November 1980

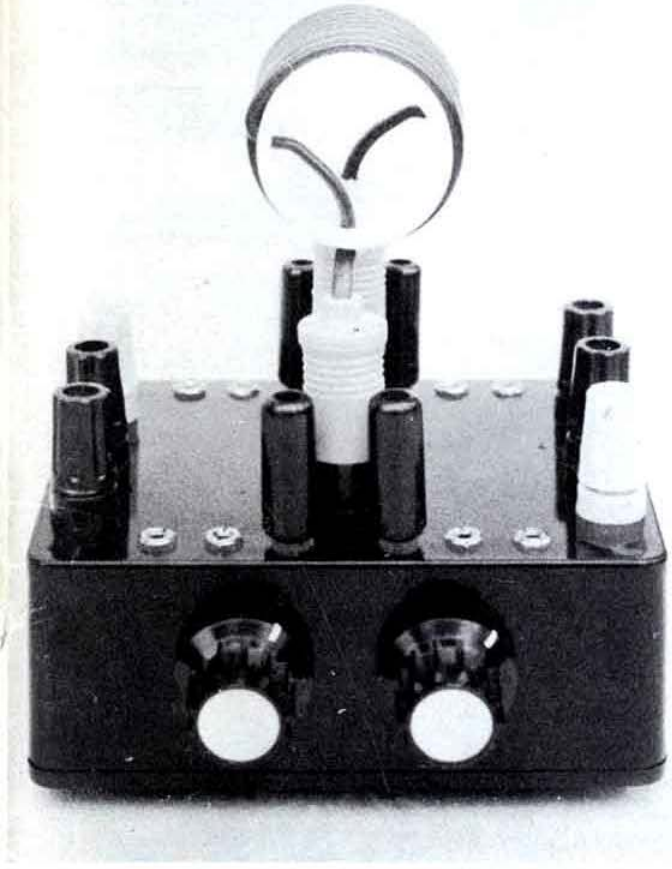
radio communication

journal of the Radio Society of Great Britain

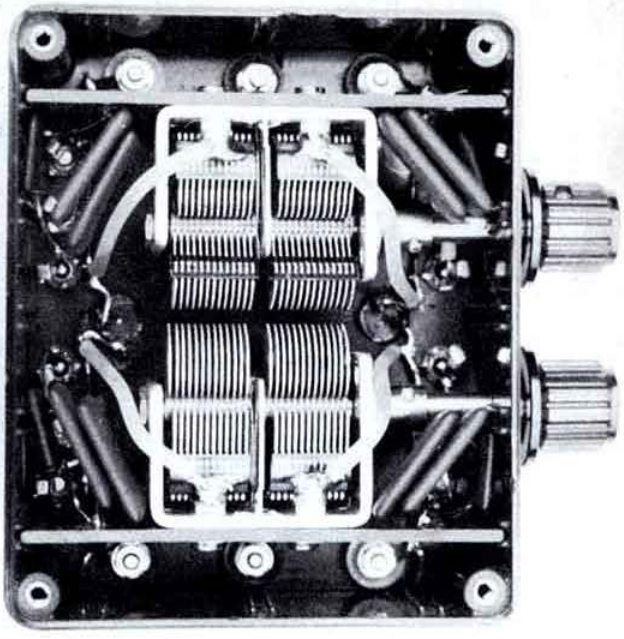
IN THIS ISSUE

A PI-TUNED BALUN ANTENNA COUPLER FOR THE HF BANDS

by A. S. CHESTER, CEng, MIEE, G3CCB



External view of the coupler



Internal view

Now available from Catronics—

real value for money in microcomputers

video genie system

Advanced features are:

1. **Built-in TV interface, the users TV set may be used as the display terminal, thus saving money.**
2. **Main Control Unit contains the CPU plus,**
   - **i) 51 key typewriter keyboard, with 10 key rollover.**
   - **ii) High quality cassette recorder, enables recording and playback of programs, data and the use of pre-recorded tapes.**
3. **Built-in audio cassette interface for connecting another cassette recorder to serve as cheap and compact storage for large amounts of data on tapes.**
4. **16k user RAM included, expandable to 48k.**
5. **Fully TRS 80 level II software compatible so a huge range of software is already available.**
6. **Full 12k Microsoft BASIC in ROM.**
7. **Full expansion capability to Discs and Printer, a small system with big possibilities.**
8. **Self-contained, all in one attractive case.**
9. **The system uses the powerful Z80 processor.**

Price only £379.50 inc VAT

Also available 9" Monitor – built to full professional specification (NOT a converted television) Model CVM600: £130.00

Full range of supporting programs and accessories available, including Amateur Radio packages.

Buy your TRIO rig from a specialist TRIO dealer such as Catronics

Because WE specialise in TRIO, YOU get a better deal.

1) SALES: Only a TRIO specialist such as Catronics knows and stocks the full TRIO range of equipment and accessories.
2) SERVICE: Only a TRIO specialist such as Catronics can offer the servicing arrangements required for today's microprocessor controlled equipment. We have probably the best equipped service workshop in the south of England with trained engineers who know how to use the equipment.

TRIO PRICE LIST (inc VAT)

TS820	160 10m transceiver 200W PEP	£669.30
DG1	Digital readout to 100Hz	£121.90
SP820	Speaker	£37.95
VFO820	External VFO	£118.45
YG88C	CW filter 8 pole	£36.80
R820	The ultimate matching receiver to the TS820	£690.00
YG455C	CW filter 500Hz	£58.65
YG455CN	CW filter 250Hz	£60.95
YG88A	AM filter 6kHz	£34.50
TS520SE	160 10m Transceiver	£437.00
SP520	Speaker	£17.25
VFO520S	External VFO	£98.90
YG3395C	8 pole CW filter	£37.95
TS120S	80 10m mobile transceiver 200W PEP	£432.40
TS120V	80 10m mobile transceiver 20W PEP	£347.30
PS20	AC power supply for TS120V	£44.85
MB100	Mobile mounting bracket	£17.25
YK88C	500Hz CW filter	£28.75
SP120	External speaker	£25.30
VFO120	External VFO	£89.70
AT120	Antenna tuner (100W)	£55.20
PS30	AC PSU for TS120S	£85.10
AT200	1·8 30MHz antenna tuner	£82.80
SM220	Monitor scope	£197.80
BS5	TS520 scanboard for SM220	£48.30
BS8	TS820 scanboard for SM220	£48.30
TL120	80 10m 200W linear	£128.80
TL922	HF linear amplifier 160 10m/2kW PEP 2 × 3 500Z tubes	£595.70
MC50	De luxe desk microphone dual impedance PTT locking bar	£24.15
MC35S	50K fist microphone	£13.80
MC30S	500 ohm fist microphone	£13.80

TR9000	2m synthesised multimode mobile	£345.00
BO9	Base plinth for TR9000	£32.00
PS20	AC power supply for TR9000	£44.85
SP120	External speaker	£25.30
TS770E	2m/70cm all mode dual bander	£730.00
SP70	Matching speaker	£18.40
TR7800	2m 25W synthesised FM mobile/fixed transceiver	£268.00
TR2300	2m FM portable transceiver PLL with all 80 FM channels	£166.75
VB2300	10W booster	£49.45
MB2	Mobile mount	£17.25
RA1	Helical rubber antenna	£6.90
PS1200	Power unit and charger TR2300/3200/2200GX	£29.50
TR2400	2 meter synthesised handheld transceiver	£198.00
ST1	Base stand and quick charger	£43.70
BC5	12V quick charger	£17.25
SC3	Carrying Case	£11.50
TS180S	160 10m solid state transceiver	£589.95
TS180S	As above but with digital frequency control	£679.65
VFO180	External VFO	£96.60
SP180	Speaker	£36.80
AT180	1·8 30MHz antenna tuner	£95.45
PS30	AC power unit for TS180S	£85.10
TR8300	70cm FM mobile 10W transceiver fitted 4 channels	£225.00
TR3200	70cm FM handy transceiver fitted 3 channels	£164.45
PB10	Pack of 10 ni cad batteries	£10.35
R1000	0·2 30MHz receiver	£285.00
SP100	External speaker	£26.45
HS5	Communications headphones, tailored response	£21.85
HS4	Communications headphones, tailored response	£10.35
LF30A	HF low pass filter 1kW 90dB, stop band rejection	£18.40
RD300	High power dummy load	£48.30

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

CATRONICS LTD, DEPT R1, COMMUNICATIONS HOUSE,
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.

ISSN0033-780

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

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

Tel 0245 84938

Office hours: 0900 to 1700

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

RSGB Headquarters,
35 Doughty St,
London WC1N 2AE

Tel 01-837 8688

Office hours: 0915 to 1715

radio communication

November 1980 Volume56 No11

CONTENTS

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

ABC MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

23,743 copies per issue average circulation in 1979

Closing date for contributions unless otherwise notified: five weeks before publication date

THE NEW HF RIG FROM TRIO

TRIO TS830S

The new TS830S, the latest from TRIO. A high performance, very affordable HF SSB/CW transceiver with every conceivable operating feature built in for 160 through 10 metres (including the new three bands). The TS830S combines a high dynamic range with variable bandwidth tuning (VBT), IF shift and an IF notch filter, as well as very sharp filters in the 455kHz second IF. Together with the optional VF0230 (remote digital display VFO) which provides split frequency operation and 5 memories for frequency hold, the amateur has available todays advanced technology linked to the proven reliability and exceptional linearity of a valve PA.

£639.52 inc VAT
Carriage by Securicor £4.50
A winning price for a winning rig

- ★ VBT variable bandwidth tuning
- ★ IF notch filter
- ★ IF Shift
- ★ Various filter options
- ★ Built in digital display
- ★ 6146B final with RF negative feed-back
- ★ Optional Digital VFO for increased flexibility
- ★ Innovative PLL system of frequency generation
- ★ RF speech processor
- ★ Adjustable noise blanker level
- ★ Adjustable audio tone
- ★ RF attenuator
- ★ RIT/XIT
- ★ SSB monitor circuit
- ★ Expanded frequency coverage

All Trio equipment is available from the following authorised Trio dealers
LOWE ELECTRONICS LTD. 119 Cavendish Road, Matlock, Derbys. Tel: 0629 2430 or 2817

LANCASHIRE **Stephens-James Ltd** 47 Warrington Rd Leigh 0942 676790	**BIRMINGHAM** **Ward Electronics** Soho House 362-364 Soho Rd Birmingham B21 9QL. 021 554 0708	**SOUTH LONDON** **Catronics Ltd** 20 Wallington Square Wallington SM6 8RG 01-669 6700	**ESSEX** **Waters & Stanton Electronics** Warren House 18-20 Main Rd, Hockley Essex. 0702 206835	**W. SUSSEX** **Bredhurst Electronics** High St Handcross Haywards Heath W. Sussex. 0444 400786
BUCKINGHAMSHIRE **Photo Acoustics Ltd** 58 High St Newport Pagnell Bucks 0908 610625	**WALES** **MRS Communications Ltd** 76 Park Rd Whitchurch, Cardiff 0222 616936	**NORTH LONDON** **Radio Shack Ltd** 188 Broadhurst Gardens London NW6 3AY 01-624 7174	**YORKSHIRE** **Leeds Amateur Radio** 27 Cookridge St Leeds LE2 3AG 0532 452657	**EAST SCOTLAND** **Jay-Cee Electronics** 20 Woodside Way Glenrothes Fife KY75DE 0592-756962

TRIO **IMPORTANT INFORMATION** TRIO

As the appointed distributors for Trio, we recommend that you purchase your Trio equipment from an approved stockist (list above). Any stockist *not* on this list has no connection with the Trio UK sales and service organisation and cannot, despite claims to the contrary, offer any meaningful guarantee of backup service on Trio equipment.

LOWE ELECTRONICS Ltd

TRIO

TR7800

2m FM
AT ITS VERY BEST
£268 inc VAT
Carriage by Securicor
£4.50

The new TR7800 just has to be voted the best 2 metre FM transceiver to appear on the world scene. Following detailed market research, Trio have produced what we think is the perfect mobile/home station rig for all users, incorporating all the features which were requested by amateur radio operators worldwide.

What does it do?

Let's take the basic specification first, and say that the TR7800 is a fully synthesised 2 metre FM transceiver having a minimum output power of 25W on transmit (typically 30 to 35W on random samples), and an incredible receiver which is typically producing sensitivity measurements of 0·12 microvolts for 12dB Sinad. This is certainly the best FM receiver of which we know. That's the basic story so let's go on to the user features.

It's clear from the photograph that you have direct keyboard entry of frequency actually from the front panel. From the keyboard, you can also select simplex and repeater shift functions for use either on UK or American repeaters. The digital readout tells you the operating frequency including any selected shift so you are completely in touch with your mode of operation.

So far so good – but what about the mysterious knob on the right hand side of the panel? Well, that selects a bank of 15 (yes, 15) memories for frequency storage and the smart part is that these are designated not 1 to 15 but 0 to 14. "So what?" sez you. "Aha" sez I, that means that if you program in all repeater channels from R0 to R9 using memories 0 to 9, the memory channel display shows you the repeater channel number whilst at the same time the digital readout shows you your transmit and receive frequencies. In addition to this, the memory channels also store the repeater shift so that it's called up automatically when you use the memory.

The remaining memories can be used to store any frequencies within the band, but a further smart part is that memories 13 and 14 can store completely separate transmit and receive frequencies for non standard shifts, etc. *And* memory 14 is also designated the priority channel so that any frequency put into it can be constantly monitored at 5 second intervals, whatever else the transceiver may be doing. *And* if you have the volume turned down, a piezo bleeper alerts you if a signal has appeared on the priority channel. You also have direct access to the channel by simply pushing the "Priority operate" button.

Final features for repeater operation include a tone burst which can be turned on or off as desired, and reverse repeater operation at the touch of a button.

Now for more facilities pertaining to scanning. In keyboard operation, you can scan the entire band in 25kHz or 5kHz intervals by simply touching the SC button. In memory mode, you can scan all fifteen memories using the same SC button. The scan system is (in my opinion) the best yet offered in that the transceiver scans until a signal is heard, stops on the frequency for about 5 seconds to allow you to check what's on, then steps on automatically to find the next busy frequency. If you want to stop the scan, simply press the PTT bar on the microphone or touch the C (cancel) button on the keyboard. By scanning this way, you eliminate the annoying locking up on busy repeater channels that so often ruins your enjoyment of an otherwise satisfactory scanning system.

In addition to scanning, the TR7800 can be stepped up and down the band in 25kHz or 5kHz steps using the UP/DOWN buttons on the hand microphone. The microphone is supplied as a standard with the TR7800. If either button is held down, the TR7800 tunes across the band until the button is released.

The mic buttons also allow you to step up and down the memory channels.

LED indicators show Simplex, +600 or −600 operation, a busy lamp on occupied frequencies and "on air" indication. Signal strength and TX output are indicated on an LED bar display.

Memory contents can be retained by installing four standard AA size Nicad batteries inside the transceiver. The batteries are charged when the TR7800 is switched on, and the memories are then retained for up to five days on the batteries.

All in all, the TR7800 is an amazing transceiver and follows the Trio design pattern for the '80s. Let's face it, Trio are now showing the way to go and the others are truly a long way behind. Why not see the TR7800 soon and test the truth in what I've been saying.

SPECIFICATIONS

(GENERAL)

Semiconductors:	MPU 1, ICs 18, transistors 58, FETs 9, diodes 77
Frequency range:	144·000 to 145·995MHz
Frequency synthesizer:	Digital control, phase locked VCO
Mode:	FM (F3)
Antenna impedance:	50Ω
Power requirement:	13·8V DC ±15%
Grounding:	Negative
Operating temperature:	−20°C to +50°C
Current drain:	0·4A in receive mode with no input signal 6A in HI transmit mode (Approx.) 2·5A in LOW transmit mode (Approx.)
Dimensions:	175mm (6¾") wide 64mm (2½") high 206mm (8⅛") deep (projections not included)
Weight:	2·1kg (4·63lbs) approx.

(TRANSMITTER SECTION)

RF output power (at 13·8V DC, 50Ω load):	HI 25W min LOW 5W approx. (Adjustable)
Modulation:	Variable reactance direct shift
Frequency tolerance: (−20°C to +50°C)	Less than ±20 × 10⁻⁶
Spurious radiation:	Less than −60dB
Maximum frequency deviation: (FM)	±5kHz
Microphone:	Dynamic microphone with PTT switch

(RECEIVER SECTION)

Circuitry:	Double conversion superheterodyne
Intermediate frequency:	1st IF ..... 10·695MHz 2nd IF 455kHz
Receiver sensitivity:	FM better than 0·2μV for 12dB SINAD
Receiver selectivity:	FM 12kHz (−6dB)
Spurious response:	Better than 60dB
Squelch sensitivity:	0·16μV (threshold)
Auto scan stop level:	Less than 0·2μV (threshold)
Audio output:	More than 2·0W acrosss 8Ω load (10% dist.)

THIS RIG REALLY SHOWS THE WAY TO GO

LOWE ELECTRONICS Ltd

TRIO TS180S

APPROVED TRIO DEALER

£679.65 inc VAT

Carriage by Securicor £4.50

Trio's TS180S with DFC is an all solid-state HF transceiver designed for the DXer, the contest operator, and all other Amateurs who enjoy the 160 through 10-metre bands. The following features prove, beyond doubt, that the TS180S is the finest rig available!

Digital Frequency control (DFC) including four memories and manual scanning. Memories are usable in transmit and/or receive modes. Memory frequencies to be tuned in 20-Hz steps up or down, slow or fast, with recall of the original stored frequency. It's almost like having four remote VFOs!

All solid-state . . . including the final. No dipping or loading. Just dial up the frequency, peak the drive, and operate.

High power . . . 200W p.e.p./160W dc input on 160-15 metres, and 160W p.e.p./140W dc on 10 metres. Also covers more than 50kHz above and below each band (28-30MHz), WARC, etc., and receives WWV on 100MHz.

Improved dynamic range.

Single-conversion system with highly advanced PLL circuit, using only one crystal with improved stability and spurious characteristics.

Built-in microprocessor-controlled large digital display. Shows actual VFO frequency and difference between VFO and "M1" memory frequency. Blinking decimal points indicate "out of band". Monoscale dial, too.

IF shift . . . Trio's famous passband tuning that reduces QRM.

Selectable wide and narrow CW bandwidth on receive (500-Hz CW filter is optional).

Automatic selection of upper and lower sideband (SSB NORM/SSB REV switch).

Tunable noise blanker (adjustable noise-sampling frequency).

RF AGC ("RGC"), which activates automatically to prevent overload from strong local signals.

AGC (selectable fast/slow/off).

Dual RIT (VFO and memory/fix).

Three operating modes—SSB, CW and FSK.

Improved RF speech processor.

Dual SSB filter (optional), with very steep shape factor to reduce out-of-passband noise on receive and to improve operation of RF speech processor on transmit.

13·8 VDC operation.

TRIO TS120V/S

TS120V £347.30 inc VAT

TS120V	**£347.30**	TS120S	**£432.40**
PS20 4 Amp	**£44.85**	PS30 20 Amp	**£85.10**
AT120	**£55.20**	MC35S mic	**£13.80**
SP120	**£25.30**	TL120 linear	**£128.80**
VFO120	**£89.70**		

Carriage by Securicor £4.50

THE SYSTEM APPROACH

What do we mean by the "System Approach"?

Well, take the TS120V and you have the finest 20W p.e.p. mobile HF transceiver you could buy. Many operators are even buying it as a second station because it's so good. Consider its features, the single conversion PLL derived top performance; the accurate digital readout; the passband tuning; the noise blanker; the superb engineering; THEN maybe add the PS20 mains power supply and you have an equally great home station; OR maybe add the multi-function VFO120 second VFO unit; OR the SP120 external speaker; OR the 100W AT120 antenna tuner or maybe even a superb Microwave Modules 2 metre or 70 cm transverter to get you up on the VHF and UHF bands. It all adds up to a fine station tailored exactly to your own needs.

If you need more power, the TL120 200W p.e.p. linear is now available, but you will need a heftier 12V supply to run it. A suitable unit would be the PS30 which delivers up to 20 amps fully regulated and protected. Lots of people are buying the PS30 as a general purpose heavy duty supply for shack use.

Finally, should you really want high power all the time, consider the TS120S which incorporates all the features of the TS120V but has a built-in high power, fully protected 200W p.e.p. linear and it's still not too expensive to enjoy!

TAKE A GOOD LOOK AT THE PRICES!!!

THE GREAT HF LINE-UP BY TRIO

LOWE ELECTRONICS Ltd

TRIO TS520SE

£437.00 inc. VAT

Carriage by Securicor £4.50

VOTED "MY FAVOURITE TRANSCEIVER" BY RADIO AMATEURS WORLD WIDE

In the face of ever increasing complexity in amateur radio equipment, it's comforting to know that the TS520SE is still in volume production. Radio amateurs all over the world (and dealers too) have voted the TS520SE "my favourite transceiver" because of its astounding reputation for reliability, high sensitivity receiver, and of course the unequalled Trio audio quality coming from the transmitter. The TS520SE incorporates all of the features demanded by today's amateur, and at an outstandingly low price. No wonder it's top of the list in popularity, and comparison with other transceivers will convince you that the TS520SE is the best value on the market today.

Of course, the bare figures cannot tell you just how nice it feels in use, nor can they tell you the pleasure of hearing other operators saying "never heard better audio OM, what rig are you using?" The TS520SE standard specification includes CW wide/narrow switching (using the optional 500Hz filter), semi breakin keying with sidetone, PTT or VOX operation, really effective noise blanker, switched AGC time constants, 5 function metering, switched RF attenuator, RIT, speech processing for punchy transmit audio, fixed channel facilities, 25kHz calibrator, fan cooled PA internal loudspeaker, and of course the TS520SE will take all the wide range of current matching accessories including the DG5 true frequency digital readout, the VFO520S remote VFO unit, the SM220 station monitor scope and panoramic display and so on.

When talking to prospective purchasers of the TS520SE, the question we are most often asked is "how does it compare in price to its rivals?" and the transceiver it is most compared with is the Yaesu FT101Z series. The price for the **FT101Z** taken from March 1980 Rad Com is **£575** including VAT and you also should add PA fan at **£13.80** (the fan is standard on the TS520SE) making a grand total of **£588.80.**

TRIO R1000

NEW PRICE!

£285.20 inc. VAT

THIS PRICE INCLUDES DC KIT FITTED

Carriage by Securicor £4.50

The R1000 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. As an option, on request, you can have 6kHz AM wide, 2·7kHz AM narrow and 2·7kHz SSB. The 12kHz filter remains in the set for use if required.

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

To minimise front end overload, a step RF attenuator is included which gives 0·6dB 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.

This receiver is so advanced it makes everything in its price range completely obsolete.

THE FINEST EQUIPMENT FROM TRIO

LOWE ELECTRONICS Ltd

TRIO TS770E

THE RIG FOR MULTIMODE CONTACTS ON 2m & 70cm

£730.25 inc. VAT

NEW PRICE!

Carriage by Securicor £4.50

The only dual band high performance transceiver available today. The TS770E is another successful result of Trio's advanced engineering capability and represents the peak of RF engineering for VHF and UHF.

Full coverage 144–146 and 430–440MHz using an advanced microprocessor controlled synthesiser generating 20Hz steps for that "VFO feel". Eight memory channels which can be scanned, cross band operation for satellite use, VOX, break in CW, 15–18W output at any frequency, terrific receiver performance, search and scan facilities, in fact everything one might expect from the best equipment designed by the best manufacturer in the business.

The TS770E gives you a single package to replace all those boxes you use right now. Performance and convenience on VHF and UHF are yours today with the TS770E.

Fitted with repeater shifts of 600KHz for 2m, 1·6MHz and 7·6MHz for 70cm. Repeater shifts are automatically correct for the band in use, even on the memory channels.

For complete information, contact us right now and we will send a detailed brochure.

TRIO TR9000

THE MULTIMODE RIG FOR 2 METRES

£345.00 inc. VAT

Carriage by Securicor £4.50

The TR9000 has certainly been awarded 'the most wanted rig' award by the radio amateur fraternity. By careful market research, TRIO have provided almost every facility in the TR9000 that even the most demanding 2 metre operator could wish for. Not *every* feature I hasten to add; we have been asked if it will step in 8.33kHz increments for tripling to 70cm, but not even TRIO could have foreseen that particular, peculiar request. But on with the flog talk . . . . .

As you can see, the TR9000 has a complete array of facilities including all mode operation, noise blanker, RIT, 5 memories, twin digital VFOs and digital frequency readout to 100Hz. Now for the smart parts.

The TR9000 is based on a 100Hz synthesiser controlled either by a photo microsensor on the main dial or by the remote up/down microphone. On FM, the operator has instant selection of either 25kHz steps (for convenient mobile use), 12·5kHz steps (for future use), or 100Hz steps (for continuous tuning). On SSB and CW, the synthesiser steps are automaticaly switched to 100Hz and the digital display is extended to match.

A special feature is the search facility on SSB which tunes the whole band, and the scan facility on FM which scans in 25kHz or 12·5Hz steps, stopping on any received signal. The scan may then be held by touching the HOLD button or depressing the PTT switch on the microphone.

The TR9000 has firmly established its' position as the best multimode on the market, but for the full story on this amazing rig, just ask us for the detailed brochure. If you need really detailed advice, we will be happy to help you at any time.

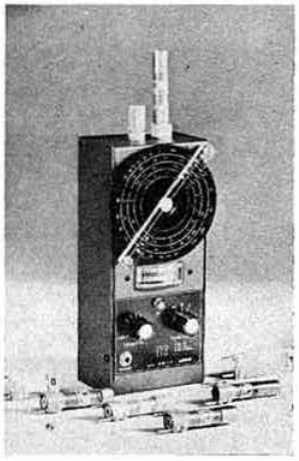
THE COMPLETELY NEW APPROACH TO VHF/UHF

LOWE ELECTRONICS Ltd

FX1

STATION WAVEMETER

£28 inc VAT



The Lowe FX-1 wavemeter is a totally new instrument which will form a necessary part of every amateur station. Covering the range 700kHz to 250MHz in seven bands, the FX-1 has high sensitivity meter indication, amplified LED indicator, and audio output for headphone monitoring of the signal. A separate antenna terminal is also provided for connection of an external pickup antenna if it is required.

The set of seven coils are all enclosed in protective sleeves, and the coils for the ranges 42–110 and 83–250MHz are of printed construction for real stability. The tuning dial is easy to read and is colour coded to match the coils. The complete coil set is housed inside the unit so you should never encounter the irritating situation when the coil you need has been mislaid.

Housed in a rugged metal case measuring 176 × 74 × 65mm, the FX-1 is a good looking, high performance wavemeter and should certainly be in every amateur radio station.

AR22 2m FM

SYNTHESIZED POCKET RECEIVER 141–150MHz IN 5kHz STEPS

This amazing receiver covers the range 141 to 150MHz in 5kHz synthesized steps with an automatic tuning system to maintain its remarkable performance across the entire range. The AR22 comes complete with built-in rechargable battery pack and a mains charger so that you can take it anywhere. It will fit into a shirt pocket too . . . Absolutely astonishing, but not expensive. See it soon.

£83 inc VAT

AR245 2m FM

SYNTHESIZED HAND-HELD 144–148MHz TRANSCEIVER

£179 inc VAT

"A staggering technical achievement"; "How can they get it into such a small size"; "Outperforms any rig I've ever had"; these are typical of the comments made by amateur radio operators after seeing and using the remarkable AR245 2 metre FM handheld transceiver. What does it mean to you? Well, at last you can really take your amateur radio with you, anywhere you want to go, because in this handheld unit, you have a complete synthesized 2 metre FM transceiver covering 144·000 to 147·995kHz in 5kHz steps. Also included are + and −600kHz repeater shifts and a crystal controlled tone burst unit.

5W OUTPUT ON BUILT-IN BATTERIES PROVIDED

INCLUDED IN PRICE—NICAD PACK, CHARGER, WHIP, XTAL TONE BURST, ETC.

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

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

Normal repeater and reverse repeater shifts are provided together with a fully automatic tone burst. It's too much to talk about in a short advertisement so why not call us and ask any questions. It's top quality, certainly; top value, undoubtedly: at **£189** inc VAT.

Remote frequency readout available.

HC1400 £189 inc VAT

NEW PRICE!

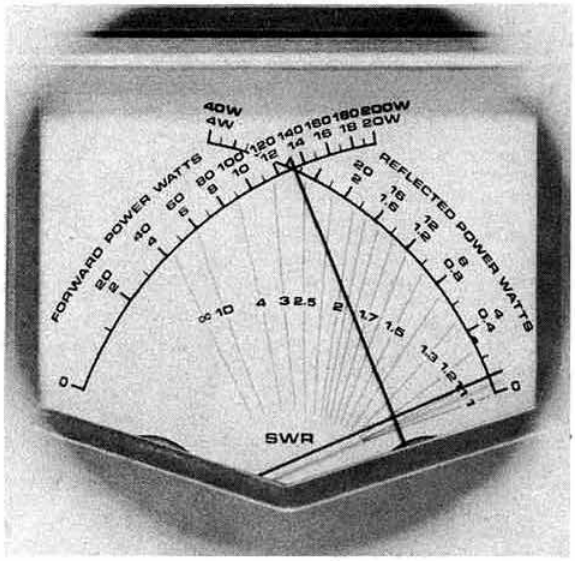
HOKUSHIN AERIALS—THE MOST POPULAR THERE ARE

GPV5	2m BASE STATION COLINEAR.....	**£29.50 inc VAT**
HF5	80–10m VERTICAL.....	**£48.50 inc VAT**
GDX2	50–480MHz 3dB DISCONE	**£39.50 inc VAT**

CARR. BY SECURICOR **£4.50**

FULL LIST OF MOBILE AERIALS IN OUR CATALOGUE

LOWE ELECTRONICS Ltd



WHAT DO YOU KNOW ABOUT CROSS POINTER POWER METERS?

Until recently, the in-line measurement of RF power and SWR involved calculation or the use of two instruments. Now, DAIWA have introduced a range of power meters which provide an elegant solution to the whole problem of RF measurements. Utilising two toroidal current transformers to detect true forward and reflected power, and feeding the outputs to a twin movement meter with crossed pointers, it is now possible to measure forward power (LH scale), reflected power (RH scale) and SWR (where the pointers cross) at a single glance. The photograph shows 130W forward power, 1W reflected, and an SWR of about 1·2 to 1. The DAIWA CN series power meters represent the ultimate power meter for the professional and amateur alike, and are indispensable in the fully equipped station. Three models are currently available covering frequencies right up to 2·5GHz so there's one for you whatever your interests.

CN620A	1·8–150MHz up to 1kW	**£52.81 inc VAT**
CN630	140–450MHz up to 200W	**£71.00 inc VAT**
CN650	1·2–2·5GHz up to 20W.....	**£95.00 inc VAT**

CN620A £52.81 inc VAT

CNA1001A ANTENNA TUNER

£129.95 inc VAT

The new CNA1001A antenna tuner from Daiwa has already changed the whole concept of antenna tuning in the amateur radio station. No longer do you have to fiddle with this control and that control in order to reach a match condition, simply push a button and let the tuner do it for you.

The CNA1001A incorporates a sensitive reflected power detector which monitors SWR all the time. At the first push of the operate button, a motor driven gearbox drives the load and match variable capacitors through their entire range in overlapping small increments seeking a correct match. When matching is achieved, the motor drive stops and that's that. The CNA1001A needs only a small sniff of RF to work on (typically 5 watts) so you needn't worry about blowing up your PA, and it covers all the current and future amateur bands from 3·30MHz, includes switching for two antenna systems, a 10 watt (50 watt 1 minute) dummy load and best of all includes a cross needle power and SWR meter.

This section measures power from 0·200W in two ranges and reflected power from 0·40W together with the unique Daiwa cross pointer SWR system. All this in one compact unit requiring only 12V dc to drive the tuning motors.

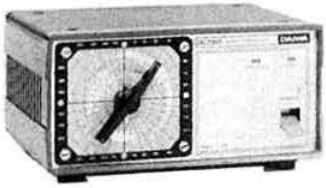
CNA1001A Specification

SWR/Power meter.	Frequency range	3·30MHz inc new bands
	Line impedance	50 Ohms
	Power ranges Forward	20/200 Watts
	Reflected	4/40 Watts
	Meter accuracy	± 10% of full scale
	Power rating	500W pep
	Input power for auto tune	1·10W
Tuner	Frequency	3·5,7,10,14,18,24,28MHz
	Input impedance	50 Ohms
	Output impedance	10·250 Ohms
	Operate time	45sec maximum

Size 225 × 90 × 245mm Weight 3·6kg Dummy load 10W (50W 1 minute)
Outputs for two antenna systems SO239 connectors

DAIWA INDUSTRY CO., LTD. **DISTRIBUTED IN UK BY** **LOWE ELECTRONICS Ltd**

LOWE ELECTRONICS Ltd



The Daiwa range of rotators are probably the best amateur rotators available. The quality of construction is up to the high standards we have come to expect from Daiwa and the rotator system is of a completely new design which eliminates "out of sync" operation and for the first time gives a true 360° indication on a circular scale based on a great circle map centred on the UK.

Both the DR7500 and DR7600 can be supplied with either of the controllers available, and both upper and lower mast clamps allowing mounting inside a standard tower or on the top of a pole. The DR7500 will handle beams up to and including 3-element tribanders, whilst the DR7600 will handle up to and including a 2-element 40 metre beam.

Each rotator system is supplied complete with rotator unit, control unit, and upper and lower mast clamps.

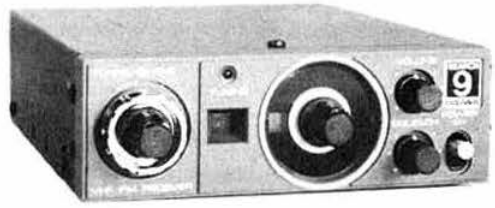
The rotators can be ordered as either "R" or "X" versions. The "R" suffix denotes the controller with the back lit scale and control by switches marked "left" and "right" to drive the rotator round. The controller pointer then smoothly indicates the direction in which the rotator is pointing. However, as an alternative, the "X" suffix unit is of the preset type where the controller pointer is turned by the operator to the beam heading required. The rotator then turns to this heading and stops. Correct operation of the rotator is indicated by a discreet flashing light on the control unit. With this type of control unit, you can go into the shack, set the rotator turning to the direction you need and then do something else whilst the rotator comes round.

Either control unit can be specified with either of the two rotators, ie DR7500R is the smaller rotator with the round control whilst DR7500X is the same rotator but with the preset control unit.

DAIWA ROTATOR SYSTEMS

DR7500X £98 inc DR7500R £108 inc DR7600X £135 inc DR7600R £144.90 inc

CS201 £11.98 inc VAT
2-WAY COAX SWITCH
0-500MHz
PLUS DIAWA QUALITY

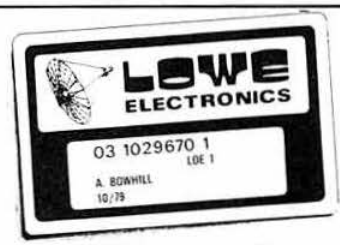


SR9 2m FM MONITOR
TUNABLE + CRYSTAL CONTROL
£46 inc VAT

DON'T FORGET THAT OUR CATALOGUE CONTAINS DETAILS OF THE WIDEST RANGE OF EQUIPMENT AROUND.
48p IN STAMPS WILL BRING IT TO YOU

THE WAY TO HAVE TOMORROW'S EQUIPMENT TODAY

WRITE FOR FULL DETAILS TODAY



SEND 48p IN STAMPS FOR COMPLETE CATALOGUE AND ANTENNA BOOK
PLEASE SPECIFY ANY PARTICULAR INTEREST AND WE WILL SEND FULL INFORMATION

HEAD OFFICE AND SERVICE CENTRE
CHESTERFIELD ROAD, MATLOCK, DERBYS. TEL: 0629-2817 or 2430. TELEX 377482. OPEN 9-5.30 TUES-SAT. PHONE IN 9am-9pm

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

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

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

COMMUNICATIONS COMPUTER

TONO THETA 7000E

The new Theta 7000E means that every Amateur can enjoy the visual display of CW, RTTY, and ASCII in both transmit and receive modes. Just connect the TONO to any TV set via the antenna terminals or to a page printer from the parallel port provided. Bring up your CW speed in receiving or sending by either watching receiver sent or from recorded cassettes. Connection to the transceiver is via the key, phone and mic sockets.

THETA 7000E. SOME OF THE OUTSTANDING FEATURES
VHF and Composite video output provided

Printer interface
Wide range of transmitting and receiving speeds – 10CW speeds + 8RTTY
Built in demodulator for high performance for 170, 425 & 820Hz shift
Crystal controlled modulator for AFSR – Hi or Lo tone
Convenient ASCII key arrangement
Large capacity display memory – 2 pages 32chr × 16 lines split screen for Rx & Tx if required
Automatic transmit/receive switch
Anti noise circuit
Battery backed-up memory 7 channels of 64 chrs
Send function
Buffer memory – 53 character type ahead
Rub out function
Simultaneous access of the memory
Pre-loading function
CR (carriage return) LF (Line feed) cancel function
Cursor control function
Word Mode operation
Automatic CR/LF (72, 60 or 80 chrs per line)
Echo function
Word Wrap around function
Transmit/receive in ASSCII mode in RTTY
CW identification function
Mark and break (space and break) system
Monitor circuit
CW practice function
Variable CW weights
Cross pattern checking output terminal
Log computer output provided
Test message function (Ry and QBF)

£640.00 inc

PLEASE ASK FOR THE PRICE LIST OF ACCESSORIES FOR THIS UNIT – INCLUDING PRINTER, MONITORS, ETC.

THE ICOM SIDEBAND PORTABLES

IC-202S
£169 inc VAT

IC-202S

The IC-202S is a very well designed 2m SSB portable. It offers: 3W pep output on USB, LSB and CW. * Large Battery capacity (HP11 type) or Nicads if you wish * A special VXO circuit to provide smooth tuning and crystal stability needed for SSB operation on 2m. * Each of the four 200 kHz band positions allows operation anywhere in 2m. (Supplied with 144·144·2 and 144·2–144·4) * Top of the band Oscar xtals available for "cross-pond working" * It has a DC socket and SO239 sockets for mobile or base station working, barefoot or as a prime mover. * Mobile mounting brackets, Nicad packs, chargers, cases all available options. You must agree, a very versatile well proved rig.

IC-402
£242 inc VAT

SEE THE SIDEBAND TWINS AT LEICESTER

IC-402

The 70cm twin of the 202S having very similar features, covering the frequency range of 432–435·2 MHz.

BARCLAYCARD VISA

FROM **THANET** OF COURSE

Access

Come to the Leicester Exhibition and see how

ICOM DOES IT ALL!

We are proud to announce the arrival of ICOM'S new 9 band HF Transceiver—however, we apologise to all those customers patiently waiting as the demand far exceeds the supply

The IC-720 Price less than £700 inc VAT (PSU extra)

SPECIFICATIONS

General:

Frequency coverage:
Receive: 0·1-30·0MHz
Transmit: 1·8-1·999MHz
3·6-4·099MHz
6·9-7·499MHz
10·0-10·499MHz
13·9-14·499MHz
17·9-18·499MHz
20·9-21·499MHz
24·8-25·000MHz
28·0-28·999MHz
29·0-29·999MHz

Temperature Limitation: −10°C − +60°C
Antenna Impedance: 50Ω
Power Requirement: 13·8V DC, negative ground, ±15%
Current Drain: Min audio output 0·9A. Max audio output 1·2A. Transmit: SSB 16A, CW, RTTY 20A, AM 14A
Dimensions: 111 (H) × 241 (W) × 311 (D) mm.

Transmitter

Emission Mode: CW (A1), RTTY (F1), SSB (USB/LSB), AM
Output Power: 100W continuous (AM 40W)

Modulation System: SSB, AM Balanced Mod. CW, RTTY reactance Mod.
Spurious Output: More than 60dB below peak power output
Harmonic Output More than 60dB below peak power output
Carrier Suppression: More than 40dB below peak power output
Unwanted Sideband: More than 50dB down at 1000Hz AF output
Microphone Imp. 1·3KΩ, dynamic with built-in pre-amp.

Receiver

Receiving system: Superhetrodyne, with continuous bandwidth control.
Receiving Mode: A1, A3J (USB/LSB), A3, F1
Intermediate Freq.: 1. 39·731MHz
2. 9·0115MHz
3. 10·750MHz
4. 9·0115MHz
Sensitivity: Less than 0·25 micro-volts for 10dB S + N/N
Spurious Response Rejection Ratio: More than 60dB
Selectivity: SSB, CW, RTTY more than 2·3kHz at −6dB, Less than 42kHz at −60dB CW Narrow (Option) More than 500Hz at −6dB, Less than 1·5kHz at −60dB, AM. 3kHz at −6dB, less than 18kHz at −60dB
Audio Output: More than 2 Watts
Audio Impedance: 8Ω

THANET ELECTRONICS LTD

143 RECULVER ROAD, HERNE BAY, KENT. Tel: 02273 63859

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

£89.95

FOR A HANDHELD?
YES . . . AND INCLUDING
NI-CADS & AC CHARGER

PALM II £89.95* inc.vat
PALM IV (70cms) £149* inc.vat

Both units come complete with all accessories and fitted S20, 22/SU20 plus 600kHz and 1·6MHz shifts. Extra channels £3 each.

* If xtal controlled toneburst required please add £10.

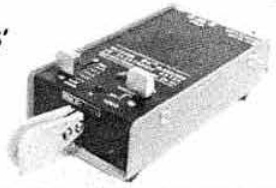
SAE FOR LEAFLETS

PRODUCT NEWS

SELF POWERED TX FM (144MHz) MONITORS £12.95

This amazing little unit plugs into the antenna line (power rating 5–15 watts) and detects the FM signal via its RF powered discriminator and passes the audio to a standard earpiece. Amazing! Now there should be no excuse for testing tone bursts! Price including VAT and postage **£12.95.**

CW ENTHUSIASTS' ELECTRONIC KEYERS £29.95 Model EK121



Yes, it's true, this little unit has all the features you would expect from something costing a lot more. Built-in paddle, dot memory for easy sending, semi- or fully-automatic switch settings, variable speed control, LED indicators, etc. It matches all modern transceivers and comes complete with instructions and can be either self-powered from HP7 cells or external DC supply.

AMAZING VALUE 4AMP PSU

We've bought a quantity of really superb 4amp 12v power supplies at a super price. These are fully protected and have a transformer 50% larger than anything similar. Send for yours today. **£22.95** inc VAT. Carriage £1.50.

FDK VHF TM56B MONITOR

CHANNEL SCANNING 230VAC/12VDC

The TM56 is one of our most popular models, combining great performance with modest price. The TM56B has the basic receiver design of our mobiles and includes its own 230V AC supply, plus external 12V DC input. 12 fixed channel positions are included, plus 4 autoscan positions. Any one of the Autoscan channels can be cancelled. Amateur band and marine band versions available fitted 10 channel and 9 channel respectively. **New reduced prices of £79.00 for either model.**

2m HANDHELD MONITOR

8 CHANNEL SCANNING includes ni-cads + "S20" & AC charger £69.95

"The Professional One"

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

DenTron . . .

NEW MODELS— FACTORY FRESH FROM USA

New MLA2500B
2kW 160–10m Linear
2× EIMAC 8875 tubes
£695 inc VAT

(new model fitted high/low power switching)

YAESU—AT BEST PRICES!

YOUR GUARANTEE:

As the largest direct retailer in the South we can guarantee you a good deal on all Yaesu items. We buy at best possible prices and sell at best possible prices. If you think you can buy cheaper elsewhere, then simply write or telephone giving details of advertisement and name of company and we'll try to match it. If we can't beat the price there may be a very good reason that perhaps you should know about!

FRG-7 RECEIVER

£189 inc VAT

Securicor Delivery £4.50 extra

Without doubt the ideal way to listen to amateur and commercial transmissions when funds are limited. Thousands of these receivers have been sold and remember, every one we sell is individually tested.

FT707 £499
inc VAT
FP707 £109
inc VAT
100W ssb/cw 80–10m
Fitted new bands
Free Securicor Delivery

Accessories: FC707 £74 FV707DM £178 MR7 £14.95

NEW RECEIVER FRG7700

DELIVERED BY SECURICOR FREE!

By the time you read this we hope to have the new FRG7700 receiver in stock. This is an up-date of the FRG7000 fitted FM and with optional memories. Please phone for latest information. Special price on old model FRG7000 whilst stocks last!

OTHER YAESU ITEMS

FT101Z	£464	SP107	£27	FRG7000	Special
FT101ZD	£540	YM35	£12.60	FT202R	£99
FV101Z	£126	FL2100Z	£360	FT207R	£199
FT107M	£690	YH55	£10.35	NC1A	£18.95
FP107E	£106	QTR24D	£24.95	FT225RD	£499
FP107	£97	FP12	£78	FT480R	£359
FC107	£97				

PRICES INCLUDE VAT

Den Tron GLA1000B

1kW Linear
80–10m

£295
inc VAT

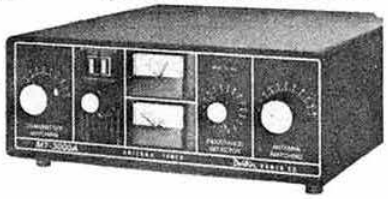
This is the ideal linear for the budget minded ham radio operator—send for details today

Den Tron ATU's (including new bands)

1·8MHz–30MHz
MT3000A
3kW ATU
Built to Military spec.

£275
inc VAT

Two models to choose from



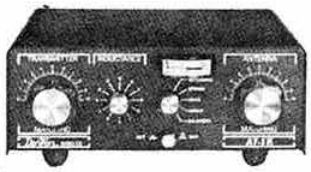
Includes exciter dummy load, RF watt meter, swr meter, antenna selector—matches anything to anything.

AT1K

1·2kW ATU
1·8–30MHz

£99 inc VAT

Includes swr meter and antenna switch.



Ideal for UK licence limits

GLOBAL SHORT WAVE RECEIVING AERIALS

Global short wave antennas are designed for the serious short wave listener who requires general coverage capability throughout the short wave spectrum. Two models are available, either the broad band dipole or the inverted "L" model. Full details of these antennas are available on receipt of a stamped addressed envelope. The inverted "L" is **£9.95** and the dipole is **£29.** Both come with full instructions, hardware, etc and the dipole model includes 50ft of 50 ohm coax feeder.

WATERS & STANTON ELECTRONICS

18/20 MAIN ROAD, HOCKLEY, ESSEX. Tel: (0702) 206835

TRIO

APPROVED TRIO DEALER

NEW LOW PRICES ALL MODELS STOCKED

24 HOUR DELIVERY—
—FROM THE PEOPLE YOU CAN TRUST

ALL PRICES INCLUDE 15% VAT

TRIO **TS120V £347**
TS120S £432

SOLID STATE RIG RELIABLE AT LAST

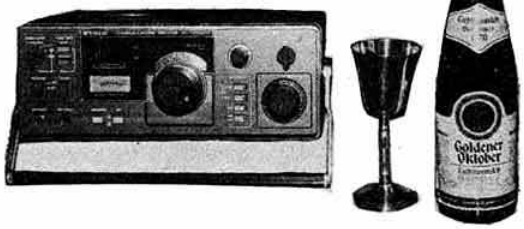
Up until now there has been a natural reluctance to accept solid state HF rigs as anything but a second rig or mobile unit with dubious reliability of the PA devices. Now at last the new TS120 series gives you 80-10 metre coverage at either 10 watts output or 100 watts output. Digital readout and variable 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.

STOP PRESS TS120V + 4 amp PSU (not Trio) £359 inc. VAT

NEW TRIO TR7800 25W FM TRANSCEIVER £268

The new TS7800 is a remarkable new 25 watt transceiver having a host of features that put it head and shoulders above the competition in the £250 class. Touch pad tuning, 14 memories, priority channel auto alarm, up/down mic frequency control etc, etc — all go to make this unit a super package. Reverse repeater is available at the touch of a button and auto-scan is available over either the entire band or just the memories. Separate digital displays indicate both frequency (transmit and receive) and the memory channel numbers. There's a host of other features that we cannot mention in the space available but for the price of a 12p stamp we'll be happy to send you the full colour brochure.

NEW TRIO R1000 RECEIVER



YOUNG—BUT VERY MATURE!

Every one is individually tested by us and despatched by Securicor

£285 inc VAT—A REAL WINNER

STOP PRESS—PRICE REDUCTIONS!
TS770E, £730 TR2400, £198
R1000, £285 TL922, £595
TS830S, £639

NEW TRIO TR9000

NEW

TRIO

TR2400 £198 inc VAT

The new TR2400 really does eclipse all other hand-helds in its sheer technology. There's no other model that can approach its performance. The large LCD readout has low current drain and the 1·5 watts output is a good compromise between effective communication and reasonable battery drain. 10 memories, automatic scanning, instant reverse repeater operation, 144-148MHz etc etc . . . all adds up to the new leader in hand-helds . . . the Trio TR2400. Get your Barclaycard or Access cards ready for this one . . . half its fascination is operating it—the other half is owning it.

2 METRE FM/SSB/CW MOBILE OR BASE ONLY

£345 inc VAT

NEW TS770E
2m/70cm IN STOCK £763

The new Trio TR9000 heralds the beginning of a new era in 2 metre mobile or base station operation. A host of new features that makes its direct competitor look pretty expensive! FM has two tuning rates either 25kHz or 12½kHz per step. On SSB the tuning rate is in 100Hz steps or with the search button depressed, it will step in 10kHz at the same time searching for signals within each 10kHz segment. Dual VFO enables the operator to hold one frequency whilst searching for another. The inclusion of five memory channels provides for the storage of your five favourite frequencies.
Built-in scan permits FM scanning 25 or 12½kHz steps with momentary pauses on busy channels whilst providing continuous scanning of SSB/CW over 2MHz. Positive or negative repeater shifts are already programmed into the unit. For base station use, the PS20 AC supply can be used plus the SP120 external speaker and the BO-9 system base plinth. An exciting rig at a very reasonable price. Send today for details.

XMAS PRESENT IDEAS FROM

Bredhurst electronics

HIGH STREET, HANDCROSS, W. SUSSEX. 0444 400786

THE **NEW**

TRIO TS-830S

The TS-830S is a high-performance, very affordable, HF SSB/CW transceiver with every conceivable operating feature built in for 160 through 10 meters (including the three new bands). The TS-830S combines a high dynamic range with variable bandwidth tuning, IF shift, and an IF notch filter, as well as very sharp filters in the 455kHz second IF. Its optional VFO-230 digital VFO provides five memories.

PRICES ON APPLICATION

ICOM IC-2E

CHECK THE FEATURES

FULLY SYNTHESIZED—covering 144-145·995 in 400 5kHz steps.

POWER OUTPUT—1·5W with the 9V rechargeable battery pack as supplied—but lower or higher output available with the optional 6V or 16V packs.

BNC ANTENNA OUTPUT SOCKET—50 ohms for connecting to another antenna or use the rubber duck supplied.

WEIGHT—450g with power pack & antenna.

DIMENSIONS—Height 116·5mm (without battery pack), width 65mm, depth 35mm.

SEND/BATTERY INDICATOR—Lights during transmit but when battery power falls below 6V it doesn't light indicating the need for a recharge.

FREQUENCY SELECTION—by thumbwheel switches, indicating the frequency.

+5kHz SWITCH—adds 5kHz to the indicated frequency.

DUPLEX SIMPLEX SWITCH—gives simplex or plus 600kHz or minus 600kHz Transmit or 700kHz for you travellers!!

HI-LOW SWITCH—reduces power output from 1·5W to 150mW reducing rapid battery drain.

EXTERNAL MICROPHONE JACK—If you do not wish to use the built-in electret condenser mic and optional microphone/speaker with PTT control can be used. Useful for pocket operation.

EXTERNAL SPEAKER JACK—for speaker or earphone. Supplied ready to go complete with nicad battery pack, charger, rubber duck and all for

£159 inc VAT & carriage

TRIO TS-520SE

This rig is the latest in the famous TS-520 series. It is identical to the TS-520 except that the 12V DC supply and the socket for the matching Trio transverter have been deleted. However, provision is now made for switching in an optional narrow CW filter.

If you are looking for the best value ever in home station HF tranceivers, this has got to be the choice.

TS-520SE £437 inc VAT & carriage

FDK MULTI-750E

2m (& 70cm) ALL-MODE

AMAZING VALUE **£299 inc VAT & carriage**

- **Simple and smooth VFO control gives either 100Hz or 5kHz steps on both FM and SSB modes for optimum convenience.**
- **The large green fluorescent display tube gives full frequency readout to 100Hz and provides safe and clear readout for both night and day operation.**
- **Standard features include noise-blanker, RIT control with switch, RF attenuator gain control, automatic crystal controlled tone-burst, high and low power switching and remote up/down frequency control microphone unit.**
- **Compare its compact size and light weight, its smart appearance and comprehensive front panel controls. Simple and reliable operation is made possible by employing advanced solid-state and logic techniques.**
- **A dual VFO is employed for the selection of two independent frequencies anywhere in the band. This also enables split frequency operation, particularly useful when used in conjunction with the optional "UHF-EXPANDER" transverter.**

For normal repeater operation a pre-programmed shift is selected by front panel selector.

M750 BUILDS INTO A 2m & 70cm PACKAGE

MAIL ORDER **BREDHURST ELECTRONICS** **RETAIL PREMISES**

HIGH STREET, HAND CROSS, W. SUSSEX

Tel: 0444 400786 9am-5.30pm

TO ORDER ANY OF THE ABOVE ITEMS SIMPLY WRITE, ENCLOSING A CHEQUE OR PHONE YOUR CREDIT CARD NUMBER

MAIL ORDER

FROM

AMCOMM

by two way FREEPOST

MORSE KEYS

HK 707	Straight Up/Down keyer	£10.06
BK 100	Semi-automatic mechanical bug	£17.88
MK 702	Up/Down keyer on marble base	£22.43
MK 702	Manipulator	£22.43
MK 704	Squeeze paddle	£14.38
MK 705	Squeeze paddle on marble base	£22.43
EKM 1A	Morse code practice oscillator	£8.63
MK 1024	Automatic memory keyer	£135.13
EK-150	Semi/Automatic keyer	£74.75

LINEAR AMPLIFIERS

2M10 80P	144MHz 10W input/80W output with 9dB preamp	£138.00
2M25 150P	144MHz 25W input/150W output with 9dB preamp	£184.00
2M10 150P	144MHz 10W input/150W ouput with 9dB preamp	£209.88
2M3 150P	144MHz 3W input/150W output with 9dB preamp	£209.88

G. WHIP Mobile Antennas

Tribander 10-20 Slide	£24.73
L.F. Coil 40/80/160 MTS	£6.56
L.F. Whip Telescopic	£3.34
Multimobile 10-20 Auto	£28.75
M/Mobile Coil 40/80/160	£6.56
M/Mobile Whip Telescopic	£3.34
Flexiwhip 10M Mast	£17.25
F/Whip Coils 40/80/160	£6.56
Base Standard	£4.49
Base Heavy Duty	£5.75
Extenarod	£11.50

SHURE MICS

201	Hand ceramic omnidirectional high impedance	£14.49
202	Hand ceramic noise reducing high impedance	£15.18
401A	Hand controlled magnetic high impedance	£16.56
401B	Hand controlled mag. low impedance (200 ohms)	£16.56
444	Desk adjustable height controlled magnetic	£32.43
526T	Desk controlled response transistor preamp	£39.33

DUMMY LOADS

DL20	30W DC 150MHz with PL259 connector	£6.33
T 80	80W DC 500MHz with SO239 connector	£22.94
T-150	150W DC 500MHz with SO239 connector	£32.78

YAESU MICS

YD 148	21.27
YD 844A	22.42
YM 21	13.80
YD 846	8.52
YE 7	8.52
YM 24	16.67
YM 37	8.62
YM 34	21.27
YM 35	14.66

ADONIS MICS

AM802G Compressor 3 outputs	£59.95
AM502G Compressor 1 output	£39.95

Microwave Modules

MMT 432/28S	£136.85
MMT 432/144R	£173.65
MMT 28/144	£90.85
MMT 144/28	£90.85
MMC 28/136	£24.90
MMC 28/156	£24.90
MMC 28/144	£24.90
MMC 144 any IF	£24.90
MMC 144 28LO	£24.15
MMC 70/any IF	£24.90
MMC 432/28S	£29.90
MMC 432/144S	£29.90
MMC 1296/any IF	£32.20
MMD 050/500	£69.00
MMA 28 preamp	£14.95
MMA 144 preamp	£14.95
MMV 1296 23cm tripler	£34.50
MML 144/100 linamp	£142.60
MML 432/100 linamp	£228.85
MML 144/25 linamp	£48.30
MML 432/50 linamp	£113.85
MM 2000	£169.00

Unadilla/Reyco

Antenna Traps –
Precision moulded coil forms stainless hardware Aluminium tube irridit finish Coated aluminium wire. Fully waterproofed.
Available 7/14/21 Mhz £9.99

W2AU Balun

3.5/30 Mhz 2.5Kw with Lightning Arrestor – Suitable Vees, Yagis, Doublets, Quads etc.
£9.99

Standard

C8800 2m Tcvr £252.00
C7800 70cms Tcvr £275.00

Dentron

GLA 1000 Linear Amp 10/80 1Kw £295.00
MLA 2500 Linear Amp 10/160 2Kw £699.00
MT 3000 3Kw Tuner/SWR/Dummy Load £275.00

Yaesu Products

FT 901DM	FP 707	FT 225RD
FV 901	FC 707	FT 720
FTV 901	FT 78	FT 107M
SP 901	FT 101ZD	FV 107
YO 901	FT 101Z	FC 107
FT 707	FV 101Z	FP 107

Telephone for Prices & Literature

PLEASE PHONE FOR DETAILS

FDK Mult 700EX £199.00 FDK Mult 750E £299.00	Send 30p for our bumper bundle literature	No Quibble Guarantee Same Day Despatch All Items Advertised

Scanning Receivers

BEARCAT 220FB £240.00
BEARCAT 210 £220.00
PUMA 20 900 channels Programmable £99.00
STANDARD c800 10ch + 1 low power transmit CH £79.00
AR 22 Pokcer Receiver 144-150 Mhz £91.50

UHF Hand Held

New AR 740 Synthesised with repeater split 2000 channels £219.00

Choose your AMTECH here

Amtech 100 Mobile Match		£16.95
Amtech 200 Random Wire ATY 10-160m		£25.95
Amtech 300 Random and Coax Fed ATU		£39.95
Amtech CW 250 – The most outstanding CW filter available		£24.90
Amtech Channelguard – A plug in device to eliminate those unwanted stations	Decoder	£15.25
	Sender	£7.25
Amtech FM7: FM Demodulator for FRG 7		£11.90

Rotators

Stolle 2010	£47.50
KR 400	£105.00
AR 40	£59.00
KR 9502A	£50.00
Rotor Bearing	£12.00

*All items VAT and carriage paid.

SWR/RF Power Meters

SWR 25 3.5/170Mhz	£12.94
LEADER LPM 885 – HF 1Kw	£58.00
HANSON 3.5/150Mhz 200w	£28.75
REECE UHF 74 144/432	£16.28
HANSON FS 500H 1.8/60Mhz 2Kw	£67.85
OSKAR SWR 200 3-30Mhz 2Kw	£40.00

Antennas - Wide range in stock including Jaybeam - Hygain - Cushcraft - ASP Telecon Hokushin etc...

Special - Rubber Duckie ¼w BNC or 259 £6:50

Amcomm Services

194 NORTHOLT ROAD, SOUTH HARROW, MIDDX.
Telephone: 01-864 1166, 01-422 9585

Opposite South Harrow Tube Station on Piccadilly Line

Showroom Opening Hours
Tuesday to Saturday
9.00 – 5.30 Sunday by Appointment

All items over £100 available on easy terms at List Price.

NO POSTAGE REQUIRED

AMCOMM SERVICES
FREEPOST
HARROW
MIDDX
HA2 0BR

Please send me _____
at _____ enclosed cheque/P.O. for
_____ or charge my VISA/ACCESS
Nr. _____
Name _____
Address _____
_____ Post Code _____

AMATEUR RADIO EXCHANGE

FIRST AGAIN ! !

As the only amateur radio shop in London where ALL the leading makes of equipment can be seen and tried under one roof . . . YAESU, ICOM, TRIO/KENWOOD, etc . . . we like to be in there fast when the manufacturers announce something new. So, even as this issue goes to press in mid-October, we actually have in stock the very latest from YAESU, the fabulous new FRG-7700 receiver.

Its advanced and attractive styling and well-planned layout are obvious from the picture opposite, and the accompanying design notes point out some of the more significant features which have been built into it.

So, it's got the aesthetics . . . the ergonomics . . . the specification. What about the

'THE WAYFARER' FROM YAESU

FT-707

The new FT-707 is an ultra-compact solid-state transceiver covering 80-10m, including 30, 17 and 12m (all factory installed), with 100W output 50% out developed in 3:1 VSWR, digital (bright LED's in mode sensitive counter) and analogue readout, status at a glance (from string LED and single displays), 16 poles of crystal filtering continuously adjustable IF bandwidth 2·4kHz to 300Hz.

FT-707 £499 inc VAT

NEW FROM TRIO/KENWOOD

Their long-awaited entry into the 2m mobile all-mode transceiver field, the TR-9000, with a truly amazing array of features built in. 5-channel memory, twin VFO's giving independent operation down to 100Hz steps, scan facility in 25kc or 12.5kc steps plus continuous free scan in SSB/CW over the entire 2m band—scan operation from mic of course.

TR-9000 £342 inc VAT

. . . AND THE LATEST 2m ALL-MODE MOBILE . . . YAESU's FT-480

- ★ Bright green fluorescent display
- ★ Steps FM—1kHz/25kHz/100kHz
  SSB and CW—10Hz/100Hz/1KHz
- ★ Step or scan control from mic
- ★ Scan stops or pauses on signal
- ★ Scans whole band or memories
- ★ Monitors priority channel and locks on when busy
- ★ Digital clarifier plus or minus 10kHz
- ★ Clarifier shift displayed
- ★ LED CS-meter true peak reading on SSB
- ★ Semi break-in and sidetone on CW
- ★ "Satellite" mode cancels all shifts and permits tuning during transmission

FT-480 £359 inc VAT

CLOSED WEDNESDAY, BUT USE OUR 24-HOUR ANSAFONE SERVICE, OR RING MARTIN (G4HKS) ON 01-575 5291 FOR EVENING SALES ENQUIRIES

NO-INTEREST HP OVER 6 MONTHS

ACCESS

CREDIT SALES BY TELEPHONE

BARCLAYCARD VISA

INSTANT HP FOR LICENSED AMATEURS

AMATEUR RADIO EXCHANGE

performance? Well, from our test experience of it, we can assure you it's got that as well. Sensitive . . . stable . . . selective . . . so that, frankly, if you can't receive the station you want, they've probably gone off the air!

While the FRG-7700 is the big news this month, we do of course carry our usual full stock of transceivers, amplifiers, antennas and accessories, both new and second-hand. So, whether you're looking for a major item of equipment or just some bits and pieces, Brenda and Bernie invite you to phone or call in . . . to buy . . . to sell . . . or just to browse . . . but to have a cup of Brenda's coffee any way!

HERE! NOW! YAESU'S LATEST RECEIVER

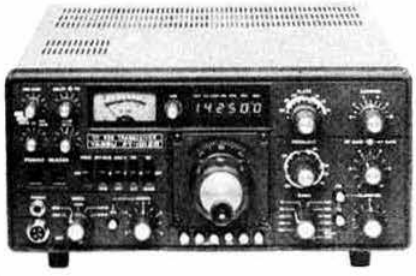
The superb FRG-7700 ! !

The one with all the features including FM right across the band and 12-memory option.

- ★ General coverage 150kHz–30MHz
- ★ Digital and analogue readout
- ★ Fine tune ★ Attenuator ★ 12v or mains
- ★ Noise blanker ★ Fast or slow AGC
- ★ Digital clock and automatic ON/OFF timer
- ★ Three AM filters, 12kHz, 6kHz and 2.7kHz
- ★ Receives in LSB, USB, AM and FM
- ★ Optional 12-memory recall facility enabling you to store your favourite frequencies for recall at the touch of a button.

BASIC PRICE £309 inc. VAT

+MEMORIES £389 inc. VAT



YAESU FT-101ZD

New rigs with new names and numbers come and go, but the YAESU 101 series goes on and on. For, of all the many transceivers we sell, no other gives so little trouble or needs so little servicing.

Our 101s come complete with cooling fan and microphone and even have AM facility! So, if you're looking for a de-luxe HF transceiver with all the important features, but at a sensible price, look no further.

FT-101Z £488 inc. VAT ★ FT-101ZD £569 inc. VAT

BOTH WITH MIC AND COOLING FAN

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

So easy for Overseas Visitors—Northfields Station is just seven stops from Heathrow on the Piccadilly Line—or phone your order and let us deliver it to you at the Airport.

Western

Western FOR HF TRANSCEIVERS

ALL PRICES DOWN!

FT-707

Truly christened the "WAYFARER", Yaesu's new solid-state transceiver goes anywhere, base or mobile, and has all the desirable "big rig" features together with exceptional performance. 100W RF output; digital readout; IF width control; LED "S" and "Power" meter display; FULL band coverage, 80 10 metres, including 30m, 17m and 12m. This **must** be the transceiver all you YAESU fans have been waiting for!

ONLY £495

FP-707 AC PSU/Speaker	£99.00
FC-707 Antenna Tuner	£69.00
YM-35 Hand Microphone	£11.95
MMB-707 Mobile Bracket	£12.50

TS-120S TRIO

A very popular mobile or base station solid-state HF transceiver. Small in size but big on features at a sensible price. This little gem from TRIO-KENWOOD features digital readout, IF shift to beat the QRM, VOX and break-in CW, 100W RF output on all bands 80-15 metres (slightly lower on 10m). Superb value for an up-to-date HF rig.

PS-30 AC PSU	£79.00
MC-35S Hand Microphone	£12.95
SP-120 Matching external speaker	£22.50

£419

. . . OR IF YOU STILL PREFER 6146B's IN THE FINAL . . .

FT-101Z FROM YAESU MUSEN

Latest in a famous line, but what an improvement! Full band coverage, IF width control for superior selectivity, excellent performance and Yaesu's well-known quality. ZD model has digital readout built-in, both models in excess of 100 watts RF out (lower on 10m). Try our price for size!

NOW DOWN TO £479 'Z' £559 'ZD'

TS-520SE from TRIO-KENWOOD

It would be hard to find better value for an HF transceiver than the TS-520SE. Covering all HF bands 160 10 metres, it features 6146B in the PA; Wide/Narrow CW switching (with optional filter); speech processor; high sensitivity and dynamic range; RF attenuator and other features to make your operating a pleasure. A first-class transceiver at a down-to earth price!

NOW DOWN TO £415

SEE YOU AT LEICESTER!

IN ADDITION TO THE GOOD VALUE YOU SEE ON THESE PAGES, we will have plenty of EXHIBITION SPECIAL OFFERS at LEICESTER!
Come early and avoid disappointment. Full credit facilities available on these offers—Bring your CREDITCHARGE card—or ask us about INSTANT HP. Also on sale will be:

Power Meters	Headsets	Masts and Towers	HF Mobile Antennas	Antenna Switches	Insulators
Plugs and sockets	Microphones	VHF and UHF Antennas	HF Base Antennas	Dummy Loads	Dipole Centres etc.

A NEW TELESCOPIC MAST FOR THE BUDGET-CONSCIOUS AMATEUR

Ever felt like having a tilt-over mast but thought you couldn't afford it? Ever thought that the big lattice masts were too much when you only need support for your VHF/UHF antennas?

THE ALL-NEW 30ft 'ULTIMAST' is the answer to your problems

- ★ Slim, unobtrusive appearance
- ★ One-winch operation
- ★ Self-supporting for large
- ★ VHF antennas
- ★ Can be guyed to increase loading capability
- ★ Telescopic and tilt-over
- ★ Simple ground fixing
- ★ Inexpensive
- ★ Choice of head units (optional extra)

PRICE—YOU'LL NOT BELIEVE IT! PHONE AND SEE HOW LOW!

ALL ABOVE LISTED PRICES INCLUDE VAT AT 15% AND CARRIAGE

HEAD UNIT FOR ROTOR

TELESCOPING TOP IN ROUND TUBE

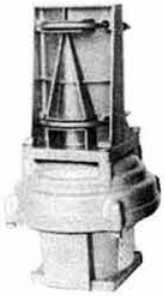
BOTTOM SECTION IN SQUARE TUBE

BASE POST

Electronics (UK) ltd

GIVE YOUR ANTENNA A GOOD TURN WITH A Western ROTOR

EMOTATOR



CHOOSE 'EMOTO' FOR VALUE and RELIABILITY . . .
. . . WE ARE THE SOLE U.K. DISTRIBUTORS!
Models 103 SAX (illustrated) and 502 (SAX now have 360° circular dial presentation.

Emoto 103SAX For light UK and large VHF arrays..... **£86.25**
Emoto 502SAX For heavier HF beams plus VHF/UHF **£125.35**
Emoto 1102MXX The really big one for large HF monobanders and the largest VHF/UHF arrays **£189.75**
Emoto 1103MXX As 1102MXX but slower rotation speed and greater turning power **£194.35**
AND DON'T FORGET . . . The well-known rotary mast bearing MB-300 ..... **£13.80**

EP-200

Due to high demand, our first consignment of these excellent rotors sold out very quickly. We hope to have new stocks available in time for Leicester. Specifications are:

Supply—220/240VAC 50Hz
Motor—24VAC
Rotation—360° (+5°, −0°) in 60 secs.
Braking torque—1000 kg-cm
Mast size—28-44 mm
Max. antenna weight—50 kg
Wind area (max.) —0·25 m²
Cable—5-way
Silent control box, lower bracket included, good value at

£29.95

EXCLUSIVE! TWO NEW SCANNERS FROM Western

SEE THEM AT LEICESTER

handic 0016 Introductory Price
£249

handic 0012 Introductory Price
£199

Two new VHF/UHF FM scanning receivers, manufactured to professional standards and available NOW, exclusively from WESTERN.

★ Fully keyboard programmable for 8 or 16 channels
★ Cover 68-88, 144-174 and 410-512MHz
★ Full range scanning plus 16 channels (handic 0016) or 8 channel scanning (handic 0012)
★ AC and DC supply standard
★ Channel lockout and memory backup
★ Built-in telescopic antenna; external antenna jack

ALL PRICES INCLUDE VAT AND FREE DELIVERY

Western Electronics (UK) ltd
HEAD OFFICE (All Mail/Enquiries)
FAIRFIELD ESTATE
LOUTH, LINCS, LN11 0JH
Tel. Louth (0507) 604955
Telex: 56121 WEST G

Our Agents
Southern: Alan Paxton, G4BIZ, Southampton, Hants (0703) 582182
N. Ireland: Les Lyske, GI3CDF, Newtownards (0247) 812449
Scotland: Jim Henderson, GM4HKW, Falkirk (0324) 25559

Opening hours:
LOUTH: 9-12; 1-5pm Mon-Fri. By appointment Sat 9-12.
LEICESTER: May's Hi-Fi, Churchgate (Tel. 0533-58662). Mon Sat 9-6pm; closed Thurs.

RadioShack Ltd for Crazy Clearance

UNITED KINGDOM SALES & SERVICE FOR

COLLINS EQUIPMENT

		inc. vat	carr.
KWM-380	Amateur HF Transceiver	1,897.50	10.00
KWM-380 OPTIONS			
AC-3801	Noise Blanker	124.20	5.00
AC-3802	Speech Processor	POA	—
AC-3803	Control Interface	86.25	2.00
AC-3810	CW Filter, 500 HZ	62.10	1.00
AC-3811	CW Filter, 250 HZ	62.10	1.00
AC-3812	RTTY Filter, 1.7 kHZ	62.10	1.00
AC-3813	AM Filter, 6.0 kHZ	62.10	1.00
KWM-380 ACCESSORIES			
AC-2801	Rack Mount	86.25	2.00
AC-2808	Blower Kit	124.20	2.00
AC-2821	DC Standby Power Cable	34.50	2.00
MM-280	Handheld Microphone	23.00	2.00
MM-281	Handheld Noise cancelling Mic	28.75	2.00
SM-280	Desk Top Microphone	48.30	2.00
SM-281	Desk Top Noise cancelling Mic	54.05	2.00
AC-2827	CW Key	18.40	2.00
AC-2828	Microphone Foot Switch	23.00	2.00
AC-2829	Headphones	41.40	2.00
AC-2830	Lightweight Headphones	23.00	2.00
KWM-380 BOOKS			
NTN	Owners Manual	4.00	1.00
NTN	Service Manual	20.00	2.00

R. L. DRAKE PRODUCTS

		inc. vat	carr.
TR-7/DR-7	Transceiver/Gen. cov. Receiver, Digital	1035.00	5.00
PS-7	Power Supply 120/240v for TR-7	207.00	5.00
PS-75	Sideband Duty P.S.U. for TR-7 120/240v	138.00	5.00
RV-7	Remote V.F.O. for TR-7	132.25	2.00
MS-7	Matching Speaker for TR-7 and R-7	29.90	2.00
R-7/DR-7	Digital Receiver 0-30 MHz	989.00	5.00
SL-300	CW Filter for TR-7 and R-7 (300 Hz)	39.10	0.50
SL-500	CW Filter for TR-7 and R-7 (500 Hz)	39.10	0.50
SL-1800	SSB/RTTY Filter for TR-7/R-7 (1800Hz)	39.10	0.50
SL-4000	AM Filter for R-7 Receiver (4000 Hz)	39.10	0.50
SL-6000	AM Filter for TR-7 and R-7 (6000 Hz)	39.10	0.50
AUX-7	Range Prog. board and 1 Receiver module	32.20	1.00
RRM-7	Range receiver modules for Aux-7 (500 KHz)	5.75	0.50
RTM-7	Range tcve. modules for Aux-7 (500 KHz)	5.75	0.50
NB-7	Noise Blanker for TR-7	66.24	1.00
NB-7A	Noise Blanker for R-7 Receiver	66.24	1.00
FA-7	Fan for TR-7 and PS-7	20.70	2.00
MMK-7	Mobile mounting kit for TR-7	34.50	2.00
MN-7	ATU/RF Wattmeter, 160-10 m (250w)	124.20	5.00
MN-2700	ATU/RF Wattmeter 160-10 m (2kw)	207.00	5.00
WH-7	RF Wattmeter/VSWR Bridge (HF)	59.80	2.00
385-0004	Service Manual for TR-7	18.50	2.00
385-005	Service Manual for R-7	18.50	2.00
7037	TR-7 Service Kit	37.95	1.00
L-7E	Linear Amp. 2kw. 10m-160m. *Without Tubes*	759.00	10.00
	Tubes for L-7E (2 × 3-500Z)	138.00	5.00
TR-4CW(RIT)	Transceiver AM/SSB/CW with R.I.T.	496.80	5.00
AC-4	120/240v Power Supply for TR-4CW	109.25	5.00
34-PNB	Plug-in Noise Blanker for TR-4CW	73.60	1.00
DC-4	DC Power Supply for TR-4CW	138.00	5.00
RV-4C	Remote V.F.O. for TR-4CW	109.25	5.00
FF-1	Crystal Control for TR-4CW	39.10	1.00
MS-4	Speaker for TR-4CW; R-4C; SPR-4	29.50	2.00
TV-42LP	Low Pass Filter 100W	10.35	1.00
TV-3300LP	Low Pass Filter 2kw	18.40	1.50
7073	Hand Microphone for TR-7	18.40	1.00
7077	Desk Microphone for TR-7	29.90	2.00
DL-300	Dummy Load, 300W	20.70	1.00
DL-1000	Dummy Load, 1000w	37.95	2.00
RCS-4	Remote control ant. switch, 5 way (4 line)	82.80	5.00
CS-7	Remote control ant. switch, 5 way (7 line)	115.00	5.00
B-1000	Balun for MN-7 and MN-2700, 4:1	20.70	1.00
1525-EM	Encoder Microphone	36.80	1.00
AA-10	2m Amplifier, 1w in-10w output	46.00	1.00
WV-4	RF Wattmeter 20-200 MHz	69.00	2.00
SPR-4	Programmeable gen. purpose Receiver	460.00	5.00
DC-PC	DC Power Cord for SPR-4	4.60	0.50
FL Filters	For R-4C, .25/.5/1.5/4.0/6.0kHz, each	39.10	0.50
Manuals	Spare Operating Manuals	6.00	1.00
Crystals	Accessory Crystals for R-4C and SPR-4	6.44	0.50
Interface	R-7/TR-7 connecting cable	20.70	1.00
AK-75	Multiband Antenna	23.00	2.00
AA-75	Antenna Insulator Kit	2.30	0.50
RP-700	Receiver Projector	69.00	1.00
SP-75	Speech Processor	79.35	2.00

BENCHER PRODUCTS

BY-1	Keyer Paddle (Black base)	28.75	2.00
BY-2	Keyer Paddle (Chrome base)	37.75	2.00
BY-3	Keyer Paddle (Gold plated)	92.00	2.00
ZA-1	Balun 3.5-30 MHz for dipoles	12.65	1.00
ZA-2	Balun 14-30 MHz for beam antennas	13.80	1.00

HAL COMMUNICATIONS

		inc. vat	carr.
DS-2000	KSR	322.00	5.00
	Optional Morse for DS-2000	98.90	5.00
DS-3000	KSR version 3.X	920.90	5.00
DS-3000	KSR version 2.X	675.00	5.00
DS-3100	ASR super deluxe	1536.40	5.00
ST-6000	Demod./Keyer/Scope	414.00	5.00
ST-5000	Demod./Keyer	207.00	5.00
RVD-1005	V.D.U. Baudot	230.00	5.00
DKB-2010	Demod. keyboard with memory	253.00	5.00

TEN-TEC EQUIPMENT

TRANCEIVERS			
515	Argonaut, 5w. SSB/CW, 3·5-30MHz	276.00	5.00
540	Triton IV 200w. SSB/CW, 3·5-30MHz	437.00	5.00
544	Triton IV as above with Digital readout	546.25	5.00
545	Onmi-A. Analog. Series B. SSB/CW, 1·8-30MHz	598.00	5.00
546	Omni-D. Dig. Series B. SSB/CW, 1·8-30MHz	701.50	5.00
570E	Century 21, CW only, 3·5-29MHz	230.00	5.00
574E	Century 21, Dig. 70w. CW, 3·5-29MHz	299.00	5.00
580	Delta Digital, 200w, SSB/CW, 9 Bands	552.00	5.00
POWER SUPPLIES			
210/E	115/230 vac, 13vdc, 1A, for Argonaut	27.60	2.00
252MO/E	115/230 vac, 13vdc, 18A, for Omni	89.70	5.00
262M/E	230 vac, 13vdc, 18A, deluxe with VOX (Triton)	101.20	5.00
280	230 vac, for Delta tcvr	92.00	5.00
ACCESSORIES			
206A	Crystal Calibrator	18.86	2.00
208A	CW Filter for Argonaut	29.90	2.00
212	29.0-29.5 Crystal for Models 540/544	3.45	0.50
213	29·5-5·30MHz Crystal for models 540/544	3.45	0.50
215P	Microphone, ceramic, with plug	18.40	2.00
217	500Hz 8 pole Ladder Filter	36.80	1.00
218	1·8KHz 8 pole Ladder Filter	36.80	1.00
240	160m Converter for Models 540/544	69.00	2.00
241	Crystal Oscillator for Models 540/544	23.00	1.00
242	Remote V.F.O. for Models 540/544	112.70	5.00
243	Remote V.F.O. for Models 545/546	87.40	5.00
244	Dig. Display/Counter for Models 540/544	124.20	5.00
245	CW Filter for Models 540/544	17.25	2.00
247	Antenna Tuner	43.70	2.00
248	Noise Blanker for Models 545/546	32.30	1.00
249	Noise Blanker for Models 540/544	18.40	1.00
276	Crystal Calibrator for Model 570E	18.86	1.00
277	Ant. tuner/VSWR Bridge for Century 21	57.50	2.00
1140	DC Circuit Breaker for 540/544/545/546	5.75	1.00
1170	DC Circuit Breaker for Century 21	5.75	1.00
KEYERS			
645	Ultramatic, dual paddle for 545/546	55.20	2.00
670	Single-paddle keyer for 570/574	18.86	2.00
KR-5A	Single-paddle keyer, 6-14 vdc	25.30	2.00
KR-50	Ultramatic, dual paddle, 117 vac/6-14vdc	69.00	2.00

AVANTI ANTENNAS

AH151-3G	2m on-glass mount antanna	19.78	5.00
AH150-3M	2m magnetic mount antenna (3dB)	24.95	5.00
AH450-5G	70cm on-glass mount antenna	21.85	5.00
AH450-3G	70cm on-glass mount antenna (3dB)	19.78	5.00
AH28-9B	10m dual polarity base antenna	79.35	5.00
AV-200	27MHz on-glass mont antenna	17.25	2.00
AV-241	27MHz magnetic mount antenna	25.30	5.00

VIBROPLEX

Presentation	Super deluxe	89.70	2.00
Original	Deluxe	59.80	2.00
Original	Standard	46.00	2.00
Lightning	Deluxe	59.80	2.00
Lightning	Standard	46.00	2.00
Champion		43.70	2.00
Vibro-Keyer	Deluxe	59.80	2.00
Vibro-Keyer	Standard	46.00	2.00

Bargains at Leicester Exhibition

BEARCAT SCANNING RECEIVERS

BC-210		184.00	5.00
BC-220		258.75	5.00
BC-250		258.75	5.00

TELEX COMMUNICATIONS INC

HFC-91	Underchin headphones	6.21	1.00
HMC-2	Underchin headphones	9.20	1.00
HTC-2	Twin Receiver headphones	14.72	1.00

BOOM MICROPHONE HEADSETS

CM-610	3-2-20 ohms. high impedance mic	29.90	2.00
CM-1210	3-2-20 ohms. high impedanc mic	39.10	2.00
CM-1320	3-2-20 ohms. high impedance mic	48.30	2.00
CM-1320S	3-2-20 ohms. Single headphone	36.80	2.00

DUAL MUFF HEADPHONES

C-610	Dual Receiver magnetic	6.90	2.00
SWL-610	Dual Receiver magnetic	8.28	2.00
C-1210	Dynamic, foam-padded	18.86	2.00
C-1320	3-2-20 ohms. *TELEXS BEST*	26.22	2.00

MICROPHONES (battery powered)

PROCOM 1	High Output	11.96	2.00
PROCOM 11	Variable gain	17.95	2.00
CB-73R	Dynamic, noise-cancelling	23.92	2.00
CB-73S	as above with 6-wire lead	25.30	2.00

HUSTLER ANTENNAS

MO-1	Foldover Mast (fold is 15 inches above base)	13.80	5.00
MO-2	Foldover Mast (fold is 27 inches above base)	13.80	5.00
BM-1	Bumper Mount	10.35	2.00
C-32	Ball Mount	5.29	2.00
C-29	Stainless steel Spring	8.05	2.00
RM-10	10m Resonator	6.90	2.00
RM-15	15m Resonator	8.05	2.00
RM-20	20m Resonator	9.20	2.00
RM-40	40m Resonator	11.50	5.00
RM-80	80m Resonator	13.80	5.00
SF-2	2m 5/8 whip	9.20	5.00
RM-10S	High Power 10m Resonator	9.20	2.00
RM-15S	High Power 15m Resonator	10.35	2.00
RM-20S	High Power 20m Resonator	11.50	2.00
RM-40S	High Power 40m Resonator	13.80	5.00
RM-80S	High Power 80m Resonator	18.40	5.00
4-BTV	10-40m Vertical	69.00	5.00
5-BTV	10-80m Vertical	87.40	5.00
DCX	Discone VHF/UHF 40-700MHz	13.80	5.00
DCL	Discone VHF/UHF 40-700MHz (with 50ft coax)	20.70	5.00
QD-1	Quick Disconnect	10.35	1.00
5106	Top section of QD-1	8.05	1.00
HLM	Trunk lip Mount	12.65	2.00
CG-144	2m Colinear	23.00	5.00
CGT-144	2m Colinear with Mount	29.90	5.00
G6-144A	2m Colinear for Base Station use	52.90	5.00
G7-144	2m Colinear for Base Station use (7dB)	73.60	5.00

ASTATIC MICROPHONES

T-UG9-D104	Golden Eagle	71.30	2.00
T-UPG-D104	Silver Eagle	50.06	2.00
UG8-D104	Crystal D104	32.20	2.00
T-UG9-D104	D104 with amplifier and grip to talk	41.40	2.00
T-UP9-D104	D104 with amplifier and p.t.t.	41.40	2.00
525-DL6	Hand microphone. Dynamic. 400 ohms	12.42	2.00
400	Hand microphone. Dynamic. *BUCKEYE*	5.75	2.00
565-M6	Hand microphone. FET amp. *MARINER*	32.20	2.00
D104-M	Hand microphone. FET amp. 4 wire	24.15	2.00
D104-M6	Hand microphone. FET amp. 6 wire	28.75	2.00
555	Hand mic. noise-cancelling. 4 wire	21.85	2.00
557	Hand mic. noise-cancelling. 6 wire	26.45	2.00
531	Hand microphone. High impedance	8.05	2.00
539	Hand microphone. Noise-cancelling	8.05	2.00
1104-C	Desk Microphone. FET amp	36.80	2.00

TRIO OSCILLOSCOPES

CS-1830	Dual trace 30MHz B/w with delayed sweep	523.25	5.00
CS-1577	Dual trace 30MHz with signal delay	471.50	5.00
CS-1572	New dual trace 30MHz scope for VTR servicing	488.75	5.00
CS-1566	Dual trace 20MHz	339.25	5.00
CS-1560A	Dual trace 15MHz 10mV/cm on X and Y	316.25	5.00
CS-1562A	Dual trace 10MHz auto run and trigger TB	261.05	5.00
CS-1352	Dual trace 15MHz portable, mains/12v	362.26	5.00
CS-1575	Dual trace 4ch. audio scope	270.25	5.00
CO-1303D	Sgl. trace 5MHz service/student scope	109.25	5.00
DM-800	Dip resonance meter 700kHz-250MHz	51.75	1.00
AG-203	Sine/square generator. 10Hz-1MHz	120.75	5.00
AG-202	Sine/square generator. 20Hz-200kHz	65.55	5.00
SG-402	Matching RF generator. 100kHz-30MHz	52.90	5.00
DL-705	Digital multimeter	80.50	5.00
FC-756	Frequency counter. 10Hz-500MHz	258.75	5.00

The above scopes are complete with probes

TRIO EQUIPMENT

TS-820	160-10m Transceiver. 200w P.E.P.	669.30	5.00
DG-1	Digital readout to 100Hz	121.90	1.50
SP-820	Speaker	37.95	1.50
VFO-820	External V.F.O.	118.45	5.00
YG-88C	CW Filter. 8 pole	36.80	0.50
TS-520SE	160-10m Transceiver. 200w P.E.P.	437.00	5.00
DG-5	Digital readout and freq. counter	103.50	1.50
SP-520	Speaker	17.25	1.50
VFO-520S	External V.F.O	98.90	5.00
VG-3395C	CW Filter. 8 pole	37.95	0.50
DK-520	Conversion Kit to fit DG-5 to older TS-520	10.35	1.00
AT-200	160-10m Antenna Tuner. 200w	82.80	1.50
SM-220	Station Monitorscope	197.80	5.00
BS-8	TS-820 scan board for SM-220	48.30	0.50
BS-5	TS-520 scan board for SM-220	48.30	0.50
R-820	Amateur Band Receiver	690.00	5.00
YG-455C	CW Filter. 500Hz	58.65	0.50
YG-455CN	CW Filter. 250Hz	60.95	0.50
YG-88A	AM Filter. 6kHz	34.50	0.50
TS-180S	160-10m solid state Transceiver. 200w P.E.P.	589.95	5.00
TS-180S	As above but with Digital frequency memories	679.65	5.00
VFO-180	External V.F.O.	96.60	2.00
SP-180	Speaker	36.80	2.00
DF-180	Digital frequency control	104.65	1.00
AT-180	160-10m Antenna Tuner	95.45	5.00
PS-30	Mains Power Unit for TS-180	85.10	5.00
TS-120S	80-10m mobile Transceiver	432.40	5.00
TS-120V	80-10m mobile Transceiver. 20w P.E.P	347.30	5.00
MB-100	Mobile mounting bracket	17.25	1.00
YK-88C	CW Filter. 500Hz for TS-120S or TS-120V	28.75	0.50
SP-120	External speaker	25.30	2.00
VFO-120	External V.F.O.	89.70	5.00
AT-120	100w Antenna Tuner	55.20	2.00
PS-20	AC Power Supply for TS-120V	44.85	5.00
PS-30	AC Power Supply for TS-120S	85.10	5.00
TL-120	80-10m 200w P.E.P. Linear for TS-120V	128.80	5.00
TL-922	160-10m Linear Amp. 2kW. *Tubes included*	672.75	5.00
MC-50	Desk Microphone dual impedance	24.15	2.00
MC-35S	Handheld Microphone. 50K	13.80	1.00
MC-30S	Handheld Microphone. 500 ohm	13.80	1.00
LF-30A	HF Low Pass Filter. 1Kw	18.40	1.00
BPF-2A	2m Bandpass Filter. 144-146MHz. 50w rms	21.85	1.50
RD-300	High Power Dummy Load	48.30	2.00
TS-770E	2m/70cm all mode Transceiver	763.60	5.00
SP-70	Matching Speaker	18.40	2.00
TR-9000	2m synthesised multi-mode mobile tcvr	345.00	5.00
BO-9	Base plinth for TR-9000	32.20	5.00
TR-7600	2m synthesised mobile/fixed tcvr	220.00	5.00
RM-76	Microprocessor control unit	60.95	1.50
TR-2300	2m FM portable tcvr. PLL with all 80ch	POA	5.00
VB-2300	10w booster	49.45	2.00
MB-2	Mobile mount	17.25	1.00
RA-1	Helical rubber antenna	166.75	0.50
PS-1200	Power unitcharger for 2300/3200/2200GX	29.50	2.00
TR-2400	2m synthesised handheld tcvr	210.45	5.00
ST-1	Base stand and quick charger	43.70	2.00
BC-5	12v quick charger	17.25	2.00
SC-3	Carrying case	11.50	0.50
PB-24		14.26	1.50
TR-3200	70cm FM tcvr, fitted with 3 channels	164.45	5.00
MB-1A	Matching mobile mount	9.20	1.00
PB-10	Pack of 10 ni-cad batteries	10.35	0.50
TR-3200/2300	Spare power lead	1.30	1.60
R-1000	Gen. cov. Receiver. 0-2-30MHz	297.85	5.00
SP-100	External Speaker	26.45	2.00
HS-4	Headphones, tailored response	10.35	1.00
HS-5	Headphones, tailored response	21.85	1.00

KDK KYOKUTO

KYOKUTO DENSHI COMPANY LIMITED

KDK 2025 2m SYNTHESIZED 25w TRANSCEIVER

- ★ Custom designed microprocessor control
- ★ 25kHz *and* 12·5kHz synthesizer steps!!
- ★ 'Instant QSY', 10 times rate button
- ★ 25 Watts of reliable RF output
- ★ Band scan between any 'easy set' limits
- ★ 10 write-in non-volatile memory channels
- ★ Memory scanning with hold facility
- ★ Standard ± 600kHz or any repeater split

The KDK FM2025E is a 12V dc two-metre FM transceiver for mobile or base station use. Although feature packed, operational ease is assured by use of a "custom microprocessor.

Digital frequency synthesis provides full band coverage in 12·5kHz or 25kHz steps. "Single knob" frequency selection is by an optically coupled encoder. A dialling speed switch (increases tuning steps) facilitates rapid QSY's.

A 10 slot memory with Ni-Cad back-up, provides 10 duplex (plus + 600kHz shift) and/or 5 semi-duplex channels, making the 2025 as easy to use mobile as a crystal controlled transceiver. One memory is semi-dedicated to "priority" and programmable when the 2025 is dial controlled.

The 2025 embodies the best non-lockout scanner. It scans occupied or empty channels and a flick switch enables immediate transmission. The scanner works on the memories and across any selected portion of the band (scan limits are defined by two of the memories).

Dual gate UHF MOSFETS in the RF and mixer provide superior intermodulation performance with high sensitivity maintained over the band by auto-varicap tuning. A monolithic crystal filter in the first IF and a 15 pole ceramic filter in the second provides excellent selectivity.

The single conversion transmitter uses a balanced mixer and a VCO on the signal frequency (directly modulated for superb FM) and a hybrid power module for 25W (or 3W) RF. The PA is impervious to breakdowns under infinite VSWR.

Necessary control function instructions are programmed into the microprocessor itself. But by re-arranging a diode matrix, the lower frequency transceive limit, the high frequency receive limit and the high frequency transmit limit may be altered to allow for changes of band plan or location.

Switchable auto-tone-burst, RF attenuator, squelch, microphone, microphone clip, power lead, mounting bracket, handbook are, of course, part of the package.

NEW LOW PRICE £225.00 INC. VAT!!

INCLUDING VAT AND SECURICOR DELIVERY

Direct from the Importers or from any of those dealers listed below:

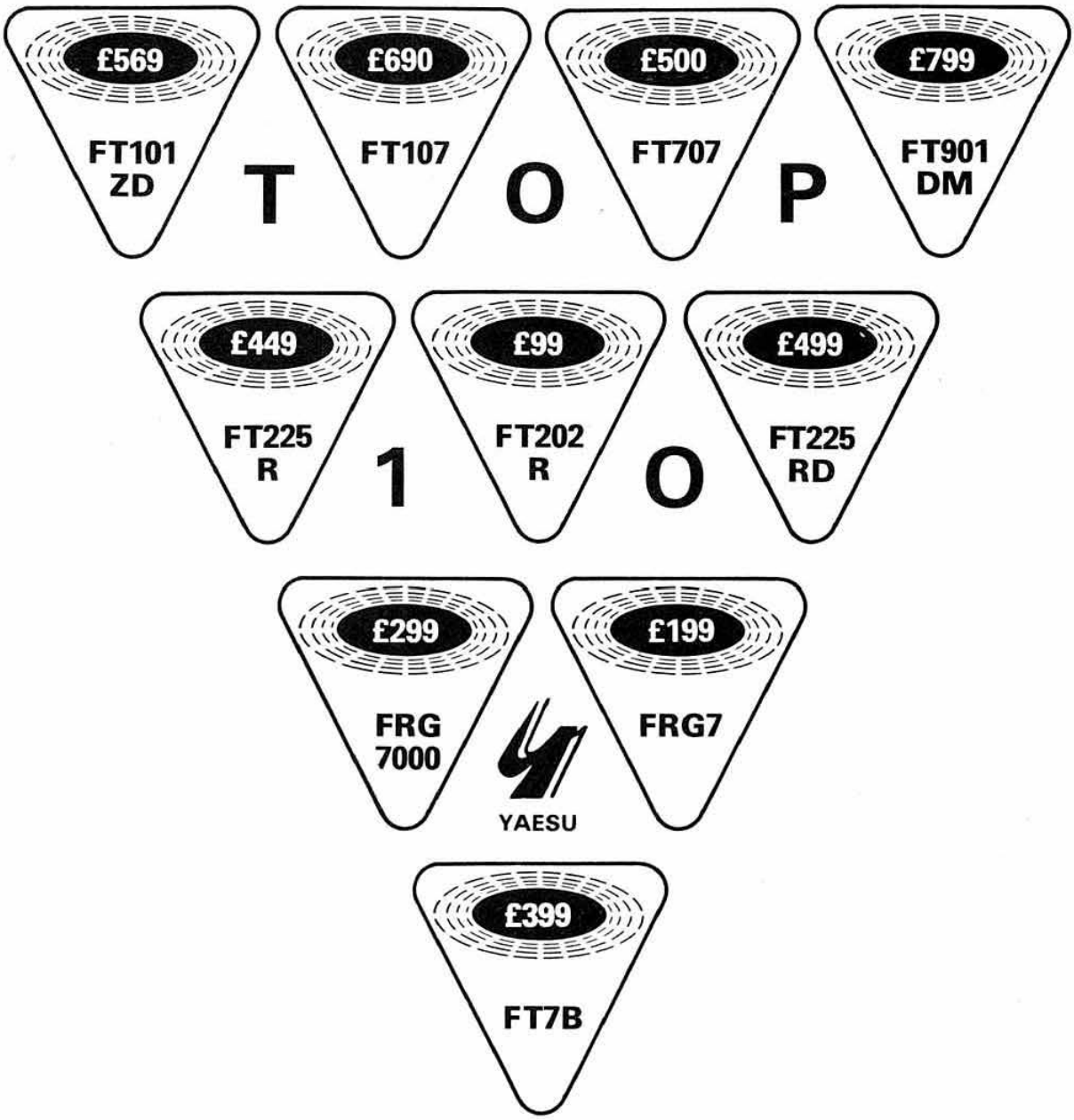
AMATEUR ELECTRONICS LTD, 508-514 Alum Rock Road, Birmingham 8	J. BIRKETT, 25 The Strait, Lincoln	D. P. HOBBS, 13 Benedicts Street, Norwich	REG WARD & CO LTD, George Street, Axminster
AMCOMM, 194A Northolt Road, South Harrow	BREDHURST ELECTRONICS, Handcross, West Sussex	HOLDINGS LIMITED, Mincing Lane, Blackburn BB2 2AF	SMC LTD, Osborne Road, Totton
AMATEUR RADIO EXCHANGE, 2 Northfield Road, London, W13	C. B. ELECTRONICS, 771 Ormskirk Road, Wigan	LEYS AND DUNCAN, 19 Low Street, Banff	SMC (JACK TWEEDY) LTD, 150 Horncastle Road, Woodhall Spa
AMATEUR RADIO SHOP, 4 Cross Church Street, Huddersfield HD1 3PT	GAREX ELECTRONICS, 7 Norvic Road, Marsworth	LOWE ELECTRONICS, Chesterfield Road, Matlock	SMC (JACK TWEEDY) LTD, 79 Chatsworth Road, Chesterfield
B. BAMBER ELECTRONICS, 5 Station Road, Littleport	L. HARDIE, 542 George Street, Aberdeen	RADIO SHACK LTD, 188 Broadhurst Gardens, London NW6 3AY	SMC (NORTHERN) LTD, 257 Otley Road, Leeds 16

SMC

SOUTH MIDLANDS COMMUNICATIONS LTD

S M HOUSE, OSBORNE ROAD
TOTTON, SOUTHAMPTON
HAMPSHIRE SO4 4DN

TELEPHONE: TOTTON (0703) 867333
CABLE: 'AERIAL' SOUTHAMPTON
TELEX: 477351 SMCOMM G



REDUCTIONS!

YES, SMC's YAESU PRICES ARE DOWN!!

SUBSTANTIAL REDUCTIONS ON ALL MAJOR ITEMS OF YAESU MUSEN

CONTACT ANY SMC BRANCH FOR FURTHER DETAILS OF OUR SERVICE

VERSATOWER

TELESCOPIC & TILTOVER RADIO TOWERS

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.

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.*

25–120ft, post, base plate, wall, fixed base or mobile (on high-speed trailer) versions.

Price of towers are for the complete package – tower sections, mounts, telescopic and luffing gear, guys, head unit and winches.
AS APPROPRIATE FOR ANY PARTICULAR MODEL

The sample of prices exclude VAT and delivery

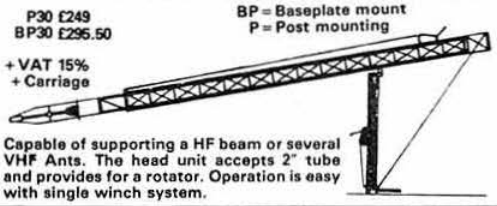
STANDARD 13M20 SERIES				*HEAVY DUTY 16M20 SERIES*			
Post Mounting 13M20				*Post Mounting* 16M20			
P25	25'	Tower	£236.20				
P40	40'	Tower	£323.60	P40	40'	Tower	£476.60
P60	60'	Tower	£392.70	P60	60'	Tower	£541.10
Fixed Base 13M20				*Fixed Base* 16M20			
FB25	25'	Tower	£175.60				
FB40	40'	Tower	£262.40	FB40	40'	Tower	£382.20
FB60	60'	Tower	£332.20	FB60	60'	Tower	£446.70
Socket Types 13M20				*Socket Types* 16M20			
SP25	25'	Tower	£274.60				
SP40	40'	Tower	£361.50	SP40	40'	Tower	£528.50
SP60	60'	Tower	£431.30	SP60	60'	Tower	£592.70
Base plate 13M20				*Base plate* 16M20			
BP25	25'	Tower	£276.00				
BP40	40'	Tower	£361.90	BP40	40'	Tower	£496.30
BP60	60'	Tower	£431.20	BP60	60'	Tower	£560.70
Wall Mounting 13M20				*Wall Mounting* 16M20			
W25	25'	Tower	£190.20				
W40	40'	Tower	£277.00	W40	40'	Tower	£390.30
W60	60'	Tower	£346.80	W60	60'	Tower	£449.50

80-85-100-120' and MOBILES PRICES ON APPLICATION

NEW '30ft': 10ft SECTIONS

P30 £249
BP30 £295.50
+VAT 15%
+Carriage

BP = Baseplate mount
P = Post mounting



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

SOUTH MIDLANDS COMMUNICATIONS LTD

OSBORNE ROAD, TOTTON
SOUTHAMPTON SO4 4DN
SMC
Telex: 477351 SMCOMM G
Tel: Totton (0703) 867333

SMC-HS

INTERCHANGEABLE ELEMENT MOBILE ANTENNAS

SMC HS Mobile antennas, tabulated below, features an in-built PL259M connector which mates with the SO239M of the cable assembly (fits a $\frac{3}{8}$" hole in car body or the cast chromed gutter mount) or the magnetic base (recommended for smaller antennas only). This arrangement is ideal for easy removal (element change, car wash and anti-vandal), tests and portable operation.

MODEL	BAND	GAIN	TYPE	POWER	LENGTH	PRICE
20SE	14MHz		($\frac{1}{4}\lambda$)	100W	1·72m	£12.00
15SE	21MHz		($\frac{1}{4}\lambda$)	130W	1·72m	£10.00
10SE	28MHz		($\frac{1}{4}\lambda$)	100W	1·27m	£10.00
4E	70MHz	0dB	$\frac{1}{4}\lambda$	150W	1·03m	£6.50
2NE	144MHz	3dB	$\frac{5}{8}\lambda$	150W	1·30m	£5.50
78F	144MHz	4·5dB	$\frac{7}{8}\lambda$	100W	1·75m	£10.00
78B	144MHz	4·5dB	$\frac{7}{8}\lambda$	150W	1·72m	£11.00
258	432MHz	5·5dB	$2\times\frac{5}{8}\lambda$	100W	0·94m	£10.00
358	432MHz	6·3dB	$3\times\frac{5}{8}\lambda$	100W	1·36m	£12.50

SMC78B 'BALL' | BASE COIL | BASE COIL 'FOLDED' STATE

All models have a locking fold-over joint except the SMC78B which has an in-built ball (in case the cable assembly is fitted askew).

CABLE ASSEMBLY

SMCSOCA

C/w 4M RG58 & PL259 plug
SMCSOCA . . £3.00

GUTTER MOUNTING

SMCGCD

Adjustable, cast, chrome
SMCGCD . . . £3.00

MAGNETIC BASE

SMCSOMM

c/w 4M RG58 & PL259 plug
SMCSOMM . £6.50

Carriage, £1.00 complete antennas, or £0.50 for accessories – any quantity

NB: Prices do NOT include VAT (15%)

SOUTH MIDLANDS COMMUNICATIONS LTD

OSBORNE ROAD, TOTTON
SOUTHAMPTON SO4 4DN
SMC
Telex: 477351 SMCOMM G
Tel: Totton (0703) 867333

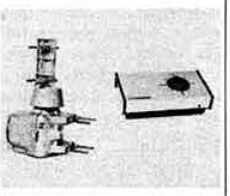
South Midlands

SMC FOR THE WIDEST CHOICE IN ROTATORS

CDE

Accurate, silent self-calibrating control box. Dial up desired beam heading, push knob; motor rotates to that position and then switches off.

For UHF and small VHF use



RC5W 5-core control cable per metre **26p**
AR30 (post and packing free) **£41.00**

CDE

Upper support bearing for AR30, AR20, etc.

Takes 1⅛" stub and 1⅝" mast.

Post and packing **85p**
CD562 **£6.75**

STOLLE

Upper support bearing for all "offset" Stolle.

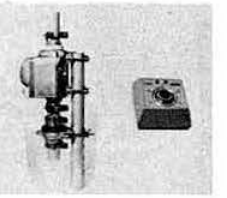
Takes 1⅛" stub and 2" mast.

Post and packing **£1.00**
RZ100 **£10.00**

STOLLE

Automatic control box. Dial desired direction and the rotator turns to the position and stops. Turning shaft (up to 1⅜") passes through rotator.

For UHF and small VHF use.

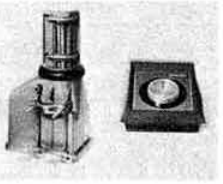


RC5W 5-core control cable per metre **26p**
2010 (post and packing free) **£45.00**

CHANNEL MASTER

Automatic control box. Dial direction secondary pointer gives position during travel.

Takes 1-2" mast and 1-1⅞" stub.



RC3W 3-core control cable per metre
9502A (post and packing free) **£46.00**

CHANNEL MASTER

Upper mast support bearing.

Takes 2" mast and 1¾" stub.

Post and packing **£1.20**
9523 **£10.20**

Rotary bearing 3-way guying.

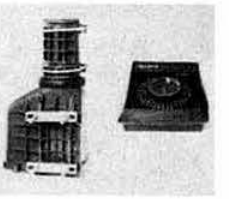
Takes 1⅞-2⅛" mast.

Post and packing **85p**
9525 **£11.30**

CHANNEL MASTER

Automatic control box. Dial direction secondary pointer gives position during travel. Stainless steel hardware. Heaviest duty "offset type". To 5sq ft.

Takes 1-2" masts and 1-2" stub.

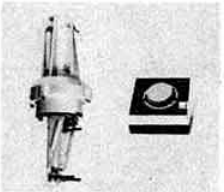


RC3W 3-core control cable per metre
9508 (post and packing free) **£57.00**

STOLLE

Automatic control box. 24V AC motor. Lightweight head.

To 2½sq feet. Takes 1¼-1½" tube.

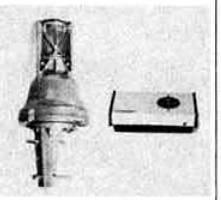


RC50W core control cable per metre **26p**
505 (Rail £1.65) **£25.00**

CDE

Accurate, silent self-calibrating control box. Dial up desired beam heading, push knob; motor rotates to that position and then switches off.

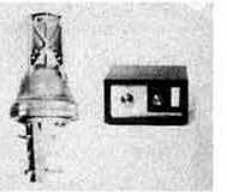
For VHF use and light HF use c/w low casting.



RC5W 5-core control cable per metre **26p**
AR40 (post and packing free) **£52.00**

CDE

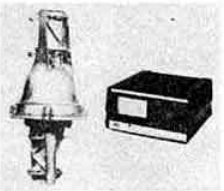
Four position preset plus normal manual controls. Handles aerials up to 5sq ft of wind area. Supplied with lower mast fit casting.



RC5W 5-core control cable per metre **26p**
BT1 (post and packing free) **£79.50**

CDE

Large illuminated meter gives read out of antenna heading at all times. Armature brake. Low voltage meter. Handles antennas to 8½sq ft.



RC8W 8-core rotor cable per metre **39p**
CD45 (Securicor Delivery free) **£99.00**

CDE

Large illuminated meter gives read out of antenna heading at all times. Wedge solenoid brake mechanism. Handles antennas to 15sq ft.

RC8W 8-core rotor cable per metre **39p**
HAM IV (Securicor Delivery free) **£145.00**

CDE

Large illuminated meter gives read out of antenna heading at all times. Wedge solenoid brake mechanism. Handles antennas to 30sq ft.

RC8W 8-way rotor cable per metre **39p**
T2X (Securicor Delivery free) **£199.00**

PRICES DO NOT INCLUDE VAT (15%)

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

A	G3ZUL	Brian	Stourbridge	(03843) 5917
G	GI3KDR	John	Bangor	(0247) 55162
E	GM8GEC	Jack	Edinburgh	(031665) 2420
N	GI3WWY	Mervyn	Tandragee	(0762) 840656
T	GW3TMP	Howarth	Pontybodkin	(035287) 846/324
S	GW4GSW	Alan	Swansea	(0792) 24140

Communications Ltd

SMC FOR THE WIDEST CHOICE IN ANTENNAS

YAESU

HF ANTENNAS

GEM QUAD PRODUCTS				
GQ2E	2 Ele antenna	£124.00	R	£3.75
GQ3E	3 Ele antenna	£187.00	R	£6.45
GQ4E	4 Ele antenna	£249.00	R	£7.05
GQCK1	Con kit 1 ele	£63.00	R	£2.90
GQCK2	Con kit 2 ele	£125.00	R	£4.20
GQSPIDER	Centre piece	£26.25	SP	£1.25
GQSPREADER	Spreader arm	£9.85	R	£1.50
HY GAIN HF ANTENNA				
12AVQ	Vertical 10-20m	£37.50	SR	£1.50
14 AVQ/WB	Vertical 10-40m	£52.50	SR	£1.50
18 AVT/WB	Vertical 10-80m	£76.00	SR	£1.50
14 RMQ	Roof mount kit	£19.50	SR	£1.50
18V	Vertical 10-80m	£27.80	SR	£1.50
18HT	"HY Tower"	£225.00	R	£10.90
103BA	3 Ele Yagi 10m	£51.00	SR	£1.50
105BA	5 Ele Yagi 10m	£92.00	R	£2.75
153BA	3 Ele Yagi 15m	£62.75	R	£2.05
155BA	5 Ele Yagi 15m	£117.50	R	£4.15
203BA	3 Ele Yagi 20m	£117.50	R	£3.45
204BA	4 Ele Yagi 20m	£155.00	R	£5.10
205BA	5 Ele Yagi 20m	£205.00	R	£6.60
402BA	2 Ele Yagi 40m	£158.00	R	£4.55
DB10/15A	3 Ele 10-15m	£115.00	R	£3.40
TH3JNR	3 Ele 10-20m	£113.50	SR	£2.15
TH2MK3	2 Ele 10-20m	£109.75	R	£2.25
TH3MK3	3 Ele 10-20m	£157.00	R	£4.05
TH5DXX	"Thunderbird"	£178.30	R	£4.70
TH6DXX	"Thunderbird"	£205.00	R	£5.90
HYQUAD	2 Ele Quad	£169.00	R	£4.25
BN86	Balun ferrite 1:1	£13.50	SP	£1.00
LA1	Lightning arrest	£39.50	SP	£0.65
JAYBEAM HF ANTENNA				
VR3	Vert 10-20m	£34.00	R	£1.50
TB3	3 Ele 10-20m	£135.00	R	£3.75
MINIBEAM ANTENNA				
C4	Vert miniature	£42.15	SR	£1.50
HQ1	"Mini" quad	£83.85	SR	£2.80
MOSLEY HF ANTENNA				
TA32JRE	2 Ele beam	£78.00	R	£2.25
TA33JRE	3 Ele beam	£116.00	R	£2.40
TA33JRHPE	3 Ele c/w balun	£132.00	R	£2.60
MUSTANG 2	2 Ele beam	£117.00	R	£2.40
MUSTANG 3	3 Ele beam	£145.00	R	£2.60
RD5	Dipole ham	£35.00	SP	£1.25
SWL7	Dipole B.C.	£35.00	SP	£1.25
SMC TRAPPED DIPOLE				
SMC TD/S	Standard 14swg	£26.50	SP	£1.50
SMCTD/HP	Hi power 14swg	£29.50	SP	£1.50
SMCTD/P	Portable ant	£32.50	SR	£1.50
SMC-HS ANTENNA				
SMCHF5V	Vertical 10-80m	£35.00	SR	£1.50
SMCHF5R	Radial kit loaded	£25.65	SR	£1.50
G WHIP HF MOBILE				
GW BASE	Base Standard	£3.90	SP	£0.55
TRIBANDER	Antenna 10-20m	£21.50	SP	£0.75
LF40-160	Loading coil each	£5.70	SP	£0.45
LFWHIP	Telescope whip	£2.90	SP	£0.45
MULTIMOBILE	Antenna 10-20m	£25.00	SP	£1.00
MM40-160	Loading coil each	£5.70	SP	£0.45
MMWHIP	Telescopic whip	£2.90	SP	£0.45
FLEXIWHIP	Antenna 10m	£15.00	SP	£0.75
FF15-160	Loading coil each	£5.70	SP	£0.45
HY GAIN MOBILE ACCS.				
415	Bumper strap	£10.80	SP	£1.50
499	Body mount	£10.80	SP	£1.00
511	Spring H.D.	£9.50	SP	£1.25
417	Spring medium	£8.20	SP	£1.00
SMC-HS MOBILE				
SMC15SE	Ele 15m 1·72m	£11.00	SP	£1.25
SMC10E	Ele 10m 1·27m	£10.00	SP	£1.25
SMC10SE	Ele 10m 1·72m	£11.00	SP	£1.25
SMCSOCA	Cable assembly	£3.00	SP	£0.55
SMCGCD	Gutter clip	£3.00	SP	£0.55
MX913/M	Dust cover	£0.40	SP	£0.35

CABLES & CONNECTORS R.F.

COAXIAL 50 OHM CABLE				
URM95	Solid centre	2·mm	p/m	£0.20
UR43	Solid cebtre	5·0mm	p/m	£0.20
UR76	Stranded core	5·0mm	p/m	£0.22
RG58U	Stranded core	5·0mm	p/m	£0.22
RG213	Low loss	10·2mm	p/m	£0.48
UR67	Low loss	10·2mm	p/m	£0.52
COAXIAL 75 OHM CABLE				
307EP	Economy type		p/m	£0.16
UR70	Stranded light	5·7mm	p/m	£0.24
UR39	Medium duty	7·8mm	p/m	£0.36
UR57	Low loss	10·2mm	p/m	£0.57
BALANCED TWIN CABLE				
302	75 Ohm Light duty		p/m	£0.14
306	300 Ohm Ribbon		p/m	£0.15
2X21	240 Ohm Dual foam		p/m	£0.11
BNC COAXIAL PLUG 50 OHM				
UG88	Standard type 5·5mm			£0.64
UG959	Large Type 11·2mm			£2.60
BNC COAXIAL SOCKET 50 OHM				
UG90	Standard, 4 hole type			£0.66
UG1094	Nut fixing type			£0.62
UG89	Free cable end 5·5mm			£0.82
BNC COAXIAL COUPLER 50 OHM				
UG914	Back to back female			£0.93
UG491	Back to back male			£0.93
UG274	"T" 2 female 1 male			£1.44
SMS 3F BNC	"T" 3 female			£1.74
UG306	Elbow male– female			£1.62
BNC CABLES 50 OHM				
BNC18BNC	1·5' RG58 BNC ends			£2.22
BNC36BNC	3·0' RG58 BNC ends			£2.30
BNC36CROC	3·0' RG58 BNC/clips			£2.17
UHF COAXIAL PLUG				
PL259	Standard type	11·2mm		£0.48
PL259P	Push on type	11·2mm		£0.69
UG175	Reducer	5·0mm		£0.12
UG176	Reducer	5·6mm		£0.12
PL259R	Reduced type	5·0mm		£0.58
PL259A	De-luxe type	11·2mm		£0.98
PL259B	De-luxe type	5·0mm		£0.98
PL259SS	"Solderless"	11·2mm		£0.55
PL259SL	"Solderless"	5·0mm		£0.55
PL259E	Angle type	5·0mm		£0.83
PL259M	Metric type standard			£0.65
PL259PM	Panel mount 4 hole			£0.93
UHF COAXIAL SOCKET				
SO239F	Standard 4 hole fix			£0.42
SO239F31000	4 Hole ptfe Ag plate			£0.84
SO239T	2 Hole fixing type			£0.42
SO239NI	Nut fix inside type			£0.51
SO239NO	Nut fix outside type			£0.51
SO239E	Free angle type 5·0mm			£0.88
UHF COAXIAL ADAPTOR				
PL258	Back to back female			£0.79
PL274	Back to back chassis			£0.93
PL258M	Back to back male			£1.20
M359	Elbow male– female			£0.93
M358	"T" 2 female 1 male			£1.20
M358AF	"T" 3 female			£1.48
M458	"X" 3 female 1 male			£1.85
UG255	UHF socket–BNC plug			£1.53
UG273	UHF plug–BNC socket			£1.53
SO/FP	UHF socket–F plug			£0.60
SO/25	UHF socket 2·5mm jack			£0.69
SO/35	UHF socket 3·5mm jack			£0.69
UHF CABLES				
PL36PL	3·0' RG58 PL259 ends			£1.61
N COAXIAL PLUG 50 OHM				
UG536	Small type 5·5mm			£2.35
UG21	Standard type 11·2mm			£1.15
N COAXIAL 50 OHM				
UG58	Standard 4 hole fix			£0.82
UG1052	Free cable end 5·5mm			£2.49
UG23	Free cable end 11mm			£1.48

VHF ANTENNA

HIDAKA VHF ANTENNA				
LT606	50-500MHz log	£75.95	R	£1.50
JAYBEAM 4 METRE				
4Y/4M	Yagi, 4 element	£14.95	SR	£1.50
PMH2/4M	Harness, 2 way	£10.60	SP	£1.25
JAYBEAM 2 METRE				
HO/2M	Halo, head only	£3.70	SP	£0.55
HM/2M	Halo, with mast	£4.40	SP	£0.65
UGP/2M	Ground plane	£8.15	SP	£1.50
C5/2M	Colinear vert.	£34.80	SR	£1.50
LR1/2M	Colinear	£19.60	SR	£1.50
5Y/2M	Yagi, 5 element	£8.90	SR	£1.50
8Y/2M	Yagi, 8 element	£11.50	SR	£1.50
10Y/2M	Long Yagi 10 ele	£24.70	SR	£1.50
14Y/2M	Long Yagi 14 ele	£31.30	SR	£1.50
D5/2M	Yagi, 5 over 5	£15.90	SR	£1.50
D8/2M	Yagi, 8 over 8	£21.60	SR	£1.50
PBM10/2M	10 Ele parabeam	£29.20	SR	£1.50
PBM/14/2M	14 Ele parabeam	£35.50	SR	£1.50
Q4/2M	Quad, 4 element	£18.70	SR	£1.50
Q6/2M	Quad, 6 element	£24.80	SR	£1.50
5XY/2M	Yagi, 5 ele cros	£18.00	SR	£1.50
8XY/2M	Yagi, 8 ele cros	£22.50	SR	£1.50
10XY/2M	Yagi, 10 ele cros	£29.80	SR	£1.50
PMH2/C	Harness, circular	£5.90	SP	£0.45
PMH2/2M	Harness, 2 way	£7.80	SP	£0.75
PMH2/2ML	Harness, 2 way	£8.80	SP	£1.00
PMH4/2M	Harness, 4 way	£18.70	SP	£1.50
JAYBEAM 2M/70CM				
X6/2M/X12/70	6 Ele 2, 12, 70	£33.50	SR	£1.50
JAYBEAM 70CM				
C8/70	Colinear, vert.	£39.50	SR	£1.50
D8/70	Yagi, 8 over 8	£17.80	SR	£1.50
PBM18/70	18 Ele parabeam	£21.50	SR	£1.50
MBM48/70	Multi, 48 Ele	£24.50	SR	£1.50
MBM88/70	Multi, 88 Ele	£32.60	SR	£1.50
8XY/70	Yagi, 8 Ele X	£27.00	SR	£1.50
12XY/70	Yagi, 12 Ele X	£33.50	SR	£1.50
PMH2/70	Harness 2 way	£6.75	SR	£0.65
PMH4/70	Harness 4 way	£14.30	SP	£1.25
JAYBEAM 1296MHz				
D15/23	Yagi, 15 over 15	£26.90	SR	£1.50
SMC VHF ANTENNA				
GP2U	Ground plane	£4.35	SP	£1.00
SMC-HS VHF ANTENNA				
SMCGDX1	80-480MHz	T.O.S.	SR	£1.50
SMCGDX2	50-480MHz	£41.70	SR	£1.50
SMCVHFL	65-520MHz Rx	T.O.S.	SR	£1.50
SMCGP144W	2m 6dB Colinear	£21.70	SR	£1.50
SMCGP432X	70cm 7dB Colinear	£24.35	SR	£1.50
ASCOT MOBILE ANTENNA				
See page 1138 for full details of ¼ range.				
Please enquire for data on ½ & ¼ λ types.				
BANTEX MOBILE ANTENNA				
42SS	Ele stainless 42"	£1.75	SP	£0.75
40GF	Ele glassfibre 40"	£3.65	SP	£0.95
20SS	Ele stainless 20"	£1.40	SP	£0.65
18GF	Ele glassfibre 18"	£2.75	SP	£0.65
B5	Ele ¾ glass 2m	£7.65	SP	£0.95
BGASS	Ele ¼ stain 2m	£7.00	SP	£0.95
BGAGF	Ele ¼ glass 2m	£8.25	SP	£0.95
B5U	Ele ¾ stain 70cm	£2.15	SP	£0.65
UCL	Ele coln. 70cm	£6.85	SP	£0.75
UDL	Ele coln. 70cm	£13.65	SP	£0.75
BM	Base standard	£2.15	SP	£0.35
BC	Base trunk lip	£7.00	SP	£0.55
BMM	Base Magnetic	£12.35	SP	£1.00
SMC-HS VHF MOBILE ANTENNA				
See page 1139 for details of standard range.				
SMC2M/PL	Helical 2m PL259	£3.00	SP	£0.35
SMC2M/BNC	Helical 2m BNC	£3.85	SP	£0.35
XM913M	Dustcap M SO329	£0.40	SP	£0.35
SMC118M	2m 6dB Colinear	£24.65	SP	£1.50
SMCBSD	Bumper Strap	£6.70	SP	£0.75
SMCSOCAL	Cable Assembly	£3.35	SP	£0.35

(S = Securicor (possible), R = Rail, P = Post) **NB: PRICES AND CARRIAGE COSTS DO NOT INCLUDE VAT (15%)**

Access

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

NORTHERN (Leeds) BRANCH
Colin Thomas G3PSM
257 Otley Road,
Leeds 16. Yorkshire.
Leeds (0532) 782326
9-5.30 Monday Saturday

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

BARCLAYCARD VISA

YAESU MUSEN

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

OUR ONLY AUTHORISED UK AGENTS

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

'101 AND '901
THE
NUMBER ONE
IN
BASE STATION DESIGN

While some talk of "system design" to mean an external power supply and speaker the '01 range offers unparalleled choice, both in frequency coverage (160–10m, 4m, 2m, 70cms), modes (SSB, CW, AM, RTTY and FM) and the incredible range of accessories available.

Call one of our authorised distributors for colour brochures on the two '101Zs and the three '901Ds, study the specifications and features available, remembering you can uprate, at a modest additional expense to end with the transceiver tailored to *your* requirements.

Whichever model you choose it is one of the most comprehensively equipped transceivers (remember the mains PSU is inbuilt) available, and is ready to go on the air. Your investment is safegurded and base station operation enhanced by *the largest line of accessories available, part is illustrated below;*

FTV901R Transvertor main frame, with or without the 2m module, add the 70MHz (or 50MHz) unit then the 430MHz module, note the repeater shift, Oscar facility (cross band with additional Rx), 10MHz coverage on 70cms etc.

FV901DM External spin tuned synthesized VFO with 40 memory channels, 3-speed auto and manual scanning, or for economy the standard FV101Z external VFO.

YO901 Monitor-scope AF, IF, (broad only in 101Z) and RF envelope monitoring, 2 tone oscillator for PEP measurements, add the bandscope to make (or better still start with a *YO901P* and you have a panoramic adaptor (spectrum analyser) facilities with 2, 10 or 20KHz a division.

FC901 Antenna tuner, power meter, (250W FSD) and SWR bridge.

SP901P External speaker with phone patch or the standard *SP901* external speaker.

But this is only half the story! not shown are the;

FL2100Z Linear amplifier, top to ten using a pair of carbon anode 572B triodes.

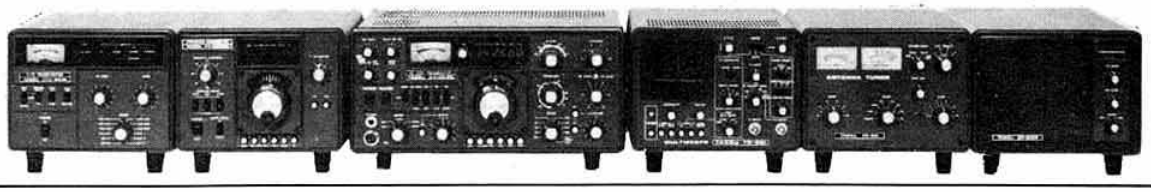
YR901 RTTY/morse decoder/encoder provides a dot matrix video output (optional VHF, 525 line modulator) and mechanical teleprinter outputs with autostart. On RTTY three shifts and two speeds are catered for, on CW speed sensing is automatic, and full page store is incorporated.

YVM1 Video monitor with big 25 × 19cms screen for use with a YR901.

YK901 Keyboard. Output in ASC11 translated to CW or RTTY by the YR901, has AR, AS, BT, HH, SK keys for professional CW.

Small Accessories

QTR24D Quartz world time clock **YH55** Head phones
FF501DX Low pass filter **YD148** Dual impedance desk mic



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.

COUNCIL

President
P. Balestrini, TEng(CEI), MITE, G3BPT

Executive Vice-President
B. O'Brien, G2AMV

Immediate Past-President
J. Bazley, G3HCT

Honorary Treasurer
P. F. D. Cornish, FCA, G3COR

Ordinary members
E. J. Allaway, MB, ChB, MRCS, LRCP, G3FKM
R. Bellerby, BSc, FBIS, G3ZYE
T. P. Douglas, MBE, AMIEE, G3BA
D. S. Evans, PhD. BSc. FIM. G3RPE
K. A. M. Fisher, TEng(CEI), MIPRE, G3WSN
G. R. Jessop, CEng, MIERE, G6JP
D. M. Pratt, BTech, CEng, MIEE, MIERE, G3KEP
G. M. C. Stone, CEng, FIEE, FIERE, G3FZL

Zonal members
Zone A. B. O'Brien, G2AMV
Zone B. J. Anthony, G3KQF
Zone C. D. J. Andrews, G3MXJ
Zone D. L. Hawkyard, G5HD
Zone E. R. G. Barrett, GW8HEZ
Zone F. W. F. McGonigle, GI3GXP
Zone G. G. I. Knight, GM8FFX

REGIONAL REPRESENTATIVES

Region 1—W. M. Furness, G3SMM
Region 2—D. Smith, G4DAX
Region 3—H. S. Pinchin, G3VPE
Region 4—M. Shardlow, G3SZJ
Region 5—R. E. G. Kendall, G8BNE
Region 6—F. S. G. Rose, G2DRT
Region 7—D. A. G. Pedder, G3LFX
Region 8—D. N. T. Williams, G3MDO
Region 9—H. W. Leonard, G4UZ
Region 10—P. Jones, GW4HAT
Region 11—P. H. Hudson, GW3IEQ
Region 12—F. Hall, GM8BZX
Region 13—A. B. Givens, GM3YOR
Region 14—C. W. Tran, GM3WOJ
Region 15—I. Kyle, GI8AYZ
Region 16—M. S. Appleby, G3ZNU
Region 17—H. G. Cunningham, G8FG
Region 18—W. Ricalton, G4ADD
Region 19—R. J. Broadbent, G3AAJ
Region 20—B. L. Goddard, G4FRG

HONORARY OFFICERS

Audio tape and slide library co-ordinator
D. Simmonds, G3JKB

Awards managers
hf—P. Miles, G3KDB
vhf—Jack Hum, G5UM

Emergency communications manager
P. Balestrini, G3BPT

HF manager
E. J. Allaway, G3FKM

Intruder Watch organizer
(Post vacant)

Observation Service organizer
D. M. Pratt, G3KEP

Microwave manager
D. S. Evans, G3RPE

Slow morse organizer
M. A. C. MacBrayne, G3KGU

Telecommunications liaison officer
R. F. Stevens, MBE, G2BVN

Trophies manager
P. A. Miles, G3KDB

VHF manager: T. P. Douglas, G3BA

Video tape and film library co-ordinator
J. Anthony, G3KQF

Correspondence to RRs and honorary officers should be addressed directly to them (QTHR).

RADIO SOCIETY OF GREAT BRITAIN

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

Founded 1913
Incorporated 1926

Member society, International Amateur Radio Union

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

The national society representing all UK radio amateurs

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

GENERAL MANAGER AND SECRETARY
D. A. Evans, G3OUF

EDITOR
A. W. Hutchinson

ANNUAL SUBSCRIPTION RATES

UK corporate: £12.50, including VAT — **Overseas: £12.50**

Associates under 18: £5 — **Students aged 18 to 25: £7.50**
(Student applications should give the member's age at last renewal date and include evidence of student status)

Associated societies: £12.50 (including *Radio Communication);*
£7.50 (excluding *Radio Communication).*

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			
SW from Midlands	G3BA	G3KQF	0930
NE from S Devon	G3CHN	*(Vacancy)*	1000
NW from Manchester	G3SMT	G4IAL	1000
NNW from Cleveland	G8LIC	G8FTZ	1000
W from Carlisle	G8DVD	G3VIJ	1030
SE from Lincoln	G8OFQ	*(Vacancy)*	1030
SW from London	G3FZL	G3IIR/G3VAG	1030
S from Aberdeen	GM8GHV	GM3ZBE	1030
W from Bristol	G4CJZ	G3ZWY	1100
W from Bangor, Co Down	GI3TLT	GI3SXG	1130
Frequency: 145·525MHz (S21 FM). Vertical polarization			
Jersey	GJ8KNV	GJ4ICD	0930
Cornwall	G2ABC	G3NPB	0930
Hampshire, north	G8CKN	G3PZN	0930
Suffolk	G3ZNU	G4FSG	0930
Leeds	G3SPX	G3PSM	0930
Co Down	GI3WEM	*(Vacancy)*	0930
Edinburgh	GM4EHO	GM8PKQ	0930
E Cornwall/S Devon	G3ZYY	*(Vacancy)*	1000
Londonderry	GI2DHB	*(Vacancy)*	1000
London	G3FZL	G3IIR/G3VAG	1000
Birmingham	G3PWJ	G3BA	1000
Lincolnshire	G8OFQ	*(Vacancy)*	1000
Tyneside	G4FUT	*(Vacancy)*	1000
Glasgow	GM8PSM	GM3UCI	1000
Elgin	GM8LHE	*(Vacancy)*	1000
Southampton	G8LVC	G8ADM	1030
E Sussex coast	G8SC	G3ZFE	1030
Bristol	G4CJZ	G3ZWY	1030
Manchester	G3LEQ	G3JWK	1030

QTC
amateur radio news

New dimension *Radio Communication*

Ever since its first issue, as the *T&R Bulletin* in July 1925, the dimensions of the Society's journal have remained virtually unchanged and, while its number of pages increased but slowly, it remained a comfortable size to hold and read.

However, with the tremendous increase in the number of pages over the past few years, it has become too thick for comfort. In addition, fashions change in publishing as in everything else, and the vast majority of magazines are now printed in formats based on the international A4 paper size.

Commencing with the January 1981 issue, therefore, *Radio Communication* will appear in a new format—275 by 210mm page size compared with 245 by 185mm as at present. This will result in an increase of 40 per cent in print area per page, so that 88 pages of the new format will be equivalent of 123 pages of the present size. Not only will this change present the journal in a more modern format but other advantages will accrue in printing and binding.

Members are asked to bear the new size in mind when ordering Easibinders in the near future. It will be essential to specify the format required (for 1980 and earlier issues, or for 1981 issues onwards) and potential purchasers of the existing format binders are asked to advise RSGB Publications (Sales) as soon as possible so that a sufficient number can be reserved for them. Prices for the new format binders will be published as soon as stocks have been received.

RSGB National VHF Convention 1981
A date for your diary

Those who have attended the RSGB National VHF Convention over the years will have realized that it has steadily outgrown the premises in which it was held, so that it is now no longer practicable to hold it in its former venue.

Next year's convention will be held on 11 April at a new venue; the almost-brand-new multi-million pound grandstand at Sandown Park Racecourse, Esher, Surrey. There will be the usual lectures and evening social function, together with an enlarged trade show in the 10,000ft^2 of well-lit space that will be available in a single area on the ground floor. Due to the availability of this extra space, the restriction which has existed in recent years on the selling of complete transceivers has been lifted.

Sandown Park Racecourse is a delightful venue, easy to reach by car from any direction and, being a racecourse, has virtually unlimited space for free parking. Esher station, 10min walk from the venue, is only 35min by train from Waterloo station, from where there is a good service.

More details will be published in future issues.

Stolen equipment

From a car parked in the UMIST car park, Manchester, on 17 September: Trio 2300, serial number 921137. Any information to M. K. Dunn, G3KTL, 30 Sudbury Drive, Cheadle, Cheshire SK8 3BT.

1981 RSGB PRESIDENTIAL INSTALLATION

The installation of Mr Basil O'Brien, G2AMV, as the 47th President of the Radio Society of Great Britain will take place during a

SOCIAL EVENING
(Buffet supper followed by dancing)
commencing at 7 for 7.30pm on
Saturday, 10 January 1981
at the
Queen Hotel, City Road, Chester

Admission will be by ticket only. Tickets will be limited to two per member, and the total number available is also limited.

Price per person: £3

All applications for tickets must quote callsign or BRS number of the applicant, and should be addressed to Miss D. P. Biesiegel, RSGB HQ, 35 Doughty Street, London WC1N 2AE, **and must be received by 15 December 1980.**

For those wishing to stay at the Queen Hotel, specially reduced terms have been agreed. Bookings must be made direct with the hotel, mentioning the function and adding to the address above "Cheshire CH1 3AH" (Tel 0244 28341).

Radio Amateur Old Timers' Association

Members are asked to note that the date of the 1981 reunion has been changed to *Sunday 26 April*, not 2 May as had been originally proposed. A buffet luncheon has been arranged at the Hotel Metropole, Brighton, and it is hoped that all the delegates to the IARU Region I Conference, to be held there, will be able to join us for a very enjoyable event.

RAIBC picnic

The annual club picnic of the Radio Amateur Invalid & Blind Club, which is held at Romsey in Hampshire on the Broadlands Estate due to the kind interest shown by the late Lord Louis Mountbatten, must surely typify all that is best in the amateur fraternity—the hand of friendship is really in evidence.

To a non-radio onlooker, a day spent standing in the middle of a field just talking to people would seem strange pleasure, but members of the RAIBC travel from many parts of the country by private ambulance, converted mini-bus, and private car to do just that, bringing their picnics and folding chairs, their "junk" and contributions for the bring-and-buy, and generous contributions to the mammoth raffle.

This year the picnic took place on 20 July, and was organized as usual by the Southampton RSGB Group under the energetic and efficient guidance of John Compton, G4COM—who spends the entire day seeing fair play in the "junk" tent, while refreshments and other stalls, talk-in station operation, etc, are run by his voluntary helpers.

RAIBC would like to thank the Southampton RSGB Group most sincerely for working so hard to give our blind and disabled members this opportunity to meet, and also for making a great contribution to club funds through the stalls' profits.

GB2SM jubilee year

The Science Museum radio station, GB2SM, has been demonstrating the practice of radio communication to visitors for the past 25 years, and during this time tens of thousands of contacts have been made throughout the world.

It has progressed from a simple table-top layout into a large purpose-built console which enables the visitor to see all that is happening. This was manufactured to the museum's design by Imhof-Bedco Ltd, and allows flexibility in the use of equipment and its accessibility to the operator. During times of maximum activity it provides for three separate operating positions to be worked simultaneously, thus enabling more than one mode to be demonstrated.

The main position utilizes a Collins KWM2 and 30L1, with a 75S3B and Racal 1772 receiver also available. An alternative position uses a KW 2000E integrated with an Eddystone EA12. VHF operation is covered by a Trio TS700 and linear amplifier. Eight antennas located on the roof of the museum provide for both local and long-distance communication to be demonstrated.

Geoff Voller, G3JUL, has been the staff operator of the station since it started in 1955, but assistance has been given by a number of volunteers, all experienced operators and many being members of FOC. These people started as a contest team and were world leaders during the station's early days. Their operation is now mainly at weekends, and their expertise is much appreciated when, besides providing a high standard of operating, they are ambassadors of amateur radio, helping the visitor to understand the world of radio communication and encouraging people to enter the field of electronics.

The station can be viewed during normal museum opening hours, and demonstrations are at 1130 and 1600 Monday to Friday and 1500-1730 on Sundays. Special demonstrations can be arranged for parties visiting the museum if advance notice is given.

ITU conferences

The 1980 meeting of the ITU Administrative Council decided on the following calendar for future conferences:

1981

2 November for six weeks—Region 2 mf broadcasting conference.

1982

3 March for three-and-a-half weeks—WARC for mobile telecommunications.

6 September for four weeks—Preparation for planning conference for broadcasting in the band 87·5-108MHz.

1983

10 January for five weeks—WARC for planning of the hf bands allocated to the broadcasting service.

13 June for five weeks—Region 2 broadcasting satellite conference.

31 October for six weeks—Second session of planning conference for broadcasting in the band 87·5-108MHz.

1984

12 March for six weeks—WARC on the use of the geostationary satellite orbit.

October for seven weeks—Second session of WARC for planning of the hf bands allocated to the broadcasting service.

1985

Mid April for four weeks—Planning conference for the broadcasting service 1,605-1,705kHz in Region 2.

October for four weeks—Conference to review the Final Acts of the African vhf/uhf broadcasting conference.

November for six weeks—Second session of WARC on the use of the geostationary satellite orbit.

1986

March for six weeks—Conference dealing with the shared use of the vhf and uhf bands allocated to fixed, broadcasting and mobile in Region 3.

Mid October for six weeks—WARC for mobile services.

Former RSGB Council member becomes IEE divisional chairman

Mr R. C. Hills, BSc(Eng) Hons, CEng, FIEE, FIERE, G3HRH, the IBA's assistant director of engineering (operations), is the new chairman of the Science, Education and Technology (SET) Division of the Institution of Electrical Engineers.

Ray Hills is responsible for IBA's three engineering operational departments concerned with the planning, construction, operation and maintenance of nearly 600 television and local radio installations throughout the UK, and also IBA's technical training and industrial safety departments.

He graduated from Bristol University in 1954. After a graduate apprenticeship at the BBC he joined the corporation and was later seconded for a year to the Nigerian Broadcasting Corporation. He joined the IBA (ITA) in 1967 as head of the masts and aerials section; was appointed head of the station design and construction department in 1969; became chief engineer (transmitters) in 1973, and assistant director of engineering (operations) in 1978.

Ray Hills is a former Council member of the RSGB, and a vice-president of the IERE.

Guernsey amateur radio get-together

This event, to be held on 21 and 22 March 1981 at the Greenacres Hotel, Guernsey, will be a ticket-holders-only function. It will consist of social functions, and will not be restricted to Guernsey radio amateurs—anyone will be welcome. Attractions will include a grand raffle, and prizes for those who have travelled the farthest.

Further details and tickets may be obtained from Nigel Lihou, GU8OVO, "Argyll", Foulon Road, St Peter Port, Guernsey; tel Guernsey 21430. Tickets: £6.50.

Anyone intending to attend this event is asked to obtain their tickets before the end of February.

A pi-tuned balun antenna coupler for the hf bands

by A. S. CHESTER, CEng, MIEE, G3CCB*

ANTENNA couplers come in all shapes and sizes, and many "universal" designs have appeared which enable a transmitter to be matched into a wide variety of balanced and unbalanced loads over several frequency bands. Most examples seen, however, appear to give priority to matching in the single-ended mode, and then to provide an alternative balanced output by means of a separate balun transformer. In the coupler to be described, good balance was the principal aim from the very beginning, while provision for single-ended loads tied to separate earth or counterpoise systems became available as a useful but secondary feature.

The design is derived from the familiar pi-network, and features a bifilar-wound inductor to provide and maintain accurate balance under varying conditions of use. Variable impedance transformation is achieved in the balanced mode, after which a single-ended output may be taken if required. For unbalanced loads the technique offers a four-to-one advantage over the conventional pi-coupler in impedance level (more reasonable values for inductance and capacitance) for a given performance.

The coupler evolved from the requirement to feed a variety of balanced resonant lines from the 50Ω unbalanced output of a commercial transmitter. The range of feeder impedances encountered was initially in the region of 1 to 5kΩ, but it was later realized that the technique could just as readily be applied to flat (non-resonant) lines in the range 200 to 600Ω. For completeness, the range was extended down to the 50/70Ω region where a tuned matching device is not strictly necessary when the load is known to be substantially resistive. Single-ended outputs may be taken at one quarter of the impedance values given above.

Evolution

The final circuit design may be approached in various ways, but the method described here retains the pi-network as the basis for illustration. The basic configuration connected to a resistive load is shown in Fig 1(a). Provided the ratio of inductance to capacitance is chosen to give a reasonable value of Q and the circuit brought to resonance, the load will be reflected to the input without change and the output voltage will be approximately equal in magnitude and in anti-phase with respect to the voltage at the input. This result leads to the possibility that a balanced output might be taken from the inductor at twice the voltage of the single-ended input.

Connecting the load across the inductor and increasing its resistance four times (twice voltage, half current) results in the arrangement shown in Fig 1(b). This preserves the balance across the inductor with respect to its centre point. Because of the onesided input, however, any attempt to connect this point to signal earth will upset the balance and the tuning to a degree dependent on the mutual inductance (coupling) between one half of the coil and the other. Ideally the mutual inductance should be such as to give a coefficient of coupling of unity, allowing complete freedom to take the centre tap to signal earth or to any other earth system that the user may wish to employ. However, this condition can only be approached for very short coils, and falls away markedly for windings of more realistic proportions.

Some quantitative measure of the coupling problem can be obtained from [1], where a treatment is given on the relation between mutual inductance and the physical shape and disposition of two axially-mounted air-cored coils. It is shown graphically in Fig 10.10 of [1] that a very short coil having a length-to-diameter ratio of 1:5 will exhibit a coupling coefficient of 0·6 between the two halves, while a much longer coil of ratio 2:1 will reduce the coefficient to one third of this value.

Clearly some means must be found of achieving the best possible coupling between the two halves of the inductor and maintaining this value irrespective of coil shape. In practice, this condition is achieved with the two halves wound bifilar-fashion and connected in phase as illustrated in Fig 1(c). The effective inductance of two identical coils, L, connected in phase and coupled together by mutual inductance M is given by

$$L_T = 2L + 2M$$

and the coefficient of coupling by

$$k = \frac{M}{L}$$

Since, in this application, $k = 1{\cdot}0$,

$$L_T = 4L$$

The fixed transformation ratio of 1:4 already provided at the input can now be modified by adding capacitors in series with the earthy ends of the coil windings and connecting the load across these components. This brings the circuit to the balanced-pi configuration shown in Fig 1(d). In a later illustration, the pi-shape is more obvious, but the method of illustration adopted here may be generally preferred since it more clearly resembles the physical construction of the bifilar coil and the practical layout of the coupler.

Analysis

Before attempting to establish design criteria for the balanced coupler, it is necessary to relate the network back to its single-ended counterpart for which sets of formulas are readily available. The two networks are compared in Fig 2, where the balanced version at (b) gives the same performance as the basic network at (a) with all impedance arms scaled up by a factor of four. The balanced version is electrically identical to that previously shown at Fig 1(d), allowing for a reversal of the output terminals and adding dots to the coils to indicate the relative polarity of the windings. The network is first analysed

*3 Rowanside, Prestbury, Cheshire SK10 4BE.

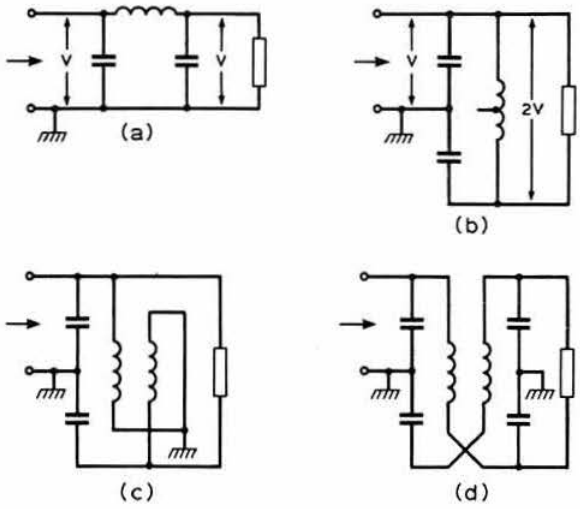


Fig 1. Evolution of coupler; (a) basic symmetrical pi-network; (b) load connected across inductor; (c) inductor halves unity coupled; (d) pi restored in balanced mode

in its basic form and then the way in which the results can be applied to the balanced configuration is shown.

Despite the apparent simplicity of the pi-network, a full analysis is not easy to undertake, and a variety of formulas has appeared in the literature with varying degrees of complexity depending on the application and the accuracy required. Compare, for example, the formula given in [2] with that in [3], each giving reasonable accuracy under limited conditions of use. The present application, however, demanded a much more comprehensive approach and, for this reason, the accurate method of pi-network analysis described in [4] was adopted as the basis for computation. From the data given, the following set of formulas was selected:

$$X_L = \frac{R1Q}{1+Q1^2} \quad \ldots\ldots\ldots (1)$$

$$= \frac{R2Q}{1+Q2^2} \quad \ldots\ldots\ldots (2)$$

where $$Q1 = \frac{R1}{X_{C1}} \quad \ldots\ldots\ldots (3)$$

$$Q2 = \frac{R2}{X_{C2}} \quad \ldots\ldots\ldots (4)$$

and $$Q = Q1 + Q2 \quad \ldots\ldots\ldots (5)$$

The number of variables in the formulas given raises an obvious difficulty and, in the reference, an intermediate graphical stage is introduced to resolve the components of Q in terms of the ratio $\frac{R2}{R1}$ before going on to obtain values for the other parameters. For the task in hand, however, the author was more concerned with the effect that a range of loads would have on the parameters of his coupler for a fixed value of X_L. From this standpoint it was found that by selecting a set of discreet values for X_L and Q it was possible to compute all other network parameters, including load resistance, from

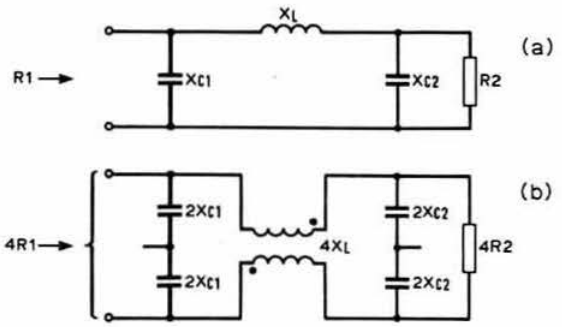


Fig 2. Equivalent pi networks

these values without the need for intermediate graphs. The final graphs that were produced gave values of X_{C1}, X_{C2} and Q directly against R2 for a range of fixed values for X_L.

The detail of the method was as follows:

A. Fix a value for R1.
B. Select a pair of values for X_L and Q.
C. Calculate:

$$Q1 = \left[\frac{R1Q}{X_L} - 1\right]^{\frac{1}{2}} \quad \text{(from equation (1))}$$

$$Q2 = Q - Q1 \quad \text{(from equation (5))}$$

$$R2 = \frac{X_L(1+Q2^2)}{Q} \quad \text{(from equation (2))}$$

$$X_{C1} = \frac{R1}{Q1} \quad \text{(from equation (3))}$$

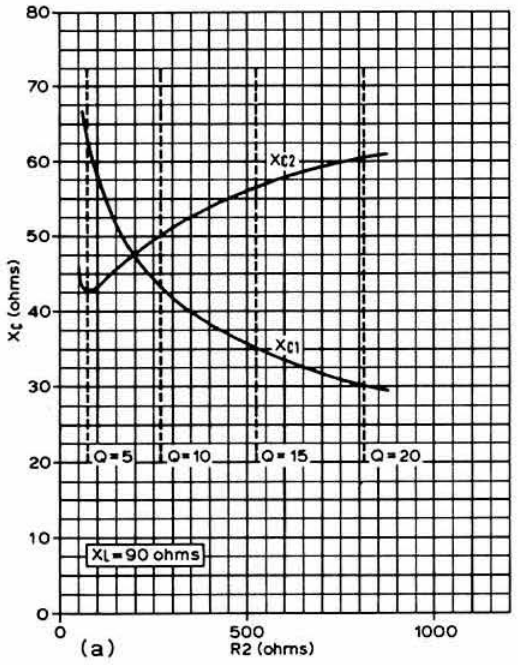
$$X_{C2} = \frac{R2}{Q2} \quad \text{(from equation (4))}$$

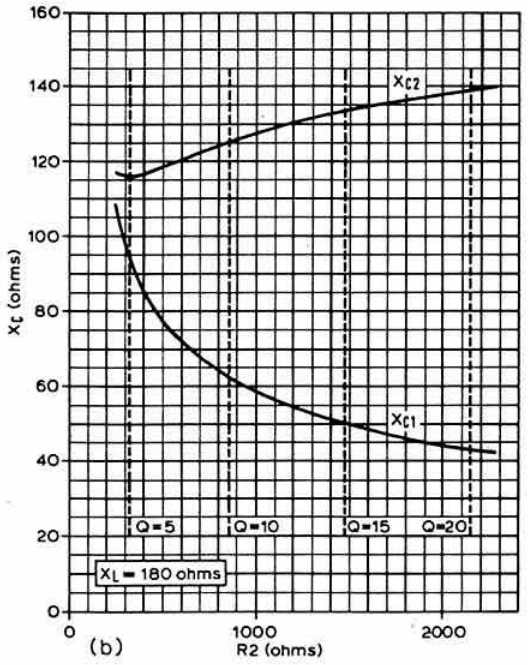
D. Repeat systematically for all combinations of X_L and Q in the required range.
E. Plot X_{C1}, X_{C2} and Q against R2 for each selected value for X_L.

All quantities given above correspond to those shown on the networks in Fig 2, where the balanced version is shown to be four times the all-round impedance of the basic circuit. It will be seen from the analysis, however, that it is not necessary to take this factor into the formulas during calculation provided that numerical values appropriate to the version being considered are applied. Thus, in the procedure that follows, the simple network parameters (R1, X_{C1}, X_L etc) are applied directly to the design of the balanced coupler using values appropriate to that configuration.

Design procedure

The balanced input resistance of the coupler R1 was fixed at 200Ω, equivalent to a single-ended load on the source of 50Ω. After some trial calculations, three values of X_L were selected at 90, 180 and 360Ω which, when combined with a range of Q from 5 to 20, produced three overlapping ranges of load resistance from 50Ω to 5kΩ. The overlaps proved to be useful in allowing a choice to be made between relatively high or low Q for a given load over portions of the range. The full set of graphs from which values of X_C can be read against load





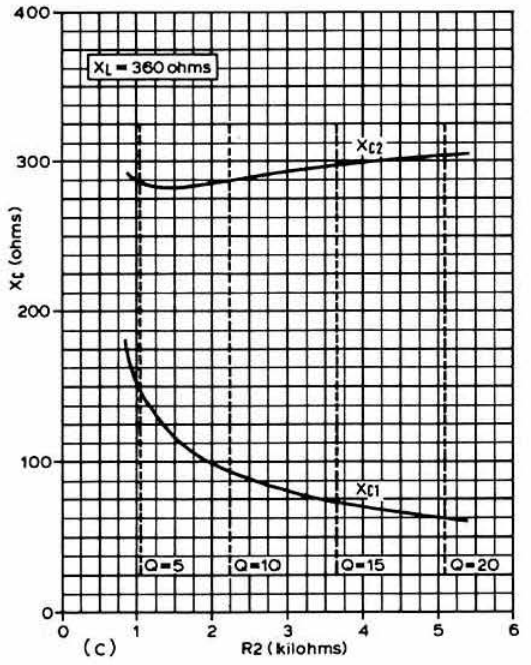


Fig 3. Design data: (a) XL = 90Ω; (b) XL = 180Ω; (c) XL = 360Ω

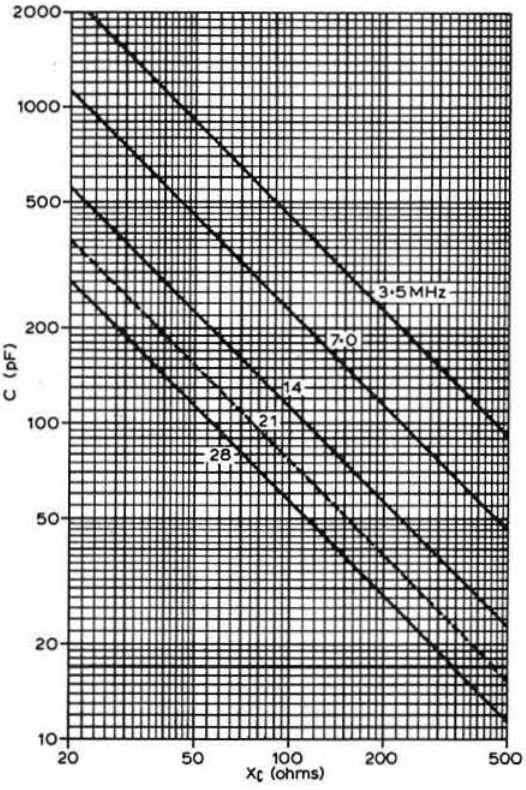
resistance for a given value of XL is presented in Fig 3. The variation of Q over each range of load is indicated at four points on each graph.

Values of capacitance may be calculated separately from Xc for any given frequency, but it is always useful to have a graphical aid to hand and, in Fig 4, a capacitance-reactance diagram specially tailored to meet the particular application is presented. It should be carefully noted that the values of Xc shown in Fig 3 relate to the total capacitive reactance across the input or output of the coupler. After transferring this value to Fig 4 the capacitance value must be *doubled* to obtain the correct value for each of the two capacitors in series.

Inductance values against reactance are more easily presented in tabular form, and Table 1 shows this relationship against the appropriate hf bands. The economy obtained in being able to use the same inductor for various combinations of impedance and frequency can easily be seen. The simple arithmetic is spoilt to some extent by the presence of the 21MHz band but some economy can also be effected here, if required, by combining other values. The inductance values given have been rounded down to the nearest integral and give the indicated reactance values at 2·3 per cent above lower band edge frequencies.

Table 1. Inductance-reactance data

Frequency band (MHz)	XL (Ω) 90	180	360
	Inductance (μH)		
3·5	4	8	16
7	2	4	8
14	1	2	4
21	0·67	1·33	2·67
28	0·5	1	2



Fit 4. Capacitance-reactance diagram

The WARC frequency allocations in prospect at around 10·1, 18·1 and 24·9MHz may present some difficulty in maintaining an economical range of inductance values over all hf bands. Looking at the new and current allocations together, it seems reasonable to pair off certain adjacent bands to produce compromise figures on which the calculation of inductance can be based. The following procedure is suggested. Combine 24·9 and 28 to produce a geometric mean of 26·4MHz. Similarly, 18·1 and 21 will give 19·5MHz. The remaining band at 10·1MHz can be regarded as 9·75 and, being half 19·5MHz, can be shared with the latter on a 2:1 impedance basis. Inductance values for the compromise arrangement can be determined for the three levels of reactance as before, with acceptably small errors in the range 3·5–7·7 per cent. Calculated values for the 3·5, 7 and 14MHz bands will remain unchanged.

Practical aspects

From the data given, an antenna coupler can be constructed to serve any specific or general purpose that the user has in mind, but there are a few points to watch in the choice of capacitors and in the design of the inductor.

The coupler calls for some low values of capacitive reactance, and it would be very costly to provide all that is required on the lower bands in the form of variable capacitors. At the same time, rf voltages on the input side are low, and receiver-type variables combined with small silver-mica fixed capacitors may be used up to the maximum permissible (UK) input power. At the output, power handling capability reduces with increasing impedance, and a peak voltage rating in excess of 500V would be required for a power level of 100W into a balanced load of 5kΩ. In practice an appropriate allowance should be made for the occasional gross mismatch, and a 100 per cent safety factor on this voltage rating seems desirable.

The bifilar inductor is central to the coupler design, and some care is needed in its construction if the best results are to be obtained. In addition to the usual requirements of adequate power handling capacity and high Q, the component has to achieve the best possible degree of coupling between the two windings combined with an acceptably low value of self-capacitance. These two criteria would appear to be mutually incompatible, especially at the higher frequencies, and some compromise may be necessary. The Q of the inductor should be at least several times that of the loaded Q of the coupler if power loss in the coil is to be kept to a minimum.

For early experiments the author used polythene-insulated solid conductors taken from old coaxial cables which, when close-wound over plain formers, gave a uniform winding pitch without the need for helical grooving. The most compact coils, however, were obtained using 72Ω flat twin feeder which provided a ready-made close-spaced bifilar winding material. Details of a set of coils using this cable are given later.

It has already been shown that given a coupling coefficient of unity, the combined inductance of the two windings of the bifilar coils will be four times the value of the inductance of each coil when taken separately. In practice the coefficient of coupling will depart from the ideal by an amount depending on the displacement between the conductors of the two coils, but values in excess of 0·95 can be achieved with good design. The most important point in construction is to keep the conductors closely paired to the fullest possible extent until the connections are made to the main circuit. Any parting of the twinned conductors will increase leakage inductance and reduce the coefficient of coupling. A mine of information on the calculation of inductors is given in [1], and a small allowance can be made on the data given for the departure from unity coupling, but it is always advisable to check final values on a component bridge. The value of the coefficient of coupling, k, can be checked on a bridge as follows:

Measure individual winding inductance L

Measure combined winding inductance L_T

Then $k = \frac{L_T}{2L} - 1$ (fields assisting).

Alternatively, measure combined winding inductance with fields opposing (leakage inductance) L'_T

Then $k = 1 - \frac{L'_T}{2L}$

The measurements need more care as 4L approaches L_T and k approaches unity.

A prototype coupler

A coupler has been constructed to verify the techniques described in this article and to provide a test bed for further development. Flexibility and economy were the main objectives in its construction and for this reason external plug-in coils combined with a range of fixed capacitors were used. A pair of twin-ganged variable capacitors provide intermediate values of capacitance between steps in the range. The complete circuit diagram is shown in Fig 5.

The fixed capacitors are switched into circuit by means of

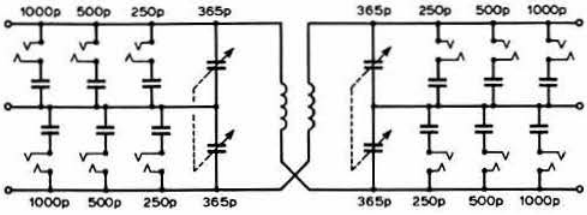


Fig 5. Prototype coupler

patch plugs to provide steps of 250pF to a total capacitance of 1,750pF per section. The 365pF variable capacitors bring the total available capacitance to 2,115pF per section which allows a combined reactance (two sections in series) down to 43Ω at 3·5MHz. For lower values of reactance at this frequency (loads greater than 250Ω at $X_L = 90\Omega$) additional fixed capacitors of 1,000 + 1,000pF will be needed on the input side. The method of switching allows the largest range of variable capacitance to be achieved at the lowest cost.

The bifilar coils are wound with 72Ω flat cable (20swg) on 1·35in diameter polypropylene tube (d-i-y plumbing). The method gives a winding pitch of 6·5 paired-turns/in when close wound, and an effective diameter of 1·45in. For constructors wishing to use these materials, a set of winding data is given in Table 2. The completed coils were checked on a bridge and adjusted to within ±1 per cent. The lower values of inductance are subject to greater variation according to the manner in which the conductors are led away from the coil, and will need individual adjustment by the constructor.

The complete coupler is built into an ABS box of 4·7 by 3·8 by 1·7in and, being both electrically and mechanically symmetrical, can be used with the power flow in either direction. The general layout can be seen in the photographs on the front cover of this issue. The twin-ganged capacitors are Jackson Type "O", and the fixed capacitors are switched by 2·5mm jack plugs modified to short the socket contacts. The coil connectors are DIN two-way, and the input/output terminals allow a variety of connectors to be used.

The capacitor voltage rating of 400V peak allows a power handling capability of 50W into a reasonably well balanced load up to 5kΩ. The coils also allow this rating on the lower bands but will reduce to 25W at 21-28MHz. In practice it would be wise to keep well within these ratings to allow for gross mismatches. As it stands the prototype coupler is in regular use at G3CCB on the 7, 14 and 21MHz bands, and performs very largely as predicted by the design data.

Operation and test

The coupler is adjusted in the same manner as a conventional pi-network in that loading is increased by raising the input capacitance and lowering the output capacitance while maintaining resonance of the whole circuit. This principle applies whatever the ratio of impedance transformation or whether it is greater or less than unity (step up or step down). Since the lower capacitance side will have the greater effect on resonance, it is usual to regard any adjustment there as "tuning", whereas an adjustment on the high capacitance side is regarded as "loading" or "coupling".

For balanced loads greater than 200Ω, the higher capacitance will be on the input side. With a load of 200Ω the input and output capacitors will be about equal in value, and an adjustment of either will have about the same effect on coupling and tuning. Below 200Ω, the roles of the capacitors change over and the input control becomes the one more concerned with tuning. Constructors having little requirement to feed balanced loads below 200Ω may find it useful to label the input and output controls COUPLING and TUNING respectively.

The unit may be tested through a range of loads at low power using carbon composition resistors. Output should be checked with an oscilloscope or rf voltmeter, and the capacitor settings compared with the data given on the graphs in Fig 3. Reasonable agreement between the two sets of results should be expected. Real antenna loads will cause greater discrepancies, since any reactive component present at the end of the feeder line will have to be tuned out by the coupler.

A few points on the subject of balance might be useful. In the absence of an earth connection at the output, the degree of balance with respect to the centre tap will depend only on the tolerances allowed for in the capacitors, and should be very good indeed. The extent to which this balance is upset when an earth lead is connected depends on the amount by which the coupling coefficient of the bifilar inductor falls short of unity and on the nature of the earth system itself. A short heavy lead connected between the output and the input centre taps will show up any inherent unbalance in the coupler to the fullest extent, and such a test may be applied for this purpose. Normally, the two centre terminals are kept apart to give the load some degree of isolation from the equipment chassis. To guard against the build-up of static, it would be advisable to provide a dc leakage path from the output terminals to mains earth. Carbon composition resistors of 1MΩ 1W rating should be satisfactory in this position.

Table 2. Coil winding data

General values				21MHz values	
L	T	L	T	L	T
16	14	2	2·5	2·67	3·25
8	8·5	1	1·25	1·33	1·58
4	4·75	0·5	0·625	0·67	0·875

72Ω flat cable close-spaced on 1·35in dia former; L in microhenries, T in paired turns to nearest 0·125th turn.

Conclusion

The prototype unit described in this article meets the requirement for a universal coupler and tuner at power levels up to around 25W. Higher powers call for an increased voltage rating for the capacitors, more robust switches and heavier gauge conductors for the bifilar coil at the higher frequencies. The constructor might also prefer the inductors to be switched rather than using the plug-in coils adopted by the author. Altogether, the design of the coil seems to offer plenty of scope for ingenuity in meeting these requirements while maintaining a high overall performance.

References

[1]. *Radio Designer's Handbook*, 4th edn, F. Langford Smith, p477. Iliffe. (Obtainable at most good technical libraries.)
[2]. *Radio Communication Handbook*, 4th edn, p6.41. RSGB.
[3]. *Radio Communication Handbook*, 5th edn, Vol 1, p6.39. RSGB.
[4]. *Radio Data Reference Book*, 4th edn, T. G. Giles and G. R. Jessop, p45. RSGB.

A proportional temperature-controlled oven

by N. D. N. BELHAM, G2BKO (ex G8FCH)*

SMALL ovens with thermostatic control are readily available for use with crystals, but they have their limitations. When one sample containing a 1MHz crystal forming part of an oscillator circuit was tested, the thermostat switched the heater on for 40s and off for 20s; as a result the frequency of the oscillator varied between 1·000002MHz and 1·000004MHz. If the output had been multiplied up for use in the 144MHz band the variation would have been some 288Hz. With the proportional temperature-controlled oven to be described, a preset equilibrium temperature can be obtained.

General description

To enable complete devices to be tested while still in their screening boxes, the oven has inside measurements of 21 by 18cm and a height of 12cm. It is constructed from 1·8cm chipboard lined with expanded polystyrene tile, and the front is removable. A small hole in the top allows a long mercury thermometer to be inserted to make gentle contact with the device.

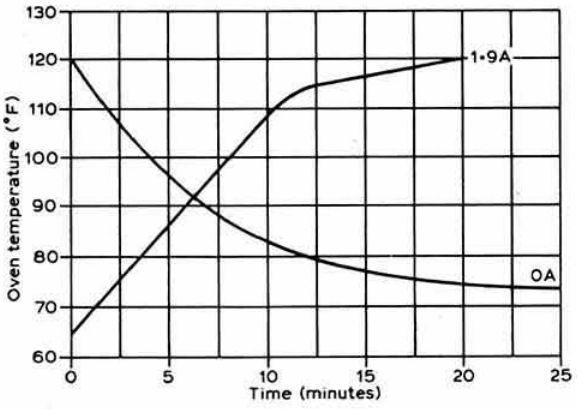


Fig 1. Heating and cooling times

The heater is made by connecting two 15Ω and one 10Ω wirewound 10W resistors in parallel, and forms the source resistor of an RCA40364 transistor. Experiments were made by varying the base bias by hand. Fig 1 shows that when maximum power is used the oven takes just 20min to reach an equilibrium temperature, and about as long to cool. Fig 2 shows

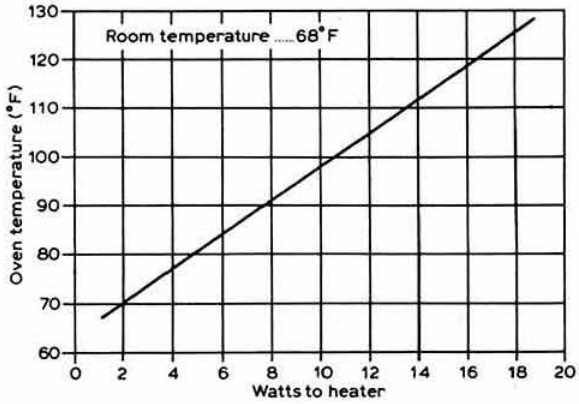


Fig 2. Equilibrium temperature and wattage

equilibrium temperatures reached as the heater power is varied.

Since the equilibrium temperature is reached when the rate at which electrical energy is supplied is equal to the rate at which heat energy is lost, and since the rate at which heat energy is conducted through the oven walls is proportional to the difference in temperature inside and outside the oven, the graph shown in Fig 2 should be a straight line. The temperature of the oven exterior differs little from room temperature, and so loss by radiation is minimal.

The 40364 is rated at 36W with a maximum current of 6A. Its connections are shown in Fig 3, which also shows the test circuit used to measure the base bias conditions. The results were as follows:

Base bias		Heater		
Voltage	Current	Voltage	Current	Wattage
3	4mA	2·5	0·5A	1·25
5·4	10	4·6	1	4·6
7·75	15	6·9	1·5	10·35
9·75	25	8·9	1·9	16·9

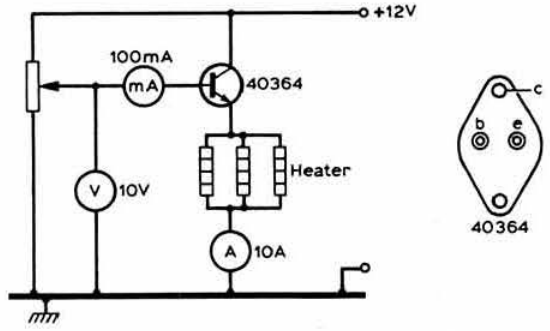


Fig 3. Circuit to measure power at base of 40364

Development

Two further stages of directly-coupled amplification were added so that the circuit became as shown in Fig 4. Measurements of the bias at the base of the BC109B taken for the required change in heater current were as follows:

Bias volts	0·7	0·675	0·660	0·580
Heater current	0+	0·5A	1·0A	1·5A

* 7 Binyon Close, Badsey, Evesham, Worcs WR11 5EY.

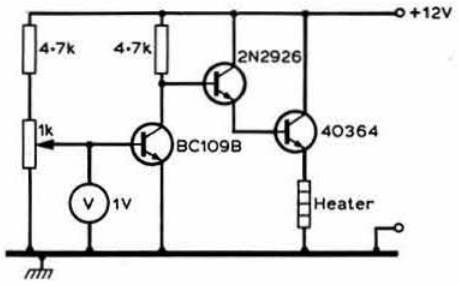


Fig 4. Initial circuit

A VA1055 thermistor was inserted in series with the base, and its resistance was measured by a bridge and found to fall from 21kΩ at 68°F to 15kΩ at blood heat. The base current of the BC109 was about 1μA, and it was found necessary to shunt the base to ground by a 0·1μF capacitor to avoid hum pickup. As it was judged that the gain was insufficient a pnp 2N3702 stage was added, but the added gain proved to be too great—the circuit snapped between full on and full off, ie producing "square heat waves" from the heater. The gain was reduced by fitting an emitter load to the 2N3702 and by making its collector load into a preset resistor. The base supply of the 2N3702 was stabilized by using three conducting diodes in series, as shown in Fig 5. The control unit is built on a suitable heat sink, external to the oven.

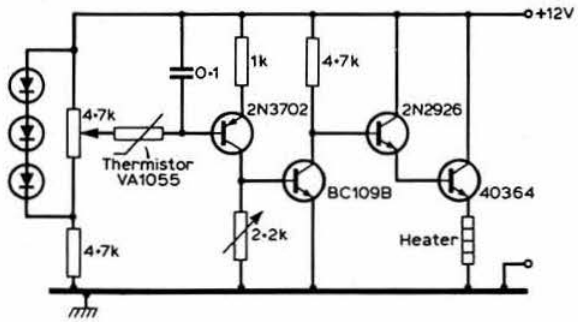


Fig 5. Final circuit

Results

In use the temperature of the oven rises quickly and then tails off towards the equilibrium point; it has remained for hours at that point. As the box is made of wood there is no trouble in fixing devices in position or in bringing connections through it—even control shafts produce few problems. The equilibrium temperature is set by changing the bias on the 2N3702 base, and must, of course, always be above room temperature.

In general the completed oven almost completely eliminates the effect of temperature changes on equipment, and it was, in fact, made to enable a series of vfo experiments to be conducted undisturbed by temperature changes.

If the 40364 fails and short-circuits, the full supply voltage will be applied to the heater, and energy will flow at a rate of approximately 34W. The combined rating of the heater resistors is 30W; provided their mounting can survive a temperature of 180°F, little damage to the oven should result from a temporary fault. □

TR7010 cw sidetone and morse practice oscillator

by V. S. EVANS, G4AVT*

THE Trio 7010 ssb abd cw mobile 144MHz transceiver has no sidetone oscillator. The expert cw operator can no doubt do without, but most amateurs require a tone to listen to while sending morse. Numerous circuits have been published which depend upon picking up a "sniff" of rf either with a

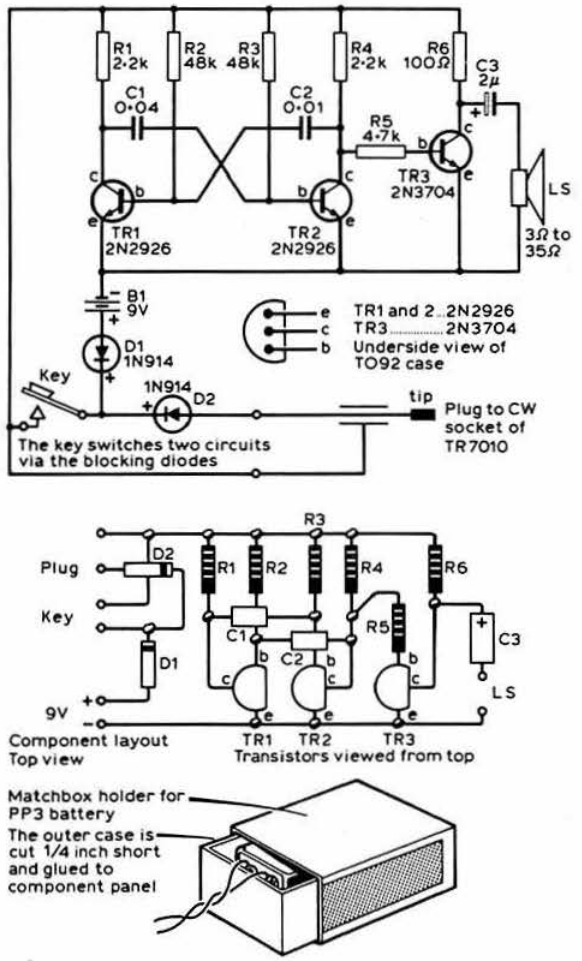


Fig 1. Circuit diagram and component layout

*"Beacon View", Parbold Hill, Parbold, Lancs WN8 7TG

direct connection to a point inside the transmitter or an inductive coupling to the out-going coaxial cable.

The author decided upon a different approach, *viz* to work an audio oscillator from the same key while transmitting. It was found that the key when plugged into the 7010 had a voltage across it when "open", and it was thought that here was a possibility of using this potential as a power source by way of an inverting transistor. However, various drawbacks were found and that idea abandoned.

The next idea was to give the oscillator its own power source, namely a small dry battery and to make and break its supply with the transmitter key. It was obvious that the battery potential would be across the key, and therefore also across the transmitter circuit, when the key was "open". The TR7010 circuit showed that this would not be desirable. The problem was solved by using two blocking diodes to separate the dc paths.

D1 gives through passage for the battery supply to the oscillator when the key is down and blocks off the potential on the transmitter line when the key is open. Similarly D2 gives free passage to complete the transmitter circuit when the key is down, but prevents the potential from the battery going to the transmitter.

The layout of components, as shown, can be mounted on a small piece of Paxolin board. Quite a small box will accommodate the oscillator board, a PP3 battery and a magnetic earpiece of the surplus PO phone variety, or a mini loudspeaker.

Talk-in for the mobile operator

by M. J. L. FADIL, G4CCA*

RALLY, exhibition and special event stations nowadays usually provide talk-in facilities for the visitor arriving by car, and while the organization and operation of a talk-in station have been discussed elsewhere[1] a need does exist to consider the role of the mobile operator and the procedures to be followed while en route. Drivers and passengers have a part to play which is equally as important as that of the talk-in operator, and it is hoped that these notes will provide useful guidelines.

Equipment

Easy and safe manipulation by the driver-operator of the controls of mobile transmitters and receivers is mandatory. Single-knob frequency selection and the use of a boom microphone generally ensure that technical adjustments are minimal. Although commercial "black box" transceivers satisfy the requirement of simplicity, the "safety" boom microphone is not yet in widespread use and as it is not commercially available it will have to be constructed by the amateur. Fig 1 shows a design which has proved very successful and can be highly recommended.

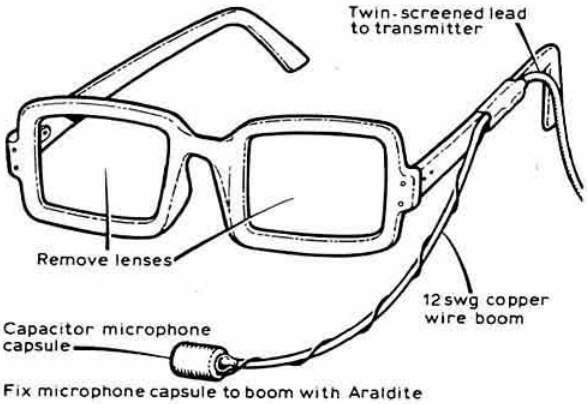


Fig 1. Boom microphone, using old pair of sunglasses

*26 Kingsley Place, London N6.

Procedures

Contact with the talk-in operator should be established as early as possible on the journey; position being given by reference to road numbers and nearest town: eg "GB2VHF—This is G2XYZ on A171 near Oldbury".

This position will be pinpointed by the talk-in station, and a route will be planned and advised: eg "Continue on A171 and report crossing ring road".

This instruction should be noted by the passenger, preferably in writing, and should be acknowledged back to the talk-in station. The mobile operator should then maintain radio silence.

On reaching the reporting point the mobile operator should call the talk-in station: "GB2VHF—G2XYZ at Ring Road".

Further instructions will follow and should be acknowledged, again being written down by the passenger. This sequence will eventually deliver the visitors to the event.

Finally, safe arrival should be advised: "G2XYZ arrived—thank you—out".

Lost

Whenever there is uncertainty of the exact position of a mobile station, the talk-in operator will ask for road names for identification purposes. In extreme cases the mobile station will be asked to stop in order to allow more time for an accurate fix to be made. Once the position has been ascertained, a new route will be planned, taking the mobile back to the correct road. Normal instructions then follow.

Changes of frequency

Instructions to change frequency should be acknowledged: "G2XYZ QSY S23".

Establish contact on the new channel with minimum fuss: "GB2VHF, this is G2XYZ, over".

A few "DOs" for the mobile operator

Do call in early on your journey.
Do get your passenger to take notes.
Do acknowledge all instructions.
Do listen carefully for your callsign.
Do keep transmissions brief and speak distinctly.

Reference

[1] *Amateur Radio Operating Manual*, p139. □

technical topics

Pat Hawker, G3VA

A recent issue of *Ham Radio*, a magazine launched a decade or so ago for experimentally-minded amateurs, contained six main technical articles: all good, but all either moderately or heavily mathematical. One seriously wonders what percentage of readers outside (or even inside) the professional electronics field would have the patience or the expertise to absorb even the gist of the information at a first reading. On the other hand there seems to be a steady trickle (flood?) of publications intended for the amateur and written at a "popular" level with absolutely no mathematics and not much technical content either.

Amateur radio thus seems to be following the same path as electronics and electronics publications generally, becoming ever more specialized and divided into strata of scientist, designer, maintenance engineer and/or laboratory technician, user and/or operator, business and sales personnel etc. To cater for these, publications range from institutional "prestige" journals to business news sheets.

I wonder if it is just sheer laziness or cussedness that makes me sigh for the days when one could keep abreast of, or at least in touch with, most developments from just a handful of well-balanced journals. The days, for example, when one could even understand parts of a *Proc IRE* paper in a way I suspect few expect to understand much of what appears in its successor, *Proc IEEE*.

Once upon a time a radio amateur was designer, operator and service engineer all rolled into one. Few could make that claim today. And pity even the professional maintenance engineer confronted with some modern digital equipment. No wonder that, scrawled above a piece of complex broadcast equipment, can sometimes be seen the prayer: "Please God make it just a blown fuse". A recent amateur radio equipment review praised the unusually *large* size of the "black box"—pointing out that at least it gave the service engineer a fighting chance!

PLL cw filter

Many times it has been noted in *TT* that the most selective and potentially the most effective form of audio filtering for the reception of marginal cw signals is still a good pair of experienced human ears. Yet that does not imply that we cannot at times usefully provide them with assistance by making their task easier in all but the most difficult of circumstances.

One sophisticated technique that is now available to the home constructor is the pll signal-conditioner ic device; in many situations it can almost magically remove interference and noise, and provide an easy to read output at virtually a fixed signal level. Several filter designs using pll signal conditioners (which are popular also for rtty applications) have been published: for example by M. Traska, *QST* January 1979, and J. S. Beeson, *73* October 1979. They provide, in effect, a very steep-sloped filter with a bandpass of roughly 15 per cent of the centre frequency.

Gary Bold, ZL1AN (*Break-in* June 1980, pp226–8) describes a very simple pll filter based on the National LM567 ic. This has a number of features that make it straightforward to build and use; yet it requires only the pll ic, one af amplifier transistor and "a handful of junk-box components". It is likely to be of particular use to those with equipment having only an ssb filter; it is fitted in the audio output and requires no modifications or even internal connections to the equipment.

The principles are simple. An af reference oscillator is set to about the expected signal audio frequency and runs continuously, although internal logic in the ic inhibits output. By means of phase comparison this oscillator is made to lock on to the signal frequency, which it will then "track" over a greater range than the initial "acquisition" frequency. Once the internal oscillator is "locked", the internal logic enables the locally-generated tone to appear at the output. In other words this is a regenerator-type filter but with a built-in ability to distinguish a wanted signal, while remaining unaffected by an off-frequency signal and some forms of noise; because we are listening to the local signal it is unaffected by fading unless this is so deep that the ic falls out of lock.

In the ZL1AN design a variable control enables the operator to sweep the local oscillator and hence the loop frequency across the passband of the receiver, while the "tuning switch" when operated provides an output of the reference tone so that the device can be readily set to a required acquisition frequency. The filter is simply connected to a low-impedance "speaker" output of the receiver. It needs a 9V supply with zener regulation to 5·1V (adjust resistor so that it passes about 20mA); the ic requires 12mA at 5·1V when locked. Since the supply also powers the af output transistor, with transient current rising to possibly 100mA during full-volume transients, it will be more economical to derive power from the mains than from batteries.

The af output from the ic is of square-wave form, and in conjunction with the non-linear output stage produces a penetrating, easy-to-read "raspy" tone. The 4·7μF capacitor

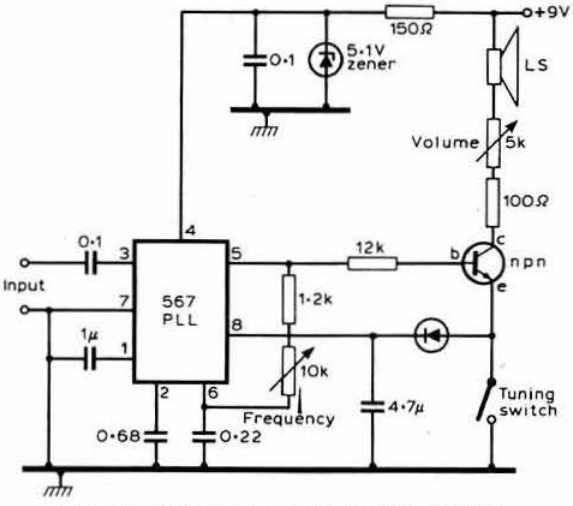


Fig 1. ZL1AN's simple phase-locked-loop cw filter

between pin 8 and earth reduces the turn-on and turn-off transients.

The passband of the "loop" is controlled by the capacitor connected to pin 2 of the ic (0·68μF) and this should be roughly half the value of the capacitor connected to pin 1 which filters the output from the lock detector: ZL1AN has found that the values shown are well capable of meeting his requirements, although they could perhaps be usefully increased for those not interested in fairly high-speed keying.

To facilitate tuning of the receiver, ZL1AN listens simultaneously to some output direct from the receiver. At high speeds the "just perceptible" lock-up time begins to be noticed, although ZL1AN claims that his filter reproduces 40wpm "adequately".

He warns that, despite what has been written elsewhere, this type of pll filter does not perform well under conditions of really high static; some designs have gated-off the first 8ms of af output but this tends to result in excessive clipping of high-speed dits.

Although in practice ZL1AN almost invariably uses the filter for cw contacts, and finds that it provides a genuinely pleasant output; nevertheless in really high-noise, marginal conditions he prefers the inbuilt logic of the human brain. The pll filter, however, locks on to and reproduces signals which, when viewed on an oscilloscope, appear to be buried in noise. So he concludes: "If your receiver lacks a cw filter you should seriously consider building this unit. It really works."

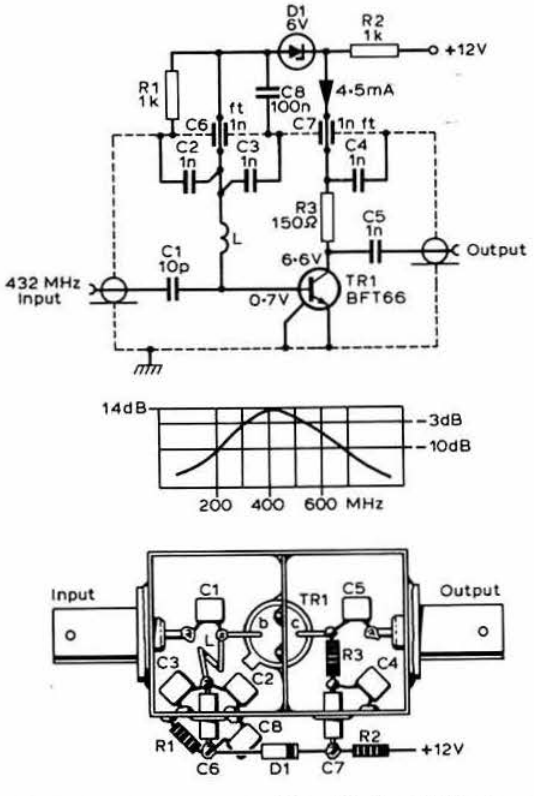


Fig 2. YU1PKW's 432MHz preamplifier with about 14dB gain and a noise factor of about 1·5dB

432MHz bipolar pre-amplifier

The September *TT* contained information on ZE5JJ's state-of-the-art "moonbounce" 70cm preamplifier using a very-low-noise gasfet. (Incidentally G6HD is not happy with the way almost everyone has cheerfully adopted the term "*gas*fet"—ie gallium arsenide or GaAs fet—for how, he asks logically, can a "gas" device ever be "solid-state"?).

The Dutch *Electron* (No 9, 1980) reprints an alternative, rather lower cost, amplifier based on the BFT66 bipolar transistor. This design stems from another eme enthusiast, YU1PKW. It is claimed to provide a good yet simple 70cm preamplifier, with about 14dB gain and a noise factor of around 1·5dB. As can be seen from Fig 2 the response is broadband, and this could prove a handicap in areas where there are strong Band 4 (470-580MHz, channels 21-34) television signals. In such circumstances it may prove advisable to place a tuned bandpass filter or fixed-frequency rejection stub between the antenna and the amplifier.

More on low-profile vertical antennas

Brief notes on three low-profile top-loaded antennas ("Umbrella", "Nord" and "UG") suitable for 1·8MHz and 3·5MHz were given in the August *TT*. Although only about λ/10 high, these can be adjusted to provide a resistive match to coaxial cable over a fairly narrow bandwidth; and this type of approach is described in some detail in the book *Vertical antennas* based on articles which appeared in *CQ* some years ago.

John A. Crux, G3JAG, mentions that the Nord antenna was originally patented in 1968 (US patent 3,386,098) by John H. Mullaney on behalf of Multronics as "an electrically short tower antenna with controlled base impedance" capable of providing vertically polarized signals with mast heights equivalent to 5-20°. G3JAG notes that the umbrella information given in the *CQ* publication is sufficient to enable a satisfactory antenna to be built. He built one for 3·5MHz and "it was excellent". He points out that it is possible to make such an antenna work on 1·8MHz without *any* loading coils. "The bandwidth is narrow, but the efficiency is extremely high."

Charles Moizeau, ex-WB2URU, now living in France, was also interested in these low-profile designs. He draws attention to a "Vertee" design, intended for 3·5 and 7MHz, which was described by Pete Czerwinski, W2JTJ, in *QST* (December 1961, pp18-19): Fig 3. On 3·5MHz this works as a "T" with 40ft single-wire top loading (but WB2URU sees no reason why other forms of capacitive loading should not be used). On 7MHz this top loading is automatically "disconnected" from the vertical radiator, consisting of a length of coaxial cable, as a result of the shorted λ/4 transformer formed by the inner surface of the braid and the inner conductor: length "A" forming an electrical λ/4 dependent on the velocity factor of the cable (resonated by short-circuiting inner to outer by means of a needle). Thus on 7MHz the antenna works as a conventional monopole. On 3·5MHz "A" acts as a series inductance, reducing the amount of top loading to 40ft. On both bands the base impedance is resistive, and roughly about 30-35Ω, thus providing a reasonable match for 50Ω coaxial cable. Fine adjustments for optimum vswr on 3·5MHz can be made by pruning the flat-top loading without affecting 7MHz operation. Similarly, fine adjustments on 7MHz need not materially affect 3·5MHz operation. For the decoupling stub, once the optimum distance "A" has been established using a needle, it is

possible to make a more permanent connection if required. Fig 3(c) shows the arrangement used by W2JTJ for adjusting the antenna: in the article it was reported that WA2LLQ had also used it on 21MHz.

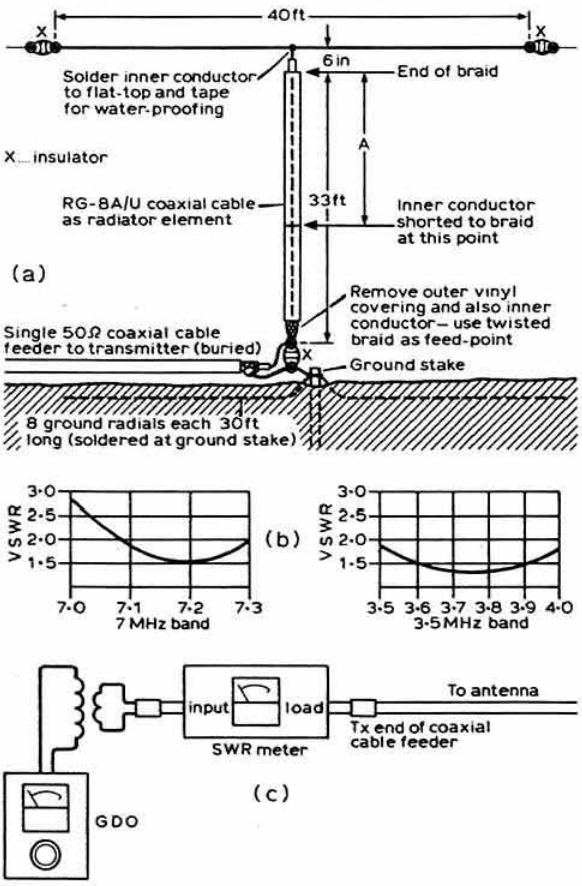


Fig 3. The 1961 "Ver-Tee" antenna suitable for 3·5 and 7MHz with a vertical height of 33ft. It could be used also on 21MHz. Dimension "A" is an electrical quarter-wave at the median operating frequency and depends on velocity factor of the cable (162/MHz gives approximate length in feet for cable indicated which is a solid-dielectric coaxial cable). W2JTJ found optimum lengths to be 23ft 2in for 7·1MHz and 22ft 10in for 7·2MHz. Note that his lengths were intended for the wider American 7 and 3·5MHz bands. (c) shows the method of adjusting lengths of "A" on 7MHz and the flat-top loading section on 3·5MHz. Output from a transmitter could be substituted for the gdo

144MHz tiltable turnstile antenna

Dave Gordon-Smith, G3UUR, points out that the simple reactive dipole technique for producing elliptically polarized signals (*TT* September 1980) extends back well before the 1979 *Radio* article. It is mentioned in the classic work by Kraus (*Antennas*, p427) who in turn credits G. H. Brown and J. Epstein of RCA (*Electronics* 18, June 1945). G3UUR used this idea in a 144MHz tiltable turnstile some years ago; this produced omnidirectional coverage in both horizontal and vertical modes

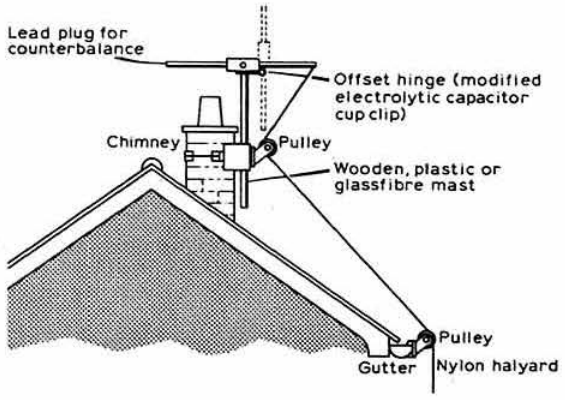


Fig 4. G3UUR's 144MHz omnidirectional "tiltable turnstile" providing horizontally-polarized signals when in the horizontal position, and elliptically-polarized signals (in some directions) when pulled into the vertical position

which could be selected by pulling a rope. In the vertical mode it provided some elliptical and some vertical-only polarization depending upon direction. At the time, G3UUR was concerned more with the ability to work both fm and ssb, mobile and fixed stations, rather than on securing the now-recognized advantages of circular polarization. He writes:

"The technique is a bit of a compromise since the resistance of the feed impedance changes as the length of the dipole is varied. Below the resonant length the feed impedance has a resistive portion nearer 50Ω and above it 80Ω. The actual lengths I ended up using were 34·7in and 41in. The power sharing is better than 0·5dB, and the phase greater than 80°. The

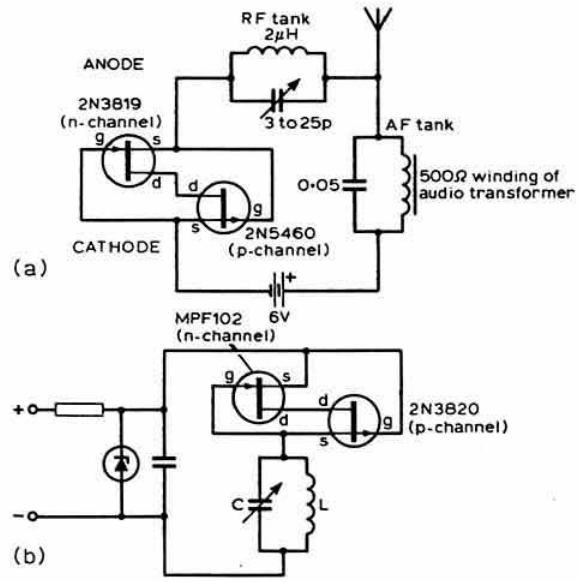


Fig 5. Negative resistance oscillator using n-channel and p-channel fets ("lambda diode oscillator"). (a) The *Electronics* signal source design; (b) G3MYM's 14MHz direct-conversion oscillator

feed impedance is near 50Ω if the residual capacitive reactance is cancelled with a 0·25μH coil (six turns of 20swg, 0·5in long and 0·375in id). This I think is the best compromise that can be obtained without special techniques to keep the radiation resistance constant at 65–70Ω. The coil also provides a dc short-circuit to guard against static."

The lambda-diode nro

The bipolar negative resistance oscillator in the form developed by D. Tranmer, G3NJT, (*TT* October) has a close affinity to the two-terminal fet oscillator described in *Electronics* (see *TT* January 1976). The orginal application (Fig 5(a)) was to form a useful general purpose rf/af/modulated-rf signal source, and later W9IV showed how it could form a useful aid in conjunction with a frequency counter for checking the tuning range of LC circuits etc. Somewhere along the years the configuration has been given the name "lambda diode".

R. W. Mickleweigh, G3MYM, (*Short-wave Magazine*, September 1980) suggests that the nro can form a useful vfo for such applications as a 14MHz direct conversion receiver: Fig 5(b). The zener diode and resistor need to be selected to bring the two fets (p-channel and n-channel devices) into the negative resistance range. While he shows how this can be calculated, the early notes by W9IV (*TT* July 1978) indicate that this is likely to be about 6V and could be found experimentally with a potentiometer across a 12V supply, and then a suitable zener diode and resistor combination could be substituted.

Those German crystal filters

In the June/July issue, I mentioned the revival of interest, particularly in the Netherlands, in the well-built German wartime hf equipment. Dick Rollema, PA0SE, is currently contributing articles on this subject to *CQ* ("German World War II communications receivers" Part 1, August 1980, pp20–7). These are based on PA0AOB's collection of working equipment and are subtitled "technical perfection from a nearby past". This may produce a wry smile or two among those who have read some of the official appraisals made in Allied establishments after the war. These found very little good to say about the opposition, rather to the astonishment of those of us who had had an opportunity to try them out under field conditions; both the hf radio equipment and the early tape recorders from which virtually all modern tape recording is derived. It taught me, for one, the strength of the "not invented here" syndrome that permeates the world of official research and development laboratories!

One of the by-no-means-negligible design features was the use in some equipments of just one type of valve, much simplifying the problem of spares. Another, undoubtedly, was a variable-bandwidth crystal filter (0·2–10kHz) that had a substantially symmetrical passband, yet also incorporated a tunable notch "phasing") control: the design of these filters (Fig 6) is discussed in some detail by PA0SE. They were of the constant-k rather than the more usual half-lattice configuration. In some receivers more than one such filter was provided in successive i.f. stages.

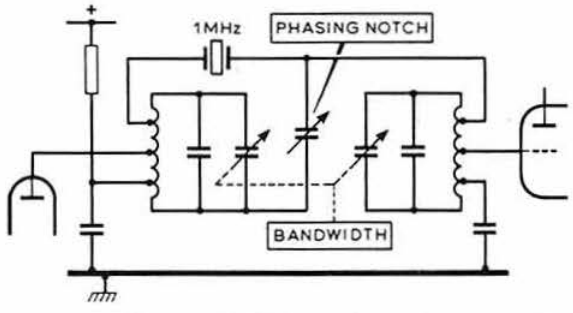


Fig 6. Form of constant-k 1MHz crystal used in some wartime German receivers providing variable-bandwidth symmetrical filter with phasing notch

The flexible dipole

The description of F8OP's classic centre-fed dipole (or "centre-fed zepp") in *TT* (June/July, p637) has brought several comments from other devotees of this flexible approach. For example, Stan Cook, G5XB, writes:

"I have been using this method of feed in various forms for close on 50 years and often wonder why other types of multiband antennas are used. I have come to realize that the best rule is to make this form of antenna fit the space available, while avoiding, if possible, total λ/2 resonance. Even this resonance is not too troublesome if the so-called 'Z-match atu' is used in place of the more conventional tapped coil and series/parallel capacitor. At the heights normally used by amateurs, say 30 to 40ft, such an antenna on the lower bands

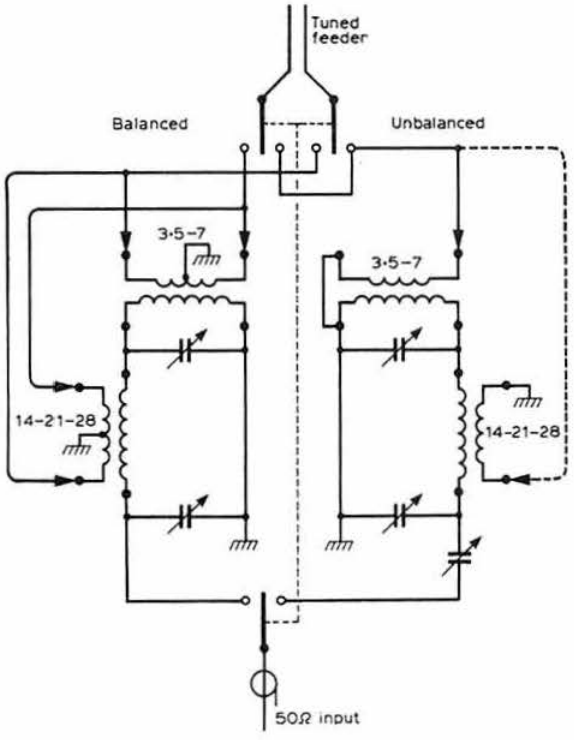


Fig 7. Antenna tuning arrangement used by G5XB with centre-fed multiband dipole to provide vertical or horizontal polarization

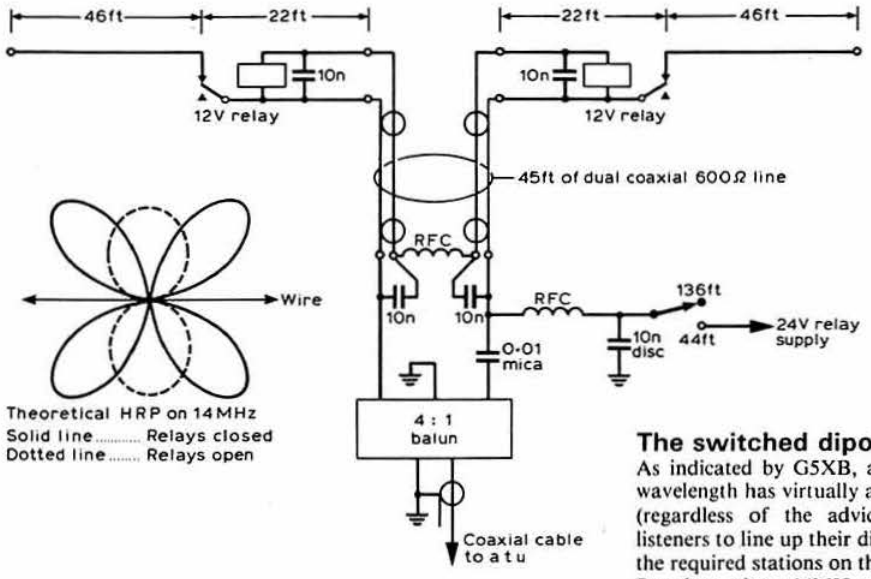


Fig 8. G3LNP's centre-fed dipole with relay switching in order to provide broadside radiation on 14MHz

tends to be omni-directional, particularly for high-angle radiation, and only directional with lobes nearly in line with the wire; ie similar to the properties of a 'long wire'. There appears to be considerable advantage in symmetry, that is to say, the top should be as nearly level as possible, with the feeder vertical.

"It is not always realized that this type of antenna has a useful 'spin-off' in that it easily converts to a top-loaded vertical by strapping the feeders and exciting it against earth. The antenna then becomes a useful low-angle vertical radiator, being in effect a scaled-down version of the commonly-used broadcast-type 'T' antenna. In this condition it produces a high-intensity ground-wave beneficial to local working on 1·8 and 3·5MHz in addition to its low-angle dx-raising properties. A 'T' antenna produces very little high-angle radiation, the discrimination being often in excess of 40dB at critical distances. The system in use at G5XB for the past 20 years has a 168ft 'top', is nearly 50ft high with 40ft of 3·5in-spaced open-wire feeder that requires only six spreaders. Two separate Z-match types of atu are used for quick switching between horizontal and vertical polarization, often with impressive results."

G5XB mentions that last June it was possible with this antenna to maintain communication with F0EWZ/G2HOP in the south of France during daylight on 3,677kHz at times when no other G signals were audible in that area (F0EWZ was using a loaded $\lambda/4$ vertical). Notable benefits also accrue for morning dx on 7MHz when the vertical polarization takes the sting out of the powerful and "over-driven" local stations which, G5XB claims, "inhabit the band mid-morning".

G5XB emphasizes that the advantages of this form of switched polarization feed can be achieved with a conventional feed arrangement if the coupling coil is screened, or electrically balanced to earth, to prevent capacitance coupling. An earthed centre tap on the coupling coil is usually sufficient, in lieu of a Faraday screen which can be rather cumbersome to accommodate. Fig 7 shows the arrangement used at G5XB.

The switched dipole

As indicated by G5XB, a dipole at a height low in terms of wavelength has virtually an omni-directional radiation pattern (regardless of the advice frequently given to short-wave listeners to line up their dipoles carefully to be broadside on to the required stations on the 49, 41 and 31m broadcast bands!). But above about 14MHz the radiation pattern of an antenna at about 25ft or above does begin to resemble the text-book diagrams (though often still distorted by nearby objects, off-centre feeding, absence of balun transformer etc).

Tony Preedy, G3LNP, has a 41m top centre-fed dipole and this does tend to have, as might be expected, negligible broadside radiation on 28MHz. He overcomes this problem by using a pair of high-voltage sealed relays to shorten the dipole span into the length required to form a double extended Zepp on this band. Normally the relays are closed, providing the traditionally good performance on all bands; however, when broadside radiation is required the relays are energized and an improvement of up to 10dB is achieved in some directions.

G3LNP points out that in situations where the antenna is easily raised and lowered it is quite possible to use links instead of relays for this purpose. I remember that at one time home-made mercury switches, opened by pulling a cord, were sometimes used to alter the length of antennas.

To power his relays G3LNP uses 600Ω feeder made of miniature coaxial cable. This also means that the feeder requires less tension than thin solid wire of the same effective diameter, and fewer spacers to keep it in shape.

The 44ft section of the dipole is made of twin flex, and the dc for the relays is introduced at the balun by means of 1mH rf chokes; 10nF capacitors ensure that only the relay voltage appears on the inner core of the miniature coaxial cable.

Soldering PL259 plugs

Two follow-up comments have come in on the August item about soldering PL259 plugs.

John A. W. Edwards, G3ERR, finds an easier way than that suggested by G3ISD is to lightly tin the braid all round and trim the edges before inserting the cable end into the plug body: Fig 9. Then, he suggests, there is no real difficulty in soldering the braid to the plug body through the holes, although it helps to have more heat than a pencil bit usually provides.

G8RSD points out that there are two main kinds of PL259 plug. One is intended solely for UR67 thick cable and has the four soldering holes at 90° to each other round the plug metal body; the other is for the UR43/UR76 small cables with

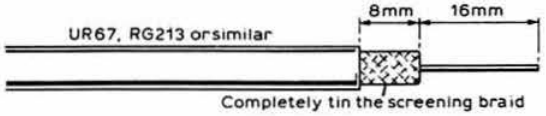


Fig 9. G3ERR's suggested method of cable preparation for soldering PL259 plugs

adapters, and these have two soldering slots of the type mentioned by G3ISD.

He recommends the following procedure for the UR67 type of PL259. Strip the coverings of the wire centre conductor and cut back the white plastic central insulator so as to leave the centre conductor long enough so that when screwed into the rear of the plug the centre wire/s stick out through the hollow plug centre spigot or pin from inside. It can then be cut to length and soldered to the pin. The insulation covering the coaxial cable braid is stripped back carefully just enough so that when the cable is fully inside the plug the braiding around the inner insulator will be uncovered enough to be soldered through the four plug holes. The braid is cut back so that it does not short circuit the centre live conductor(s) and the earthed outer of the PL259 plug.

The PL259 plug is twisted with big pliers so its thread engages on the black outer sheathing, making it waterproof and watertight, and this is further ensured by filling up the four holes from outside with solder.

Properly used, the PL259 plug and UR67 cable can be made completely watertight without additional sealing. In every case the PL259 rear locking ring must be slid down the cable rearwards before the adapter and/or plug are fixed.

On the other hand, the UR43/UR76 type of PL259 plug can never be made waterproof (unlike the BNC plug). The cable is stripped for PL259 use as with the UR67, but the adapter is first placed on the UR43/76 cable and the cable so stripped that, before inserting into the PL259 front end and body of the plug, the braiding is pulled back over the fore end of the adapter. The adapter and cable are then screwed into place, and the braiding soldered to the outside of the PL259 and earthed by soldering up the slits and braiding seen through them. These cables and PL259 plugs with adapters, because they cannot be made waterproof, should be considered merely a temporary expedient. The slits or slots and holes are not intended for teasing and soldering the outer copper braiding.

G8RSD notes that similar arguments apply also to soldering BNC plugs to UR43/UR76 cable. With both BNC and PL259 plugs when used with the correct cables, good watertight, weatherproof joints should be no real problem. He is very much against the practice of using "adapters" as this can also lead to high losses, short circuits etc, as well as lack of waterproofing. He adds that once the proper way of connecting up PL259 and BNC plugs is learned, it can be quite a pleasure doing them in the confidence that it should never prove necessary to do so for a second time. In fact, G8RSD believes this whole subject really requires a booklet to do the subject full justice!

An FT101 on 10MHz

Bill Kitchen, G4GHB, recognizing that 10·1MHz is likely to be the first of the new hf bands to be released, recently decided to explore the possibility of FT101 transceive operation on the WWV position. He has discovered that this can indeed be done: to quote: "I am now ready for the new band and hope to be one of the first to use it when it becomes available". He has tested his relatively simple modification with a dummy load,

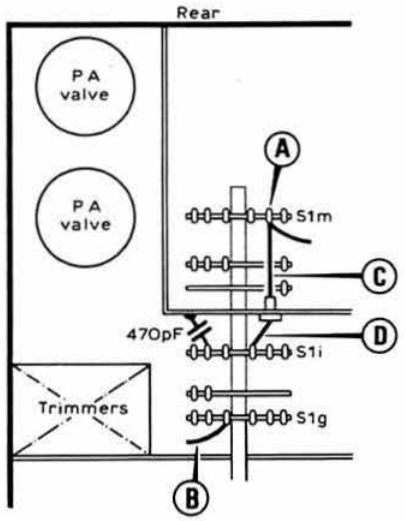


Fig 10. G4GHB's simple modifications to provide transceive operation on the 10MHz WWV position on the FT101, making him QRV for the new 10·1 to 10·15MHz band

wavemeter and frequency meter, and finds just as much output on 10MHz as on the other bands.

His method is as follows:

The bottom covers are removed to allow access to the pa compartment. The bandswitch wafers are located as shown in Fig 10, and the following wires added: on S1m a link from the 7MHz position to the WWV position on the wafer (wire A); on S1g a link from the 14MHz position to the WWV position (wire B).

Then drill a hole in the internal screen and fit a feedthrough insulator. From S1m connect wire C from "A" to the feedthrough insulator. The other side of the insulator is connected to the "common" of the wafer S1i. The WWV position on the bandswitch then goes to earth via a 470pF capacitor.

That completes the modification, but G4GHB adds a few points worth noting.

(1) When drilling the hole for the insulator, ensure that as little swarf as possible falls into the equipment. Deburr the hole and push in the insulator. Turn the transceiver upside down and shake to remove any metallic swarf.

(2) To solder the 470pF capacitor to the screen, first remove a little plating by scratching it off, for example with a screwdriver. The value of 470pF may not be optimum, although it proved satisfactory in this case.

(3) Neutralization of the power amplifier stage may be affected on 28MHz, and may require adjustment. Note that on 28 and 21MHz there will now be far more loading capacitance available than is necessary, so take care to watch the pa current when adjusting the pi-network.

(4) For those who may not like the idea of drilling holes in an FT101, it may be possible to unsolder and remove S1 and replace it with one having more contacts, then soldering the contacts for 1·8, 3·5, 7, 14 (as original) plus the WWV position. This might not require the use of S1i and a fixed value capacitor. However, G4GHB rejected that idea in favour of drilling the hole.

It should be appreciated that these modifications do not stem from Yaesu and have to be undertaken at owner's risk. □

Locator systems for vhf and uhf

by JOHN MORRIS, G4ANB*

Introduction

The QRA locator system has been in use on vhf and uhf for some years, but it may not be the one best suited to amateur needs. Indeed, at the IARU Region 1 conference in Miskolc in 1978, a recommendation was made to all member societies to start discussing possible replacements for the present QRA system. (Although the official name has now been changed to "QTH locator", the old name "QRA" will be used here to avoid confusion with locator systems in general.)

It is worth considering why any locator system at all is felt to be necessary. The main reason is pure convenience. A locator is essentially a map reference, allowing the position of a station to be easily and concisely transmitted. After all, who wants to have to send (or, even worse, write down in a contest) "about two thirds of the way from East-Grimthorne-in-the-Marsh to Nether-Nettlebed-by-the-Sea"? A locator allows brevity, essential in contests and openings of an unpredictable nature (sporadic-E, aurora etc), while giving sufficient information for the position of a station to be calculated with reasonable accuracy. The use of a scientific calculator or computer allows rapid and accurate conversion from locators to bearings and distances, without the uncertainties introduced by trying to make measurements with a ruler on a map. Who has reasonably detailed maps of everywhere they are likely to work, anyway?

Finally, awards must be considered. The basing of these on international boundaries is absurd on vhf and uhf, where dx usually does mean distance rather than rarity. A locator system allows a somewhat fairer assessment of achievement to be made by permitting the number of locator areas, rather than countries, worked to be the basis for an award.

Requirements

Having decided that a locator system is highly desirable, if not essential, it is worth looking at what features and characteristics it should have for amateur use. The following list is roughly graded into order of importance, although others may well disagree with the author's notions of what is important.

(1) **Global.** The locator system should cover the whole of the surface of the earth. This is becoming increasingly important in these days of satellites, moonbounce, transequatorial propagation and other transcontinental communication modes on vhf and uhf.

(2) **Positionally unique.** A given locator reference should specify only a single area of the surface of the earth, the size of this area depending on the system in use.

(3) **No ambiguity in locator.** A given position should have only one possible locator reference.

(4) **Brevity.** The locator reference should be as short as possible, given other constraints. This is, after all, the reason for using a locator in the first place.

(5) **Consistency of format.** The locator should have a constant basic outline, such as two letters, two numbers, one letter as in the present QRA system. Not only does this make copying the locator easier, but to allow a particular character to be either a letter or a number is bound to lead to confusion (Try writing India Oscar Zulu Sugar with one zero two five underneath, in your usual scrawl. Then see if someone else can tell the letters from the numbers!).

(6) **Precision.** The locator must be capable of specifying the location of a station with reasonable accuracy. The general feeling of amateurs seems to be that the QRA is about right in this respect. Thus the smallest squares should be about the same size as the present ones for general use, ie about 5km.

(7) **Compatibility with QRA.** This is a requirement unique to European amateurs, but vital for worldwide acceptance. If a new locator system is adopted, then G9BF, having just worked his 250th big QRA square on 144MHz, is going to be justifiably annoyed if he has to start all over again. If the new system is suitably compatible with the present QRA, however, it will be possible to translate from one to the other, with no ambiguity, thus allowing awards and lists to be continued.

(8) **Big squares and little squares.** For lists and awards fairly large squares are needed, and these should be describable as a part of the whole locator (for example ZL34b is in "ZL" square). Again, the feeling seems to be that the present QRA has this about right. Make the big squares too big, and those running low power from a valley will seldom get the chance to work anything new. Make them too small, and every other contact will be in a new square.

(9) **No mixed characters.** Each character in the locator should be a function of either latitude or longitude, but not a function of both.

(10) **Letters and numbers.** Locators consisting of just letters or just numbers seem for some reason to be more difficult to copy and remember than those with a mixture.

(11) **Simplicity.** Given all of the above constraints, the system should be as simple as possible to translate to and from latitude and longitude.

Although not exhaustive, this list is thought to cover all of the main points to be considered when examining a suggested locator system. Other criteria are possible, the most interesting being from PA3AHD, who suggests "possibility to get funny words"—although it is not clear whether he considers this to be a good or bad feature.

Proposed systems

Since the start of discussion on locator systems, many amateurs in Europe and elsewhere have spent many hundreds of hours inventing, comparing and dissecting a bewildering variety of locator systems. To analyse all of the proposals in detail would take several whole issues of *Radio Communication*, and therefore their main features are summarized in Table 1. All of the suggested locator systems follow the same basic plan. All or

*120 Whitehorns Way, Drayton, Abingdon, Oxon OX14 4LQ

Table 1. Summary of proposed locator systems

System	Format [1]	Accuracy [2]	Criterion [3] (+ = good; − = bad)						
		(km)	1	5	7	8	9	10	11
DL9GS-a	llllnnl	3·3	+	+	+	+	−	+	−
DL9GS-b	llllnnl	3·3	+	+	+	+	−	+	−
EA8EX	vvvvvv	0·5	+	−	−	+	+		+
I4BTU	lnnlnnl	3·3	+	+	−	−	−	+	−
OH1SZ	lnllnl	3·7	+	+		−	+	+	
OH3WX	vvvvvvvv	0·02	+	−	−	−	+		
OH8AHX	vllnnnn	0·7	−	+	−	+	−	+	−
PA0DAR	vvnnv	2·7	+	−	−	+	−		
PA3AHD-a	vvnnvv	3·0	+	−	+	+	+		+
PA3AHD-b	vvnnvv	3·0	+	−	+	+	+		+
SM0BYC	nnvvnn	6·7	+	+		+	−		
SM0DRV	lnllll	2·6	+	+	−	+	+	+	+
SM0FOB	vvvvv	3·0	+	−	+	+	−		−
SM3FSK	lnllll	3·3	+	+	−	+	+	+	+
SM6GPV	llnnllnn	0·7	+	+		−	+	+	
SP9DH	nnnnnll	3·3	+	+	−	+	−	+	
YU3HI	vvnnvv	2·2	+	−		+	+		+
W3XO	llllnn	6·5	+	+	−	+	+	+	
Georef	llllnnnn	1·1	+	+	−	+		+	
QRA	llnnl	3·3	−	+		+	−	+	−
G4ANB	llnnll	3·7	+	+	+	+	+	+	+

Notes:
[1]. l = any letter; n = any number; v = letter or number.
[2]. Defined as half the length of the diagonal of the smallest square at 52°N.
[3]. The criterion numbers correspond to the list set out in the text.

Table 2. Translation from the first two characters of a QRA locator to the first four characters of the proposed new locator system for the area between 12°W to 40°E, and 40°N to 66°N.

QRA 1st letter:	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
Proposal 1st char:	I	I	I	I	I	I	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K	K	K	K	K
Proposal 3rd char:	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9

QRA 2nd letter:	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Proposal 2nd char:	N	N	N	N	N	N	N	N	N	O	O	O	O	O	O	O	O	O	P	P	P	P	P	P	P	P
Proposal 4th char:	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5

part of the surface of the earth is divided into regions along lines of latitude and longitude. These regions are usually called squares, even though they are generally rectangles drawn on the surface of a sphere. These squares are subdivided, again along lines of latitude and longitude, into smaller squares, and this process is repeated to give the smallest squares. The sizes of the various squares and the method used to label them define the characteristics of a locator system.

The QRA system, which will be familiar to most regular users of vhf, may be used to illustrate this process. At the same time one can demonstrate some of the reasons for many amateurs wishing to change to a new system. The area covered by the basic version of the QRA is from 40° to 66°N, and 0° to 52°E. This region is divided into squares each 2° from west to east, and 1° from south to north. These are labelled with two letters, the first giving the longitude and the second the latitude, starting at the southwest corner. Thus large square BK runs from 50° to 51°N and 2° to 4°E. The QRA has been extended to cover the whole of Europe and northern Africa by repeating this sequence every 52° from east to west and every 26° from north to south. These large squares are divided into an 8 by 10 grid of the middle size squares, each 12′ wide in longitude and 7·5′ high. These are labelled from west to east, and north to south, with the numbers 01 to 80. The squares are finally divided into nine yet smaller squares, arranged as a 3 by 3 grid, each being 4′ east to west and 2·5′ north to south. These are labelled a to j, with a being the centre square of the top row, and proceeding clockwise to finish at j in the middle.

The QRA has three main disadvantages. First, it does not cover the whole of the earth, nor can it easily be extended to do so. Amateurs in North America and Australia are discussing the introduction of a locator system for use on vhf and uhf, and there are obvious advantages in the same system being used worldwide. Second, a given locator reference could refer to several different places on the earth. This is clearly undesirable when trying to calculate distances and bearings from locators. Finally, its translation to and from latitude and longitude is a comparatively complex process, as anyone who has written a computer program to do this will know only too well.

All of the systems described in Table 1 have their good points, but few of them fully meet the list of criteria set out earlier. For this reason the author has concocted a new system. Once again three sizes of squares are used. The largest, called "fields", are each 20° wide from west to east, and 10° high from south to north, thus dividing the earth into an 18 by 18 grid. These fields are given two letter indices, AA to RR, with the first letter specifying the longitude and the second the latitude, and the origin being at the south pole at 180°W. Thus the field AA runs from 180° to 160°W, 90° to 80°S. North of this is AB, east is BA and so on. The field covering most of the UK (50° to 60°N, 20° to 0°W) is then IO. These fields are divided into 100 squares, each 2° wide and 1° high, labelled from 00 in the southwest corner to 99 in the northeast. It will be seen that these squares are identical with the present large QRA squares, making translation at this level a trivial matter. QRA square ZL becomes IO91, AL becomes JO91, YN becomes IO83 and so on, as shown in Table 2. Thus existing awards and lists could be continued, with no problems in translation from QRA.

The final division is of these squares into a 24 by 24 grid of sub-squares, each one being 5′ wide by 2·5′ high. These may be compared with the present QRA small squares, which are 4′ wide and 2·5′ high. The sub-squares are labelled using two letters, again the first specifying the longitude and the second the latitude, starting from AA in the southwest corner, and running to XX in the northeast. A full locator thus consists of two letters, two numbers and two letters, with a typical reference (that of the G4ANB QTH) being IO91IP.

A few points about this proposed system may need some further explanation. The letters I and O are included, as opposed to many systems where they are omitted. It is felt that there is no risk of confusion with the numbers 1 and 0 because of the consistency of the locator format. The first two characters are always letters, and so that IO in the above example must be India Oscar, and not one zero. Similarly the third and fourth characters are always numbers, and so the 91 must be ninety one—there is no chance of it actually being a nine followed by a letter I. That there is no risk of confusion so long as a consistent format is used is demonstrated by the present QRA system; ZO01a is instantly recognizable by regular vhf operators as Zulu Oscar zero one alpha, with no ambiguity. A positive reason for retaining the letters I and O is that it simplifies the decoding process, both by hand and using a computer.

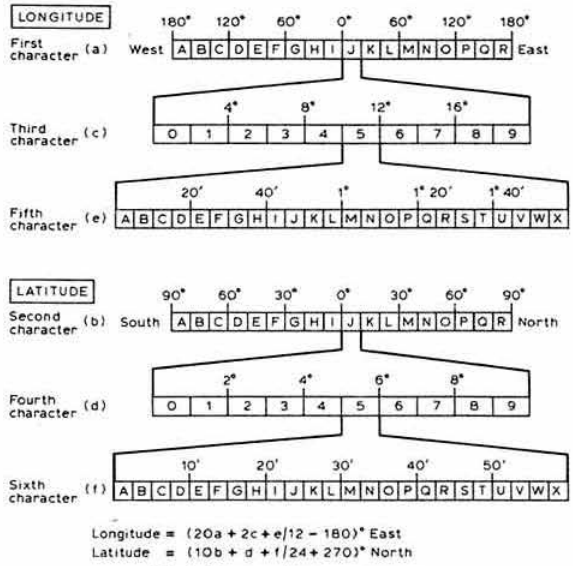


Fig 1. Proposed locator system

It will also be noted that all of the longitude defining characters (the second, fourth and last) run from west to east, and the characters giving latitude (the first, third and fifth) run from south to north. This is intended to simplify the translation process, as compared with the QRA, where the third and fifth characters depend in a non-simple way on both the latitude and the longitude, the second character runs from south to north, the fourth from north to south, and the fifth in a spiral!

The size of the fields is sufficiently great for the first two characters of a locator reference often to be omitted, as they are generally implied by the callsign, and hence the country, of the station. For example, the G4ANB locator, IO91IP, may be abbreviated to 91IP, the IO being implied by the G prefix. The same abbreviated locator sent by a Spanish station would, with no ambiguity, imply IN91IP, or by a Polish station JO91IP. Thus in contests and short openings such as sporadic-E, only four characters would generally be sent, as opposed to the present five, so saving a little time without any significant degradation in accuracy from the present situation.

Fig 1 shows how the locator is built up from the various sizes of square, and Fig 2 shows the positions of the fields covering Europe.

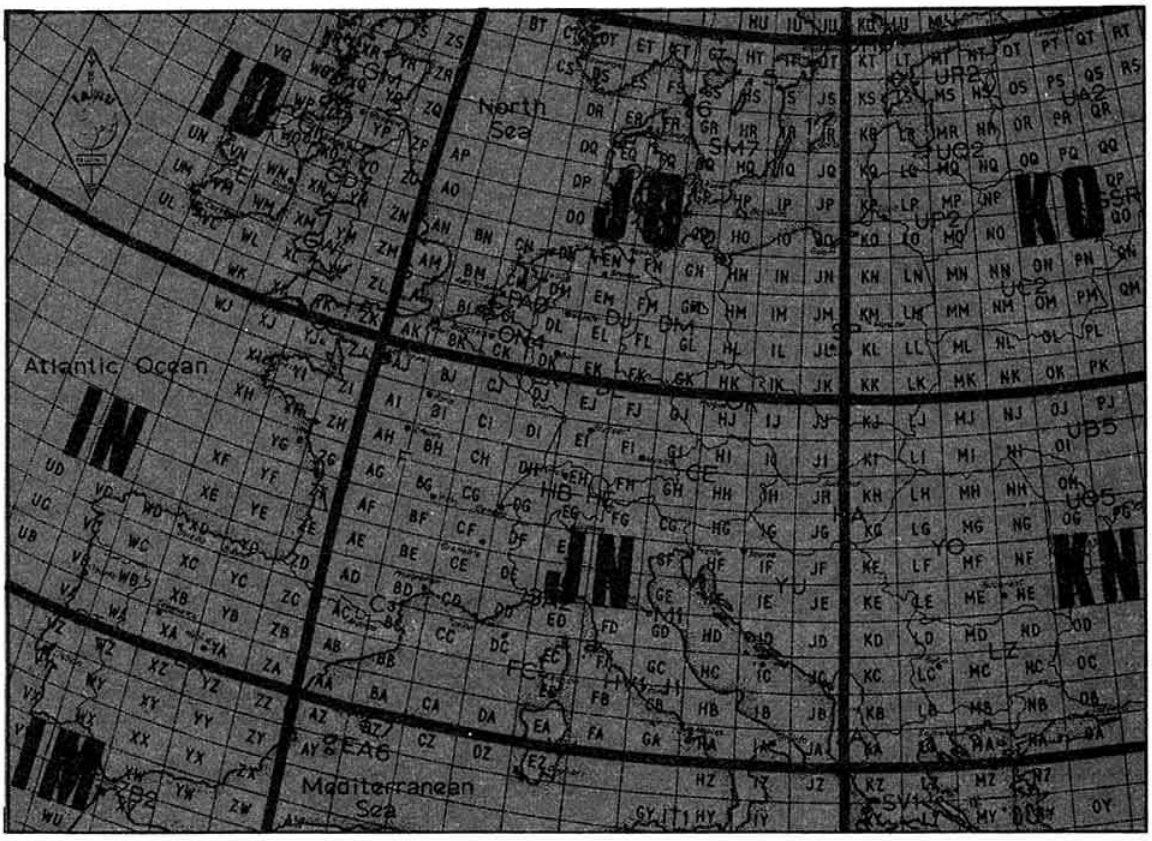


Fig 2. Proposed locator system fields covering Europe

Action

At the meeting of the IARU Region 1 vhf managers in Maidenhead in April 1980 it was felt that the time had come to compare all of the proposed systems and try to find the best. The result was a recommendation for the publication of the modified G4ANB proposal described here, with a view to getting comments from all regions, the objective being to take a decision at the 1981 IARU Region 1 conference. It was also recommended that the system should be called simply "locator", without any "QTH" or "QRA".

Before the meeting information about various systems had been sent to Regions 2 and 3, and replies from the ARRL vhf columnist, W3XO, and the Australian vhf manager, VK5LP, were presented. W3XO wrote: "I feel that the G4ANB system is probably the best compromise in the light of the present European popularity of the QTH locator system with its 2° by 1° squares. I therefore support the G4ANB proposal."

VK5LP said: "From a study of the submissions sent to me, and which have been discussed among some of the interested amateurs here, the general indications are that we are in agreement with the idea of a worldwide locator, and the one proposed by G4ANB seems to be the most acceptable, particularly as it is compatible with the ORA system."

Conclusions

(1) Amateurs in other countries are considering the adoption of a locator system.
(2) The present European QRA no longer fully serves amateur needs for long-distance communication, nor can it be adapted for worldwide use.
(3) It would be advantageous for the same locator system to be used worldwide.
(4) For any new system to be acceptable, it must allow records and awards based on large QRA squares to be continued, and preferably use existing maps.
(5) Other proposed systems suffer from defects which make them unacceptable for amateur use.
(6) A new system has been proposed which it is thought will meet amateur needs for the foreseeable future, and which has received support from many countries in IARU Region 1, and from Regions 2 and 3.
(7) It is hoped that a decision may be made at the IARU conference in April 1981. To this end comments are being invited from all regions.

Readers comments on this topic are invited. They should be sent to the author, who will pass them on to the VHF Committee after using relevant comments for discussion in *4-2-70.*

MORE INFORMATION ON . . .

"Wire beam antennas and the evolution of the G3LDO double-D"

The author of this article, published in the June/July 1980 issue of *Radio Communication,* Mr P. Dodd, G3LDO, advises the following correction to the length formula:

Errors in the measurement of the 28MHz model resulted in incorrect formulas being obtained; the correct formulas are:

Reflector	Driven element
$\frac{15{,}740}{f} = l$ cm	$\frac{13{,}430}{f} = l$ cm
$\frac{6{,}085}{f} = l$ inches	$\frac{6{,}076}{f} = l$ inches

The formula includes 2in (10cm) to tie the end of the wire to the insulator.

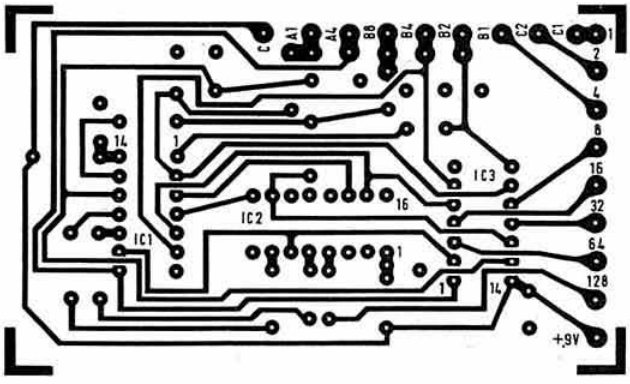
When the antenna is working correctly, a front:back ratio of five S-points should be obtained; in practice, nine S-points can be achieved.

"A compact hf vswr meter and a useful atu"

The author of this article, published in the September 1980 issue of *Radio Communication,* Mr L. Varney, G5RV, advises:
(1) The split-stator variable capacitor referred to in the components list may be hard to come by and/or be quite expensive. However, a single-section variable capacitor of 75 to 100pF maximum, with suitable vane spacing and mounted on an insulating sub-panel or on stand-off insulators, may be used perfectly satisfactorily, as the coils of this balanced tuned circuit are centre-tapped and connected to chassis/earth. For transmitter output powers of up to 100W p.e.p., it would be possible to utilise a standard receiver-type twin-gang variable capacitor of 350 or 500pF per section connected as a split-stator capacitor but insulated from earth. The use of such a capacitor, having an effective capacitance of 150 or 250pF maximum, may require a small reduction in the number of turns on each of the plug-in coils.
(2) On p890, right-hand column, line 18, for "matching stub" read "matching section".

"An 80-channel selector system for the IC240"

The author of this article, published in the August issue of *Radio Communication,* Mr A. Daykin, G8JCA, points out that two short lines of track were omitted on Fig 2. The amended drawing given below includes the missing connections to IC2, pin 6 and terminal B4.



microwaves

Charles Suckling, G3WDG *

Aligning antennas accurately in the field

One of the rewarding aspects of operation at microwave frequencies is that it takes a considerable degree of operating skill to achieve even a short-range contact!

The necessary use of high-gain antennas with narrow beamwidths means that pointing has to be accurate to within a few degrees, as shown in Fig 1. The newcomer to microwaves is advised to become proficient in antenna pointing before taking to the hills, as this will help greatly in making the first contacts.

To start with, it is necessary to determine the beam heading required to work a particular station, either by drawing a line on a map and measuring the angle with a protractor, or, better, by calculation from the stations' national grid references (*Microwaves*, September). The only remaining problem is then to set the antenna to this heading with the required degree of accuracy.

A variety of methods has been developed for doing this, including using the position of the sun as a reference, or identifying some local feature, but by far the most straightforward is to use a compass. However, simply using a compass as bought is unlikely to give sufficient accuracy, and this has led a number of operators to seek other methods. G3YGF has recently developed a form of "sighting" compass, with which it is quite easy to set antennas repeatedly to within one or two degrees. He has found it perfectly adequate for use with a 4ft dish on 10GHz.

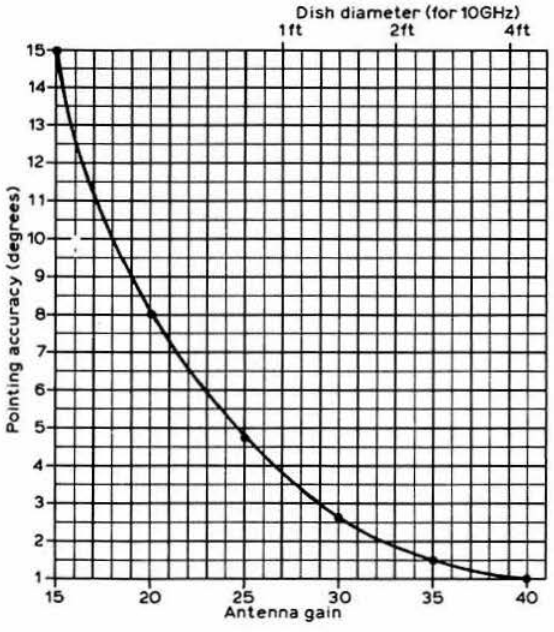


Fig 1. Required pointing accuracy as a function of antenna gain

The method of construction of the sighting compass is apparent from Fig 2. Dimensions are not too critical and may be altered somewhat to fit the available compass. Three pieces of Perspex are sawn to form a triangle, and each is scribed lengthwise along its centre line to produce a mark. The ends of the bottom and upright pieces are chamfered with a file to mate with the diagonal piece, and the whole assembly is then glued together using Rapid Araldite. Care should be taken that the marks on the three pieces are lined up accurately while the glue sets. The compass may then be glued into position.

The recommended type of compass is made by Silva, and has a rotating cursor calibrated in degrees. Such compasses are available from outdoor-sports shops. While the glue is setting, rotate the cursor so that the indicated bearing is 360° and, by sighting through both ends of the compass in turn, check that the 360° and 180° marks on the cursor line up exactly with the scribe marks. The compass should be moved until this is the case.

The final stage in the construction of the sighting compass is to fit the mirror. The optimum position is found by moving the mirror by hand along the diagonal piece of Perspex until a good reflection of the face of the compass is seen. This should be done while looking through the upright piece and sighting on a distant object. Be careful to keep the compass level during this operation.

The most accurate way of using the sighting compass to determine the direction in which a dish is pointing is as follows. First, stand behind the antenna and then move to a position some 10yd or so to left of the dish so that the two edges of the rim are in line. Sight the compass on the dish so that the two marks are in line with the rim of the dish, and carefully turn the cursor to align with the compass needle—the arrowed end of the cursor coinciding with the north-seeking end of the needle (normally painted red). The bearing indicated on the cursor is then noted and the procedure repeated from the other side of the dish, except that this time the arrowed end of the cursor is aligned with the south-seeking end of the compass needle. Ideally the two readings taken from each side of the dish should read the same, but a discrepancy of one or two degrees is permissible; the average value can be used in this case. If the discrepancy is large, say 5° or more, it is best to repeat the whole procedure.

The actual bearing of the dish is calculated from the formula: real bearing of dish (relative to true north) = measured "bearing" − 90° − magnetic correction (approximately 7°). If the bearing so obtained is negative, add 360° to it to find the correct answer.

While this method is very good for determining the direction in which an antenna is pointing, it is rather tedious to use it every time that an antenna is to be set to a desired beam heading. This problem can be overcome completely, however, if some sort of calibration to give a read-out of its heading is fitted to the antenna itself. For a mast-mounted antenna this can take the form of a round piece of wood at the base of the mast marked in degrees, with a pointer fixed to the mast. A similar sort of arrangement could be fitted to the top of a tripod. The advantage of this is that the antenna heading need only be measured once, being used to calibrate the position of the readout circle (or pointer). All other beam headings may then be read off as desired, with no further need to use the

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

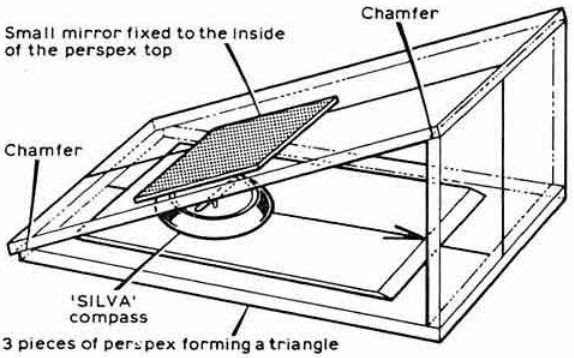


Fig 2. Construction of the sighting compass

compass. This can be a very great advantage when it is intended to work more than one station, as in a contest for example.

All the above assumes, of course, that the dish has no squint, ie the direction of the radio beam is the same as that expected mechanically. This is usually true if the feed is mounted centrally, which can be checked quite accurately by eye. However, it is good practice to check that the antenna is on the correct heading by peaking up for maximum signal strength during the first contact of the day. Any discrepancy of beam heading, be it due to squint or inaccuracies in the compass headings, can then be calibrated out by resetting the read-out. If it is found that there is a large error, it is worth repeating tests with any stations that could not be worked earlier on.

It should not be forgotten that the antenna is as sharp in the vertical plane as it is in the horizontal. It is strongly recommended that a small spirit level be permanently attached to the antenna, for example on the waveguide going to the feedpoint. This will allow the antenna to be set exactly horizontal. The presence of any squint in the vertical plane should be checked for by adjusting the elevation of the antenna for maximum signal.

Operating news

The Telford group (G3ZME) have been very active recently on 10GHz, and during the August leg of the Cumulative Contest they operated portable from the top of Snowdon. All the equipment was carried up on the mountain railway amid a lot of strange looks from the other passengers! Seven contacts were completed, all over 120km. The best contact was over a 150km path to EI2VDF/P on the Wicklow mountains near Dublin. Two of the Telford group, G3UKV and G8VZT, keep a regular Sunday morning 10GHz schedule. The 5km path between their home stations is very obstructed, and the only way they can make contact is to bounce signals off a nearby gasholder!

The August Cumulative Contest date also saw some interesting contacts made in Scotland. The Oxford University group operating as GM3YGF/P from near Aberdeen, made two contacts with GM3FYB/P and GM3HYX/P near Edinburgh, over a 166km all-sea path. Narrow-band ssb equipment was used by all stations. GM3FYB/P was running 1mW p.e.p. output, while GM3HYX/P had only 25μW p.e.p. output on 10GHz! Nevertheless good signals were received by GM3YGF/P from both stations. G3YGF notes that the wet Scottish mist got the better of his G3JVL mixer, and that it needed 30min in front of a generator-powered fan heater to dry it out before it would operate! The 10W twt pa fortunately did not suffer, and was received at 59+ by both GM3FYB/P and GM3HYX/P, and they could hear GM3YGF's signal wherever their dishes were pointing!

On 1·3GHz the expedition did not have the benefit of such power, being limited to 250mW from a Microwave Modules transverter kindly lent by GM8FFX. Unfortunately no two-way contacts were made, although GM8BJF (running 200W p.e.p. output) was copied.

GM3ENJ reports that he, GM3FYB, GM8CSE and GM3HYX have not been neglecting the bands between 1·3 and 10GHz, and lists a number of most interesting contacts made over the last few years. Of special interest are the following: G3FYB/P (Branxton Moor) to GM3HYX/P (Horsley Hill) in 1975 for the first G-GM 5·7GHz QSO; G3FYB/P (Rosscastle Hill) to GM8CSE/P (Horsley Hill) in 1976 for the first G-GM 2·3GHz QSO; GD3FYB/P (Mountain Gate) to GW4BRS/P (Great Orme) in 1978 for the first GD-GW 3·4GHz QSO; GD3FYB/P (Mountain Gate) to GM8CSE/P (Cocklaw Edge) in 1978 for the first GM-GD 2·3GHz QSO. In 1979 the following firsts were made: GM3FYB/P (Cocklaw Edge) to GD8CSE/P (Mountain Gate) for the first GM-GD 3·4GHz QSO; GM3FYB/P (Cocklaw Edge) to GD8CSE/P (Mountain Gate) for the first GM-GD 5·7GHz QSO; G3FYB/P (Black Preston) to GD8CSE/P (Mountain Gate) for the first G-GD 2·3GHz QSO; G3FYB/P (Black Preston) to GD8CSE/P (Mountain Gate) for the first G-GD 3·4GHz QSO; and G3FYB/P (Black Preston) to GD3HYX/P (Mountain Gate) for the first G-GD 5·7GHz QSO.

Special microwave awards

To stimulate even more activity on the 10 and 24GHz bands, the RSGB has been sponsored by Microwave Associates Ltd to introduce two brand-new microwave awards. These are open to amateurs all over the world, and are to be given to those achieving the first-ever contacts exceeding 1,000km on 10GHz and 250km on 24GHz. The only rules for these awards are that participants must operate within the terms of their licences, and that claims should be submitted to RSGB headquarters together with a written statement from a senior member of the participants' national society, confirming that the contact has taken place, ie vhf manager or microwave manager. To put these awards into perspective, contacts approaching these distances have already been made, so they are certainly not far out of reach.

On 10GHz the most likely propagation mode to yield success is super-refraction, as used for the current world record contact. It can be shown that the path loss on 10GHz in a perfect super-refraction duct is 143dB. A near minimum size of equipment to cope with this path loss would typically consist of 5mW transmitter power, wideband fm in 250kHz bandwidth, a 15dB noise figure receiver and 1ft dishes. Experience shows that ducts are usually less than perfect, so somewhat larger equipment will probably be necessary.

Of the non-enhanced conditions approaches to cover this distance on 10GHz, moonbounce offers a better chance than troposcatter. Even so, calculations indicate that narrow-band techniques using transmitters generating several tens of watts, together with gasfets, preamplifiers and dishes at least 10ft in

(Continued on page 1170)

4-2-70

John Morris, G4ANB*

Repeater news

After a few last-minute problems, the latest batch of 433MHz repeater proposals, uhf Phase 5, was sent to the Home Office at the beginning of September to be considered for licensing. The proposed callsigns, locations and channels are:

GB3CW	Near Newtown, Powys	RB6
GB3GR	Grantham, Lincs	RB11
GB3GY	Grimsby, Humberside	RB11
GB3HZ	Near High Wycombe, Bucks	RB4
GB3LS	Lincoln, Lincs	RB2
GB3MT	Bolton, Greater Manchester	RB12
GB3NF	Near Southampton, Hants	RB11
GB3OS	Stourbridge, Worcs	RB11
GB3PU	Perth, Tayside	RB0
GB3SM	Leek, Staffs	RB13
GB3SW	Salisbury, Wilts	RB6
GB3TD	Swindon, Wilts	RB13
GB3VH	Hatfield, Herts	RB13
GB3VS	Glastonbury, Somerset	RB13
GB3WG	Near Port Talbot, West Glamorgan	RB6
GB3YL	Lowestoft, Suffolk	RB14

GB3MT is to be an rtty repeater, with the same specification as the operational unit GB3PT (RB12, Barkway, Herts).

Licences have been issued by the Home Office for two more of the 145MHz repeaters in vhf Phase 4. GB3SI became operational on 14 September from St Ives, Cornwall, on Ch R1. GB3DA is due to come on the air on Ch R5 from Danbury, near Chelmsford, Essex, on 26 September. The remaining units in this phase, GB3KN, GB3WR and GB3YJ, are still with the Home Office at the time of writing.

Several uhf repeaters have recently become operational, including GB3NT (RB0, Newcastle upon Tyne), and GB3SY (RB6, Barnsley, South Yorkshire). GB3KL (RB4, Kings Lynn, Norfolk) came on the air on 14 September, as did GB3HW (RB13, Gidea Park, Essex). GB3MA in Manchester is to change channel from RB4 to RB14, while GB3MR at Park Moor, Stockport, Cheshire, is to go from RB14 to RB11. The channel change for GB3BK in Reading has been completed, and the unit is now operational on RB11. GB3NR (RB0, Norwich, Norfolk) is off the air pending a move to a new site.

The continuing search for a new site for GB3WH (R4, near Abingdon, Oxfordshire) entered a new phase when representatives from the area travelled to RSGB HQ to discuss the problem with the general manager and members of the Repeater Working Group. At the meeting Mike Dennison, G3XDV, the RWG chairman, suggested a new approach to the problem which, after some discussion, met with the approval of the local representatives. Mike proposed that GB3WH should be moved to Ch R2, and transferred to a site near Swindon, where it would be screened by the Chiltern Hills from any co-channel interference with GB3SL in London. This would free Ch R4 for use by a new repeater, GB3VA, located in Aylesbury Valley. These proposals are still being considered by the parties concerned, but it would seem that this scheme could go a long way towards solving the problem of vhf repeater coverage in the area.

*120 Whitehorns Way, Drayton, Abingdon, Oxon OX14 4LQ.

Repeater maps

The mention in September of the many requests made for maps showing the repeater networks in relation to major roads prompted replies from several readers. Ron Howe, G3PLB, of Basildon, has produced a "do-it-yourself" repeater map. He recommends *Bartholomews British Isles Motoring Map*, on which the location of each repeater may be marked with a small coloured sticker. The self-gummed stickers used by G3PLB are about 8mm in diameter, and are sold by many stationery shops in packets containing four different colours. Ron uses red for 145MHz, and yellow for 433MHz repeaters, with blue and green presumably held in reserve for microwave units. Updating the map consists of simply replacing or adding stickers, each of which has the appropriate channel number written on it. Ron finds his map very useful when travelling around the country, a quick glance telling him which channel to select for the local machine.

The Leicestershire Repeater Group has produced its own repeater maps, one for vhf and one for uhf. The secretary, Mike Barker, G8CAC, has kindly sent samples of these maps, which are A4 size (about 30 by 21cm) and show the callsign, channel and status (operational or proposed) of each unit, as well as main motorways and trunk roads. They are sold at 10p each by the group, whose cartographical division is busy preparing up-to-date versions, which will be available from the group's stand at the forthcoming ARRA exhibition.

The *Amateur Radio Operating Manual* contains maps of the vhf and uhf repeater networks, but the almost weekly changes make it impossible for these maps to be completely up-to-date. The RSGB is, however, considering the publication of updated versions. For those wishing to make their own maps, the *UK Repeater List*, which is available from RSGB Publications (Sales), is the best source of information. This shows all the operational and proposed repeaters in the UK, and is updated on a day-to-day basis. It contains over 170 entries, listed alphabetically by callsign, and for each one gives channel, location, QRA locator, status, and the callsign of a person to contact for further information. All of this for 30p, *including* postage and packing, must be good value—and RSGB members get a 3p reduction!

145MHz ssb repeater proposal

Tony Whitaker, G3RKL, has submitted an updated proposal to the Repeater Working Group for an experimental 145MHz ssb repeater, to be given the callsign GB3SF. The proposal, describing the purpose of such a unit, comments that amateurs have for several years demonstrated the practicability of ssb at vhf for both fixed and mobile stations. It points out that much research and development in this field is being carried out by commercial organizations, and suggests that now is the time for amateurs to lead the way by demonstrating the feasibility of an ssb repeater.

The proposed input frequency is 145·185MHz, or perhaps a few kilohertz higher, with the output 600kHz above the input, as for vhf fm repeaters. This would place the unit above Ch R7, but keep the output below 145·8MHz, which marks the lower limit of the satellite sub-band, and which is also used by Raynet for inter-county communication. Initial trials would be carried out from the top of the metallurgy tower at the University of Sheffield. After a few months GB3SF would be moved to Harpur Hill, where it would be co-sited with GB3HH, the fm repeater which is already operational on Ch R4. The eventual

aim would be to run both units on the same antenna system, a four-dipole stack, which is currently used by GB3HH alone.

For acceptable voice quality to be obtained from an ssb transmission, the frequency of the re-inserted carrier must be accurate to within a few hertz. The GB3SF proposal recommends that a frequency reference should be provided by the transmission of a pilot carrier, at a level 16dB down on speech peaks. The repeater receiver would have limited afc, with a capture range of ±150Hz of the nominal input frequency. It is suggested that most amateur transmitters could be modified to produce the pilot frequency by slightly unbalancing the balanced modulator so that sufficient carrier is leaked. Access to the repeater would be obtained by a 1,750Hz tone, and maintained by the carrier.

The proposal stresses that GB3SF would not be a linear transponder in the accepted sense, but a conventional single-channel voice repeater using ssb as its transmission mode instead of fm.

The Repeater Working Group and the VHF Committee are still considering this proposal, and are trying to establish the level of both local and national support or opposition for this experimental project. Readers comments on this topic are invited. They may be sent to your scribe, who will attempt to extract relevant comments for discussion in *4-2-70* before passing them on to the appropriate committees.

Tone re-access or carrier re-access?

Most UK repeaters use carrier re-access, which means that once activated by a signal with a valid toneburst, they may be re-accessed by simply transmitting on the input frequency. In contrast, some units use tone re-access, where a toneburst must be sent at the start of every over. The IARU Region 1 standard is for carrier re-access, and this is recommended by the Repeater Working Group to repeater builders, but the final decision regarding re-access technique is left to the group concerned.

A request was recently made by an amateur radio dealer that the IARU standard be enforced and carrier re-access introduced uniformly on all repeaters. The reasoning behind this request is that as a few repeaters still use tone re-access, automatic toneburst must be fitted to all new rigs, making them more expensive. The Repeater Working Group discussed this request at some length, but finally concluded that the re-access method should be left to the discretion of the repeater builders. In the same way time-out on repeaters is optional and, where fitted, the timing may be set as desired by the constructors.

Expedition reports

The Oxford University Radio Society expedition to Aberdeenshire between 11 and 26 August met with a few problems, but on aggregate was deemed a success. G3YGF, G4KGC, G8LYB, G8RHI and G8RPV operated GM3OUR/P on 144MHz, and GM3YGF/P on 432MHz, from a site 16km southwest of Peterhead, in locator ZR41f. The equipment for 144MHz consisted of an IC202S, aided by a 3N204 preamplifier and a linear amplifier using a pair of 4CX250b valves. The antenna was a pair of F9FT 16-element Yagis, stacked vertically, with the centre 30ft agl. On 432MHz an IC402 was used to drive a K2RIW linear amplifier via an intermediate stage using a 2C39A. On receive a masthead-mounted gasfet preamplifier provided a 0·5dB noise figure. The 432MHz antenna system consisted of an array of eight F9FT 21-element Yagis, arranged as a box of four horizontally by two vertically, and centred 20ft agl. Heliax was used to phase the antennas together on both bands, together with Kungsimport antenna combiners.

Considerable care was taken to adjust each Yagi to 50Ω by bending the reflector and first director, so ensuring equal power division and optimum gain. These careful preparations allowed 10·5dB of sun noise and 1·5dB of ground noise to be heard on 432MHz, although problems were encountered with a high local noise level.

On 432MHz 28 stations were worked on tropo, but there was no spectacular dx. A sked with SM6HYG failed, but during the attempt the Swedish station received a 2s meteor burst from GM3YGF/P. The group worked three stations on 432MHz moonbounce—DL9KR and G3WDG on 24 August, and K2UYH on 25 August. The third contact is believed the first between Scotland and the USA on 432MHz.

The most interesting contact on 144MHz tropo was with LA1EKO, in the Eko Fisk oilfield, locator BQ37g. It is believed that this station will be operational from the North Sea for some time, possibly with high power in the near future. On 144MHz meteor scatter contacts were completed with Y24TN, Y59UN, SM3FGL, OH3TH and OH3MS on cw, and DK3KCF on ssb. A frantic 2h period on 16 August produced auroral contacts with 44 stations in 10 countries and over 20 QTH locator squares.

Conditions on both bands were generally poor for tropo, but the expedition managed to give several UK stations their first contacts with ZR square. Members of the expedition have expressed their thanks to GM8FFX for hospitality, assistance and loan of equipment; Mutek Ltd for the loan of antenna combiners; and Racal Ltd for the loan of a synthesized solid-state hf transceiver.

Ann, G4EYL, and Graham Fairbrass, G8LUV, decided to combine a week-long holiday with a 144MHz dxpedition, and conversations over the air convinced them that a station operating from the Isles of Scilly, in WJ locator square, would prove a very popular attraction. An examination of the Ordnance Survey map, and local knowledge provided by a telephone call to G3RPC, helped them select a good site on the island of St Mary's. The homebrew linear amplifier was rather bulky to be carried, but G8LZK offered the loan of his Nag 144MHz amplifier. A 16-element F9FT portable Yagi was loaned by the RAF Scampton club and delivered by G8OFQ and G4CPJ. A TS700 transceiver and portable mast completed the equipment. The final stage in the preparations was to tell the RSGB about the trip, and so gain publicity on GB2RS.

Suitably burdened with suitcases, rucksacks and poles, Ann and Graham left their High Wycombe home on 2 September for the overnight journey by road, rail and sea. The antenna was erected soon after arrival, and the first contact, with GU8VLT, was made. Over the next six days, regular operation as G4EYL/A between 1700 and 2100gmt produced 350 contacts, with 11 prefixes and 35 QTH locator squares worked. The site was just as good as expected, and the advance publicity resulted in many stations trying for a contact with WJ square. Apart from the day of the IARU contest, 6 September, conditions were generally poor. Ann and Graham have produced a special QSL card for the trip, and would like to thank all the people who called them and made taking the equipment worthwhile. They are hoping to make a repeat visit next year, with equipment for both 144 and 432MHz.

Adrian Ball, G8PSF, enjoyed his lower power activities as EI3VAN/P from Tramore and Wicklow. A five-element Yagi bolted to the car, an IC202S, and a 25W solid-state linear

amplifier produced many contacts with EI, F, G, GD, GJ, GW and GM stations, despite below average conditions. Power was taken from the carlighter socket, of which Adrian comments "What would we do without them—probably short out the whole system!". G8PSF recommends operators visiting Eire to take advantage of the visitors' permit licences, which are free for the first three months.

USA 50MHz band plan

Amateurs in the USA are allocated the 50 to 54MHz band. Their licensing authority, the FCC, has recently "de-regulated" the band, meaning that from 14 July 1980 any mode of operation is allowed between 50·1 and 54MHz, although 50 to 50·1MHz remains cw only, and repeaters are restricted to above 52MHz. The VHF/UHF Advisory Committee (VUAC) of the ARRL is working with various 50MHz special interest groups to produce a voluntary band plan. The situation is complicated by amateurs in many other countries not having the full 4MHz allocated. In Australia, for example, operation is allowed only above 52MHz. The actual allocation varies from one country to another, with no single frequency common to them all. The 50MHz dx chasers in the USA would obviously like to be able to work stations in all of these countries, so a series of "dx windows" has been suggested. The proposed VUAC band plan is as follows:

50–50·08MHz	CW and beacons
50·08–50·1MHz	CW only
50·1–50·5MHz	CW, ssb, a.m. and other narrow bandwidth modes
50·2MHz	National calling frequency
50·5–54MHz, except as noted below	FM and repeaters
51–51·1MHz	Pacific dx window
52–52·1MHz	Pacific dx window
53·1, 53·2, 53·3, 53·4 and 53·5MHz	Radio control spot frequencies

This band plan is still at the proposal stage, and various other schemes have been suggested, although most run along broadly similar lines. The Six Metre International Radio Klub, SMIRK, for example, is working for a "gentleman's agreement" to restrict fm to above 51·1MHz, with a Pacific dx window between 52 and 52·1MHz—non-fm modes would then avoid 51·1 to 52 and 52·1 to 54MHz.

70MHz news round-up

E. J. Harland, G3VPF, of Weymouth in Dorset, has very kindly offered his services in answer to the plea for help with new hardware for the 70MHz Gibraltar beacon, ZB2VHF. He has previously built the 10GHz Alderney beacon, GB3ALD, and is currently constructing 24GHz beacons for Alderney and the Isle of Wight. In his letter, G3VPF offers his standard logic board, which has 1024 bits of cw storage and seven-channel analogue fm telemetry. A local PMR service engineer can provide a 10W transmitter, and G3VPF is prepared to package these items into a suitable complete unit.

Chris Tran, GM3WOJ, reports that the antenna system of the GB3SX beacon (AL71d, 70·685MHz) has been repaired, and that signals are regularly audible in Dumfries. Chris is planning a new 70MHz beacon to go on the same site as GB3ANG (YQ35c, 144·975MHz). He is modifying a Pye Westminster for the transmitter, and G4ENB is providing the keyer. They hope that the new unit will be operational early in 1981.

Next year should hopefully bring a few ssb contacts with Gibraltar on 70MHz. GM3WOJ is sending a transverter to Jimmy Bruzon, ZB2BL, in readiness for the 1981 sporadic-E season. The transverter, which uses a QQV06-40A in the final, will give ZB2BL full ssb and cw capability on 70MHz.

Harold Turner, G8VN, in Derby, is one of many operators to comment on the rapid rise in activity on 70MHz. He has provided a long list of stations worked recently, and during the 70MHz contest on 17 August he made 24 contacts, including GD, GJ, GM and GW stations. All of these contacts were made with fairly modest equipment: 10W rf from a Microwave Modules MMT70/144 transverter, and a two-element beam. Harold proposes the introduction of a contact period from 8·30 to 9pm every night from Monday to Friday inclusive, when 70MHz stations would not merely listen on the band but would call CQ. He is sure that there are many operators who only listen and, on hearing no signals, close down without putting out a call.

John Baker, GW3MHW, has remounted his six-element 70MHz Yagi at 45ft agl, on a "tower made from scaffold pipes—very strong". On 27 June at 1945gmt he made the first GW–SM crossband 70 to 28MHz contact by working SM6PU. Gordon reports that the GB3SU beacon (ZN61a, 70·695MHz) has been received in Spain, and that G4BPY is trying to arrange some amateur cross-band tests.

Many readers have commented on the eastern European fm broadcast stations which can often be heard in the UK on 70MHz, in particular the Gdansk transmitter on 70·310MHz. During a contact on 14MHz with SP2DX, GM3WOJ mentioned that he could hear the Gdansk station all through the summer by sporadic-E. This report amazed the Polish operator, who lives very close to the transmitter. The only report ever received by SP2DX about reception of this station in the UK was several years old. GM3WOJ comments that the moral is clear: what may be everyday propagation to UK amateurs may be totally unfamiliar to someone at the other end of the path, hence no contacts. A second point to note is that these broadcast signals can interfere with attempts to make cross-band contacts on 70MHz, so frequencies should be chosen with care.

Transatlantic television on 50MHz

The report in September's *4-2-70* of the 50MHz Gibraltar beacon, ZB2VHF, being heard in the USA on 15 July prompted Roger Bunney, in Romsey, to report his reception of North American television signals a few days earlier. Both vision and sound were received on channel A2 (system M, 525 lines, video at 55·25MHz and audio at 59·75MHz) on 11 July between 2020 and 2200gmt. The signal quality was very poor, often disappearing into the noise, but the transmissions were positively identified as being North American in origin. The last time North American television was seen by double-hop sporadic-E was in July 1978, when CKCW-TV in Moncton, New Brunswick was received on Ch A2, with the video only on Ch A3. Earlier in the evening of 11 July Roger copied signals from RUV Iceland on Band 1 via single-hop sporadic-E.

RTTY frequencies

A letter from Eric Yeomanson, G3IIR, reveals that the Sunday rtty news bulletin, GB2ATG, has recently been suffering QRM from phone stations on 144·6MHz. The bulletin is transmitted twice, once using fsk, and again using afsk. Most of the problems occur with the first transmission as, unless it is very strong, fsk is difficult to detect on an fm receiver. Stations

The vhf/uhf antenna farm of Dave Olean, K1WHS, in East Lebanon, Maine, USA. On the left may be seen the 336-element 144MHz moonbounce array, made up of 24 14-element Yagis. The three towers which can be seen over the rooftop hold, l to r: five-element Yagi for 28MHz; 144 and 432MHz terrestrial arrays; and 220MHz array and 50MHz Yagi. *Photo:* Nadine White

believing they have chosen a clear frequency could therefore unwittingly be causing great annoyance to rtty operators. Apart from the news bulletin, the situation can be frustrating at other times, as 144·6MHz is the rtty dx frequency.

All operators are asked to avoid the recognized rtty frequencies: 70·56, 144·6, 145·3, 432·6 and 433·3MHz. In the words of G3IIR: "It is undesirable that the situation should arise where rtty signals are heard all over the band due to rtty operators trying to find a frequency."

144MHz openings

The good tropospheric conditions of July and August continued intermittently into early September, with an excellent opening coinciding with the IARU Region 1 Contest on 6 September. Geoff Grayer, G3NAQ, near Newbury, was the cause of a pile-up of Continental stations on 2 September. He worked 66 non-G stations in 5h of continuous operation. Contacts over 1,000km included OK1KKH/P (HJ06c), OE5OLL and OE5VHL (both in GI58c), IW2BAI (EF68b) and I2AV (EF46j). Geoff comments on the great variation in operating standards—from the many operators who waited patiently for a contact, to the few offenders who persisted in calling despite statements from G3NAQ that he was listening for a particular station or country.

John Heys, G3BDQ, of Hastings, switched on the rig at 1913gmt on 2 September and immediately heard, and then worked, OK1KKH/P, receiving a 5/7/9 report. John reports: "This really set the adrenalin racing and I had a minor ball on ssb." Among the many Danish, Swedish and East and West German stations worked over the next 2h were Y38ZA (HN01c), OZ1BJF (HP75h) and SM7JUQ (GP36h). Conditions were also good for G3BDQ on 3 September, when OK1MBS (HK48a) and many East and West German stations were worked. The propagation apparently passed over the low countries, with Dutch stations being considerably weaker than the dx. Equipment at G3BDQ is an IC211E with a Nag linear amplifier, and a 16-element F9FT Yagi at 400ft asl.

Mark Hatton, BRS43475, in Hereford (locator YM77j), took his first steps on the path to vhf by inserting a 144 to 28MHz converter between his indoor 28MHz dipole and Realistic DX160 receiver. During the contest on 6 September he logged seven countries and 23 locator squares, the best dx being F1FID (BD43c).

Several Continental stations were heard to be well over the 1,000 contacts mark towards the end of the contest, and a few UK entries were approaching this number. The highlights for G3NAQ included EA1TH/P (YC65c), HB9POI/P and HB9PDM/P (both in EG square), F1DUZ/P in the rare YG square, and F1BHI/M (AC square) who was *walking* with a 20W rig in a haversack (although he did not mention what antenna he was using!). Altogether Geoff worked 74 QTH locator squares from his home QTH during the contest.

DX warning nets

The most common lament heard on 144MHz in the aftermath of a sporadic-E or auroral opening runs along the lines: "Well, the band was absolutely dead, and then I heard a very strong Italian station calling CQ. I called him, and we gave each other 5 and 9, sent out 73s, and signed off. I turned around to see what else was about, and the whole band was full of "G" stations calling CQ and working all of the dx! Where do they all come from?"

The second most common lament is heard from operators who have come on the air just after the end of the opening: "I missed it all as usual. It's very annoying, because I have been in the shack all day, tidying up, but I didn't have the rig switched on."

The answer to the first of these and the solution to the second often lies in the use of telephone dx warning nets. At the simplest level this is just an arrangement between two friends that each should telephone the other on hearing an opening. In the extreme it can become a highly organized network of 10 or more people, set up to circulate the news of an opening as quickly as possible.

One such group operating successfully is the Thames Valley Anomalous Propagation Net. Setting up such a net does not involve a great deal of effort, according to Geoff Grayer, G3NAQ, its present organizer. Ten people are involved, which is considered an upper limit for viable operation. Organization consists of arranging the participants into a ring, ordered by geographical proximity to keep dialling time as short as possible. A sketch of this ring is sent to all the members, together with a list of names and telephone numbers. The list can contain any special instructions, such as telephone numbers at work for those lucky enough to be flexible in this respect, and times when a member will not be available. On receiving this list each person should add the appropriate dialling code to each number. It is important that participants know exactly what is expected of them, and so a set of instructions is also issued. All this information is kept in a prominent position near the telephone.

When a member notices an opening his first duty is to telephone *both* of his neighbours in the ring. An operator receiving a telephone warning makes only one call, to the next person in the ring. In this way the message is propagated in both directions around the ring, until somebody receives two calls, when the net stops and everybody knows of the opening. If any telephone call is unanswered, then that person is skipped, and a call made to the next number, and so on until a reply is received.

This is one form of organization, but others are of course

possible. No doubt readers will be able to concoct their own schemes for the rapid circulation of warnings. Whatever method is used, there are a few points which must be agreed between the participants. They must decide whether the net should be activated only when an opening occurs, or when one looks likely (such as sporadic-E being heard on the fm broadcast band). If members do not want to be disturbed in the middle of the night, then time limits must be set. The propagation modes to be covered by the net must be decided. Most nets cover only sporadic-E and aurora, but some also include tropospheric openings. Once the organization and purpose of the net have been decided, the matter is left in the hands of a net organizer who draws up and circulates lists of telephone numbers and instructions.

G3NAQ comments that nets of this kind tend to suffer from teething troubles at first, usually arising from misunderstandings, especially by non-amateur members of the household! One job of the organizer in the event of the net failing to operate correctly is to go back and trace where the message got lost. After a few of these exercises the net usually runs smoothly. The only other maintenance required is the occasional issue of updated lists of names and telephone numbers.

The most difficult part of operating a dx warning net is in the self-discipline required to leave the rig just as an opening is starting. It is worth remembering that the net is for mutual help, and that next time there is an opening somebody else will probably make the sacrifice to give you the warning. Messages should be kept as short as possible, giving only the identity of the caller and the nature of the opening. For example, a typical telephone warning might be: "Geoff, this is John. Sporadic-E. South. Goodbye." For very good openings the "Goodbye" may be omitted!

Using linear amplifiers

Graham Murchie, G4FSG, the chairman of the Martlesham RS, has written to *4-2-70* with some comments on the use—and abuse—of linear amplifiers on vhf and uhf. His letter makes so much sense that the relevant parts are reproduced here:

"We run a K2RIW amplifier on 432MHz, and our experience is that it can provide a clean, stable signal. To my mind, less than unconditional stability means poor constructional techniques, wrong valve bases, and/or "surplus" valves. K2RIW amplifiers do have a 1kW capability, but this means that they can be run in a linear mode, rather than be overdriven to try and get out the last picowatt. We *can* run more than 400W p.e.p. output into a dummy load, but the signal is not as narrow as we would like. Turning back the drive by 1dB or so (say from 9W in to 7W in) makes a great deal of difference.

"Too many commercial transistor linear amplifiers, especially on 144MHz, are designed for, say, 10W *maximum* input, and are being driven by rigs with 10W *minimum* output. The 1dB or so discrepancy causes absolute havoc. My suggestion is that everyone should tune for maximum (they do anyway), and then back off the drive by 20 per cent. This is only about 1dB, and I am sure their amateur neighbours would approve—it might also help their tvi neighbours. I know that the immediate response is "How?". The suggestion we make locally is to use long lengths of coaxial cable, preferably thin RG174 or equivalent, as a matched attenuator.

"Finally, power supplies are as important as the linear, if not more so. For valves, really good screen and grid supplies are often overlooked when trying to supply eht at the correct voltage. For transistorized amplifiers, hum is evident on rather more signals than it should be."

Note: RG174 coaxial cable has a loss of approximately 35dB/100m at 144MHz, so a convenient 1dB attenuator may be made using a 3m length.

Awards

How useful is a rare prefix when aiming for the vhf awards? Not as useful as many readers probably think, according to GU8FBO. In a recent award claim he commented: "The GU prefix has not helped as much as might be expected on vhf, as beams tend not to be turned down this way." Nevertheless the requisite cards were eventually secured, and GU8FBO has been awarded 144MHz FMD Senior No 153.

For many operators the task of obtaining the QSL cards seems to be almost as difficult as working the stations for an award. G4HEB encountered this problem, and commented on his recent claim for the 144MHz FMD Standard (No 551) that he had received only a 30 per cent return. Operators on 432MHz seem to fare rather better; G8RYK collected all the cards for 432MHz FMD Standard No 154 between February and July 1980.

George Grzebienak, BRS41733, of west London, and Martin Chapple, of Leamington Spa, have been sending useful reports on 144MHz A3j transmissions, and their efforts have been rewarded with 144MHz FMD Standard Listeners certificates Nos 35 and 36 respectively.

With the 144MHz news from Geoff Grayer, G3NAQ, came the following note (with which your scribe heartily concurs) expressing appreciation for the service given by vhf awards manager Jack Hum, G5UM: "I have used Jack's services three times in the last couple of months, and in each case the cards and certificate have appeared seemingly by return of post. Nevertheless he obviously checks through the cards carefully, having in several cases noted /P or /M contacts which I have omitted to mark as such on the check list. Contrast this with over three months waiting for two overseas awards earlier this year!" □

Microwaves

(Continued from page 1165)

diameter, will be necessary—a formidable challenge indeed!

The 24GHz award could be obtained over a line-of-sight path between stations sited at least 1,000m in height. Such paths exist in many countries. In the absence of atmospheric absorption, the sort of equipment in current use—eg 25mW transmitters, 1ft dishes and 200kHz-bandwidth receivers—would be capable of covering this distance with about 10dB in hand. However, atmospheric absorption can add several tens of decibels of extra path loss, depending on the amount of water vapour in the atmosphere, so the line-of-sight approach may be more difficult than it might appear at first.

The alternative approach of using a super-refraction duct is particularly intriguing. While such ducts reduce the basic path loss very considerably, on 24GHz the humidity essential for their formation will cause an attenuation. It will be interesting to see where the balance lies, and perhaps these awards may stimulate some interest in propagation research! □

swl news

Bob Treacher, BRS32525 *

144MHz dx reports

Continuing to give the vhf bands a mention if there is enough material, this month's news begins with details of the superb conditions which corresponded with the RSGB 144MHz Contest on 6–7 September. It must have been the first major contest for some while which was blessed with good conditions throughout. After just 36min of the contest, F1FIB/P had been logged in BD43c, and many French stations were audible in south east England. The best dx reported from these parts included F6EUY/P (BE49j), HB9MM/P (DG32a), F6EUZ/P (CD15f), HB9ARI (DH75h), EA2EI/P (ZD74d), DK0VL (EH11h), DK6DC/P (EL73b) and DL0BQ/A (FH34f). Glyn Redhead, RS41755, from Sheffield, reported his best dx during the same contest as EA3JA/P (BC44c), F6CJG/P (BF21j), F6EVA/P (AC30b) and F1BUT (AD63g). In fact conditions were extremely favourable, and some really big scores must have been claimed in both the transmitting and receiving sections. As a matter of interest Glyn was using an AR88d with a PA0MS converter and a pair of phased seven-element Yagis in the loft. John Ralph, BRS44000, also reported a number of French stations heard during the event; his QTH is in Berkshire.

Flying the flag

Your scribe unfortunately had to miss the Clipperton DX Group HF Convention in Paris on 20 September. However, G3ZAY, G4BUO and G4FAM attended and were the only British amateurs present. Many well-known callsigns were noted, including FY7AN, FK8CR, FB8XV, DJ9ZB, ON5NT and ON6BC. The assembled gathering was treated to numerous tape/slide shows, and amateurs and swls were obviously entertained exceedingly well by their French hosts. So perhaps more British dxers will attend next year's event.

The contest scene

G4DFI reports a steady stream of logs for the Cray Valley RS SWL Contest. Entries already include a multi-operator and several dx logs, notably from the USA. There are also several lower-frequency-only logs which show large scores, plus a number of all-band entries. Full details will be given later. By the time this is read, the "Contests calendar" will be devoid of major hf contests, with the exception of the ARRL 28MHz DX Test, which usually occurs in early December. By then 28MHz should be back at its best, and much dx should be audible. There are also rumours of a lower-frequency-only contest early in 1981. If this materializes, details will be published as soon as they are received. For those who really want to plan in advance, the RSGB 7MHz SSB and CW Contests occur on 7–8 February, and 28 February–1 March 1981 respectively. Everyone should have ample time to have their antenna systems perfectly matched so that there is a bumper turn-out for both events.

*79 Granby Road, Eltham, London SE9 1EH

1980 hf countries table

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS25429	193	219	236	131	112	26	917	ssb
RS42604	186	202	176	141	122	23	850	ssb
BRS8841	117	149	207	97	85	1	656	ssb/cw
BRS43475	118	153	192	86	74	10	633	ssb
ARS42503	58	131	126	98	50	2	465	ssb
BRS35943	97	97	93	76	85	5	453	ssb
BRS18529	49	95	155	74	59	15	447	ssb
BRS43273	112	119	105	34	20	0	390	ssb
A9191	75	101	125	53	24	10	388	ssb/cw
BRS41992	66	84	146	31	46	13	386	ssb
BRS40705	99	105	94	40	23	0	361	ssb
BRS44395	43	132	87	47	29	9	347	cw
ARS42591	47	79	122	28	64	0	340	ssb
BRS20185	81	85	94	20	27	2	309	ssb/cw
BRS42559	44	71	108	36	21	5	285	ssb
BRS40293	52	85	90	30	23	0	280	ssb
BRS40634	31	101	68	20	17	0	237	ssb
ARS43261	54	50	75	20	18	0	217	ssb
BRS43135	24	48	74	22	30	9	207	ssb
BRS40814	42	21	57	26	15	4	165	ssb
ARS43457	20	45	57	21	7	1	151	ssb/a.m.
ARS43496	1	38	66	22	21	2	150	ssb

DX news bulletins

G3NWG asks whether there are any dx news bulletins broadcast in English. After consulting several knowledgeable types your scribe can only suggest the W1AW dx bulletins. These are transmitted on rtty, cw and ssb. Details are as follows: **ssb**—daily, 0130 and 0430gmt on 3,990, 7,290, 14,290, 21,390 and 28,590kHz; **cw**—daily, 0000, 0300, 2100gmt (weekdays also at 1400gmt) on 3,580, 7,080, 14,080, 21,080 and 28,080kHz.

Apart from this bulletin, there are the usual well-known dx nets which exchange dx information—namely the DK2OC Net, which meets daily at 1200gmt on 21·320MHz (this is likely to QSY to 28·750MHz for the winter); the French DX Net on 14·175MHz; the Russian DX Net on 14·250MHz, and the DX-DX Net on 21·280MHz at 1700gmt on Mondays and Fridays.

September reflections

A number of reporters seem to have failed to catch up with HK0AA and HK0AB because of holidays, and with FR0/J due to poor copy in G-land. However, a goodly number did manage all three—much to the envy of those who did not! The really exotic dx trips should now cease for a while, but it is possible that PY0, St Peter & Paul Rocks, will be activated again before the end of the year. Larry Hoult, BRS42559, reports some useful dx on 14 and 21MHz, the best being YJ8NPS on 21, and ZK1BJ on 14MHz. John Goodrick, BRS44395, has been busy writing up logs for the Cray Valley event and the LZ-DX Contest, in which he put in cw-only entries. His most notable catches included JT1AN and 3B9ZV on 21MHz. Harold Moss, BRS18529, considers his best dx of the period to be 3B8LH and XP1AB, both on 14MHz. Derek Casson, BRS41992, was pleased to log FR0FLA/T on Tromelin Is, VY1CC in the Yukon, and 6O0DX in Somalia. John Doughty, BRS40705, has been rewarded for some concentrated listening with KH0AC and A35TW. Also noted were 4S7 and 9V1 on 21MHz, and ST2 on 28MHz. John Ralph, mentioned earlier, reports VP8SB, OA4CN, and W6RO aboard the *Queen Mary*, while 14MHz produced VR6TC as his prize catch. Mark Mullins, RS42604, claims QSLs from W4PYH/KH8, TY9ER, HM1PW and A4XIH. Bob Tough, ORS43382, reports having a spell in hospital, but he was

(Continued on page 1177)

the month on the air

John Allaway, G3FKM *

News from overseas

G3NRN is currently living in Greece and awaiting the day when he is the owner of an SV licence. He was formerly VK6JL and VK5SE and says that he would very much like to contact any British amateur living in Greece—please write to J. L. Schuler, 25 Parnasidos St, Kato Halandri, Athens.

Alan Osborne, G3SLI, kindly responded to the comments in August *MOTA* concerning amateur radio in other countries. He has visited Damascus recently and had the pleasure of meeting Rasheed, YK1AA. It seems that there are three stations active in Syria at the present time: Mike, YK1AN, is not very active; and Omar, YK1AO, is on the air most days from 1200 to 1600. Rasheed himself is on most evenings from 1700 on 14,300kHz, and often talks to his son (YK1AM) who is operating from Saudi Arabia. He finds few European signals audible at this time so tends to work other Arab stations. He is using the Drake 4-line T4XB, R4B and L4B, with a TA33 beam, but the linear is not used much during television hours. It seems that only phone operation is permitted from Syria in the bands 3·5 to 28MHz.

A letter has been received from Ian Hunt, VK5QX, concerning the occasional activity by Alex, VK5CCT, from Cocos-Keeling Is. Alex is a pilot who takes his radio gear with him and gives up most of his night's sleep in order to get on the air as VK9CCT/VK9Y. Operation is mostly confined to 14MHz due to lack of time for setting up other antennas, but a multi-band vertical may be used at some time in the future. Ian acts as QSL manager for the operations and says that he is much against the bulk mailing of QSL cards to those who have sent adequate return postage for single mailing. He draws attention to the fact that the airmail postage to the USA is 55c and that US$1 is worth 80c (Australian). Cards cost several cents each, and many applicants do not include an addressed envelope, so these have to be provided as well. This means that the whole effort is not done with profit in mind. A USA QSL manager is being sought to ease the problem, and it is worth noting that even cards sent out via the VK bureau cost 4c each for processing that way. Ian concludes by thanking all those who have helped during these VK9Y operations, and hopes that more operators may be able to join in the activity in the near future to lessen the load on VK5CCT. Paul, VK3CGR, has also operated as VK9CGR in the past, and VK5QX also deals with requests for his QSLs.

Maurice French (formerly G3ZXD, VP8PI and ZK1CI) is now VP5TCT and on the air from Grand Turk Is. He received his licence on 10 September and is especially looking for contacts with UK stations. His favourite operating times are from 2100 to 2300 on weekdays, and from 1700 at weekends, and he uses 14,180, 21,180 and 28,475kHz. He also joins the DX-DX Net on 21,280kHz on Mondays and Fridays at 1715 or 1730.

*10 Knightlow Road, Birmingham B17 8QB

DJ3NG operated from FH0FLP and FR0FLP earlier this summer. He also holds the callsign 5Z4NG

His equipment consists of a TS120S with ground plane and dipole antennas. A linear amplifier and two-element quad or beam should be in use soon, and activities should expand into the 3·5 and 7MHz bands. Maurice still has his ZK1CI logs and QSLs and is able to answer requests via the address in "QTH Corner".

Dxpeditions

According to the *Long Island DX Bulletin*, JY3ZH has been issued with the callsign YI3JY for use during a January 1981 visit to Iraq, and WA3HUP has already been mentioned as QSL manager.

The same source also says that J28AL and a number of other keen dxers will probably go to Abu Ail during early December, and will use the callsign J20A/A.

More activity from Sable Is is prophesied for either the last weekend in October or the last weekend in November (for the CQ WW DX Contests). VE1AI is an engineer with the telegraph company and is working on communications across the 125-mile path to the mainland. Amateur radio operation is often possible at very short notice, but may have to end rapidly due to changing weather.

The visit by PY7YS and others to St Peter & Paul Rocks is due to take place in mid-December and will be an all-band round the clock effort. There will be six operators, and some 1·8MHz activity is planned.

DX news

UA1PAL is now asking for QSLs via UA4HLK, and at the time of writing was often a good signal on 21MHz cw around 1100.

OY7ML says that he is not able to help with QSLs for OY2LP, OY4NA, OY5CD, OY7G or OY5JA as they are not licensed. OY6FRA, the club station, will be active during the winter in a number of contests, and now has a beam on a 50ft tower. OY7ML is the only Faroe Is station active on 1·8MHz.

TR8IG is to be found on most days around 21·006kHz at 2100, and 5V7HL keeps a schedule with N5ABC on Wednesdays and Sundays on 21,357kHz at 2200. At that time a list made earlier (at 2130 on 21,290kHz) will be worked.

7X5AH appears regularly on Fridays at 0100 on 14,220kHz, and at 0400 in the 3,790–3,795kHz area. KA5HID/9G1 and other Ghanaian stations meet on 21,330kHz daily between 1030 and 1300.

8Q7AZ may be found just inside the USA phone bands on 21 and 28MHz between 1700 and 1900, and FB8XY on Amsterdam Is meets DK2OC on 21,320kHz at 1230 daily. D68AP is

said to appear to work a pre-arranged list of stations on 21,285kHz at 1830 on Thursdays.

"VK0AC" is a pirate, according to VK2AOK/WA2RRV, who previously held the call. The real VK0AC left Macquarie Is in November 1977. 4K1A, at the USSR base in Antarctica, frequents 14,023kHz from 1100.

A report in the *DX Bulletin* says that third-party facilities are now available to Australian amateurs for internal contacts. VK3BOE is now running a European/Australian net on 21,183kHz at 1200, and DK9KE has one on 21,155kHz at 1130. VK9ZG has been reported on both, and will be on Willis Is until December when the automatic weather station on the island becomes operative.

PE1AQS/ST2, who was formerly TZ4AQS, has been worked on 14MHz ssb, and another new Sudan station seems to be VK5BD/ST2 who has been on 21MHz ssb.

Long Skip says that ZD9GH keeps a schedule with QSL manager ZS6UD on 14,320kHz at 1700 on Thursdays, and works ZD7HH on the same frequency and at the same time on Tuesdays. ZD7HH may operate from Tristan da Cunha himself for a short spell in 1981.

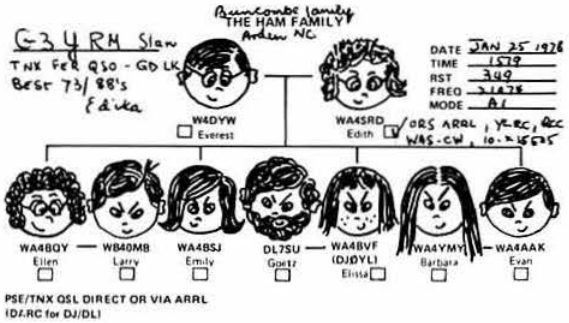
3B9AE on Rodrigues Is is frequently on 14,175kHz in the evenings, and also checks into the Caribbean Net on 14,175kHz at 1100. QSLs go to PO Box 18, Rodrigues Is (via Mauritius).

New callsigns are being introduced in Transkei, where the S8 prefix is being dropped in favour of S83 (for general licences), S84 (for novice licences) and S88 (for ladies). S8AAT is now S83T, and S8AAW is S83W.

QSL cards

EA8LD has very kindly forwarded a copy of a letter currently being sent out by John Monaco, KH3AA, concerning the necessity for a QSL card to bear an indication of signal report. In the letter KH3AA says: "Some amateurs have returned my QSLs, or have asked for another one, with the request that their signal report be filled in on the card. They are under the erroneous impression that a card without a signal report on it is not valid for ARRL DXCC credit. Therefore this clarifying note is being sent to those who have made such a request from me for a new card. According to W3AZD, who is the DXCC award manager, signal reports on a QSL card do not constitute verification of the QSO for credit. The award is issued on the basis of the mode of operation. If the mode is not indicated on the card separately, then a signal report becomes valuable as it will determine whether credit be given for a cw or phone endorsement. If neither mode nor signal report appears on the card, then credit for any endorsement obviously cannot be given. However, the card is still valid verification of the QSO and credit will be applied towards a mixed DXCC award.

"My personal operating habits do not include keeping a record of the signal reports exchanged during QSOs. A mental note is made at the time of the contact to assist me in knowing how I am being copied. After the QSO, reports are of no further use or value. Since my phone conversation with W3AZD I have chosen to dispense with the signal reports altogether. They are unnecessarily time consuming and 'after the fact' as far as logs and QSLing go. . ."



The QSL card of the Buncome family of Arden, NC, USA—the largest amateur radio family?

Contests

All Austria Contest

1900 15 November until 0600 16 November

1·8MHz cw only. Exchange RST and serial QSO number (starting from 001)—this must be confirmed by the receiving station repeating the whole code. Each contact counts one point, and the multiplier is two for each Austrian Bundesland (OE1–OE9) and one for every other prefix worked. Austrian stations are permitted to use the bands 1,823–1, 838kHz, 1,854–1,873kHz, and 1,897–1,900kHz. Logs must be postmarked no later than 15 December and should be sent to OVSV, "AOEC 1980", Postfach 999, A–1014 Wien, Austria. Listeners may enter, and should log the same information as transmitters; each complete logging counts one point. A station may only be logged consecutively for three QSOs, and may be logged again after five more log entries. Enclose description of station with log, and also the usual signed declaration that licence conditions have been observed.

The CQ WW DX Contests

0000 29 November to 2400 30 November (CW section)

Rules (as then available) of this contest were given in September *MOTA* but news of changes was given in September *CQ*. It now appears that unless the original log is sent in, a photocopy must be included with the entry, and a new 80 QSOs per sheet log form should be used. G3FKM has no supply of these, and it is suggested that a direct application to *CQ* be made by those needing them. It is advised that phone logs be sent direct to Bob Cox, K3EST, 5801 Huntland Drive, Temple Hills, Md, 20031, USA, and that cw logs be sent to Larry Brockman, N6AR, 7164 Rock Ridge Terrace, Canoga Park, Cal, 91307, USA.

In the **1979 CQ WW DX (Phone) Contest** UK scores were as follows:

SINGLE OPERATOR

Callsign	Band	Points	Callsign	Band	Points
G3FXB	All	4,708,014	GM3XNJ	28MHz	85,968
GM4GPN	All	1,081,380	GM4CHX	28MHz	62,144
G3XTT	All	614,304	GJ3XZE	28MHz	34,719
G4CVZ	All	527,094	G3XHV	28MHz	16,276
GM3BCL	All	356,775	G2VJ	28MHz	7,701
G3YBH	All	331,134	**G3NFV**	21MHz	190,008
G3VAO	All	131,425	G3NT	21MHz	25,773
G4ENM	All	113,190	**G4CNY**	14MHz	706,080
G2FNK	All	99,792	**G3VPW**	14MHz	605,324
GM4FSA	All	81,366	G3KKJ	14MHz	126,217
GD4GWD	All	56,180	G4HLN	14MHz	19,136
G3MXJ	28MHz	1,296,826	**GU3YIZ**	7MHz	49,324
G3ZQW	28MHz	1,209,359	**GM3ZSP**	1·8MHz	6,068
GM4GRC	28MHz	607,230	**G3SZA**	1·8MHz	3,895
G3XBY	28MHz	494,006	G3XWZ/A	1·8MHz	1,760

In the all-band section **G3FXB** was world second, on 28MHz **G3MXJ** was world fifth, and on 1·8MHz **GM3ZSP** and **G3SZA** world third and fifth respectively. In the **QRP section G3FTQ** came world sixth (out of 49 entries) with 90,985 points.

MULTI-OPERATOR, SINGLE-TRANSMITTER

GW6GW	6,054,540 points	G8JC	2,786,370 points
G3HTA	3,894,728 points	G6CW	2,386,800 points
G6UW	3,894,728 points	G3RRS	544,765 points

In the multi-operator multi-transmitter category **GM3MBP** scored 1,452,860 points.

Congratulations to certificate winners (listed in bold type).

TOPS CW Club Contest

1800 6 December to 1800 7 December.

3·5–3·6MHz. Contacts with own country count one point, in same continent two points, in other continents five points, with GW8WJ, GW6AQ and GB2TAC 25 points. Exchanges consist of RST and serial number (from 001). Final score is total QSO points multiplied by the number of different prefixes worked. Send logs before 31 January 1981 to Peter Lumb, G3IRM, 14 Linton Gardens, Bury St Edmunds, Suffolk, IP33 2DZ.

In the 1979 contest GB2TAC *(HMS Belfast)* scored 62,504 points and came third. GW3KOR was seventh with 56,580, G3ABG 16th with 41,022, and other UK scores were G4BUO (23,450), G3LCG (20,790), G3ILO (14,472), G3PKS (12,366), G2GM (12,320), G3ESF (9,120), G3MCK (3,834), G6GH (1,664), G3AWR (1,245) and G3AHS (440). There were 179 entries.

Awards

The Cornish Award

Rules for applicants for this certificate were published in the June/July issue of *Radio Communication,* but these have now been modified. Requirements for 144MHz QSOs are now the same as for the hf award, and the cost is 50p, US$1 or five ircs.

The Worked All GM Award

Issued by the Aberdeen RC for working, on any mode or band, the following stations: 15 GM3s, one GM2, one GM4, one GM5, one GM6 and one GM8. The cost for UK applicants is £1, which includes return postage on the QSLs (which must be submitted). Overseas stations should not send QSLs but a list of confirmed contacts and 10 ircs. Applications should be sent to GM4BKV, S. Sutherland, 67 Greenfern Rd, Aberdeen AB2 6TP.

Dutch Wadden Islands Award

The Wadden Islands include Vlieland, Texel, Schiermonnikoos, Terschelling, Griend, and Ameland, and this award is given to European applicants who have worked at least nine stations on three different islands since 1 January 1980. Others need at least four stations on two different islands. Send log details and US$2, DFI9 or DM9 to the manager: PO Box 2, 3330 AA West Terschelling, Netherlands.

Diploma da Regiao do Vinho do Porto

Needs confirmed contact with three different stations in each of the 23 counties in the Portuguese port wine region since 1 April 1980. Applications must be made on a special application form obtainable from ARP, PO Box 2145-4021 Porto Codex, Portugal (please send return postage). The award costs US$2.50.

The CQ CA Award

The various contests which will be taking place are an excellent way in which to qualify for this highly attractive (and colourful) award which is made to those who have proof of contact with at least 500 USA counties. Additional seals are awarded to those with 1,000 counties (in at least 25 states), 1,500 counties (in at least 45 states) and 2,000, 2,500, 3,000 and all counties (currently 3,079). The last four categories require representation from all 50 states. A special record book is required for this award and may be obtained from *CQ Magazine,* 76 North Broadway, Hicksville, NY, 11801, USA. It is suggested that two books are purchased and that one is kept as a record for further endorsement applications. The present price of the book is not indicated, but a suggestion of US$5 might be reasonable as it is a fairly large item. The application for the award, which costs US$5 or 25 ircs, should be sent to Ed Hopper, W2TP, PO Box 73, Rochelle Park, NJ, 07662, USA. QSLs do not need to be submitted. The award is also available to listeners.

Diploma dos Concelhos Portugueses

The Portuguese Counties Award is issued in four classes: A for fixed hf, B for mobile hf, C for fixed vhf, and D for mobile vhf contacts. The basic certificate (Grade 1) requires 75 counties, and Grades 2, 3, 4, 5, 6 and 7 require, 125, 175, 200, 225, 250 and 275 counties respectively. There are no date restrictions but applicants must have QSLs in their possession. Applications must be made using a special booklet supplied by ARP (price US$1), and copies of the Lista do Codigo Postal, which gives county locations of all towns, are also available from the same source at US$2. It is suggested that two of these be obtained, one to submit for the award and the other to retain as a record for further endorsements (as with the USA CA). The award costs US$2.50 (or equivalent) from The Association de Radioamadores Portugueses, PO Box 2145, 4021 Porto Codex, Portugal. There is a Portuguese Counties Net which meets every Friday on 14,345kHz, between 2100 and 2400 and this is an excellent way to collect counties. David Brighton, G41SK,

QTH CORNER

CR9B	via WA3HUP, M. A. Crider, RFD 2 Box 5-A, York Haven, Pa, 17370, USA.
FC0FOC	via DJ3TF, W. Wiessely, Max Regerstr 6, 8450 Amberg, W. Germany.
F0AHY/FC	via DL4FF, V. Havran, Constandinstr. 33, D-6082 Morfelden-Waldorf, W. Germany.
H44HB **H44PD** **H44SH**	PO Box 350, Honiara, Solomon Is.
HS1ABD	via K3EST, R. G. Cox, 5801 Huntland Rd, Temple Hills, Md, 20031, USA.
HV1CN	(September QSOs) via DL1RK, K. Deering, Am Lanzenboden 22, 6384 Schmitten 1, W. Germany.
J28CC	via F6FGN, A. Dany, Gendarmerie, Av Kennedy, 84200 Carpentras, France.
VP2KAQ	via N0TG, W. Rowe Jr, 3237 Connecticut Drive, St Charles, Mo, 63301, USA.
VP5TAT	M. French, c/o Cable & Wireless, PO Box 78, Grand Turk, Turks & Caicos Is.
ZF2BP	via W4YKH, W. N. Parker, 3154 Ravenwood Dr, Falls Church, Va, 22044, USA.
ZF2DA	via N4AJO, R. McLain, Box 34, Madison, Va, 22727, USA.
ZF2DL	via WD4AEX, R. Harris, 7628 Dunston St, Springfield, Va, 22151, USA.
ZK1CI	via VP5TAT (see above).
3B8ZV	via ZL1BIL M. Edwards, Box 190, Pe Aroha, New Zealand.
3B9ZV	via ZL1BIL (see above).
WA1YIG/3B8	via WB2DCP, D. Grametbauer, 100 Hamilton Av, Leonardo, NJ, 07737, USA.
5N3ALE	via DK2OC, U. Adelung, Klopstockstr 2, 1000 Berlin 21, W. Germany.
8P6IM	via VE3JTQ, M. Spenuk, 820 Rymal Rd E, Hamilton L8W 1B6, Ont, Canada.
9U5AV	via K5VT, Dr V. Thompson, 625 E. 35th, Baltimore, Md, 21218, USA.
9Z7CSJ	Box 1167, Port of Spain, Trinidad.

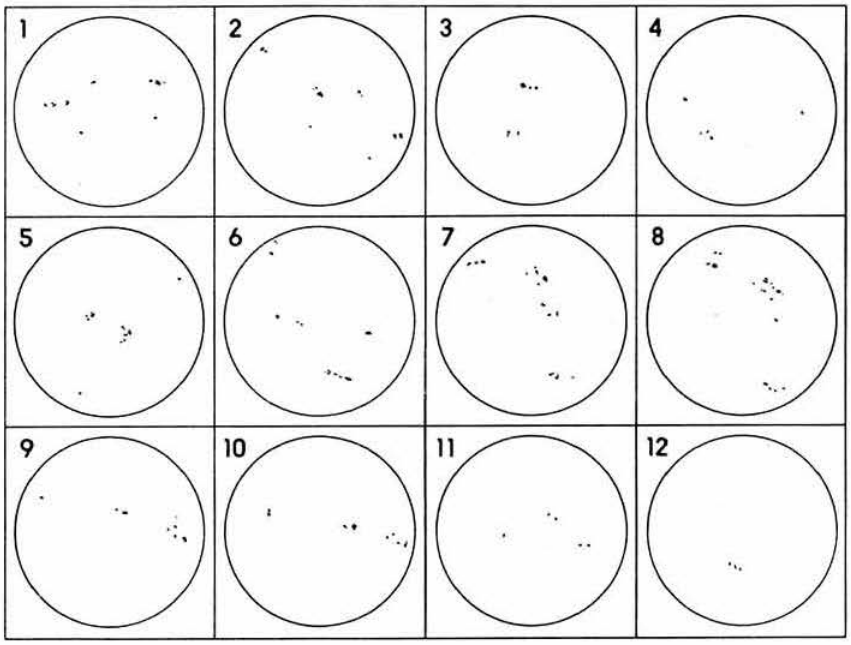
RSGB QSL Bureau, G3DRN, 30 Bodnant Gardens, London SW20 0UD

VISUAL SUNSPOT RECORDS

There is still plenty of sunspot activity. Compare these recordings with those for the same period last year. *(Radio Communication* August 1979, p749.)

The sunspot cycle usually increases faster than it decays, so there may be plenty of sunspots for some time to come—*G2UK*.

1. 2 June 1980
2. 4 June 1980
3. 8 June 1980
4. 12 June 1980
5. 14 June 1980
6. 17 June 1980
7. 22 June 1980
8. 23 June 1980
9. 26 June 1980
10. 27 June 1980
11. 29 June 1980
12. 3 July 1980



(8 Crown Place, Owlsmoor, Camberley, Surrey) will supply check lists of counties if supplied with a large stamped addressed envelope—at least 6 by 8½in please.

Blue Lake Award

Issued by the SE Radio Group of Mt Gambier, South Australia, to those who have contacted five or more members since 1 January 1980. Any bands or modes may be used, but no crossband contacts. Send detailed list of QSOs plus five ircs to: Awards Manager, VK5ALC, SERG, PO Box 1103, Mount Gambier, South Australia, 5290.

The UN-DU Award

Details of this appeared in August 1980 *MOTA*. It is now known that photocopies of QSLs will be accepted by the sponsors, and the photocopy of the applicant's licence is no longer needed.

Worked All Transkei Award

Zone 38 stations must have worked four S8 stations since 26 October 1976, and all others two. Any modes or bands as well as crossband. Send log extract certified by two other licensed amateurs and US$1 to Transkei Amateur Radio League, PO Box 750, Umtata, Republic of Transkei, Southern Africa.

Diploma dell'unita D'Italia

Issued by the Turin section of ARI to celebrate the centenary of the unity of Italy. It will be awarded to those who have contacted at least 18 Italian regions plus Turin city or province since 27 March 1961. Listeners may also apply, and the award is made for vhf contacts if at least five regions have been worked on the vhf bands. Send QSLs to La Segreteria della Sezione ARI di Torino, Casella Postale 250, Torino, Italy. No mention of fee is made in the information supplied to the writer.

Amateur radio in France

Jean-Yves Camus, FE-6476, has just joined the RSGB and has sent in some details of how amateur radio is organized in France. As in Britain there are two classes of transmitting licence—one for 144MHz and higher (issued after examination) which uses the F1 prefix, and one for all bands which also requires a morse test and whose owners are allocated F2, F3, F5, F6, F8 or F9 calls. F0 indicates a temporary licence issued to a foreigner, and the F4 and F7 prefixes are not currently being issued. The series had reached F6G by the time Jean's letter was written, and F6K was to be used by clubs. Frequency allocations on the hf bands are as in the UK, with the exception of 1·8MHz where only 1,828kHz cw is allowed. A listener licence is issued free of charge on declaration of equipment to the PTT, and holders are given an FE call followed by a four-digit number.

A4XVK (ex G4BVH) in his shack on Masirah Island

Ken Alford, G2DX, (right) a grand old man of amateur radio, celebrated his 87th birthday in August, when G2FIX and G8IUF (left) called to congratulate him. G2DX was first licensed as TXK in July 1912, and in 1919 received his present callsign. Among his early achievements were working the USA in 1922, and Australia in 1924. *Photo*: G4AJD

Calling GI yls

Mabel Bell, GI8SXN, 21 Plantation Ave, Lisburn, N Ireland, is hoping to start a BYLARA sub-group in N Ireland, and would like to contact all lady operators and listeners who may be interested. Please write direct to Mabel.

Band reports

No report this month from G8KG, who is in the process of QSYing to East Anglia, but from comments received it is clear that at the time of going to press 28MHz was opening up nicely for the autumn season—GM3LYY reporting the working of 44 USA states in less than a week. There have been some Far East signals on 7MHz in the late afternoon—not really expected so early in the year—all-in-all a promising start to the winter dx season.

Many thanks to the following for sending in logs: G2CDT, G3HB, G5JL, G3s AAE, GHY, GIQ, GVV, IMW and KSH, GM3LYY, G3NWG, GM3PPE, G3s SVW and YRM, G4EHQ, GW4KGR, and RSs 1066, 25429 and 31301.

Stations listed in italics were using cw.

3·5MHz. 0500 C6ADV. **0600** *CM1RH,* VO1EV, W7FGW, W0WP, ZLs 1JC, 3GS, 4AP. **2000** LZ2HA. **2300** UK9CAE.

7MHz. 0000 *HZ1HZ,* VU2CK, 9G1JX. **0400** 6Y5DA. **0500** CE9AK, HK0AB, *VP2VGS* (QSL to SM0CCM). **0600** A35TW, C6ADV, *FP0FJW, KL7Y,* TG, VE7, 5W1BJ, 7X4MD. **0800** HK0AA. **1700** A7XD, JA6XMM. **1900** JA6XMM. **2000** *VK3MR.* **2100** EP2TY, *VK3APN.* **2200** *OX3AX,* VS5DD, *ZB2EO.* **2300** JY5MM.

14MHz. 0300 *5N0DOG* (QSL to W4FNU). **0500** D4CBC. **0600** VP2AZE. **0700** A35TW, C21BS, *FO8GM, KC4USL,* KL7, P29PNG, T3LA, VK2AGT, *VK9NL,* ZL, *4K1B.* **0800** FK8s DD, DH, *HK0AA,* KL7, LU1ZD, *P29EJ,* VK9NL, VK0KH, ZK1AD, 5W1AU. **1000** KC4USV, YJ8BJ. **1200** HK0AA. **1600** FR0FLO/T, KC6IN. **1700** FH8YL, FR0DZ/J. **1800** FR0EUT/G. **1900** FH8CM, FK8CK. **2000** CE9AF, H44SH (QSL to AD1S), *9U5AV.* **2100** KL7H, PY7PO/0. **2200** VP8SB, *9X5AB.* **2300** *FP0HL, HK0AA, VK3IM,* W6-W7, *4U1UN.*

21MHz. 0600 *KH6, 9G0ARS.* **0700** HC8GI, ST2MM, VS5DD, ZL. **0800** *FK8DM, J28CC, KH6, KL7, M1C, VQ9NN,* ZK2TW, ZL, *5W1CW,* 6T1NI. **0900** C5ACA, *JT1AN,* KC4USV, UA1PAL, VS6, *5W1CW, 9J2BO,* (QSL to W6ORD). **1000** HM0U, KL7Y, XT2AW, *5W1BZ.* **1100** FK8DH, H44JB, VK9ZG, 3B8LH (QSL to DL0LH), 9G1NO (QSL to Nowfal, PO Box 533 Accra). **1200** T3AY, VK9NNW, 3B8DB. **1300** **HV3SJ**, *TA1VA, VK8UK,* VK9ZG. **1400** *FR7BY,* VS5s DD, RP, *VS6GY,* W6-W7. **1500** *FR7BP/T, FY7YE,* (QSL to W5JLU), HS1AMI. **1600** A6X-JA, *FR0DZ/G, HS5AID* (QSL to AG6D), *KL7CYL,* VQ9MA, VS5JI, W6RU, YB0ADT (QSL to VE7CBK). **1700** EC9AQ, TU4A, *VS5SI* (QSL to JA7SGV), *3B6CD,* 4S7SG (QSL to JA7SGV). **1800** FR0FLO, J73B, VP8S, PP, ZR. **1900** HK0AA, HT2DX, TR8IG, VP2AA (QSL to W4ZQX), *3B8CV, K9EF/8R1, ZL1AH* (LP). **2000** *FR7BP/T,* KH6WU, W6-W7, *ZD8UA, ZL1AH* (SP), *9U5AV.* **2100** FR0FLO/T, TR8DX, W6-W7, VK, 5V7HL. **2200** *CP7GM, FK8DD* (QSL to WB3JUK), *VK3YD.* **2300** *CX, FM,* KC4AAC, *W6, XE, 4U1UN.*

28MHz. 0600 FR0FLO/T. **0800** FH0EUT, H44WH, *9U5AV.* **0900** JA, H44PT, KX6BU, *5W1BZ.* **1000** *EA9GT, FR0DZ/J,* JA, JY9XK (QSL to G3FGP), *KG6RT,* P29RP, K5LBU/ST0, VK. **1100** H44s, HB, PD, WH, *SL8AEN/MM* (in Arctic), TJ1CK. **1200** AP2SA, FG7BG, DF3NZ/ST2, VP8SB, VS6GN, *8Q7BB.* **1300** FR0EUT/G, FR0CIW/J, HH2FH, WA4EHS/KH2, W1-W5, YC1BZ, *5N0DOG.* **1400** HZ1HZ, VP8SB, W6-W7, 3B8LH. **1500** J3AH, YC1BSA. **1600** HK0FBF, HS1WR, W6-W7. **1700** CE9AF, FR7BT/T, J3AJ, S8SW, W6-W7, VE6-VE7, VP8s JB, PU, ZR, XE1EFT, 3B6CD. **1800** FR0RX/T, JW2CF, KH6CF, TA4A, VP8QG (QSL to WA4JGS), W6-W7. **1900** CE, CX, HC, PZ5AA (Box 1881, Paramaribo), VE7, VP5RIT. **2000** KA5BPE/VP2A. **2100** OA8AA, TG9EW. **2200** LU, PJ, PY, ZP.

Thanks are also due to all those who sent in information and to the authors of the following: *Long Skip* **(VE3FRA),** *DX'press* **(PA0TO),** *CQ Magazine* **(W1WY),** the *Ex-G Radio Club Magazine* **(W3HQO),** the *DX Bulletin* **(K1TN),** the *Long Island DX Bulletin* **(W4UL/W2IYX),** and *DX News Sheet* **(Geoff Watts).**

Items for the **January** issue **must reach G3FKM** no later than **28 November,** and for **February** by **2 January.** □

HF propagation study

Predicted hpf + luf in megahertz for November 1980

	00	02	04	06	08	10	12	14	16	18	20	22
Suva (s)	2212	2212	2010	1906	2207	3508	4309	3807	3005	2107	2011	2012
Wellington (s)	2212	1912	1911	1908	3107	3508	3509	3107	2605	2007	1711	2112
Osaka	1910	1810	1710	2011	3412	3311	2309	1708	1708	1708	1708	1706
Hong Kong	1509	1510	1512	2714	4615	4413	3909	2906	2503	2004	1505	1507
Sydney (s)	1512	1515	1517	2718	3717	3613	3508	3304	3002	2004	1507	1510
Moscow	1203	1202	1202	1704	3505	4406	4606	4104	3302	2002	1503	1203
Bangkok	1507	1510	1512	3214	5216	5515	5512	4807	3504	2204	1605	1506
Singapore	1607	1510	1512	3415	5217	5215	5112	5007	3603	2403	1704	1706
New Delhi	1603	1505	1508	3410	5212	5112	4610	3906	2902	2202	1703	1703
Perth	1711	1613	1616	3419	4021	3719	3614	3208	3203	2703	1905	1808
Teheran	1703	1603	1604	3407	5509	5610	5509	5105	3702	2702	1903	1803
Colombo	1704	1607	1610	3413	5515	5616	5614	5109	3904	2803	1904	1804
Bahrain	1803	1703	1605	3308	5111	5412	5111	4006	3802	3003	2103	2003
Cyprus	1703	1602	1502	2805	5008	5209	5209	4706	4104	2903	2103	1804
Aden	2104	1905	1707	3310	5213	5215	5214	4710	4305	3304	2404	2204
Seychelles	2102	1905	1709	3312	4912	5212	5110	5008	4605	3403	2702	2302
Mauritius	2203	2006	1710	3212	4512	4712	4511	4308	4205	3503	2702	2402
Nairobi	2203	2103	1805	3109	5113	5114	5113	4910	4706	3604	2903	2503
Malta	1503	1402	1302	1704	3906	4307	4308	4007	3905	2604	2103	1603
Salisbury	2403	2203	1905	2909	4413	4715	5115	4812	5109	3705	3103	2602
Cape Town	2402	2203	2106	2410	4112	4412	4712	4711	4608	3904	3202	2802
Lagos	2604	2303	2103	2206	5110	5113	5114	4714	4711	4107	3404	2904
Suva (l)	2613	2412	2110	2107	3307	3209	3210	2608	2406	3007	3311	3012
Gibraltar	1302	1202	1202	1102	2803	3704	3505	3404	3404	2702	1902	1602
Ascension	2604	2303	2303	1907	4611	5214	5115	4816	4714	4309	3504	3004
Wellington (l)	2612	2212	2210	1908	2607	2209	2110	1909	2006	2308	2511	2612
Dakar	2602	2302	2202	1904	4607	5210	5112	4712	4710	4306	3503	3002
Adelaid Is	2806	2705	2304	2005	3507	4009	4210	4411	4411	4211	4010	3408
Las Palmas	2103	1803	1802	1603	3504	5007	4809	4609	4708	3905	3103	2503
Falklands	2506	2204	2205	1807	3212	3817	4022	4423	4521	4517	3513	3009
Rio de Janeiro	2505	2204	2204	1806	3410	4814	5118	5019	5017	4614	3610	3007
Buenos Aires	2505	2104	2104	1804	3207	4313	4518	4920	5018	4616	3612	3008
Sydney (l)	2415	2013	2011	1708	2408	2612	2418	2022	1924	2122	2520	2817
Lima	2403	1902	2002	1804	2207	3109	5309	5112	5113	4712	3611	2908
Barbados	2403	1903	1902	1802	1702	3407	5313	5115	4814	4611	3508	2905
Bogota	2302	1802	1802	1804	1706	2509	5109	5212	5012	4612	3510	2906
Jamaica	2202	1702	1702	1804	1706	2009	4709	5111	5112	4712	3210	2606
Bermuda	2202	1802	1703	1804	1706	2709	4809	5211	5211	4710	3208	2604
New York	1906	1706	1706	1806	1706	1908	3610	4912	5112	4511	2908	2307
Mexico	1905	1802	1702	1804	1706	1708	2209	4708	5111	4412	2812	2209
Montreal	1909	1708	1708	1908	1709	2010	3612	4813	5113	4312	2710	2209
Denver	1905	1803	1802	1904	1706	1808	1909	3408	4609	4110	2610	2008
Los Angeles	2006	1903	1902	1904	1706	1708	1609	2608	4208	3611	2411	2010
Vancouver	2006	2204	2203	2004	1806	1808	1709	1908	2706	3008	2109	1908
Iceland	1208	1208	1208	1207	1507	2808	3508	3508	3508	2208	1508	1208
Honolulu	2011	2208	2104	2004	1906	1708	1509	1407	1505	2908	2111	2012

First two digits are hpf, last two luf.

Propagation predictions

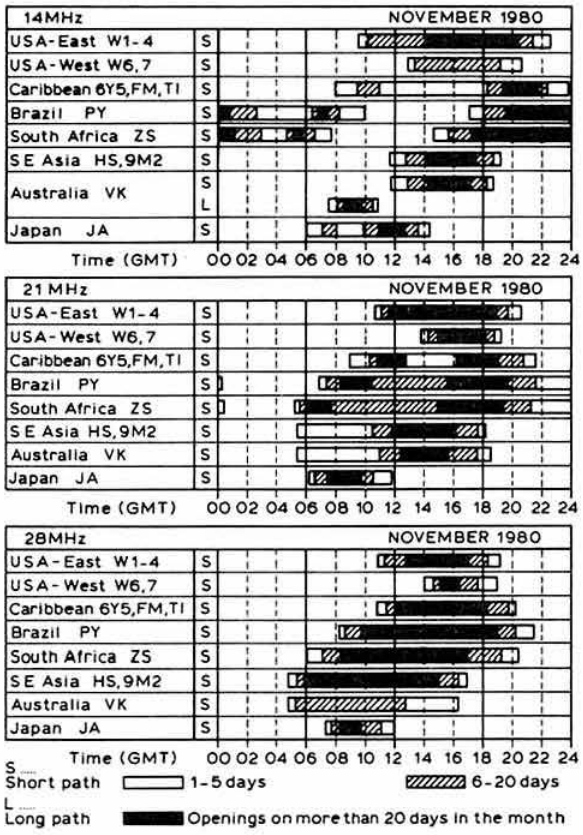
At the end of October/beginning of November, propagation conditions reach their maximum in the annual cycle. Added to the present high level of solar activity this will lead to very good conditions on the higher frequency bands (**28** and **21MHz**). Traffic with all continents will be possible on **28MHz**. Chances of contact with western North America will be better from southern Europe than from countries further north. Owing to seasonal conditions **28MHz** will close between 1800 and 1900gmt.

All continents will be heard on **21MHz**. DX via the indirect path will be possible on this band as well as on **14MHz** during the winter months under favourable conditions. Towards the end of the month **21MHz** will close about 2000gmt.

On **14MHz**, dx will be possible from afternoon until about midnight. During the latter half of the night practically the only traffic possible will be with South America and Africa.

There will be no noticeable changes from last month on **7** and **3·5MHz**; the latter will be interrupted by the dead zone during the early morning.

The provisional sunspot number for August 1980 from the Swiss Federal Observatory was 135·4. During the first week of the month there was little solar activity. Subsequently this increased rapidly and on several days numbers approaching 200 were recorded. The predicted smoothed numbers for December 1980, January and February 1981 are 134, 131 and 129 respectively.



SWL news

(Continued from page 1171)

allowed to have his station with him. He logged PY1ZAE, YC0UU, ZZ5EG, OE5GML/YK and 5Z4RH, all on 21MHz. He hopes to have a five-band vertical soon.

Dave Whitaker, BRS25429, has been concentrating on 7MHz ssb with good results—A7XD, UA1PAL, HK0AB, A35TW and 5W1BJ were all new calls for him. These took his all-time total on 7MHz to 222. Robert Small, BRS8841, back from F and 3A2, found FR0DZ/J on 14 and 21MHz cw, and 9U5AV on 14MHz cw. On 21MHz, ZK1CF, D68XX and FW8SC were the best of the crop. He also reports several impressive QSL returns in the shape of K6LPL/KH3, FW0XR and K8VIO/KH4.

Stephen Bowlzer, BRS43273, still runs a DX160 into a long-wire, and due to his forthcoming marriage feels that he will have to persevere with that set-up for a little longer. His dream of an antenna farm and mono-banders will also have to go into cold storage! However, he reports that the station is pulling in some good dx–H44JB, T3AY, FO8FU—but he missed T3AC and VK9NL. Stephen reports BY1BC (QSL via K3RLY) but has been around long enough to know it could not have been legitimate.

David Hawes, A9191, mentions a large number of calls noted earlier but has also heard FR7BP (/T?), ZK2TW, PA0GWK/A6 and H44MB on the hf bands, and OJ0MA on 1·8MHz (very nice!). He has also been going through the log to see the order in which he heard various countries (as your scribe suggested in an earlier issue). He reports some interesting anomalies, such as G on 7MHz—No33, OK on 21MHz—No104, and ZL on 14MHz—No146. David now has 100 countries confirmed.

Andy Swiffin, G8OEG, is pleased to see a paragraph or two concerning vhf swls (we try to please everyone!). He has been licensed for three years—he was A8603—and still has not received an swl report. He will certainly QSL any swl report, even if it is from just down the road; he points out that he has QSLs on his shack wall from his listener days from no more than 10 miles away, heard on 144MHz a.m., on a super-regen receiver! His QTH is now in Stockport.

Last, but by no means least, we welcome three newcomers. Graeme Caselton, RS44984, from Orpington, Kent, mainly listens on 144MHz with an FDK TM56b and a colinear, but he is constructing a 10-element Yagi and hopes to purchase an FRG7 receiver for hf band listening. Details of all RSGB vhf awards are available from Jack Hum, G5UM, QTHR.

George Cartwright, BRS35559, from near Maidstone, Kent, uses a KW201 and a 9R59DS, and also has a converter for 144MHz. His best QSL to date arrived within four days of posting, courtesy of VK2VNE.

Finally, L. Collinson, BRS41320, who listens to the hf bands with a G209 receiver and a 60ft long-wire. He prefers 21MHz, and considers CP8AL, TA1MD and VS5DD to be his best dx to date, all heard between 1700–1830gmt.

It is interesting to note that several reporters wrote to Brian Russell, BRS33915, for the *W6GO DX Managers List*. All the reports received so far confirm it to be a worthwhile publication to have. Details were given on p805 of the August issue of *Radio Communication*.

Reports, table scores etc for the **January 1981** issue should reach your scribe by *17 November*, (remember no *new* table entries will be accepted after this date), so that your scribe can meet all the Christmas schedules. □

council proceedings

A brief report on the Council meeting held on 17 July 1980

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

Apologies for absence were received from Messrs D. J. Andrews, R. J. Bellerby, P. F. D. Cornish and Dr D. S. Evans.

Raynet Ltd

The President vacated the chair, which was taken by Mr O'Brien, executive vice-President, during the discussion on this subject.

Mr Balestrini gave a short history of the formation of Raynet Ltd by Mr T. I. Lundegard, chairman of the Raynet Committee. After considerable discussion the matter was referred to the Finance & Staff Committee for appropriate action.

General manager's report

The general manager reported that the overall increase in Society membership during the year ended 30 June 1980 was 8·66 per cent; the number of new members being a record. He also described some of the difficulties still being experienced with subscriptions by bankers' orders arising from bank procedures.

An alternative venue for the 1981 RSGB exhibition was being sought following the destruction of Alexandra Palace by fire. Several possibilities were being investigated.

Also under investigation was the possible use of the Society's data processor and membership records to originate "copy" for the *RSGB Amateur Radio Call Book.*

Immediately after the lunch-break the general manager introduced the new ARRL film entitled *The world of amateur radio,* which featured scenes taken at RSGB HQ during 1978.

Review of committee business

Education (22.3.80)

Mr Anthony read the following extract from the minutes:

"Mr Newnham read out a letter he had received, deploring financial cuts in adult education, and individuals were urged to write to local authorities in protest about the reduced facilities for RAE courses and examination centres. The committee recommended that Council be asked to write to the Secretary of State for Education on this matter."

The parliamentary private secretary at the Department of Education & Science had been in contact by telephone with Mr Anthony.

Mr Knight referred to an item in the minutes concerning the Society's editorial attitude on articles for *Radio Communication.* Mr Pratt said this arose from a complaint about the vetting procedure.

Mr Hutchinson said that to guarantee the accuracy of articles, all were independently reviewed by a suitably qualified person. If the reviewer's opinions differed from those of the author, these problems were normally successfully resolved. An author had never previously complained about this procedure.

Finance & Staff (29.5.80, 19.6.80)

Accepted without comment.

HF Contests (12.6.80)

Accepted without comment.

IARU (5.6.80)

Council accepted a recommendation that Mr R. Bellerby be co-opted as a member of the IARU Committee to maintain close liaison regarding the organization of the Region 1 Conference in 1981. This co-option was to be on a temporary basis.

Mr Fisher asked if any replies had been received regarding use of the 10MHz band. Dr Allaway said that he had received seven letters commenting on the 10MHz band, but there appeared to be a low interest in this subject. The HF Committee was discussing the matter.

Mr Stone commented that the cost of rooms for the Region 1 1981 Conference in Brighton seemed significantly lower than the cost of accommodation in Monaco. Dr Allaway said that most societies appeared happy with the arrangements.

Action was being taken to enable the RSGB to join the IARU Region 3 Association.

Membership & Representation (17.5.80)

Mr O'Brien outlined the scheme suggested by the M & R Committee for Society badges. After discussion, Council agreed that the scheme could proceed.

Mr O'Brien said that the M & R Committee had debated the title for the affiliated society/club contact person at great length and had come to the conclusion that it was inappropriate for yet another layer of representation, thus the phrase "affiliated society/club representative" had been deliberately avoided. There was some discussion on this subject, and Mr Stone wished his feelings to be recorded as being in favour of the use of the term "representative". Council accepted the M & R Committee's feelings.

Rally & Exhibition (6.5.80)

Accepted without comment.

Propagation Studies (15.5.80)

Accepted without comment.

Raynet (24.5.80)

Mr Balestrini read a letter from the Raynet Committee vice-chairman, Mr E. Yeomanson, G3IIR, concerning a statement written by the committee chairman from which he wished to dissociate himself.

Mr Jessop agreed with Mr Yeomanson's remarks and expressed great concern about the matter.

Technical & Publications, (11.6.80)

Mr Jessop reported that he was still waiting for further input for the *VHF/UHF Manual,* particularly the microwave section.

Council discussed payments currently being paid to authors of articles published in *Radio Communication* and agreed that the committee should review them and make recommendations.

Telecommunications Liaison (22.5.80)

Accepted without comment.

VHF (12.7.80)

Some discussion took place on aspects of the vhf convention dealing with exhibits and location.

VHF Contests (11.6.80)

There was a short discussion on contest irregularities.

Membership and representation

Waived subscriptions in respect of five members on the grounds of disability were noted.

The following new affiliations were noted: East Antrim Amateur Radio Club; English China & Clay Radio Club, Cornwall; Harwell Amateur Radio Society, Didcot, Oxon; Merion Amateur Radio Society, Gwynedd; Pontefract & District Amateur Radio Society; and Smiths Industries Radio Society, Cheltenham.

The appointments of the following area representatives were approved: Mr B. Bennett, G3EAM, Lincoln; Mr A. J. Glassford, GW3ACF, Port Talbot; and Mr D. Holt, G4OO, Spalding.

It was noted that Mr W. James, G6XM, had resigned as area representative for Swindon.

Honorary vice-presidents

Mr Jessop suggested that additional honorary vice-presidents be appointed; no appointments having been made since 1976. He proposed Mr Ken Alford, G2DX. He was now 86 years old and had been a member of the Society since 1922. He was a great supporter of the Society and was active on the air every day. This would be discussed at the next meeting of Council.

Correspondence

The President referred to two letters concerning repeaters, and a general discussion on repeater jamming took place.

Mr T. P. Douglas

Mr Douglas explained the health reasons for giving up the majority of his commitments to the Society. He would have to drop all commitments prior to the end of 1980, except those directly connected with his role as vhf manager. The Society would need to seek a new vhf manager for 1981. The President formally thanked Mr Douglas for his services to the Society over the years.

RSGB SLOW MORSE PRACTICE TRANSMISSIONS

Alterations and additions to this list should be sent to the organizer, Mr M. A. P. MacBrayne, G3KGJ, 25 Purlieu Way, Theydon Bois, Essex.

Clock time	Callsign	MHz	Mode	Town
Mondays				
1200	G3GNS	1·910 3·550	A1 A1	Locking, Avon
1300	G3VHE	3·525	A1	Swindon, Wilts
1330	G3VHE	145·350*	F2	Swindon, Wilts
1830	G4CGT	1·930 145·525	A1/A3J (usb) F2	Darwen, Lancs
1830	GM4HIG	144·250 horizontal to south-west	A1/A3J	Aberdeen
1900	G3VHE	145·350*	F2	Swindon, Wilts
1900	G3ZRZ	1·975	A1/A3	Blackpool, Lancs
1930	GI3SXG	144·100	A1/A3J	Newtownards, Co Down
2000	G3LZV	145·250 vertical to south	F2/F3	Manchester
2030	G3ASR	1·875 144·175* vertical	A1/A3J A1/A3J (lsb)	Harrow, Middlesex
2030	G2FKO	145·525	F2	Bideford, Devon
Tuesdays				
1830	G4CWN	144·100	A1/A3J	Stoke-on-Trent, Staffs
1830	G4CGT	1·930 145·525	A1/A3J (usb) F2	Darwen, Lancs
1900	G4RS	3·565 145·525*	A1/A3J F2/F3	Catterick, N Yorks
1930	G3ZYY	145·550 vertical to east	F2/F3	Saltash, Cornwall
2030	G3IRM	1·975	A1/A3	Bury St Edmunds, Suffolk
2030	G4FFC	144·390 horizontal to south	A1/A3J	Pertenhall, Beds
2030	G3OHM/A	144·180	A1/A3J	Birmingham
2030	G3KGU	1·915	A1/A3	Theydon Bois, Essex
2030	G2FKO	145·525	F2	Bideford, Devon
2100	G4EWK	144·850 to south-west	F2	Burton-on-Trent, Staffs
2200	G3AWL	144·110 to south	A1/A3J	Easington, Co Durham
Wednesdays				
1200	G3GNS	1·910 3·550	A1 A1	Locking, Avon
1830	G4CGT	1·930 145·525	A1/A3J (usb) F2	Darwen, Lancs
1830	G3WNR	145·450*	F2/F3	South Shields, T & W
1900	GW3WSU GW4GSH	145·250*	F2	Barry, S Glam
1900	G2ABC	145·250	F2/F3	Truro, Cornwall
1900	G3ULY G4EXD	1·960 145·475*	A1/A3J F2/F3	Culgaith, Cumbria
1930	G3ZYY	145·550 vertical to east	F2/F3	Saltash, Cornwall
2000	G3SWP	144·180*	A2/A3J	Doncaster, South Yorks
2000	G3LZV	145·250 vertical to south	F2/F3	Manchester
2015	G3WVJ	1·845	A1/A3	Staines, Middlesex
2030	G2FKO	145·525	F2	Bideford, Devon
2100	G3HVI	144·750*	A2/A3	Stoke-on-Trent, Staffs
Thursdays				
1830	G4CGT	1·930 145·525	A1/A3J (usb) F2	Darwen, Lancs
1900	G4BNA	3·590	A1	Swindon, Wilts
1900	G3BLS	145·375*	F2	Osney, Oxford
1900	G3ZRZ	1·975	A1/A3	Blackpool, Lancs
1900	G4RS	3·565 145·525*	A1/A3J F2/F3	Catterick, N Yorks
1930	G3ZYY	145·550 vertical to east	F2/F3	Saltash, Cornwall
1930†	G3ASR	1·875 144·175* vertical	A1/A3J A1/A3J (lsb)	Harrow, Middx
2000	G2ACZ	1·808	A1	Mablethorpe, Lincs
2000	G3LZV	145·250 vertical to south	F2/F3	Manchester
2030	G2FKO	145·525	F2	Bideford, Devon
2100	G4EWK	144·850 to south-west	F2	Burton-on-Trent, Staffs
Fridays				
1200	G3GNS	1·910 3·550	A1 A1	Locking, Avon
1830	G4CRI	3·525	A1	Helston, Cornwall
1830	G4CGT	1·930 145·525	A1/A3J (usb) F2	Darwen, Lancs
1900	G4FIM	145·550	F2/F3	Leeds, Yorks
2000	G3WQK	144·775	F2	Hailsham, Sussex
2030	G2FKO	145·525	F2	Bideford, Devon
2200	G3AWL	144·110 to south	A1/A3J	Easington, Co Durham
Saturdays				
0915	G3LEQ	144·250 145·250 slant polarized to west-north-west 1·950	A1/A3J F2/F3 A2/A3	Knutsford, Cheshire
1100	G3LZV	145·250 vertical to south	F2/F3	Manchester
1200	G3GNS	1·910 3·550	A1 A1	Locking, Avon
2000	G3LZV	145·250 vertical to south	F2/F3	Manchester
2030	G2FKO	145·525	F2	Bideford, Devon
Sundays				
0915	G3LEQ	144·225 145·250 slant polarized to west-north-west 1·950 29·250	A1/A3J F2/F3 A2/A3 F2/F3	Knutsford, Cheshire
0930	G3WNR	145·450*	F2/F3	South Shields, T & W
1015	G3CGD	1·875	A1/A3	Cheltenham, Glos
1030	G3OHM/A	144·180	A1/A3J	Birmingham
1100	G2FXA	1·910	A1/A3/A3J	Stockton-on-Tees
1100	G3XJJ	3·535	A1/A3J	Northampton
1130	G3BLS	145·375*	F2	Osney, Oxford
1200	G3HVI	144·750*	A2/A3	Stoke-on-Trent, Staffs
1200	G3GNS	1·910 3·550	A1 A1	Locking, Avon
1400	G3LZV	145·250 vertical to south	F2/F3	Manchester
1800	G3WNR	145·450*	F2/F3	South Shields, T & W
1815	G4DVZ	1·915	A1/A3J	Leeds, Yorks
1815	G3LEQ	144·250 145·250 slant polarized to west-north-west 1·950	A1/A3J F2/F3 A2/A3	Knutsford, Cheshire
1815	G4DVZ	1·915	A1/A3J	Leeds, Yorks
1830	GM4HIG	3·550 145·550*	A1/A3J F2/F3	Aberdeen
1900	GW3WSU GW4GSH	145·250* to north-east	F2	Barry, S Glam
1930	G3LDW	144·160*	A1/A3J	Halesowen
2000	G3LZV	145·250 vertical to south	F2/F3	Manchester
2100	G4EWK	144·850 to south-west	F2	Burton-on-Trent, Staffs

* Omni-directional
†First and third Thursday in each month

Looking ahead

6-8 November—Amateur Radio Retailers Association National Amateur Radio Exhibition, Granby Halls, Leicester. **(NOTE DATE CHANGE.)**
6 December—RSGB AGM, IEE, Savoy Place, London.
10 January 1981—RSGB Presidential Installation, Queen Hotel, Chester.
11 April 1981—RSGB National VHF Convention, Sandown Park Racecourse, Esher, Surrey.

contest news

Second 1·8MHz Contest 1980 rules

1. The general rules for RSGB hf contests, published in the January 1980 issue of *Radio Communication*, will apply.
2. Eligible entrants. Single-operator stations only. British Isles entrants must be members of the RSGB.
3. When. 2100gmt Saturday 8 November to 0100gmt Sunday 9 November.
4. Sections
(a) British Isles stations.
(b) Overseas stations including EI.
5. Contacts. CW (A1) only in the 1·8-2·0MHz band.
6. Exchange. RST and serial number commencing at 001. British Isles stations must send their appropriate county/region code, as published in the February issue of *Radio Communication*.
7. Scoring
(a) British Isles section. Three points for each completed QSO, with a bonus of five points for the first contact with each county/region or country outside the British Isles.
(b) Overseas section. Three points for each completed QSO with a British Isles station, with a bonus of five points for the first contact with each county/region.
8. Logs. RSGB hf contest log sheets, written on one side only; or A4 sheets with seven columns headed; date/time gmt, callsign, RST/serial number sent and received, code received, bonus and points.
9. Declaration. Each entry must be accompanied by the following declaration: "I declare that my station was operated strictly in accordance with the rules and spirit of the contest and I agree that the decision of the Council of the RSGB shall be final in all cases of dispute". The declaration must be signed and dated.
10. Address for logs. RSGB HF Contests Committee, c/o D. Thom, 37 Wittington Road, Benhall, Cheltenham, Glos.
11. Closing date for logs. Logs must be postmarked no later than 20 November 1980.
12. Awards
(a) The Victor Desmond Trophy will be awarded to the leading British Isles entry.
(b) The Maitland Trophy will be awarded to the Scottish station scoring the highest aggregate number of points in this contest combined with the First 1·8MHz Contest 1981.
(c) Certificates of merit will be sent to the first three stations in the Overseas section and to the leading station in each overseas country.
(d) Certificates of merit will also be sent to the first three stations in the British Isles section.
(e) A certificate of merit will be awarded to the highest placed entry from a station which has not entered a Second 1·8MHz Contest before. Candidates for this award should mark their logs "First time award".

Summer 1·8MHz Contest 1980 results

Publication of the results of the contest has been delayed because of suspected log irregularities which are being investigated.

3·5MHz Field Day 1980 results

This year's field day was marred by bad weather—heavy rain and high winds appear to have plagued most entrants. G3WNR commented: "WX more like November than July!" and that sums it up nicely.

In spite of the weather, some 28 portable stations were active during the contest (including six from "Enfield LDN"), but only 17 have actually sent in entries. It is a pity that the tabulated results do not reflect the true level of support, as they are invariably used as a measure of a contest's popularity.

An immaculate log from G3XTJ/P (Barnet) has placed the station at the top of the 15W section, well clear of the rest. G3XTJ and G3RTE operated a TenTec Triton 2, using the driver stage to feed an inverted V at 30ft. In second place was G3GRS/P, operated by G4s BUO, FJW, and GML, just 10 points ahead of G3JKS/P.

Honours in the 5W section have gone to G4CZB/P. The rig was an FT301S coupled to a dipole at 30ft and operated solely by G4CZB (who said he much appreciated the 1h lunch break!). The 5W runner-up, also a single-operator entry, was G4DDX/P—he used a TenTec Argonaut and a dipole at 25ft.

Subject to Council approval, the Houston-Fergus Trophy will be awarded to G3XTJ/P, and certificates of merit will be sent to G4CZB/P and the stations placed second and third in each section.

Comments from competitors
"WX appalling—wellies and polythene sheets flew across field!"–G3XTJ/P.
"We in the north are at a great disadvantage—perhaps a 40m FD would even things out?"–G3WNR/P.
"A medal to the person who gave us a 1h lunch break"–G4DDX/P.
G3NKS

	15W SECTION				5W SECTION		
Posn	Callsign	QSOs	Points	Posn	Callsign	QSOs	Points
1	G3XTJ/P	77	625	1	G4CZB/P	53	445
2	G3GRS/P	69	510	2	G4DDX/P	45	403
3	G3JKS/P	66	500	3	G8IB/P	40	365
4	G3UOF/P	60	470	4	G3GDT/P	43	358
5	G3VIP/P	51	450	5	G3XWZ/P	21	205
6	G4CDD/P	41	319	6	G3NKS/P	16	150
7	G4FIM/P	49	306	Check log from G2VJ is acknowledged with thanks.			
8	G3IFF/P	36	302				
9	G3WNR/P	39	300				
10	G4JKG/P	32	253				
11	G3YRC/P	11	50				

IARU Region 1 VHF/UHF/SHF Contest 1978 results

144MHz FIXED SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	**F1DPU/A**	132,797	34	GD4GNH	70,226
2	**G4DGA**	125,441	72	G8JVM	45,785
3	F1KLQ	122,551	82	G8AZA	42,629
4	G8IQL	122,535	114	G8LZA	33,997
5	OZ5TE	117,193	215	G8HAO	16,817
6	DJ7CL	115,521	496 entries listed		

144MHz PORTABLE SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	F6CTT/P	258,112	27	G3VCP/P	142,735
2	HB9AGG/P	246,420	34	G3PIA/P	129,137
3	HB9AMH/P	239,658	42	G4DZO/P	119,470
4	F1EKU/P	235,334	53	G4CDU/P	107,272
5	G6UW/P	224,133	65	GW3OUR/P	99,044
6	F6CVN/P	213,556	117	G8PMR/P	72,472
14	GW8BHH/P	176,156	119	G3PQY/P	71,841
16	G6HH/P	169,289	149	G3XNO/P	60,443
19	G4BRA/P	165,077	201	G3NYY/P	48,288
20	G4BPO/P	159,100	302	G8NQP/P	24,231
24	G4FUF/P	148,549	444 entries listed		

432MHz FIXED SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	OZ9FW	99,131	114	G8KAX	6,551
2	OZ9DT	78,343	116	G5UM	6,444
3	PA0EZ	58,114	117	G3BPM	6,402
4	DK2GRX	53,272	119	G8FUL	6,107
5	DC8YR	41,648	129	G8DLX	5,053
18	G8AZA	29,777	134	G3VCT	4,332
68	G8IWA	12,181	135	G8DAB	4,207
80	G3VJG	10,772	161	G3COJ	2,276
85	G4EDR	10,349	163	G8HGN	2,186
103	G8IEM	7,484	191	G8ART	1,144
111	G8MKN	6,860	219 entries listed		

432MHz PORTABLE SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	OK1KIR/P	140,048	33	GW6UQ/P	36,406
2	F1ANH/P	106,017	34	G3AKF/P	36,307
3	OK1AIB/P	102,934	48	GW4ASR/P	28,942
4	DK3IK/P	98,544	53	G3NYY/P	23,713
5	G4BPO/P	95,381	56	G4ALE/P	22,076
16	G8PUB/P	59,545	69	G4ARD/P	16,364
23	G8EAH/P	46,033	146	G8LM/P	2,808
25	GW4BRA/P	39,628	164 entries listed		

1·3 GHz FIXED SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	PA0EZ	10,739	27	G3FYX	1,882
2	DK2UO	9,418	28	G8DAB	1,870
3	DC8BB	8,655	31	G3COJ	1,511
4	DJ9DL	7,722	34	G3SPJ	1,341
5	PA0GMS	6,920	38	G3XWZ	1,114
15	G3JXN	3,550	46	G8ART	569
17	G3TDG	3,361	51	G8IEM	431
24	G3FZL	2,315	57	G8CTT	279
26	G3VCT	2,056	59	G8ACJ	249
			68 entries listed		

1·3GHz PORTABLE SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	OK1KIR/P	29,154	21	G4ALE/P	6,156
2	PA0HLM/P	17,482	22	G4DDC/P	6,015
3	G3XDY/P	15,358	23	GW4CBW/P	6,000
4	DK3UC/A	13,071	25	G3ULT/P	4,826
11	GW4AJW/P	8,336	27	G3PQY/P	3,417
16	G3SBV/P	6,598	34	GJ8EZA/P	2,526
17	G4ERX/P	6,273	67 entries listed		

2·3GHz PORTABLE SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	PE0MAR/P	2,402	6	G4ALE/P	1,525
2	PA0HLM/P	1,830	8	G4EEE/P	1,226
3	PA0NYM/P	1,748	11	G4DDC/P	888
4	G3XDY/P	1,660	17 entries listed		

70MHz Trophy and SWL Contest results

Increased activity and better conditions encouraged more entries for the major 70MHz contest of the year. Once again a station has been disqualified for declaring a power in excess of the legal limit for the band. Most entrants lost a few points, and those who find their scores increased should check their maps and rulers. The division of sections into single-operator fixed station and "other" stations still causes confusion on cover sheets. The QTH given on the air should be precise enough to allow distances to be measured accurately—see general rule 11 for RSGB vhf contests.

The South of Scotland VHF/UHF Contest Group will receive the VHF Managers Trophy, with certificates going to GJ3YHU/A, GD4IOM, and GD2HDZ. BRS15822 also receives a certificate, but more listener entries would be welcomed. *G3XDY*

SECTION S

Posn	Callsign	Points	QSOs	QTH	Pwr	Best dx
1	GD4IOM	516	46	XO67	90	GJ3YHU/A
2	GD2HDZ	477	45	XO68	80	GJ3YHU/A
3	G4AGE	435	57	ZN64	50	GJ3YHU/A
4	G3RQZ	340	50	AL51	100	GM3WOJ/P
5	G4HNS	337	52	ZM05	130	GJ3YHU/A
6	G4BWW	303	38	YN26	70	GJ3YHU/A
7	G4FKI	251	47	AL31	40	GM3XBY/P
8	G3PWK	242	33	AM42	130	GM3WOJ/P
9	G4FRO	212	24	YL37	10	GM4ERX/P
10	G3BOC	172	22	YM16	10	GJ3YHU/A
11	G5UM	162	25	ZM35	15	GJ3YHU/A
12	G3PJX	159	36	ZL69	50	GM3WOJ/P
13	GM3YOR	151	17	YO65	60	G3JEQ/P
14	G3TWG	146	28	ZL37	90	GM3WOJ/P
15	G5DF	107	17	ZO51	50	G3JEQ/P
16	G5HD	42	6	XK07	3	GM3XBY/P

SECTION M

Posn	Callsign	Points	QSOs	QTH	Pwr	Best dx
1	GM3WOJ/P	1,017	76	XO26	130	GJ3YHU/A
2	GJ3YHU/A	1,006	71	YJ69	50	GM4ERX/P
3	GM3XBY/P	956	76	XO10	100	GJ3YHU/A
4	G3JYP/P	735	69	YO29	130	GJ3YHU/A
5	G4ADV/P	567	42	XK54	60	GM4ERX/P
6	G3JEQ/P	558	79	ZL77	50	GM3YOR
7	GM4ERX/P	527	48	YP42	100	GJ3YHU/A
8	GM4BVE/P	433	41	XO28	60	GJ3YHU/A
9	G4AOL/A	322	54	ZL46	50	GM3WOJ/P
10	G4EKT/P	314	36	ZN10	70	GJ3YHU/A
11	G4CLB	280	50	ZL37	70	GM3XBY/P
12	G3VIP/P	279	33	ZN49	1	GJ3YHU/A
13	G4HWF/P	193	23	ZM63	9	GM4ERX/P
14	G3PGN/M	58	18	AL22	10	G3JYP/P
15	GM3TAL/P	42	6	XP15	3	G4AGE

SWL SECTION

Posn	Station	Points	QSOs	QTH	Best dx
1	BRS15822	147	27	ZL40	GM3WOJ/P

Disqualified: G3PRC/P, general rule 13.

Check logs gratefully acknowledged from G4FEV and G3FME.

Veralum ARC Transmitting & Receiving Contest 1980 rules

Section 1. 1·8MHz 2000-2400gmt, Saturday 22 November
Section 2. 144MHz 0900-1300gmt, Sunday 30 November

The rules of the contest are the same as published on page 1055 of the November 1979 *Radio Communication,* with the following exception: **Post** separate logs for each section of the contest to F. Claytonsmith, G3JKS, 115 Marshalswick Lane, St Albans AL1 4UU. Entries must be postmarked not later than 15 December 1980.

Copies of the rules may be obtained from G3JKS.

144MHz QRP Contest results

This annual contest remains popular despite clashing with the Woburn Rally. Many contestants complained about the two sections under rule 4a. Four sections are favoured: portable and fixed, both multi- and single-operator. The VHF Contests Committee has taken note.

Propagation was said to be poor to average but dx was possible with the quiet conditions on the band. Sporadic-E was evident—G3NPB in Cornwall reported 5min of Es around 1352gmt to work I0AMU/0 in GB43d, 50km south of Rome; G4CGF/A in Somerset at 1357 to work IW0UAM/1S0/P in EA16b (Sardinia); G8SJP/P near Dover reported momentary Es at 0946 to work ED1ECO in WD22a, and at 1404 EI3VCA/P in WN79f square. Sporadic-E only reached 100MHz in the Channel Isles.

As prior notification of site operation is not a requirement of the rules, station inspection proved difficult to implement, and some portable stations were inaccessible. Every contestant described the method of reducing power. G3NNG proposed 1W rms instead of 1W p.e.p., and a simple standard circuit to measure the rms. Comments and circuit suggestions to the committee, please.

Thanks for check logs received from G3FXA/P, G3TKY/P, G3TLI/P, G4HZA, G4IGY and G8VIY. *G8ACJ*

SECTION S

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	G4CYA	830	121	ZN43	PE1FIR	465
2	G8AWZ	545	65	AM27	G8PFC/P	397
3	G3NPB	498	46	XK63	I0AMU/0	1,700
4	G4ANB	314	60	ZL24	GM8MJV/P	412
5	G3XBY	279	57	ZM52	ON5UN	393
6	G4DDL	206	50	ZL47	G8DVK/P	362
7	G4AZA	183	35	ZL13	G8DVK/P	290
8	G4AGO	94	29	ZL66	F0CVE/P	313

SECTION M

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	GW3NNG/P	1,740	220	YL03	ON1KLS	–
2	G8SUP/P*	1,625	201	AL66	ED1ECO	1,030
3	GW4ERP/P	1,593	169	AN61	DB6DC/P	525
4	G8WGT/P	1,552	230	YN75	PA0FRE	533
5	G8NQP/P*	1,568	205	YK10	–	–
6	GM8MJV/P	1,561	156	YP58	ON5UN	639
7	G8DVK/P	1,332	148	YO54	F1EZG	592
8	G8MJD/P	1,261	160	ZO71	PE1AAP	540
9	GW8LWR/P	1,255	183	YL05	F1BBD	510
10	GW8KPZ/P	1,221	179	YM04	F1BDC/P	580
11	GW4GZL/P	1,166	176	YM55	F1BBD	546
12	G8KXM/P	1,126	198	ZN61	F6CKZ	465
13	G8ERX/P	1,076	144	ZN07	GJ8SBT	540
14	G3PQY/P	1,051	130	ZN18	DG2ZJ/P	684
15	G4BZD/P*	995	141	ZN34	–	–
16	GJ8SBT/P*	951	186	ZL26	GI4FUM/P	481
17	G8RZO/P	950	87	YJ59	PA0FHG/A	585
18	G6YB/P	903	163	YL57	PA0FHG/A	615
19	G8SDS/P	871	119	YK28	PA0FHG/A	524
20	G4IPE/A	735	107	AN51	GJ8SBT/P	460
21	G3UUP/P	734	143	ZL26	GM8MJV/P	435
22	GW8CSA/P	707	119	YM04	G8SJD/P	358
23	G3LTY/P	705	93	AL55	GM8MJV/P	495
24	GW8MDY/P	703	96	YM21	GM3OBC/P	395
25	G8PFC/P	649	84	YO20	G8OCN	441
26	G8SRC/P	643	113	ZL32	PA0FHG/A	450
27	G4HRO/P	598	128	ZN71	GJ8SBT/P	426
28	G3VEF/P	584	101	ZK05	GM8MJV/P	460
29	G8JAY/P	581	124	ZL01	OR7MB	426
30	G8PNM/P	576	100	ZN52	PA0FHG/A	440
31	GM8GEC/P	566	82	YP42	G8NQP/P	500
32	G8HHQ/P*	563	84	ZL74	GM8MJV/P	475
33	G3TEU/P	543	81	ZN07	ON5UN	449
34	G4CGF/A	542	85	YL77	IW0UAM/IS0/P	1,460
35	G3VIP/P*	536	84	ZN49	–	–
36	G8RXK	532	94	ZL28	DD2EW/P	454
37	G2HIF/P	524	86	ZL33	GM8MJV/P	417
38	G2SU/P	479	96	ZN11	G8SJP/P	354
39	G8KKC/P	469	91	ZL59	GM8MJV/P	488
40	G4IXT	440	95	XM79	PA0FHG/A	484
41	G4DZO/P	416	64	AK11	G4CRC/P	383
42	GW3ZTT/P	381	67	YM04	–	–
43	G4JZA/P	369	54	XK56	G8WGT/P	450
44	GI4FUM/P	356	48	XD11	G8NQP/P	493
45	G3YMD/P	292	40	AL77	GW4ERP/P	369
46	G8SDK/P*	131	19	AM64	PA0FHG/A	282

* Single-operator station.

SWL SECTION

Posn	Station	Points	QSOs	QRA	Best dx	Km
1	BRS32525	505	94	AL41	GM8MJV/P	460
2	BRS43204	231	43	ZM63	EI3VCA/P	347
3	BRS15822	158	28	ZL40	G3ILD	348

DF Qualifying Event South Manchester results

Seventeen teams assembled at the start, a lay-by on the A49, near Stretton, Cheshire, and the weather was warm and sunny. Good signals were received from both transmitters, and competitors were split evenly when selecting their first transmitter.

The A station, G3FVA/P, manned by Roland Parkinson and Tim Winter, was located approximately 14 miles distant, in a swampy area of disused land among hawthorns. The site, which was not obvious from the map, caused several competitors problems in locating the area, but once in it they were not long in finding the transmitter. First in was Bill North at 1437, pursued by Eric Mollart and George Whenham who arrived 2min later.

The B transmitter, G3UHF/P, was operated by Dave Holland and Ron Smith, and was located seven miles from the start. The site was a large area of waste land, "a nightmare place" comprising of a small lake, swamps, mounds, brambles, hawthorn, wild briar and mosquitoes. An exceedingly long and branching antenna had been passed through the more unpleasant aspects of the area. The transmitter was hidden deep in the middle of a giant mountain of brambles, etc, the only way in having been hacked out by the transmitter crew. Several competitors spent most of the afternoon searching. The transmitter operators were becoming convinced that nobody would find them when Bill North appeared at 1534, followed at 1542 by Trevor Gage. The operators suspect several teams then followed, guided by audio "emissions" from one competitor (who shall remain nameless).

After the event, competitors enjoyed a splendid buffet tea, provided by Mary and Christine, to whom the South Manchester Radio Club would like to express its thanks. Thanks also to all who helped and competed, making the event a success. Bill North completed his hat-trick by winning the SMRC DF Trophy on three consecutive occasions!

Posn	Name	Club	Time of arrival Station A	Station B
1	W. North	Mid-Thames	1437	1534
2	T. Gage	Mid-Thames	1442	1542
3	P. Tyler	Mid-Thames	1440	1545
4	G. Whenham	Coventry	1439½	1546½
5	G. Taylor	Ariel	1443½	1547
6	M. Easterbrook	Dartford Heath	1442½	1609
7	E. Mollart	Mid-Thames	1439	1610
8	A. Simmons	Mid-Thames	1532	1629
9	D. Newman	Slade	1443	–
10	R. Vickers	Slade	–	1546
11	C. Merry	Dartford Heath	–	1547½
12	D. Yorke	South Manchester	–	1547½
13	T. Gleeson	South Manchester	–	1548
14	J. Warburton	South Manchester	–	1549
15	J. McBurney	South Manchester	–	1611
16	C. McKenzie	South Manchester	1627	–
17	R. Shepherd	Mid-Thames	–	–

Messrs P. Tyler and G. Taylor qualify for the national final.

DF Qualifying Event Slade results

The area chosen for this event was unusual, because although the start and the two actual transmitter sites were in typically verdant spots, the intervening terrain consisted almost entirely of built-up areas of the Black Country. Appreciating the difficulty which competitors would experience in obtaining accurate bearings in these circumstances, the organizers compensated by siting the transmitters fairly close together and operating to a generous transmission schedule.

The entry of 26 teams, which equalled the record for an RSGB event, assembled on Barr Beacon, which gives commanding views over the industrial West Midlands. Station A was 9km away near Bloxwich, in an extensive marshy area bordering a large pond. The operator had found a relatively dry island, well concealed in the bushes, which formed an ideal spot to watch the competitors as they squelched towards him through the mud! Station B was in the Baggeridge Country Park, near Sedgeley, 18km from the start. No less than four sets of hv power lines crossed immediately above the spot, which had been deliberately chosen by the operator, in the hope that the competitors would be led astray by re-radiation. So successful was this plan that one very well-known competitor spent much of the afternoon going round and round a large electricity sub-station some three miles away from the site, and was still there when the contest closed!

Seventy people met for tea in Walsall, where the results revealed that Brian Bristow had won the event, with Paul Yeates and Ian Butson qualifying for the national final. As this was the last qualifying round of 1980, the complete results of the Bert Simmonds Memorial Trophy competition could also be determined. These indicated that Brian Bristow had again emerged victorious, thereby retaining the trophy, which was re-presented to him by Dave Simmonds, nephew of the late Bert Simmonds.

Posn	Name	Club	Time of arrival Station A	Station B
1	B. M. Bristow	Mid-Thames	1438	1521
2	W. J. North	Mid-Thames	1455	1539
3	P. Yeates	Salisbury	1440	1539½
4	W. Pechey	Mid-Thames	1429	1542
5	P. H. Lisle	Mid-Thames	1544	1434
6	A. Simmons	Mid-Thames	1546	1512
7	T. C. Gage	Mid-Thames	1558	1445
8	I. R. Butson	Colchester	1439	1604
	C. D. Merry	Dartford Heath	1604	1502
10	C. D. Plummer	Mid-Thames	1608	1511
11	D. E. Newman	Slade	1611	1511½
12	P. Tyler	Mid-Thames	1612	1537
13	M. Easterbrook	Dartford Heath	1459	1613
	C. M. Wells	Mid-Thames	1613	1505
15	R. B. Parsons	Burton-on-Trent	1425	1614
16	D. Holland	South Manchester	1456	1615
17	G. H. Taylor	Ariel	1618	1532
18	R. Goodearl	Mid-Thames	1628	1544
19	K. Boby	Oxford	1628½	1438
20	E. L. Mollart	Mid-Thames	1438	–
21	M. M. Ellis	South Manchester	1509	–
22	P. Sharman	Dartford Heath	1532	–
23	R. Shepherd	Mid-Thames	1546	–
24	G. C. Foster	Stratford-upon-Avon	1548	–
25	P. M. Williams	Slade	1629	–

One competitor failed to locate either transmitter.

Slade Radio Bert Simmonds Memorial Trophy 1980 results

The following are the final placings in the 1980 Bert Simmonds Memorial Trophy Competition, which is based on the results of the RSGB df qualifying events and adjudicated by the Slade Radio Society.

Posn	Name	Club	Points
1	B. M. Bristow	Mid-Thames	30
2	A. Simmons	Mid-Thames	23
3	W. J. North	Mid-Thames	19
4	C. D. Plummer	Mid-Thames	15
5	E. L. Mollart	Mid-thames	13
6	W. Pechey	Mid-Thames	12
7	R. B. Parsons	Burton-on-Trent	11
8	T. C. Gage	Mid-Thames	10
	M. P. Hawkins	Chelmsford	10
10	D. Holland	South Manchester	9
11	P. H. Lisle	Mid-Thames	8
12	G. A. Whenham	Coventry	7
13	C. M. Wells	Mid-Thames	6
	P. Tyler	Mid-Thames	6
	I. R. Butson	Colchester	6
16	P. Yeates	Salisbury	4
17	G. C. Foster	Stratford-upon-Avon	3
	C. D. Merry	Dartford Heath	3
19	J. R. Vickers	Slade	2
	D. E. Newman	Slade	2
	G. H. Taylor	Ariel	2
22	M. Easterbrook	Mid-Thames	1
	B. J. Mahony	Rugby	1

DF Qualifying Event Burton-on-Trent results

The annual tour of Staffordshire started this year at the top of Buttermilk Hill, a few miles south of Uttoxeter, where 14 teams assembled beneath an unsettled sky.

Station A, G3NFC/P, was well heard by all competitors, but only two teams headed for this station first. They were sorry – it was located about 3/4 miles from the start in a thick wood throughout which meandered over a mile of thin antenna wire.

The other station, G3RBP/P, was 13 miles north of the start on the side of a very steep cutting which had formed part of a disused quarry railway. Soon after 2.30pm, four teams converged on the transmitter from four directions, two of which were distinctly hazardous.

Chris Plummer won the contest and, subject to confirmation, Dave Holland and Trevor Gage qualify for the national final.

Posn	Name	Club	Time of arrival Station A	Station B
1	C. D. Plummer	Mid-Thames	1539	1432
2	D. Holland	South Manchester	1603	1451
3	T. C. Gage	Mid-Thames	1605	1456
4	I. Butson	Colchester	1610	1451½
5	G. Foster	Stratford-on-Avon	1611	1437
6	D. Newman	Slade	1613	1433
7	P. Tyler	Mid-Thames	1614	1524
	W. North	Mid-Thames	1614	1524½
9	C. Wells	Mid-Thames	1619	1434
10	C. Merry	Dartford Heath	1624	1503
11	G. Whenham	Coventry	1536	–
12	J. E. Drakeley	Slade	–	1555
13	P. M. Williams	Slade	–	1556
14	W. Pechey	Mid-Thames	1611	–

Contests calendar

1 November	Shefford & D ARS Transmitting and Receiving (Section 2) *(Rules in August issue)*
2 November	144MHz CW *(Rules in October issue)*
3, 11, 19, 27 November	432/1,296MHz Cumulative *(Rules in August issue)*
5-6 November	YL Anniversary Party (Phone) *(Rules in September issue)*
8-9 November	Second 1·8MHz *(Rules in November issue)*
8-9 November	Esperanto contest (ILERA) with swl section. Details from G4MR, QTHR.
8-9 November	International Police Assn (IPA) *(Rules in October issue)*
9 November	OK DX *(Rules in October issue)*
15-16 November	First Alternative Energy *(Rules in October issue)*
15-16 November	Cray Valley Activity *(Rules in October issue)*
15-16 November	All Austria *(Rules in November issue)*
22 November	Verulam ARC Transmitting and Receiving 1980 (Section 1) *(Rules in November issue)*
29-30 November	CQ WW DX (CW) *(Rules in September, October and November issues)*
30 November	Verulam ARC Transmitting and Receiving (Section 2) *(Rules in November issue)*
6-7 December	TOPS CW Club *(Rules in November issue)*
7 December	144MHz Fixed *(Rules in October issue)*
7-8 February 1981	7MHz (Phone) *(Rules in August/September issues)*
28 February-1 March 1981	7MHz (CW) *(Rules in August/September issues)*

obituaries

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

Mr D. H. Jones, G3BO
Donald Jones died on 10 August, aged 78. He had been a radio amateur since the early 'thirties, when he was the second in the area to hold a licence. He joined the RSGB in 1935. He was a founder member of the North Devon Radio Club, and encouraged others' interest in the hobby. His interest in construction continued from his young operating days.

Mr D. A. Findlay, FCA, DFC, G3BZG
Doug Findley, who died on 7 September, was closely involved with the RSGB at all levels for many years. He was elected to the RSGB Council in 1952, and from that time until 1956 he also held office as the Society's hon treasurer. In 1957 he was elected President of the Society. In 1970 he again became involved in the administration of the Society when he took on the task of general manager, a position he held until 1974.

Apart from his services to the Society, Doug was also active both on the air and in club events, from which he derived a wide circle of friends. During the second world war he served in the RAF and was awarded the DFC.

Mr L. A. Miller, GI3LSM
Len Miller died on 23 July, shortly after completing his regular evening QSOs with friends.

He gained pleasure from the hobby both through contact with fellow amateurs, and as a keen experimenter. He was first licensed on 6 May 1957, and became a regular contributor to the evening nets on 3·5MHz. He was well known for his abilities as an "anchor man" in schedules.

Mr C. H. Newlove, G4JWN
Charles Newlove died on 19 August. He had received his class A licence only 10 weeks before. His earlier callsign was G8VSZ, having passed his RAE with credit in his 75th year. He founded the Lymington Amateur Radio Group, and pursued his new hobby with great enthusiasm. He was known for his friendship and helpfulness to other amateurs.

Mr O. H. Owen, G2AUZ
Owen Owen died on 1 April. He first became interested in radio in the early days and built his first receiver in a cigar box in the early 'twenties. He received his first broadcasting licence "for experimental purposes" in 1922, and had remained very active in amateur radio circles until shortly before his death.

Mr C. Proctor, G5PR
Clive Proctor died in July. He was a popular member of the Chichester and District Amateur Radio Club.

We have also been advised of the deaths of:

Mr H. Bruce, RS44199, on 8 August;
Mr G. R. Kay, G3LQD;
Mr G. A. Raahauge, G2AMJ, in August;
Mr W. R. C. Scott, G3IFG;
Mr R. Webb, G6XY, on 17 September.

raynet

M.G. Barker, G8CAC*

As from 1 September, I took over the role of group information officer from Len Crane, G3PED, who was unable to continue handling group information in addition to routine mail in his capacity as Raynet secretary. By the time that this column is published, all known controllers should have received the 1981 Raynet Survey Questionnaire which I sent to them. Any controller who has not received a form should contact me as soon as possible at the address given below.

The Raynet Committee asks that these forms are returned by mid-December so that the records can be checked and suitably updated, and all the appointments can then be confirmed or reaffirmed at the January committee meeting. Please return the forms promptly, as for the past two years a few groups have had to be chased up for their information, and the task of processing the completed forms is big enough without the problems of chasing up the outstanding ones.

It is hoped to publish these appointments in the first possible issue of *Radio Communication* after the January meeting. Further appointments will then be published on a monthly basis, thus formally completing the requirement of the new edition of the Raynet rules.

The committee realizes that the questionnaire is an annual chore for controllers, but it must have the information that it contains as it forms a vital part of the group information update—it is the only information or communication that the committee receives from some groups every year.

What information is required? From county and area controllers the committee would like details of groups that they have, or consider that they have, under their control, and the area each group covers—preferably by local authority districts. From group controllers, details of their own and their deputy/assistant/committee members' addresses, telephone numbers and, again, the area the group covers, plus details of the frequencies that the group uses. The approximate numbers of group members using these frequencies mobile, as fixed stations and hand portable are also needed, but not details of individual members' equipment.

The information from the questionnaire will be processed and used to check information held on the RSGB data processor, and to create new data files which the committee and the Society, as well as the Home Office and other user services, need access to. The frequency information is used to generate an overall picture of channel usage within the UK. It is hoped to publish a breakdown of this information early next year in the newsletter circulated to all controllers.

To sum up: if you are a controller and have not yet received your form, contact me immediately. Please give details of your group's officers and area by local districts, complete the frequency section and return the form as quickly as possible. The committee welcomes comments on the format of the form and will bear them in mind when drawing up the 1982 issue. I take this opportunity to thank you in advance for your co-operation.

* 3 Burley Close, Desford, Leicester LE9 9HX.

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 12 November for the January 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, 13, 27 November, 11 December. Ainsdale Scout HQ. Full details from G2CUZ.

Blackburn (East Lancs ARC)—First Thursday in each month, 7.30pm. YMCA, Blackburn, Sec F. Hill, G3YWH.

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

Bolton (B&DARS)—First, third and fourth Wednesdays in each month. Horwich Leisure Centre, Horwich, Bolton. Sec Alan Hartley, G8PRH, tel Bolton 46023.

Bolton (BTCARC)—newly affiliated club—no other details available.

Bolton (Edbro RC)—Details from sec, c/o Edbro Ltd, Lever Street, Bolton.

Bury (BRS)—Tuesdays, 7.30pm. Second Tuesday in each month (Main meeting). Mosses Community Centre, Cecil Street, Bury. Thursdays (RAE course now running in conjunction with the Bury Technical College), 7-9pm. The club continues to thrive. Details from the club's publicity officer Chris Marcroft, G4JAG, 24 Lancaster Avenue, Ramsbottom, tel Ramsbottom 2168.

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. Sec D. Cutts, tel Gresford 3344.

Colne (Rolls Royce ARC-Barnoldswick)—First Wednesday in each month. Rolls Royce Sports and Leisure Centre, Barnoldswick. Club call, G3RR. Hon sec, L. Metcalfe, G4IEX, 1 Park Avenue, Salterford, via Colne, Lancs.

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

Eccles (E&DARC)—Tuesdays, 8.30pm. White Swan, Worseley Road, Swinton. CW class each week. Sec Chris Harrison, G8KRG, 15 Cockey Moor Road, Starling, Bury BL8 2HD, tel 061-797 0031.

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

Liverpool (L&DARS)—Thursdays, 8pm. Conservative Association Rooms, Church Road, Wavertree, Liverpool. Thursdays (G3AHD cw practice, 144·250MHz), 8.30pm. All are welcome to call in or listen. Will the new secretary please give RR1 programme details of future events.

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 (L&DARS)—Thursdays, 8pm. Conservative Association time. Callsigns G3OUL and G8JUL active 1·8 to 432MHz. Would prospective members please contact Paul Broadhurst, G8LGL, 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. Sec J. Dent, G8OWY, 76 Lynwood Grove, Audenshaw, Manchester. Club station G3HOX active on hf and vhf.

Manchester (MUARS)—Wednesday afternoons and most lunchtimes in the radio shack (Manchester University Union, top floor). CW and RAE classes etc available. G3VUM active on hf, rtty, etc. Also with UMIST on Thursday evenings in UMIST union bar! Visitors always welcome. Details from J. Lenartowick, G8RQZ, c/o Radio Society, Manchester University Union, Oxford Road, Manchester 13.

Manchester (South Manchester RC)—Fridays: 7 November (Annual dinner), 14 November (Mystery lecture), 21 November ("A history of computers", by R. Ibbett), 28 November (Natter night), 5 December (Tape/slide lecture), 12 December (Main lecture contest), 19 December (Christmas party), 26 December (Club closed), 2 January (Discussion on club hf and vhf shack and contest operation). Mondays (Informal meetings), 8pm. Sale Moor Community Centre, Norris Road, Sale. Hon sec, D. C. Holland, G3WFT. 32 Woodville Drive, Sale M33 1NF, tel 061-973 1837. Visitors always welcome.

Manchester (UoMISTRS)—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—Third Thursday in each month (informal), 8pm. Globe Club, Willows Lane, Accrington, Lancs. Details from sec. G3RXH.

Ormskirk (OARC)—Tuesdays, 8.30pm. "Over 60's" Hut, Liverpool Road (opposite Christ Church). For details contact either G4HDU, tel Aughton Green 423062; or sec G4IGX, tel Ormskirk 75546. Club interests include vhf, uhf, hf, rtty, contests, film and slide shows.

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)—Alternate Thursdays. St Mary Magdalene Church Hall, Farringdon Lane (Ribbleton Lane), Preston. Hon sec G. Earnshaw, G3ZXC.

St Helens (StH&DARC)—Thursday, 7.45pm. YMCA, North Road, St Helens. Hon sec Paul Gaskell, G8PQD, 131 Greenfield Road, St Helens, tel St Helens 25472. Club net Sundays 11.30am, 145·575MHz (S23).

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, 8pm. Blossoms Hotel, Buxton Road (corner of Bramhall Lane), Stockport. Club net 3,692kHz, 11am, Sundays. SRS International, 28·430MHz, 10am, Sundays. Hon sec, G3FYE.

Thornton Cleveleys (TCARS)—First and third Wednesdays in each month, 8pm. St John Ambulance Hall, Fleetwood Road North (next to Gardener's Arms), Thornton. RAE classes available to club members. Details from sec A. Parr, G3IWP, 43 Argyle Road, Poulton le Fylde, Lancs.

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)—This club has amalgamated with ICLRC and now meets every Wednesday, 7.30pm. ICL Sports and Social Complex, Newton Park, near Winsford. Facilities comprise a meeting room, classroom, shack and canteen. New members should note all club members *must* be associate members of ICL Sports and Social Club and membership is limited. For details please contact M. Barry.

Wirral (WARS)—First and third Wednesdays in each month, 7.45pm. Sports and Recreation Centre, Grange Road West, Claughton, Birkenhead. Hon treasurer G. O'Keeffe Wilson, 20 South Drive, Upton, Wirral, Merseyside.

Wirral (W&DARC)—Second and fourth Wednesdays in each month, 12 November ("UK repeaters", by G4BVE), 26 November ("Radio aurora", RSGB tape/slide lecture), 10 December ("Propagation", by G3LEQ), 24 December (No meeting), 8pm. Sports Concourse, West Kirby, Wirral. Hon sec Ian Brooks, G8PMW, 28 Paignton Road, Wallasey, tel 051-639 5666.

On January 10, G2AMV will be installed as the RSGB President at an evening function at the Queen Hotel, Chester. See page 1144 for details.

Quite a number of the above entries are "repeats". Would the various club/society reps like to update RR1 on future programmes, changes in secretary and/or venue etc. *RR1.*

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

Bradford (UoBARS)—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 J. Clegg, G3FQH, has written to tell me that the club has decided to hold a rally next year at Shelley High School, Shelley, nr Huddersfield, on Sunday, 5 July. Give Jack a shout if you are interested.

Doncaster (DMIofHEARC)—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)—Wednesdays, 7.45pm. Bradshaw Tavern, Bradshaw, Nr Halifax (you get a good pint there!). Sec, G8NUC. The club has sent me an interesting newsletter, from which I gather that a 1,296MHz rig for club use is being built. At the other end of the scale the club is thinking of entering the "low power" field day. This winter's club project may be a crystal calibrator. It seems that members have been having problems with spurious police transmissions on 144MHz, but members' efforts might have sorted out the problem by now.

Hornsea (HARS)—Wednesdays, 8pm. The Mill, Mill House, Attic Road, Hornsea. Sec Mrs J. Heathershaw, G4CHH. After a very full summer programme, including both field days, the committee has the autumn programme in hand. The club success is reflected in its growing membership and the number of new calls to its credit. See Scarborough.

Hull (H&DARS)—Fridays, 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 (HUR&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, Alwoodly, Leeds 17. New sec G4GDL. Club net, 8pm, Thursdays on 3·750MHz. 1981 White Rose Rally will be on 12 April at West Park Girls High School.

Leeds (L&DARS)—New club. Mondays, 8pm. Temporary venue: The Malt Shovel, Crab Lane, Town Street, Armley, Leeds 12. The chairman, Neville Barker, G4FIM, tells me that the club, which was formed in mid-August, already has 66 members. The club hopes to appeal to all amateur radio interests by involving itself in field days, contests, constructional projects, etc, and has started already by putting on a display at the Leeds Printers' Gala Week. Everyone is welcome, wives and girlfriends especially. The club is in the process of arranging a Christmas dinner—the provisional date being 17 December. For details contact G4FIM, tel Leeds 564703.

Leeds (LUUARS)—The club is no longer active and looks as if it will remain this way for some time. Details from G4HGT or G4GVN, QTHR.

Otley (OR&ES)—Tuesdays, 8pm. 14 Back of Court House Street, Otley. Sec Jack Annakin writes that G4DZY gave a good lecture on Moonbounce and aurora last month. Visitors are very welcome here, contact Jack under his old call, G8DFZ.

Pontefract (P&DARC)—The new club premises are in use. Details from sec, G4DTO, 43 Red Hill Drive, Airdale, Castleford, Yorks. Good beer served at this club, I enjoyed my visit. *RR2.*

Scarborough (SARS)—Mondays, 7.30pm. Scarborough Cricket Club, North Marine Road, Scarborough. Sec G4JAQ. A busy period for this club. The Hornsea club was entertained for the second round of the G3GBH Trophy Contest. The very close run contest was eventually decided after the seventh "sudden death" question to break the tie. Well done Hornsea, and many thanks to question master, G4HYD, from Hull. The G5VO Morse Trophy was won by G8MWS. A busy JOTA, with lectures and film shows for scouts and guides is organized, the annual dinner is being arranged at the moment. Latest new callsign in the club is G8XLQ—the president's wife!.

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.

Sheffield (British Steel Corporation ARS)—Wednesdays, 7.30pm. Tinsley Sports and Social Club, Bawtry Road, Sheffield. Details from G3XSI, tel Sheffield 51417.

UK FM Group (Northern)—7 December, 4 January, 7.30pm. Royal Hotel, Church Street, Barnsley. Sec G8PLJ.

Wakefield (W&DARS)—Alternate Tuesdays, 4 November (Pie and peas supper, Rose and Crown Inn, Methley, 8pm), 18 November (On the air), 2 December (RTTY, by G3WWF), 16 December (Christmas social), 30 December ("On the air"). 8pm. Holmfield House, Denby Dale Road, Wakefield. Details from G4BLT NOT QTHR, tel Wakefield 255515.

York (YARS)—Fridays, except third in each month, 7.30pm. United Services Club, 61 Micklegate, York. Sec K. Cass, G3WVO. An active season for this club, but first a most important announcement: *the date of the annual dinner has been changed to 27 November 1980.* An invitation to visit the Science Museum on 14 September must have been quite a trip, and the club's trip to RAF Linton on Ouse to observe some night flying should be fascinating. Keith Cass was very enthusiastic about a lecture on microcomputers by Malcolm Newsome on 26 September so they are definitely state-of-the-art in York! JOTA should get the usual high level of support, with GB3YSS having a good airing. Visitors always get a warm welcome at York.

That's it for this month. Don't forget to "prod" your secretaries, I can't send news in if I don't receive it! *RR2.*

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

Birmingham (Midland ARS)—25 November (Surplus sale), December (no meetings), 8pm. Room 110, University of Aston, Gosta Green, Birmingham. Sec G8BHE, tel 021-422 9787.

Birmingham (Slade RS)—First Friday in each month, 7.45pm. The Kingsbury Road Community Centre, 75 Kingsbury Road, Erdington, Birmingham B24 8QH. Sec G4FGF, tel 021-770 3474.

Birmingham (South Birmingham RS)—Thursdays (HF night on the air), Fridays (Construction and morse classes), 7.30pm. 3 December (Christmas party and constructional contest), 7 January (Surplus sale), 8pm. Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Sec G4GZI, tel 021-427 7104.

Birmingham (University of Birmingham ARS)—Lunchtimes and Thursdays during term, 7.30pm. Tuesdays (RAE classes), 7.30pm. Club room, second floor Students' Union (above shop). Sec G8VNC.

Burton-on-Trent (BoT&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 G4IDK, tel Penkridge (078571) 2067. Visitors and new members welcome.

Coventry (CARS)—Fridays, 8pm. Baden Powell House, 121 St Nicholas Street, Radford, Coventry. Sec G8SEQ, tel Coventry (0203) 598186. Visitors welcome.

Coventry (CTCARS)—Mondays, 7pm. Winfray Annexe of the college. Sec G8ISJ.

Coventry (UoWARS)—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)—21 November (Constructional contest), 5, 19 December (Christmas quiz), 2 January, 8pm. Civil Defence HQ, Gaol Street, Hereford. Sec G4CNY, tel Hereford (0432) 3237.

Kidderminster (K&DARC)—Mondays (Informal), 9.30pm. Bellman's Cross, Shatterford. 11 November (Film show), 25 November, 9 December, 23 December (Social evening—see sec), 6 January, 8pm. Aggborough Community Centre, Hoo Road, Kidderminster. Sec G4ILQ, tel Kidderminster (0562) 4930.

Lichfield (Chad RC)—Alternate Wednesdays, commencing 19 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 G4JKQ, tel Ibstock (0530) 60396.

Malvern Hills (MHRAC)—Second Tuesday in each month, 7.30pm. The Foresters' Arms, Wilton Road, Barnards Green, Malvern. Sec G8JAO, tel Malvern (06845) 63270.

Mid-Warwickshire (MWARS)—First and third Mondays in each month, 8pm. 61 Emscote Road, Warwick. Sec G8RZR, tel Warwick (0926) 496453.

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 G8DIQ, tel Shrewsbury (0743) 54694. New members and visitors welcome.

Solihull (SARS)—18 November ("Amateur radio on a shoestring", by Rev. G. Dobbs, G3RJV), 16 December (Surplus sale), 7.30pm. The Manor House, High Street, Solihull. Club net (G3GEI), Fridays, 9.30pm on 1,960kHz. Sec G4BBT, tel 021-743 7277. Morse classes available. 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 (SoTARS)—Thursdays, 7.30pm. 2a Racecourse Road, Oakhill, Stoke-on-Trent. Sec G4CWN.
Stourbridge (StARS)—17 November (Surplus sale), 1 December (Constructional evening), 15 December, 5 January (Constructional evening), 7.45pm. Library, Longlands School, Brook Street, Stourbridge. Sec G4IEB, 7 Hanbury Hill, Stourbridge, West Midlands DY8 1BE, tel Stourbridge (03843) 2006.
Stratford-upon-Avon (SuA&DARC)—No regular meetings but occasional events. Help always given to new amateurs and swls. Chairman/sec G3OOQ, tel Stratford (0789) 5973.
Sutton Coldfield (SCRS)—24 November (Natternight), 8 December, 22 December (Natternight), 12 January, 7.30pm. Central Library, Sutton Coldfield. Sec G8TUR, tel 021-353 2061.
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) 69708. Club net Wednesdays 145·375MHz, 9pm. Visitors welcome.
Telford (T&DARS)—Wednesdays, 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G8INA, 16 Selkirk Drive, Sutton Heights, Telford, Salop TF7 4JE. Visitors welcome.
Walsall (WARC)—Alternate Wednesdays, commencing 26 November, 8pm. Forest Community Centre, Forest School, Hawbush Road, Leamore, Walsall. Sec G4GKC, tel Walsall (0922) 31675.
Willenhall (W&DARS)—Alternate Wednesdays, commencing 26 November, 8pm. Three Crowns, Stafford Street, Willenhall. Sec G4FAP. New members welcome.
Wolverhampton (WARS)—17 November (Natternight), 1, 8, 15 December (Natternight), 22 December (Social evening in The Anchor at Coven—see G8EDG), 29 December (no meeting), 5, 12 January, 8pm. Neachells Cottage, Danescourt Road, Stockwell End, Tettenhall, Wolverhampton WV6 9PH. Sec G8EDG, tel Wolverhampton (0902) 763617.
Worcester (W&DARC)—29 November (Annual dinner—see sec), 1 December ("Transatlantic meteor scatter tests", by David Butler, G4ASR), 5 January (Demonstration of home computer kits by Micro Print Limited), 8pm. Old Pheasant, New Street, Worcester. Sec G4EKG, tel Evesham (0386) 41105. New members and visitors welcome.

REGION 4—RR M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel Derby (0332) 556875.
Derby (D&DARS)—Wednesdays: 5 November (Bring and buy), 12 November (Visit by Birketts of Lincoln), 19 November (Practical computing), 26 November ("Aircraft safety", by G8TUS of CAA), 3 December (Junk sale), 10 December (Constructor's contest), 17 December (Christmas party), 31 December (New Year natter night), 7.30pm: Morse classes Tuesdays and Thursdays, 7pm. Sec Jenny Shardlow, G4EYM, tel Derby 556875.
Derby (Nunsfield House ARG)—Fridays, 7 November (AGM), 14 November (Construction contest), 21 November ("Digital building blocks with cmos and ttl", by G3ZOW), 28 November (Tech film show), 5 December ("Hong Kong and Thailand", illustrated lecture by G. Fotheringham and M. Melbourne), 12 December (Quiz night and buffet), 19 December (Evening with Nascom-2), 7.30pm. Nunsfield House, Boulton Lane, Alvaston, Derby. Sec Ian M. Cage, G4CTZ, tel Derby (0332) 71875 or 799452.
Glenfield (Leicestershire Raynet Group)—Meetings monthly, County Hall, Glenfield. Sec M. G. Barker, G8CAC, tel Desford 3026.
Grimsby (GARC)—First and third Thursdays in each month, 8pm. Alexandra Club, Cleethorpes. Sec R. Scarlett, G4HZF, tel Grimsby 71215.
Hinckley (HAR&ES)—For details contact P. A. Wheatley, G8SHH, tel Hinckley 613987.
Ibstock (IARC)—A new club has been formed in Ibstock, meeting at the Ram Inn, High Street, Ibstock, on Tuesdays. 11 November (Talk by G8CGW), 25 November (Winter df evening), 5 December (Christmas supper), 9 December (Free evening), 23 December (Christmas drinks at club). Sec Ted Bowen, G4JKQ, 40 Grange Road, Ibstock, tel Ibstock 60396.
Leicester (LRS)—Mondays, 7.30pm. Club House, Gilross Estate Cottage, off Groby Road, Leicester. Sec J. W. Moore, G4GVC, tel Leicester 895911.
Leicester (LPARS)—Mondays, Wednesdays, Thursdays and Fridays, lunchtime during term. Leicester Polytechnic. Sec R. Newstead, G3CWI, 24 Richmond Road, Leicester.
Leicester Repeater Group—for details contact Sec M. G. Barker, G8CAC, tel Desford 3026.
Leicester VHF/UHF Group—Contact G4FZL.
Lincoln (LSWC)—Second and fourth Wednesdays in each month. Lincoln Corporation Social Club, Waterside South, Lincoln. Sec G4JES, 4 Horner Close, Brant Road, Lincoln.

A "check your rig evening" at the Derby & DARC. L to r: G8VHU, G8TXQ, G8IHA, G8NLP, G4FAE, and G3XOF shown using a Thru-Line power output meter

Loughborough (LFARC)—Fridays, 8pm. Brush Sports and Social Club, Fennel Street, Loughborough. Sec G8BUB.
Louth (L&DARC)—11 November (AGM). Eastgate Union Church, Eastgate, Louth. Sec R. M. Padbury, G4GAB.
Mansfield (MARS)—First Friday in each month, 7.30pm. New Inn, Westgate, Mansfield. Sec G4AAH, 233 Southwell Road, Mansfield.
Matlock (Derwent Valley ARS)—First Monday in each month, 3 November (AGM). Chatsworth House, Matlock Training College, Chesterfield Road, Matlock. Sec Steve Boller, G8VEF, c/o Lowe Electronics Ltd.
Melton Mowbray (MMARS)—Third Friday in each month, 7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray. Sec R. Winters, G3NVK,tel Melton Mowbray 3369.
Nottingham (ARCoN)—Thursdays, 6 November (Forum), 13 November (High definition amateur television demonstration by G8RYK), 20 November (Activity night), 27 November (Visit by Lowe Electronics), 4 December (Forum), 11 December ("Antennas", by G4AFJ), 18 December (Christmas quiz), 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. Sec M. Shaw, G4EKW.
Nottingham (Trent Polytechnic RS)—Mondays, 7pm. Ninth Floor, Newton Building. Sec P. M. Bond, G8TIS, via Students' Union.
Nottingham (NURC)—Tuesdays and Thursdays, 1pm. Shack behind Union Shop. Sec C. Coleman, G4HCW. Theatrical Mechanics, extension 2146.
Scunthorpe (SARC)—Tuesdays, 11 November (AGM), 18 November ("History of the licence", by G2CVV), 7.30pm. RAE class, Thursdays, 7.30pm. Morse class, Thursdays, 9pm, Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe. Sec Joe Sheardown, G8TIY, tel Scunthorpe 732438.
Spalding (S&DARS)—First Friday in each month, Pinchbeck Teachers Centre, Pinchbeck, Spalding. 12 December (Annual Christmas social and junk sale at The White Swan, Spalding). Sec Gordon Parker, G4EMK, tel Bourne 2649.
Wigston (WRC)—First and third Friday in each month, 7.30pm. United Reform Church, Wigston, Leicester. Sec Steve Parker, G8TLC, 59 St Michaels Avenue, Leicester, tel Leicester 61541 (daytime).

REGION 5—RR R. E. G. Kendall, G8BNE, 19 Willow Green, Needingworth, Huntingdon, PE17 3SW. Tel St Ives (0480) 67538. Following information is latest received.
Bedford (B&DARC)—First Wednesday in each month. Other Wednesdays (Informal). 8pm. Club shack, Ravensden, Bedford. Sec G8PZZ/G4JTJ, tel 0234 47818.
Cambridge (C&DARC)—Fridays, 7.30pm. Coleridge Community College, Radegund Road, Cambridge. For information contact sec G8JKV, tel Swavesey 31120.

Cambridge (CUWS)—Mondays. St John's College bar. Details from Chris Budd, G8OPB, 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 (SN&DARC)—Recently formed club. Alternate Mondays, 7.30pm. Ernulf Community School, Eynesbury, St Neots. Details from Paul Herrod, G8TQI, tel St Neots 74642. New members very welcome.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 7EA. Tel Penn (049481) 4240.
Arborfield School of Electronic Engineering (REME) RC (G3IHH)—Tuesdays, 7.30pm. Sec Peter Matthews, G8LBM, tel Arborfield Cross 760957, after 7pm.
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)—For details of current activities contact D. Sargeant, G3YMC. tel Bracknell 21006.
Burnham Beeches (BBRC)—First Thursday in each month, 8pm for 8.15pm start. St John Ambulance, Serena HQ, Slough. Contact Janie Britton, tel Windsor 61723.
High Wycombe (Chiltern ARC)—John Hawkins Ltd, Victoria Street, off Oxford Road (A40), High Wycombe. Further details from sec W. Catterall, G4IWC, 78 Fairacres, Prestwood, Great Missenden, Bucks, tel Great Missenden 4504.
Maidenhead (M&DARS)—First Thursday and third Tuesday in each month, 7.45pm. Red Cross Hall, The Crescent, Maidenhead. Sec J. Patrick, G3TWG, tel Bourne End (06285) 25275.
Mid-Thames RDF Club—Details from Sec C. Gage, Lowfield House, Bolter End Lane, Lane End, High Wycombe, Bucks HP14 3NB, tel High Wycombe (0494) 881842.
Newbury (N&DARS)—Second Tuesday in each month. Newbury Technical College. Details from sec G8LTD, tel Newbury 46078.
Newport Pagnall (Milton Keynes ARS)—10 November (Talk on rocket propulsion), 8pm. Lovatt Hall, Newport Pagnall, Bucks. Sec D. White, G3ZPA, Rose Cottage, Whaddon Road, Shenley Brook Road, Milton Keynes MK5 7AF, tel Shenley Church End 310.
Oxford (O&DARS)—Second and fourth Wednesday in each calendar month, 7.30pm. Civil Service Social Club, Marston Road, Oxford. New sec C. Marshall, G4IOK, 9 Mountfield Drive, Whitney, Oxon, tel Whitney 4867.
Oxford (OURS)—Wednesday evenings during term. Further details from Simon Pike, G8KRD, Brazenose College.
Reading (RARC)—Details from sec Chris Young, G4CCC.

Clubs and club secs in my region, please update your news and send it to me. *RR6*

REGION 7—RR D. A. G. Pedder, G3LFX, 97 Elgar Avenue, Tolworth, Surbiton, Surrey KT5 9JS.
Addiscombe (AARC)—Tuesdays, 9.15pm. Prince of Denmark, 152 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 G8LEL, tel Byfleet 46847.
Bexley Heath (North Kent RS)—Second and fourth Thursdays in each month, 8pm. St Mary's Institute, 2 North Cray Road, Bexley. Sec Dr C. P. Conduit, G4KCZ, 49 Baldwyns Park, Bexley DA5 2BE.
Brixton (Ferndale RS)—Wednesdays, 6.30pm. Brixton College, Ferndale Road, London SW4. Sec G4GTO, tel 01-660 2532.
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 G4FUG.
Croydon (Surrey Radio Contact Club)—First and third Wednesdays in each month, 7.30pm. TS Terra Nova, 34 The Waldrons, Croydon. Sec G4FFY, tel 01-642 9871.
Crystal Palace (CP&DRS)—Third Saturday in each month, 15 November ("Generating electricity", by G4AVV and G8GJO), 20 December (Film show and Christmas party), 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, 14 November (Equipment sale), 28 November (Construction contest), 12 December (Vintage wireless and ot's night), 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec G4BHQ, tel Guildford 76375.
Guildford (U of Surrey E&ARS)—Informal meetings, lunch-times 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, 8.15pm. For details contact Sec R. Pellatt, RS41392, 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)—For meeting details contact hon sec G. W. Brind, G4CMU, tel Burgh Heath 54497.
Thames Ditton (Thames Valley ARTS)—Giggs Hill Green Library, Giggs Hill Road, Thames Ditton. Sec G3ZNW.
Tolworth (Decca ARG)—First Thursday in each month, 6 November (Equipment demonstration and talk by Bredhurst Electronics), 20 November (AGM), 4 December ("Quads and other antennas", by G3LHZ), 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.

RR7 would be *very pleased* to receive clubs' entries before the copy date published at the beginning of "Club news".

REGION 8—RR D. N. T. Williams, G3MDO, Seletar, New House Lane, Thanington, Canterbury, Kent. Tel 0227 66586.
Brighton (B&DRS)—5 November ("A posh junk sale"), 19 November (AGM), 3 December (A night of films). Details of events from J. Trimmer, G4JDM, 7 Dale Crescent, Patcham, Brighton.
Burgess Hill (Mid-Sussex ARS)—Alternate Thursdays, 7.30pm. Marle Place Further Education Centre, Leylands Road, Burgess Hill. Details from the sec, Jack Brooker, G3JMB, tel Hassocks 4965.
Canterbury (East Kent RS)—4 December (Cheese and wine). Further details of events from G8PFE, QTHR
Chichester (C&DARC)—Details of future events from J. Chinn, 5 Shrubbs Drive, Middleton-on-Sea, Bognor Regis PO22 7SL, tel 2335.
Crawley (CARC)—26 November (G3MDO/G3JMB and RR and AR visit), 10 December (Members' evening). Further information from D. L. Hill, G4IQM, tel 0293 882641.
Dartford (DHDFC)—2 November (Club hunt), 14 December (Club hunt), 16 December (EGM at Horse and Groom, 8pm). Details of club events given on club net, 1930kHz, Sundays at 10.30am, and Tuesday evening net 145·325 (S13). Please check with G4FYV for start details before every hunt. Further information from sec Alan Burchmore, G4BWV.
Dover (South East Kent YMCA ARC)—Details from 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 F. Donovan, G4ALD, 4 Rembrandt Drive, Northfleet, Kent DA11 8NG.
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—The group is responsible for GB3KR (Dover) and the proposed GB3KN (Mid-Kent), and for 432MHz repeaters GB3CK (Charing), GB3EK (Margate), GB3NK (Wrotham), and GB3SK (Folkestone). Information leaflet and membership details from G3XDV.

The special station GB2ITU was operated by the Tonbridge School Radio Club as part of the international activity in support of Telecommunication Day 1980. The operator is Tim Hughes, G3GVV

Maidstone (MYMCAARS)—First and third Fridays in each month, 19 December (Construction contest), 7.30pm. Y Sports Centre, Melrose Close, Loose, Maidstone. Details from J. A. Hastie, G4IRV, tel Medway 251387.
Medway (MARTS)—Fridays, 8pm. Aurora Hotel, Gillingham. Newcomers and visitors welcome. For details of club meetings contact G4HJE, QTHR.
Sussex Repeater Group—Information from G4EFO. Treasurer G4GNX, 38 Elphick Road, Newhaven.
Tunbridge Wells (West Kent ARS)—7 November ("How to get on the new bands without getting a new rig", by G3ROO), 21 November ("Basic operating techniques", hf by G6TQ, vhf by G8KPZ), 5 December ("Choosing and using a scope"). Adult Education Centre, Monson Road, Tunbridge Wells. Tuesdays following the Fridays (Informal) at Drill Hall, Victoria Road. Details from Brian Castle, G4DYF, tel 0732 56708.
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. Tel Stoke Fleming 505.

Camborne (Cornish RAC)—First Thursday in each month. 6 November (Surplus equipment sale), 4 December (Quiz and social evening), 7.30pm. SWEB Clubroom, Pool, Camborne. Cornish net weekdays 10am on 3·715MHz and on Sundays 11am on 3·682MHz. Visitors very welcome at club meetings. Full details from Spencer, G3VGO, tel Devoran 864255.
Exeter (EARS)—Second Monday in each month, 10 November (Any questions), 8 December ("History of space flight", by J. W. Burnley), 7.30pm. Community Centre, St Davids Hill, Exeter. Full details from Geoff Draper, RS44198, 1 Carlyon Close, Heavitree, Exeter EX1 3AZ.
Exeter (EUARS)—Every Sunday afternoon, 2.30pm, Room 225, Applied Science Building, Exeter University, North Park Road, Exeter. Anyone, "belonging" to the University or not, is welcome to attend. New hon sec Miss Anne Bellchambers, Exeter University Amateur Radio Society, 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. Hon sec Mrs J. Nicholson, 35 Hollymount Close, Symonds Farm, Exmouth, tel 77263.
Newquay (N&DARS)—Alternate Wednesdays, 7.30pm. Treviglas School, Newquay. Full details from Ted, G3YJX, tel Wadebridge 2772.
North Devon (NDRC)—Second Wednesday in each month, 7.45pm. Pilton Community College, Barnstaple. Fourth Wednesday, 7.30pm. Bideford School, Abbotsham Road, Bideford. Full details from George, G4CG. Tel Barnstaple 3683.
Plymouth (PRC)—Alternate Mondays. 10 November (Talk on astronomy), 24 November (Open forum), 6 December (Social evening), 8 December (Club activity night), 22 December (Ragchew night), 7.30pm. Physics Lab, Tamar School, Paradise Road, Plymouth. Full details from Trisha Day, c/o G3ZYY, tel Saltash 5913.
Plymouth (PPARS)—During term time listening facilities available on 3·5–28MHz and on 144 and 432MHz with ssb on 144 for 12 hours every day. Newcomers very welcome. For further details contact Jeff Key, G8VTW, Amateur Radio Society, Plymouth Polytechnic Students Union, Drakes Circus, Plymouth.
Saltash (S&DARC)—First and third Fridays in each month. 7 November (AGM), 21 November (Surplus equipment sale), 5 December (Film evening), 19 December (Social evening), 7.30pm. Burraton Toc-H Hall, Saltash. Visitors always welcome. Full details from R. S. Pridham, G4BVB, tel Tavistock 832891.
St Austell (English China Clay RC)—Welcome to a newly affiliated club—English China Clay. Meetings on alternate Mondays, 7.30pm. Full details from Jack Redfearn, G8HSZ, tel St Austell 3647.
Torbay (TARS)—Every Friday with special meeting on last Saturday in each month. 29 November (G3LHJ's film show), 13 December (Christmas party), 27 December (No meeting), 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay. Torbay net on 3·756MHz Mondays, Wednesdays and Fridays at 10.30am and on Saturdays at 10am. Visitors always welcome at club meetings. Full details from Hugh Davies, G4DZH, tel Paignton 523063.

RR9 sends sincere Christmas greetings to all members in Devon and Cornwall.

Club members at Yeovilton Air Day operating GB2FAA, 1-2 August 1980. L to r: CPO John Hogpen, G3KSK, G3OMH, G3HZL, G3NOF, G3WAO, G8VFY, G4DEP, G8VOF, G4GNV, G3BEC, G3MYM, and G4JBH. ***Photo:*** **G8VUZ**

REGION 10—RR P. A. Jones, GW4HAT, 68 Pastoral Way, Tycoch, Swansea SA2 9LY.

Barry (BCoERS)—Thursdays, 8pm. Teachers Centre, Weycock Cross, Five Mile Lane, Barry, South Glamorgan. Details from GW8OPK.
Blackwood (BARS)—Fridays, 7pm. Oakdale Community Centre, Oakdale, Blackwood, Gwent. Details from GW8UCQ, 2 The Alders, Oakdale, Blackwood.
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, 10 November ("Introduction to synthesizers, Part 1", by John Case, GW4HWR), 8 December (Film show), 11 January ("Introduction to synthesizers, Part 2", by GW4HWR), 7.30pm. The Pantmawr Inn, Pantmawr Estate, Cardiff. Details from sec Joe Brooke, GW3GHC.
Haverfordwest (H&DARS)—New club, details unknown, awaiting information from club secretary.
Loughor (LAR&EC)—Every second Monday, 8pm. Loughor Boating Club. Further details from sec T. Griffin-Thomas, GW8TYS, 77 Castle Street, Loughor, Nr Swansea, W Glam, tel Swansea 893392. All amateurs, enthusiasts and swls welcome.
Merthyr (Hoover ARS)—Mondays, 7.30. Hoover Social Club, Pentrebach, Merthyr. Details from GW3RNC.
Newport (NARC)—Mondays, 7.30pm. Adult Education Settlement, Brynglas Road, Newport. Details from GW4HYZ.
Newtown (PARC)—Thursdays, 7.30pm. College of Further Education, Newtown, Powys. Details from GW4DWX.
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 sec GW4ESV. The club will be holding its Christmas social evening on 9 December, at the Baglan Bay Hotel and will commence at 7.30pm. All interested parties and guests please forward names, etc, to club hon sec *asap*.
Rhondda (RARS)—Every other Thursday, 7.20pm. Transport Employees' Club, Porth. Details from GW3PHH.
Swansea (SARS)—Thursdays, fortnightly, 13, 27 November, 11 December, 8 January, 8pm. 8 November (Coach trip to ARRA Exhibition, Leicester, leaving The Dragon Hotel, Swansea at 7.30am. Seats £4 each, bookable from sec). Club net each Sunday, 1000gmt, 28·530MHz, net controller, GW4BIQ. Further details from sec GW4HSH, tel Swansea 404422.
Swansea (UCoSRS)—Thursdays, during term, 7.30pm. Room 801, Applied Science Building, University College of Swansea. Details from Tim Davies, c/o Dept. of Electrical Engineering.

IS your club mentioned here? If not nudge your secretary into writing to his RR. Does your club have some organized programme? Yes? Well, let's get it down in this column for others to see. *RR10.*

REGION 11—RR P. H. Hudson, GW3IEQ, Silhill, Dinas Dinlle, Caernarvon.

Following information is latest received.
Bangor (UCoNWARS)—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 144MHz), 8pm. Newcomers and visitors welcome.
Towyn (T&DARC)—Newly formed club. More details from hon sec GW8SYX, Merion ARS, tel 0654 710402.

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). Mail for the club should not be addressed to the club premises but to the secretary S. Sutherland,GM4BKV, 67 Greenfern Road, Aberdeen AB2 6TP.
Dundee (Kingsway TC ARC)—Tuesdays, 6.30pm. Electrical Laboratory, Kingsway Technical College, Dundee. Programme in process of preparation. Sec GM8RDU. All amateurs welcome.
Elgin (Moray Firth RS)—No updated information received.
Invergordon (Easter Ross RC)—Wednesday evenings. 100 High Street, Invergordon. Details from sec GM4DKL. Visiting amateurs welcome.
Inverness (ITCARC)—No updated information received.
Kirkwall—Members now meet on a few occasions each year. For details of meeting places and dates etc, contact GM3IBU, tel Kirkwall 3232.
Perth (P&DARG)—First and third Tuesdays in each month. Perth College of Further Education. Further details from Ian McLaren, GM8RYZ, 75 Viewlands Road West, Perth, Tayside.
Shetland (Lerwick RC)—Wednesdays, 7.30pm, at their new, luxurious clubrooms at Islesburgh House, Lerwick. Members also use club premises at other times. The club station, GM3ZET, is active on hf and vhf bands. A repeater group has been formed, and plans for a possible repeater and construction of equipment are under way. It is intended to run RAE classes if there is sufficient interest. Sec GM4BBL. All visiting amateurs, swls and those working at Sullom Voe Oil Terminal are welcome to visit the club.

RR12 requires up-to-date information from club secretaries as soon as possible. Failure to update *will result in the club entry being withdrawn from this column in the next issue.*

REGION 13—RR A. B. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. Tel Kirkcaldy (0592) 200335.

Following information is latest received.
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.
Borders Repeater Group—This group was set up to administer the two 144MHz repeater projects GB3BT (Berwick-upon-Tweed) and GB3SB (Scottish Borders). For details contact GM8MJV, tel 031-663 203.
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 GM3RFQ.
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 UARC)—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 summer programme from GM8BJF, tel 031-447 5527.
Glenrothes (G&DARC)—Wednesdays and third Sunday in each month. 16 November, 21 December, 7.30pm. Provosts Land, Leslie, Fife. Details, GM4HBG, tel Glenrothes 771057.
St Andrews (UoStA R&ES)—Details from Physics Department, North Haugh, St Andrews.

REGION 14—RR C. W. Tran, GM3WOJ, 21 Richmond Avenue, Dumfries DG2 7JS.

Following information is latest received.
Ayr (AARG)—Two Sundays in each month. Meetings restart in September. 7.30pm. Community Centre, Wellington Square, Ayr. Details from sec GM3THI.
Dumfries (D&GREC)—First and third Mondays in each month, 7.30pm. Cargenholm Hotel, Dumfries. Details from sec C. Rodgers, GM8JKA, 5 Elder Avenue, Lincluden, Dumfries.
Falkirk (Stirlingshire ARG)—Details from sec GM4DGT.
Glasgow (West of Scotland ARS)—Fridays. 7.30pm. 22 Robertson Street, Glasgow. Details from sec I. McGarvie, GM4JDU, 3 Kelso Avenue, Paisley.
Greenock (G&DARC)—Tuesdays and Fridays (RAE course). 7.30pm. 22 Inverkip Street, Greenock.
Helensburgh (HARC)—First and third Wednesdays in each month. 7.30pm. Clyde Street School, Helensburgh. Details from GM4FEO.

Chris Tran, GM3WOJ, RR14, with members of the Ardeer ARC (GM3USL) during a recent visit. L to r: GM3VMB, GM4IGS, GM3XNE, GM3VVM, swl W. Love, GM3DJS, GM3GBY, GM3WOJ, GM4RV, GM3ZFU, GM8MMW, GM3JVX, swl B. Robertson, swl J. Traill, and GM4DOZ. On the table are exhibits from the club's construction competition, and on the right is the logic for the club's new GB3AY 144MHz repeater

Motherwell (Mid-Lanark ARS)—Third Friday in each month. 7.30pm. Wrangholm Hall Community Centre, Jerviston Street, Motherwell. Details from sec GM4FKD.
Stevenson (Ardeer RCARS)—Thursdays, 7.30pm. Ardeer Recreation Club. Details from sec GM8BOM.

REGION 15—RR I. J. Kyle, GI8AYZ, 2 Galgorm Gardens, Ballymena, Co Antrim BT42 1BA. Tel 0266 2024.
Ballyclare (East Antrim ARC)—Second Tuesday in each month, 8pm. Carntall Orange Hall, Carntall Road, Mossley. Details from GI4BWM or GI8DMX.
Ballymena (BRC)—Fridays 8pm, Tuesdays, 7.30pm morse and RAE classes. New address: 70 Cennick Road, Gracehill. Sec GI4HCN.
Bangor (B&DARS)—Second Friday in each month, 14 November (Annual surplus bring and buy sale), 7.30pm. Stevenson Memorial Hall, Six Road Ends, Co Down. Sec GI8RNE.
Belfast (BRSGBG)—Third Wednesday in each month, 8pm. 90 Belmont Road, Belfast. For details contact GI3USS.
Belfast (CoBYMRC)—Tuesdays, 7pm; Saturdays, 2.30pm. 12 Wellington Place, Belfast. Sec Paul McTaggart, 14 Thirlmere Gardens, Belfast BT15 5EF.
Belfast (Queen's UoBRC)—Tuesdays during term, 7pm. Morse and RAE tuition available. 37 Fitzwilliam Street, Belfast.
Coleraine (C&DARC)—For details contact GI8RPI.
Coleraine (NWARS)—For details contact GI4AHD.
Dromore (Lagan Valley ARS)—Second Monday in each month, 8pm. Scout Hall, Mossvale Road, Dromore, Co Down. Details from AR GI4GDV.
Lisburn (Lagan Valley ARS)—For new meeting place contact GI8RKC.
Londonderry (North West Ireland ARS)—First Monday in each month. Technical College, Strand Road, Londonderry. Sec GI2DHB.
Magherafelt (MARS)—First Tuesday in each month, 8pm, 12 Garden Street, Magherafelt. Sec GI8JNP.
Mid-Ulster (MURSGBG)—First Sunday in each month, 3pm. GI4BAC's QTH. For details contact GI4RJW.
North Ulster (NURSGBG)—Details of meetings from GI4HVI, GI8JTS QTHR.
Omagh, Co Tyrone—New club formed, for details contact GI8TST.

REGION 16—RR M. S. Appleby, G3ZNU, 45 Cedar Avenue, Kesgrave, Ipswich IP5 7HA. Tel Ipswich (0473) 622559.
Braintree (B&DARS)—First and third Mondays in each month, 7.30pm. Braintree Community Centre, Victoria Street, Braintree. Details from Dave Boniface, G3ZXX, 131 Humber Road, Witham.
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, 4 November (Surprise lecture, subject tba), 2 December (Professional satellite communications), 6 January (Annual film show), 7.30pm. Marconi College, Arbour Lane, Chelmsford. Morse classes are also available at the club. Details from Andrew Mead, G8KQE.
Colchester (CRA)—Thursdays, fortnightly, 13 November ("Tackling tvi", by G3YWM), 27 November ("Financing amateur radio", by G4FJC), 11 December (Film evening), 7.30pm. Colchester Institute, Sheepen Road, Colchester. Details from Frank Howe, G3FIJ.
Felixstowe (FARC)—Tuesdays, informal, 8pm. Felixstowe Ferry 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. Further details from hon sec A. C. Keeble, G4HPU.
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 time, 12 November (Talk by G3NYK), 26 November (Talk by G4FZZ), 10 December ("How to set up an amateur station, Part 2", by G4GVW), 7.30pm. Handford House, Ranelagh Road, Ipswich. Formal club meetings will be moving venue in the new year to the club room in the Rose and Crown public house. Morse classes are also available at the club. Details from Jack Tootill, G4IFF, 76 Fircroft Road, Ipswich.
Loughton (L&DARS)—Fridays, fortnightly, 8pm. Loughton Hall, Rectory Lane, Loughton. Details from Barry Capon, G8UBH, 180 High Road, Loughton.
Lowestoft (L&DARC)—Fridays, 7.30pm. North Suffolk Teachers' Centre, Lovewell Road, Lowestoft. Details from Paul Godfrey, G8JBD.
Martlesham (MRS)—First Wednesday in each month, 3 December (John Bryant, CB Association), 7.30pm. British Telecom Research Laboratories, Martlesham Heath, Ipswich. Visitors always welcome but must first contact Simon Garrett, G4EVN, at above address.
Norwich (Norfolk ARC)—Wednesdays, 7.45pm. Crome Community Centre, Telegraph Lane East, Norwich. Details from Andrew Kiddle, G4HVC.
Southend (S&DRS)—Fridays, fortnightly, 8pm. Church Hall, Sir Walter Raleigh Drive, Rayleigh, Essex. Contact sec G3YOA.
Stowmarket (S&DARS)—First Monday in each month, 7.30pm. Red Cross Hall, Stowmarket railway station. Details from Jim Lowe, G8SCB, 22 Bluebell Grove, Needham Market.
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) 876018.

Basingstoke (BARC)—Third Wednesday in each month, 7.30pm. Chineham House, Popley, Basingstoke. Sec, G4HTM, tel Basingstoke 23421.

Basingstoke (UK FM Group Southern)—First Wednesday in each month, 7.30pm. Chineham House, Popley, Basingstoke. Chairman Mike Payne, G3ZRM, tel Aldershot 26108 .

Bournemouth (BRS)—First and third Fridays in each month, 8pm. Dolphin Hotel, Holdenhurst Road, Bournemouth. Sec Glenn Lloyd, G8GTB, tel Poole (0202) 769317.

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.

Farnborough (F&DRC)—Second and fourth Wednesdays in each month, 7.30pm. Railway Enthusiasts' Club, Access Road, off Hawley Lane (near M3 bridge), Farnborough. The AGM will be held on 26 November. Sec Ivor Ireland, G4BJQ, tel Farnborough (0252) 43036.

Guernsey (GARS)—Tuesdays and Fridays. Details from sec GU8KUT, PO Box 100, St Peter Port, Guernsey.

Horndean (H&DARC)—Second Thursday in each month, 7.30pm. Merchiston Hall, Horndean. Sec S. Jenkins, G4CHO, tel 0705 591788.

Jersey (JAEC)—Second Wednesday in each month. 7.30pm. The Quennevais, Communicare Centre, St Brelade's, Jersey. Hon sec Mrs M. Smith, tel 0534 23249.

Jersey (JARS)—Sundays, 10.30am. 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. Hon sec Phil Ciotti, G3XBZ, 214 Rossmore Road, Parkstone, Poole.

Portsdown Hill Repeater Group—Group net on GB3PH, Mondays at 7.30pm. Sec G8GNB, tel Titchfield (03294) 41456.

Portsmouth (P&DRS)—Thursdays, 7.30pm. Portsmouth Community Centre, Malins Road, Buckland, Portsmouth. Sec G3JZV.

Salisbury (SR&ES)—Tuesdays, 7.30pm. Salisbury Activity Centre, Wilton Road. Sec G2FIX, 74 Victoria Road, Wilton, Salisbury.

Southampton (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)—Wednesdays. The Clubroom, Kent Road. 7.30pm. AR J. R. Compton, G4COM, tel Fair Oak 3017.

South Dorset (SDRS)—First Tuesday in each month, 7.30pm. Civilian Canteen, Army Bridging Camp, Wyke Regis, Weymouth. Sec G3ZGP, tel Weymouth (0305) 812893.

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, 8pm. The Scout Log Cabin, Stockbridge Road, Winchester. Sec G3MCL.

REGION 18—RR W. A. Ricalton, G4ADD, 4 South Road, Longhorsley, Morpeth, Northumberland. Tel Longhorsley 259.

Durham (DURES)—During term. Physics Dept, Science Site, Durham University. Sec Miss Elizabeth Dean, 26 Almsford Avenue, Harrogate.

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. Sec G8HPW.

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. Old telephone exchange, Ellington. Sec G4GWB.

Newcastle upon Tyne (Tyne & Wear Repeater Group)—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. Activity and interest in most bands. Club callsign, G3ZQM. Sec G4ILW. All welcome.

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

Barking (BR&ES)—Club re-opened 1 September. Monday–Friday. 13 November (Talk on home computing), 27 November (Tape/slide show), 18 December (Christmas party), 7.30pm–10pm. Westbury School, Westbury Road, Ripple Road, Barking, Essex. Morse on Tuesdays. Further details, Alan Sammons, tel 01-594 2471.

Central London (Post Office HQ ARG)—For Post Office members only. For details contact J. A. Clarke, Room 134, Cardinal House, Farringdon Road, London EC1M 3ND.

Cheshunt (CDRC)—5 November (RSGB video tape show), 12 November (Natter), 19 November (AGM—turn-up-and-be-counted night), 26 November (Natter), 3 December (Open), 17 December (Christmas social), 31 December (No meeting). The Church Room, Church Lane, Wormley, Herts. Details from G8BVL, tel Waltham Cross 32198, or Jim, Ware 4316.

Chingford (Silverthorn RC)—7.30pm. Friday Hill House, Simmonds Lane, Chingford E4. Hon sec Chris Hoare, G4AJA, tel 01-529 2282. All are welcome to attend any meeting.

Chiswick (Acton, Brentford & Chiswick RC)—18 November ("Grid dip oscillators", by G3IGM), 16 December (Members' selected items for discussion), 7.30pm. Committee Room, Chiswick Town Hall, High Road, Chiswick. Hon sec W. Dyer, G3GEH, 188 Gunnersbury Gardens, Acton, W3, 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, 16 November (Tom Hook, G8DPB, on microwaves), 21 December (AGM and annual junk sale—bring and buy at the best prices), 3pm. Wanstead House, The Green, Wanstead E11 (200yd south of Wanstead Tube Station). All welcome. All details from Rod Holmes, G3PKQ, tel 01-558 2928, or G3AMF, tel 01-989 9224.

Edgware (E&DRS)—Second and fourth Thursday in each month, 13 November ("Microwaves", by G3BNL), 27 November (Natter nite), 11 December (Junk sale), 8 January (AGM), 8pm. The Watling Centre, 145 Grange Hill Road, Burnt Oak, Edgware. Details from D. Lisney, G3MNO, tel 01-907 1237, or any committee member. Slow morse classes held on first and third Thursday in each month, 7.30pm. All welcome. Edgware net, Mondays.

Harrow Weald (RSH)—Fridays, 8pm. Harrow Arts Centre, High Road, Harrow Weald. Sec G4AUF, tel 01-868 5002. New session of lectures starts in September.

Havering (HDRS)—Wednesdays, 8pm. Fairkytes Arts Centre, Billet Lane, Hornchurch. Further details from sec, A. Negus, tel Upminster 24059. All welcome.

St Albans (Verulam ARC)—Fourth Tuesday in each month, 25 November (Desert island amateur radio), 16 December (AGM and Christmas social), 7.30 for 8pm. New address, Charles Morris Memorial Hall, Tyttenhanger Green, Tyttenhanger, Nr St Albans, Herts. Informal meetings are held from October to April on the second Thursday in each month at the RAFA Headquarters, Victoria Street, St Albans. Details from Hilary Clayton Smith, G4JKS, tel 0727 59318.

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 antenna for licensed members to use.

Southgate (SRC)—Second Thursday in each month, November (G6QM Construction Trophy—why not bring along your "home brew" gear and enter it in the competition!), December (AGM—all welcome), 7.45pm. The Scout Hut, Wilson Street, Winchmore Hill Green, N21. Contact secretary, John Fitch, G8EWG, tel 440 7353. All newcomers welcome.

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, 6 November (Talk—"ROC"), 20 November (G8KMG—talk on popular music through the ages), 8 November (Stand at Davids Book Fair, Letchworth), 4 December (Hospital radio), 11 December (Annual Christmas dinner), 18 December (Natter nite), 8pm. Senior Staff Canteen (just inside the gate), Site B, British Aerospace, Gunnels Wood Road, Stevenage. Details, G8MCV, tel 0438 64624; Society net, Tuesdays at 7.30pm on 145·250 fm.

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.

RR19 thanks those clubs who replied to the suggestion for an ORM in September's "Club news", but he was disappointed that many clubs failed to respond.

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park, Portishead, Bristol BS20 8NQ.

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. RAE and morse classes. Club station, G3TAD, active hf and vhf. Visitors and new members most welcome. Hon sec G8GFZ.
Bristol (BRSGBG)—Last Monday in each month. 27 October (Films, including *The Secret Listeners* and *World at their Fingertips*), 24 November (Homebrew competitions), 15 December (Christmas party), 7pm. Small Lecture Theatre, Queens Building, University Walk, Clifton, Bristol. Details from hon sec, G8GLQ.
Bristol (North Bristol ARC)—Fridays, 7.30pm. "Self help enterprise", Braemar Crescent, (off Braemar Avenue), Northville, Bristol, RAE and morse classes. Club station, G4GCT, active 3·5-28MHz and 144MHz. Hon sec G2HDG.
Bristol (Shirehampton ARC)—Fridays, 7pm. Twyford House, Shirehampton. RAE and morse classes. Lectures, films and df hunts planned. HF and vhf station, G4AHG, active. New members welcome. Hon sec G4GTD.
Bristol (UoBAR&CS)—Club is re-organizing with G3KAC and G8CXH club calls. Further details from L. Mather, G8OKI, or c/o University of Bristol.
Brunel Technical College RS—welcomes licensed students to operate club station, G4FNB. Student swls welcome. Details from Students Union, c/o Brunel Technical College, Cabot House, Ashley Down Road, Bristol BS7 9BU.
Cheltenham (CARA)—First Thursday (Formal) and third Friday (Natter night) of each month at 7.30-8pm. The Old Bakery, Chester Walk, Clarence Street (rear of public library). Hon sec G4ILI, tel Cheltenham 43891. All visitors welcome.
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 (1·3GHz) at Alveston, Avon. Group meets on *ad hoc* basis. Information from G8NNU.
Taunton (TARS)—Fridays, 7.30pm. The Basement, The Mount, Taunton. Details from hon sec, G8TJF.
Weston-super-Mare (WsMARS)—Third Monday in each month, 7.30pm. Rugby Club, off Drove Road, Weston-super-Mare. Hon sec, G8IGB.
Yate (Y&DARC)—First Friday in each month, 8pm. G3RQN QTH. Further details from G8LGC. All welcome including swls.
Yeovil (Y&DARC)—Thursdays,13 November ("QRA basics", by G3MYM), 27 November (Committee meeting and natter night), 11 December ("Using an rf voltmeter", by G3MYM), 7.30pm. Building 101, Houndstone Camp, Yeovil (off A3088). Club nets Sunday, 10.30am, 3·660MHz and Tuesdays 8pm, 144MHz fm S21. Further details from hon sec G3NOF, tel Yeovil (0935) 24956.

sstv scene

P. Burnett, G4BLL*

Judging by the amount of correspondence received requesting copies of the JA0BZC scan converter article (mentioned in "SSTV scene" June/July 1980), there would appear to be a "new wave" of interest in sstv coming along. This will be most welcome, as the injection of "new blood" is as vital to sstv as to any other facet of our hobby.

According to a newsletter circulated by G4ACI, a number of British amateurs have sent for and/or received the Japanese Copy 400 board produced by OH5RM (see "SSTV scene" February 1980). This board has proved to be an invaluable starter in sstv/fstv for the people concerned but, unfortunately, it has to be reported that it is now no longer available from that source—apparently OH5RM had seriously underestimated the time and commitment involved in producing the board and making it available to overseas amateurs. Does anyone know of an alternative source of supply?

A very interesting tape was received from Grant Dixon, G8CGK, who has developed three keyboard programs for his Triton computer. The first generates five lines of six letters, and as an alternative the second generates seven lines of 10 letters; in each case five pages are available, any of which can be called up in random order. The third program represents an entirely new approach to the generation and transmission, in sstv mode, of alfa-numeric information, and G8CGK very aptly describes it as a "line writer". Thirteen scan lines are used at the top of the frame to convey the information, and there is capacity for 16 characters. The characters are shifted along the line during vertical retrace (ie every 13 scan lines), thus providing rapid update, and can be typed in as the sstv is being transmitted. Grant comments that he intends to re-write the program to produce a message line of 10 larger characters which will be better for clarity under conditions of QRM etc. G8CGK is to be congratulated on this unique development, he would like to hear (as would "SSTV scene") from anyone experimenting on similar fronts or with the application of computers to sstv in general. His article "SSTV and the microprocessor" in the June 1980 issue of *CQ TV* also makes very interesting reading.

G3WW has informed "SSTV scene" of the successful completion and installation of the W9NTP second memory board into his Robot 400, although, he admits, after much help from G3GGJ. Richard warns of possible trouble using ic holders where the pins are also used as the feedthrough connection between top and bottom tracks (it is not easy to solder on the top side of the board, particularly if the socket is fully seated). Many of the sockets he installed had to be removed because of bad contacts, despite careful visual inspection. If degradation of the picture is experienced from the second memory, VE3EGO has found that swapping memory chips between the two banks often effects a cure. G3WW is now working on a third memory board, to give full colour capability, where he has used strip sockets to avoid the through-contact soldering difficulty.

"Chinese" Copy 400 built by G4BLL

Anyone interested in a second or third memory board should send their enquiry (with sae) to G3GGJ, QTHR.

G4AXC reports that he has become interested in sstv and has an 8080 computer with cpm on an 8in floppy—he hopes to interface this to a scan converter and is seeking any information on the subject. G8OOC wrote on similar lines regarding the use of a microprocessor for slow to fast scan. He has nearly completed the fast-scan side of the converter, and as an initial experiment is going to use 4k rams giving 128 by 128 by 4 shades of grey. G8OOC comments that he hopes his final design will enable a converter to be built from easily-obtainable parts for about £80-£100, "SSTV scene" is certainly looking forward to reporting more news of this project.

It was a very pleasant surprise to receive a letter from GM3SBC advising us of his re-interest in sstv. Ed says he has been inactive for the past two years due to other commitments but is now in a more favourable position to resume his sstv activities.

Letters have also been received from 6Y5MP, ON7PZ and GJ8KNV; and from GW4KAZ who uses a "Spacemark" monitor but intends up-dating to a scan converter.

W0LMD is reported as saying that he thinks colour sstv transmission in its present form is a waste of time because of the three frames required to transmit a colour picture; three separate black and white pictures could be transmitted thus conveying more information. □

*21 South Cross Road, Cowcliff, Huddersfield, Yorkshire.

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 £1 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 1980 for issues in brackets: **21 November (January), 19 December (February).**

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

FR101D rx, hf, 4m, 2m, matching spkr SP1, £375. A. Sillence. Tel Southampton (0703) 782545.

Heathkit HW12A, 80m band tx/rx, 200W p.e.p., comp with HP23B power supply, HS24 spkr, xtal cal, mic, handbooks, all in fine cond, £120. G3WY, QTHR. Tel Evesham 45497.

Nikon FE, auto, four weeks old, guarantee, manual, carrying strap, Nikon 43-86mm zoom lens, F3·5, the lot £200, negotiable. Joystick vfa, mint, £15. G5DCS, 33 Shrubbery Avenue, Worcester, Worcs. Tel Worcester (0905) 20040.

Icom IC280E synthesized 10W fm mobile tx/rx, one year old, comes with scanner, remote cable, brackets, etc, £200 ono. G4HHV, QTHR. Tel 01-800 4454.

M5 Starphone, wkg superbly on 70cm, comp with all accessories, single channel, xtals for SU8, RB0, £65. PF1s, wkg SU8, comp with batteries, charger, £25. Trio 9R59DS, orig packing, £40. G4HDK, QTHR. Tel Slough 48406.

IC255E, fairly good cond, orig packing, manual, etc. £200. TR3200, as new, c/w nicads, charger, helical, orig packing, RB0, 2, 4, 6, 10, 14, SU8, 18, 20, rev RB4, 6, 10, VB3200 10W pa/pre-amp, as new, the pair, £170. IC22A R0-7, rev R0, R7, S20-23, auto t/b, tatty, hence £90. Starphone M5 multi-channel, RB6, 10, SU8, tx works fb, but rx needs attention, hence £35. Will deliver reasonable distance from south London. Tel Mike, 01-654 4185.

KW2000A, psu, mic, good cond, £140. G4DRW, QTHR. Tel York (0904) 792662.

Trio 7500 incl mobile mount, etc, easy channel change for mobile, £200. Icom IC202E incl nicads, £125. Microwave Modules 25W linear, £25. All ono. G8IMT, QTHR. Tel Peter, Yatton 832312.

FT200, FP200, 80-10m, perfect cond, boxed, spare pa, offers around £240. G4GLB, QTHR. Tel Tony, Greenhithe (0322) 844726.

Trio 2300 2m portable synthesized tx/rx, as new, c/w case, strap, etc, nicads, RA1 helical antenna, reverse repeater fitted, in orig packing, still under guarantee, £155 ono. G8UVK. Tel Torquay (0803) 33833.

STE Arac 102 rx, covers 144 to 146MHz, 28 to 30MHz a.m., fm, ssb, comp with matching ASAP 154 mains power supply, bargain, £70 ono. Dale, 80 Masefield Drive, Rushden, Northants. Tel Rushden 55923.

Eight inch disc drive (GSI FDD 110), 220/50 mains motor, S100 single density controller (WAMECO FDC1), incl onboard 2708 firmwave, spare drive pcb, hardware/software documentation provided, untried, so the lot £240 ono, incl carriage. G8AVR, QTHR. Tel Templecombe (Somerset) 70587, evenings.

EA12 rx, mint, £175. KW2000B tx/rx, £235. KW VFO4B remote vfo, £30. 18-300MHz Marconi sig gen, £20. Avo 8, £50. Avo 40, £35. 30 note full-size organ, pedal board, £30. R/C bridge, £30. BC221, £20. G3GYW, 28 Lundy Close, Southend, Essex. Tel Southend (0702) 528112.

Robot 400 sstv converter, hardly used, £475. Buyer collects. Harding, 25 Hilldene Avenue, Romford, Essex. Tel Ingrebourne 45374.

Yaesu FR50B/FL50B tx/rx, cw, ssb, rx incl top band, xtal cal, £165 ono. 5 Bridge Road, Oldfield Road, Bath. Tel 24058, after 5pm.

Dentron atu MT2000A, £135 ono. Trio VFO520, suits TS520, S, SE, or 820, £45 ono. Both exc cond, boxed, manuals. G3XXQ, QTHR. Tel 0632 746723.

Drake TR7 station, unused, as brand new, boxed, TR7 tx/rx, PS7 psu, R7 rx, RV7 remote vfo, L7 linear, MN2700 atu, SP75 speech processor, 7077 desk mic, MS7 spkr, FA7 fan, DL1000 d/load, genuine reason for sale, offers. Tel 0602 54047.

FV101B, £55. YO100 monitor scope, £80. Elliott FT628 uhf base station, 10W, comp with manual, £30. *Wanted:* any worthwhile and proved mods for FT901. GW4HAT, 68 Pastoral Way, Tycoch, Swansea. Tel 0792 28737, after 6.30pm.

Electronic organ, Yamaha 4B, two manual, stool, vgc, £230 ono. Drake lpf TV3300, 52Ω, vgc, 1,000W, £10. *Wanted:* HRO, b/s all coils or other comms rx, FRG7, EC10 or w.h.y.? G3XHC, QTHR. Tel Dartmouth 3621, evenings.

I will deliver my FRG7 for £120 or my 22 channel digital readout Cambridge for £60, 70 miles from QTH or Southampton or anywhere between. MK Products sstv, £40 ono. G8RBW, QTHR. Tel Derby 831332.

FT227RB tx/rx, four memories, scanner, vgc, £195. Starphone AM7 tx/rx, midband, £65. Heathkit Mohican, needs attention, £10. Heathkit HW17A 2m a.m. vfo rx, xtal tx, wkg, £30. G8CAA, QTHR. Tel 01-432 3356, daytime, 0732 838698, evenings.

PET, new roms, £90. Old roms, £20. 8K of dynamic r.a.m., 4027, £35. UHF Cambridge, SU20, RB4, RB14, £60. Shure Unidyne, £20. Eight new PP3 nicads, £30. New 110V Soundlite, £10. Groovac record cleaner, £4. Comsar sequencer, £50. G3TGF, QTHR.

TS520 in immac cond, 240V or 12V dc, never used mobile, cw filter, Trio spkr, manual, orig packing, £325. G4IP, QTHR. Tel 0562 884111.

FT101EE, pristine cond, three matched pairs pa valves, three driver valves, all leads, etc, manual, £330. FT223, 10W mobile rig, 24 channel, 13/23, R1, R5, R7, R8, mint cond, £100. 4m Storno fm base station, 70·26, fb cond, £20. FT202R, 19/23, one spr channel, comp with base charger, nicads, ext mic, helical ant, brand new cond, £99. Eddystone 730/4 rx, gc, amateur bands, external digital readout, manual, superb cond, £135. Carr extra. Tel 0202 522796, after 6pm.

Versatower P40, HD head unit, auto brake winch, only few months old, brand new, boxed, Hygain TH3 Mk3 beam, BN86 balun, CDE Ham 4 rotator, 30m of cable, boxed as new, 35m UR67/RG213 coaxial cable, offers please. Tel 0602 54047, anytime.

LM14 frequency meter, good cond, no psu, orig charts, operating/maintenance manual, spare valves, buyer collects, £25. G4DHE, QTHR. Tel 0257 793276.

Standard C826MC 2m fm tx/rx, vfo, excluding mic, £75 ono. G8JUK, QTHR. Tel 0502 3606.

Pye Cambridge FM10B, t/b, pre amp, S-meter, fitted S18-23, xtals for R5-7, 12V mains psu, spare harness, control box, spkr, mic, handbook, spares, incl valves, £55. Bantam HB1FM, single channel on S22, nicads, charger, helical antenna, £35. G8ROG, QTHR. Tel 0272 877789.

IC245E 2m multimode, keypad, in good cond, £250. Would consider IC240 part exchange. GM8BOV, QTHR. Tel 031-331 2755.

TS520 in superb cond, fitted Trio cw filter, ac, 12V dc psus, Shure 201 mic, manual, never used mobile, £320. G4BYA, QTHR. Tel 0635 22 680.

Brand new pair unused 3-500Zs TT21, QV04/7s, VCR139A, 4X150As, 13A mains variac, 50 cfm, blower-motor, panel-meters, dipole-balun, 10W dummy load, xtals, 1MHz, 1·85MHz, various for 7MHz, 14MHz. G4GLT, QTHR. Tel Coalville 35835.

Europa B 2m, transverter, new QQVU6-40 fitted, £65. MMT 432-28S, unused, £90. MMC432-28S, £14. G3RKZ, QTHR.

TR2400, sti base, ext mic, 110V adapter, λ/4 antenna, lot, £200. Multi FDK700E 0-25W 2m, £120. 5A power supply to suit, £25. All new, unmodified Toshibi stereo amp, tuner, £100. Toshibi cass deck SA320L, PC5060, £100. Turner, 20 Pightle Close, Elmswell, Nr Bury St Edmunds, Suffolk IP30 9EJ.

FT101E, mint, fan, speech processor, 12V dc supply, mic, workshop service manual, new spare pa valves, £450. Property deceased amateur, new unused Dentron MT3000A 3kW 160-10m atu, £200. G3KGM, QTHR. Tel 01-300 0767.

FT202R, S20-22, R3, R5-6, nicads, NC1 charger, £95. Standard C828M, 12 channels, compact 10W fm rig, one xtal per channel, £110. G4CTU, QTHR. Tel Kidderminster (0562) 3966.

FRG7, fitted Ambit filter, £150. Hammerlund SP600JX, £120. AR88D, new S-meter, wooden cabinet, £45. Racal selector/protector, £30. Racal i.f. diversity unit, £20. BC221 charts but no psu, £15. Bound copies *Radio Communication* 1969-79, offers. Tel Gordon, 0734 474064.

TS520, mint, cw filter, mic, phones, Yaesu-style transverter socket, a new TS520SE with accs, would cost nearly £500, £350 ono. G3SEK, QTHR. Tel 0235 812584, evenings.

Yaesu 101ZD, mint, unmarked, 1·5 years guarantee, latest model, fan, mic, a.m., offers. Many other parts and units, multimeters, etc, at stupid prices. Emigrating, so waste no time. Tel 01-776 1628.

Yaesu FLDX400, FRDX400, spkr, fitted all filters, 2m, 4m converters, £290. FT7, virtually unused, boxed, £260. AC psu, £25. Inspection anytime, prefer buyer collects. GM4BHH, QTHR. Tel Alness 882483.

NEC CQ110E digital hf tx/rx, 160–10m, Hygain 18AVT/WB vertical, Joystick type J, brand new. G4BKM, QTHR. Tel Denham (0895) 834358.

Hammerlund HQ215, superb rx, all solid-state, £185 ono. FDK 800D, £170. Both items mint cond. G3LEZ, QTHR. Tel 0702 230489.

Atlas 210X 10–80m solid state ssb tx/rx, 200W i/p, noise blanker, mobile mount, h/b psu, £200 or offers. C. Baker, c/o MTL, Power Court, Luton LU1 3JJ.

FRG7 fine tune, no mods, Perspex dust cover, manual, orig packing, exc cond, £155 ono. G8VUW. Tel 021-704 1236.

Rotel RA311 amplifier, £35. WW Dolby kit, assembled, wkg, £40. Dolby calibration open reel, cassette, £2 each. FM tuner using Larsen tunerset, £25. Channelmaster rotator, needs attention, £5. G8HHQ, 53 Riverside Gardens, Romsey. Tel Romsey 513650 or Winchester 822565 (day).

HW12 single bander, 80m, mains psu, £95. KW202 rx, built-in notch filter, KW204 tx, spare pair 6146B valves, the pair £320. Converter 28/144 dual gate mosfet, £18. GW4BMN, QTHR. Tel 0341 250 330.

FT101E, £350. FM discriminator, £20. Europa-C, £80. KW Supermatch, £80. Electronic keyer, two memories, £40. Datong FL1 filter, £40. 12AVQ, £15. HQI, £50. AR22 rotator, £30. G3ULX. Tel 0643 3454.

Free 16ft gable mounted steel mast to purchaser of attached semi, three bedrooms, bath, fitted kitchen, central heating, garage, hf wire length garden, convenient all amenities, bargain £22,500. G8HJS, QTHR. North Birmingham. Tel 021-358 3105.

Drake TR4C, ac psu, mint, delivered England, Wales, now about £600 new, £350 ono. RG8 52Ω heavy coaxial, 27, 22yds, 33p per yd. 27yds 8-way rotator cable, 20p per yd, will cut. GD3TIU, QTHR. Tel Douglas (0624) 3417.

Heath SB104A, £350. SB604 loudspeaker, £30. SB644 remote vfo, £80. SBA104 noise blanker, £10. PS1144 psu, £60. Heath desk mic, £25. All in mint cond, will deliver 100 miles. All ono. GM3ZXL, QTHR. Tel 041-779 2303.

Oscilloscope, Solartron CD711SZ, double beam, 10MHz, variable trigger delay, manual, good cond, £50. Buyer collects. Tel Blackpool (0253) 885683.

Uniden 2030 2m fm tx/rx, 13·8V dc, 1/10W output, toneburst, R0, R2–7, S20–23, comp with mic, mobile mounting bracket, manual, exc value, £95. G8UHL. Tel Bradford (0274) 575284, after 6pm or weekends.

AR22 rotator, 100ft cable, control box damaged but wkg, £20. Heathkit electronic keyer, comp, £15. G4AFW, QTHR. Tel 072 885 2464.

IC211E, comp with ICRM2 remote controller, mint cond, in orig packing, £450. Yaesu FR400SDX rx, comp with 4m/2m converters, matching spkr, £160. A. P. Tapp, G8TFZ, 13 Montgomery Close, Saltash, Cornwall PL12 4HU. Tel Saltash (07555) 5311.

600MHz dfm, £80. Yaesu YO301 scope, £100. Hansen FS500 hf pwr meter, swr, £40. AR240 2m handheld, £100. Homebrew IC211E keypad, £5. GM3XNE, 4 Afton Place, Ardrossan, Ayrshire. Tel 0294 67326.

AR88LF, two HROs, comp with coils, incl b/s, Trio, as new. *Wanted:* AR88D in exc cond, or B400. Collins TCS tx/rx. Power unit. In exchange w.h.y.? S. A. Wright, 22 Crown Street, Mansfield, Notts NG18 3JL. Tel Mansfield 29473, evenings.

FT220 multimode tx/rx, mains or 12V operation, four preset channels (×4), total 16, repeater shift, toneburst, etc, exc wkg cond, £200. Tel Southend (0702) 557374.

Gem quad, £80. Marconi TF867 sig gen 15kHz–30MHz, precision attenuator down to 0·4μV, £59. Pair of Cetron 572Bs, brand new, unused £45. Carriage extra on all items. G4EVS, QTHR. Tel 0287 38434, after 6pm.

Telequipment D53 double beam scope, 20in video monitor, 10in wide pen recorder, 10mV sensitivity, 2m Pye Vanguard AM25B, unmodified, valves QY4-250, 5B254M, 50W public address amplifier, psu, transistors throughout. G3OAD, QTHR. Tel 0452 812109.

Yaesu FT200, psu, therefore static or mobile, Oskar SWR200 power/swr meter, vertical 18AVT antenna, comp station on the air in five minutes, £250. G. E. Spark, G3UOX, 45A Norwich Road, Scole, Diss, Norfolk IP21 4EE.

IC22A,.xtalled for R3–7, S0, S20–24, vgc, £90. 5/8 mag mount whip, brand new, £12. Belcom AMR217B scanning monitor, rx, nine marine channels fitted, easily changed to 2m, £80. G8AHA, QTHR. Tel Daventry (03272) 5521, daytime. Will deliver anywhere UK.

Commodore PET2001 8K computer, built-in cassette, up-grade roms, many games, etc, £350 ono. G. Savin, 6 Hawkswood Close, Chilwell, Notts.

FT227R, 25/5kHz steps, 1MHz scanner controlled from mic, 12W output, £185. G8IJT, 12 Primrose Road, Walton-on-Thames, Surrey.

TS700, manual, mic, some xtals, good cond, £230, px. IC202, TR7010, linear, Microwave Modules, 100W, 144MHz, as new, £95. G4JXK, 5 Margarita Road, Fareham, Hants. Tel Fareham 288566.

TenTec Argonaut 509, TenTec linear 405, 100W, p.e.p., cw filter, two years old, in exc cond, all for £185. FP12 Yaesu power pack, as new, £50. Icom 201 2m fm, ssb, cw preamp, 12 xtals, £175. G4DXC, QTHR. Tel 0274 563289.

Trio TR2200GX/VFO30G, seven channels, nicads, charger, helical, etc, £150. Icom IC251E, £410. All vgc. G4DRK, QTHR.

FL2100 linear, superb cond and performance, no tvi, £240. G3GRF, QTHR. Tel York (0904) 705367.

SX200 scanner, £180. 8-over-8 Yagi, telescope mast, AR22R rotor, £50. Heathkit DX100 ssb adp, req attention, offers. Avo test bridge. G3KYG, QTHR. Tel 863225.

FT101 Mk2, fitted B type filter, G3LLL rf clipper, fan, immac, handbook, orig packing, £300. G3UZM, QTHR. Tel Exmouth (03952) 73090.

Liner 2, ssb mobile, little used, front end preamp, perfect cond, £100. GM8CTQ, 22 Montrose Drive, Bearsden, Glasgow. Tel 041-942 7802, evenings/weekends.

FT227R, mic, 13·5V reg power supply, Ringo Ranger antenna, mint cond, £175. Callers only. G2OF NOT QTHR. Tel West Drayton 42977.

TS770 2m/70cm multimode, 2m Jaybeam ground plane, SML power meter, swr bridge, £610. C. D. Evans, G4EYA. Tel 01-777 9908.

SEM Z-Match, as new, £25. Hokushin HF5 five-band trap vertical, £25. SML SWR25 2m swr meter, £6. G3WUD, QTHR. Tel 01-902 7211.

TR2400 handheld, £180. TS700 set of xtals, S16–23, R5, £15. QRO transformer, mains to 3kV 1A rms continuous, 130lb, £30. Woden UM3 transformer, offers. G3ONP, QTHR. Tel Wolverhampton 788459.

FT207R 2m handheld, as new, charger, spkr/mic, orig packing, £175. Boot mount W15U Westminster, 10 channels, control box, spkr, mic, manual, RB0, 6, 10, good cond, £100. Mobile 10m ssb/a.m. tx/rx, 12W, synthesized, commercial, exc cond, £80. Matching 100W commercial 10–80m solid-state linear, £70. Hustler 10m bumper mount fold-over whip, £20. G3VZJ, QTHR. Tel Reading (0734) 413891.

Kenwood twins T599S, R599S, incl 144, 432 on rx, £400 ono. FM321 40 ch 70cm mobile, £160 minimum. Set of parts for 400W hf linear, £100. SAE list. G3DPR, QTHR. Tel 066641 470, evenings.

7MHz QRP cw tx/rx, solid-state, homebrew, approx 1·5W input, active audio filter, sidetone, runs on 12V dc, very stable, £25. PA valves: four 6146B, two 12BY7A valves, brand new, unused, £25. 20 and 80m rx, homebrew, ZVC type i.f. strip, 2·4kHz xtal filter, rf/i.f./af gain controls, S-meter, built in Centurion case, Eddystone dial, integral mains power supply, ls, £50. 18AVT/WB 10–80m ground plane antenna, approx one year old, lacquered from new, hence exc cond, £45. Mains transformer, 200/220/240V in, 625–0–625V out at 275mA. Heavy so buyer collects, offers please. G3ZOH, QTHR. Tel Farnborough (Kent) 58413.

Stereo hi-fi: Goodmans Module 80 vhf tuner/amp (2 by 30W), pair Celestion Ditton 15 spkrs, Sony TC131SD stereo cassette unit, all teak cases as new, one owner, all handbooks, leads, circuits, etc, £200 cash, ono. Bath area. Tel 0373 4694.

Drake TR4C with AC4, as new, £450 ono. Sommerkamp FT250 (FT200) with FP250, specimen cond, complete, in orig packing, £30 of spare valves, £195. 10/80 400W hf linear, couple of hours use only, £100. Prefer buyer tests/collect or can deliver 50 miles Manchester. Tel 061 766 5265.

TR7200G 2m fm mobile tx/rx, fitted S0, S18–23, R0, R2–7, R5 input, preamp, auto toneburst, comp with mount, £100. G3YDU, QTHR. Tel Plymouth (0752) 701878.

Trio TS520S 500Hz cw filter, manual, new cond, £395. KW low pass filter, uhf sockets for plug 259, £6.50. Yaesu FL200B tx, all hf bands, 260W p.e.p., £95. G4IBG. Tel 0273 731391.

FT227R, synthesized 2m fm tx/rx, £180. Icom IC202 ssb portable, fitted 144·0–144·4, 144·6–145MHz, comp with nicads, Icom inbuilt charger, deluxe carrying case, £130. G3SNC, QTHR. Tel Aldridge 52193.

Icom IC215, as new, £105. Stornophone 500 handheld, three channel, nicads, marine band, £45. Heathkit electronic keyer, £15. Pye Pocketfone uhf tx and rx type PF1, needs attention, £20. S. Green, c/o Hillbrow Road, Southbourne, Bournemouth, Dorset.

BC221 built-in psu, exc, £20. RS600 sig gen, £10. PCR rx to 18MHz, psu, first class, £20. Prefer buyers collect. *Wanted:* digital frequency meter, small gen cov rx. G4ILA. Tel 051-652 1309.

Icom IC245 fm/ssb/cw, synthesized 2m tx/rx, 144–148MHz, toneburst mic, mobile bracket, orig packing, little used, superb rig, £285, offers invited. IC3PE matching psu/spkr, 12V, 3A, £39. Twin meter swr bridge, £6.50. Eight-element Yagi, coaxial, £5. G4DFS, QTHR. Tel 0226 790043.

Only one FT501, FP501, 10–80m dig readout, exc cond, fb rig, 500W, £325 ono. BC221 good cond charts, stb ps, £15. Mini beam, three-element ZYG1, 15–20dB f-b, exc per, cost £30 to build, accept £20 ono. ZL Special 2m beam,. 12-element, 13·5dB, £15. Eight 807 valves, £4 plus post. G3JNY, QTHR. Tel Leeds 863058.

Johnson USA 500pF wide spaced variable, 1kW rating, £20. Jackson Bros, 500W rating, £10. Both as new, comp with large skirted control knob, 813 filament trans, 10V, 12A, tapped input, high quality, £10. Postage extra. Tel 0995 40387.

HAL DKB2010 dual mode k/board (rtty/morse), RVD1005 video unit, £400. Mustang Mk2 three-element beam, £90. Yaesu FT202R, six channel handy talky, nicads, NC1 ac fast charger, all mint, £115. Carriage extra. G3UFU, QTHR. Tel 0803 312879.

Yaesu FT7 hf tx/rx, 15W out, all 10m xtals, accessories, perfect cond, Yaesu FL110 matching linear, 130W output, perfect cond, both six months old, £355. G3KLF. Tel Fareham 236906, weekends or evenings only, please.

FRDX400 rx, external spkr, 10–160, incl wwv, 2m, 4m converters, all cw filters fitted, a.m., ssb, cw, fm, mint cond, orig packing, manual, £150 ono. G8VVF, QTHR. Tel Tavistock 832838.

Pocketfones, PF1, vgc, 25kHz filter, toneburst, RB6, two sets batteries, leather cases, £35. As above, RB10, no toneburst, £30. TX leather case, £1.50. Creed 7BRP, cover, £25. 6S6M auto, £6. Both wkg, some spares. G4EGH, QTHR. Tel Medway 373852.

Yaesu FT2FB, 12 channel, 2m tx/rx, 10W output, fitted R0, R3–7, S20–23, etc, mount, manual, mic, toneburst, £96 ono. Tel 05304 3973.

New unused Storno 700, six ch uhf radiotelephone, cw mic, spkr, £145. Icom IC3, remote control unit, £45. Marconi audio sig gen, metered output, £12. Burns frequency standard, locks to Droitwich tx, £55. Storno 500 vhf marine handheld type, approved, fitted 6–9–16 channels, cw charger, two nicads, helical antenna, leather case, £145. New Drake DC4 12V mobile power supply, £45. Tel Harlow (027-982) 291, 7–8pm.

Sommerkamp FLDX500, £155. G3DHY, QTHR. Tel 0723 582788.

FT101, G3LLL processor, matching ls, £250. YO100, as new, leads, £80. All orig packing, manuals, FT75B/DC75B, manual, extra xtals, offers. Carriage by arrangement. GD3JIU, QTHR. Tel 0624 24346.

FT207R, £165. NC2 charger, £32. YM24, £12. MMT432-144R, £150. MMC144-28, £15. ZVC board, 10·7MHz, £50. Pye Europa rx board with circuits, £40. All ono. *Wanted:* Trio TR2300. G8OQN NOT QTHR. Tel John, Portsmouth (0705) 750600, evenings or weekends.

Yaesu FTDX560, in good cond, fitted cw filter, comp set new spare valves, incl Toshiba matched-pair for pa, manual, £200. G4BYA, QTHR. Tel 0635 22 680, evenings.

FT101 Mk1 10–160m, fan, no mods, good cond, orig packing, £260. 18AVT/WB, used little, orig packing, £35. Going vhf. Will deliver reasonable distance. G4CRB, QTHR. Tel Runfold (Surrey) (02518) 2578.

Realistic DX160 rx, matching spkr, 18 months old, exc cond, manual, £75 ono. S. Geraghty, The Flat, Midlands Electricity Board, Gaolgate, Stafford ST16 2NT. Tel 0785 56320, after 6.30pm.

FDK Palm 2, incl nicads, charger, fitted S20, S22, R6, £70. G4CIC, QTHR. Tel 0706 77620.

Yaesu FT7, extra 10m xtals, £220. Strumech winch, no motor, offers please. 70cm 18-element Parabeam, £15. G3WBN, QTHR. Tel 01-654 2761.

Regency M100E mobile scanner, 66–88, 140–175, 430–512MHz, new, £158. Standard C828 2m fm tx/rx, £110. Pye Compact, 70cm, £30. Datong rfc/m, boxed, £20. *Wanted:* SX42. HQ145. BC348 or similar rx, w.h.y? G4AFY, QTHR.

FT101E, July 1978, £360. FV101, separate vfo, £50. YC601B, separate digital readout, frequency counter, November 1979, £80. All as new, orig packing, handbooks. G3ISD, QTHR. Tel Sittingbourne 77431.

FT75 c/w dc, ac, vox units, £90. MMT 432/28S transverter, £95. MMT 144/28 transverter, £65. Multimobile, 10–80, £20. CT52 oscilloscope, £18. HQ1 miniquad, £30. MBM/70 48-element multibeam, £18. 8Y/2M Yagi, £8. 85RP Creed reperf/printer, £9. 7TR Creed reperf, £5. 6S4 auto tx, £5. GD1U gdo, £10. G4CVZ, QTHR. Tel 051-220 5470, after 6pm.

Eddystone 840C gen cov communication rx, good cond, £90 or best offer. GW3YVC. Tel Cardiff 755190, evenings.

Solartron scope, variac 8A Philips pcr rx, 52 set antenna tuner, USN freq meter, 115V ac, used valves: 6AC7, 6SH7, KT66, etc, CR100 series, manual, S36, manuals, etc. *Wanted:* gc rx. Earnshaw, 18 Hanson Street, Middleton. Tel 061 653 9604.

18AVT/WB 10–80m vertical antenna, £45. Racal digital freq meter SA520, 100kHz, £5. BSR audio sig gen LO50A, £5. Collect only. G2BUW, QTHR. Tel Romford 43122.

Several twts, mostly 6cm, some with mounts, psus, offers for job or part lot, Pye colour monitor, spares, £70 ono. Clearing shack of tx valves, bases, relays, etc. G3WJG, QTHR. Tel Chorleywood 3337.

HW8 80–15m QRP cw tx/rx, professionally built, extras fitted, £95. Valves, power transformers, sae for list. XF9B, xtals, unused, £22. Mechanical bug key, as new, £10. G3WKL, QTHR. Tel 090862 6334, after 6pm.

Drake R7 rx, few months old, 0–30MHz, £850 ono. Plessey GDO33 24GHz Gunn oscillator, unused, with data, £10. Prefer buyer collects R7 due to value. C. H. Brain, G4GUO, QTHR. Tel Worthing 45400.

KDK 2016E 2m mobile, base, 1,000 channels, fully synthesized, scanning, memory, reverse repeater facility, comp with 5/8 mag mount, mobile antenna, comp station, £150. G4JPV. 19 Stonehouse Road, Wallasey, Merseyside L44 2DJ. Tel 051-639 8708.

FDK Multi 11 fm, 2m mobile, 10W/1W, fitted 10 simplex, six repeater channels, perfect cond, £140 or would consider exchange for immac FRG7. Codar CR70A rx, £30. Two wireless sets No 22, £20 ono. G8SAJ, QTHR. Tel 06845 63552.

227RB mods by Amateur Radio Exchange, mint, £220 ono. Liner 2 preamp, £120 ono. Tel Norman, 01-530 2792 (Wanstead).

IC245E, £299. Multi U11, RB2, 6, 10, 14, SU0–8, 16, 18, 20, £199. Counters: YC355D, £90; *VHF Communications* design, 500MHz, £50. Telequipment D54R dualbeam, £299. Jaybeam 70cm 8XY, £15; 12XY, £20; FT7, £250. FT221RD, £310. FRG7, £140. FT101EE and fm, £420. G4ITF, ex-G8FFI, QTHR. Tel 0705 386184.

Trio QR666 gen cov rx, fm bc band, £90 ono. Carriage extra. G8AFQ NOT QTHR. Tel Kelvedon 70127, evenings.

Multi U11, four simplex scanning channels, six repeaters, as new, £175. ASP 70cm mobile colinear antenna, unused, £12. 432–28MHz MM converter, £20. 144MHz pre-amp, SEM, £7. 75Ω 100W carbon resistor, £2.50. TE46 c/res analyser, £7.50. G4IOT, G8PXS, QTHR. Tel Folkestone 76063.

AR88, no suffix, orig version, RCA illuminated S-meter, in good order, handbook, present owner for 30 years, £50. Marconi TF144G/1 sig gen, exc cond, spare meter, some spare valves, £35. Buyers collect. G3CWW, QTHR, Huddersfield. Tel 0484 842330, evenings.

FT202R, six channel handheld, nicads, charger, £80. G8CZH, QTHR.

IC251E 2m multimode, as new, £425. FT101E, £365. MMT 432/28S 70cm transverter, £90. Trio TR2300, ME151 linear, £185. Palm 4 70cm handheld, nine channels, £140. Transformer, 21V, 5A, £4. G8KMV, QTHR. Tel 0438 54689.

Swan 350 tx/rx, 400W p.e.p., built-in xtal frequency check, used little, manual, psu, lp filter, £150. Minimitter TOP27 tx, £25. G3KRU, QTHR. Tel Macclesfield 23022, evenings.

Compukit UK101 software, rtty, £5.25. QTH distance calculator, contest score, £2.50. Software exchange, send sae, w.h.y. for details. Pye U450L base station, wkg, xtals for 433·2, RB6, £22. All "or offers". G4HHT, QTHR. Tel Coventry 610408.

Xtals for TR7010 covering cw frequencies 144·025 to 144·070, new, £5 for pair. Condenser mic, built-in amplifier for tie or lapel, low impedance, new, £5. G2ATM, 21 Birkland Avenue, Palins Road, Mapperley, Nottingham. Tel 0602 202592.

Microwave Modules MMT28/144 10m transverter, good cond, £60. G4GUR, QTHR. Tel 061-436 5021.

FRG7, mint, no mods, orig packing, manual, comp, £145. G5VH, QTHR. Tel 0533 783197.

Yaesu FR50B amateur bands rx, 10–80m, wwv, unmarked orig cond, no mods, £95 ono. Jaybeam 2m ground plane, only used two months, as new, £4. G8UZJ. Tel Tony, 0684 293934 (North Gloucestershire), evenings/weekends.

Yaesu FT225RD multimode base station, exc cond, fitted pre-amp, nine months old, handbook, orig packing, reason for sale, going hf, £400. G8VHE, 35 Rose Lane, Marple, Stockport, Cheshire. Tel 061-427 5931.

70cm gear: 70cm–2m converter, £7.50. 2m–70cm varactor tripler, £7.50. 6dB mobile colinear, mount, £7. 70cm anode lines for QQVO320A, £1. QQVO320A, mint, two at £4 each. *Wanted:* Datong rf clipper, unit or module. G4BLT NOT QTHR. Tel Wakefield (0924) 255515.

FT221RD, exc cond, orig packing, £315. FT227RB amateur radio, exc, fitted scanner, mod board, remote mic scan, exc cond, orig packing, £195. Smith, G4HWL, QTHR. Tel Cosham 388821, office hours, Petersfield 4059, home.

Trio 520S, two years old, used 4h transmit on hf, very little listening use, £400. Trio TR9000 multimode 2m mobile, four months old, £300. 2m ground plane, loft use only, £5. MK Products slow-scan tv boards, complete, taken from wkg monitor, £20. Two 5BP7 tubes, one scratched, £7 and £4. Microwave Modules MMDO50/500MHz frequency counter, used little, £55. Kamoden 360TR multitester, 100kΩ/V, incl transistor tester, £18. G8PWY, QTHR. Tel Penketh 6166, between 6–7pm only please.

Collins vfo 70E8, £8. Geloso vfo 4/102, £4. EXTU5 tx, 100pF wide spaced variable capacitors, £1. 2in dia by 5in ceramic coil formers, 40p. 50pF two gang rx variables, 50p. Many other values. Imhof enclosed 19in rack cabinet, 3ft high, £12. Hundreds xtals, valves, 6CH6, 6BW6 spkrs, 50p. Yaxley switches, wirewound pots, 15p. One per cent resistors, 5p. High wattage resistors, 10W onwards, 10p. Orig manuals: R107 AR88D, AR88LF, CR100, £2 each. Mains transformers, chokes, meters, all post extra or collect. Enquiries, sae, Bentley, 27 De Vere Gardens, Ilford, Essex. Tel 01-554 6631.

FT227RB, 2m tx/rx, no mods, four memories, scan, all channels, less than one year, used little, exc cond, orig packing, £195. G8GX NOT QTHR. Tel 051-625 7598.

S100 personal computer: 2MHz Z80, 64K r.a.m., 2S+4P ports, SA400, s/d controller, CPM BIOS p.r.o.m. fitted, attractive case, large psu, two fans, mains filter, external serial keyboard/video/modulator (64 by 16), well documented, £695. G8AVR, QTHR. Tel Templecombe (Somerset) (09637) 70587, evenings.

Uniden 2030 fm mobile, 10W out, fitted S0, R3-7, S19-24, auto xtal t/burst on rpts, £100. G8KLV, QTHR. Tel Chippenham 50880, after 6pm.

HW8, psu, £75. Pair xtals for PF1, RB4, £2.50. Car adapter for PF1, £4. Morse course, six C90 tapes, 8-15wpm, figs, £9. G4DTB, QTHR. Tel Hereford 4971.

IC202E, vgc, £125 ono. Six TIL312, C anode, seven seg displays, brand new, £4.50. G4KAE. Tel Saltford 3453.

Creed 7B teleprinter, £20 ono. Buyer collects. G3SIP, QTHR. Tel Horncastle (06582) 7086.

Multi 700E 25W mobile, perfect, £170. 5/8 magmount available, ITIM5 Starphone, 5W 70cm tx/rx, channelled SU8, SU20, RB10, RB13, auto toneburst, £80 ono. IC202 ssb portable, 144-144·4, beacon, Oscar, £115 ono. Wilson, G4IPE, 112 Upgate, Louth, Lincs LN11 9HG. Tel 0507 602220.

TS120V, PS20 power supply, £335. Yaesu FP301, 13·5V, 25A power supply, £65. All items in new cond. Carriage extra, could possibly deliver. G3GHB, QTHR. Tel Inkberrow 792582, evenings or weekends.

Trio TR3200 portable 70cm fm tx/rx, case, nicads, charger, etc, xtalled SU8, SU18, SU20, SU22, RB0, RB0 reverse, RB2, RB6, RB10, RB14, special, which triples to 1·3GHz calling channel, £120. G8JAO. Tel 06845 63270, after 9pm, weekdays.

TR2200G/VB2200, 12ch R0-1, R3-7, RR5, S20-23, auto toneburst, time-out indicator, nicads, charger, £135 ono. Heathkit 32ft self-supporting galvanized tower, 12ft by 2in, hd alum, tube to 40ft, dismantled, collect Birmingham, £100 ono. G3RWM NOT QTHR. Tel 021-308 5171 after 6pm.

Icom IC225, 80ch, 2m tx/rx, 10W output, £135. FDK Multi U11, 70cm, fitted 11ch, £140. Motorola HT220, 4ch fitted, RB2, £100. G8HED, QTHR. Tel 0253 853632.

HQ1 antenna, £65. 7-el 2m antenna, £10. 16ft mast tube, £15. SSM Europa B transverter, £35. Stolle 2030 rotator, control, wire, £50. G3TQT, The Old Vicarage, Withybrook, Nr Coventry. Tel Rugby 832252.

500W KW Atlanta, psu, £180. Remote vfo, £40. Vox unit, £10. Set spare valves, £15. Shure 444, £15. The lot, £240. All wkg. Will haggle. Collect or carriage extra. G3SAX, QTHR. Tel 058 83 556.

Type 13A d/b oscilloscope, good wkg cond, probe, leads, etc, £40. Approx 1,400 new service sheets for radio, tv etc, offers? *Wanted:* AR88 rf/i.f. screening covers. G4BBJ, QTHR. Tel 0474 534301.

KW2000E, exc cond, just been overhauled by KW (Decca), mains psu, Shure mic, £275 ono. G4FPG, QTHR. Tel Elmsted 312.

FRG7 rx, mint cond, £150. Magnum 2 144MHz transverter, 28MHz i.f., £60. Trio MC50 desk mic, £15. Nseiki coaxial switch, five in, one out, £7. Thompson 1in Vidicon tube type TH9828, industrial grade, £50. G3WHK, QTHR. Tel 01-330 5795, after 6pm.

FT202R 2m handheld tx/rx, six channels, used little, perfect cond, £90. FT101 cw filter, 350 c/s, YF30HC1, unused, £15. Bauer single paddle key unit, £6. G3KZU, QTHR. Tel Oxford (0865) 63000.

HW7 cw tx/rx, HWA71 psu, £25. 18V all bands vertical ant, £10. AR40 rotator, control box, cable, £40. G4AYP, 62 London Road, Andover, Hants. Tel 0264 66527.

Eddystone 680X rx, 0·5-30MHz xtal phasing, vgc, full wkg order, no modifications, may deliver, £100 ono. G8TYQ NOT QTHR. Tel 01-691 7555, anytime.

Heathkit SB104A digital transistor tx/rx, 100W, SB604 psu, SB644 vfo, £400. SB610 monitor scope, £60. RF sig gen RF1U, £20. 2m SSM Europa, FT101 cables, antenna relay, £50. All immac. G3CDE, QTHR. Tel 0483 75236.

Fb mobile rig, Icom IC225 80ch synthesized fm tx/rx, £160 ono. Carriage by arrangement, but would prefer buyer inspects and collects. G3DNX, QTHR. Tel 061-480 9994.

813s, bases checked electronically, £10 each. Avo 7X, shunts, 3,600V, 60A, 120A, 240A, 480A, £20. Transponder AN/APX6, contains microwave components, no valves, £5. BC221, charts, p/pack, spkr output stage added, £28. Barnes. Tel 0229 54466.

IC215, fitted R0-7, S9-10, S19-23, Icom nicads, built-in charger, as new, £120. Microwave Modules 144/25 linear, pre-amp, £33. *RSGB VHF/UHF Manual,* new, £4. PCBs for *Wireless World* synthesized 2m tx/rx, £6. G8SJH NOT QTHR. Tel Hitchin (0462) 58728.

Collins S-Line round emblem 75S3B rx, 3253 tx, 312B station control, output W/m, spkr, power supply for 3253, Magnum Six rf speech processor, all in mint, 444 mic, box, spares, valves, the lot £800. GW4NZ, QTHR. Tel Neath 4376.

Collins 75A4 rx, matching spkr, mechanical filters for cw, ssb, a.m., passband tuning notch, noise limiter, 1kHz readout on all ham bands, £350. 14-el 2m Parabeam, £18. 70cm 6-over-6, £8. G4LW, QTHR. Tel Trowbridge 3166.

Drake R4A, £150. Datong rf clipper, £20. Magnum 4 transverter, £80. Magnum 2 transverter, £80. MM 28/432 transverter, £80. Heathkit IO12U scope, £15. Shure 444 mic, £10. G3XTT, QTHR. Tel 0604 37894, after 6.30pm.

KW 12V dc psu for 2000A/B tx/rx, £23. Postage/packing, £2. Transformer, USA 230V, 115V input, 235-0-235, 200mA, 6·4V, 6·7A, 5V, 4A, choke, 10H, 200mA, 160Ω, £4. 2E26 valves, £2 each. 6BW6, £2 each. G3MBL, QTHR. Tel 01-445 4321.

AR88, £40. SX62, £40. BC221, Mullard valve tester, offers. SR9 marine, xtals, £55. SP600, £110. *Wanted:* Redifon GR286/M, dfm to 200MHz, vhf signal gen, 12V marine vhf r/t. G3DVF. Tel Alnwick 602487.

Deceased amateur's equipment (G4CHW): Trio TS520SE tx/rx, purchased Longleat this year, unused, orig packing, price new, £437, sell £390 ono. Contact J. R. Brain, G3VVO, 68 Sheridan Road, Bath. Tel Bath 314886.

FT101, accessories, £260. Tech Assoc compressor, £15. Fan, £7.50. G-whip, 10-15-20m, new, £25. Mobile matching unit, new, £10. Used as base station only. G3RQG, QTHR. Tel 0444 52452.

QTH, outskirts Bournemouth, detached corner bungalow, two double bedrooms, lounge, d/room, kitchen, large hall, separate toilet, fgch, garage, plenty space caravan/boat, immediate possession, £31,000. Consider exchange Yorkshire area. Davis, 13 Glamis Avenue, Bournemouth. Tel Northbourne 3621.

60ft BX1 tiltover tower, winches, cables, ground post, some damage to post fins but repairable, buyer collects, offers. Collins S-Line round dot 75S3C, 32S-3, 516F2 power supply, 312B4 control unit, £750. Asahi 4E 10m beam, £15. G3DAM, QTHR.

Shack/QTH clearance: TS520S, TS120S, MC50S, MC30S, FL2100, FT207R, G-whip, miniquad, QRO linear, QRO linear parts, test equipment, tools, welder, compressor, etc, list available. G4IQT NOT QTHR. Tel Luton 881323.

Drake R7 rx, £850 ono. Buyer collects. FL2100B linear, £230. TR7500 2m fm, £150. G4GUO, QTHR. Tel Worthing (0903) 45400, evenings and weekends.

FRG7 in mint cond, no mods, hardly used, £130 ono. G8WQG, Tel John, Wickford (037-44) 67947.

FT201 ac/dc, 3-30MHz, £280. FT202R, S20-22, cw, nicads, charger, £85. Versatower P60, never erected, buyer collects, £300. BC221 cw mains pack, £20. Prefer buyer collect. G4GZ, QTHR. Tel Cleethorpes (0472) 56315, day, (0472) 2207, evenings.

RTTY sale: CV89 tu, psu, manual, various Creed 75 teleprinters, 7B motor psu, triple head auto tx, Collins 51S1 rx, manual, offers. GW3IGG, QTHR. Tel Johnston (0437) 890759.

TR2400, as new, orig packing, £160. G-whip, 5-band, as new, mount hardly used, £20. P. Thomas, G4IBO, 24 Silverberry Road, Worle, Weston-super-Mare.

FRG7 rx, fine tune, narrow filter, not fitted, £140. 9MHz, 12kHz fm xtal filter, £10. IC700TX psu, IC700RX, digital display fitted, all solid-state except driver and pa, 2X6146B, £100. All ono. G4BRX, QTHR. Tel Bishops Cleeve 5321.

Trio TR2300, rubber duck, nicads, £125; with matching psu, £150. John Lightowlers, 46 Haig Road, Blackpool. Tel 45053.

FT225RD, used for two hours in three months, guaranteed for approx nine months, comp with 5-el Yagi, mobile 5/8 mag mount, £495. Buyer collects or Securicor. G2GC, G4IJZ, QTHR. Tel 0924 250103.

Hallicrafters SX24, £20. HRO, four coils, £25. G2DAF linear, two QV03/12s, 500W, incl psu, 2kV, £50. T/A bandpass, notch filter, £15. Buyers collect. G4COY, QTHR SW Lancs.

RCA AR8516L rx, 80kHz-30MHz, 18 ranges, manual, £180. Hudson base tx, 2m vfo, £25. L/B AM10D, unmodified, cables, £20. RTTY diversity rx, RCA FSNOCIZA manual, accessories, £30. Deviation freq shift rx, Admiralty No 64011, £10. Carriage extra. G3RST. Tel 089 26 2022.

Comlete hf amateur station: Icom IC700, tx/rx, 80-10m; xtal calibrator; 18AVT vertical antenna; swr/power meter; mic; phones; all cables, connectors. Prefer buyer to inspect/collect. £215 ono cash. Owner emigrating. G4KCL. Tel Telford (0952) 47987.

WANTED

Manual for Murphy B40D, miniature valves, for purchase of loan. Will pay expenses. G3NOG, QTHR. Tel 0642 580058.

For the National Wireless Museum: old tx, rx, valves, spkrs, components, QSL cards, radio books, magazines, catalogues, valve-tester, marine tx, cct of Cossor vhf r/t type CC2/8MS, old morse keys. Details please to hon curator, G3KPO, QTHR. Tel Shanklin 2586.

Drake MN4 antenna matching unit. G3ONU, 7 Brackendene, Bricket Wood, St Albans, Herts. Tel Garston (Herts) 76344.

FV901DM synthesized scanning external vfo or FTV901R vhf/uhf transverter in exchange for YO901 multiscope, bandscope, all leads, boxed, 12 months old. G3VYP, QTHR. Tel Yarpole (056 885) 296.

P40/P60 comp with base, Tribander TA3Jr, Mustang or similar. Heavy duty rotator UR67 coaxial, 100ft. G4KDZ, Grays, Essex. Tel 0375 78783.
Suitcase radios. American researcher purchases military radios built inside civilian style suitcases or other clandestine radios, any style or cond, working or otherwise, complete or incomplete. Send phone number in letter. Melton—Box 2037, Ogden, Utah, 84404, USA.
Manual for Taylor meter 90A. 4m rx or converter, good price paid. Cassette tape recorder, must be in good cond, good quality. Old reel-to-reel, doesn't have to work. Manual for 4m Pye Ranger. Tel Rodger, Woburn 545, after 6pm.
P60 Versatower required, cond and price please. G4GTA, QTHR.
Heathkit equipment grid dip meter. Cantenna dummy load. IM38 valve voltmeter. IG42 signal generator. Prefer these types specified but other models considered. Must be with relevant manuals. C. Burgess, G8EWL, QTHR.
TV502S transverter for TS520S, price and condition to G8AQF, QTHR. Tel Preston (0772) 633778.
Two bases and top cap for 4-400 valves. CW filter for Heathkit SB101. G3YCP, QTHR Somerset.
VHF/uhf fm tx/rx in exchange for any of the following mint items: STE ARAC102 10m/2m all mode rx, MM2000 rtty/tv converter, MMT28/144 transverter, Yaesu FL110 hf linear, Avanti 10m beam. Cash adjustment. Hi-fi also wanted. G3SEV. Tel 0702 585548 (Essex).
GEC BRT400 or 402 rx, cond or version immaterial. Any spares, literature, etc, for same. *For sale:* good Eddystone 750 or exchange w.h.y.? G4JOW, 16 Alexandra Road, Bridgwater. Tel 424093 (home), 422873 (office).
Information on any difficulties in dealings with SEM (Southern Electronic Modules) Ltd, of Isle of Man, formerly known as SSM (Solid State Modules) of Huddersfield. Paul Karagianis, 20 Lea Road, Sonning Common, Reading RG4 9LJ.
HRO rx, in good alignment/wkg order, usual coils, bandspread coils, or data for winding same, all offers answered. Askey, 4 Keswick House, Lowth Road, London SE5 9NL.
TenTec Argonaut, for new amateur going QRP. Ling. 18 Malham Close, Lincoln LN6 0XE. Tel 0522 685247.
Swan 700CX and power supply unit. GD5DZ, QTHR. Tel 0624 87416.
Urgent: Manual/operating instructions for Eddystone 5/870A rx. Please contact Mersereau, Crucible Theatre, Sheffield S1 1DA. Tel 0742 760621.
Bearing compass, handheld, ex-RAF type illuminated from batteries in handle, comp with transit box is most suitable type. Others considered should be in alcohol and have prism magnifier. State cond, details and price. G3TJT, QTHR.
Manual for Heathkit RG1 rx, for purchase or loan. Telephone call and postage refunded. G8VUF. Tel Bromsgrove 71692.
Datong morse tutor. Single paddle key, 40/50W linear, suitable for 1·56MHz. Spare plug-in modules for Bird Thruline wattmeter. Solar cells for 12V battery charging, or small wind generator. Tel Harlow (027-982) 291, between 7-8pm.
Cossor oscillograph model 1039, circuit diagram, other information if available to purchase or copy. G. C. Manning, G2IK, 42 Norton Road, Knowle, Bristol BS4 2HA. Tel 0272 777375.
Any KW E-Zee Match atu for trap dipole, 10-80m, in wkg cond. Grid-dip oscillator, 10-160m to comply with station licence requirements. G4BOP, QTHR.
FT202R handheld tx/rx, or Icom IC2E or Trio 2200GX. Details and price to G8SAN, 78 Reservoir Road, Selly Oak, Birmingham.
Ex-govt rxs: 17 set, R208, R1155, R1132. Any part of early home chain radiolocation gear, state price required. Anyone remember pulse repetition frequency of above radar? GM8BFG, QTHR Orkney.

Special event station

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

26-30 November
Practical Wireless will have a station in operation on their stand at the Breadboard '80 Exhibition at the Royal Horticultural Halls, Elverton Street, Westminster, London SW1. The callsigns will be GB2PW and GB8BB. Details from the magazine's editorial office, Westover House, West Quay Road, Poole, Dorset BH15 1JG, tel Poole 71191.

Mobile rallies calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

26 April 1981—Southend & DRS Mobile Rally, Southend Airport Exhibition Centre, Aviation Way, Southend-on-Sea, Essex. Many attractions, including licensed bar, refreshments, parking for 300 cars, aircraft museum, talk-in station, bring-and-buy stall. Details from F. Thorogood, G8ORV, QTHR, tel Southend-on-Sea (0702) 616239.

MEMBER'S AD ORDER FORM

FOR SALE ☐ WANTED ☐ (Tick as appropriate)

- **See first "Members' ads" page for conditions of acceptance and current rate.**
- **Not more than 40 words, including name, address etc.**
- **Do not forget to include remittance.**
- **Please write in block capitals, or type.**

Licensed members are asked to use their callsign and QTHR, meaning that their address in the current *RSGB Amateur Radio Call Book* is correct. BRS and A members will, of course, have to provide their name and address or telephone number.

I enclose cheque/PO for ..... to cover the cost of this advertisement.

Signed .....

Date .....

AMATEUR ELECTRONICS UK

AEUK – Your number one

AS FACTORY APPOINTED DISTRIBUTORS WE OFFER YOU—

NEW FACTORY APPROVED PRICES

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

Access

HOW TO REACH US (EASY PRIVATE PARKING ON OUR 90ft FORECOURT)

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

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

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

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

AMATEUR ELECTRONICS UK

source for YAESU MUSEN

H

WE ARE PLEASED TO ANNOUNCE A NEW PRICE STRUCTURE FOR YAESU PRODUCTS WHICH GIVES THE PURCHASER EVEN BETTER VALUE FOR MONEY FOR AMATEUR RADIO'S FINEST EQUIPMENT RANGE. NOW, FROM THE WORLD'S NUMBER ONE MANUFACTURER COMES THE OPPORTUNITY FOR EVERY OPERATOR AND SWL TO OWN THE BEST ON THE MARKET AND GONE IS THE NECESSITY FOR SETTLING FOR SECOND BEST.

SEE US AT LEICESTER—STAND 38

G

A FT-202 The ever-popular 2m FM hand-held. Superb value at. . . . . **£99.00** VAT incl

B FT-901DM. Truly the HF Transceiver with a reputation beyond compare. Every Operator's ultimate dream. . . . . **£799.25** VAT incl

C FT-225RD. No other 2 metre base-station can match the tried and proven FT-225RD Multimode. . . . . **£499.00** VAT incl

D FT-107M. YAESU's pace-setting all solid state HF Transceiver. Now exceptional value . . . . . **£690.00** VAT incl
Complete with internal PSU and memory, only. . . . . **£887.80** VAT incl

E FRG-7. The finest value for money general coverage receiver available on the market today. Rugged and reliable and so many thousands in use. . . . . **£199.00** VAT incl

F FRG-7000. This is the general coverage receiver for the man who insists on the best and only the best. . . . . **£299.00** VAT incl

G FT-207R. The sophisticated 207 is still the best buy in synthesized 2-metre hand-helds at . . . . . **£199.00** VAT incl

H FT-101ZD. Don't settle for the rig with the add-on digital counter, settle for latest technology with the world famous YAESU MUSEN FT-101ZD HF Transceiver. Now superb value at . . . . . **£569.25** VAT incl

THE ABOVE IS ONLY PART OF THE STORY—FOR FULL DETAILS OF ALL THE NEW PRICES SEND TODAY FOR THE LATEST YAESU CATALOGUE AND LEAFLETS. ALL YOU NEED TO DO TO OBTAIN ALL THE LATEST LITERATURE AND OUR CREDIT VOUCHER VALUE £3.60 IS TO SEND 36 PENCE IN STAMPS—A 10-1 WINNING OFFER!

STOP PRESS! FRG-7700 NEW GENERAL COVERAGE RECEIVER NOW IN STOCK!

AGENTS: NORTH WEST—THANET ELECTRONICS LTD, GORDON,G3LEQ, KNUTSFORD (0565) 4040.
WALES & WEST—ROSS CLARE, GW3NWS, "GLENVIEW" NEWPORT ROAD, MAGOR, GWENT (0633) 880146.
EAST ANGLIA—AMATEUR ELECTRONICS UK—EAST ANGLIA, DR T. THIRST (TIM) G4CTT, NORWICH 06925 403
NORTH EAST—NORTH EAST AMATEUR RADIO, DARLINGTON 0325 55969
SOUTH EAST—AMATEUR ELECTRONICS, UK—COASTAL, CLIFTONVILLE, KENT
KEN McINNES, G3FTE, THANET (0843) 291297. 9 a.m.–10.30 p.m.

G3FIK

508-514 ALUM ROCK ROAD
BIRMINGHAM 8
021-327 1497
Telex 337045 6313

MODULAR ELECTRONICS

95 HIGH STREET SELSEY, Nr CHICHESTER, SUSSEX. TEL: SELSEY (024361) 2916

DISTRIBUTOR FOR SOLID STATE MICROWAVE (THOMPSON-CSF) RF PRODUCTS

G8CQS

Type	Output	Gain(dB)	Volts	Freq	Price Exc Vat
2N3866	1	10	28	175	£0.85
2N4427	1	10	12	175	£0.92
2N3553	2·5	9	28	175	£1.02
2N5913	2	7	12	470	£1.40
SD1127	4	12	12	175	£2.10 (1)
2N6080	4	12	12	175	£4.10
SD1143	12	10	12	220	£6.00
2N6081	15	6·3	12	175	£6.50
2N6082	25	5·7	12	175	£7.50
2N6084	40	4·5	12	175	£11.00
RF2127	70	6·6	12	175	£21.00 (2)
SD1019-5	100	6+	28	175	£16.00
2N5590	10	5·2	13	175	£5.50
2N5591	25	4·4	13	175	£6.90
SD1428	45	6·5	12	175	£11.55 (2)
2N5944	2	9	12	470	£5.90
2N5945	4	8	12	470	£7.50
SD1135	5	7·5	12	470	£4.50
SD1136	10	5·5	12	470	£6.75
2N5946	10	6	12	470	£9.50
SD1088	25	6·8	12	470	£16.00 (2)
SD1089	40	4·3	12	470	£22.00 (2)
SD1434	45	5·0	12	470	£23.00 (2)

NOTE (1) G.Emit. IC202/215 P.A. (2) Controlled "Q" Type

Low noise semiconductors

TRW TP491 1·5dB N/F at 500MHz T Pack	£3.20
MUL BFR90 2·5dB N/F at 1·0GHz	£2.45
MUL BFR91 2·5dB N/F at 1·2GHz Pack	£3.00
Sig SD306 1·5dB N/F at 150MHz "D" MOS	£2.20
Sig SD201 4dB N/F at 1·2GHz "D" MOS sin/gate	£2.00
BFR34A 4dB N/F at 2GHz T Pack	£1.99
BFT66 Low intermod. for Preamp. Low noise	£2.25
3N204 2nd Generation MOSFET to replace 40673	£1.35
40673 RCA Low noise MOSFET	£0.80

BF900 Stripline VHF/UHF MOSFET. 2dB N/F 200MHz **£1.35**

SPRAGUE GOODMAN 500V MICA TRIMMERS Prof. Quality Grade 1 Low Loss Mica. Equiv. to ARCO. Capacities in Pf. 2·5-7 **70p**. 4-20 **75p**. 7-40 **75p**. 16-100 **85p**. 25-150 **95p**. 40-200 **£1.00**. USA Man.

UNDERWOOD-UNELCO Cased mica Caps. Resonance >2GHz. 500V working 30 and 50pf **£1.40**. 100 and 150pf **£1.50**. 1000pf **£1.60**. PTFE Sheet 0·25mm (11 thou) 10kV Dia Stable. Sheets of 300mm square **£2.00**.

ANTENNA RELAYS. Mag. Dev. 951-170-12V 50Ω RG43 cable. Good VSWR to 1296 **£7.45**.

Hewlett Packard Diodes. 5082 Series. 2800 H.Car. **97p** 2835 H.Car **85p**. 3080 Pin **85p**.

ITT 10·7 Xtl Filters for 12·5kHz spacing 910Ω 25pf. **£6.00**

ITT Xtl Filter for 25kHz spacing 910Ω 25pf. **£7.00**

TRIMMERS

Jackson Tetfer PTFE (UHF) 1·5-10pf Low Loss **28p**. Dau. PTFE film. 1·5-9pf 2-18pf all **24p**.

Surplus 10mm 2·5-25pf 3 pin type **12p**.

FERRITES. Mullard. FX1115 Bead **5p**.

FX1898 6 hole **11p**. FX2049 2 hole trans **10p**.

50Ω BNC COLINE. Plug RG43 **61p**. S/H Sock **60p**. Greenpar 50Ω 4 hole Sock **55p**.

CAPACITORS. All ceramic. Min types.

Mul 1000pf 100V plate **5p**. 1500pf **5p**.

Disc 500V 1000pf **5p**. 200pf **4p**.

UHF Micadisc F/T 22pf **15p**.

1000pf solder F/T **9p**. 50pf **8p**

TBA 120 Int cct F.M. amp disc **70p**.

MC12013p 500MHz ÷ 10 I/C with ttl O/P 5V with instructions for use. **£10.00**.

Dual UHF FET E420 = 2 × E300 Ideal Mixer **£1.10**.

Redpoint 6M1 heatsink S/sided 2·6 deg/w **£1.60**

Radiospares 100mm long S/Side 4 deg/w **96p**.

Dau 4¾ × 2" S/Side 4·2deg/w **70p**.

Extra 10p postage over normal due to weight.

SEMICONDUCTORS. Surplus. All good. RCA 16142/2N5070 25W PEP, HF, SSB, Ex equip. All good, 28V only **£2.00**.

RCA 2N5914 12V 470MHz 2w 7dB **£3.50**.

218BLY. Studless like C1-12 12V 470MHz 2W **£2.75**.

2N918 **50p**. 2N5179 **70p**. BFY90 **£1.10**. BF180 **40p**. BF115 **40p**. BC149 **12p**. CIL 108 **12p**.

ST2110 = BSX19/20 or 2N2369 **22p**. BFR15 **£1.75**. Plas Br Rect 400V 2·5A **30p**. ZS276 600V 1·5A **8p**.

FINISHED EQUIPMENT

ME202-25 for use with IC202/215 **£37**.

New PA2 Preamp BF900 MOSFET. The best at **£7.00**.

PM2-10 Amp 0·4W in for 10W 144MHz 13·8V 50Ω **£16**.

PM2-15 Amp 1·3W in for 15W 144MHz 13·8V 50Ω **£17**.

PM2-25 Amp 3W in for 20 + W 144MHz 13·8V 50Ω **£18.25**.

CPM modules as above but with RF changeover etc. add **£6.50** to above prices and prefix to read CPM.

PM70-4 Amp 0·4W for 4W 432MHz 13·8V 50 **£17**.

PM70 10 Amp 2·5W for 10W 432MHz 13·8V 50Ω **£17.50**.

PM70 10 Amp 1·6W for 10W 432MHz 13·8V 50Ω **£18.50**.

PA U2 432 preamp 13dB gain with N/F <2dB **£7.75**. Tested Prescaler board with input amp. Type 35mV 432MHz. 5V supply TTL O/P. Neg Earth. **£21.00**. Prescaler tested without input amp. 200mV sens **£15.50**.

BARCLAYCARD OR ACCESS ABOVE **£10** exc VAT. MINIMUM INVOICED ORDER TO SCHOOLS COLLEGES AND APPROVED ACCT. CUSTOMERS **£10**. MINIMUM EXPORT ORDER (VAT FREE) **£15.00**.

Post and packing 50p up to **£20** value, above **£20** Post Pack/Reg. **£1.25**. VAT is chargeable on Post/Packing.

ALL PRICES EXCLUDE VAT. Add 15% to goods cost plus postage.

WOOD & DOUGLAS

9 HILLCREST, TADLEY
BASINGSTOKE, HANTS RG26 6JB

9 HILLCREST, TADLEY, BASINGSTOKE, HANTS RG26 6JB

A new product is added to the range this month. The **PTK1** is a user programmable end of transmission signature generator. This acts just like a piptone but gives a morse character up to 9 bits in length, the most obvious being 'K', at the 'over' end. This has been designed for repeater groups but could be used for other applications. This can be bought for **£5.60** in kit form or **£7.85** assembled and will be available along with all our range of kits and modules on **J. BIRKETT'S** stand at the ARRA Leicester Exhibition this month.

PROJECT	CODE	ASS'MBL'D	KIT
70cms FM TCVR (0·5W) TX	70FM05T	25.95	17.80
RX	70FM05R	47.25	38.50
70 cms Multi-channel TX	70MC06T	18.10	11.30
RX	70MC06R	26.05	18.60
70cms FM Package (70FM05TR + MC)	70PAC	110.00	82.00
70cms Power Amps 0·05-1W	70FM1	11.25	6.25
0·5-3W	70FM3	16.80	11.80
0·5-5W	70FM5	17.40	12.75
0·5-10W	70FM10	29.35	20.90
3·0-10W	70FM10/3	18.80	13.95
70cms Pre-Amp (Bipolar)	70PA2	6.55	5.10
70cms Pre-Amp (MOSFET)	70PA3	7.25	6.10
70cms Pre-Amp/Power Amp	70PA/FM10	39.80	30.80
2M FM TCVR (1·5W) TX	144FM2T	30.25	21.15
RX	144FM2R	49.80	40.70
2M Synth TX	SY2T	23.10	17.25
2M Synthesiser Mk II	144SY25B	69.70	50.95
2M FM Package (RX + TX + Synth)	144PAC	135.00	102.00
2M Synth Mk I Adaptor	SY25PB	10.90	8.25
2M Synth MK II 70cms Adaptor	SY25S70	5.95	3.65
2M Synth Scanner	PROSCAN1	20.10	14.75
2M Synth Display (2 pcb's)	DISP1/2	20.15	15.80

PROJECT	CODE	ASS'MBL'D	KIT
2M Power Amps 1·5W-10W	144FM10A	16.15	12.45
144FM10A with full c/o	144FM10B	28.90	22.90
2M Linear Amps 1·5W-10W	144LIN10A	23.35	17.66
144LIN10A with full c/o	144LIN10B	30.45	24.55
2M Pre-Amp (3SK88/BF981)	144PA3	7.50	6.25
2M Pre-Amp (3N204)	144PA2	7.35	6.07
Toneburst	TB2	6.05	3.10
Piptone (12V PTT)	PT1	6.60	3.40
Piptone (Solid State PTT)	PT2	6.65	3.45
Economiser	BE1	4.10	2.85
Regulator	REG1	5.95	3.70
Solid State Relay (2M)	SSR1	4.85	3.16
Solid State Relay (70cms)	SSR2	4.90	3.22
Microphone Pre-Amp	MPA1	5.15	2.50
Noise Filter	SLF1	5.10	3.90
Reflectometer	SWR1	5.60	4.55
CW Filter (Audio)	CWF1	5.85	4.25
Filters (144, 433, 384MHz)	BPF1	4.85	2.85
Pin Switches (144, 433MHz)	PS1	6.20	5.10
TVI Filter	70FI6P	3.95	3.05
Microwave Drive Source	MD05T	28.35	19.25
Microwave Driver PA 10W	MD10PA	29.35	20.90

Above is a brief listing of the current product range as full kits. These cannot be split and sold in component parts. We do have, however, many components that are hard to get for the average amateur which include 23cms pre-amp boards and devices (NE64535), diecast boxes, chip resistors (51Ω and 100Ω), PTFE trimmers, Mullard thick film amplifiers (OM335, OM361) etc. A large SAE (A4 size) will bring you the latest lists and new projects. The range is constantly expanding and it is worth giving a call if you have a simple query on TADLEY (07356) 5324 during evenings and weekends. The above prices will be current for 1980 and include VAT at the current rate. Please include 60p on your total order for post and packing. The kits include all pcb components except crystals unless stated otherwise. Suitable boxes and external hardware is not supplied in the kit but some suitable stock is held. Any kit purchased from the range will be gladly serviced but a £2.50 cover charge would be appreciated on larger items. All items in kit form are usually ex-stock either with us or our rally agent J. Birkett of Lincoln. Assembled items unless stock will be 10-14 days from receipt of order, and will be tested and aligned to specification.

A. WOOD, G4EEE **M. P. TELKMAN, G8DCA**

SOMMERKAMP AT ARROW

CHECK THE SPECIFICATIONS ? YOU'LL SEE SOMMERKAMP IS YOUR BEST BUY!!

SOMMERKAMP FT307CBM includes all these "extras" **Basic set 80-10M + ready built VCO circuits** fitted 3 Marine bands, easy extension to new Amateur bands with extra crystals. Fan cooled "no-tune" PA. Audio peak & notch filters + variable bandwidth IF. RF speech processor, noise blanker etc. **DMS unit fitted** – 12 channel memory + scanning from **YM35 Mic.** 234V ac **Mains PSU FP107** fitted + **CW filter.**
Our "ALL-IN" price £899.00

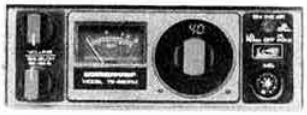
FT277ZD (FT101ZD) SOMMERKAMP SPECIFICATIONS BEATS ALL!!
Basic set 160-10M with WWV rx. & Aux. pair 6146B P.A. with **Cooling Fan** fitted, 234V ac & **12 dc Inverter** fitted, full AM facility with **AM Filter** fitted and **CW filter** All at the same price as others charge for basic set only! and we don't ask extra for the **YM37 mic.**
Our "ALL-IN" price £589.00

FT767DX SOMMERKAMP'S "WAYFARER"
Ultra compact 12V dc Transceiver with the wonderful receiver & unique digital LED metering. All Existing & proposed bands (80-10m + 30, 17 & 12m) factory fitted. YM35 Scan. Mic & CW Filter included at **"ALL-IN" price £499.00**

FT7B/SOMMERKAMP still a top bargain in Mobile/Base stations. 80-10m CW/AM/SSB Analogue, calibrator, VOX, clarifier, side-tone monitor, Audio peak filter. Includes **Microphone, Mobile Bracket Leads/ plugs**
SPECIAL THIS MONTH "ALL-IN" price £399.00

NEW NEW NEW NEW NEW NEW

10 Metre All-mode
FM + AM + CW + USB/LSB
Digital readout, remote scanner
100 W PEP
£325.00 (Class A only)



Microprocessor controlled 2M FM hand-held with 12.5kHz channel facility, scanner, memory, keyboard entry. Tone pad.
"ALL-IN" price £196.00
YM24 speaker mic. **£16.67**
N9-C charger **£7.50**
"ALL-IN" package £217.00

NEW MODEL PRICES

FTC4703 70CM FM 25W Mobile	**£287.00**
FT404R 70CM FM Hand-held	**£207.00**
FT720RUB 70CM 10W FM Mobile	**£355.00**
FT720RVHE 2M 25W FM Mobile	**£325.00**
FT480R 2M ALL-MODE MOBILE	**£359.00**

The Worlds most compact 80-channel 50W 2M FM Mobile featuring auto select of simplex/repeat mode & digital channel readout
"ALL-IN" price £199.00

PLUS NEW version TS280LP has all facilities at 10 Watts output
"ALL-IN" price £169.00

SOMMERKAMP PRODUCTS CAN BE SEEN AT AUTHORISED AGENTS:-
Aircomm – 22 Brecon Road, Abergavenny
Amateur Radio Shop – 4 Cross Church St, Huddersfield
Broadcast Production Services – Dublin 316914

ARROW ELECTRONICS LTD

7 Coptfold Road, Brentwood, Essex CM14 4BN
Tel: 0277 226470 or 219435 **Telex: 995801**
Open 5 days week. Closed Thurs.

ACCESS • VISA • INSTANT HP • TWO YEARS WARRANTY
FREE QSL's • BEST TRADE-IN PRICES
OUR "ALL-IN" PRICES INCLUDE VAT. DELIVERY EXTRA AT COST
FULL PRICE LIST COVERING ALL SOMMERKAMP MODELS FREE ON REQUEST

muTek limited

rf technology from G4DGU

muTek moves!
By the time that you read this, muTek will have moved. With the help and encouragement of the Dartington North Devon Trust, CoSIRA, and the Torridge District Council we are moving to a brand-new factory unit in the North Devon village of Bradworthy (XK09f; IO70FV). This will allow considerable scope for the expansion of both our amateur radio manufacturing and professional consultancy activities and should allow the introduction of some exciting new products over the next few months.

The "Moonbeam"
One of the oldest (and most boring!) jokes in the moonbounce business is to ask if a yagi used for eme is a moonbeam! At the risk of attracting groans we've adopted the name for our first excursion into antennas; a 15 element 4·2 wavelength NBS yagi for the 432MHz band. This is essentially the design that we have used, combined as an array of eight, for eme. We will not be quoting a gain figure as we have no intention of joining the ranks of the spec spivs: the absolute free-space gain of a high-gain antenna below 1GHz is incredibly difficult to measure accurately, and we'd prefer to retain our integrity rather than leap around shouting figures that we weren't completely sure of.

We're selling these antennas in semi-kit form—most of the difficult jobs are already done: apart from the final assembly (which you have to do with the competition's antennas, anyhow!) the only significant work is in cutting the parasitic elements to length and mounting them through the boom. We estimate that this should take rather less than an evening, and require no tools other than a pair of sidecutters, a ruler, a file and a hammer and centre punch.

A result of adopting this approach is that our prices are really rather reasonable, and we are adopting a pricing structure that we hope will encourage people to put more aluminium in the sky!

1—£16.50 2—£31.00 4—£60.00 8—£116.00
Carriage—£1.50 per antenna

FT221/225GT front-end board
Seemingly after every contest we receive delighted 'phone calls from users of this unit. But it's not only contests where the benefits of a good front-end can be felt as several hundred satisfied customers world-wide will confirm. **£53.87**

144MHz preamplifier
Using a 3SK88 noise matched to 50Ω and including a high-quality output bandpass filter, an inbuilt pad for gain adjustment and facilities to control your antenna relays via the output cable, this is not an "rf switched masthead preamp". Rather it has been designed for the individual who wishes to put a properly engineered system together. **£10.79 (unboxed). £17.72 (boxed)**

Microwave system components

1·3GHz low noise amplifier	£22.72	1·3GHz—144MHz mixer—lo	£22.60
1·3GHz gain block	£11.15	2·3GHz low noise amplifier	£22.72
1·3GHz bandpass filter	£6.75	2·3GHz gain block	£16.10
		350·400MHz source	£18.25

Kungsimport antenna combiners

2-144N	£26.75	4-144N	£29.75
2-432N	£23.50	4-432N	£26.50

We still have no firm price for Ben's dipole/splasher feeds for 1·3 and 2·3GHz. Try ringing if you are interested—we may know by the time this reaches you.

TVI filter £1.80

NEC rf and microwave transistors
NE12683—gasfet—**(£26.08). ND4692**—x band schottky mixer—**(£3.51). NE64535 (£10.00). NEO2137 (£1.91). NE57835 (£6.73). NE73432E (£0.97). NE77320**—2W at 1·3GHz—**(£10.00). 3SK88 (£1.73). 3SK74 (£0.60). ND4991**—gp schottky mixer/detector to 2GHz—**(£0.40).** Don't forget that we have the expertise to help you learn to use these devices. This extends rather beyond half understood rip-offs of published designs...!

Data on request. SAE appreciated. CWO. Please add 50p p&p unless otherwise indicated. VAT should be added to total of order plus carriage.

muTek Limited, Bradworthy, Holsworthy, Devon EX22 7TU
Telephone: Bradworthy (040942) 543

G4DSG G3HEO

D. P. HOBBS LTD.

THE COMPONENT SPECIALISTS

FDK 700EX 144-146Mhz 12½ & 25kHz steps, scan, etc. **£199.00**
FDK 750E Multimode FM/SSB/CW TCVR. **£299.00**
R517 Aircraft band monitor rec, VFO + 3 fixed channels **£49.75**
DAIWA SR9 2m monitor rec, VFO + 11 fixed channels. **£46.00**
YAESU FRG7 PLL communications rec, 0·5-30MHz. **£199.00**
LOWE SRX30 PLL communications rec, 0·5-30MHz. **£158.00**
DM350 50k PTT hand mic. ..... **£4.83** + 30p p&p
DL20 DUMMY LOADS 15W 30W peak PL259. ..... **£6.04** + 30p p&p
SEIF 13·8V 4amp power supplies. ..... **£22.95** + £1.20 p&p
HANSEN FS601MH Peak reading (SSB) watt meter SWR bridge. **£46.00**
HANSEN FS500H 20/200/2kW. Peak reading watt meter SWR bridge. **£67.85**
REACE UH74 144/432MHz watt meter SWR bridge with remote head. . **£17.00**
MICROWAVE MODULES 2m, 70cm, 23cm converters, MMT 144/28, MMT 432/28S; MMT432/144R transverters; MML144/25W linear amps.
ELECTROLYTICS 400mfd, 400V; 700mfd, 350V. ..... **£1.20** + 30p p&p each
DOUBLE SIDED FIBREGLASS PC board approx 6" × 4" **70p.**
UNIVERSAL TEST LEAD KIT Screw in probes, croc clips, spades, banana, needle point tips **£2.10** + 30p p&p.
ASCOT, BANTEX & JAYBEAM AERIALS Veroboxes, alloy & plastic boxes, resistors, capacitors, ICs, etc Bernards & RSGB Books.
Transformers as last month's advertisement.

Prices include VAT **Access & Barclaycard**

11 KING STREET, LUTON, BEDS. Tel: 20907
Open 9am-5.30pm Mon-Sat. Closed all day Wed.
ALL MAIL ORDERS TO LUTON

ALSO VISIT—D. P. HOBBS (NORWICH) LTD.
13 St. Benedict's Street, Norwich, Norfolk. Tel 615786
Open 9am-5.30pm Mon-Sat. Closed all day Thurs.

GW4EIN

AIRCOM of Abergavenny for SOMMERKAMP

IN WALES AND BORDER COUNTIES

STOCKIST FOR MICROWAVE MODULES

FULL RANGE OF JAYBEAM AERIALS, CABLE ROTATORS AND ACCESSORIES

MOBILE ANTENNA BY TAL WITH THE NEW PCB HEART—NEAT, SMART AND EFFECTIVE.

CORDLESS 'PHONES, THE IDEAL INTERCOM—DON'T LOSE THAT QSO—MAKE AND TAKE CALLS ANYWHERE

SHOP OPEN TUESDAY TO SATURDAY 9 TILL 5

Demonstrations in your shack Mondays

50 mile radius of QTH for appointment

Mail order. Access and Barclaycard welcome

22 Brecon Road, Abergavenny, Gwent
NP7 5UG. 'Phone 2566

TRIO

APPROVED TRIO DEALER

Photo Acoustics Ltd

MICRO COMMUNICATIONS DIVISION

RADIO COMMUNICATIONS—AUDIO—VIDEO AND COMPUTER SALES AND SERVICE

ICOM

AUTHORISED ICOM DEALER

TRIO

TS520SE	160-10m transceiver 200W p.e.p.	£437.00
TS180S	160-10m 200W p.e.p. transceiver	£679.65
TS120S	80-10m mobile transceiver 200W p.e.p.	£432.40
TS120V	80-10m mobile transceiver 20W p.e.p.	£347.30
TS830S	160-10m HF bands transceiver, includes new bands plus various IF options, digital display 2 × 6146 PA and all the features you could want	£639.00
TS770E	2m/70cm multimode base station	£730.00
TR9000	2m multimode mobile or base station, 5 memories RIT	£345.00
TR7800	2m 25W mobile or base station, 15 memories autoscan	£268.00
TR2300	2m handheld 80 channels	£166.75
TR2400	2m synthesised handheld transceiver	£198.00

All TRIO accessories available plus the range of TRIO OSCILLOSCOPES

RECEIVERS

R1000	0.2-30 MHz receiver	£285.00
R820	Simply the best amateur receiver	£690.00
SRX30	SSB/AM/CW. 500kHz-30MHz	£158.00
SR9	144-146 or 156-162MHz tunable or crystal receiver FM	£46.00
AMR217B	Scanner with 8 crystals, mains or battery, marine or amateur	£120.75
FS10	10 channel pocket scanner	£82.00
Regency	Digital flight scan, full band coverage no crystals required	£215.00
AP12	With batteries and charger	£89.70
AP12	With 12 crystals	£118.45
R512	Air band scanner fitted 5 channels	£138.00
R517	Air band portable, tunable plus crystal control	£49.45
	Extra crystals for the above each	£2.80
SX200	Scanner scans VHF UHF 26-514MHz & AM/FM	£235.00

ACCESSORIES

CN1001A	Automatic ATU and SWR	£129.95
CN620	Cross pointer SWR 1.8-150MHz	£52.81
CN630	Cross pointer 140-450MHz	£71.00
CN650	Cross pointer 1.2-2.5GHz	£95.00
T3170L	3.5-150MHz	£12.94
FS7	SWR Power meter	£33.00
RW151D	Watt meter 0-150W 0-500MHz	£69.00

PET

NEW CBM 8032—80 column + 24k Rom	£1029.25
NEW CBM 8050 950k storage dual drive	£1029.25
CBM 2001-8—8k including cassette	£435.88
CBM 3008—8k Qwerty keyboard	£457.70
CBM 3016—16k Green screen	£569.25
CBM 3032—32k Green screen	£718.75
CBM 3022—80 column dot matrix printer	£440.45
CBM 3023—Friction feed 80 column dot matrix printer	£387.55
CBM 3040—Dual drive mini floppy	£718.75
C2N—Cassette deck	£56.93
KIM 1—The ideal teaching aid	£106.95
KIM 3B—8k ram board	£110.40
KIM 4—Mother board	£74.75
All PET leads and accessories available including manuals	

NASCOM

System 80—no RAM—FREE ROM	£258.75
Graphics board with 3k RAM	£103.50
Keyboard cases NAS 1/2	£4.03
16k RAM board 'B' will take 48k	£161.00
Power supplies NAS-PEN Zeap 2	P.O.A.
IMP printer	£373.75

VIDEO GENIE

EG3003 Tandy level 2 compatible, with 16K RAM integral cassette boxed and ready to go only £345.00

DOLPHIN

BD80P PET/IEEC Parallel or RS232C high quality matrix printer	£517.50
Ricoh RP1500 Daisy wheel inc. interface	£1828.00
BASE 2 Super print 800 friction or tractor feed inc. 3 standard interfaces + NEC	£373.75

CONSUMABLES—SOFTWARE

Mini Disks—Box of 10	£22.94
C15 Cassettes—high quality—Box of 10	£4.60
80 Column tractor feed paper—per 1000 sheets	£9.66
Labels—per 1000	£8.05
Printer Ribbons	£2.53

Petsoft—Commodore—BSF—Monitor
Everything from Space Invaders to a complete Business System
Large range of books in stock

ICOM

IC2E	2m Handheld	£159.00
IC240	2m Mobile—10 watt	£169.00
IC255E	2m Mobile—25 watt inc scanner	£255.00
IC260E	2m Mobile Multimode	£339.00
IC251E	2m Multimode base station	£479.00
IC215E	With S20, 22, RO-9 inc	£149.00
IC402	70cm ssb portable	£242.00
IC202S	2m ssb portable	£169.00
IC720	HF all band ssb, cw, rtty, am—100W transceiver 0.1-30MHz	P.O.A.

12 months guarantee, this includes PA transistors etc.
All accessories available.

AERIALS

Full range of J Beams VHF, UHF aerials—Revco—Ascot—Hokushin Hy-gain G-Whip—G2DYM—TRIO etc.
Check our prices before you buy.

MICROWAVE MODULES

Full range available P.O.A.

S.E.M.

Full range available P.O.A.

ROTATORS

AR40	For Mini Beams	£59.80
DR7500X	For 3 element HF beams. Preset controller	£98.04
DR7500R	For 3 element HF beams. Round controller	£107.98
DR7600X	Takes up to 2 element 40m beam. Preset controller	£135.00
DR7600R	Takes up to 2 element 40m beam. Round controller	144.90
KR400	Kenpro rotator	£105.00
5 core—6 core cable—UR43—UR67—UR67—twin feeder		P.O.A.

Power Supplies—large range available P.O.A.
Microphones—TRIO, AKG, Shure, Beyer, P.O.A.
Plugs, sockets, dummy loads, lightening arresters etc. all available.

PLEASE PHONE FOR QUOTATION ON ANY ITEMS NOT LISTED

ALL PRICES INCLUDE VAT

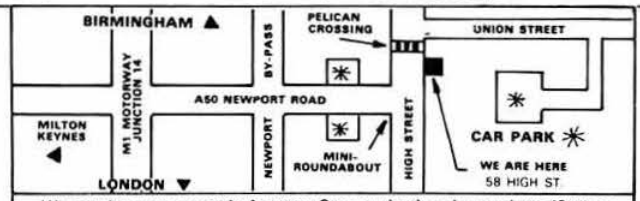
WE ALSO SUPPLY FROM OUR A/V DIVISION—VIDEO RECORDERS—TAPE RECORDERS—COPIERS—MIXERS—TELETEXT RECEIVERS—AUDIO—AMPLIFIERS ETC. BY REVOX, UHER, AKAI, SONY, NEAL, MARANTZ, TANDBERG, SHARP, ASSMANN, NATIONAL PANASONIC, ETC.

Have a day out, take the XYL and Harmonics to the superb new shopping centre at Milton Keynes and come and visit our new Showrooms 5 minutes away in the High Street of Newport Pagnell, and have a cup of Steve's tea! Contact Derek, G3TGE, Steve G8PWS or Judy.

MAIL ORDER SECURIOR DELIVERY

Ask for details of our Credit Card Scheme—£750 instant credit could be available to you now!

MONDAY-SATURDAY
9.30 am-5.30 pm



We may be a new name in Amateur Communications but we have 12 years of service to the Broadcasting and Recording Industry—Educational and Governmental Depts.

HIRE PURCHASE PART EXCHANGE

or let us sell your rig for you—no commission charged if you purchase new rig from us.

MONDAY-SATURDAY
9.30 am-5.30 pm

58 HIGH STREET, NEWPORT PAGNELL, BUCKS. ● TEL. 0908 610625

fact: Shure brings intelligibility & reliability to professional communications microphones

Experienced operators recognize that the audio quality of the transmitter is limited by the quality of the input from the microphone. On the air, there's no mistaking the crisp, intelligible messages from Shure microphones.

Shure microphones have been the overwhelming choice of professional communications users all over the world for over 30 years. Many milestone improvements developed for demanding professionals are found on Shure microphones:

ARMO-DUR* Case: Lightweight, immune to oil, grease, fumes, salt spray, sun, rust, and corrosion. Prevents RF burn!

"Million Cycle" leaf switch: Just one of the crucial wear points Shure-tested to ensure reliability and extraordinary durability.

TRIPLE-FLEX* Cable: Provides three or four times longer flex life than previously available cords on hand-held microphones.

CONTROLLED MAGNETIC* or Dynamic Transducer: The exclusive Shure-designed super-rugged transducers that give excellent voice intelligibility and super reliability.

To improve your on-air intelligibility we suggest the following Shure Microphones:

	Mobile Application	Fixed Station Application
SSB	414A* 407A* 577A**	444D 526T Series II
FM	414B* 507B* 577B**	450 526T Series II

*General recommendation. Consult equipment instruction manual for correct microphone impedance.
**Noise-cancelling.

SHURE Fixed-Station Mics

Controlled Magnetic* Fixed Station Microphone (Models 444D, 450)
Our most popular fixed-station microphones. Unmatched performance characteristics. Adjustable stand raises microphone for most comfortable talking position.

New Transistorized Fixed-Station Microphone (Model 526T Series II)
A new design for maximum versatility in fixed-station operation. Modulation level (volume) control for high undistorted output with high- or low-impedance inputs.

SHURE Hand-Held Mobile Mics

Omnidirectional Mics (Models 407A, 407B, 507B)
Small, easy-to-handle design, with rugged Dynamic or CONTROLLED MAGNETIC* transducers for excellent voice intelligibility. Hum-shielded and insulated against shock. Model 507B Dynamic version features extended low and high frequency response, especially suitable for mobile FM transmitters. Modular construction simplifies field service.

Compact Mini Mics (Models 414A, 414B)
Ideal for miniaturized or portable communications systems, or where dashboard space is limited. The 414 Series CONTROLLED MAGNETIC* microphones are about half the size and weight of conventional microphones—yet they are rugged units, recommended for critical outdoor or indoor applications.

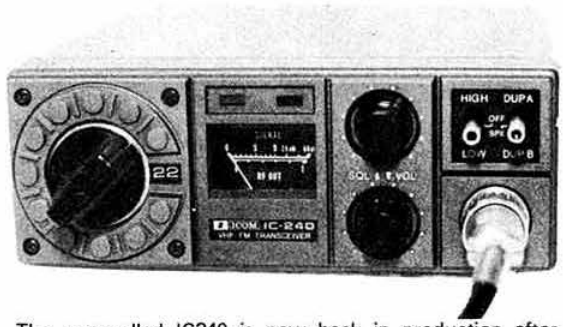
Noise-Cancelling Mics (Models 577A, 577B)
These Shure Dynamic microphones shut out background noise, permit clear transmission even where the noise level is so great that the operator cannot hear himself talking! The ARMO-DUR* case is lightweight, feels natural to the touch. The 577A is high impedance, the 577B is low impedance.

Communications Microphones by . . .

SHURE

Shure Electronics Limited, Eccleston Road, Maidstone ME15 6AU
Telephone: Maidstone (0622) 59881

IT'S BACK!



The unequalled IC240 is now back in production after several months delay due to the introduction of several new models. The famous ICOM factory wisely listened to the pleas from world wide ICOM distributors and decided to allocate enough production time to re-introduce this much loved rig. We are now receiving regular monthly supplies.

ICOM®

FROM **THANET**

So what does the IC240 offer? It is

VERY Easy to use—one hand operation—the simplest rig for mobile operation.

VERY Reliable—the most reliable set we have ever sold.

VERY Sensitive ·3 microvolts for 20db quieting or better.

VERY Clean—the phase-locked-loop synthesized method of producing a pure noise-free signal is a well tried system. Quite a few repeaters are using IC240's!

VERY Clear audio on both transmit and receive.

VERY Rugged P.A. it will put up with the chap that stuffs his RF into nothing—or something that isn't really a good antenna.

VERY Versatile. Full repeat and true reverse repeater facility. Numerous circuits and articles written on what you can do with your IC240 because you can get into the synthesizer via the matrix board. Do your own thing! Supplied with enough channels already programmed to satisfy most people—and some spare spaces left to insert your own choice with diodes. No xtals to buy! High power 10 watts output. Low power 1 watt switchable.

VERY Popular—over 3,000 sold in the UK.

VERY Sensible channel arrangement 22 channel positions marked with the "S Channel" number programmed at 25kHZ spacing.
and last of all

VERY Cheap **£169 incl vat!** this is

VERY GOOD VALUE FOR MONEY.

PHILIPS

70cm SYNTHESIZED TRANSCEIVER PHILIPS TYPE FM321

PHILIPS

Catronics are proud to announce the availability of the world's first 70cm 40 channel FM mobile transceiver in the UK. Especially made to our own specification by Philips—Europe's largest manufacturer of Radiotelephone equipment.

Just look at its star packed features:

- ★ Full 40 channel coverage RBO to SU39
- ★ Direct LED display of channel number
- ★ Electronic Channel change up or down from front panel
- ★ Remote Control channel change on microphone
- ★ 3 position squelch control for ease of operation
- ★ "Nominated Repeater Position" may be preprogrammed to your local Repeater channel for instant access
- ★ Crystal controlled Toneburst operates in Repeater Mode
- ★ Receiver sensitivity 0.3μV for 12dB SINAD
- ★ Transmitter output power 5W minimum, gives typically 25W e.r.p. with Jaybeam U5 mobile antenna
- ★ Supplied complete with mobile mounting bracket, microphone with P.T.T. and channel change, operating manual etc

The Philips FM321—We want you to have the best even better value now at £197 + VAT = £226.55

Available from: **Lowe Electronics Ltd, Matlock**
Stephens-James Ltd, Leigh
Booth Holdings, Bath
Waters & Stanton, Hockley

Buy from your dealer or direct from Sole Importers:

Catronics

ACCESS/BARCLAYCARD

CATRONICS LTD.
(Dept P1)
Communications House,
20 WALLINGTON SQUARE,
WALLINGTON, SURREY.
Telephone: 01-669 6700.

BARCLAYCARD **GAREX** (G3ZV1) ACCESS

KDK 2025 2m SYNTHESISED TRANSCEIVER
Full band coverage 25 or 12½kHz steps/10 channel memory/scans memories or selected band portion **£225 inc VAT.**

VHF FM MONITOR RECEIVERS
HF 12 POCKET SIZE 12 channel xtal controlled. 4MHz bandwidth in range 130-175MHz. With nicad and charger. **£57.95.** Xtals extra, see below.
SOUNDAIR 008 PORTABLE SCANNER 8 channel xtal controlled. With nicad and charger. **£59.** Xtals extra.
SR-9 top-selling monitor: 2m FM with 144-146MHz full coverage VFO, plus 11 xtal controlled channels, ideal for fixed, /M, and /P use. 12V DC operation **£47.50. MARINE BAND** version, 156-162MHz, same spec and price.
CRYSTALS FOR NR-56, SR-9, HF-12, SOUNDAIR 008 All 2m channels from 0 (145.00) to 32 (145.80) incl. at £2.46 (+ 15p post). Over 40 popular marine channels at £2.85 (+ 15p post). Sae list.
CRYSTALS FOR 28·5MHz suit most Jap/USA 10m rigs. 28·5MHz Tx and 28·045MHz Rx HC18U **£4.60 per pair.**
RESISTOR KITS new extended range at old prices E12 series 10Ω to 1M, 61 values, 5% carbon film, ¼W or ½W general purpose rating. Replenishments available. Starter pack, 5 ea value (305) **£3.10.** Standard pack, 10 ea (610) **£5.55.** Mixed pack 5 ea ¼W + ½W (610) **£5.55.** Giant pack 25 ea (1525) **£13.60.**
NICAD RECHARGEABLES—physically as zinc carbon: AA(U7) **£1.30**; C(U11) **£3.35**; PP3 **£5.55. ANY 5** + : less 10%; **ANY 10** + : less 20%
GAREX FM detector and squelch conversion ready assembled with full fitting instructions. Tailor made, easy-fit design for AM Cambridge, replaces squelch board with minimum of other modifications, **£5.75.** Transistor Vanguard (AM25T) version (modified squelch), **£6.35.**
PYE CAMBRIDGE SPARES (sae full list). Rx RF board 68-88MHz **£5.95.** 10·7MHz I.F. **£3.65.** 2nd mixer 10·7MHz to 455kHz **£3.** 455kHz block filter 12½kHz **£9.40,** ditto 25kHz **£3.** 455kHz AM I.F. **£3.65.** Audio bd. **£1.95.** AM squelch **75p.** Many other PYE parts in stock.

AUTHORISED DISTRIBUTOR OF REVCO AERIALS

PRICES INCLUDE UK POST & PACKING & 15% VAT.

GAREX ELECTRONICS, 7 NORVIC ROAD, MARSWORTH, TRING, HERTS HP23 4LS MAIL ORDER ONLY
Phone 0296 668684. Callers by appointment.

Lee Electronics Ltd

NEW LOW YAESU PRICES!!

FRG-7
£164.00
SECURICOR £3.50

FRG-7000
£259.00
SECURICOR £3.50

RI000
INC FREE PHONES
£251.00
SECURICOR £3.50

SCANNERS
PUMA 20 £86.00
S.AIR £33.74
POST £1.00

FT707
RANGE
NOW AVAILABLE

FT480R
NOW
AVAILABLE

FT720
RANGE
NOW AVAILABLE

FT101ZD
£495.00
SECURICOR £3.50

FT101Z
£425.00
SECURICOR £3.50

FT901DM
£695.00
SECURICOR £3.50

FT107M
£600.00
SECURICOR £3.50

FT225R £390.00
FT225RD £433.00

ASK FOR PRICES ON YAESU ACCESSORIES

FT207R £173.00
FT202R £86.00

STANDARD

C800 Scanner	£69.00
C8800 2m Trans	£219.00
C7800 70cm Trans	£259.00

ICOM

IC-2E Handy 2m	£138.26
IC-260E 2m FM/SSB	£294.78
IC-255E 2m FM	£221.50
IC-251 2m FM/SSB	£434.00
IC-720 NEW HF	£694.50

POWER SUPPLIES

PX402 3A nom 4A max	£19.95
PW5000 6A nom 7A max	£39.95
EP2500 25A nom 30A max	£79.95

ADONIS MICS

AM 802G Compressor	£52.00
AM 502G Compressor	£34.00
AM 202S Clip type	£18.25
AM 202FV Swan neck	£26.50
AM 202H Head set	£24.50

J-BEAM
FULL RANGE IN STOCK

MICROWAVE MODULES
FULL RANGE IN STOCK

LUNAR LINEAR
FULL RANGE IN STOCK

SHURE MICS
FULL RANGE IN STOCK

LEE ELECTRONICS LTD
400 EDGWARE ROAD, LONDON W2
Tel: 01-723 5521. Telex: 298765

ALL PRICES ARE + VAT
HP & Part exchanges welcome

Buy it with Access

BARCLAYCARD VISA

DATONG ELECTRONICS LIMITED

3 MAJOR NEW PRODUCTS

GENERAL COVERAGE CONVERTER MODEL PC-1

Parametric mixer plus LSI synthesiser give superb performance in new general coverage adaptor for two-metre receivers.
Model PC-1 represents yet another contribution to the state-of-the-art from Datong. Combining a remarkable parametric mixer with LSI synthesiser Model PC-1 transforms any two-metre all-mode receiver or transceiver into a superb communications receiver covering 10 kHz to 30 MHz in thirty segments each covering one megahertz.

● Simply connects in two metre receiver's antenna lead ● Gives full coverage from 30 MHz right down to below 20 kHz ● Ultra simple controls - simply select the MHz band required on Model PC-1 and tune the kHz on your two metre receiver. ● Correct input filters automatically selected by internal logic ● High input intercept (10 dbm) means that PC-1 will not overload first ● Negligible internal noise generation ● Fully digital LSI synthesiser design for long term reliability ● Attractive green LED illuminated dials ● Compact attractive stying blends with all modern transceivers.
Our new parametric mixer completely eliminates conventional transistors or FET's from the signal path and replaces them by varactor diodes. The result is superb strong signal handling performance (input intercept 10 dbm) with negligible noise generation.
The combination of Model PC-1 with your good quality two-metre receiver will give performance comparable to that of really top class general coverage receivers and far superior to that of common general coverage receivers.
And the beauty is that you probably already own the expensive bit! In effect for just over £100 you get a general coverage receiver of truly superb performance.
In operation Model PC-1 is delightfully simple. No manual preselector tuning is required. Instead internal decoding logic selects one of six bandpass input filters as the two decade "MHz" selector switches are operated. For operation at VLF (below 500 kHz) a panel push-button selects a 500 kHz low-pass filter.
This broadband technique gives almost constant high sensitivity over the full tuning range (even to 20 kHz!) and the parametric high-level mixer avoids the spurious signals which are often an undesired by-product of broad-band systems.
Model PC-1 requires a non-critical external power source of 12 volts at 100 mA. Our Model MPU is suitable (Price £6.90 including VAT)

Price: £105.00 + VAT (Total: £120.75)

OUTDOOR ACTIVE DIPOLE ANTENNA MODEL AD370

Sensitive broadband receiving antenna for outdoor mounting, covering 200 kHz to 30 MHz.

Model AD370 is a new active dipole antenna especially suitable for outdoor mounting and represents an addition to our existing active antenna system (Model AD170).

FEATURES

● Weather resistant construction for outdoor use ● Excellent sensitivity from 200 kHz to well over 30 MHz ● Strong signal performance to professional standards ● Overall length only 104 inches. Uses two taper-ground stainless steel whips 50 inches long ● Fitted with 8 metres of coaxial down lead (easily extended if necessary) ● Good rejection of interference picked up by the feeder due to excellent balance.
Model AD370 makes an ideal outdoor (or indoor) antenna for use with good general coverage communications receivers.
Mounted outdoors, for example, screwed to a gable-end or window frame, the antenna is quite unobtrusive and can be used where normal antennas would be impracticable.
The two 50 inch tapered steel whips supplied with AD370 give excellent pick-up sensitivity thanks to specially designed circuitry. From below 200 kHz to well over 30 MHz Model AD370 gives performance virtually equivalent to very much larger conventional antennas. Moreover compared with unbalanced antennas Model AD370 shows good rejection of interference picked up by the feeder.
The active circuitry is housed in a substantial water resistant polycarbonate case with gasket seal. Eight metres of coaxial cable are fitted as standard.
Model AD370 can be supplied either as an alternative head unit (complete with whips and feeder) for use with an existing AD170 installation, or complete with interface unit for new installations. Model AD170 is of course still available as normal for indoor installations.

Prices: Complete antenna system (comprising Model AD370 head unit with eight metre cable and interface unit type IB5, requiring 12 volts at 140mA): **£45.00 + VAT, total £51.75**
Special package price complete with MPU or MPU/1 mains power unit: **£49.00 + VAT, total £56.35**
Model AD370 head unit with 8 metre cable (for use with an existing AD170 antenna system: **£33.00 + VAT, total £37.95**

VERY LOW FREQUENCY CONVERTER MODEL VLF

Converts signals in the DC to 500 kHz range to the range 28.000 to 28.5000 MHz.
Model VLF adds the "missing band" to existing communications receivers. Most receivers do not cover the region below several hundred kiloherz. Model VLF plugs the gap and gives high sensitivity in this neglected region.

FEATURES

● Adds the VLF band to "general coverage" receivers. Simply connects in series with the antenna ● Picks up Omega, time signals, beacons etc, plus longwave broadcasts, with microvolt sensitivity ● Used with an amateur-bands-only HF receiver Model VLF gives you quick access to LW and MW broadcast stations (with reduced but usable sensitivity above 500 kHz) ● Quality construction in diecast box. SO239 connectors, crystal controlled, LED indication, on/off switch ● Operates from built-in 9 volt battery (PP3) or external power supply (5-15 volts DC at 5 mA) ● Antenna connects straight through when unit is switched off (for reception only).

Price: £22.00 + VAT, total £25.30

DATONG ELECTRONICS LIMITED

Spence Mills Mill Lane Bramley Leeds LS13 3HE England Tel: (0532) 552461

CHANGES IN ADVERTISEMENT RATES AND SIZES SEE PAGE 1232

DATONG ELECTRONICS LIMITED

PRODUCTS FOR THE SERIOUS COMMUNICATOR

LEARN MORSE THE EASY WAY

The Datong Morse Tutor (Model D70) is your passport to a full licence. Compact, with internal battery and speaker plus personal earphone it provides unlimited random morse to practice on. With D70 you can practice morse anywhere, anytime and at your own pace. With the Morse Tutor, practice becomes a pleasure because you get results quickly.

IMPROVE RECEPTION

Our two no-compromise audio filters give a remarkable ability to filter out the intelligence from the noise.

MODEL FL2

the new "top-of-the-line filter, offers extremely sharp pass-band edges for truly exceptional filtering performance on all modes, but especially for SSB. **Its 10 poles of fully variable low and high pass filtering give sharper filter edges even than normal crystal filters.** A separate manually tuned notch filter is also fitted.

MODEL FL1

on the other hand, was recently described in "73 Magazine" (October 1979) as "truly the Rolls Royce of the current filter market". It is the only filter in the world which can notch out an interferring whistle from SSB signals **automatically.** Additionally, for CW, bandwidths down to 20 Hz are practicable thanks to the use of "limited AFC" – another Datong exclusive.

Both filters connect in series with the loudspeaker and will improve virtually any receiver. An external DC supply is required.

Prices: All prices include delivery in UK. Basic prices are shown with VAT inclusive prices in brackets.

ASP £69.00 (£79.35)	D75 £49.00 (£56.35)	RFC/M £23.00 (£26.45)
FL2 £78.00 (£89.70)	FL1 £59.00 (£67.85)	UC1 £119.00 (£136.85)
D70 £43.00 (£49.45)	AD170 £33.00 (£37.95)	AD170 + Mains Power Unit £37.00 (£42.55)
MPU (Mains Power Unit) £6.00 (£6.90)		

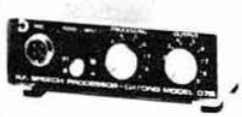
WORK MORE DX

Datong RF clippers make your speech sound louder and clearer. The worse the conditions the greater the benefit. This is exactly what you need for working DX. After all, if they can't hear you, you can't work them!

All three models use the same innovative r.f. clipping techniques which have made the name Datong synonymous with r.f. clipping.

MODEL ASP

is fully automatic with calibrated push-button selection of degree of r.f. clipping in steps of 6 dbs from 0 to 30 dbs. It adjusts itself to suit your voice and microphone.



MODEL D75

is manually adjusted and has LED monitoring to aid in setting.

MODEL RFC/M

is a fully tested printed circuit module for building into your own case.

All three units feature very long life battery operation and connect in series with your microphone.

No internal modifications are required to your rig.

RECEIVE MORE BANDS

The Datong **UP-CONVERTER** (Model UC1) converts any good quality ten-metre or two-metre receiver or transceiver into a really high performance general coverage receiver.

It gives full coverage in thirty 1MHz segments from 60 kHz to 30 MHz.

At low cost, UC1 adds a new dimension to your expensive amateur bands only equipment and for sheer performance beats most of the common general coverage receivers.

INDOOR ANTENNA

MODEL AD170

Active Antenna is designed for under-roof mounting and gives sensitive reception right through from below 60 kHz to Band 1 TV around 50 MHz. It needs no tuning and includes a switchable 12 db broadband amplifier.

Although only three metres long, Model AD170 has the same directional properties as a full size dipole, even at 60 kHz.

Full data sheets on any product available free on request. New literature includes: short form catalogue, new ASP data sheet, FL2 data sheet.

DATONG ELECTRONICS LIMITED

Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Telephone: (0532) 552461

TUNE IN
to the new-look

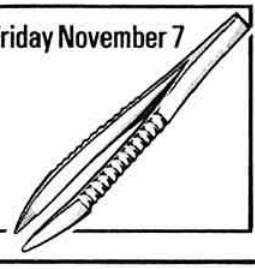
- **PW 'HELFORD'**
  A new series giving full instructions on how to construct this Amateur Bands Transceiver.
- **'SLIM JIM' FOR 28 MHz**
  By popular request, Fred Judd, designer of the 'Slim Jim', has produced a version for the 10-metre amateur band.

Practical Wireless

November issue OUT NOW 65p

December issue out Friday November 7

FREE
WORKSHOP
TWEEZERS



YAESU MUSEN

FT-101Z
FT-901
FRG-7000
FT227RB
FT-7B

FT-101ZD
FRG-7
FT225RD
CPU-2500R
FT207R

FT101Z

All ex-stock and FREE SECURICOR DELIVERY

APPOINTED JAYBEAM DISTRIBUTOR FOR NORTH WALES
ASP MOBILE ANTENNAS. SEM PRODUCTS STOCKED
FULL RANGE OF AMIDON TOROIDAL CORES IN STOCK

W2AU CUBICAL QUAD SPIDERS. Aluminium 2" Boom	£26.50
BOOMLESS CUBICAL QUAD SPIDERS. Aluminium	£26.50
BALUN KITS Toroidal Core. 1:1 or 4:1 LF Unit	£5.85
As above but for HF use	£6.85
COPPER AERIAL WIRE 14 swg Hard Drawn 140'	£8.84
Same as above, 70'	£5.34
12V at 3AMP POWER SUPPLIES	£23.00
SEM Z MATCH. Will handle 1kW 160-10m	£50.00
LOW PASS FILTER. Nye-Viking 2-3MHz	£19.50
MULTIMETERS ME-221	£17.00
FERRITE RINGS Mullard FX 1588 for TVI/AFI	£0.67

All prices include VAT and carriage
PL259, SO239, REDUCERS, COAX, ROTATORS, ETC, ETC, ETC
Please send a Stamped Addressed Envelope with all enquiries

ALL SWAN EQUIPMENT IN STOCK

TMP ELECTRONIC SUPPLIES

Britannia Stores, Leeswood, Mold
Clwyd CH7 4SD
Tel: Pontybodkin 846 (035287)
Business hours: 9.30-5pm Mon, Wed, Thurs, Fri; 9.30-1pm Tues & Sat

---

MAIN AGENTS FOR YAESU MUSEN

NEW!

THE 4MH MINI-BEAM

AVAILABLE FROM

THE AMATEUR RADIO SHOP

G4MH
4 Cross Church Street Huddersfield Yorkshire

MINI-BEAM SPECIFICATION

Element length 11ft. Boom length 60 inches. Turning radius 7 feet. Operating frequencies 10, 15, 20mtrs. Forward gain (ref dipole = 1·00) 3·6dB. S.W.R. at resonance 1·5 to 1·00 max. Front to back ratio 7dB. Power rating 1,400 Watts P.E.P. Input impedance 50 Ohms. Rotator requirements AR40.

Access

OPENING OFFER £77·50 inc VAT
plus £2·50 carriage within UK

BARCLAYCARD VISA

SAE FOR DETAILS

WANTED, WANTED, WANTED
SECOND-HAND GEAR

SOTA COMMUNICATION SYSTEMS LTD

24–26 CHILDWALL LANE, BOWRING PARK, LIVERPOOL L14 6TX, ENGLAND

Tel: 051-480 5770 Hours 9am–6pm Monday to Saturday Telex: 628702 SOTA G

RADIO CONSULTANTS, SUPPLIERS AND MANUFACTURERS

THE EQUIPMENT FOR THE SERIOUS OPERATOR

Following the success of our equipment in the USA
we have increased production and can now offer our equipment
for quantity sale on the UK market

ACCESS **ALL EQUIPMENT GUARANTEED FOR 12 MONTHS** BARCLAYCARD

100 WATT 144MHz BASE STATION LINEAR/PREAMPLIFIER

★ Drive 10–20W
★ RF output 100W
★ RX Preamp 1·5dB NF
★ Gain (RX) 12dB
★ AC power supply built in

Price **£170.00** + VAT
(£195.50)

100 WATT 144MHz MOBILE LINEAR AMPLIFIER

★ 12V operation
★ Drive 10–20W
★ RF output 100W
★ Linear or Class C operation
★ Manual or RF keying

Price **£100** + VAT
(£115.00)

50 WATT 432MHz LINEAR AMPLIFIER

★ 12V operation
★ Drive 10W
★ RF output 50W
★ Other features as above

Price **£75.00** + VAT
(£86.25)

1,296MHz LINEAR TRANSVERTER

★ I.F. 28MHz or 144MHz
★ 12V operation
★ Drive 5mW to 500mW
★ RF output 2·5W to 3W
★ RX NF <3·5dB

Price **£140·00** + VAT
(£161·00)

432MHz LINEAR TRANSVERTER

★ I.F. 28MHz
★ 432 to 436MHz
★ Drive 5mW to 500mW
★ RF output 18W
★ RX NF <2·0dB

Price **£140.00** + VAT
(£161.00)

LUNAR

WE ARE THE OFFICIAL IMPORTERS
AND DISTRIBUTORS
FOR LUNAR EQUIPMENT

2M10-80P linear	£120 + VAT
2M30-160P linear	£160 + VAT
HF3-100L2 linear	£120 + VAT
PA28 preamp	£20 + VAT
PA144 preamp	£20 + VAT
PAI144 preamp	£28 + VAT
PA432-2 preamp	£22 + VAT
PAE432-5 preamp (EME)	£40 + VAT

A.R.R.A.
NATIONAL AMATEUR RADIO EXHIBITION
GRANBY HALLS
LEICESTER
6, 7, 8, NOVEMBER 1980
STAND 31B

NEW PRODUCT

1,296MHz SOLID STATE
LINEAR AMPLIFIER
★ Drive 2·0 Watts ★ RF output 10 Watts
Price: T.B.A.

SAE WITH ALL ENQUIRIES PLEASE

TRADE AND EXPORT ENQUIRIES WELCOME

STEPHENS-JAMES LIMITED

TRIO R-1000

TR-9000

APPROVED TRIO DEALER

TRIO TS-120V

INTRODUCING THE TR-7800
Latest technology rig from TRIO

25 watts—15 Multifunction memory channels—M0-M12 for simplex and ±600kHz repeater offset (M13 for nonstandard offset). Memorizes transmit and receive frequencies independently. M14 priority channel with simplex ±600kHz, or nonstandard offset operation. Priority alert (bleeps when signal appears on M14 priority channel) and push-button operation switch for instant operation on priority channel. Frequency coverage 144-00-145·955MHz in switchable 5kHz or 25kHz steps. Front panel keyboard for selecting frequencies. Auto scan for entire band. **£268.50**

TRIO PRICES
Full Range of Accessories Available

R1000	£298.00	AT180	£95.45	TL922	£672.75	TR2300	£166.75
DM800	£51.75	TS120S	£432.40	TS520SE	£437.00	TR2400	£210.45
TS180S	£679.65	TS120V	£347.30	SP520	£17.25	TR9000	£340.10
SP180	£36.80	TL120	£128.80	TS830S	£640.00	TR800	£270.00

YAESU
FRG7 Receiver £199.00

DRAKE
TR7 Transceiver and AC PSU £1,242.00
MN7 Antenna Matching Unit £124.20
Other Drake equipment available to order.

S.T.E. MILAN
AA1 Audio Module £4.95
AD4 FM Discriminator £5.00
AR20 C.C. FM Receiver £50.00

STABILISED POWER SUPPLIES
Model 122 12·6V 2·5A £15.66
Model 122s 10–15V 2A Single Meter £22.50
Model 125 10–15V 5A £28.00
Model 1210/1 10A 13·5V £65.00
Model 156S 4–15V 6A Twin Meter £40.00
Model 1210S 4–20V 10A Twin Meter £88.00
Model 1220 13·5V 20A £95.00
Maximum ratings quoted.

MICROWAVE MODULES
MMC144/28Lo 2m Converter £24.15
MMC432/28S 70cm Converter £29.90
MMC432/144S 70cm Converter £29.90
MMC1296/28 23cm Converter £32.00
MMC1296/144 23cm Converter £24.15
MMV1296 23cm Tripler £39.50
MMDO50/500 500MHz Freq. Counter £69.00
MMT432/28S 70cm Transverter £136.75
MMT432/144R 70cm Transverter £173.50
MMT144/28 2m Transverter £90.75
MMA144 2m Preamp £14.90
MML144/100 2m Linear Amplifier £142.50
MML144/25 2m Linear Amplifier £48.30

TRANSCEIVERS AND RECEIVERS
SRX30 Solid State Receiver £158.00
Sky Ace aircraft band hand held receiver £49.00
R512 Aircraft Band Scanning Receiver £138.00
Digital Flight Scan Airband Receiver £230.00
SR9 2m FM Receiver £46.00
FDK TM56B FM Scanning Receiver £109.00
AMR217B 2m Scanning Receiver £120.75
Bearcat 220FB Scanning Receiver £241.50
Standard C8800 FM Transceiver £252.00
AR22 2m Handheld Receiver £85.00
SX200 Scanning Receiver £239.50

HY-GAIN
12AVQ 10–15–20m Vertical Antenna £43.13
14VQ/WB 10–15–20–40m Vertical £60.38
18AVT5WB 10–15–20–40–80m Vertical £87.40

VARIOUS ANTENNA
HF5 vertical 10-through 80m £41.40
Discone 5 Antenna 50–480MHz £36.80
C4X 10–15–20m Vertical £46.00
HQ-1 Minibeam Tribander £96.76
Complete range of JAYBEAM HF AND VHF-UHF Antennas, send 15p for catalogue and price list.

G-WHIP. Mobile Antenna Range
Tribander Helical 10–15–20m £23.00
LF Coils for above £6.56
LF Telescopic for coils £3.00
Standard Basemount £4.20
MultiMobile 10–15–20m £26.45
Coils for above £6.56
Extendarod £10.93
Flexiwhip 10m £16.00
Coils for above £6.56*

LEICESTER EXHIBITION
NOV. 6, 7, 8—SHOP CLOSED DURING THIS WEEK

FDK
Multi 700EX Transceiver £199.00
Multi 750 Transceiver £299.00
Palm 2 Portable Transceiver £89.50

SECONDHAND EQUIPMENT
Due to the fact that our secondhand equipment stock changes daily and our adverts are in press weeks before publication we are not publishing a list. A S.A.E. will bring you an up-to-date list or please phone. Good clean equipment wanted and spot cash will be paid. All secondhand equipment carries a three month guarantee. Items sold on commission basis.

Shop Hours: Mon to Fri 9.30am to 5.30pm
Saturday 9.30am to 4.30pm
ACCESS and Barclaycard facilities
HP terms arranged. Part exchanges always welcome.
We are located on the A574. Turn at the Greyhound Motel on the A580 (East Lancs Road) and we are about ½-mile on right. No parking problems at any time.

STEPHENS-JAMES LIMITED
47 WARRINGTON ROAD
LEIGH WN7 3EA
ENGLAND
Telephone (0942) 676790

AND THERE'S MORE WHERE THIS CAME FROM

It's a long time since one of our adverts was presented in 'list' form - but simply because we do not try to squeeze this lot in every time doesn't mean that it's not available. Our new style price list (now some 40 pages long) includes all this and more, including quantity prices and a brief description. The kits, modules and specialized RF components - such as TOKO coils, filters etc. are covered in the general price list - so send now for a free copy (with an SAE please). Part 4 of the catalogue is due out now (incorporating a revised version of pt.1).

LINEAR ICs - NUMERIC LISTINGS

TBA120S	1.00	KB4413	1.95								
L200	1.95	KB4417	1.80								
U237B	1.28	TDA4420	2.25								
U247B	1.28	KB4420B	1.09								
U257B	1.28	KB4423	2.30								
U267B	1.28	KB4424	1.65								
LM301H	0.67	KB4431	1.95								
LM301N	0.30	KB4432	1.95								
LM308H	0.96	KB4433	1.52								
LM308N	0.65	KB4436	2.53								
LM339N	0.66	KB4437	1.75								
LM348N	1.86	KB4438	2.22								
LF351N	0.38	KB4441	1.35								
LF353N	0.76	KB4445	1.29								
LM374N	3.75	KB4446	2.75								
LM380N-14	1.00	KB4448	1.65								
LM380N-8	1.00	NE5044N	2.26								
LM381N	1.81	NE5532N	1.85								
2N419CE	1.95	SD6000	3.75								
NE544N	1.80	SL6270	2.03								
NE555N	0.30	SL6310	2.03								
NE556N	0.50	SL6600	3.75								
NE560N	3.50	SL6640	2.75								
NE562N	4.05	SL6690	3.20								
NE564N	4.29	SL6700	2.35								
NE565N	1.00	ICL8038CC	4.50								
NE566N	1.60	MSL9362	1.75								
NE570N	3.85	MSL9363	1.75								
SL624	3.28	HA11211	1.95								
TBA651	1.81	HA11223	2.15								
uA709HC	0.64	HA11225	1.45								
uA709PC	0.36	HA12002	1.45								
uA710HC	0.65	HA12017	0.80								
uA710PC	0.59	HA12402	1.95								
uA741CH	0.66	HA12411	1.20								
uA741CN	0.27	HA12412	1.55								
uA747CN	0.70	LF13741	0.33								
uA748CN	0.36	SN76660N	0.80								
uA753	2.44										
uA758	2.35										
TBA810AS	1.09										
TBA820M	0.75										
TCA940E	1.80										
TDA1028	2.11										
TDA1029	2.11										
TDA1054	1.45										
TDA1062	1.95										
TDA1072	2.69										
TDA1074A	5.04										
TDA1083	1.95										
TDA1090	3.05										
HA1137	1.20										
HA1196	2.00										
HA1197	1.00										
TDA1220	1.40										
LM1303	0.99										
LM1307	1.55										
MC1310P	1.90										
MC1330	1.20										
MC1350	1.20										
HA1370	1.90										
HA1388	2.75										
TDA1490	1.86										
MC1496P	1.25										
SL610P	1.60										
SL611P	1.60										
SL612P	1.60										
SL613P	1.89										
SL620P	2.17										
SL621P	2.17										
SL623P	2.24										
SL624C	3.28										
SL625P	2.17										
SL626P	2.44										
SL630P	1.62										
SL640P	1.89										
SL641P	1.89										
TDA2002	1.25										
TDA2020	3.00										
ULN2242A	3.05										
ULN2283B	1.00										
CA3080E	0.70										
CA3089E	1.84										
CA3090AQ	3.35										
CA3123E	1.40										
CA3130E	0.80										
CA3130T	0.90										
CA3140E	0.46										
CA3189E	2.20										
MC3357P	2.35										
LM3900N	0.60										
LM3909N	0.68										
LM3914N	2.80										
LM3915N	2.80										
KB4400	0.80										
KB4406	0.60										
KB4412	1.95										

TTL N and LSN

7400N	0.13	7443N	1.15	74LS112	0.38	74LS169	2.00				
74LS00	0.20	7444N	1.12	74LS113	0.38	74170N	2.30				
7401N	0.13	7445N	0.94	74LS114	0.38	74LS170	2.00				
74LS01	0.20	7446N	0.94	74118N	0.83	74LS174	1.20				
7402N	0.14	7447N	0.89	74120N	1.15	74175N	0.87				
74LS02	0.20	74LS47	0.89	74121N	0.42	74LS175	1.10				
7403N	0.14	74LS48	0.99	74122N	0.46	74176N	0.75				
74LS03	0.20	74LS49	0.99	74123N	0.73	74177N	0.78				
7404N	0.14	7451N	0.17	74LS124	1.75	74181N	1.65				
74LS04	0.24	74LS51	0.24	74125N	0.38	74LS181	3.50				
7405N	0.18	7453N	0.17	74LS125	0.44	74LS183	2.10				
74LS05	0.26	74LS54	0.24	74126N	0.57	74184N	1.35				
7406N	0.28	74LS55	0.24	74LS126	0.44	74185N	1.34				
74LS06	0.27	7460N	0.17	74128N	0.74	74LS190	0.92				
7407N	0.38	74LS63	1.24	74132N	0.73	74192N	1.05				
7408N	0.17	7470N	0.28	74LS132	0.78	74LS192	1.80				
74LS08	0.24	7472N	0.28	74LS136	0.40	74193N	1.05				
7409N	0.17	7473N	0.32	74LS138	0.60	74LS193	1.80				
74LS09	0.24	74LS73	0.38	74141N	0.56	74194N	1.05				
7410N	0.15	7474N	0.27	74142N	2.65	74196N	0.99				
74LS10	0.24	74LS74	0.28	74143N	3.12	74LS196	1.10				
7411N	0.20	7475N	0.38	74144N	3.12	74LS197	1.10				
74LS11	0.24	7476N	0.37	74145	0.97	74198N	1.50				
7412N	0.17	74LS76	0.38	74147N	1.75	74199N	1.60				
7413N	0.30	74LS78	0.38	74148N	1.09	74LS247	0.93				
74LS13	0.51	7480N	0.48	74150N	0.99	74LS248	1.19				
74LS15	0.24	7481N	0.86	74151N	0.55	74LS257	1.08				
7416N	0.30	7482N	0.69	74LS151	0.84	74LS260	1.53				
7417N	0.30	7485N	1.04	74153N	0.64	74LS273	0.52				
7420N	0.16	74LS85	0.99	74LS153	0.54	74LS283	1.20				
74LS20	0.24	74LS86	0.40	74154N	0.96	74LS293	0.95				
7421N	0.29	7489N	2.05	74155N	0.54	74LS365	0.49				
74LS21	0.24	7490N	0.33	74LS155	1.10	74LS367	0.43				
7423N	0.27	74LS90	0.90	74156N	0.80	74LS368	0.49				
7425N	0.27	7491N	0.76	74157N	0.67	74LS374	1.80				
7427N	0.27	74LS91	1.10	74LS157	0.55	74LS377	1.95				
74LS27	0.44	7492N	0.38	74LS158	0.60	74LS379	1.30				
7428N	0.35	74LS92	0.78	74159N	2.10	74LS393	1.40				
74LS28	0.32	7493N	0.32	74160N	0.82						
7430N	0.17	74LS93	0.99	74LS160	1.30						
74LS30	0.24	7494N	0.78	74161N	0.92						
7432N	0.25	7495N	0.65	74LS161	0.78						
74LS32	0.24	74LS95	1.14	74LS162	1.30						
7437N	0.40	7496N	0.58	74163N	0.92						
7438N	0.33	74LS96	1.20	74LS163	0.78						
74LS38	0.24	7497N	1.85	74164N	1.04						
7440N	0.17	74LS107	0.38	74LS164	1.30						
74LS40	0.24	74109N	0.63	74165N	1.05						
7441N	0.74	74LS109	0.70	74LS165	1.04						
7442N	0.70	74110N	0.54	74167N	2.50						
74LS42	0.99	74111N	0.68								

FREQUENCY DISPLAY & SYNTHESISER ICs

SAA1056	3.75
SAA1058	3.35
SAA1059	3.35
ICL7106CC	14.00
LN1232	19.00
LN1242	19.00
MSL2318	3.84
MSM5523	11.30
MSM5524	11.30
MSM5525	7.85
MSM5526	7.85
MSM5527	9.75
MSM55271	9.75
ICM7106CP	9.55
ICM7107CP	9.55
ICM7216B	19.25
ICM7217A	9.50
SP8629	3.85
SP8647	6.00
95H90PC	6.00
HD10551	2.45
HD44015	4.45
HD12009	6.00
HD44752	8.00

CMOS 4000 SERIES

4001	0.17	4043	0.85				
4000	0.17	4044	0.80				
4002	0.23	4046	1.30				
4008	0.80	4047	0.99				
4009	0.58	4049	0.52				
4010B	0.58	4050	0.55				
4011AE	0.20	4051	0.65				
4011B	0.20	4052	0.65				
4012	0.55	4053	0.65				
4013	0.55	4063	1.09				
4015	0.95	4066	0.56				
4016	0.52	4068	0.25				
4017	0.80	4069	0.20				
4019	0.60	4070	0.20				
4020B	0.93	4071	0.20				
4021	0.82	4072	0.20				
4022	0.90	4073	0.20				
4023	0.17	4075	0.20				
4024	0.76	4076	0.90				
4025	0.17	4077	0.20				
4026	1.80	4078	0.20				
4028	0.72	4082	0.20				
4029	1.00	4093	0.78				
4030	0.58	4175	0.95				
4035	1.20	4503	0.69				
4040	0.83	4506	0.51				
4042	0.85	4510	0.99				
		4511	1.49				
		4512	0.98				
		4514	2.55				
		4518	1.03				
		4520	1.09				
		4521	2.36				
		4522	1.49				
		4529	1.41				
		4539	1.10				
		4549	3.50				
		4554	1.53				
		4560	2.18				
		4566	1.59				
		4568	2.18				
		4569	3.03				
		4572	0.30				
		4585	1.10				

VOLTAGE REGULATORS

78series	0.95		
79series	1.00		
78Mseries	0.65		
78Lseries	0.35		
79L05	0.85		
78MT2C	1.75		
79MT2C	1.75		
723CN	0.65		
L200	1.95		
TDA1412	0.75		
NE555N	1.25		
LM317MP	1.48		
LM337MP	1.48		

MICROMARKET

8080A/2	7.50
8212	2.30
8214	3.50
8216	1.95
8224	3.50
8251	6.25
8255	5.40
6800P	7.50
6810	5.95
6820	7.45
6850	4.90
6852	4.85
MC2708	7.50
2114	6.50
4027	5.78
2102	1.70
2112	3.40
2513	7.54
HM4716	4.50
81LS97	1.25

VARICAP TUNING DIODES

BA102	0.30
BA121	0.30
ITT210	0.30
BB204B	0.36
BB105B	0.36
BB109	0.27
MVM125	1.05
BB212	1.95
KV1210	2.45
KV1211	1.75
KV1226	1.95
KV1225	2.75
KV1215	2.55
KV1225	2.75

SWITCHING AND PIN DIODES

SHOTTKY DIODES

1N6263	0.62
BA182	0.19
BA244	0.17
BA379	0.35
TDA1061	0.95

SIGNAL DIODES & RECTIFIERS

1N4148	0.06
1N4001	0.06
1N4002	0.07
1N5402	0.15
OA91	0.07
AA112	0.25
BRIDGES:	
1A/50V	0.35
6A/200V	0.75

TOKO COILS AND FILTERS

SEE THE EXTENSIVE SECTION IN OUR NEW PRICE LISTS AND CATALOGUE

LF/HF FIXED INDUCTORS – FULL E12 RANGE

7BA series 1uH-1mH	0.16
8RB series 100uH-33mH	0.19
10RB series 33mH-120mH	0.33
10RBN series 120mH-1.5H	0.55
PIEZO SOUNDER PB2720	0.44

CRYSTAL FILTER PRODUCTS

10.7MHz 2 POLE TYPES:	
10M15A 15KHz BW	2.49
10.7MHz 8 POLE TYPES:	
10M4BI 15kHz BW	14.50
H4402 7.5KHz BW	15.50
10M22D 2.4KHz SSB	17.20
HF FIRST FILTER:	
B3498A 34.5MHz HF	32.00

RADIO CONTROL CRYSTALS

(No splits available)	
AM TX:-	
3rd OT 30pF HC25U	1.65
AM/FM RX:-	
3rd OT 30pF HC25U	1.65
FM TX :-	
Fund 20pF HC25U	1.85
Pairs FM	3.25
Pairs AM	3.10

CRYSTALS

32.768 kHz	2.70
100kHz	3.85
455kHz	5.00
1.0MHz	3.00
3.2768MHz	2.70
4.000MHz	2.00
4.1943MHz	2.30
6.5536MHz	2.10
10.0MHz	2.50
10.6985MHz	2.50
10.7015MHz	2.50
10.245MHz	2.50
10.7MHz	3.00
11.52MHz	2.50
100MHz	3.00

LEDs

5MM RED	0.12
3MM RED CLEAR	0.15
3MM RED	0.15
2.5 X 5MM RED	0.17
5MM GREEN	0.15
3MM GN CLEAR	0.16
3MM GREEN	0.16
2.5 X 5MM GN	0.20
5MM YELLOW	0.15
3MM YELLOW CL	0.16
3MM YELLOW	0.18
2.5 X 5MM YE	0.20
5MM ORANGERED	0.20
5MM ORA CL	0.29
3MM ORANGERED	0.19
2.5 X 5MM ORA	0.24
5MM INFRA RED	0.56
BP441 IR DET	1.51
IR OPT CPLR	1.44
5MM CLIP	0.04

LCDs

3.5 digit	9.45
4 digit	8.95
5 digit	8.95

SCHOTTKY DIODE BAL MIXERS (SBL1-MIL08)

SBL1 1-500MHz	4.25
SBL1-8 .1-200MHz	4.55
SBL1-X 10-1000MHz	5.75
SRA1 .5-500MHz	8.45
SRA1-1 .1-500MHz	9.25
SRA1H .5-500MHz	13.35
SRA3 .025-200MHz	10.25

TRANSISTORS AUDIO DEVICES

BC237	0.08
BC238	0.08
BC239	0.08
BC307	0.08
BC308	0.08
BC309	0.08
BC413	0.10
BC414	0.11
BC415	0.07
BC416	0.08
BC546	0.12
BC556	0.12
BC550	0.12
BC560	0.12
BC639	0.22
BC640	0.23
2SC1775	0.18
2SA872A	0.14
2SD666A	0.30
2SB646A	0.30
2SC666A	0.40
2SB648A	0.40
2SD760	0.45
2SB720	0.45
2SC2546	0.19
2SA1084	0.20
2SC2547	0.19
2SA1085	0.20

AUDIO POWER DEVICES

2SB753	2.34
2SB723	2.34
2SK133	3.00
2SJ 48	3.00
2SK134	3.10
2SK135	3.75
2SJ 50	3.75
BD535	0.52
BD536	0.52
BD377	0.33
BD378	0.33
BD165	0.30
BD166	0.31

SMALL SIGNAL RF DEVICES

BF194	0.18
BF195	0.18
BF224	0.22
BF241	0.18
BF274	0.18
BF440	0.21
BF441	0.21
BF362	0.49
BF395	0.18
BF479	0.66
BF679S	0.55
BF991	1.33
BFW92	0.60
BFT95	0.99
BFY90	0.90
40238	0.85

RF POWER DEVICES

VN66AF	0.95
2N3866	0.85

SMALL SIGNAL RF FET/MOSFET

BF256	0.38
2SK55	0.28
2SK168	0.35
J310	0.69
J176	0.65
40823	0.65
40673	3SK51
3SK45	0.49
3SK51	0.54
3SK60	0.58
MEM680	0.75
BFW61	0.70
BFW60	1.24
3SK48	1.64

LCD Module

CM161
Miniature clock, 12/24 hr., alarm, day, date, backlight. All for.....9.95

CAPACITORS

All 5mm or less spacing

CERAMIC 50v
2P2,3P3,4P7,6P8
8P2,10P,15P,18P..0.04
22P,27P,33P,47P
56P,68P,82P,100P..0.05
150P,220P,270P
330P,390P,470P....0.055
1N0,2N2,3N3,4N7..0.06
10N (0.01uF)....0.05
22N,47N.....0.06
100N,220N.....0.09

MONOLITHIC CERAMIC
10N,100N.....0.16

FEEDTHRU
1N0 SOLDER IN....0.09

POLYESTER (SIEMENS)
10mm LEAD SPACING
10N,22N,33N.....0.17
47N,68N,100N.....0.19
220N,470N.....0.22
1uF.....2.50

POLYESTER (GENERAL)
10mm LEAD SPACING
10N,15N,22N,33N..0.06
47N,68N,100N.....0.08
220N.....0.11
20mm LEAD SPACING
220N,330N,470N...0.18

MYLAR
5mm LEAD SPACING
1N0,10N,22N,33N..0.08
100N.....0.09
20mm LEAD SPACING
220N,470N..... 0.17

POLYSTYRENE
10P,15P,18P,22P,
27P,47P,56P,68P..0.08
100P,180P,220P,
270P,330P,390P...0.09
470P,680P,820P...0.10
1N0,1N2,1N5,1N8..0.11
2N2,2N7,3N3,3N9..0.12
4N7,5N6,6N8,10N..0.13

TANTALUM BEAD CAPS
16v: 0.22,0.33,
0.68,1.0.....0.18
16v: 2.2,4.7,10..0.19
6v3: 22,47.....0.30
10v: 22,100.....0.35

ALUMIN ELECTROLYTICS RADIAL (VERT. MOUNT)

(uF/voltage)
1/63,2.2/50,4.7/35
10/16,15/16,22/10
33/6.3.....0.08
22/16,33/10,
47/10.....0.09
10/63,22/50,33/50,
47/16,100/16.....0.10
47/63,100/25,220/16
470/6.3.....0.12
100/63,470/16,
1000/10.....0.18
1000/16,470/63...0.23
1000/63,2200/16..0.30
3300/25.....0.69
1000/100.....0.88
10000/70.....3.00

AXIAL (HORIZ. MOUNT)
1/25,4.7/16,6.4/25
10/16.....0.08
4.7/63,22/10,22/16
33/16.....0.09
47/25,100/16.....0.10
100/25.....0.11
1000/16.....0.25
2200/16,1000/25..0.36
1000/35,4700/16..0.45
1000/50.....0.58

RESISTORS

0.25W, 5% E12 CARBON
1ohm-10M.....0.02
0.25W 1% E12 METAL FILM
1.1ohm-1M.....0.05

HORIZ CARBON PRESETS
10mm TYPE
100ohms-2M5.....0.12

HORIZ CERMET PRESETS
1k, 10k.....0.27

Please send an SAE with all enquiries. Access/Barclaycard (min £5 please) Callers welcome

PRICES EXCLUDE VAT - PLEASE ADD 15%* Postage 35p per order. CWO please. (*UK only)

CWO PLEASE : Commercial MA terms on application. Goods are offered subject to availability, prices subject to change - so please phone and check if in doubt.

CATALOGUES
2 & 3....60p ea
4.....75p
(4 inc. rev. of part 1)
ALL PARTS :
.....£1.75.....

ambit INTERNATIONAL

200 North Service Road, Brentwood, Essex

TELEPHONE (STD 0277) 230909 TELEX 995194 AMBIT G POSTCODE CM14 4SG

P.M. ELECTRONIC SERVICES

PROFESSIONAL

★ COMPLETE CRYSTAL SERVICE ★

AMATEUR

PRICES SHOWN EXCLUDE VAT; UK CUSTOMERS PLEASE ADD 15%

70cm CRYSTALS

Due to the much higher multiplication involved (three times that on 2m) all our stock 70cm crystals are to much higher tolerances than our standard range.

We are stocking the following channels: RB0 (434·60/433·00), RB2 (434·65/433·05), RB4 (434·70/433·10), RB6 (434·75/433·15), SU8 (433·20), RB10 (434·85/433·25), RB11 (434·875/433·275), RB13 (434·925/433·325), RB14 (434·95/433·35), SU18 (433·45), SU20 (433·50) – TX & RX for use with: PYE UHF Westminster (W15U), UHF Cambridge (U10B), Pocketfone (PF1) AND UHF PF70 Range, and STORNO COL/COM 662 all at **£2.32**. For the U450L Base Stn we have the TX crystals for the above channels. The RX crystals for the U450L Base Stn together with TX and RX crystals for any other 70cm channel (eg RB/SU12 (434·90/433·30) RTTY, SU16 (433·40) SU22 (433·55) etc) for most UHF equipments are availabvle at **£4.48** for crystals up to 63MHz, and **£5.16** for 63 to 105MHz to amateur spec or **£5.26** for up to 63MHz and **£6.05** for 63 to 105MHz to the same closer spec as our stock items. Delivery approx 5/6 weeks.

4m CRYSTALS FOR 70·26MHz – HC6/U

TX 8·7825MHz and RX 6·7466MHz or 29·7800MHz **£2.32**

10·245MHz "ALTERNATIVE" I.F. CRYSTALS·£2.32 For use in Pye and other equipment with 10·7MHz and 455kHz I.F.s to get rid of the "birdy" just above 145·0MHz. In HC6/U, HC18/U and HC25/U.

CRYSTAL SOCKETS – HC6/U. HC13/U and HC25/U (Low loss) 16p each. **10p** P. % P. per order (P. & P. free if ordered with crystals).

CRYSTALS MANUFACTURED TO ORDER

Prices shown are for one off to our amateur specs; closer tolerances are available. Please send us details of your requirements.

A Low frequency fundamentals in HC13/U or HC6/U

Adj. tol. ±50ppm, Temp. tol. ±100ppm 0 to + 70°C

6 to 19·999kHz	**£28.12**	100 to 159·99kHz	**£9.25**
20 to 39·999kHz	**£17.74**	160 to 499·99kHz	**£6.19**
40 to 79·999kHz	**£12.40**	500 to 799·99kHz	**£7.30**
80 to 99·999kHz	**£10.60**		

B High frequency fundamentals/overtones

Adj. tol. ±20ppm, Temp. tol. ±30ppm 10 to + 60°C

†800 to 999·9kHz (fund)	**£9.75**	* 21 to 24·99MHz (fund)	**£6.73**
*†1·0 to 1·499MHz (fund)	**£10.35**	* 25 to 30MHz (fund)	**£8.28**
*†1·5 to 2·599MHz (fund)	**£4.93**	* 21 to 62·99MHz (3 O/T)	**£4.48**
*†2·6 to 20·99MHz (fund)	**£4.49**	* 60 to 105MHz (5 O/T)	**£5.16**
*ø3·4 to 3·999MHz (fund	**£6.21**	* 105 to 125MHz (5 O/T)	**£7.76**
*ø4·0 to 5·999MHz (fund)	**£4.93**	125 to 180MHz (O/T))	**£7.50**
*ø6·0 to 20·99MHz (fund)	**£4.48**	180 to 250MHz (O/T)	**£12.49**

* **Delivery** Normally 5/6 weeks (express available) – all other frequencies 7/8 weeks.
Holders – Low frequencies HC13/U or HC6/U dependent on frequency.
Mid and High frequencies are available in HC6/U, HC18/U or HC25/U unless marked † only available in HC6/U or ø only available in HC18/U and HC25/U.
HC17/U (replacement for FT243) and **HC33/U** (wire end HC6/U) available as per HC6/U above at **30p** extra on HC6/U price.
Unless otherwise specified, fundamentals will be supplied to 30pf circuit conditions and overtones to series resonance.

CRYSTALS FOR PROFESSIONAL USE

We can supply crystals to most commercial and MIL specifications, with an express service for that urgent order. Also for commercial use, eg TV or computer crystals, etc, we can supply at very competitive prices. Please send S.A.E. for details or telephone between 4.30·7pm and ask for Mr Norcliffe.

EXPRESS SERVICE

Many types of made-to-order crystals are available on our "EXPRESS SERVICE" – with delivery of three days on our class "A" service. Telephone or Telex for details.

TERMS: CASH WITH ORDER – MAIL ORDER ONLY – S.A.E. WITH ALL ENQUIRIES – PRICES INCLUDE P. & P. (BRITISH ISLES) EXCEPT WHERE STATED – OVERSEAS CHARGED AT COST.

TWO METRE CRYSTALS

CRYSTAL FREQUENCY RANGE USE (TX or and HOLDER) / OUTPUT FREQUENCY	4MHz-TX-HC6/U	6MHz-TX-HC25/U	8MHz-TX-HC6/U	10MHz-RX-HC6/U	11MHz-RX-HC6/U	12MHz-TX-HC25/U	14MHz-RX-HC25/U	18MHz-TX-HC25/U	44MHz-RX-HC6/U	44MHz-RX-HC25/U	52MHz-RX-HC25/U
144.4 (433.2)	b	e	b	e	e	b	e	e	e	e	e
144.480	e	e	e	e	e	e	e	e	e	e	e
144.800	c	e	e	e	e	c	c	c	c	c	e
144.850	e	e	e	e	e	e	e	e	e	e	e
145.000/R0T	a	c	a	c	c	b	b	b	a	a	c
145.025/R1T	a	c	a	e	e	b	e	b	e	e	e
145.055/R2T	a	c	a	e	e	b	e	b	e	e	e
145.975/R3T	a	c	a	e	e	b	e	b	e	e	e
145.100/R4T	a	c	a	e	e	b	e	b	e	e	e
145.125/R5T	a	c	a	e	e	b	e	b	e	e	e
145.150/R6T	a	c	a	e	e	b	e	b	e	e	e
145.175/R7T	a	c	a	e	e	b	e	b	e	e	e
145.200/R8T	a	c	a	e	e	b	b	b	a	a	c
145.300/S12	e	e	e	e	e	e	e	e	e	e	e
145.350/S14	e	e	e	e	e	e	e	e	e	e	e
145.400/S16	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
145.450/S18	a	e	a	e	e	b	b	b	a	a	e
145.475/S19	a	e	a	e	e	b	b	b	a	a	e
145.500/S20	a	c	a	c	c	b	b	b	a	a	c
145.525/S21	a	c	a	c	c	b	b	b	a	a	c
145.550/S22	a	c	a	c	c	b	b	b	a	a	c
145.575/S23	a	c	a	c	c	b	b	b	a	a	c
145.600/R0R	a	c	a	c	c	b	b	b	a	a	c
145.625/R1R	e	e	e	e	e	e	b	e	a	a	c
145.650/R2R	e	e	e	c	e	e	b	e	a	a	c
145.675/R3R	e	e	e	c	c	e	b	e	a	a	c
145.700/R4R	e	e	e	c	c	e	b	e	a	a	c
145.725/R5R	e	e	e	c	c	e	b	e	a	a	c
145.750/R6R	e	e	e	c	c	e	b	e	a	a	c
145.775/R7R	e	e	e	c	c	e	b	e	a	a	c
145.800/R8R	a	c	a	c	c	b	b	a	a	a	c
145.950/S38	a	e	e	c	e	e	e	e	a	e	e

PRICES: (a) **£1.95**, (b) **£2.32**, (c) **£2.50**, and (e) **£4.48. AVAILABILITY:** (a), (b) and (c) stock items normally available by return (we have over 5000 items in stock). (e) 4/6 weeks normally but it is quite possible we could supply from stock. **N.B.** Frequencies as listed above but in alternative holders and/or non stock loadings are available as per code (e).

ORDERING: When ordering please quote (1) Channel, (2) Crystal frequency, (3) Holder, (4) Circuit conditions (load in pf). If you cannot give these, please give make and model of equipment and channel or output frequency required and we will advise if we have details.

CONVERTER/TRANSVERTER CRYSTALS – HC18/U.

All at **£3.00**, 38·6666MHz (144/28), 42MHz (70/28), 58MHz (144/28), 70MHz (144/4), 71MHz (144/2), 95MHz (342/52), 96MHz (1,296/432/144), 101MHz (432/28), 101·50MHz (434/28), 105·6666MHz (1,296/28) and 116MHz (144/28).

TEST EQUIPMENT FREQUENCY STANDARD CRYSTALS

200kHz and 455MHz in HC6/U **£3.50**
100kHz in HC13/U and 1MHz in HC6/U **£2.95**
5MHz in HC6/U and 10MHz and 10·7MHz in HC6/U and HC25/U **£2.80.**

CRYSTALS FOR MICROPROCESSORS

Please let us know your requirements e.g. 4MHz HC18/U, 1 off, **£2.00;** 100 off, **£1.10;** 1000 off, **99p;** 25,000 off, **50p.**

ANZAC MD-108 DOUBLE BALANCED MIXER

5·¼00MHz supplied with full details for only **£6.95.**

2 ALEXANDER DRIVE, NESWALL, WIRRAL, MERSEYSIDE, L61 6XT. Tel: 051-342 4443

INDEX TO ADVERTISERS

CHANGES IN ADVERTISEMENT RATES AND SIZES

With effect from the issue of January 1981 the size of Radio Communication will be increased to A4 and the display advertisement format and rate structure changed. For details contact
C. C. Lindsay, 2 Leyburn Gardens, Croydon, CR0 5NL.
Tel: 01-686 5839

CLASSIFIED ADVERTISEMENTS

Classified advertisements **20p** per word, minimum **£4.00.**
Box number £1.00 extra to wordage or minimum.
Please write clearly. No responsibility accepted for errors.
Latest date for acceptance—6 weeks before 1st of issue month.
All classified advertisements must be prepaid.
Copy and remittance to: C. C. LINDSAY,
2 Leyburn Gardens, Croydon CR0 5NL. Tel: 01-686 5839.
Members' Ads must be sent to the Editor at Chelmsford.

FOR SALE

PCBs—FIBREGLASS, ROLLER TINNED, one offs or production runs to your requirements. Details: Orbit (G4GQL), 41 Benton Road, Ilford, Essex IG1 4AU.

LARGE STATION LOGBOOKS Printed with your callsign plus useful reference information: £2.00. Mobile Minilogs: 75p. Callsign Window Stickers: £1.50. Beauprint (G3OYI), Meltham Road, Honley, Huddersfield.

80m PORTABLE RECEIVER internal ferrite aerial. MOSFET front end ensures high sensitivity. For SSB/CW. Send £40 to Electronix, 54 The Close, Norwich.

QSL CARDS printed to your own specifications on white gloss cards. SAE to Caswell Press, 11 Barons Way, Woodhatch, Reigate, Surrey.

FT101 VGC, fitted CW filter and cooling fan, power cables, mic and manual. £250. Ring Dave, G4IDE, QTHR. Phone Worcester (0905) 20135 evenings.

QSL CARDS, Quality printing to your design or ours. 12p stamp only for folder showing actual samples. Express Printing Services, 28 Payne Avenue, Hove, Sussex.

QSO IN FRENCH. Special Amateur Radio booklet, useful phrases, technical vocabulary, innovation QSO sheet for beginners. Easier than you think! Excellent Xmas present. £1.75, overseas airmail £2.00. Mary Craven XYL/G4EQI, 'Grass Moor', Radford Road, Alvechurch, Birmingham B48 7DT.

TS-520 and external VFO. CW filter, internal 240VAC 12VDC power supplies. Original packing. One owner. No modifications £390. Tel: 059-783654

COPPER CLAD LAMINATE OFFCUTS for PBC's. Assorted sizes s/sided £1.60 per lb, d/sided £1.70 per lb, inc postage. Tristram, 14 Gendale Avenue, Newbury, Berks.

FOUR HEATHKIT TRAINING COURSES; AC Electronics; DC Electronics; Semiconductors; Electronic Circuits; with experimenter and all components unused. £95. Also untouched correspondence course for RAE. £25. BURNFORD, Borough Farm, Pulborough, Sussex (Tel: 07982-2155)

QSL CARDS Quality printing on coloured gloss cards, at competitive prices. Sae for samples. S. M. Tatham, 'Woodside', Orchard Way, Fontwell, Arundel, W. Sussex.

SPEECH PROCESSOR Advanced multi-stage design. Increase talk power ten times. Cased and tested £16. p&p 55p Sae full details. Malme, 'Newhaven', E. Runton, Norfolk, NR27 9HP

MISCELLANEOUS

COURSES—RADIO AMATEURS EXAMINATION. City and Guilds. Pass this important examination and obtain your G8 licence, with an RRC Home Study Course. For details of this and other courses (GCE, Professional Examinations, etc) write or phone: The Rapid Results College, Dept JT1, Tuition House, London SW19 4DS. Tel: 01-947 7272 (Careers Advisory Service) or for prospectus requests ring 01-946 1102 (24hr Recordacall).

PATENTS AND TRADE MARKS—Booklet on request, King's Patent Agency Ltd (B. T. King, Reg Pat Agent)—146A Queen Victoria Street, London EC4. Tel: 01-248 6161. Telex 8833805. Established 1886.

WANTED

GOOD SECONDHAND EQUIPMENT ALWAYS WANTED. Come to Amateur Radio Exchange for the best deal. 2 Northfield Road, Ealing, London W13. Tel: 01-579 5311.

EQUIPMENT WANTED

SPOT CASH PAID FOR GOOD USED AMATEUR AND MARINE RADIO EQUIPMENT—OR—YOUR EQUIPMENT SOLD AT YOUR PRICE ON SMALL COMMISSION—NO SALE—NO CHARGE.
TEL: AMCOMM: 01-864 1166, 01-422 9585.

ACCOMMODATION

OVERNIGHT ACCOMMODATION, LANCING, near Brighton, Sussex. 18th Century flint cottage, double room, h/c water. G8SUU, QTHR. Lancing 3102.

GUERNSEY

SELF-CATERING HOLIDAY APARTMENT
SLEEPS 2-7. PLENTY OF AERIAL SPACE
ON ONE ACRE LAWN.

HOLIDAY PAK LIMITED, THE TRAVEL BUREAU,
ST PIERRE DU BOIS, GUERNSEY.
Tel: 0481 64475. Telex: 4191191.

SITUATIONS VACANT

AN OPPORTUNITY TO PROGRESS WITH US.
RADIO TELEPHONE ENGINEERS NEEDED
£6000 p.a. including bonuses

London Communications are expanding—not only in our work load, but soon we will be moving to brand new, much larger premises near Regents Park. We need engineers with good knowledge of V.H.F. and U.H.F. mobile radio telephone. Formal qualifications not necessary but aptitude and ambition is! Call Mike Rawlings or Bill Clarke on 01-328 5344 now.

London Communications
(Equipment) Ltd
30 Boundary Road, London NW8 01-328 5344

CHELSEA COLLEGE
University of London

ELECTRONICS TECHNICIAN required for prototype development and experimental work in Electronic Research Laboratories. The main areas of research are Digital Communication Systems, Microwave Techniques, Semiconductor Devices and Signal Processing. Our vacancy is at Grade 5 salary £5,556 to £6,357 p.a. inclusive (under review) and at this grade, relevant experience is essential. Well qualified candidates with less experience may be considered for appointment at a lower grade with day release for approved study.

Further details and application form from **M. E. Cane (5ER), Department of Electronics, Chelsea College, London SW6 5PR**

Radio Society of Great Britain

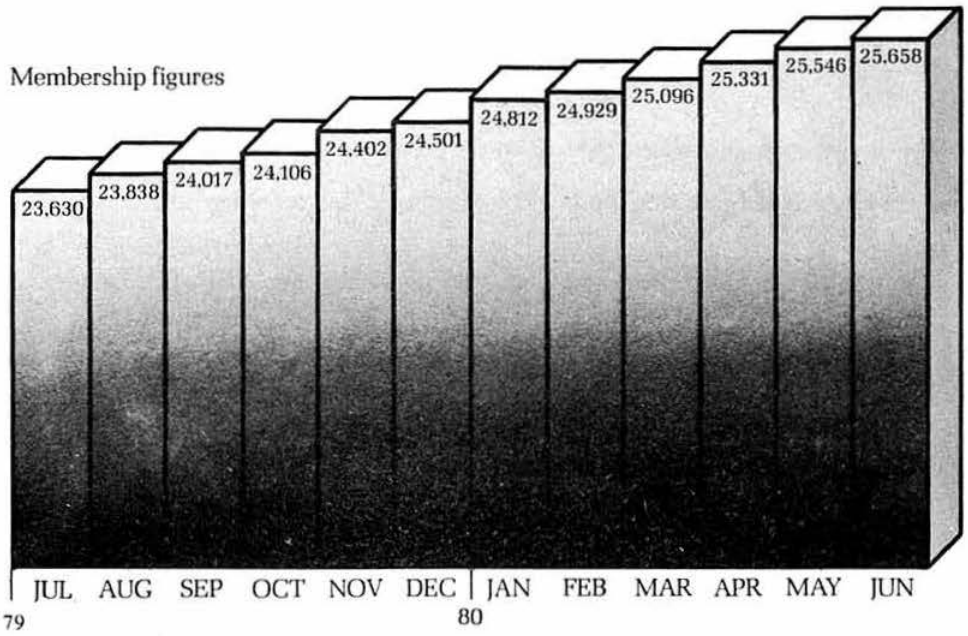
REPORT & ACCOUNTS

and

THE YEAR IN REVIEW

for the year ended

30 JUNE 1980



Radio Society of Great Britain

35 DOUGHTY STREET, LONDON WC1N 2AE

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

COUNCIL

President
P. Balestrini, TEng(CEI), MITE, MIAM, G3BPT

Executive vice-President
B. O'Brien, G2AMV

Immediate past-President
J. Bazley, G3HCT

Honorary treasurer
P. F. D. Cornish, FCA, G3COR

Telecommunications liaison officer
R. F. Stevens, MBE, G2BVN*

Members

D. H. Adams, GW3VBP*
E. J. Allaway, MB, ChB, MRCS, LRCP, G3FKM
D. J. Andrews, G3MXJ
J. Anthony, G3KQF
R. G. Barrett, GW8HEZ
R. Bellerby, BSc, FBIS, G3ZYE
T. P. Douglas, MBE, AMIEE, G3BA
D. S. Evans, PhD, BSc, FIM, G3RPE
K. A. M. Fisher, TEng(CEI), MIPRE, G3WSN
L. Hawkyard, G5HD
G. R. Jessop, G6JP
G. I. Knight, GM8FFX
W. F. McGonigle, GI3GXP
C. H. Parsons, GW8NP*
D. M. Pratt, G3KEP
R. F. Stevens, MBE, G2BVN*
G. M. C. Stone, G3FZL
C. J. Thomas, G3PSM*

**Retired on 31 December 1979*

Secretary & general manager: D. A. Evans, G3OUF

Auditors: Edward Moore & Sons, chartered accountants

Bankers: Barclays Bank Ltd

ANNUAL GENERAL MEETING

NOTICE IS HEREBY GIVEN THAT THE FIFTY-FOURTH ANNUAL GENERAL MEETING of the Society will take place at the Institution of Electrical Engineers, Savoy Place, London WC2, at 2pm on Saturday 6 December 1980 for the transaction of the undermentioned business:

1. To receive and, if approved, confirm the minutes of the fifty-third annual general meeting circulated with the November 1980 issue of *Radio Communication*.

2. To receive and consider the accounts for the year ended 30 June 1980, 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 1981.

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. Members attending the meeting should bring their current membership cards.

By order of the Council
D. A. EVANS
Secretary

1 November 1980

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.

FINANCIAL REPORT OF COUNCIL TO MEMBERS OF THE RADIO SOCIETY OF GREAT BRITAIN

COUNCIL has pleasure to present the audited accounts of the Society and its subsidiary for the year ended 30 June 1980. The accounts set out on pages iv to viii show that before taxation the Society had a surplus of income over expenditure of £37,684. Corporation Tax provisions absorb £13,600, leaving £24,084 to be added to the accumulated fund.

The accounts follow the same form of presentation as for 1979, and again highlight the gross income of the Society and the principal categories of expenditure.

Subscription income

The rise in subscription income results from the increase in rates at 1 July 1979 and a nine per cent increase in membership. Renewal dates fall more or less evenly throughout the year, and the amount credited to the Income & Expenditure Account reflects only approximately 54 per cent of a full year's increase. The additional VAT burden referred to in our report on the 1979 accounts amounted to approximately £4,800 in the year.

Advertising

Advertising rates were increased during the year in order to cover both the increased costs being borne by the Society and the increasing coverage that *Radio Communication* affords. In addition there was a substantial increase in the amount of advertising space taken both by established suppliers and newcomers to the field of amateur radio, which was most marked in the second half of the year. Because the June 1980 issue of *Radio Communication* was combined with the July issue, the income represents only 11 months.

Sales of publications

Contrary to forecasts, sales of the Society's own and other publications soared to £177,617 in the year. This included £63,575 of export sales (1979: £32,183). Overall, both home and overseas sales increased by 35 per cent in the year. The success and continued demand for the Society's publications accounts for the larger part of the overall surplus.

Other income

Other income of £8,340 comprised £7,348 (1979: £5,148) of interest on investments and bank deposit, and the balance of £992 was made up of insurance commissions and sundry fees received.

Expenditure

Practically all headings of expenditure show an increase in the year. Of administration expenses, the principal increases to the Society have been staff costs, telephone, postage, stationery etc (ie the total cost of communications to and from members) and the cost of hire and maintenance of equipment.

At the end of 1979 Council approved a plan to re-equip the Society with an IBM34 data processor to replace the IBM32 equipment which, while it had been and was still giving first-class service to the Society, had become saturated with the amount of work involved. As a result, costs of hire and maintenance, and provisions for depreciation on equipment have increased by £13,456 during the year. This is considerably less than the estimated cost of other means to cope with the increased work-load which is now more effectively carried out by the dp equipment.

Membership services

The most significant item under this heading is the gross cost of production of *Radio Communication*, which is offset by the advertising revenue. On a net basis the cost to the Society in 1980 was £47,009 compared with £43,924 in 1979. While the increase in net costs arises mainly because of increasing membership, the underlying trend of costs of production, printing and distribution of a first-class journal are forever upwards.

Of other membership services expenses, the cost of the QSL Bureau again reflects the increase in postal charges as well as an increase in volume of cards handled. The cost of beacons, repeaters, satellites and the Intruder Watch includes a provision for the balance of £1,500 authorized by Council to be donated towards the University of Surrey's satellite project.

The IARU Region 1 contribution and levy have fallen because of a reduction for 1980. The additional levy imposed during the previous year has been sufficient to meet the abnormal level of expense incurred by IARU at the World Administrative Radio Conference held in 1979.

Rallies, exhibitions and publicity produced a net gain to the Society in the year of £3,319, and this is explained in more detail in Note 7 to the accounts. This result arises from the greater professionalism of the Society in mounting and attending such events, and the continuing support of the many volunteers who man the Society's stands at exhibitions all over the country.

The cost of committee, regional and Council meetings reflects a particularly busy year largely concerned with WARC and its aftermath. The principal element of these costs is of course travelling, which bears particularly heavily for those members of Council and committees who travel long distances to serve the Society and its members, and for regional meetings which are a most essential part of the scheme of contact with members.

The increase in costs of international meetings and conferences arises because of the Society's participation in WARC and at the meetings of the IARU which preceded it. In addition, provision has been made for part of the cost that will be incurred by the Society as host to the IARU Region 1 Conference scheduled to be held in the UK in April 1981.

In balance sheet terms the Society shows a strong position as regards net current assets, which have increased by £36,000 in the year despite the large sums spent on the new dp equipment. While the Society has a strong cash flow, the pace of inflation has been such that Council approved a further increase in subscriptions from 1 October 1980 to safeguard the future position. This decision highlights a fundamental problem for the Society where the subscription renewal dates are spread throughout the year rather than on a fixed date in the year. This puts the Society at a disadvantage because the full benefits of an increase in subscriptions is delayed, while the effects of increased costs are immediate.

Council looks forward to the continuing support of the members of the Society, the advertisers who support *Radio Communication*, and all others interested in the future of amateur radio.

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 1980

1979 £	1979 £		Notes	1980 £	1980 £
		INCOME			
167,642		Subscriptions	(1)		210,258
88,529		Advertising	(1)		121,396
131,505		Book sales			177,617
5,537		Other income	(5)		8,340
£393,213		**Total income**			£517,611
		EXPENDITURE			
		Book sales			
	55,817	Cost of printing		77,517	
72,567	16,750	Costs of editing and despatch staff		26,915	104,432
		Headquarters			
	8,762	Rates, lighting, heating and cleaning		9,271	
10,249	1,487	Repairs and maintenance		2,342	11,613
		Administration			
	71,763	Staff costs		77,337	
	300	Pension		300	
	25,480	Telephone, postage, printing and stationery		40,072	
	816	Insurance		1,199	
	303	Repairs and maintenance of equipment		668	
	9,746	Equipment hire		14,732	
	4,628	Depreciation of equipment (including loss on disposals)	(1)	13,098	
	5,073	Audit fees		5,630	
	1,730	Legal and professional fees		2,863	
119,848	9	General expenses		2,047	157,946
		Finance			
	1,068	Bank charges		435	
		Debentures of Lambda Investment Company Limited			
	1,010	Interest (gross)		—	
	481	Issue expenses written off		—	
	—	Surplus on redemption of Sinking Fund Policy		(392)	
3,059	500	Bad debts		1,178	1,221
		Membership services			
	132,453	*Radio Communication*	(6)	168,405	
	3,187	Certificates, awards, trophies, etc		2,558	
	5,668	QSL Bureau		7,278	
	1,992	Beacons, repeaters, satellites and Intruder Watch		3,613	
	6,944	IARU Region 1 contribution and levy		5,325	
	2,826	Rallies, exhibitions and publicity	(7)	(3,319)	
	12,301	Cost of committee, regional and Council meetings		16,133	
166,713	1,342	Cost of international meetings and conferences		4,722	204,715
£372,436		**Total expenditure**			£479,927
20,777		**SURPLUS FOR THE YEAR BEFORE TAXATION** (Of which £37,351 (1979: £21,258) arises in the Society)			37,684
		Less Provision for taxation thereon at 40% (1979: 42%)	(8)		
	2,418	Corporation Tax on investment income		3,100	
(4,668)	2,250	Deferred tax		10,500	(13,600)
£16,109		**SURPLUS FOR THE YEAR AFTER TAXATION**			£24,084

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)
AND ITS WHOLLY-OWNED SUBSIDIARY COMPANY

BALANCE SHEETS 30 JUNE 1980

1979 The Society & subsidiary £	1979 The Society £		Notes	1980 The Society £	1980 The Society & subsidiary £
		FIXED ASSETS			
41,675	—	Freehold property at cost	(1)	—	41,675
17,162	17,162	Furniture, equipment and computer programming	(1)(2)	45,557	45,557
—	45,807	Investment in and loan to subsidiary	(3)	42,788	—
5,003	—	Sinking Fund Policy at cost (1979 Surrender value : £5,372)		—	—
63,840	62,969			88,345	87,232
		INVESTMENT			
19,503	19,503	Quoted at cost (Market value £18,307 (1979: £18,258))		19,503	19,503
		NET CURRENT ASSETS			
57,280	57,280	Stocks at lower of cost and net realizable value		84,758	84,758
33,386	33,386	Debtors and payments in advance		52,132	52,132
51,079	51,070	Bank balances and cash in hand		64,171	66,479
141,745	141,736			201,061	203,369
		Less			
(40,807)	(39,267)	Creditors and accrued charges	(9)	(62,865)	(64,387)
(2,365)	(2,365)	Corporation Tax payable		(4,025)	(4,125)
98,573	100,104			134,171	134,857
£181,916	£182,576	**NET ASSETS**		£242,019	£241,592
		Financed by			
65,746	65,684	**ACCUMULATED FUND.** Balance at 1 July 1979		82,274	81,855
16,109	16,590	Surplus for the year ended 30 June 1980		23,851	24,084
81,855	82,274			106,125	105,939
		Less			
(241)	—	Preliminary expenses of subsidiary		—	(241)
81,614	82,274			106,125	105,698
6,170	6,170	**LEGACY FUND**	(4)	6,187	6,187
83,132	83,132	**SUBSCRIPTIONS IN ADVANCE**	(1)	108,207	108,207
11,000	11,000	**DEFERRED TAXATION**	(1) (8)	21,500	21,500
£181,916	£182,576			£242,019	£241,592

(The notes on page vi form part of these accounts)

P. BALESTRINI, *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 receivable 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 40 per cent using the liability method in respect of timing differences which are not expected to continue for the foreseeable future.

2. Furniture, equipment, and computer programming

	1980	1979
	£	£
Cost 1 July 1979	34,179	25,687
Additions during year	43,202	8,492
Disposals during year at cost	(4,162)	—
Cost 30 June 1980	73,219	34,179
Accumulated depreciation	(27,662)	(17,017)
Book value as shown in balance sheet	£45,557	£17,162

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.

4. The Legacy Fund was established in the year ended 30 June 1976. Legacies and donations amounting to £17 (1979: £126) received in the year have been credited direct to this account.

5. Other income comprises:

	1980	1979
	£	£
Bank interest	5,684	3,484
Quoted investment interest (gross)	1,664	1,664
	7,348	5,148
Commissions and royalties	992	389
	£8,340	£5,537

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:

	1980	1979
	£	£
Society publicity and advertising	3,595	3,975
Surplus on the Society's own events less the cost of participation in other rallies and exhibitions	(6,914)	(1,149)
	£(3,319)	£2,826

Book sales totalling £26,563 gross (1979: £12,723) 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 as follows:

	1980	1979
	£	£
Corporation Tax deferred by reason of stock appreciation relief	17,300	14,500
Excess of taxation allowances on fixed assets over depreciation charged	4,800	2,500
Less: Losses carried forward	(600)	(6,000)
	£21,500	£11,000

Notes on the accounts, continued

9. Creditors amounting to £17,000 (1979: Nil) were subject to reservation of title to the goods supplied. The creditors concerned have been paid since the year end.

10. The Society administers certain prize and memorial funds, totalling £690 (1979: £632) which are not included in the accounts.

CONSOLIDATED STATEMENT OF SOURCE AND APPLICATION OF FUNDS
for the year ended 30 June 1980

1979 £		1980 £
	SOURCE OF FUNDS	
20,777	Surplus for the year before taxation	37,684
126	Donations, legacies and interest	17
58	Tax repaid	—
	Adjustment for items not involving the movement of funds:	
4,628	Depreciation (including loss on disposals)	13,098
(524)	Tax suffered by deduction	(500)
481	Debenture issue expenses written off	—
—	Surplus on surrender of Sinking Fund Policy	(392)
25,546	**Total generated from operations**	49,907
	OTHER SOURCE	
—	Proceeds of surrender of Sinking Fund Policy	5,395
25,546		55,302
	APPLICATION OF FUNDS	
(8,492)	Purchase of fixed assets, less proceeds of sale	(41,493)
(17,025)	Repayment of debentures	—
(417)	Sinking Fund Policy premiums	—
—	Corporation Tax paid	(840)
£(388)		£12,969
	INCREASE (1979 DECREASE) IN WORKING CAPITAL	
151	Stocks	27,478
(1,141)	Debtors	18,746
17,271	Creditors and subscriptions in advance	(48,655)
16,281		(2,431)
	Movement in net liquid funds:	
(16,669)	Cash balances	15,400
£(388)		£12,969

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 1980 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.
25 September 1980

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 1980. 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 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 G. R. Jessop 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 1980
and
REVENUE ACCOUNT for the year ended on that date

1979 £	1979 £	1979 £		1980 £	1980 £	1980 £
			ASSETS			
41,675			Freehold property at cost			41,675
5,003			Sinking Fund Policy, at cost (1979 Surrender value £5,372)			—
241			Preliminary expenses			241
9			Bank balance			2,308
46,928						44,224
			LIABILITIES			
	1,540		Sundry creditors		1,522	
(1,540)	—		Corporation Tax payable		100	(1,622)
£45,388			**NET ASSETS**			£42,602
			Financed by:			
			Authorized and Issued Capital			
100			100 shares of £1 each fully paid			100
			Revenue Account			
	1,181		Rent receivable in the year to 30 June 1980		250	
	—		Surplus on redemption of Sinking Fund Policy		392	
		1,010	*Less:* Debenture interest	—		
		481	Debenture issue expenses written off	—		
		84	Bank charges	—		
		60	Audit fee	80		
		27	Sundry expenses	229		
	(1,662)				(309)	
	(481)				333	
	—		*Less:* Provision for Corporation Tax thereon at 40%		(100)	
	(481)				233	
(419)	62		Balance at 1 July 1979		(419)	(186)
45,707			**Loan from the Radio Society of Great Britain**			42,688
£45,388						£42,602

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 1980 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
25 September 1980

EDWARD MOORE & SONS
Chartered Accountants

THE YEAR IN REVIEW

Some of the activities of the Society in the year ended 30 June 1980

GENERAL MANAGER'S REPORT

This year has been dominated by the final preparations for the World Administrative Radio Conference (WARC) and the conference itself. As readers will be well aware, this conference had the function of reviewing and specifying the frequencies that *all* users of the radio spectrum, including radio amateurs, would be permitted to use in the future.

One outcome could well have been the loss of some of our treasured frequencies. In the event, the amateur services gained three new hf bands, five new microwave bands and 10 new space allocations. These represent both welcome additional frequencies and, most important, what can only be regarded as a strong vote of confidence for amateur radio by the professional representatives of the national administrations. In simple terms, the decisions made at this conference set the framework within which amateur radio can not only operate but expand and flourish over the next decades.

Not unexpectedly, the RSGB played a significant part in the conference, which was an additional load on the Society's organization during the year. At the same time, the membership of the Society increased by nine per cent, with a record number of new members. A milestone was the enrolment, in March, of our 25,000th member, G8VVV, which was marked by a small celebration. Four records of note were: the turnover exceeding £0.5m for the first time; sales of books approaching £180,000; the pages of *Radio Communication* exceeding 1,200 and the attendance at the Alexandra Palace Exhibition of almost 7,000.

All the Society's activities, including those of its committee, have continued at a high level, with many being involved with the vital preparations for WARC. During the year the Society maintained a close interest in the proposed citizens band because of the potential interaction between it and amateur radio. Other aspects of the increased effort were the IARU Region 1 VHF Manager's Conference in Maidenhead, and the unusually high demand for RSGB-organized centres for the RAE.

In coping with its administrative load the headquarters organization has reaped the benefits of all the investment of administrative effort in planning, dp techniques and programming to ensure the most profitable and effective usage of the investment in equipment. These benefits have proved especially valuable at this time when high inflation could have led to greatly increased operating costs. In January the dp facilities were expanded to improve both our current capabilities and to cope with the future expansion of our interests.

This year surely represents one of the most eventful in the Society's history. The success with which the Society coped with events confirms the basic strength of the RSGB, and this means that we can look forward to the future with confidence.

WARC 79

It is perhaps a little difficult for those who are unfamiliar with the nature of conferences such as WARC 79 to relate its business with the day-to-day activities of individual amateurs. Nevertheless they are all-too-closely linked – the loss of some of our prime bands overnight is always a possibility which few amateurs would not overlook. We are fortunate, as amateurs that there are a number within our ranks who make it their business to be involved at this level and who guard our interests.

Conferences such as WARC decide all aspects of radio communication. In particular they decide what frequencies are to be made available to various services, of which amateur radio is one of many. Technical developments, changes in the economic and social aspirations of the member nations of the International Telecommunication Union, the responsible United Nations body, means that from time to time the rules, regulations and utilization of frequencies have to be reconsidered on a world-wide basis. WARC 79, held in Geneva from September to December 1979, was a conference of this type. It involved over 2,000 delegates representing the national administrations of the 132 countries taking part. The scale of the conference is indicated by its cost – roughly £5m – and its paperwork – approximately 96 tons.

In such a conference, only national delegations are allowed to take part in the decision making. Nevertheless it is clearly essential that amateur radio be represented to look after the interests of over one million amateurs in the world, and to defend and if possible improve the existing facilities of the amateur radio service. The main way in which amateurs can achieve their objectives is by their societies influencing their national administrations prior to the conference along lines agreed by the International Amateur Radio Union. There is also the opportunity at the conference itself for the IARU representatives both to lobby all the delegations present and to react quickly to proposals generated at the conference itself. The latter tasks involve much skill and experience, as well as stamina and dedication.

WARC 79 was successful from an amateur point of view. This was due to a combination of many factors – the years of careful planning by the IARU to ensure that societies approached their governments in a co-ordinated manner; the atmosphere of goodwill generally felt towards amateur radio; the recognition of the value of amateur radio, especially in education and in emergency communications; and the technical contributions – notably in areas involving satellites, microwaves and propagation research.

Immediately before the opening of the conference, Geneva was host to what must have been one of the largest exhibitions of its type, Telecom 79, which covered all aspects of telecommunications. Many countries sponsored large and very expensive stands to display the products of its major manufacturers of equipment, and amateurs were again fortunate in being invited to display aspects of amateur radio in this exhibition. Full advantage of this opportunity to influence delegates at another level was taken by having a stand of remarkable quality produced by the CERN Club with much backing from other bodies. Amateurs also contributed to a special symposium on amateur radio which formed part of the technical conference running concurrently with the exhibition. RSGB provided the bulk of the microwave demonstration on the exhibition stand, and also one of lecturers at the symposium.

The UK national delegation played an important role in the work of the conference. We owe a special thanks to them, and to Roy Stevens, G2BVN, who was a member of the UK team representing amateur radio. Our gain of eight new bands and 10 satellite allocations is a fitting tribute to all those involved in the amateur cause. While we must generally be pleased with the outcome of WARC 79, we must ensure that we are equally well prepared for future conferences of this type if the facilities enjoyed by a growing population of radio amateurs are to be maintained in the future.

Society activities

Interaction both at national meetings and local events between RSGB Council/staff and members is considered an essential part of the activities of the Society. It provides an opportunity for discussion and the interchange of ideas. Society Presidents are always in demand at meetings, both to represent the Society and to be available to talk with members. Additionally Society Presidents are able to represent the Society overseas when the occasion demands.

During the first half of the year the 1979 President, John Bazley, G3HCT, was able to attend a number of events around the UK. Among these was the Town & Country Festival – probably the largest hobbies exhibition held in Europe – in Warwickshire during August. The Society was attending this event for the first time, and was able to enhance the display normally provided by the local club by contributing a large amount of the Society's professional-standard exhibition equipment. In the same month the President made a short visit to the ARRL in Connecticut, USA.

Another opportunity for the President to represent the Society overseas came during October when the Dutch national society VERON celebrated 50 years of amateur licensing in the Netherlands. The general manager also represented the RSGB at this event, and combined the trip with a visit to VERON's headquarters in Arnhem, where he was able to discuss the use of the RSGB computer software previously purchased by VERON. This meeting was followed up in June when two members of VERON met the general manager and assistant general manager at RSGB headquarters to discuss the further purchase of RSGB computer software.

For the second year running the Society was represented at the successful EI/GI Convention in Dundalk during September.

On 31 December 1979 the 45th President of the Society completed his term of office and on 1 January 1980 Mr Peter Balestrini, G3BPT, became the 46th President. The Presidential Installation took place on board the Thames motor vessel *Mayflower Garden* on 12 January. The Society's special guest on this occasion was Brian Rix, MBE, G2DQU, accompanied by his wife Elspeth Gray.

There were three vacancies for ordinary members on the 1980 RSGB Council. These were filled by the re-election of Dr D. S. Evans, G3RPE, for his second three-year term of office, and by the election of two former Council members – Mr G. R. Jessop, G6JP, and Mr D. M. Pratt, G3KEP. Mr C. Thomas, G3PSM, stood down from Council at the end of 1979 before the completion of his term of office because of business commitments. This created a further vacancy on the 1980 Council which was filled by Mr K. A. M. Fisher, G3WSN, who was co-opted by Council. Council records its thanks to Mr Thomas for his years of service on Council.

There were four zonal vacancies on Council for 1980. In three zones members were returned unopposed: Mr B. O'Brien, G2AMV, for Zone A; Mr J. Anthony, G3KQF, for Zone B; and Mr W. F. McGonigle, GI3GXP, for Zone F. During 1978 and 1979 members in Wales (Zone E) had been represented by Mr D. H. Adams, GW3VBP, who had made himself available for co-option on to Council as there had been no nominations from Wales. However, for the 1980 Council a Zone E election did take place and Mr R. G. Barrett, GW8HEZ, was elected to serve for three years.

Council wishes to record its thanks to the Council members who retired at the end of 1979. Mr D. H. Adams, GW3VBP, and two Council members of long standing: Mr R. F. Stevens, MBE, G2BVN, who served on Council for 18 years and Mr C. H. Parsons, GW8NP, who had been on Council since 1970. At the Society's fifty-third annual general meeting held on 8 December 1979, fitting tribute was paid to their many years of voluntary work for the Society when Mr Stevens was made an Honorary Member, and Mr Parsons was presented with the Founders Trophy.

WARC 79 provided an opportunity for a number of visitors to be received at RSGB headquarters, among them: Noel Eaton, VE3CJ, president of IARU; Dick Baldwin, W1RU, general manager of ARRL and IARU secretary; Dave Sumner, K1ZZ, assistant general manager of ARRL; and Bruce Johnson, WA6IDN, also from the ARRL staff. During the conference two overseas society presidents made brief visits to RSGB headquarters: David Wardlaw, VK3ADW (Wireless Institute of Australia); and Shozo Hara, JA1AN (Japan Amateur Radio League).

In June, Carlos Kaufman, LU9CN, the president of RCA (Argentina) made a short visit to RSGB HQ. Other notable visitors to RSGB headquarters from foreign societies included Wojciech Nielykska, SP5FM; James Bruzon, ZB2BL: and Jay Holiday, W6EJJ. In the opposite direction the 1980 RSGB President made visits to the ARI (Italy) and DARC (Germany) to represent the Society at international meetings.

Society administration

During the year the Society's annual turnover has increased by nearly a third, and for the first time has exceeded half-a-million pounds. This is a reflection of a substantial increase in most of its activities, and has inevitably resulted in increased demands on the Society's administrative effort. Many members have expressed an interest in the workings of headquarters, especially regarding data processing, and this section briefly summarizes changes in this area.

The scale of the present operation is difficult to present in a brief way. One indication is the level of mail. Currently, RSGB HQ often receives 1,000 letters in a day: these include subscription payments and orders for our publications, and enquiries and information from newcomers to the hobby, as well as from established members, taking advantage of some of the Society's services. Fortunately most of the letters can be handled with little administrative effort: others can require many hours of research before a reply can be sent. In the other direction the Society despatches well over half-a-million separate items each year.

It is worth noting that this increased level of operation has been achieved by a somewhat smaller headquarters staff than during previous years. This has only been possible by a substantial increase in efficiency. Saving in staff salaries resulting from this has made a significant contribution to the surplus in our accounts, although this trend cannot be expected to continue for much longer.

The increase in the effectiveness of the administration is closely associated with the deliberate orientation of management around data processing techniques. It is perhaps worth noting that, at this time when computers and computing has such a bad press, that more than half the staff at headquarters use the data processing facilities as a natural part of their day-to-day routine, when only two have received any formal training. The reason for this is perhaps yet another example of radio amateurs not only being able to accept advanced technology but to enjoy doing so, and this confidence has rubbed off on to other members of the staff. The elimination as far as possible of the technical mystique surrounding computing has been a deliberate policy, and the great care taken in the design of programmes to encourage their use by untrained people has been an essential part of the philosophy.

In practice, this policy backfired in the best possible way; the increased use of the dp facilities by the staff led to problems. The original IBM32 machine could be used only by one person and for one job at a time, which included the development of new programs. This quickly became the factor limiting the more effective operation of headquarters. Consequently early in the year the position was reviewed and the decision made to install the larger IBM34 system. Besides having a greatly increased capacity, the installation proposed could be used by up to six people at a time, each dealing with different tasks. The installation and commissioning of this equipment has been a major objective during the year.

One of the main considerations influencing the choice of machine was the ease with which existing IBM32 programs, representing a considerable investment in programming effort, could be transferred. Coupled with this was retraining of the staff to use the new machine. In practice, the changeover proceeded more rapidly that even the most optimistic estimates, with the staff accepting the changes with little fuss and much enthusiasm. Within a few months all the existing jobs had been transferred from the IBM32 to the IBM34.

Since that time it has been possible to do much new programming, which has resulted in a further increase in efficiency. As an example of this, it is now possible to store information concerning a wide range of amateur radio activities, and to rapidly address this to members making routine enquiries. By this means members can get a much more detailed answer than could ever be possible if these types of enquiry had to be replied to on an individual basis.

A second example is control of committee work. Committees undoubtedly represent one of the strengths of our Society, and keeping the records of 150 or so members of committees up to date, and ensuring the correct distribution of committee papers, has represented a significant administrative load in the past. These operations are far more effectively controlled using the IBM34, with benefits all around.

The major consequence of these advances is, of course, that more and more headquarters effort can be applied to amateur radio itself rather than to mere administration. One of the outcomes has been the effort spent on exhibition stands and displays, which have been used at many events all over the UK. In particular a large number of display panels have been produced which have been very effective in illustrating various aspects of amateur radio. This large investment in effort enabled the Society to produce a stand at the Alexandra Palace exhibition which many members felt did much justice to the Society.

One of the happier aspects of this work is that the present effort in these areas not only helps to solve current problems but is a valuable investment which leaves the Society in an excellent position to cope with the future.

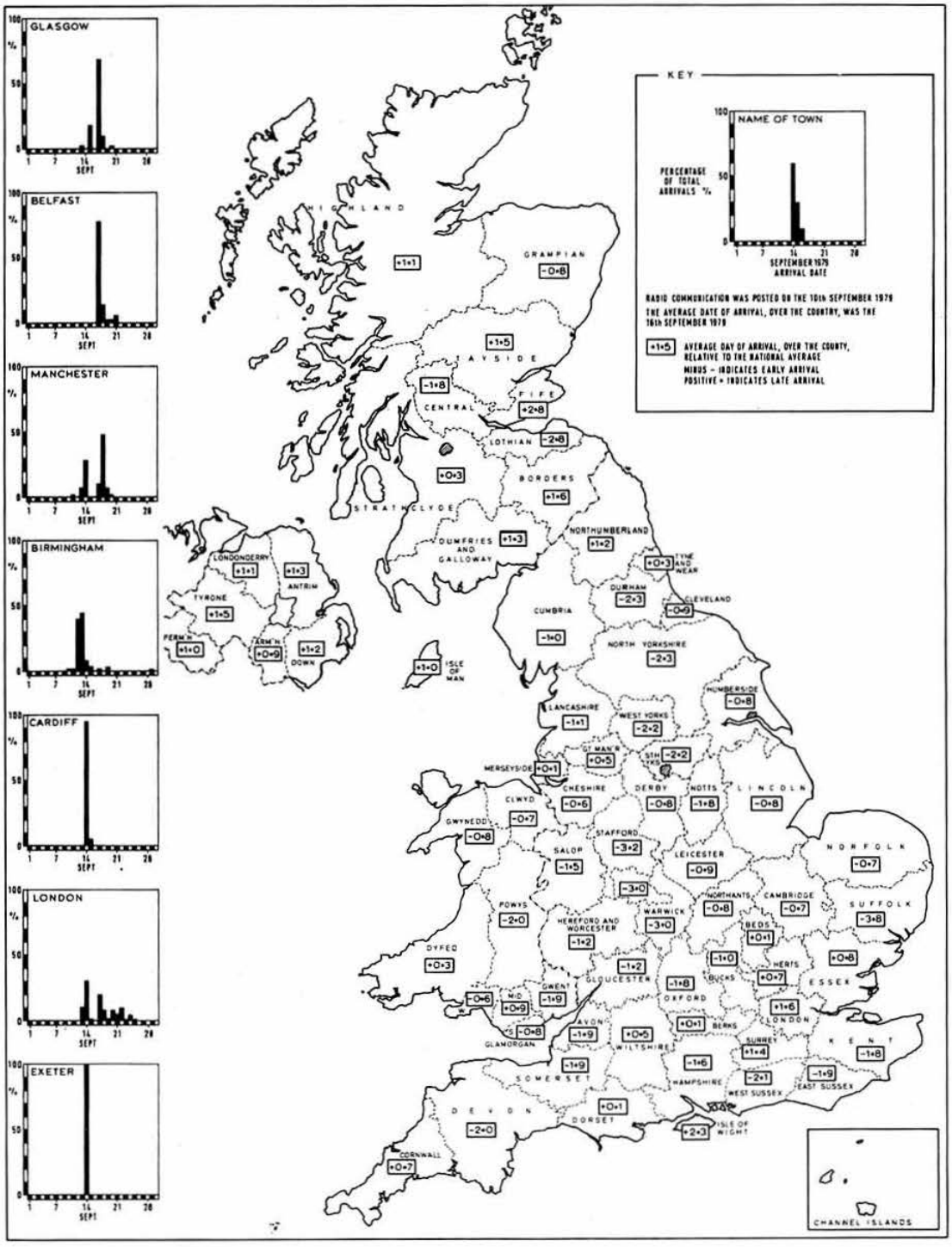
Radio Communication

The Society's main link with its members, *Radio Communication,* has continued to increase in size from 1,152 pages in 12 issues in 1978-9 to 1,202 pages in 11 issues during the year under review. The June issue was combined with that of July 1980 because of national industrial action which affected the printing industry. A decision to change the dimensions of the journal from the January 1981 issue was made during the year, and this is expected to have a number of advantages.

The problems associated with the distribution of *Radio Communication* by the Post Office have continued, with several issues running into major problems in specific areas. The Society continues to replace between 50 and 100 copies of the journal each month to members who inform headquarters that their magazine has simply not arrived. Radio communication makes it easy for RSGB members to compare the delivery dates of the Society's journal around the country, and in September the Society commissioned a survey to find out exactly how long the magazine spent in the post. Some 25 per cent of UK members assisted in the survey, and the detailed results on a county by county basis are shown on the map opposite.

Clearly the distribution for that particular month may not be repeated, and while some members will receive their magazine late one month, they may just as easily receive it early the following month. Prompted by reports that members living in the same house often receive their magazines days or weeks apart the distribution in major cities was examined in greater detail. The results in these cities are shown on the left-hand side of the map and, contrary to what may be popular belief, the London area members clearly suffer from poor distribution. The results of this survey have been passed to the Post Office and it is expected that a similar exercise will be carried out at some stage in the future.

Distribution survey of September 1979 issue of *Radio Communication*



Amateur radio and citizens band

The interaction between amateur radio and citizens band radio, and hence the Society's interest in cb, may not be immediately apparent. In practice the *type* of communications systems introduced for the general public *is* of significance to radio amateurs. During the past year Council set up a special working group, under the President, to consider the implications of cb on amateur radio, and this group operated in conjunction with Council and the Telecommunications Liaison Committee.

While recognizing the often widely differing views of individual members, the Society is in principle neither for nor against cb radio. However, it considers that 27MHz is an inappropriate place in the radio spectrum to introduce a short-range personal radio communications facility for the general public. Long-range skip conditions, large antennas, proximity to the 28MHz amateur band, and a high potential for interference to domestic entertainment equipment are among the list of disadvantages. In many other countries these factors have had a detrimental effect on amateur radio.

The Society considers that the most important decision on a citizens band facing the Government is the choice of frequency. It considers that a vhf or uhf band would help minimize the potential interference problems, not only to other spectrum users but also to the operators themselves. The Society also favours the use of fm, low-power type-approved equipment, and considers that adequate licensing controls are essential.

In May 1980 the government announced its intention to publish a green paper on citizens band, or Open Channel as they wished to call it. The Society submitted its views to the government, and in August 1980 the green paper was published. In essence the government proposed to establish Open Channel radio around 928MHz. The Society welcomes these proposals as being in line with its own view, and feels that the choice of frequency should satisfy the large majority of users, while at the same time minimizing most potential interference problems. The green paper invites comment and the Society will actively continue to consider Open Channel with the best possible interests of amateur radio in mind.

Membership

The Society's membership, based on *Radio Communication* distribution, rose during the year by 8·66 per cent; from 23,613 members on 1 July 1979 to 25,658 members at the end of June 1980. The total number of new members enrolled, 4,215, was the highest for any one year in the Society's history.

The highlight of the year was the enrolment of Miss Diane Parker, G8VVV, as the Society's 25,000th member during March. This event was marked by a special membership certificate signed by the Society's Patron, HRH The Prince Philip, Duke of Edinburgh, KG. It took the Society 67 years to achieve its quarter-century in terms of membership; at the rate of growth experienced over the last few years the Society's membership could be expected to double within the next 10 years.

The appendix to this report contains a number of membership tables which are reproduced for the record.

and finally

The comprehensive range of services provided by the Society includes: advice on technical, licensing and planning matters, Amateur Radio Observation Service, beacons, books at discount, contests, conventions, exhibitions, GB2RS news broadcasts, identity cards, operating awards, QSL Bureau, *Radio Communication*, RAE centres, rallies, repeaters, slow morse practice transmissions, and tape and film libraries.

Much of this work is done by a large number of volunteers and representatives in the field; much is done by the dedicated staff and their interaction with the volunteers. To all those involved with the Society's work, a special thank you.

APPENDIX

MEMBERSHIP STATISTICS

New members by month

	1979-80	1978-9	1977-8
July	213	214	188
August	307	311	150
September	210	249	195
October	400	379	254
November	455	483	336
December	328	140	187
January	539	510	396
February	320	301	302
March	316	415	250
April	439	226	280
May	342	339	322
June	346	366	227

Total: 4,215 new members

UK main categories

Category	1979-80 (%)	1978-9 (%)	1977-8 (%)
Ordinary Corporate	85·3	84·6	84·5
Life	0·8	0·8	1·0
Reduced/OAP	3·4	3·8	4·0
Waived	1·2	1·0	1·0
Family	1·1	0·9	0·7
Channel Islands	0·4	0·4	0·4
Student/Associate	5·0	5·7	5·6
Honorary	< 0·1	< 0·1	< 0·1
Complimentary (Non-members)	0·4	0·3	0·3
Libraries (*Radio Communication* subscribers)	0·4	0·4	0·4
Clubs	1·9	2·0	2·0

(SWLs comprise 23·9 per cent of the UK membership)

Overseas main categories

Category	1979-80 (%)	1978-9 (%)	1977-8 (%)
Surface	56·0	56·0	60·0
Air mail	7·6	5·5	5·1
Libraries (*Radio Communication* subscribers)	2·2	2·5	6·8
Complimentary (Non-members)	9·2	7·0	6·9
Clubs	1·0	0·6	0·9
Agency	24·0	28·4	20·3
Total overseas membership	2,884	3,078	2,500

COMMITTEE REPORTS

Finance & Staff

Committee: G3FKM, G3KQF, G3BPT, G3HCT, G3COR, G3RPE, G2AMV and G2BVN.

The prime function of this committee is to monitor and direct the business affairs of the Society, and reviews of the two aspects of this work contained in its title appear in the reports of the honorary treasurer and general manager respectively.

During the year a decision was taken to expand the Society's data processing capacity by exchanging its IBM32 for an IBM34, and this is now in full commission. The position of student members was reviewed and a decision made to make a reduced subscription rate available to those up to 25 years of age. Funds were made available to finance legal advice for members involved with rating of antenna installations and television interference.

A development fund was approved to enable the Technical & Publications Committee to undertake special projects involving simple equipment kits, and it was also decided that exceptional items of home-built equipment should be acquired for use in the headquarters station, or for display.

Further improvement of the Society's stand at the Alexandra Palace exhibition was assisted by the purchase of more Mahler-Hayley display panels.

It is hoped to appoint a Society archivist to supervise the preservation of historical material, and efforts are being made to regain control of the Maurice Child Collection of vintage radio gear.

John Allaway, G3FKM, chairman

Education

Committee: GW3VBP, G3KQF, G3HB, G6NZ, G8MW, G3KEP, G2WS and G2CVV.

Six meetings have been held to attend to a heavy programme of business during the period under review.

Members of the committee held informal meetings with RAE instructors at both the Leicester and Alexandra Palace exhibitions. This interchange of views is most valuable and these two meetings can now be considered as a regular feature of these exhibitions.

Video tapes and talks for beginners were presented throughout the period of the Alexandra Palace exhibition, and correspondence resulting from these talks suggests that several people are now studying for the RAE.

The Science Museum lecture series presented by the committee is now scheduled to be an annual event, and the move from New Year to the Easter period, tried for the first time this year, is considered to have been successful.

Included in the normal routine work of the committee has been the completion of a revised RAE syllabus, which has now been submitted to the City & Guilds of London Institute by our representatives on their subject committee, and the revision of the *RAE Manual* to coincide with

this syllabus revision. Work is also continuing to provide a course of instruction for the RAE suitable for the blind. This is proving to be a very difficult task but one which we hope to achieve.

For the convenience of members RAE centres were arranged in London and Derby for the December and May examinations. We are grateful for the assistance of the membership services officer at RSGB headquarters and of those who gave their services as invigilators at these examinations. It is hoped that suitable arrangements can be made for similar centres in other parts of the country in the future.

J. Anthony, G3KQF, chairman

HF

Committee: G3FKM, G3HCT, G4FTJ, G4CNY, G3AAE, G4BUO, G8KG* and G3PSM.

During the year under review two subjects were considered of sufficient importance to warrant special meetings. These were to discuss in detail proposals for a novice licence, and simple constructional articles for hf equipment. The committee examined the novice licence proposals, drafted by the sub-committee of the Telecommunications Liaison Committee, and put forward several recommendations, all of which were accepted. The chairman of the Technical & Publications Committee was invited to attend our January meeting to discuss our ideas and proposals for constructional articles of simple hf equipment suitable for publishing in *Radio Communication*.

The committee wishes to record its appreciation on behalf of the Society to Charles Emary who, as I am sure all members are aware, has dealt with the checking and issuing of hf certificates so efficiently for over 13 years. We are grateful to Peter Miles, who generously volunteered to deal with this work in future.

This year the committee decided to run a lecture programme at Alexandra Palace, and was extremely fortunate in obtaining the services of Louis Varney. His lectures on the G5RV antenna were very popular – the lecture room being packed to capacity on both days.

During the next 12 months the committee will be involved in discussing hf papers for the IARU Region 1 Conference in 1981, noting the progress of the novice licence, and pressing for the publication of simple hf constructional articles.

John Bazley, G3HCT, chairman

IARU

Committee: G3FKM, G3MXJ, G3HCT, G3BA, G3RPE, G5CO, G3GVV, G2BVN and G3SAR.

Two members of the committee, Roy Stevens, G2BVN, and Eric Godsmark, G5CO, attended the World Administrative Radio Conference at Geneva, from September to December 1979. The immense amount of work which they did, and the successes they achieved, will benefit all radio amateurs for many years to come.

At its regular meetings, the International Amateur Radio Union Committee has been reviewing the implications of WARC, with particular reference to the new frequency bands of 10, 18 and 24MHz. It is now involved in preparation for the 1981 IARU Region 1 Conference, to be held in Brighton, at which the RSGB will be the host society. Region 1 includes the whole of Africa, Europe and the Soviet Union.

Secretaries of clubs and affiliated societies are reminded that the committee's information officer, John Bazley, G3HCT, will be pleased to arrange talks on IARU matters.

R. J. Hughes, G3GVV, chairman

HF Contests

Committee: G3FKM, G3HCT, G3KDB, G3KKQ, G3MXJ, G3NKS, G3RJV*, G3WPF, G4BUO, G6LX, BRS10977* and BRS20249.

One of the committee's major achievements during the year was agreement with other European societies on a common set of rules for SSB Field Day. Following discussions at recent conferences and lengthy correspondence, the new rules, which will stimulate activity in the contest by providing direct competition between clubs and groups in different countries, were in place for the 1980 event.

Considerable improvement has taken place in the arrangements for overseas publicity for hf contests. A regular news-sheet containing details of rules and results is now sent to overseas contest managers with the aid of a computerized mailing list. This should ensure more coverage for RSGB contests in other magazines and lead to improved overseas participation.

Two new contests were implemented during the year, aimed at newcomers to contesting and those who wish to take part in club events such as AFS and NFD. Both the Cumulatives and the ROPOCO contest (which features use of postal codes in place of the usual serial number exchange) were well supported in their first year. Another new event, the 21MHz CW Contest, proved extremely popular and attracted a large entry, especially from overseas.

The increasing interest in QRP operation is reflected in additional low-power sections in various contests. In this connection, the help and advice of the Rev G. Dobbs, G3RJV, as corresponding member on this subject, has been valuable.

The df events are organized by another corresponding member of the committee, Eric Mollart, BRS10977, and continued to be popular. The committee is investigating the possibility of introducing "foxhunting" (ardf) events in the near future. These are organized in a somewhat different manner to the present df events, and their appeal is to groups rather than to individuals. They are not intended to compete with or to replace present arrangements. It is hoped to arrange an event during 1981.

D. J. Andrews, G3MXJ, chairman

Interference

Committee: G4CYR*, G3KQF, G3HLF, G4DXA*, GU3YIZ*, G8HTA, G3BLE*, G2YS* and G3VTT.

The committee continued its work in helping members to solve their interference problems.

Members of the committee delivered lectures to clubs and groups. In view of the difficulty of getting to some clubs in more out-of-the-way places, the committee is preparing a tape/film slide lecture for inclusion in the Society's library.

The committee is also preparing for a possible future edition of the *Interference Manual*.

A leaflet has been prepared by Mr J. A. Swinnerton, G2YS, and is being made available to local government authorities.

A leaflet has also been prepared with the backing of the committee, to be made available via members to members of the public who are suffering interference.

A booklet, containing reprints of articles which have appeared in *Radio Communication*, is in the pipeline.

P. F. Jobson, G3HLF, chairman

Membership & Representation

Committee: G3FKM, G3MXJ, G3KQF, GW8HEZ, G3HCT, G3RPE, G5HD, GM8FFX, GI3GXP and G2AMV.

The committee met seven times during the year, two of these meetings being held in the provinces – York in November and Plymouth in May. Discussions covered a wide field, and included a scheme to rationalize the Society's badges. Many local gatherings of members supported the use of colours to signify the duration of membership, and its was therefore decided to recommend to Council – which subsequently agreed – that there should be colours denoting three different periods of membership: 10, 25 and 40 years.

At the October 1979 conference of regional representatives and Council, a mandate was clearly given to the committee to provide some guidelines to RRs regarding their duties. Consequently the committee spent some time in drawing up a comprehensive document which set out in detail how best it was thought that an RR could further the interests of the Society and its members.

The year saw the introduction of the identity card machine previously recommended by the committee. At the time of writing this report some 1,600 members have taken advantage of the facility provided.

During the year the committee examined several suggested designs for a new society tie to replace the former pattern, stocks of which were running low. The approved design, with diagonal lines in red, white and blue above and below the Society emblem, is proving very popular with members. The introduction of a green version as well as the familiar blue and maroon has been particularly well received.

The position of RSGB groups compared with affiliated societies was considered in detail. In order to ensure that all groups received at least all the benefits available to an affiliated society it was proposed and agreed by Council that headquarters would, on application, register each group and that an appropriate registration fee would be charged. It was also agreed that, as far as affiliated societies were concerned, the name of a nominated member would be recorded at headquarters and that this person would be known as the affiliated society contact.

Society members will know that an ad-hoc committee has been formed under the aegis of the M & R Committee to consider how the GB2RS news service can be improved. In the autumn of 1979 an enlarged and improved service was inaugurated. Some six months later a detailed questionnaire was included in *Radio Communication*, and volunteers are now collating the answers provided by the 1,700 members who returned their forms. When the considerable task of examining the answers has

been completed the committee will again be considering possible ways to further improve the service within the terms of the GB2RS licence. It is gratifying to record the degree of appreciation of the enhanced service that is emerging from the replies.

The agenda for M & R Committee meetings continues to be well filled, and there is plenty of work for 1980 1.

B. O'Brien, G2AMV, chairman

Microwave

Committee: G8AGN, G3RPE, G3YGF, G4CNV, G3HWR, G3JIX, G3WDG, G3JVL and G8BBE.

The last 12 months have seen a considerable increase in Microwave Committee business. On the technical side the committee has completed a number of projects. A high-stability local oscillator chain for use in 10GHz narrowband cw/ssb transverters, and other applications, has been developed, and will be made available in kit form very shortly. Horizontally-polarized omnidirectional antennas for 1·3GHz repeater use have been investigated. Both fixed and mobile trials of a number of antennas have shown the Alford slot to be the most suitable. A considerable amount of effort on the development of 24GHz equipment has led to the publication in the *Microwaves* column of complete designs for receivers, transmitters, antennas and ancillary equipment for this band.

Liaison between the committee and the Repeater Working Group on the subject of 1·3GHz fm repeaters resulted in Trevor Groves, G8BBE, joining the committee this year. A technical specification has been drawn up and agreed, and a number of proposals have been collated and are ready for submission to the Home Office.

The committee's new QTH Squares Award scheme came into operation this year, and has been very successful judging by the large number of claims which have been processed by the vhf awards manager. The committee has continued its interest in microwave contests, and is currently reviewing the rules for the 10GHz Cumulative Contest. The committee is grateful to Alpha (UK) Ltd for sponsoring this contest by agreeing to award a cup to the leading UK entrant. The terms of reference for two new one-off microwave awards to be donated by Microwave Associates Ltd and administered by the committee have been agreed.

The committee has been involved, as in previous years, with meetings and exhibitions. It provided a stand at Alexandra Palace, contributed a lecture stream to the RSGB National VHF Convention, and organized a number of round table meetings. It also provided part of the equipment and two of the personnel for the amateur radio stand at the Telecom 79 exhibition in Geneva. A special exhibit there was a working two-way ssb link on 10GHz.

A considerable amount of effort was spent producing papers for the IARU vhf managers meeting at Maidenhead, and work is currently in progress for the 1981 IARU Brighton Conference.

C. Suckling, G3WDG, chairman

Propagation Studies

Committee: G3HTF, G8AGN, DJ5DT*, G3BYW, G3RPE, G3LTP, G3NAQ*, G3USF*, G3GVV, G2FKZ, G3LZZ*, G4AQI, G3FZL and G3DME.

The amount of business dealt with by the committee during the past year has steadily increased. G2FKZ has supplied weekly propagation summaries and forecasts to the GB2RS news bulletins, which now include ionospheric data kindly supplied by the director of the Appleton Laboratory. The hf propagation study continues, using prediction data supplied by G4AQI and tabulated in *Radio Communication*.

Under the care of G3DME the international beacon project has expanded farther afield, the latest addition being VP8ADE at Adelaide Island, in the Antarctic. Representation on CCIR Study Groups 5 and 6 has been maintained. Propagation material from various amateur radio sources has been supplied, on request, to several commercial and Government organizations.

The committee's assistance was sought in connection with an aircraft accident investigation, and our tropospheric analysis is to appear in the official report. The committee was greatly encouraged by the interest shown by members in its work on display at the RSGB National VHF Convention and at the RSGB Exhibition at Alexandra Palace.

Ray Flavell, G3LTP, chairman

Rally & Exhibition

Committee: G3MVV, G5HD, G3TDR, G3VPK, G3ICI and G3IIR.

January 1980 saw the change of the committee's name to "Rally & Exhibition." This came about by the fact that more time was being spent on organizing displays at various exhibitions around the country, and more exhibition stand material and additional graphic work was undertaken which has been used to great effect.

The past 12 months have again seen much more Society participation at exhibitions and rallies throughout the country, including representation at the 1979 EI/GI Convention in Dundalk; headquarters staff, Council members and committee members being present.

Woburn Abbey Rally, ARRA Leicester Exhibition and Alexandra Palace all had larger Society participation. The activities of various committees on the Society stand at Alexandra Palace gave members a sight of how the RSGB works for its members.

Norman Miller, G3MVV, chairman

Raynet

Committee: G3BPT, G8CAC, R. Bassett, G4AVV, G3PED, G4FRG, G6JP, GW2HPG*, G3GJW, G8MBB and G3IIR. Supplies officer, Mrs Jane Balestrini. Registration secretary, Mrs Taff Crane.

National membership has grown to about 3,600 and is increasing. A new identity card was introduced during 1980 which, when laminated, is of a better quality than anything used previously. The steadily growing membership has entailed a lot of work for Taff and Len Crane, as well as the committee. Committee meetings have been long and busy to deal with the administrative details arising from over 140 groups around the country. Controllers visiting meetings have commented on the amount of detailed work involved.

A new *Raynet Manual*, of A4 loose-leaf type to enable updating, has been produced during the year for publication in the autumn as well as specialist reports for the forthcoming 1981 IARU Region 1 Conference, the Home Office etc. Committee members have manned stands at events such as the RSGB National VHF Convention, Alexandra Palace and Leicester exhibitions and the Woburn rally. They have attended and spoken at events organized by Raynet groups, such as the South-East Symposium held at Crawley in April, and have given lectures to user services, Raynet groups and radio clubs.

Challenges remain ahead: Increased implementation of revised Home Office regulations regarding Raynet, greater participation in national defence situations, organizing and running "workshops" for training at various levels.

The committee thanks its many friends around the country for their continued support in its work of serving the community through amateur radio. I extend my personal thanks to the committee members for all their time and hard work during the year.

Ingemar Lundegard, G3GJW, chairman

Technical & Publications

Committee: G4FTJ, G3RPE, G3YGF, G4CDY, G3SJX, G3VA, G3TDR, G3UVZ, A. W. Hutchinson, GI3VCI,* G6LL*, G4IQQ, G3HWR and G2BVN.

The main concern of the committee is with technical publications, both as articles in *Radio Communication* and as books. Because of the nature of its business, it is important that the committee should be able to take a broad view of all aspects of amateur radio. We are fortunate that the present committee has members active in all aspects of the generating and assessing of technical material, both as articles and technical reviews, and in the compilation of books. The Society's book editor, Mr. R. J. Eckersley, G4FTJ, and the *Radio Communication* editor, Mr A. W. Hutchinson, are, of course, members of the committee, and provide professional expertise especially with the production of printed material at an economical and attractive price.

During the year, publications were at a record level. This was reflected in the noticeably higher work-load of the committee which met eight times during the year. The thanks of the Society must go to those who take upon themselves the task of refereeing articles and producing technical reviews as their contribution to the hobby. This year, our special thanks must go to Phil Horwood, G3FRB, who has had to resign from the committee on health grounds after many years of unstinting effort.

Early in the year, the Society published the first edition of its most successful *Amateur Radio Operating Manual*. New editions of other publications included *Amateur Radio Awards*, a novel *World Prefix Map* and, of course, the 1980 edition of the *RSGB Amateur Radio Call Book*. Reprints were made of the *RAE Manual* and the *VHF-UHF Manual*. New editions of *Amateur Radio Techniques*, *A Guide to Amateur Radio* and *Teleprinter Manual* were in the course of preparation.

The record sales of our publications is evidence of the general health of amateur radio at this time. The large number of recruits to the hobby is reflected by the remarkably high sales of the *RAE Manual* during the year – nearly 11,000 copies.

This can only augur well for the future. The outcome of WARC 79 was both to increase the number of our allocations and to extend the amateur spectrum to 200GHz. These changes represent a challenge to the committee to ensure the supply of suitable material to encourage beginners at all levels to make full use of the spectrum.

Dain Evans, G3RPE, chairman

Telecommunications Liaison

Committee: G3FKM, G3BPT, G3HCT, G5XB, G3BA, G3RPE, G3GVV, G3KEP, G4BSO, G2BVN, G3PSM and G2CVV.

With the conclusion of WARC 79 the committee was concerned with the implementation of the new regulations which will become operative from 1 January 1982. In addition to such specific matters, there has been a continuous liaison with the Home Office concerning various aspects of the amateur licence. The various proposals concerning a personal radio service were monitored, and at the conclusion of the period under review a government discussion paper was awaited. Proposals for a further type of licence were drafted and submitted to the Home Office.

The activity of the police in stopping vehicles which they believed might be carrying illegal 27MHz equipment has caused a considerable amount of correspondence both with the authorities and members concerned.

Due to ill-health the Intruder Watch organizer, G5XB, was forced to resign, and appreciation is expressed for the tremendous amount of work carried out during his term of office.

The Amateur Radio Observation Service has continued to be a valuable Society facility, and the committee thanks Mr D. M. Pratt, G3KEP, for his continuing efforts in this connection.

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.

In addition to specific matters receiving the attention of the committee, the telecommunications liaison officer and the general manager are in constant contact with the Home Office concerning beacon stations, repeaters and other matters affecting licensing.

Due to staffing problems beyond the control of the Home Office, there have often been delays but there has been no lessening of the co-operation received from the Radio Regulatory Department.

R. F. Stevens, G2BVN, chairman

VHF

Committee: G3ZNU, G3COJ, G3VEH, G3BA, G3XDV, G3SEK, G4BEL, G3FZL, G3GJW*, G4AVV*, G3IIR*, G5KW*, G4ANB* G3RWL and GM8FFX*.

July 1979 saw the retirement of Dr I. White, G3SEK, as vhf manager, and the appointment of Mr T. P. Douglas, G3BA, as his successor. Other appointments included those of Mr M. Dennison, G3XDV, as chairman of the committee's Repeater Working Group and Mr T. Groves, G8BBE, as liaison officer for microwave repeaters between the Microwave Committee and the RWG. The latter appointment has resulted in a file of firm proposals for shf repeaters which should bear fruit in the coming year. Several other changes in corresponding members with vhf interests and from other committees have occurred, notable additions being Major K. E. S. Ellis, G5KW, as our 50MHz band reporter, and Dr J. Morris, G4ANB, as the new *4·2·70* columnist – Mr G. Knight, GM8FFX, having retired after three-and-a-half years of most valuable column writing.

An IARU meeting held at Maidenhead during April 1980 was attended by vhf managers and delegates from IARU Region 1. Several items directly involving the committee included beacon stations, WARC 79 frequency band results, band planning, QTH locator systems, and 12·5kHz channel spacing. Papers discussing these items are to be presented by this committee at the 1981 IARU Region 1 Conference.

On behalf of the Society the committee presented two papers at the IERE Land Mobile Convention at Lancaster: the first by Mr H. C. Bate, G8AMD, and Mr C. Goadby, G8HVV, on the planning of the UK amateur repeater network; and the second by Dr I. White, G3SEK, on vhf/uhf high power ssb techniques. About 200 delegates attended these presentations, thus demonstrating the interest shown in our approaches and methods.

The annual RSGB National VHF Convention organized by the committee continues to draw an ever-increasing number of enthusiasts, as did the vhf/uhf stand at the Alexandra Palace exhibition.

The committee is indebted to the vhf manager for his efforts and achievements, and those of the vhf/uhf awards manager, Jack Hum, G5UM.

C. J. Morcom, G3VEH, chairman

VHF Contests

Committee: G5HD, G3VPK, G8ACJ, G3LCH, G3XDY, G2HIF, G3FZL, G3WDG* and G4BEL.

The committee met 10 times during the period under review, and organized and adjudicated 20 contests covering most of the vhf/uhf/shf bands. Some changes in the format of these events have been made, especially on the IARU co-ordinated dates in March, May and October.

In Europe most contests cover all bands from 144MHz to 10GHz. Although the committee has not gone to that extreme, it has introduced more multiband events to help overcome the large gap that previously existed on some of the IARU dates. This move brought some criticism, but in general has been accepted very well.

There were two new contests added to the calendar last year, the European Meteor Scatter and the 1,296MHz Cumulatives. Although both these events were successful in encouraging activity on the bands, the number of entries was disappointing. They have again been included in the 1980 calendar – so let's have your logs this time please!

At the RSGB National VHF Convention in March the committee was under judgement at the "open forum", and many ideas were "aired" – including reducing the 70MHz operating hours in VHF NFD, and the proposed inclusion of 2,304MHz. Both these points are still under consideration, awaiting any comments which may result from this year's events.

Our new member for 1980 is Mr M. Pharaoh, G3LCH, from the Sutton & Cheam Radio Club. He has been a regular contest operator for many years, and replaces Mr L. Turner, G4CUT, who retired at the end of 1979 after serving many years on the committee – our thanks, Les.

Roger Taylor, G4BEL, chairman

*Corresponding members

REPORTS FROM THE . . .

. . . Amateur Radio Observation Service organizer

The observation service continues to send informal notices to holders of UK amateur licences who are heard by the observers to be operating their stations outside the terms of their licences. Reports sent out are normally only in respect of instances which could lead to the licence being suspended or cancelled if the station was heard by the licensing authority. At the present time there are 15 observers located throughout the country and covering all amateur bands.

In the amateur service we are fortunate to enjoy a high standard of operating discipline compared with many other user services. This, together with the technical requirement for an amateur licence, has resulted in a very small number of reports being sent out during the year. Those who have received them have appreciated their value in clearing a misunderstanding of a licence condition or helping to correct a transmitter fault.

The licence conditions which are currently being misunderstood are: **1(2)(d).** Some people are unaware that they should only address remarks to *licensed* amateur stations. There have been instances of remarks being addressed to unlicensed and unidentified stations.

9. Reports have been sent to stations which have not been identified adequately. Callsigns should not be garbled but should be pronounced clearly – use being made of the recommended phonetic alphabet as appropriate.

D. M. Pratt, G3KEP

. . . Emergency communications manager

The main theme thoughout the period has been the consolidation of Raynet, the Society sponsored emergency communications service, as a leader in this field both nationally and internationally. At the end of 1979 the emergency communications manager circulated member societies of IARU Region 1 with details of the RSGB emergency organization, and requests for further information were received from Malta, Italy, Cyprus, Norway, Switzerland, France and Iceland.

At the Friedrichshafen meeting in June, information was given on the operation of Raynet and the relations between the Society and the Home Office in the field of emergency communications; subsequently full details were sent to PA0LOU, chairman of IARU Region 1. Discussions took place on the possible effect on radio amateur emergency work as a result of resolutions at WARC 79, the need of common standards of working, and the exchange of information – leading to perhaps, the goal of "Euronet". Emergency communications are

expected to be on the agenda of the forthcoming IARU Region 1 conference in Brighton in 1981.

There has been a marked increase in requests from the user services for Raynet participation during county shows and similar events (under the special remit granted by the Home Office, definitive details of which were recently published in *Radio Communication*), to date a total of 30 applications have been approved.

At a meeting with the Home Office earlier in the year, verbal agreement was reached that Raynet could participate at charity-sponsored walks, hikes etc, providing these were non-commercial in context. This facility is gradually being brought into operation (applications via the emergency communications manager in the usual manner). At the same meeting the use of "talkthrough" facilities by Raynet was discussed, and as a result a formal application has been made for the use by Raynet of a "manned talkthrough" facility during properly-constituted exercises and genuine emergencies, in particular for use when hand portables are deployed at incidents.

In conclusion, thanks are due to other committees of the Society and to radio amateurs in general for their understanding of the special needs of an emergency communications service, both during excercises and emergencies. Raynet continues to grow in size and is a credit to the Society and the UK radio amateur.

P. Balestrini, G3BPT

. . . Video tape and film library co-ordinator

During the period of this review, the 12 titles in this library were booked on 87 occasions. This level of use is possible only because two copies of some of the titles are held, and most borrowers did not delay returning the items after use.

It is important to note that due to the popularity of this service it is advisable to book about three months in advance of requirements. Most programme secretaries who request a film/tape for the "week after next" have to be disappointed.

Suggestions of other titles to be considered for inclusion in the library would be most welcome from members who have viewed suitable films/tapes.

J. Anthony, G3KOF

. . . HF manager

It is pleasing to be able to report that there were no major national or international problems affecting the frequencies below 30MHz which required action during the year. The chief problem was the appalling interference coming from the USSR, which continued to disrupt communications on the higher frequency bands from time to time. No action taken by the Society, IARU, or the ITU itself in response to complaints by national administrations has had any noticeable effect. Strong direct action by the ITU seems to be the only possible solution.

The good news from WARC – the allocation of three new hf bands (10, 18, and 24MHz) and the extensive changes in use of 1·8MHz – means that band planning and other problems which these changes have created will be major agenda items at the IARU Region 1 conference in Brighton in 1981, and members views would be much appreciated.

As in the previous year, talks were held with representatives of a number of societies from all three IARU regions during meetings held by ARI (in Arona) and DARC (in Friedrichshafen), and also in this country. Unfortunately the Society's participation in the IARU programme to help to advance amateur radio in the lesser developed countries has made only slow progress, but publications have been made available to several societies at no (or much reduced) cost.

John Allaway, G3FKM

. . . Intruder Watch organizer

During the early part of the year, Intruder Watch was forced into low gear by the sheer volume of reported intrusions and problems of identification, although the enthusiasm and perseverance shown by the Intruder Watch membership continued unabated. The scale of the operation may be judged by the number of intrusions reported, which in the later part of 1979 were several hundred a month. The problem was further complicated by the retirement, at least temporarily, of the organizer on medical grounds.

Nevertheless a considerable amount of information concerning regular intrusions and band activity based on the work of Intruder Watch over the past 10 years was made available to the IARU delegation at WARC 79. After consulting other IARU member societies a study was made of the entire UK Intruder Watch operation, with the object of assessing the work-load and the possibility of reorganizing the system to utilize spare capacity on the society's data processor. Accordingly Intruder Watchers were asked to take part in an exploratory run using report forms adapted for acceptance by the data processor, and the results are now being assessed.

Through the good offices of many of its members the Intruder Watch system retains the ability to investigate and identify a high proportion of intruding printer-type transmissions, but continues to lack the equipment necessary to deal with the more sophisticated communication and data transmissions which continue to "stray" into the exclusive amateur segments of the spectrum.

S. A. G. Cook, G5XB

. . . VHF manager

The work of the vhf manager is divided more or less equally between his responsibilities to the Society and to IARU Region 1, to ensure that the vhf interests of both organizations are met with in as smooth a way as possible. The UK situation has seen a large amount of correspondence and telephone calls in connection with 144MHz band planning, and the need to come to an agreement on future operation with the devotees of Raynet, Oscar, a.m. and all the other specialist modes whose frequency allocations are invaded by perverse operators who are not inclined to see band planning as being a means of ensuring fair shares for all. The overall repeater situation and its organization through the VHF Committee and the Repeater Working Group in particular needed updating, and the new organization is now working smoothly and gives effective representation with countrywide open meetings. Liaison with the Telecommunication Liaison and IARU committees, as well as with other specialist working groups, has involved considerable time and effort in order to remain abreast of and in touch with developments in the ever-changing vhf situation.

IARU matters which involved RSGB policy or thinking were dealt with by attending meetings with the REF in Paris in March, and at the IARU meeting of vhf managers held at Maidenhead in April. Particular responsibilities for the RSGB in the fields of beacon planning, world-wide locator systems, and 432MHz European band planning for the future resulted from the meeting, in preparation for the IARU Region 1 Conference to be held at Brighton next year.

The future use of 50MHz and improved activity on 70MHz have been particular areas of promotion during the year, and the annual planning of the RSGB National VHF Convention, through the VHF Committee, and the Alexandra Palace exhibition vhf exhibit were important items in the vhf manager's diary, as were the special London Repeater Working Group's deliberations. All of which added up to a very full year's work in preparation for the smooth advancement of vhf operation and techniques in the UK.

T. P. Douglas, G3BA

. . . HF awards manager

From 1 January 1980, when the writer took over the task of hf awards manager, a total of 643 certificates have been issued worldwide. The tables below show what certificates have been issued and to which country:

Title of certificate	Total of certificates issued	Certificates issued since 1 January 1980
CDXC	164	14
IARU	4,248	329
WBC	7,519	192
DXLCA	421	20
BCRRA	381	9
BCRTA	2,765	43
WAC	Not known	36
		Total: 643

Title of certificate	Total certificates issued for each area since 1 January 1980						
	UK	*EU*	*NA*	*SA*	*AS*	*OC*	*AF*
CDXC	5	1	4	–	2	2	–
IARU	23	224	18	2	58	3	1
WBC	14	86	12	–	76	2	2
DXLCA	1	13	–	–	6	–	–
BCRRA	–	4	–	–	5	–	–
BCRTA	5	15	5	1	14	2	1
WAC	36	–	–	–	–	–	–

This total of 643 amounts to a considerable number per week, so if a certificate does not arrive as quickly as members would like – patience please. Would RSGB members please remember to enclose a copy of their *Radio Communication* address label with applications. When QSL cards are submitted please enclose an sae for return of the cards. Finally the hf awards manager and, he is sure, the members also, would like to thank the previous awards managers, Charles and Harriet Emary, for many years of sterling service.

P. Miles, G3KDB

PUBLICATIONS OBTAINABLE FROM RSGB

RSGB members *can obtain a* **10 per cent discount** *on the prices listed below* **at the time of ordering** *(excluding* Ham Radio Magazine *and* Ham Radio Horizons*). To obtain the discount, deduct 10 per cent, calculated to the nearest penny, from the total value of the order (using the latest price list) and enclose a remittance for the balance. Also enclose a recent* Radio Communication *address label as proof of membership.*

RSGB PUBLICATIONS

Technical books

A Guide to Amateur Radio (18th edn)	£2.99
Amateur Radio Awards	£3.41
Amateur Radio Techniques (7th edn)	£6.08
Amateur Radio Operating Manual	£4.96
Morse Code for Radio Amateurs	£1.28
OSCAR-Amateur Radio Satellites	£4.38
RSGB Amateur Radio Call Book 1981	£4.29
Radio Amateurs' Examination Manual (8th edn)	£2.65
Radio Communication Handbook (5th edn) Vol 1	£9.76
Radio Communication Handbook (5th edn) Vol 2	£8.50
Radio Data Reference Book (4th edn)	£4.82
Test Equipment for the Radio Amateur (2nd edn)	£5.67
TVI Manual (2nd edn)	£1.91
VHF/UHF Manual	£8.24
World at their Fingertips	£3.98

Logbooks

Amateur Radio Logbook	£2.83
Mobile Logbook	£1.12
Receiving Station Logbook	£2.65

Maps, charts and lists

Countries List/HF Awards List	32p
DX Globe (incl Securicor delivery)	£88
Great Circle DX Map (in tube)	£2.10
IARU Region 1 Beacon List	30p
IARU QTH Locator Map of Europe (wall)	£1.30
Oscar Map (in tube)	53p
QTH Locator Map of Western Europe (wall)	£1.30
QTH Locator Map of Western Europe (card for desk)	67p
UK Beacon List	30p
UK Repeater List	30p
World Prefix Map (wall)	£2.21

Members' sundries

RSGB hf contest log sheets (100)	£1.50
RSGB teeshirt (small, medium, large) (new design)	£3.38
RSGB tie (blue, maroon, green)	£3.23
RSGB pennant	£2.45
RSGB station callsign plaque*	£6.70
RSGB deluxe lapel badge*	£3.80
Callsign lapel badge*	£2.10
Lapel badge (RSGB emblem, pin fitting)	73p
Members' headed notepaper (50 sheets) quarto	£1.04
Members' headed notepaper (50 sheets) octavo	73p
QSL card holders	£1.11
Radio Communication back issues *(As available)*	94p
Radio Communication bound volume, 1978	£14.78
Radio Communication Easibinder	£4.12

**Delivery approximately five weeks*

Car window stickers

"I'm on the air with amateur radio" (four colours)	82p
"I'm monitoring -5 are you?" (two colours)	66p
RSGB badge	38p

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

POSTAL TERMS: Cash with order. Stamps and book tokens cannot be accepted. Cheques and postal orders should be crossed and made payable to "Radio Society of Great Britain". Giro A/C No 533 5256. Please write your name and address clearly on the order.

OTHER PUBLICATIONS

Title	Publisher	Price
A course in Radio Fundamentals	ARRL	£3.10
Active-filter Cookbook	SAMS	£12.69
All about Cubical Quad Antennas	RPI	£2.90
Amateur Television	BATC	£2.28
Antenna Anthology	ARRL	£3.66
ARRL Electronics Data Book	ARRL	£3.33
ARRL Ham Radio Operating Guide	ARRL	£3.37
Beam Antenna Handbook	RPI	£4.02
Better Short Wave Reception	RPI	£3.56
Care & Feeding of Power Grid Tubes	VARIAN	£2.98
CMOS Cookbook	SAMS	£9.54
FET Circuits	SAMS	£4.46
FM & Repeaters for the Radio Amateur	ARRL	£3.88
Hints and Kinks for the Radio Amateur	ARRL	£3.26
IC OP-AMP Cookbook	SAMS	£11.82
IC Timer Cookbook	SAMS	£8.70
Int VHF-FM Guide (1980 edn) (out of print)	P&B	
Practical Antennas for the Radio Amateur	SCELBI	£7.94
Radio Amateur Callbook – DX listings	ARCI	£11.28
Radio Amateur Callbook – USA listings	ARCI	£11.67
Radio Frequency Interference	ARRL	£3.02
Radio Valve & Semiconductor Data Book	NEWNES	£4.28
RTTY the Easy Way	BARTG	£1.11
Saga of the Vacuum Tube	SAMS	£8.88
Simple Low-cost Wire Antennas	RPI	£3.07
Single Sideband for the Radio Amateur	ARRL	£3.70
Solid-state Basics	ARRL	£4.67
Solid-state Design for the Radio Amateur	ARRL	£6.09
The ARRL Antenna Book	ARRL	£4.13
The Complete Handbook of Slow Scan TV	TAB	£5.72
The Radio Amateurs Handbook (Paperback)	ARRL	£7.89
The Radio Amateurs VHF Manual	ARRL	£4.03
TTL Cookbook	SAMS	£8.42
Understanding Amateur Radio	ARRL	£3.87
Unique "IC" OP-AMP Applications	SAMS	£4.54
Vertical Beam & Triangle Antennas	SAMS	£4.98
World Atlas	RACI	£1.88
World Radio TV Handbook, 1980	BILL	£9.75
80m Dxing	CTI	£3.03

MORSE INSTRUCTION AIDS

Morse code cassette. Stage 1	£3.82
(Stages 2 and 3 should be available shortly)	

MAGAZINE SUBSCRIPTIONS

QST (including ARRL membership). One year	£11.84
Two years	£22.60
Three years	£32.85
Air mail, one year	£20.00

Subscriptions for *QST* should be sent to RSGB, 35 Doughty Street, London WC1N 2AE.

Ham Radio Magazine (per annum) (incl air delivery)	£14.00
Ham Radio Horizons	£6.00

Subscriptions and changes of address for *Ham Radio Magazine* and *Ham Radio Horizons* should be sent to: Ham Radio Magazine (UK), PO Box 63, Harrow, Middlesex HA3 6HS.

ORDER FROM: **RSGB Publications (Sales), 35 Doughty Street, London WC1N 2AE**

(Raynet supplies should be obtained from Mrs Balestrini, QTHR G3BPT)

Printed in Great Britain for the RADIO SOCIETY OF GREAT BRITAIN, 35 Doughty Street, London, WC1N 2AE
by E T Heron & Co Ltd, Essex and London