost of committee, regional and Council meetings		12,301	
143,134	3,307	Cost of international meetings and conferences		1,342	166,713
£334,110		**Total expenditure**			£373,598
		SURPLUS FOR THE YEAR BEFORE TAXATION (Of which £21,258			
54,067		(1978: £54,067) arises in the Society)			20,777
		Less Provision for taxation thereon at 42%	(8)		
	1,150	Corporation Tax on investment income		2,418	
9,900	8,750	Deferred tax		2,250	4,668
£44,167		**SURPLUS FOR THE YEAR AFTER TAXATION**			£16,109

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)
AND ITS WHOLLY-OWNED SUBSIDIARY COMPANY

BALANCE SHEETS 30 JUNE 1979

1978 The Society & subsidiary £	1978 The Society £		Notes	1979 The Society £	1979 The Society & subsidiary £
		FIXED ASSETS			
41,675	—	Freehold property at cost	(1)	—	41,675
13,298	13,298	Furniture, equipment and computer programming	(1)(2)	17,162	17,162
—	28,886	Investments in and loan to subsidiary	(3)	45,807	—
4,586	—	Sinking Fund Policy at cost (Surrender value £5,372 (1978: £4,856))		—	5,003
59,559	42,184			62,969	63,840
		INVESTMENT			
19,503	19,503	Quoted at cost (Market value £18,258 (1978: £17,977))		19,503	19,503
		NET CURRENT ASSETS			
57,129	57,129	Stocks at lower of cost and net realizable value		57,280	57,280
34,527	34,527	Debtors and payments in advance		33,386	33,386
67,748	67,789	Bank balances and cash in hand		51,070	51,079
159,404	159,445			141,736	141,745
		Less			
(62,323)	(61,354)	Creditors and accrued charges		(39,267)	(40,807)
(413)	(413)	Corporation tax payable		(2,365)	(2,365)
96,668	97,678			100,104	98,573
£175,730	£159,365	**NET ASSETS**		£182,576	£181,916
		Financed by			
21,579	21,517	**ACCUMULATED FUND.** Balance at 1 July 1978		65,684	65,746
44,167	44,167	Surplus for the year ended 30 June 1979		16,590	16,109
65,746	65,684			82,274	81,855
		Less			
(722)	—	Preliminary expenses of subsidiary		—	(241)
65,024	65,684			82,274	81,614
6,044	6,044	**LEGACY FUND**	(4)	6,170	6,170
78,887	78,887	**SUBSCRIPTIONS IN ADVANCE**		83,132	83,132
17,025	—	**6% DEBENTURE STOCK OF SUBSIDIARY**	(3)	—	—
8,750	8,750	**DEFERRED TAXATION**	(1)	11,000	11,000
£175,730	£159,365			£182,576	£181,916

(The notes on page vi form part of these accounts)

J. BAZLEY, *President*
P. F. D. CORNISH, FCA, *Honorary Treasurer*

NOTES ON THE ACCOUNTS

1. Accounting policies:

(a) Subscriptions—cash received in respect of subscriptions for the year has been apportioned on a time basis from the actual dates subscriptions were receivable, after deduction of VAT. Life subscriptions are credited to Income and Expenditure Account over a period of 10 years.

(b) Advertising income is the gross amount received for advertisements in *Radio Communication.*

(c) Depreciation—no depreciation has been provided on the freehold property. The Council is of the opinion that the present market value of the Society's freehold property (which is held in the subsidiary company) is in excess of £100,000, and that any depreciation required in respect of the building element would be insignificant. Other fixed assets are written off using the straight-line method over their estimated useful lives at the following rates:

Furniture — 10 per cent per annum
Equipment — 20 -25 per cent per annum
Computer programming — 20 per cent per annum

(d) Deferred taxation has been provided at 42 per cent using the liability method in respect of timing differences relating to depreciation of fixed assets and stock appreciation relief as reduced by losses available to be set off against future profits for tax purposes.

2. Furniture, equipment, and computer programming

	1979 £	1978 £
Cost 1 July 1978	25,687	16,090
Additions during year	8,492	9,597
Cost 30 June 1979	34,179	25,687
Accumulated depreciation	17,017	12,389
Book value as shown in balance sheet	£17,162	£13,298

3. The share capital of the subsidiary, Lambda Investment Company Limited (registered in England), is £100 in shares of £1 each and all the shares are held by the Society or its nominees. The debenture stock was redeemed in full at 30 June 1979.

4. The Legacy Fund was established in the year ended 30 June 1976. Legacies and donations amounting to £126 (1978 £621) received in the year have been credited direct to this account.

5. Other income comprises:

	1979 £	1978 £
Bank interest	3,484	1,825
Quoted investment interest (gross)	1,664	1,747
	5,148	3,572
Surplus on redemption of investments	—	90
Commissions and sundry income	1,551	239
	£6,699	£3,901

6. *Radio Communication* expenses comprise the whole of the costs of printing and distribution, advertising commission, and the cost of editorial staff and the Chelmsford office.

7. Rallies, exhibitions and publicity expenses comprise:

	1979 £	1978 £
Society publicity and advertising	3,975	700
Surplus on the Society's own events less the cost of participation in other rallies and exhibitions (1978 net cost)	(1,149)	110
	£2,826	£810

Book sales totalling £12,723 gross (1978: £8,688) made at rallies and exhibitions have been accounted for under income from book sales.

8. The Society is liable to pay Corporation Tax on its investment and trading income. Due to the effects of stock relief and capital allowances, tax on trading income has been deferred, for which provision has been made.

9. The Society administers certain prize and memorial funds, totalling £632 (1978: £647) which are not included in the accounts.

CONSOLIDATED STATEMENT OF SOURCE AND APPLICATION OF FUNDS
for the year ended 30 June 1979

1978 £		1979 £
	SOURCE OF FUNDS	
54,067	Surplus for the year before taxation	20,777
621	Donations, legacies and interest	126
—	Tax repaid	58
	Adjustment for items not involving the movement of funds:	
3,326	Depreciation	4,628
(594)	Tax suffered by deduction	(524)
—	Debenture issue expenses written off	481
(90)	Surplus on redemption of investment	—
57,330	**Total generated from operations**	25,546
	APPLICATION OF FUNDS	
(15,358)	Purchase of investment less proceeds of sale	—
(9,597)	Purchase of fixed assets	(8,492)
(1,500)	Repayment of debentures	(17,025)
(417)	Sinking Fund Policy premiums	(417)
£30,458		£(388)
	DECREASE (1978 INCREASE) IN WORKING CAPITAL	
16,789	Stocks	151
10,482	Debtors	(1,141)
(17,508)	Creditors and subscriptions in advance	17,271
9,763		16,281
	Movement in net liquid funds:	
20,695	Cash balances	(16,669)
£30,458		£(388)

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

In our opinion, the accounts set out on pages iv to vii, prepared under the historical cost convention, together give on that basis a true and fair view of the state of affairs of the Company and its subsidiary at 30 June 1979 and of their surplus of income and of their source and application of funds for the year ended on that date and comply with the Companies Acts 1948 and 1967.

4 Chiswell Street, London EC1Y 4XB.
20 September 1979

EDWARD MOORE & SONS
Chartered Accountants

LAMBDA INVESTMENT COMPANY LIMITED

Report of the directors

The directors have pleasure in submitting their report for the year ended 30 June 1979. The company is a wholly-owned subsidiary of the Radio Society of Great Britain (a company incorporated in England) and was formed to acquire the freehold property, 35 Doughty Street, London WC1, which is the headquarters of the Society. The directors are of the opinion that the market value of the property is in excess of £100,000.

The 6% Debenture Loan Stock was redeemed in full at 30 June 1979.

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

By order of the Board
D. A. Evans
Secretary

BALANCE SHEET 30 June 1979
and
REVENUE ACCOUNT for the year ended on that date

1978				1979	
£	£	£		£	£
			ASSETS		
41,675			Freehold property at cost		41,675
4,586			Sinking Fund Policy, at cost (Surrender value £5,372 (1978: £4,856))		5,003
241			Preliminary expenses		241
481			Debenture issue expenses		—
—			Bank balance		9
46,983					46,928
			LIABILITIES		
	41		Bank overdraft (secured)	—	
	969		Sundry creditors	1,540	
1,010					1,540
£45,973			**NET ASSETS**		£45,388
			Financed by:		
			Authorized and Issued Capital		
100			100 shares of £1 each fully paid		100
			Revenue Account		
	1,318		Rent receivable in the year to 30 June 1979	1,181	
		1,082	*Less:* Debenture interest	1,010	
		—	Debenture issue expenses written off	481	
		45	Bank charges	84	
		50	Audit fee	60	
		141	Sundry expenses	27	
	1,318			1,662	
	—			(481)	
62	62		Balance at 1 July 1978	62	(419)
28,786			**Loan from the Radio Society of Great Britain**		45,707
17,025			**6% Debenture Stock**		—
£45,973					£45,388

L. E. Newnham
P. F. D. Cornish, FCA
Directors

Report of the auditors to the members of Lambda Investment Company Limited
In our opinion, the accounts set out above prepared under the historical cost convention give on that basis a true and fair view of the state of the Company's affairs at 30 June 1979 and of the result for the year ended on that date and comply with the Companies Acts 1948 and 1967.

4 Chiswell Street, London EC1Y 4XB
20 September 1979

EDWARD MOORE & SONS
Chartered Accountants

THE YEAR IN REVIEW

Some of the activities of the Society in the year ended 30 June 1979

GENERAL MANAGER'S REPORT

As shown in Fig 1, the membership of the Society has continued to grow at an accelerating rate during the financial year under review. On 30 June it stood at 23,613, a gain during the year of 2,416. This corresponds to an increase of 11 per cent, compared with seven per cent during the previous year, and represents the largest increase in any year in the Society's history.

One of the consequences is that it has allowed a greater expenditure on services to members. Examples of these are the appointment of a full-time member of staff who is responsible for membership services, and greater committee activity.

The strength of amateur radio depends on how well those outside the hobby regard us, and much effort has been put in to ensure that we present a fair picture of our activities both to institutions and to the public at large.

Worthy of note is that improved team work among the Society's HQ staff has begun to pay dividends in almost all the Society's activities, many of which have taken on a new level of meaning.

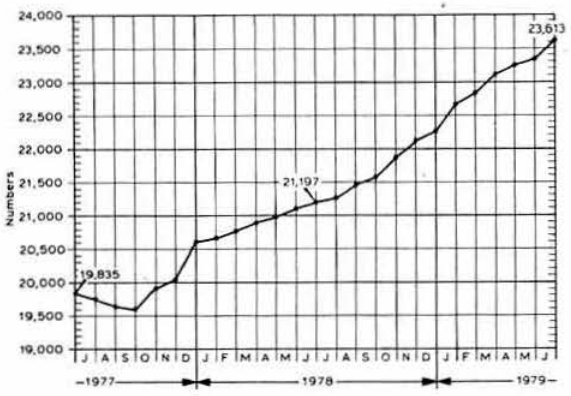


Fig 1. Membership graph

Society activities

It is essential for the well-being of a Society such as ours that members should be able to interact with those who are directly responsible for its administration. To this end, visits by Council members in general, and the President in particular, represent a valuable opportunity for members to exchange ideas and thoughts with their elected representatives.

During the first half of the year, the 1978 President, Dr Dain Evans, G3RPE, attended meetings in England, Northern Ireland, Scotland and Wales, and throughout the year Council members also travelled extensively to give talks, especially about WARC. Some of the Membership & Representation Committee meetings were held in the provinces, again to allow the opportunity of wider interaction.

RSGB has a major influence upon amateur radio throughout the world. One way this occurs is as a result of cross-fertilization arising from visits of senior officials and staff of the various national societies. This has continued throughout the year, with Presidential visits to Northern Ireland, Eire, Norway, W Germany and the USA. During his holiday in the USA, the general manager spent several days at ARRL HQ, comparing administrative techniques.

Visitors to RSGB included Col Kamchai Chotikule, HS1WR, president of the Thai society, RAST; Eu Khuanper, 9M2BS, president of the Malaysian society, MARTS; and Noel Eaton, VE3CJ, president of IARU. Other visitors included Fernando-Juan Fernandez, EA8AK, president of the Spanish society, URE: and Bernie Birdsall, VE3NB, treasurer of the Canadian Amateur Radio Federation. From ARRL came Carl Smith, W0BWJ, vice-president; and Don Miller, W9NTP, and J. Holliday, W6EJJ, both ARRL board members. From ARRL HQ came David Sumner, K1ZZ, assistant general manager, and Bruce Johnson, WA6IDN; the latter during his return from a two-month visit to Africa as part of the WARC preparations. From Japan came Takenobu Kaida, JA8OAI, the publicity manager for JARL. The total number of overseas visitors to HQ throughout the year exceeded 200.

On 31 December 1978 the 44th President of the Society completed his year of office, and on 1 January 1979 Mr John Bazley, G3HCT, became the 45th President. The Presidential Installation was held on 13 January at the Warwickshire County Cricket Ground in Birmingham, when 100 guests attended.

At the Council meeting on 1 February, Mr P. Balestrini, G3BPT, was elected executive vice-President for 1979.

An election was held in November 1978 for three ordinary members to fill vacancies on the 1979 Council. Mr R. Bellerby, G3ZYE; Mr G. M. C. Stone, G3FZL, and Mr C. J. Thomas, G3PSM, were elected. Two zonal members were also elected: Mr L. N. G. Hawkyard, G5HD, and Mr G. I. Knight, GM8FFX, to represent Zones D and G respectively. For the second year running no nomination was received for Zone E, and at the Council meeting on 1 February Mr D. H. Adams, GW3VBP, was co-opted to Council to represent this zone.

Council wishes to record its thanks to the retiring member of Council, Mr W. A. Scarr, G2WS, who served the Society with great distinction over very many years as Council member and President. It also wishes to thank Mr F. D. Hall, GM8BZX, who had been co-opted to fill the vacancy on Council resulting from the resignation on 22 July 1978 of Mr A. M. Allan, GM3ZBE, member for Zone G.

During the period under review, Council met seven times, this included one special meeting in December 1978 to discuss committee terms of reference. Attendance at Council meetings is shown in Table 1. Three meetings were held on Saturdays to make it more practicable for Council members to attend without it conflicting with their work.

Table 1. Attendance at Council meetings

Council member	Date of meeting 22.7.78	22.9.78	16.11.78	1.2.79	7.4.79	7.6.79
D. H. Adams, GW3VBP	X	–	–	–	X	X
E. J. Allaway, G3FKM	X	X	X	X	X	X
D. J. Andrews, G3MXJ	X	–	–	–	X	X
J. Anthony, G3KQF	X	X	X	X	X	X
P. Balestrini, G3BPT	X	–	X	X	X	X
J. Bazley, G3HCT	X	X	X	X	X	X
R. Bellerby, G3ZYE				X	X	X
P. F. D. Cornish, G3COR	–	X	X	X	–	X
T. P. Douglas, G3BA	X	X	X	X	X	–
D. S. Evans, G3RPE	X	X	X	X	X	X
F. Hall, GM8BZX		X	X			
L. N. G. Hawkyard, G5HD				X	X	X
G. I. Knight, GM8FFX				X	X	X
W. F. McGonigle, GI3GXP	X	X	X	–	X	X
B. O'Brien, G2AMV	X	X	X	X	–	X
C. H. Parsons, GW8NP	X	–	–	X	X	X
W. A. Scarr, G2WS	X	X	X			
R. F. Stevens, G2BVN	X	X	X	X	X	X
G. M. C. Stone, G3FZL	X	–	X	X	X	X
C. J. Thomas, G3PSM	–	–	X	X	X	–
Lord Wallace of Coslany	X	–	–			

A large part of the work of Council is to monitor the work of its committees. It is essential that there be close links between the two bodies, and this is ensured by Council members filling 53 of the 160 committee places. All of the Society's 15 committees has at least one representative on Council.

A number of modifications were made to the standing orders and terms of reference of committees. These were summarized, together with additional general information, in a new edition of the Society's "Green Book". Copies were circulated in February 1979 to Council members, chairmen of committees, and to regional and area representatives.

Society administration

During the previous financial year HQ staff was fully extended in replacing out-of-date administrative procedures with systems more appropriate to the current needs of the organization – while of course having to maintain the existing service to members. During the year under review much of the up-dating work required was completed, although there still remains a number of residual practices to be refined. A consequence of this is that more effort is now available for advancing our procedures to cope better with our current needs and looking ahead to those of the 'eighties. In addition it has also been possible to increase the proportion of HQ effort spent on direct services to members and to amateur radio in general. It is the purpose of this report to give some details of these activities.

Management techniques

As was emphasized in last year's report, the administering of a Society such as ours is an extremely complicated operation. Our success in coping has come, in general, from using more sophisticated techniques and fewer but skilled staff rather than manual methods requiring large numbers of less-skilled staff. During the year we have continued this policy.

The application of data processing techniques using the IBM32 is a good example of the cost-effectiveness of this approach which is reflected in the Society's financial position. Although difficult to make accurate estimates, it appears probable that the savings due to the use of the machine in one area, membership subscription records, results in savings in the region of £20,000 a year; on this score alone, the machine has already paid for itself. What is even more difficult is to put a value on the very considerable reduction in friction with members resulting from difficulties in coping when using manual methods.

During the year the use of the machine has been greatly extended to cover additional financial and processing tasks. Examples are rationalizing the administration of book sales at rallies and similar events, subscription refunds and overseas agency subscriptions. Its wide range of usage is illustrated by the fact that at this time eight members of staff use the machine as part of their normal routine work, and it is normally in use for 10–12 hours per day.

The same approach has been applied to other areas where superficially minor changes, such as the installation of a new automatic telephone system, have transformed both internal and external communication. The use of a folding and inserting machine for routine mailing, together with something as mundane as a faster franking machine, allows more effective use of staff effort, and makes some activities, such as the *DX News Sheet*, economically viable. The effect of these changes has been that we can now cope with the much greater administrative load resulting from the 20 per cent increase in membership over the last two years with a smaller staff than for some time.

Despite this progress there are many problems which still occupy a disproportionate amount of staff effort. An example of this is the non-delivery or the late-delivery of *Radio Communication*, for which the Society is not responsible. Nevertheless, the process of trying to replace "missing" copies is a time-consuming and expensive activity. A second example concerns bankers orders. In many cases it is not possible to identify the member associated with an order; during the year several techniques have been developed to solve this problem, with all the friction it can generate, with a high degree of success. Our classic case was a member who complained that he had not received his *RSGB Bulletin* for 14 years, despite his bank having made an unidentifiable payment each year. This has now been sorted out to the member's satisfaction.

Staff

The improvements in the quality of HQ administration are related directly to the skills and efforts of the staff. During the year we have been fortunate in acquiring the services of three new senior members of staff. On 1 July, Mr Paul Gallier, BRS40456, joined as assistant general manager, being given special responsibilities for all our data processing activities. Mr Mike Hawkins, G3ZNI, was appointed membership services officer in August. Mr Ron Wright, ACCA, who came to the Society in a temporary capacity in June 1978, was appointed full-time accountant in September. Miss Sally Anderson joined towards the end of the year as part of the administrative team.

During the year, Mr Riza, who had been responsible for the packing and despatch section, retired after four years of valued service to the Society. Mr A. H. Othen, G8FSZ, resigned as information officer in June. He had been employed by the Society for six years and had been responsible *inter alia* for organizing the RSGB RAE centres. He also is thanked for his services. At the end of the year HQ employed 17 full-time staff and two part-time staff. As was noted earlier, this is lower than for some years despite the increased work load.

In order to cope with often complicated administrative problems, such as stock control and VAT accounting at RSGB exhibitions, rallies and other events, it has become essential for members of HQ staff to attend these events as part of their duties. This is now an established staff activity which has the advantage of encouraging members to meet HQ staff and vice versa.

As will be obvious from this report, there have been major changes in the nature and level of HQ administration, particularly over the last year or so. Inevitably these have imposed additional loads on staff and it is a pleasure to note that the level of their enthusiasm has remained high. Much extra work has fallen on several key staff, some of whom, in addition to their normal duties, have freely given up their spare time for the benefit of the Society.

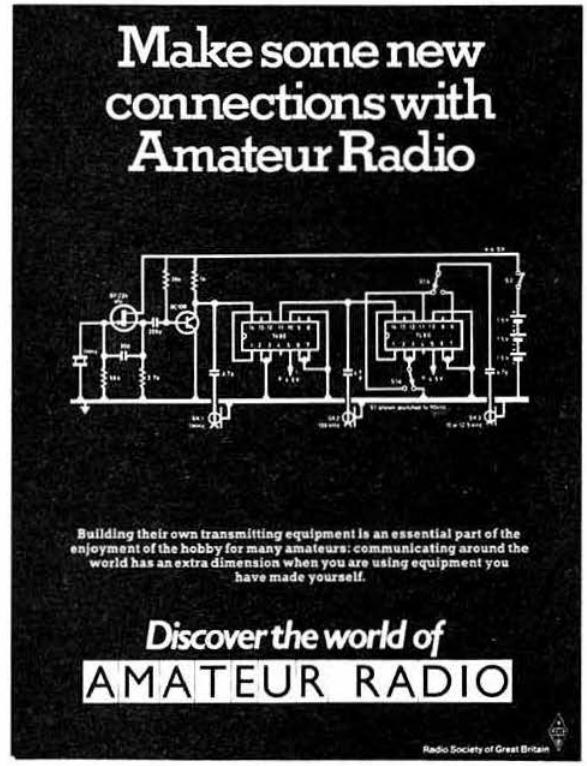
External relations and publicity

It is important, particularly at this time, that amateur radio is seen at its best, especially so that the essential differences between it and cb radio can be clearly distinguished. Over the year headquarters has been increasingly involved in several areas.

Exhibitions and similar events are obvious cases where people judge our hobby, and much effort has been extended in producing high quality display material. This has included the development of a large portable Marler Haley stand which can be used at events of all sizes and which produces a "professional image". In conjunction with a graphic artist, high quality posters and display material illustrating various aspects of amateur radio have been produced, and these appear most effective. Some of this material has also been circulated to universities, colleges, schools and clubs, and has appeared on television.

In great demand are "mini displays". These are small displays which may be borrowed for use at local exhibitions and demonstrations open to the general public. They can readily be transported either by car or rail. In designing all this material, the intention has been to inform and to impress people, and to make them feel it easy to obtain further information following their initial interest.

Relating to the media is an increasing HQ activity. Several times a week it is necessary to produce, at very short notice, information on amateur radio for newspapers and broadcasting authorities in an at-



An example of one of the high quality four-colour posters produced during the year

tempt to counteract their often widely distorted and misinformed views of amateur radio. Relating to the media acquired an extra dimension during the year with the BBC 2 "Open Door" programme transmitted in February which was presented so well by Brian Rix, G2DQU. The responsibility for this programme was mainly in the hands of David Thomas, GW3RWX, and all those involved must be thanked for their efforts.

The 1979 Alexandra Palace exhibition brought together the results of the year's work in improving our presentation techniques. The focal point was the new enlarged Society stand which featured a four-section display of the Society's interests in Raynet, hf, vhf and microwaves; a sizeable part of the Society's committee effort. The exhibition was an excellent illustration of the best form of interaction between the Society's administration, represented by HQ staff, and the skilled volunteer effort represented by the Mobile & Exhibition Committee and all the other committees involved.

Membership

During the year, the membership increased from 21,197 to 23,613. This is a gain of 2,416 members; that is, 11·4 per cent compared with 6·8 per cent, during the last financial year. The gain is due to a further reduction in the loss of members and, this year, to a sizeable increase in the number becoming members. It is noticeable that many long established amateurs are joining (or rejoining) the Society, surely a very welcome sign. Table 2 gives the breakdown of new members on a month by month basis. A more detailed breakdown of membership statistics is given in the appendix to this report.

Table 2. New members by month (1978–9)

1978		1979	
July	214 (188)*	January	510 (396)*
August	311 (150)	February	301 (302)
September	249 (195)	March	415 (250)
October	379 (254)	April	226 (280)
November	483 (336)	May	339 (322)
December	140 (187)	June	366 (227)

* The figures in brackets are for the previous financial year

Services to members

The Society provides for its members a wide range of direct and indirect services, all of which combine the activities of volunteers and staff to varying degrees. Some of the services are practical only because of a large volunteer effort, and these are best covered by the committee reports given later. Even so, there remains far more than could be described in the space available. The following therefore, will highlight only some areas of progress.

"Radio Communication"

The Society's journal is, of course, the main link between the Society and its members. Indeed, its regular appearance every month is, to the vast majority of members, the main, if not the sole, *tangible* benefit of membership.

It provides a vital source of information on all aspects of amateur radio: technical articles and features, operating news, contests, club news, national and international affairs of interest to all members, and Society and general news items—in addition to advertisements, both members' and trade. We are grateful to the authors who have submitted articles, and to the volunteer contributors who have regularly and unfailingly supplied material month after month—we are very dependent on all of them.

The first full financial year since the editorial office was established in Chelmsford has seen a record increase in the growth of the journal, both in editorial and advertising content. Compared with the previous year, the number of pages, excluding cover but including supplements, increased from 1,072 to 1,152; this record number being achieved as a result of hard work by the editorial staff and our advertising representative, and the support of our advertisers. Yet another record was in the number of copies printed, which rose from 256,400 to 277,550 copies. Of these, a monthly average of over 19,200 (UK) and 2,700 (overseas, surface) were mailed by our mailing contractors; other special categories being mailed by HQ.

The co-operation of our printers and mailing contractors in achieving these results despite problems associated with transport during the winter, is gratefully acknowledged. We look forward to the day when similar co-operation from the Post Office will reverse the continuing decline in prompt delivery service experienced during the year!

Special event stations

Special event stations have proved increasingly popular throughout the year. As those involved will realise, much of the administration required, since the facility was reintroduced in 1977, has been taken over by RSGB HQ. In order to cope with the large number of requests for special licences, during the year, the HQ procedure was again refined in the autumn of 1978.

These demonstration stations can, if well presented, provide an excellent advertisement for amateur radio: badly presented they can do much harm. To assist in this the Society has produced an information sheet summarizing some of the do's and don'ts for guidance. The new posters and mini displays have proved particularly useful at these events.

Reciprocal licensing information

With increasing foreign travel and larger numbers of reciprocal licensing agreements, considerable effort has been spent in attempting to maintain correct information in a constantly changing situation. The service is used by about 1,000 members each year. One of the problems comes from members applying for information too late because they fail to realise the time taken by foreign administrations to produce licences. Applying for information early will benefit both RSGB HQ and the individual concerned.

Planning permission

An increasingly important service to members concerns the tricky area of planning permission for masts and towers. During the year this service has been expanded considerably under the direction of Bob Price, G4BSO. Members who contemplate erecting a tower are strongly advised, as a first step, to apply to HQ for a planning package before making any other move. This package gives guidance on the best procedures to be adopted and pitfalls to be avoided. It is the Society's experience that it is all too easy for the uninitiated to generate very complicated problems which may be difficult and time consuming, or even impossible, to solve, and which need not have occurred if the member had first approached the Society.

A volunteer panel of experts has been set up during the year which can give help beyond the standard information, where this is necessary. This scheme has already proved of value and has resulted in several members being successful in planning appeals.

GB2RS

One of the most important functions of the Society is to provide information to its members, and the GB2RS news service represents a most important facility of which increasing advantage is being taken. A new feature is the regular propagation information supplied by G2FKZ each week. This is in a highly technical form, and to assist listeners an information sheet has been produced and is available from HQ. Listeners will also recognise the increasing amount of local news being carried by GB2RS, and this trend will be reinforced when the planned expansion of the service comes into being. A telephone answering machine has been recently installed at HQ: one of its functions is to make it easier for members to phone in up-to-date news.

"DX News Sheet"

For many years the *DX News Sheet,* edited by Geoff Watts, BRS3129, has provided hf enthusiasts with up-to-the-minute information on hf dx activity. During the year the Society has taken over the responsibility for its administration and circulation, leaving Geoff Watts to concentrate his efforts on its compilation.

Identity cards

Identity cards were designed to be an alternative to carrying around the rather bulky UK licence. The cards produced by the Society have the blessing of the Home Office which has notified both the Metropolitan Police and the Post Office of their standing. To retain their value, they are produced only under controlled conditions, and during the year approximately 600 were issued.

Beacons and repeaters

Both services have continued to grow. This area is another good example of the joint efforts of HQ staff, who are responsible for the licensing and site clearance work, and of many hundreds of amateurs involved in the design, construction and maintenance of the equipment. Several of the Society's committees are of course involved with frequency co-ordination, technical vetting and maintenance of standards. At this time there are 37 beacons and 102 repeaters licensed for operation.

TVI-BCI advice

During the year the Society continued to work in this area mainly through the Interference Committee. However, in one special case the

Society, by providing expert legal and technical advice, was able to help a member to successfully challenge a legal case brought by a neighbour.

Tape and film library
The tape and film library had for some years been successfully operated by Stan Coursey, G3JJC. During the year, it became necessary for HQ to operate this service. More recently the film distribution has been handled by Jack Anthony, G3KQF. This service remains very popular and it is planned to extend the range of programmes available.

Slow morse practice transmissions
Membership surveys clearly indicate that this is a highly valued service, although this is not always obvious to those volunteers who generate the transmissions. One senses an increase of appreciation in the value of the cw mode, and this is reflected in the number of people anxious to acquire expertise in this area. The Society continues to devote attention to this mode in many ways, including the generation of a series of morse code cassettes.

QSL Bureau
The QSL Bureau facility still remains one of the highly-valued services of the Society. It is operated by Mr E. G. Allen, G3DRN, who is employed full-time as the Society's QSL manager, and who works closely with the 31 honorary QSL sub-managers scattered around the UK. During the year the service handled 1,040,000 cards. Several changes have been made to improve the efficiency of the bureau during the year.

Finally
No report would be complete without the Society recording its thanks to the hundreds of volunteers who help to make possible the wide range of society activities.

D. A. Evans, G3OUF

APPENDIX

MEMBERSHIP STATISTICS

UK membership distribution by RSGB regions

Region	1978-9 per cent	1977-8 per cent	RSGB zone	Region	1978-9 per cent	1977-8 per cent	RSGB zone
1	10·2	10·0	A	11	1·0	1·2	E
2	6·4	6·3	A	12	1·6	1·5	G
3	8·9	9·1	B	13	1·7	1·6	G
4	6·2	6·1	B	14	2·4	2·4	G
5	3·9	3·9	B	15	1·9	1·9	F
6	4·9	4·9	D	16	7·0	7·2	C
7	6·8	7·2	C	17	6·9	7·0	D
8	7·7	7·8	C	18	2·4	2·3	A
9	3·0	2·9	D	19	9·4	9·1	C
10	3·1	3·0	E	20	4·6	4·6	D

UK main categories

Category	1978-9 per cent	1977-8 per cent
Ordinary corporate	84·6	84·5
Life	0·8	1·0
Reduced	2·0	2·4
Waived	1·0	1·0
OAP	1·8	1·6
Family	0·9	0·7
Channel Islands	0·4	0·4
Student/Associate	5·7	5·6
Honorary	< 0·1	< 0·1
Complimentary (Non-members)	0·3	0·3
Libraries *(Radio Communication* subscribers)	0·4	0·4
Clubs	2·0	2·0

SWLs comprise 25·1 per cent of the total UK membership

Overseas main categories

Category	1978-9 per cent	1977-8 per cent
Surface	56·0	60·0
Air mail	5·5	5·1
Libraries *(Radio Communication* subscribers)	2·5	6·8
Complimentary (Non-members)	7·0	6·9
Clubs	0·6	0·9
Agency	28·4	20·3
	1978-9	1977-8
Total overseas membership	3,078	2,500

Main distribution of overseas membership

Country	1978-9 per cent	1977-8 per cent	Country	1978-9 per cent	1977-8 per cent
USA	23·6	17·8	South Africa	3·7	4·0
Australia	9·1	9·3	Eire	3·7	3·6
Netherlands	6·8	7·9	Sweden	3·3	3·1
Canada	5·0	5·7	Spain	2·7	2·4
New Zealand	5·0	4·9	Italy	1·9	2·0
West Germany	4·5	4·0	Norway	1·6	1·5
Belgium	4·1	3·9	Finland	1·4	1·3
France	3·7	–			

The total overseas membership comes from 146 countries

COMMITTEE REPORTS

Finance & Staff

Committee: G3FKM, G3HCT, G3COR, G3RPE, G2AMV, GW8NP, G2BVN, G3PSM, G3BPT.

Although a much more stable year than 1977-8, the financial year 1978-9 saw several important staff changes. As already arranged, Mr Paul Gallier took up his position as assistant to the general manager early in July. His knowledge of computer programming has been invaluable, and among other duties he has taken on the tasks of safety officer. The Society has joined the British Safety Council in order to keep fully informed on matters affecting staff health and safety. Mr Mike Hawkins was engaged during the year as membership services officer and has been actively employed in helping HQ to provide more and better help to members. Mr Alf Othen, who had been information officer for six years, left in June, and thanks are due to him for his efforts during that period. Mr Ron Wright, the Society's temporary accountant, remained with us throughout the entire period and this has meant that most of the Society's financial records are now in the IBM32.

During the year the Society was invited by the Home Office to appoint an adviser to the UK delegation attending WARC. This invitation was accepted and the Society undertook the considerable expense involved. The value to all radio amateurs, whether RSGB members or not, of the presence of Mr R. F. Stevens during the conference is incalculable.

The committee has approved and encouraged the increased presence of the Society at non-Society exhibitions and events, and to further this end has authorized the purchase of more and better display stands and materials.

The distribution of *DX News Sheet* has been taken over by arrangement with Geoff Watts (who continues to produce it) and it is hoped to enlarge its circulation.

Structural improvements at HQ have resulted in better use being made of available space, but with the healthy increase in membership numbers some problems are still being encountered.

John Allaway, G3FKM, chairman

Education

Committee: GW3VBP, G3KQF, G3ZYE, G3HB, G6NZ, G8MW, G3KEP, G2WS, G2CVV.

During the year under review the committee held 11 meetings. The arduous task of updating material for the new edition of the *RAE Manual,* to suit the revised syllabus and new style of examination, was completed during this period and the manual published. The committee is grateful to the two main contributors G. L. Benbow, G3HB, and G. C. Oxley, G8MW, and to the Society's book editor, R. J. Eckersley, G4FTJ, for his professional assistance.

In January members of the committee presented a series of lectures designed to be of interest to young people at the Science Museum. The co-operation of the Science Museum staff, including G. C. Voller, G3JUL, of the GB2SM station, is greatly appreciated. Planning is now taking place for a similar lecture programme during Easter 1980, and it is hoped to make this an annual event. At the Alexandra Palace exhibition in May members of the committee staged a series of film shows and

talks to introduce the hobby to beginners. Judging by the questions afterwards, and the enquiries at the RSGB stand resulting from these talks, this was well received.

The opportunity was taken at the Leicester exhibition to organize a meeting between RAE instructors and committee members to allow an exchange of ideas and problems. This was most rewarding and it is planned to repeat this at the 1979 exhibition.

Work has already started on revising the RAE syllabus for implementation in 1981, and it is hoped to assemble a syllabus which would allow part of the RAE to be used as a qualification for a novice licence, should this ever be available.

Investigation is also proceeding into methods of morse code tuition and RAE instruction for the blind.

At the first meeting of 1979, D. M. Pratt, G3KEP, expressed a desire not to continue as chairman of the committee. His contribution during his many years as chairman has been most valuable, and I wish to record my personal thanks to him for his assistance since taking over this role.

J. Anthony, G3KQF, chairman

HF

Committee: G3FKM, G3HCT, G4FTJ, G4CNY, G3AAE, G4BUO, G8KG*, G3PSM*.

The HF Committee met on three occasions during the year under review, one meeting being devoted entirely to detailed planning for the HF Convention planned to be held in Birmingham on 15 September 1979. An excellent programme was drawn up, and members of the IARU team en route for Geneva who generously agreed to break their journey to travel to Birmingham and address the evening dinner included Mr Noel Eaton, president of IARU and vice-president of ARRL; Mr Dick Baldwin, general manager of ARRL; and Mr Dave Sumner, assistant general manager of ARRL. Lecturers from Drake and Datong agreed to attend the convention and the RSGB Interference Committee agreed to arrange a tvi forum. Screening of the 16mm colour film of the 7JIRL dx-pedition was also planned.

During the year the committee considered members' correspondence dealing with requests for lecturers, awards and trophies and the status of the LU3ZY operation.

The hf manager attended a meeting in Yugoslavia of the IARU Region 1 Working Group for promoting amateur radio in developing countries, and reported an urgent need for simple amateur radio instruction manuals. Articles for hf equipment that can easily be constructed by beginners and members with limited knowledge and facilities are being developed by the Technical & Publications Committee and should be available by the end of 1979.

John Bazley, G3HCT, chairman

HF Contests

Committee: G3FKM, G3MXJ, G3HCT, G3KKQ, G6LX, RS20249, G4FAM, G3KDB, BRS10977*, G3NKS, G3WPF.

At eight meetings during the year, the 10 members of the committee discussed the conduct and adjudication of hf contests.

As with many other areas of the Society's work, the difficulties in the postal system in recent times has had its effect. It has become increasingly difficult to meet editorial deadlines for contest reports, particularly where large numbers of overseas logs are involved. However, the early appearance of results remains a high priority.

During the year discussions continued with other European societies, with the object of producing a common set of rules for SSB Field Day, and the committee is pleased to report that it now seems certain that arrangements will be finalized in time for the 1980 contest. This should lead to an increased competitiveness in this event. A trophy, to be known as the Northumbria Trophy, was presented to the Society by the Northumbria Contest Group, to be awarded to the winners of SSB Field Day.

The committee plans certain new contests for the future. Among these are short cumulative events designed to give potential AFS or NFD operators practice in cw contest techniques, and a 21MHz cw contest similar in format to the existing 21/28MHz telephony contest.

Recognition has been given to the increase in interest in QRP operation and, where possible, low power sections have been added to contests. Additionally, a member of the G-QRP Club is to be invited to serve as a corresponding member to the committee.

D. J. Andrews, G3MXJ, chairman

IARU

Committee: G3FKM, G3MXJ, G3HCT, G3RPE, G3GVV, G2BVN, G3SAR, G3SEK, G5CO.

The RSGB is the only society in IARU Region 1 (ie Europe and Africa) which has a committee considering the problems and developments which affect all amateurs internationally. With the World Administrative Radio Conference commencing in September 1979, the IARU Committee's prime concern has been liaison with other countries, and with advising members of the work of the International Amateur Radio Union – the former task was achieved through the selfless efforts of Roy Stevens, G2BVN; the latter through the committee's information officer, John Bazley, G3HCT who (even in his presidential year) has continued to assist affiliated societies and clubs in the provision of lecturers.

The society was represented at the Assembee Generale of REF (the French national society) at Strasbourg by the chairman of the committee. This provided an opportunity to discuss mutual problems and to emphasize the problems caused by REF's non-observance of the 144MHz band plan. The chairman and Dr E. J. Allaway, G3FKM, travelled at their own expense to DARC's Bodensee meeting at Friedrichshafen, where they discussed WARC developments with representatives from West Germany (the host society), Austria, Belgium, France, Holland, Luxembourg, Sweden and Switzerland.

As a result of a decision made at the IARU Region 1 Conference in 1978, a working group has been established to promote amateur radio in developing countries. It held its first meeting in Yugoslavia in June; Dr Allaway, together with delegates from Yugoslavia, West Germany and Sudan, attended.

The work of this committee continues to further the cause of amateur radio for RSGB members and non-members, for those in the UK and for those much farther afield.

R. J. Hughes, G3GVV, chairman

Interference

Committee: G4CYR, G3KQF, G3HLF, G4DXA*, GU3YIZ*, G8HTA, G3BLE*, G2YS, G3VTT.

The committee continued with its existing policy, in which cases of interference were dealt with by individual members of the committee; the cases being allotted by the chairman according to the specialized knowledge of each member of the committee.

There was no significant change in the number of cases handled, although it was noticeable that there was a reduction in the number of cases involving interference allegedly caused by amateurs, and an increase in the cases where amateurs were troubled by noise emanating, usually, from industrial premises.

Members of the committee attended a number of meetings of affiliated societies and gave talks on interference matters. These included meetings at Loughton, Maidenhead and Jersey which were very well received. Clubs requiring similar talks are asked to write to the committee chairman.

The committee represented the Society at a meeting of the IARU Region 1 Interference Working Group held in Holland; Mr C. L. Turner, G3VTT, performing this duty most proficiently. Mr Turner also took over the duties of secretary to the committee after the resignation of Jeanette Maggs.

The corresponding members of the committee continued to sort out problems in the more distant parts of the UK, and the committee is always happy to hear from anyone wishing to help.

Philip F. Jobson, G3HLF, chairman

Membership & Representation

Committee: GW3VBP, G3FKM, G3MXJ, G3KQF, G5HD, GM8FFX, GI3GXP, G2AMV, GW8NP.

This committee met seven times during the year. Four meetings were held in the provinces – two in Birmingham, one in Newcastle-upon-Tyne and one in Swansea – to which regional representatives were invited as observers. After each of these provincial meetings, area representatives and representatives of affiliated societies joined in an informal gathering which proved invaluable, and there was a general interchange of opinions and information.

As a result of the significant improvement in headquarters' records and the transfer of additional data to the IBM32, less of the committee's time was occupied by associated problems. Instead, future

developments were discussed, and during the May meeting it was decided to devote future time to considering the role of the Society's representatives in the field. Another successful Regional Representatives Conference was held in September 1978.

Several matters that had previously been discussed by the committee came to fruition during the year. The identity card apparatus was delivered and has been much in demand at the events where it has been in operation. The Society diary of events has been transferred to the IBM32 and is now available on request to those planning dates for future events; club meeting dates, when they have been advised to headquarters, rallies, contests and even RSGB committee dates are included.

After considerable discussion it was decided to recommend to Council that the existing arrangements for waived and reduced subscriptions should not be disturbed; this was agreed by Council.

By the time members read this report they will have had an opportunity to study the new schedule for the GB2RS news transmissions. The "ad hoc" committee formed to review this facility met on numerous occasions and its recommendations were accepted by Council and finally agreed with the Home Office. It is hoped to keep the arrangements under constant review and to recommend any further amendments or additions that may seem beneficial.

Basil O'Brien, G2AMV, chairman

Microwave

Committee: G8AGN, G3RPE, G3YGF, G4CNV, G3JHM, G4ALN, G3HWR, G3JIX, G3WDG, G3JVL, G3SEK.

The year saw a considerable amount of progress in the microwave spectrum, and committee business reflected this. The major areas of work were 1·3GHz repeater planning, contributions to meetings, microwave contests and awards, and the encouragement of new techniques. Several groups have shown considerable interest in 1·3GHz fm repeaters for mobile operation, and much effort has been spent on evolving standards for these. Following discussions a provisional plan was circulated for comment.

The committee was also involved in a number of meetings, including its own round table meetings at Winchester and Sheffield, contributing a lecture stream to the VHF Convention, and part of the RSGB stand at the Alexandra Palace exhibition. Live demonstrations of equipment were a regular feature of the meetings, and a working two-way 10GHz ssb link was shown at Alexandra Palace.

The committee maintained its interest in microwave contests by organizing the very successful 10GHz Cumulative Contest, which was well-supported both in the UK and on the Continent. The latter support is being further encouraged by permitting foreign stations who are not RSGB members to enter.

Plans for the new Microwave Award were drafted during the year, and this will be introduced in the latter half of 1979.

The major technical developments of the past year saw the advances made in narrow-band (including ssb) techniques on 10GHz. These enabled regular use to be made of tropospheric scatter propagation on this band and it is probably fair to say that we are on the brink of a whole new era of dx communicating on microwaves.

Charles Suckling, G3WDG, chairman

Mobile & Exhibition

Committee: G3BPT, G5HD, G3TDR, G3VPK, G3MVV, G3ICI, G4FBW, G3IIR*.

There is no doubt that exhibitions are playing an increasing role in Society activities. A feature of the year under review has been the close links between the committee and headquarters staff, and this has enabled significant progress to be made. For example, the new Marler Haley stand has improved the Society's image tremendously. During the year the Society was involved in more exhibitions open to the public than ever before, and the improvements in the display material were indeed timely.

As an exercise in good relations with the general public and members, exhibitions stand on their own. Increased sales of publications and the enrolment of new members are no less significant.

Plans for the 1980 RSGB National Amateur Radio Exhibition are already in hand, and the RSGB stand will again feature much of the Society's work for amateur radio.

N. Miller, G3MVV, chairman

Propagation Studies

Committee: G3HTF, G8AGN, DJ5DT*, G3BYW, G3RPE, G3LTP, G3NAQ*, BRS15744*, G3USF*, G3GVV, G2FKZ, G3LZZ*, G4AQI, G3FZL, G3DME, G3PJT*.

The committee has maintained a full and active programme throughout the year. Using material gathered by a faithful group of correspondents. Mr C. E. Newton, G2FKZ, provided the GB2RS news bulletins with a regular weekly summary of solar, geophysical and radio propagation events, and his forecasts for the week to come earned praise from operators in the UK and on the Continent. Our ionospheric prediction experiment, tabulated each month in *Radio Communication*, was being extended by Mr J. Spurling, G4AQI, to provide lowest as well as highest path frequencies, and the dx locations were being rearranged in order of azimuth as seen from the UK, to allow a measure of interpolation between them.

Active studies continue in respect of auroral, sporadic-E and tropospheric propagation. RSGB representation on CCIR Study Groups 5 and 6 has been maintained. Mr Newton; Professor M. Harrison, G3USF; and the chairman, presented lectures on various propagation topics at the RSGB National VHF Convention in March. Liaison with amateur groups having similar interests abroad has been strengthened during the year.

R. G. Flavell, G3LTP, chairman

Raynet

Committee: G3BPT, Mrs Balestrini, G8CAC, RS16075, G8NMW, G3PED, G4AVV, GW2HPG*, G3GJW, G8MBB, G3MBQ*, G3IIR, G4FRG.

The 12 months under review have been very successful for Raynet, with a continued increase in the membership and in the number of times Raynet has been called upon by the various user services, and in the number of events at which Raynet has been present.

Total Raynet membership is now in excess of 2,000 and there are 117 Raynet groups, of which 13 are still in the process of formation; most counties have at least one group within their boundaries. We have not been as successful in Surrey where, due to the strong personalities involved in the past, the amateur population has become polarized, but we are trying to break this down.

At most committee meetings an incident where Raynet has been called upon to help out was reported. We assisted with reports of road and weather conditions in Cornwall (*Radio Communication* March 1979, p229) where the group was on duty for seven days. We also performed a similar function in East Anglia about the same time, reporting road conditions and the state of the high tides. We gave the St John Ambulance Brigade in the West Midlands radio cover for 17 days during the ambulance dispute (*Radio Communication* February 1979, p147). We provided communications between the cave rescue teams and police headquarters as they searched the countryside around Matlock looking for a young couple who were later found murdered .

We also attended numerous county shows and other events, where our assistance in helping to reduce the time taken to get patients to hospital has been acknowledged. We have also had our own displays at virtually all major rallies and exhibitions during the period.

Resulting from pressure by emergency planning officers along the east and south coasts during several incidents of oil pollution, we now have Home Office permission to provide emergency planning officers with ship-to-shore communication up to a two-mile limit—at present this can only be used during a real oil pollution situation, but the committee feels that the groups involved ought to be able to exercise at least once a year under such operating conditions.

M. G. Barker, G8CAC, chairman

Technical & Publications

Committee: G4FTJ, G3RPE, G4CDY, G3SJX, G3VA, G3TDR, G3UVZ, G3FRB, Mr A. W. Hutchinson, GI3VCI*, G6LL*, G8CXJ, G3HWR, G2BVN.

One of the most important stimuli for amateur radio must surely be the publications the hobby generates. It is not surprising, therefore, that a large proportion of the Society's total effort is concerned with publications, and the committee has primary responsibility for these.

The committee, whose members represent a wide range of amateur and professional interests in radio, met seven times during the year. One of its functions is to encourage the flow of suitable technical

material; not an easy task as virtually all the material published by RSGB comes from volunteer non-professional authors. Another function is that of maintaining technical standards; one aspect of which is the reviewing, mainly by its members, of articles submitted to *Radio Communication.* Over 70 articles were received during the year.

Another concern of the committee is the generation of books which have an important influence on the development of amateur radio, both at home and in the 100 countries in which they are sold. During the year, new editions of the *Television Interference Manual,* the *RAE Manual* and the *Call Book,* and new versions of the *Mobile* and *Amateur Radio Logbooks,* and a new QTH locator map were added to the Society's list. Work in hand included the *Operating Manual* (since published), a new edition of *Amateur Radio Awards,* the 1980 RSGB *Call Book* (since published), and a revised version of the *Great Circle DX Map.*

For some time the committee has been concerned about the need to cater for less-experienced members. This is a difficult problem because of the heavy dependence on volunteer effort: competent authors naturally prefer to write about topics that interest *them* and at the level *they* judge appropriate, and this may be beyond the skills of many others. However, some moves were made in the direction of special projects designed specifically for the less-experienced constructor, with a view to eventual publication.

The generation of good technical material is one matter. Getting it into the form of an attractive journal or book is another essential step, and getting it to customers around the world is a third. Vital to these processes are, of course, Mr A. W. Hutchinson, editor of *Radio Communication,* and Mr R. J. Eckersley, G4FTJ, the book editor, both of whom are members of the committee and headquarters staff. All make possible a substantial publishing operation.

In January, Mr R. F. Stevens, G2BVN, stepped down as chairman of the committee after 20 years' devoted service. The present state of our publications is surely a fitting tribute to the enormous efforts he has made in this area.

Dain Evans, G3RPE, chairman

Telecommunications Liaison

Committee: G3FKM, G3BPT, G3HCT, G5XB, G3BA, G3RPE, G3GVV, G3KEP, G4BSO*, G2BVN, G3PSM, G2CVV.

The main work of the committee during the past year was concerned with the preparation for WARC 79 and continuous liaison with the Home Office regarding licensing matters.

In addition, a considerable amount of work has been associated with enquiries from members on various aspects of the amateur licences.

Further submissions concerning a proposed personal radio service have been sent to government ministers and organizations.

The activity of the Intruder Watch under the guidance of Mr S. A. G. Cook, G5XB, continues at a high level. The task of collating the several hundred monthly reports and the publication of a monthly summary continues to be dealt with by Mr C. J. Thomas, G3PSM.

Additional repeater and beacon stations have been licensed during the year, and both the general manager and the telecommunications liaison officer have been in constant touch with the Home Office.

Specialist advice on planning matters continues to be given by Messrs R. W. Price, G4BSO, and C. E. Benson, G3MUX, and the committee wishes to record its appreciation of this valuable service.

The Home Office has agreed that a Society representative should serve on the UK delegation to WARC and the committee wishes to express its appreciation of this valuable facility. There has been constant dialogue between the Society and the Home Office concerning WARC proposals.

The committee also wishes to express its appreciation to Mr D. M. Pratt, G3KEP, for his valuable assistance in connection with the Amateur Radio Observation Service.

R. F. Stevens, G2BVN, chairman

VHF

Committee: G3ZNU, G3COJ, G3DAH*, G3BA, GM8FFX*, G3RWL*, G3VEH, G3FZL, G4BEL, G3SEK, G3IIR*, G3GJW*, G8DLX*, G3WDG, G8AMD.

This year the committee was once again involved with wide-ranging matters which had to be progressed on a continuing basis. Probably the most important, and certainly the most difficult, business which had to be dealt with was the implementation of recommendations which had been agreed at the IARU Region 1 Conference in Miskolc in April 1978. These were mainly concerned with vhf/uhf band planning, and to put them into effect was fraught with a multitude of problems because no-one likes to make changes that are not fully understood, and the "mountain out of molehill" syndrome begins to work at the first hint of anything affecting frequency allocations. To improve communication between specialist groups, other RSGB committees and the membership generally, changes in the composition of the committee itself were made so that proper consultation between all interested parties could take place before recommendations were published. Articles in *Radio Communication* by the vhf manager, Dr I. White, G3SEK, and the chairman were produced to appraise the membership of the reasons behind immediate operational changes and future trends.

Other work of the committee was devoted to more general matters such as introducing new "squares" awards; co-ordinating IARU beacon frequency allocations throughout Region 1; liaising with the Repeater Working Group, the telecommunications liaison officer and the general manager on repeater proposals and plans; preparing papers for the IERE Land Mobile Convention at Lancaster; consulting with headquarters on vhf/uhf aspects for the Alexandra Palace Exhibition; and, of course, making all the plans and running the annual VHF Convention/Exhibition. The committee owes much to the efforts of the vhf manager and the vhf/uhf awards manager, Jack Hum, G5UM, as well as the contributions and often very hard work of individual full and corresponding members. The year's business was most satisfying, judging by results, but it had its moments of tension and pressure, which required patience and some diplomacy to overcome.

T. P. Douglas, G3BA, chairman

VHF Contests

Committee: G5HD, G3VPK, G8ACJ, G2HIF, G3FZL, G3WDG, G4BEL*, G4CUT, G3XDY.

During the 12 months under review, the committee met nine times to discuss past contests, draw up new rules and prepare results for publication. The committee, which has nine members, organized 20 contests during the year, and adjudicated over 1,200 different logs. The format of these contests changed very little over the previous year, apart from the addition of the 432MHz fixed station event in February.

The new single/multi-operator sections certainly encouraged single-operator fixed stations to participate more in all events. The committee is considering including all portable stations in the multi-operator section, irrespective of the number of operators, and it is hoped that this will further encourage single-operator fixed stations to enter.

The year brought increased entries from most events organized, except on 70MHz where a slight fall was recorded; and it is hoped that the shorter duration of future contests on this band will reverse the decline.

Once again the highlight in the vhf calendar was the vhf Convention held in early March, where the 1978 vhf contest trophies were awarded, and it was pleasing to see and meet all the winners at the presentation.

Our thanks to Dr C. W. Suckling, G3WDG, who retired from the committee because of other commitments. The new member for 1979 is Mr J. Quarmby, G3XDY, of the Martlesham Contest Group.

Roger Taylor, G4BEL, chairman

*Corresponding members

REPORTS FROM THE . . .

. . . Emergency communications manager

The Raynet year in review has been a success both from the recruitment of new members and the formation of new groups. We are pleased in particular with the continuing close relations with our user services; of note is the fact that county emergency planning officers are relying more and more on Raynet communications expertise to assist in their emergency networks. In several instances Raynet members have been appointed as communications advisers.

It is gratifying to report the recent Home Office decision to permit Raynet members to provide communications, under conditions of oil pollution emergency, from small craft up to two miles from the coast. This decision was the result of very full negotiation and is restricted to *emergency only* and subject to a direct request from a county emergency planning officer. For these operations members will use their normal callsign, /M not being required.

Raynet looks forward to, and is continuing to press for, permission to

operate manned talk-through for emergency links, and to being able to provide 432/144MHz patching for hand-portables to mobiles at scenes of operations.

It is perhaps an opportune time to remind readers that while Raynet may provide third-party communications from the four specified user services during emergencies, they may also be present on stand-by to provide communications when danger to human life exists at county shows and similar events, again at the written request of one of the user services. This request must be forwarded to the emergency communications manager for his ratification at least four weeks before the event.

During the period under review, ratification was given for Raynet groups to operate at 15 of these special events. In this context it is worthwhile commenting that requests continue to be received for permission to operate at motor rallies, races, auto-crosses etc, but under no circumstances can such permission be granted. The official view and Home Office ruling is that these events have a well-known risk, are usually commercially orientated, and such safety communications as are considered necessary can be made by the organizers taking out a short-period licence and hiring the equipment from those organizations that exist for this purpose.

In closing this report I would mention that I have received requests for information on Raynet from several countries, both European and farther afield. Several of these now have emergency networks modelled on Raynet. Apart from the USA, the UK has one of the largest organized emergency networks run by a national society.

The post of emergency communications manager covers the general co-ordination of efforts of all radio amateurs and user services to produce, with the combined efforts of the National Raynet Committee chairman and members, an efficient professional emergency communications service run by radio amateurs.

Peter Balestrini, G3BPT

. . . HF manager

The appointment of the Society's first HF manager in July 1978 completed the coverage of the radio spectrum by specialist committees and managers. HF communication, by the nature of propagation factors, is very largely an international rather than a domestic matter, and demands world-wide co-operation. Correspondence generated through the pages of *The month on the air,* and meetings with representatives from societies from every continent during the year have been valuable. Meetings organized by DARC and SRJ—in Friedrichshafen and Kozara (Bosnia) respectively—have been attended, the latter in the capacity of RSGB representative on the IARU Region 1 working group dealing with the promotion of amateur radio in developing countries. In both instances useful progress was made and closer ties forged with other societies.

Closer co-operation within the UK has also been sought, and during the year a number of specialized societies with a majority of members with hf interests were invited to appoint liaison officers. The offer was well received and all but one group accepted.

This year's Alexandra Palace Exhibition had, for the first time, an hf section on the RSGB stand. The 14MHz receivers made from kits prepared by ARRL and DARC for the IARU aid programme, and the G3TDR receiver, all attracted a great deal of interest.

Honorary officers of the Society exist for a number of reasons, not least of which is to help members, and constructive suggestions as to ways in which hf services may be improved are invited.

John Allaway, G3FKM

. . . Intruder Watch organizer

Once again the Society's Intruder Watch system is able to report a high level of activity and substantial progress in its operations throughout the year. During the winter and spring the high level of solar activity attracted a large number of intruding transmissions to the exclusive amateur bands, principally as fundamental signals in the 14 and 21MHz segments, and as second, third and fourth harmonics—mostly from international broadcasting—between 28 and 29·7MHz. A peak occurred in January when 12 watchers reported 486 intrusions.

Progress was also made in identifying intruding teleprinter and data communication signals, and the well-established method of up-converting cassette recorded audio tones to radio frequency signals was further developed. One watcher, described as "special systems investigator", provided valuable information by the application of microprocessor techniques to the unscrambling of a number of tape-recorded discrete telegraph systems. As a result it was found possible to identify the origin of a number of CCITT recommended communication systems, including those employing the two- and four-channel time-division-multiplex ARQ format, and the single-path error-correcting networks. Information concerning the identity of intruders produced by this means was passed to the UK administration.

The weekly A3j voice communication between the organizer and the Region 3 co-ordinator, VK3LC, continued to provide a useful exchange of information. Contact with VK3XB, the VK co-ordinator, who also has a weekly link with K6KA in Region 2, has been particularly useful in confirming the origin of intruding signals by plotting beam headings from the three areas.

During the year two members of the Intruder Watch visited a number of affiliated societies to describe the structure of the Intruder Watch system, and to emphasize how much its work depends on attracting members conversant with the rapidly advancing technology of international communications.

S. A. G. Cook, G5XB

. . . Slow morse practice transmissions organizer

During the year an attempt was made to bring the published schedules as up-to-date as possible. Each operator was requested to complete a questionnaire which sought to ascertain if he was still actively participating in the service, and if he had any suggestion for its improvement. As expected, the subsequent list showed a decrease in the number of members providing the service. From the suggestions made it is obvious that most operators would like the Home Office to allow random letter groups to be sent. Also several of those using the 144MHz band, and many listeners, would like to see their local repeater transmitter used to extend slow morse coverage. Others proposed the use of specific frequencies on 144MHz. An approach has been made to the VHF Committee, which has tentatively agreed in principle to the use of 145·250MHz for F2 transmissions, and 144·250MHz for other modes. A final decision has yet to be taken.

In view of the popularity of this service, there is still a great need for many more members to volunteer if it is to provide a country-wide service for the listeners.

M. A. C. MacBrayne, G3KGU

. . . VHF manager

The role of vhf manager is two-fold: to maintain a balanced "overview" of all amateur vhf/uhf matters in the UK, and to liaise with other national vhf managers in IARU Region 1. An important aspect of this work is band planning, often a delicate balancing-act between the deserving but conflicting interests of different users of the vhf and uhf bands. In conjunction with the chairman of the VHF Committee, many hours have been spent in explaining the needs of one group of band users to another, in an attempt to encourage a rational response to the changing demands upon our limited frequency allocations.

In a year without a meeting of Region 1 vhf managers, international correspondence has still been brisk on such subjects as interference on 432MHz from radiolocation systems and long-range radar, satellite band planning after WARC, repeater and beacon frequency co-ordination, meteor scatter procedures, QTH locator systems and, pervading everything, the possible repercussions of WARC.

Other tasks have included the organization of the Society's vhf stand at Alexandra Palace, and the co-ordination of the RSGB contribution to the IEE/IERE Land Mobile Radio Conference.

At the end of the year under review, it became clear that increasing commitments outside amateur radio were going to prevent me from carrying out the work of vhf manager as thoroughly as I felt necessary, so I regretfully resigned the post. I believe that vhf/uhf matters within the Society are beginning to move in the right direction for the 'eighties, and will continue to do so in the capable hands of Tom Douglas, G3BA, the new vhf manager.

Ian White, G3SEK

. . . VHF/UHF awards manager

The most significant event in the vhf/uhf awards area has been the introduction of the new QTH Squares Awards, one entitled "4-2-70" and the other "Microwave". In the former category two awards were made within weeks of its introduction, and in the Microwave class no fewer than five, all for operations on 10GHz, have been issued. It will be important for claimants for either award to learn the habit of putting QTH square information on their QSL cards if the system is to function smoothly.

In the established "Four Metres and Down" categories, 66 certificates were issued in the year under review. In addition a large number of certificates were issued on the instructions of the VHF Contests Committee to winners of vhf/uhf contests.

If eventually the existing "Four Metres and Down" award system is to be phased out, one's recommendation to the VHF Committee would be to let it continue until 1981, by which time it will have operated for 20 years, and to give the membership ample notice of termination in view of the fact that numerous operators are still collecting cards for it.

Jack Hum, G5UM

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