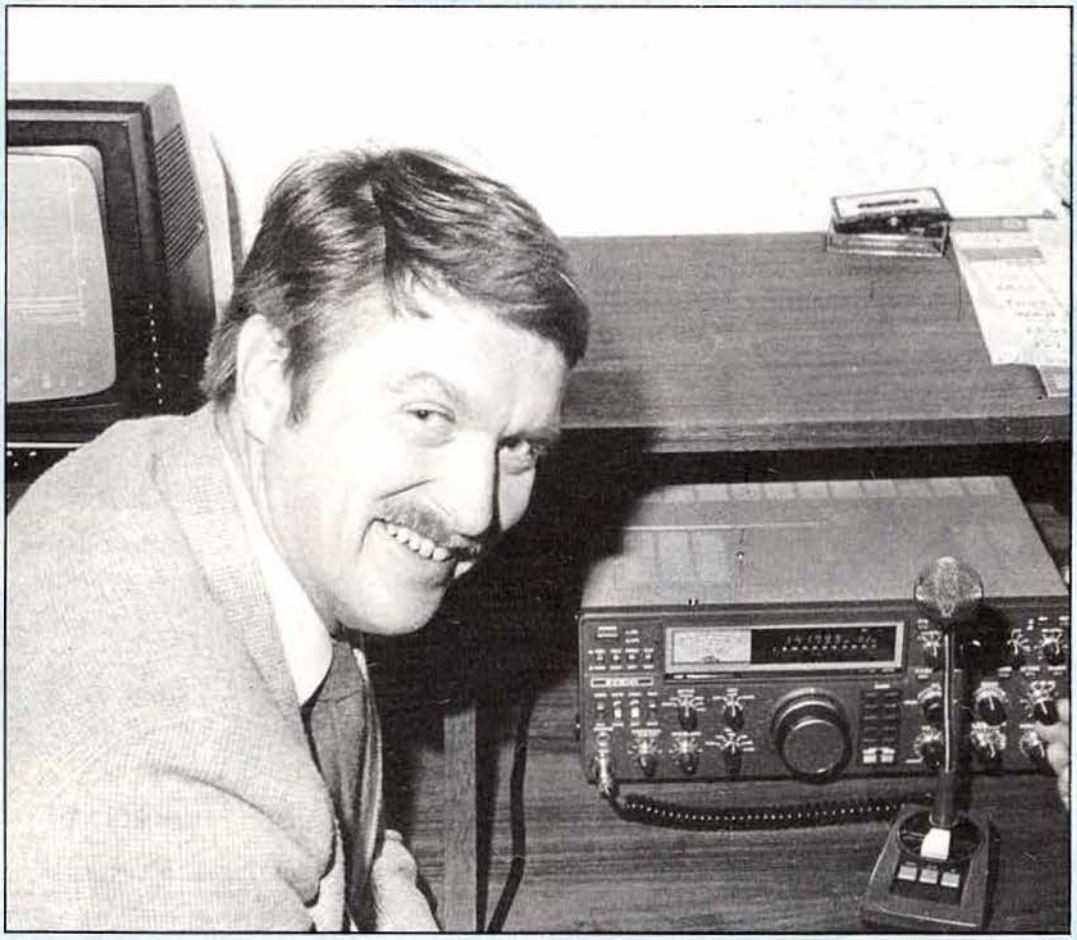
November 1984

RADio COMmunication

ASTRONAUT / AMATEUR VISITS RSGB HQ



Astronaut Dr Tony England, WOORE, at the RSGB headquarters station GB3RS during his visit on 28 September 1984. (See page 948)

Journal of the Radio Society of Great Britain

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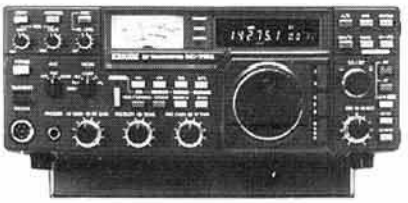

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Technical articles on subjects of amateur interest are always welcome and should be sent to: The Editor, *Radio Communication*, 88 Broomfield Road, Chelmsford, Essex CM1 1SS.

All articles received are reviewed for technical merit by the RSGB Technical & Publications Committee, or an acknowledged expert on the subject, before acceptance. Payment at high competitive rates will be made for all articles published.

A contribution will only be considered for publication on the understanding that the person submitting it is the original author and owner of the whole copyright, and that on acceptance for publication such copyright will become the property of the RSGB in consideration of the above-mentioned payment by the RSGB to the contributor.

The editor will be pleased to send intending authors a manuscript preparation guide and to give any other advice and assistance requested.

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the TH21E & TH41E, hand size handhelds.

In trying to describe the new 2 metre FM transceiver from TRIO, I am faced with a major difficulty. The TH21E is small, 2.24 inches wide, 4.72 inches high and only 1.1 inches deep but size alone is not the rig's fascination. Only by holding the transceiver can one begin to appreciate the attention that has been placed on its ergonomics. The way in which the TRIO TH21E, once picked up, seems impossible to put down. Its ability to slip into the inside pocket and for you to forget you have it. So far no one who has seen a TH21E has been able to resist picking it up, it's as simple as that.

There is also a 70 centimetre version of the TH21E available, the TH41E.

Operating the TH21E could not be easier. Thumbwheel switches being used to set the frequency, the last digit being set by a simple top panel switch. Power output is 1 watt (HI) and 150 milliwatts (LOW). I have used the rig over the past few days and have been really amazed at the distance that can be covered on 1 watt. Both transceivers have repeater shift, the tone burst switch is on the top panel. Microphone and earphone sockets are also located on the top panel enabling both the conventional speaker/microphone and the NEW TRIO HMC1 headset to be used. A clever feature of the headset is that it has, incorporated in its connecting cable, a minute vox unit. The transceiver comes complete with aerial, nicad battery pack and charger.

I am pleased that I can claim one of the rigs to use at home prior to writing the advertising and let the rest of the company fall out about who is having the other one. Never before can I remember two handhelds that have had such fascination.

TH21E	2 metre transceiver	**£175.00** inc VAT, carr £7.00
1H41E	70 centimetre version	**£198.00** inc VAT, carr £7.00
SMC30	speaker/microphone	**£21.50** inc VAT, carr £1.00
HMC1	headset with VOX	**£25.00** inc VAT, carr £1.00
DC21	DC power supply	**£18.98** inc VAT, carr £1.00
PB21	Nicad battery case	**£18.58** inc VAT, carr £1.00
BT2	Dry battery case	**£9.00** inc VAT, carr £ .75
SC8	Soft case	**£9.88** inc VAT, carr £ .75
EB2	External battery case	**£14.58** inc VAT, carr £1.00

the TR2600E & TR3600E, handhelds with DCS.

I have been using the TRIO TS711E VHF 2 metre base station for some time now. The transceiver has, as standard, a digital code squelch facility which when used in conjunction with our other TS11E operated by my colleague David, G4KFN, has proved most useful.

It was with considerable interest, therefore, that I greeted the news that TRIO were going to introduce a higher specification version of the current TR2500 that would incorporate this new call facility. As the TS711E can also be programmed to send your callsign digitally at the beginning and end of each transmission, I wondered whether TRIO would include this useful facility on the new rig.

The answer is yes! The new TR2600E has digital code squelch and will also send your callsign automatically. The digital code squelch and callsign ability are not the only new features to be incorporated into the new TS2600E. Each memory will store both frequency and whether or not the rig was set with simplex or repeater shift: Most useful on today's FM scene when a contact made by repeater quickly becomes a simplex one. Two modes of memory scan are available, the rig looking for either a clear or a busy frequency. Having locked on a signal, scanning resumes after a timed period or when the carrier drops (in open channel scan, when a carrier appears). Programmable scan is as the TR2500, lower and upper scan limits are entered into memories 8 and 9, any multiple of 5 kHz (10, 15, 20, 25 kHz) being programmable. The TR2600E also has a priority channel and the ability to omit selected channels from the scan pattern. Anyone who has used a TR2500 will know that occasionally one or two frequencies entered in memory become superfluous. To remove these frequencies without removing everything would be most useful. A definite advantage is that the time taken for memory scan is shortened. The new higher specification TR2600E has this facility. The normal up/down frequency shift facility of the TR2500 is retained along with lockout switches for press to talk and keyboard entry. The frequency readout is improved, the full 145.500 digits being displayed and to stop the operator having to continually give 5 by 9 reports the TR2600E has an S meter as part of the top panel which doubles as a battery state indicator.

For the UHF enthusiast there is also a 70 centimetre version of the TR2600E, the TR3600E.

Until now, the TRIO TR2500 and TR2600 were 'the" hand held FM transceivers for 2 metres and 70 centimetres—the TR2600E and the TR3600E, with their higher specification, provide the only alternative.

TR2600E	2 metre handheld complete with DCS.	**£269.88** inc VAT, carr £7.00
TR3600E	70 centimetre handheld with DCS.	**£289.00** inc VAT, carr £7.00
BC2	AC Charger	**£10.98** inc VAT, carr £1.50
DC26	DC/DC converter	**£19.47** inc VAT, carr £1.50
EB3	External battery case	**£14.45** inc VAT, carr £1.00
HMC1	Headset with VOX	**£25.00** inc VAT, carr £1.00
PB26	Nicad battery pack	**£30.50** inc VAT, carr £1.00
SC9	Soft case	**£18.50** inc VAT, carr £1.00
SMC30	Speaker/microphone	**£21.58** inc VAT, carr £1.00

TRIO

TRIO-KENWOOD CORPORATION

Shionogi Shibuya Building, 17-5, 2-chome Shibuya, Shibuya-ku, Tokyo 150, Japan

TRIO-KENWOOD COMMUNICATIONS, GmbH

D-6374 Steinbach-TS. Industriestrasse,8A West Germany

the TS711E & TS811E, base station transceivers for VHF and UHF.

Ever since the demise of the TRIO 700 series of equipment, we, here at LOWE ELECTRONICS have been campaigning for the introduction of a new "true base station" transceiver. Those who have used a TRIO TS700S or G will know what I mean. There is that certain feel which a base station transceiver has which the mobile or portable rig, when taken out of the car or used in the shack, definitely has not. I am pleased to say that TRIO have introduced a new 2 metre base station, it is called the TS711E. I have been fortunate enough to have used the transceiver over the past couple of weeks and again I am lost for words. Certainly there will be a TRIO TS711E in my shack, I have even prepared a space for it!

Having used the rig let me explain some of its features. In size, weight and appearance the TS711E is similar to the TS430S HF transceiver but unlike the TS430S it has its own internal power supply. It also has an inbuilt speech processor and IF shift, both ideal features for today's active 2 metre band. Power output is 25 watts but the rig I have been using produces 32. Typical TRIO! The TS711E has two VFO's and, wait for it, forty memory channels. Yes, I too wondered how one could use so many memories.

Initially I started to use the rig as I had my dual band TRIO TS780. One VFO left on 144.300 and the other on 145.500. Since the rig remembers both frequency and mode there was no problem operating SSB on one VFO and with the electronic click step engaged, FM on the other. Electronic click step?. . .the TS711E has been designed so that as a multi-mode rig you can have a free running VFO on SSB and CW and when operating FM, a VFO 5 or 12.5 kHz click steps. I refer to the click step as electronic because a touch switch instantly changes the VFO function. Of course, I need not tell you that the memories remember which VFO operation has been selected or for that matter whether repeater shift was required. On SSB and CW the TS711E's synthesized VFO tunes in 10 Hz steps.

After using the rig for some time without the 40 memories I concluded that since it was possible to move a frequency from memory to VFO it would make sense to program the memories logically and then use them as a basis for operating. Result, the rig is a dream to use. With the TS711E's memory carrying a sequence of calling channels, beacon, simplex and repeater frequencies a swift rotation of the VFO (which also serves to change memory channels) and the entire band can be looked at in seconds. To check on OSCAR 10, dial up the correct memory holding say the satellite beacon frequency, if that's audible then move the beacon frequency to the VFO by pushing the appropriate switch and there you are, tuning the correct part of the band, in the right mode and with the VFO running free. The same can be applied to the CW end of the band and with the VFO set to click stop, FM channels also.

There are facilities to put both VFO's on the same frequency, to operate split using one VFO for receive and the other for transmit. A priority call channel is available as is the ability to go back to a predetermined frequency. The TS711E will scan the band or the memories holding for a brief period on an occupied frequency. It will also scan the memories looking at only those frequencies entered in a particular mode. Programmable scan is also included, memory channels 39 and 40 setting the limits. The now standard full repeater facilities are included.

For the blind operator the TS711E is a dream come true. Full voice announcement of frequency and whether the rig is set to repeater shift comes by fitting the optional VS1 board. A push button, conveniently located on the bottom corner of the front panel, activates the voice. The careful location of this control shows TRIO's attention to detail. How difficult would the switch have been to find for the blind operator had it been located in the middle of the panel. Mode of operation is indicated by switches which when pushed instead of a general beeping, send the morse code letter F for FM, U for USB, C for CW, L for LSB and A for auto. Auto, whats auto?. . .With auto switched on, as you tune across the band the TS711E selects the correct mode for the appropriate frequency. You can over-ride this function and as I have said elsewhere, *you too can transmit FM on the SSB part of the band.*

Enough I hear you say. Sorry, one more feature. DIGITAL CODE SQUELCH! The transceiver has as standard an inbuilt selective tone call system incorporating a call alarm. So if you are not in the shack, then you will know you have been called. The transceiver will also send up to 6 letters or numbers as part of the selective call. I am sure it will not be long before TRIO introduce a TS711E accessory (I am told it is called the CD-10 call sign display) which will decode the information. Then will you not only know that you have been called but who has called you, the 6 letters or digits making up the callsign.

What more can I say, what a rig! For the operator who wants the finest two metre base station transceiver TRIO have produced the TS711E. For the UHF operator there is the TRIO TS811E, the 70 centimetre version. Both ideal ways of getting on to the VHF/UHF bands.

TS711E.....	2 metre base station transceiver with DCS.	**£785.00**	inc VAT carr £6.00
TS811E.....	70 centimetre base station transceiver with DCS.	**£878.00**	inc VAT carr £6.00
CD10.....	Callsign display unit	**£105.40**	inc VAT carr £6.00
SP430	Matching speaker	**£30.99**	inc VAT carr £2.50

The new DCS system has also been applied to the popular compact mobiles, the TM201A and TM401A. The NEW transceivers are the TM211E for two metres and for 70 centimetres, the TM411E. The two rigs also have front panels whose viewing angle can be adjusted. So what was an easy to accommodate rig becomes much more so. The tight space which would take a rig but where you could not see its front panel is a thing of the past. Add the convenience of a digital code squelch system, 25 watts output on the 70 centimetre TM411E and the two new rigs from TRIO provide the only alternatives to the TM201A and TM401A.

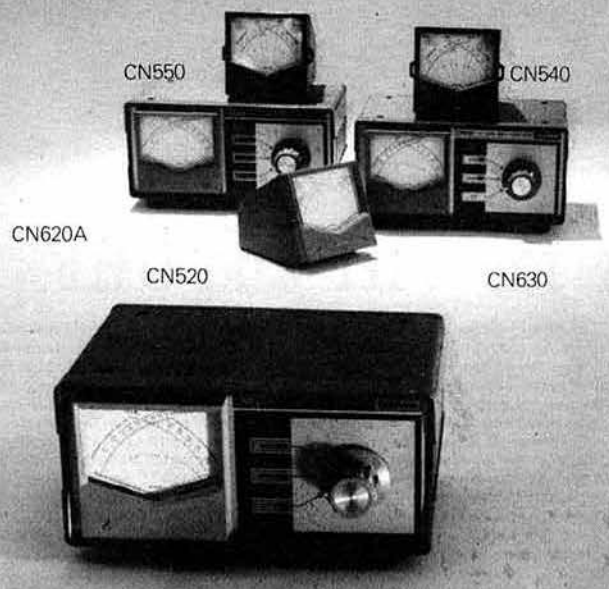
TM211E.....	2 metre FM mobile with DCS.	**£360.00**	inc VAT carr £6.00
TM411E.....	70 centimetre FM mobile with DCS.	**£410.00**	inc VAT carr £6.00
CD10.....	Callsign display unit	**£105.40**	inc VAT carr £6.00

the TM211E & TM411E, mobile with DCS.

LOWE ELECTRONICS Ltd

CHESTERFIELD ROAD MATLOCK DE4 5LE TEL 0629 2430/2817

for "cross needle" metering, DAIWA



What's so special about "cross needle" metering? Well, it's typically Daiwa to go direct to the heart of the matter and develop a system which will give you the true value of forward power, reflected power, and SWR all at a single glance. The elegant simplicity of the idea hides a great deal of thought, which of course is the hallmark of Daiwa products.

You will see from the photograph that the meter displays have two scales, one reading forward power, the other reflected power. Since SWR is calculated using these two values, Daiwa have arranged the meter pointers so that SWR is shown at the crossing point of the two meter needles.

Why don't other makers use the idea? Basically it's a question of power meter accuracy. The usual type of single or twin meter "SWR/power meter" uses a simple strip line to measure the VSWR on the transmission line. You will note that I have said "VSWR", and this is important. These so-called power meters are in fact only measuring the voltage standing wave and in order to display power, you need to monitor both voltage and current in the line. Daiwa meters of course, do just that, and consequently are very accurate indeed. The cheaper so-called power meters depend for their accuracy in being terminated in a load, and exhibit wild inaccuracy when terminated in a reactive load. In other words, when the indicated VSWR on the meter is other than 1:1, their accuracy is quite badly affected.

To summarise; the Daiwa cross needle power meters give you easy, unambiguous readings at a glance, and what's more those readings are accurate even in lines displaying high SWR, and since Daiwa meters measure true power, they are accurate at any point in the feedline from transmitter to aerial.

As with all Daiwa products, their meters show the Daiwa approach design, combining accuracy, ease of use and interpretation, and that indefinable feel of quality which is the sure sign of a good product. Once owned, never discarded.

CN520	1·8-60MHz	£39.50 inc VAT
A500	mounting bracket for above meters	£2.10 inc VAT
CN620A	1·8-150MHz up 1kW	£66.21 inc VAT
CN630	140-450MHz up to 200W	£98.11 inc VAT
CN650	1·2-2·5GHz up to 20W	£129.50 inc VAT

Carriage on "5" series meters £1.50, on "6" series £2.50.

the 2 metre BELCOM LS202E, hand held FM & SSB.

Until now, dual mode 2 metre transceivers have been available suitable for shack, car or shoulder operation. Mobile they may have been but convenient lightweight hand portables they were not. With the advent of the BELCOM LS202E that has now changed.

- Full coverage of the 2 metre amateur band from 144 to 146MHz in 5 KHz steps on both SSB (Upper and Lower) and FM, selection of frequency by means of rotary thumb wheel switches. In addition, a VXO control giving +/− 5 KHz frequency shift and RIT with centre click stop are provided on the top panel. For night time operation the frequency readout and S meter can be illuminated by an internal LED.
- The use of hybrid IC's and a miniature SSB crystal filter has made the LS202E even smaller than some of the existing FM only handheld portables. The rig measures 62mm wide, 40mm deep and 165mm high, small enough for your jacket pocket and weighs only 520 grammes.
- RF power output SSB(PEP), FM 3.5 watts (at 10.8 volts)
  2.5 watts (at 7.2 volts)
  1.5 watts (at 6 volts)
- The LS202E is equipped for repeater operation having both frequency shift and 1750 Hz tone burst.
- A comprehensive range of accessories is available . . . .

LS202E..... £225 inc. VAT

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EMPORIUM NEWS

Good Morning

Just back from the **Scottish Convention,** which I really enjoyed. The **Glasgow club** certainly have the venue and expertise to organize a good Exhibition and **my thanks** on behalf of the company go to them.

The only new models which we were able to display were the **TS711E** 2 metre base station and the **TR2600E** 2 metre hand portable, the other pre-production models having been returned to TRIO. Although we now have a considerable waiting list for the TS711E it was the new **higher specification** version of the TR2500, the TR2600E, which was in demand —in fact, I had to break a "Lowe Electronics' Golden Rule" and sell at the end of the Convention the demonstration transceiver. I spent a lot of time discussing **the merits of DCS** (Digital Code Squelch) with interested amateurs. It would appear that I am not the only person to want a quiet net frequency. There must be many of us who look back on the days when the band was **a little quieter.** Of course no one can now complain that 2 metre contacts are not available. With the **TRIO DCS system** a frequency can be monitored and unless the calling station has your code then the rig will remain silent. Above all, the system is easy to use and apply to any FM frequency you choose. Once set you can get on with other jobs in the shack confident that you will not be disturbed and that you will miss nothing, **even if you have to make your own tea** and possiblly even carry the cup or mug to your shack. If you have been called in your absence then the rig will be telling you so. **The TS711E** does this by means of **a quiet tone** emitted from the rig which sounds until you cancel it— **the TR2600E** has a **yellow indicator light,** which, when your code is actuated, lights and remains lit until you cancel it. Very clever, very simple and **typically TRIO.**

TS-711E £785.00 inc VAT
TS-811E £878.00 inc VAT

I am sure I've told you of my doubts regarding DCS, now I wouldn't be without it. It is, in fact, that like the telephone, the first DCS rig was no good until the invention of the second but with the volume of sales that we are experiencing here at Matlock it will not be long before there are many stations using the system. If you have one and your friend is considering a new rig **tell him about the TRIO DCS System.**

Back to the tea. I am very fortunate to have a wife devoted to looking after my every need. It is a fact that I would have to consult the cooker instruction book in order to turn it on and as for how many tea bags are needed, **I have no idea.** What a wonderful thing it is to have a wife who understands the hobby of Amateur Radio.

On our club visits this year we have had a little competition using **the Telereader CWR610E Code Master.** As the unit not only decodes RTTY ASCI and CW at various speeds, but when keyed by hand gives an accurate readout of what you sent, you will have some idea of the style of our competition. The Telereader CWR610E is **easy to use** and coupled with a short wave general coverage receiver is capable of giving much pleasure. There can't be many radio amateurs who, when tuning over an RTTY signal, have not wondered what is being sent. With **a CWR610E Code Master in your** shack then **much is revealed.** I'm afraid I can't tell you what to listen for but I assure you that armed with a good aerial, a general coverage receiver, a CWR610E Code Master and either a monitor or television, then you are set to read a great deal and be fascinated.

I am pleased to say that we now have **new shops** in both **London** and **Cardiff.** The Cardiff shop, under the management of **Richard GW4NAD,** is now fully set up and easily found in Clifton Street, Cardiff. The shop is not at street lvel but it on the first floor of **South Wales Carpets.** Enter the carpet shop and follow the signs which will direct you to our shop. The shop has our full range of products on display. Leaflets are also freely available as well.

The **new London shop** is now in operation at 223/225 Field End Road, Eastcote. The shop is much larger and **Andy G4DHQ** is on hand to advise. Car parking is available behind the shop and costs only **20p** for the whole day. I definitely recommend that you pay and display as the car park gets its visit from "The Patrol" and the fine is £6.00. On my last visit the patrol man was checking my car—**of course I had paid my 20p.** For the quick visit street parking outside the shop is available, though I have noticed the gaps are quickly filled. I can also recommend next door but one, the **"knife and fork"** restaurant; they certainly know how to look after their customers. On my visits to the shop whilst building work has been in operation, cups of tea and biscuits have appeared as if by magic. For those who are partial to a steak there is a **Berni** just down the road. That reminds me, there's a **Berni** the other way too! I am flattered that **Amateur Radio Exchange** also share my view that **Eastcote** is a good place for a shop. They have decided to supply a **Hi Fi shop** with **Kenwood amateur radio equipment.** The shop is just down the road from our own. On my last visit to London I popped in to see what it was like. I must admit there seemed to be more **Hi Fi** than **amateur radio equipment**—so, for those who wish, a visit to Lowe Electronics in Eastcote can be combined with a look at A.R.E.—**an opportunity to compare the two.**

It is with great pleasure we announce that Jim Fish G4MH has just been appointed a Trio dealer. Those who have known Jim over the years will, I am sure, be delighted that the "Amateur Radio Shop", Huddersfield is now a source of the best in Amateur Radio.

Moving to CW, we stock a range of equipment to help you through the test. I cannot overstate the flexibility of the CWR510E Code Master. At **£8.79,** carriage £1.00 we have a self-contained Morse Practice Oscillator. The two straight keys we have are the simple **HK708** at £15.27, carriage £2.00. A more de luxe version is the **HK702** which has a marble base, at least it looks like marble. The **HK702** costs £31.03, inc VAT and carriage is £2.25. For the electronic enthusiast there is the **EK150** and **MK1024** priced at £96.12 and £169.50 respectively, carriage is the same for both items being £2.50. The EK150 has built-in side tone and is either solid state or relay keying. The MK1024 is much **more sophisticated** having a **1024 bit memory.** Last, but certainly not least, is the **Daiwa DK210** electronic key which has a **"weight"** control, an unlikely name but gives the electronic key a **human feel.** To operate the **DK210** which, incidently, costs **£50.51** inc VAT, carriage £2.25, you need a squeeze paddle. The item is an **MK704** and costs **£14.57,** carriage £1.00. Altogether a nice selection and all good value for money. Especially that green screen monitor which has to be seen in order for its quality to be appreciated.

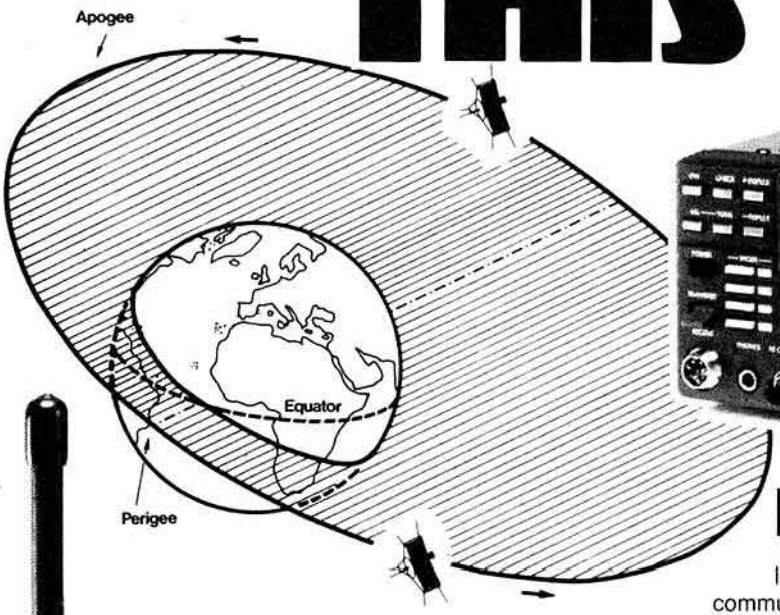
For some reason our **second-hand** shelves **seem empty.** No sooner has a rig been placed on the shelf, appeared on our list of current second-hand equipment published each Thursday, **than it is sold.** The same is also happening at the Lowe Shops. In order to fill our second-hand shelves, why don't you ring to find out what your old rig is worth. Many people are pleasantly surprised when told the value of their equipment. The latest equipment from TRIO could be in your shack for less than you think. Of course there are certain pieces which have a **"Reputation"** or are just too old but these are few. I repeat why not give us a ring, **either to your local Lowe Shop or here at Matlock. TRIO** have recently **reduced** the **price** of the **TS430S,** for further details please **ring.**

Anyway, that's about it for now as **Beryl** has just produced her **holiday photographs** and I, being a keen photographer, want to check her **exposure!**

So until next month Gud DXes 73es FBYLS, XYLS, esFBOM, etc.

David G8GIY

ICOM IS OUT OF THIS WORLD.



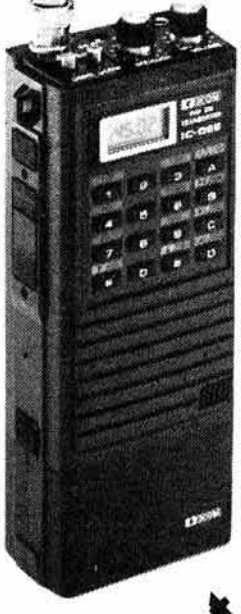
IC-271 & 471

ICOM can introduce you to a whole new world via the world communications satellite OSCAR. Did you know that by making simple modifications, you can Tx to OSCAR on the 430-440MHz IC-471 and Rx on the 2m. IC-271.

Once these modifications have been made you can track the VFO's of the Rx and Tx either normally or reverse. This is unique to these ICOM rigs and therefore very useful for OSCAR 10 communications. Digital A.F.C. can also be provided for UOSAT etc. This will give automatic tracking of the receiver with digital readout of the doppler shift.

The easy modifications needed to give you this unique communications opportunity are published in the December '84 issue of OSCAR NEWS. Back issues of OSCAR NEWS can be obtained from AMSAT (UK), LONDON, E12 5EQ.

BUT, ON THE OTHER HAND...



IC-02E IC-04E, (70cm).

The new direct entry microprocessor controlled IC-02E is a 2 meter handheld jam packed with excellent features.

Some of these features include: scanning, 10 memories, duplex offset storage in memory and odd offsets also stored in memory. Internal Lithium battery backup and repeater tone are of course included. Keyboard entry is made through the 16 button pad allowing easy access to frequencies, duplex, memories, memory scan and priority.

The IC-02E has an LCD readout indicating frequency, memory channel, signal strength, transmitter output and scanning functions. New HS-10 Headset, with earphone and boom microphone, which operates with either of the following:- HS 10-SB Switch box with pre-amplifier giving biased toggle on, off and continuous transmit. HS 10-SA Voice operated switch box, with pre-amplifier, mic gain, vox gain and delay. The IC-2E continues to be available.

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ICOM PRICES ARE DOWN TO EARTH.

(Please contact us or your local Icom dealer for current prices)

IC-751

The IC-751 could be called the flagship of the ICOM range as it features 32 memory channels, full HF receive capability, digital speech synthesizer, computer control and power-supply options. The 751 is fully compatible with ICOM auto units such as the AT-500 and IC-2KL. The IC-751 now has a remote push-button frequency selector pad

Standard features include: a speech processor, switchable choice of J-FET pre-amp or 20dB pin diode attenuator and two VFO's, marker, 4 variable tuning rates, pass band tuning, notch, variable noise blanker, monitor switch, direct feed mixer in the front end, full break-in on CW and AMTOR compatibility.

The first IF is 70.045 MHz. Any XIT and RIT adjustment is shown on the display. The transmitter features high reliability 2SC2904 transistors in a low IMD (-32dB@ 100W) full 100% duty cycle. For more detailed information on this excellent set, please get in touch with us.

IC-R71E

For those who like the easy life, the R71E has the option of an infra-red remote control unit, making it a very sophisticated rig indeed, here are some details.

100 KHz – 30 MHz all mode (with FM option). Quadruple conversion superhet. IF frequencies 70MHz,9MHz and 455KHz with continuous bandpass tuning and notch filter. Virtually immune from adjacent channel interference with 100db dynamic range. Adjustable AGC, noise blanker and switchable pre-amplifier. Direct keyboard into twin VFO's with 32 programmable memories. 5 year lithium memory backup cell. Memory and band scan with auto-stop. Tuning rates 10Hz, 50Hz and 1 KHz with 6 digit readout. AC mains operation. Auto squelch tape record function.

OPTIONS:- Synthesized voice readout, infra-red remote controller, 12 V DC kit, mobile mounting bracket, two CW filters 500 and 250 Hz, FM unit, computer interface, headphones.

Agent: Gordon G3LEQ, or telephone Knutsford (0565) 4040. Please telephone first, anytime between 0900 – 2200 hrs.

You can get what you want just by picking up the telephone. Our mail-order dept. offers you: free, same-day despatch whenever possible, instant credit, interest-free H.P., telephone Barclaycard and Access facility and a 24 hour answering service.

Please note that we now have a new retail branch at 95, Mortimer Street, Herne Bay, Kent. Give it a visit, BCNU.

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Thanet Electronics
Dept RC, 143 Reculver Road, Herne Bay, Kent.
Tel: (02273) 63859/63850

ICS... Professional Data

✻ ✻ ✻ UK made

AMT-2 ALL MODE TERMINAL UNIT

A new standard in intelligent terminal units, the AMT-2 gives superlative AMTOR/RTTY/CW/ASCII performance when used with any computer equipped with a serial interface and ASCII terminal emulation software. Incorporates its own microprocessor for code conversion, leaving your own computer free to do other creative tasks.

Many programmable features and excellent 'on air' performance. The AMT-2 is the logical successor to the proven AMT-1 which is presently in use on all continents and by both ARRL and RSGB headquarters stations. The AMT-2 offers the following features:

- —Built in 'panadaptor' type LED tuning indicator
- —12 Volt DC input
- —Programmable data rates
- —Wide/narrow receive shifts
- —CW receive as standard
- —300/1200 Baud RS232 computer interface
- —RTTY 'Squelch' to prevent printing on noise
- —Excellent demodulator circuit with 4 pole bandpass filter
- —European IARU tones
- —FSK and AFSK outputs

Your computer needs no specialised RTTY software.

Price: **£199.95**
P&P: £2.50

Whilst the AMT-2 will operate with any general purpose ASCII data communications software, specialised software is available from ICS for the following micros which incorporates additional amateur radio operating features:

Computer	*Items supplied*	*Price*
Commodore 64	Cartridge or disc plus cable	**£45.00**
VIC-20		**£45.00**
BBC Model B		**£39.00**
IBM-PC		**£20.00**
Apple II		**£20.00**

Add £1.00 p&p

THE AMT-2 IS FIRST CHOICE FOR THOSE WHO WANT MAXIMUM PERFORMANCE AND VERSATILITY; MAY WANT TO WRITE THEIR OWN CONTROLLING SOFTWARE, OR MAY WISH TO CHANGE COMPUTERS IN FUTURE WITHOUT BUYING NEW SOFTWARE.

✻ ✻ ✻ USA made

CP-1 TERMINAL UNIT

This excellent modulator/demodulator incorporates its own 'magic eye' tuning indicator and comes with an external 240 Volt power supply. Separate mark and space filters link to a front panel tuning control which permits adjustment for any shift up to 1000Hz. The CP-1 has the sensitivity to pick out RTTY signals close to the noise level and it also incorporates an excellent CW demodulator. Interface to the computer is at TTL or (optionally) RS232 levels. Unlike the AMT-2, this unit does not incorporate its own microprocessor and therefore requires special RTTY software to run in your computer. It is compatible with most available RTTY software.

Other features are:

- —IARU tones
- —FSK, AFSK and oscilloscope outputs
- —Front panel tone reversal switch
- —Simple connection to SPKR, MIC, PTT lines on your transceiver.

Price: **£165.00** p&p £2.50

Compatible software available from ICS is as follows:

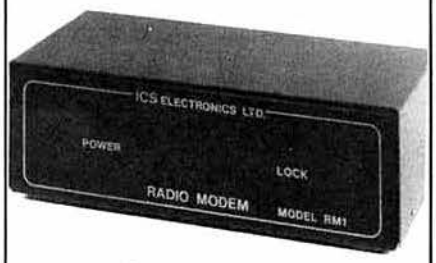
Computer	*Modes*	*Price*
Commodore 64	RTTY/CW/ASCII	**£33.91**
Commodore 64	AMTOR/RTTY/CW/ASCII (MBATOR)	**£60.00**
VIC-20	RTTY/CW/ASCII	**£33.91**
BBC Model B	RTTY only	**£33.91**

Add £1.00 p&p

The price of the software includes a made up interface cable, keyboard overlays and manual.

THE CP-1 IS FIRST CHOICE FOR THOSE WISHING FOR THE BEST POSSIBLE PERFORMANCE ON H.F. USING RTTY CODE CONVERSION SOFTWARE RUNNING ON A HOME MICRO COMPUTER.

✻ UK made



RM-1 RADIO MODEM

The RM-1 is a ruggedly built, low cost modem which offers the minimum needed to get on the air with conventional RTTY or high speed ASCII data communication. It is designed primarily for use on VHF with AFSK, where signal levels are generally good and QRM levels are relatively low. The RM-1 lacks the extensive filtering and tuning indicators of our other units, but the performance is surprisingly good for the price. It is also provides adequate performance on HF, provided you do not want to work extremely weak signals.

Three modes are selectable:

- 170 Hz IARU tones for RTTY use
- Wide shift IARU tones for ASCII data transmission at up to 1200 Bauds (can also be used to demodulate 425, 850Hz shift RTTY).
- CW transmit and receive.

Other features are:

- —Interface and software compatible with the CP-1 and AMT-2
- —Plugs in in place of the AMT-2 for high speed data trasmission.
- —Both TTL and RS232 level interfaces are provided
- —Tone reversal switch
- —12 Volt DC input
- —Simple MIC/SPKR/PTT connection to transceiver.

Price: **£60.00**
p&p £1.50

All software listed for the CP-1 is also suitable for the RM-1.

THE RM-1 IS FIRST CHOICE FOR THOSE STARTING OUT ON RTTY WITH A RESTRICTED BUDGET AND FOR EXPERIMENTERS WANTING TO SWAP PROGRAMS AT HIGH DATA RATES ON VHF.

PLEASE ADD VAT AT 15%
Closed Wednesdays
Callers by Appointment
12 months parts and labour warranty

Access

BARCLAYCARD VISA

Communication by Radio

❊ ❊ USA made

THE "MICROPATCH"

Available for both the VIC-20 and Commodore 64 computers, the "Micropatch" is the simplest way yet to get on RTTY/CW/ASCII. All the hardware and software for a good performance system are included in one easy to install plug-in package. The software is so user friendly and the hardware so easy to install that this must be the ideal way for the newcomer to computers to get on the air with data communication. You can update to either the CP-1 or MBA-TOR (or both) later.

Principal features are:
—12 Volt DC powered
—RTTY/CW/ASCII transmit/receive
—Built in 3 LED tuning indicator
—All cables, connectors supplied
—Wide/Narrow receive tones
—Split screen display with on-screen clock, programmable memories, disc and printer operation
—Keyboard selectable modes/Baud rates
—Excellent manual
—Nothing extra to buy.

Two models are available, one for the VIC-20, the other for the Commodore 64.

Price: **£139.00**
p&p £1.50

FIRST CHOICE FOR THE NEWCOMER TO COMPUTER RTTY WHO REQUIRES GOOD PERFORMANCE WITH MINIMUM COMPLICATION

TI-1 TUNING INDICATOR

A superb multiple LED 'panadaptor' type RTTY tuning indicator. Connects in the Speaker lead between your transceiver and terminal unit. Calibrated to within 10Hz.
Prices may vary due to the fluctuating exchange rates.
Send large SAE for full details.
Switchable 170/425/850Hz shift IARU tones. Has its own built in extension speaker.

Price: **£95.00**
p&p £1.50

USA made

PKT-1 PACKET SWITCHING TERMINAL NETWORK CONTROLLER

The first commercially made TNC for the newest mode—packet switching.

Packet switching is the hottest mode in Amateur Radio—permits multiple QSOs on one frequency on VHF or satellites. Both current protocol standards are implemented.

12 Volt DC power input. Just connect between an ASCII terminal and your VHF FM rig and you're on the air.

Price: **£433.91**
p&p £2.50

USA made

TAPR TNC BOARD KIT

Software compatible with the above assembled unit, this is the kit that most people in the USA are using. Easy to assemble, professionally made and with an amazingly comprehensive manual.

Built in modem and microcomputer.

Includes U.K. mains power supply.

Less cabinet.

Price: **£256.52**
p&p £2.50

Note: Both of the above units represent the definitive implementation of packet radio and they are up to the latest 'state of the art' standards. As packet radio standards develop, upgrade software will be available from I.C.S.

FIRST CHOICE FOR TECHNOLOGY TRAILBLAZERS, WHO WANT TO BE AMONG THE FIRST WITH SOMETHING REALLY NEW. PLENTY OF ROOM FOR EXPERIMENT.

MBA-TOR

This is the ultimate data communications software for the Commodore 64 and is the result of the combined efforts of professional software writers on both sides of the Atlantic!

It fully implements AMTOR/RTTY/CW and ASCII modes and works with any terminal unit without external timers or add-ons.

The AMTOR implementation is up to the same standards as the AMT-2 and the split screen user interface is extremely easy to use.

Every operator convenience that you can think of has been built into this program—it really is a masterpiece!

Supplied with manual, overlays and cable on cartridge. TTL level terminal unit interface.

Price: **£60.00**
p&p £1.50

STOP PRESS: Now also available for the VIC-20

NOTE

The receive performance of RTTY terminal units is difficult to quantify, as it depends on filter shape and dynamic range, cross modulation performance. What matters in the end is the ability to copy weak signals accurately through QRM and noise.

In order to give you guidance, we have given a 'STAR RATING' to our various products, based on our own practical tests. These are defined as follows:

❊ Average performance
❊❊ Good performance
❊❊❊ Excellent performance

Amtor Mk. II boards still available, converts an existing RTTY station to AMTOR.

Kit	**£93.04**
Assembled & tested:	**£117.39**
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Contains: 15W Soldering Iron 2 spare bits, heat shunt, solder, pliers, cutters, and screwdriver 40-00007 15.56

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Versatile waveform generator with sine, triangular and square wave outputs. On board mains PSU 41-01302 27.00

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Single board 40W per channel stereo amplifier 41-01301 38.00

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5 LED per channel stereo VU meter for use with stereo amplifiers 41-01401 11.50

5W AUDIO AMP
A very compact audio output stage for use in a wide range of equipment 41-01406 4.60

UNIVERSAL AMP
A universal audio pre-amp with a gain of 10 41-01604 6.45

MONO REVERBERATION UNIT
Single channel, spring line reverb unit to add echo effects to tape recording etc. 41-01602 10.00

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Very low distortion tone generator and signal detector for circuit fault finding 41-01603 10.45

10MHz DFM
8 Digit LED digital frequency meter and period measurement 41-01500 54.10

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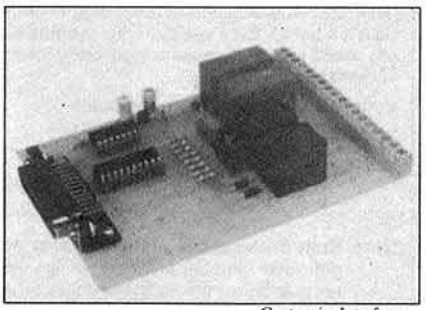
Extend the range of the 10MHz DFM to 50MHz 41-01501 8.55

1-5MHz PRE AMP
Low frequency pre-amp and waveform shaper for the 10MHz DFM 41-01502 5.13

1-30V 1mA-2A PSU
Adjustable 1-30V Power supply with pre-setable current limit from 1mA-2A 41-01600 37.46

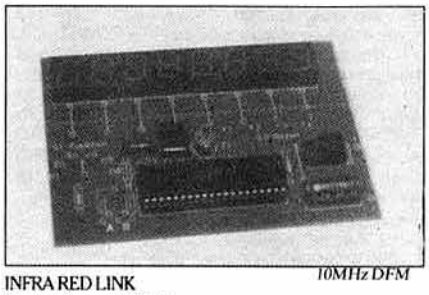


Centronics Interface

5-12V 1A PSU
Adjustable PSU from 5-12V with current protection, 1 amp max output 41-01504 6.45

1-30V 1.5A PSU
1-30 volt adjustable PSU with protected output up to 1.5 Amps 41-01402 10.45

3 DIGIT LED DVM
DVM to read up to 99.9 volts or configured as an ammeter to read up to 9.99 amps 41-01403 17.00



10MHz DFM

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Single channel IR Link with relay output 41-01300 9.60

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Thermistor based temperature sensor with relay output 41-01303 6.20

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Realistic steam sound and whistle for model railways 41-01304 9.20

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Control lamps and drill speed 41-01305 5.70

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Alarm to indicate high water level or flooding 41-01601 2.70

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Doorbell chime with adjustable tones 41-01503 7.00

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Miniature low-noise MOSFET pre-amp for the 2m amateur band 41-01307 3.91

2M CONVERTER
Low noise 144MHz-28MHz amateur band converter 41-01306 17.35

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20W - 10dB gain - power amplifier for the 2m band. Automatic TX switch over, RX pre-amp, robust construction 41-01404 32.87

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Low noise, miniature pre-amp for the 70cm amateur band 41-01506 4.78

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70cm to 144MHz low noise converter featuring pre-aligned helical filter, schottky diode mixer and low noise transistors 41-01405 21.50

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10W Power amp to boost the output of handheld and portable 70cm transceivers 41-01505 33.82

CRYSTAL CALIBRATOR
Crystal reference calibrator for alignment of receivers, outputs at 4, 2, 1MHZ, 100, 50 AND 10KHz 41-00801 4.32

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Improves to mute performance of the majority of CB rigs 41-01605 5.40

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DATA & PRICES

Type	V(nom)	Capacity	Stock No.	1-9	10-49
AA	1.2V	500mAH	01-12004	0.80	0.74
C	1.2V	1.2AH	01-12024	2.35	1.99
D	1.2V	1.2AH	01-12044	2.00	2.00
PP3	8.4V	110mAH	01-84054	3.70	3.50

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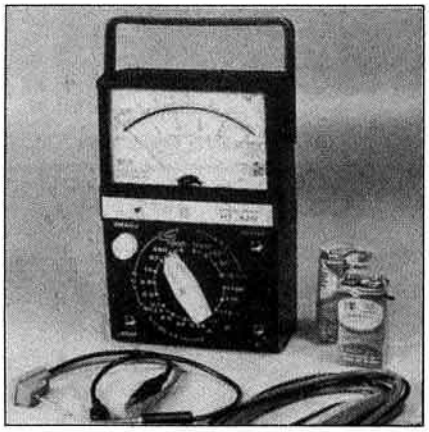
To recharge up to 4 AA size NiCads.
Size; 112 x 71 x 37mm 01-00409 4.95

CH1/22
To charge PP3 type NiCads.
Size; 70 x 50 x 32mm 01-00159 4.30

CH8/RX

Will recharge AA, C, D and PP3 size cells with automatic voltage selection. Will recharge following combinations: 4xD, 4xAA, 4xC, 2xPP3, 2xD + 2xC, 2xD + 2xAA. 2xD + 1xPP3, 2xC + 2xAA, 2xC + 1xPP3, 2xAA + 1xPP3. Charge rate: 11mA for PP3, 45mA for AA size, 120mA for C and D size, for 16 hrs. Power: 240V 50Hz. Output Voltage: 2.9V for AA, C and D size, 11.0V for PP3 size. Weight: 0.475kg. Size: 199 x 109 x 55mm. 01-02204 9.45

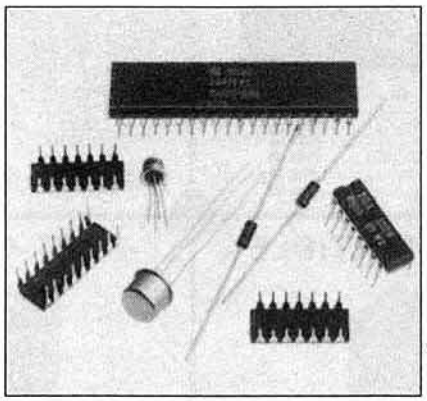


HT320

High quality, high specification meter at a reasonable price. In addition to the usual ranges, facilities are provided for measuring transistor parameters such as Iceo and Hfe.
Meter movement fully protected against overloads. 3-colour mirrored scale in robust case. Supplied complete with comprehensive instructions, test leads, transistor test leads and batteries (2 x HP-7, 1 x PP3).
DC Volts: 0.1V, 0.5V, 2.5V, 10V, 50V, 250V, 1kV (20kΩ/V). AC Volts: 10V, 50V, 250V, 1kV (18kΩcV). DC current: 50μA, 2.5mA, 25mA, 250mA. Resistance: 2k, 20k, 2M, 20Mz. AF Output: −10dB to +22dB for 10VAC (0dB/0.775V, 600Ω). Leakage (Iceo) 15μA, 15mA, 150mA. Hfe: 0-1000 (Lc/Tb). Weight: 410gms. 56-83201 14.00

RF Generator LSG17

A stable wide-range generator for the hobbyist, service technician, schools, colleges, etc. Frequency range: A/100kHz-300kHz, B/300kHz to 1MHz (Harmonics 96-450MHz) C/1MHz-3.5MHz, D/3.0MHz-11MHz, E/10MHz-35MHz, F/32MHz-150MHz. Accuracy: k1.5%. Output greater than 100mV (no load). Ext. xtal osc for 1 to 15MHz crytal. Power required: AC100, 115 or 230V 3VA. Size & Weight: 150(H) x 238(W) x 130(D)mm, 2.5Kg approx. 56-90017 115.00



Linear ICs

		Stock No.	Price
LF351	Bi-FET op amp	61-03510	0.49
LF353	Dual version of LF351	61-03530	0.81
LM380N	IW AF power amp	61-00380	1.45
LM381	Stereo pre-amp IC	61-00381	3.27
NE544	14 pin DIL servo driver IC	61-00544	1.80
NE555N	Multi-purpose low cost timer	61-05550	0.21
uA741CN	DIL low cost op-amp	61-07411	0.42
TDA1062	RF ocillator and mixer system for 1-200MHz	61-01062	1.95
TDA1083	Portable radio AM/FM audio in one IC	61-01083	1.95
HA1388	18W PA from 14V	61-01388	2.75
MC1496P	Double balanced mixer/ modulator	61-01496	1.25
TDA2002	8W into 2 ohms power amp	61-02002	1.25
ULN2283	1W max 3-12V power amp	61-02283	1.00
CA3089	FM IF amp, detector, mute, AFC, AGC system	61-03089	2.84
CA3130E	BIMOS op amp	61-31300	0.80
CA3140E	BIMOS version of 741	61-31400	0.46
MC3359	Low current dual conversion NBFM IF and det	61-03859	2.95
LM3900	Quad norton amp	61-39000	1.20
LM3909N	8-pin DIL LED flasher	61-39090	0.68
KB4412	Two balanced mixers IF amp with AGC for AM/SSB	61-04412	1.95
ICM7555	Low power CMOS version of 55 timer	61-75550	0.98
HA11225	Low noise FM IF	61-11225	1.45
HA12017	83dB S/N phono preamp 0.001% THD	61-12017	0.80
MC14412	300 baud MODEM controller (Euro/US specs)	61-14412	6.85

Selected Lines

PB2720	80dB Piezo Buzzer	43-27201	0.55
10M15A	10.7 Filter	20-10152	2.10
10M08AA	10.695 Filter	20-11152	3.49
FC177	LCD Freq. Meter	39-17700	20.00
CM161	Min LCD Clock	40-80161	8.25
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Dragon to Centronics Connect Cable		03-10017	7.25
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14 x 0.3"	IC socket	28-14000	0.13
16 x 0.3"	IC socket	28-16000	0.13
6V	KUIT-A Relay	46-80000	0.48
9V	KUIT-A Relay	46-80001	0.48
12V	KUIT-A Relay	46-80002	0.48
CX120P	COAX Relay	46-90120	11.96
CX520D	COAX Relay	46-90520	26.98
CX540D	COAX Relay (BNC)	46-90540	26.98

Books

Beginners Guide to Amateur Radio	02-11262	4.50
Beginners Guide to Electronics	02-04134	4.50
Active Filter Cookbook	02-21168	12.70
CMOS Cookbook	02-21398	11.85
TTL Cookbook	02-10358	11.00
Design of Active Filters	02-21539	10.15
Design of Op-amp Circuits with experiments	02-21537	9.30
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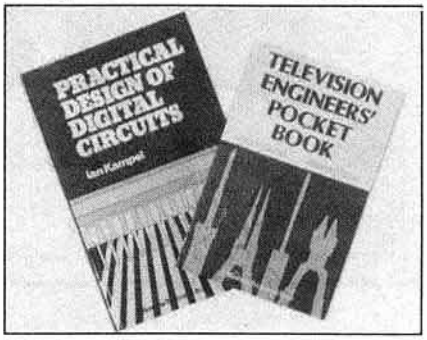
Z-80 Microcomputer Design Projects	02-21682	12.70
Z8000 Microprocessor: A Design Handbook	02-37345	16.10



68000: Principles and Programming	02-21853	12.70
8085A Cookbook	02-21697	13.55
Handbook of Electronic Tables Formulas	02-21532	11.00
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Two 4 bit CPU's: 10 memories (independent Tx & Rx), reverse/simplex (either) by single key touch, scanning; manual-auto band (full or partial) —memory, clear-busy, skip-select, programmable power save system (10 selectable dwell times). Large LCD ½" Digits +10 special functions, "any angle". Meter; S/battery condition, VOX. 65 × 34 × 169mm.

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FT209R (3.7W),	c/w FNB4, YHA14, CSC11 etc	£249.00
FT209RH (2.3W)	c/w FBA5, YHA14, CSC10 etc	£235.00
FT209RH (3.7W)	c/w FNB3, YHA14, CSC10 etc	£249.00
FT209RH (5.0W)	c/w FNB4, YHA14, CSC11 etc	£259.00
CSC10	Soft case (FBA5, FNB3 fitting)	TBA
CSC11	Soft case (FNB4 fitting)	TBA

For general accessories see FT203R list.
FNB5, FNB3, FNB4, YH2, MH12A2b, SMC8.9AA, NC15, MMB2¹

FT203R & FT703R HANDHELDS

"THUMBWHEEL" TINY HANDHELD

Ultra compact 65W × 34D × 153Hmm, synthesised handheld. Computer aided design and component insertion with chip capacitors and resistors has produced this modern marvel: 2.5W RF (10.8v) (3.5W RF (12V)). It has VOX (for use with YH-2 lightweight headset, and built in 'S'/PO meter. Supplied with tone burst, helical and appropriate case.

FT203R	c/w FBA5, CSC6 etc	£155.00
FT203R	c/w FNB3, CSC6 etc	£175.00
FT203R	c/w FNB4, CSC7 etc	£185.00
FBA5	7.2/9V Cell case only (6 × 'AA')	£6.85
FNB3	10.8V NiCad Pack (425mAH)	£33.50
FNB4	12.0V NiCad Pack (500mAH)	£38.25
CSC6	Soft case (FBA5 or FNB3 fitting)	£6.00
CSC7	Soft case (FNB4 fitting)	£6.85
YH2	Headphone/Microphone option	£14.50
MH-12A 2b	Speaker/Microphone option	£17.69
MMB21	Mobile mounting bracket	£8.00
SMC8.9AA	Charger (slow) 13A style	£8.05
NC15	Charger (quick) and Power Unit	£49.95

FT290R & FT790R MULTIMODE

LAST FEW FT290's £259

FT690R	Multimode Transceiver 6m	£259.00
FT290R	Multimode Transceiver	£279.00
FT790R*	Multimode Transceiver 70cm	£259.00*
SMC2.2C	2.2Ah Nicads 'C' size	per set £21.60
SMC8C	220mA Charger (13A Style)	£9.20
MMB11	Mobile Mount	£28.19
CSC1A	Carrying case	£4.45
FL6010	6m 10W Amplifier	£49.00
FL2010	2m 10W Amplifier	£66.25

FT230R & FT730R FM MOBILES

FT230R	2m Transceiver 25W	£269.00
FT730R	70cm Transceiver 10W	£239.00*
MMB15	Mobile mounting bracket	£14.65

**** Limited quantity available at this price***

KDK 2033 FM MOBILE, 144MHz

Sensitivity better than .2μV for 12dB SINAD

NEW **£239**

144 MHz, 12VDC FM Transceiver.
25W/5W Hi/Lo (both adjustable).
Compact 2⁵⁄₁₆ × 6¾ × 7⁵⁄₁₆".
12½KHz steps (100KHz fast QSY).
Amber LCD'Sunlight View'. Side Lit Display.
100's of Hz + channel number. Sensitivity <0.2μV for 12dB SINAD. Single knob frequency control "Dual". Endless or non endless dial options.
RIT; 1KHz steps. V.F.O. + memory. Two 5 slot memories A, B, A+B, A×B.
11th memory instant "call" channel.
Memory simplex or duplex channels.
Band scanning, programmable limits.
Scan halts squelch + centre zero.
Pause on scan halt for 3 seconds.
Scan/tune/RIT from microphone ±600KHz split, plus cross memory.
Repeater input listen—press "dial".
Setable, steps, tone, splits, limits.
Simple controls for safe mobile.
CW mobile mount, mic, handbook.

FT 726R MULTIMODE UHF, VHF, HF

FT726R	Transceiver main frame only	£619.00
FT726R(2)	Transceiver c/w 2m	£775.00
21/24/28	HF module	£209.00
50/726	6m module	£195.00
430/726	70cms module	£259.00
SAT726	Full duplex module	£99.75
XF455MC	600Hz CW filter	£41.85

GRIMSBY
SMC (Humberside)
247A Freeman Street,
Grimsby, Lincolnshire
Grimsby (0472) 59388
9.30-5.30 Mon-Sat

STOKE
SMC (Stoke)
76 High Street,
Talke Pits, Stoke.
Kidsgrove (07816) 72644
9-5.30 Tue-Sat

LEEDS
SMC (Leeds)
257 Otley Road,
Leeds 16, Yorkshire.
Leeds (0532) 782326
9-5.30 Mon-Sat

CHESTERFIELD
SMC (Jack Tweedy) Ltd
102 High Street,
New Whittington,
Chesterfield
Chesterfield (0246)
4533409-5.30 Tue-Sat

BUCKLEY
SMC (T.M.P.)
Unit 27 Pinfold Workshops
Pinfold Lane, Buckley,
Buckley (0244) 549563
10-5 Tue-Fri 10-4 Sat

JERSEY
SMC (Jersey)
1 Belmont Gardens
St Helier, Jersey
Jersey (0534) 77067
9.00-5.30 Mon-Sat
Closed Wed

EDINBURGH
SMC (Scotcomm)
23 Morton Street
EH15 2HN
031-657 2430
10-5.00 Tue-Fri (9-4 Sat)

N. IRELAND
SMC (N. Ireland)
10 Ward Avenue
Bangor, Co. Down
Bangor (0247) 464875

HEAD OFFICE: S. M. HOUSE, RUMBRIDGE STREET, TOTTON, SOUTHAMPTON, SO4 4DP, ENGLAND, & MAIL ORDER Tel: (+44) (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton

POWER METERS

IN LINE POWER/SWR BRIDGES P.E.P., AVERAGE 1·8-440MHz

The Hansen range covers 30 quality models with top-of-the-line the FS710. This is a flat frequency response, peak envelope power and average in-line wattmeter with many novel features. Notable being the 'power independent' SWR scale—no forward power calibration knob, just direct reading SWR.

FS-500H

		HANSEN		
FS710H	1.8-60 MHz	15/150/1500W	PEP Auto SWR	**102.95**
FS710V	50-150 MHz	15/150W	PEP Auto SWR	**102.95**
FS50HP	1.8-60 MHz	20/200/2000W	Interval PEP/SWR	**99.95**
FS50VP	50-150 MHz	20/200W	Interval PEP/SWR	**99.95**
FS500H	1.8-60 MHz	20/200/2000W	PEP	**79.95**
FS500V	50-150 MHz	20/200W	PEP	**72.95**
FS300H	1.8-60 MHz	20/200/1000W		**53.50**
FS300V	50-150 MHz	20/200W		**53.50**
FS200	1.8-150 MHz	20/200W	PEP/SWR Internl Battery	**57.95**
FS601M	1.8-30 MHz	20/200W	PEP	**58.95**
FS601MH	1.8-30 MHz	200/2000W	PEP	**58.95**
FS602M	50-150 MHz	20/200W	PEP	**58.95**
FS603M	430-440 MHz	5/20W	PEP	**58.95**
FS210	1.8-150 MHz	20/200W	Auto SWR/ Power Meter	**63.50**
FS301M	2-30 MHz	20/200W		**41.00**
FS301MH	2-30 MHz	200/2000W		**41.00**
FS302M	50-150 MHz	20/200W		**41.00**
FS711H	2-30 MHz	20/200W	Head/ Display	**42.35**
FS711V	50-150 MHz	20/200W	Head/ Display	**42.35**
FS711U	430-440 MHz	5/20W	Head/ Display	**42.35**
W720S	130-430 MHz	20/200W	Head/ Display	**41.50**
FS7	145&(432 MHz)	5/20/(200)	(200W on 144 only)	**46.97**
FS5E	3.5-150 MHz	20/200/1000W (1KW HF only)		**42.75**
FS5S	1.8-150 MHz	20/200/1000W (1KW HF only)		**43.75**
SWR3E	3.5-150 MHz	20/200/1000W (1KW HF only)		**28.75**
SWR3S	3.5-150 MHz	F/S Meter ant. switch 20/200W		**30.50**
SWR50B	3.5-150 MHz	Twin Meter		**30.50**
FS20DL	3-150 MHz	1/10W Dummy/SWR/Power		**43.65**
FS20D	3-150 MHz	5/20W Dummy/SWR/Power		**43.65**
FS800	1.8-150 MHz	6/30/150W Dummy/SWR/ Power		**125.35**
W720S	930 MHz	7.5/15W Head/Display		**46.00**
		JD		
JD110	1.5-150 MHz	10/100W		**15.85**
		MIRAGE		
MP2	50-150 MHz	50/500/1500W	PEP	**P.O.A.**
		SMC		
S3-30L	Mini (CB Style)			**8.80**
T3-170L	3.5-170 MHz	Relative	Twin Meter	**16.95**
		WELZ		
SP300	1.8-500MHz	20/200/1KW	SWR/ Power	**115.00**

T3-170L

NB: PRICES INCLUDE VAT AT 15%
Carriage free by post

SMC-HS

HF, VHF, UHF ANTENNAS MOBILE VERTICALS

SMC-HS Mobile Elements, tabulated below, feature an inbuilt PL259M connector, which mates with the SO239M on any of the four standard mounts. This arrangement is ideal for easy removal —band changes, comparative test, car wash, and anti-vandal, system checks from the feed point, portable operation and for ease of garaging etc. All models have fold over bases (either lift and lay or locking collar) except the 78B which has an inbuilt ball in case the mount must be fitted askew.

SMC 78F

GCD

SMC258

GCD

	SMC-HS MOBILE ANTENNAS	£	P&P
SMC6P2T/PL	Telescopic 2M PL259 fitting ¼λ	5.75	0.85
SMCT144h	Telescopic 2M ½ wave BNC	9.95	0.85
SMC6P2T/BNC	Telescopic 2M BNC fitting ¼λ	6.00	0.85
SMC2H/PL	Helical 2M PL259 fitting	5.75	0.85
SMC2H/BNC	Helical 2M BNC fitting	6.00	0.85
SMCHS430S	70cm ½ wave BNC fitting 2.5dB¼	7.95	0.65
SMC2QW	2M ¼ wave 0dB¼ 1.6'	2.70	1.85
SMC2NE	2M ½ wave fold 3.0dB¼ 4.3'	7.95	2.00
SMC2VF	2M ½ wave fold 3.0dB¼ 3.5'	13.65	2.00
SMC78F	2M ½ wave fold 4.5dB¼ 5.7'	15.95	2.50
SMC78B	2M ½ wave ball 4.5dB¼ 5.6'	15.95	2.59
SMC78SF	2M ½ wave short 4.7'	15.95	2.50
SMC88F	2M 5/8 wave 5.2dB¼ 6.5'	21.95	2.50
SMC118M	Colinear 2M 11/8 7dB¼ 9.7'	33.35	2.65
SMC258	70cm 2 × ½ fold 5.5dB¼ 3.1'	15.60	2.00
SMC268C	70cm 2 section colinear 6dB¼	25.95	2.00
SMC358	70cm 3 × ½ 6.3dB¼ 4.7'	19.65	2.00
SMC70N2M	Dual band 2M 2.7dB¼ 70cm 5.1dB¼ (¼λ & 2½λ)	19.65	2.00
SMCHS770	144/432 Duplexer 50W	17.85	1.85
SMC20SE	20M 1.72M 100W PEP	19.95	2.50
SMC15SE	15M 1.72M 130W PEP	16.75	2.50
SMC10SE	10M 1.72M 200W PEP	15.95	2.50
SMC17SE	17M 1.915M 200W PEP	17.95	2.50
SMC12SE	12M 1.915M 200W PEP	16.75	2.50
RSL-28b	Yaesu 10M mobile whip	10.65	2.00
SMCGCCA	Gutter clip 4 mtrs cable	10.95	2.00
SMCSOCA	Cable assembly 4M	5.65	1.50
SMCSOCAL	Cable assembly 6M	5.95	1.50
SMC50CALLR	Cable assembly c/w 5M cable/ PL259	6.50	1.50
SMCROL	Rollet, 10mm thick (for SMC50CALLR)	1.15	0.50
SMCTMCAS	Trunk mount c/w 6M cable	9.95	2.00
HDTMCA	HD trunk mount c/w 5M cable	15.40	2.00
SMCSOMM	Magnetic base c/w 4M cable	10.95	2.00
SMCSOWM	Adjustable wing mount base	4.85	0.90
SMCGCD	Gutter clip deluxe	5.30	1.50
SMCBSD	Bumper strap deluxe	10.95	1.50
HS88BK	Bumper mounted extension for 144 MHz antennae	23.35	2.00

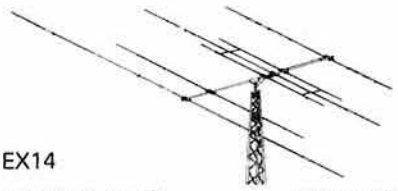
SOMM

HS770

NB: PRICES INCLUDE VAT AT 15%

HF ANTENNAS

SMC have the greatest range of HF antennas eg. Multi Beams/Quads, over 20 models. Shown below is the sensational new Explorer 14—contact us for full details.



EX14

MULTIBAND BEAMS		Inc VAT	P&P
EX14	Explorer 10-20m	**£335.00**	£5.95
TH3JNR	3 Ele 10-20m	**£212.00**	£3.50
TH5DXX	5 Ele 10-20m	**£419.00**	£6.70
TH7DXX	7 Ele 10-20m	**£545.00**	£8.75
TB3	3 Ele 10-20 Jaybeam	**£189.75**	£5.90
HQ1	Mini Quad 10-20	**£169.00**	£4.00
G4MH	Mini Beam 1-20	**£88.50**	£4.50
TA33JNR	3 Ele 10-20 Moseley	**£177.10**	£6.00
Mustang 2	2 Ele 10-20 Moseley	**£177.10**	£6.90
Mustang 3	3 Ele 10-20 Moseley	**£220.80**	£6.90
GQ2E	2 Ele 10-20 Quad	**£279.00**	£5.40
GQ3E	3 Ele 10-20 Quad	**£439.00**	£9.20
GQ4E	4 Ele 10-20 Quad	**£605.00**	£10.00
Hyquad	2 Ele 10-15M dipole 20M	**£339.00**	£6.00
LP1007	Log Periodic 13-20 MHz	**£2065.00**	DIST
3Y1015D20	3 Ele 10/15M Dipole 20M	**£179.00**	£5.95
DB10/15A	3 Ele 10-15m	**£209.00**	£4.80

TB3

MONO BAND BEAMS			
103BA	3 Ele Yagi 10m	**£75.00**	£3.50
105BA	5 Ele Yagi 10m	**£159.00**	£3.95
153BA	3 Eli Yagi 15m	**£105.00**	£3.50
155BA	5 Ele Yagi 15m	**£239.00**	£5.90
203BA	3 Ele Yagi 20m	**£189.00**	£4.90
204BA	4 Ele Yagi 20m	**£299.00**	£7.30
205BA	5 Ele Yagi 20m	**£399.00**	£9.40
402BA	2 Ele Yagi 40m	**£259.00**	£6.50
18TD	Dipole Tape 10-80m		

HF5V

HF5R

VERTICALS			
12AVQ	Vertical 10-20m	**£54.00**	£2.75
14AVQ	Vertical 10-40m	**£73.00**	£2.75
18AVT/WB	Vertical 10-80m	**£119.00**	£2.75
18V	Vertical 10-80m taped	**£38.50**	£2.75
C4	Vertical 10-20m	**£69.00**	£2.65
SMCHF5V	Vertical 10-80m	**£65.00**	£2.65
SMCHF5R	Radial Kit for above	**£39.85**	£2.65
TRAP DIPOLE			
SMCTD/HP	High Power 10-80m	**£47.50**	£2.65
SMC TD/P	Portable inc coax	**£67.50**	£2.65
MOBILE			
Tribander	10-20m Slide sw.	**£29.33**	£1.65
Multimobile	10-20m	**£33.92**	£1.85
Flexiwhip	10m only	**£19.21**	£1.85
Extra coils	For above to 160m	**£7.25**	£1.00
Flexiten	2, 10, 12, 17, 15, 20, 30, 40, 80M	**£52.33**	£2.35
Bases	For above	**£6.90**	£1.00

NB: PRICES INCLUDE VAT AT 15%
Carriage extra. Mainland rate shown.

Head office
Mail orders
Service & Spares

S. M. HOUSE, RUMBRIDGE STREET, TOTTON, SOUTHAMPTON SO4 4DP, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton
See preceding pages for complete addresses and phone numbers of branches

10M FM CORNER

Join the many others who have found that operating 10M FM can be a pleasant alternative to the overcrowded 2M band. The SMC Oscar 2 10M gives you 40 channels, channel 1 being 29.310 MHz and channel 40 29.7 MHz, a power o/p of approximately 4 watts and a receive sensitivity of better than 3μV for 12db sinad. Also for your enjoyment when the band opens up, we have incorporated a – 100kHz repeater shift (by using the original panel Hi/Low power switch), so from the car or at home you can enjoy 10M FM without having to pay £500 for an HP transceiver.

OSCAR 2 10M FM £49.00 inc

ACCESSORIES		INC	P/P
SMCGP27	¼ Wave vertical with radials	£25.75	£2.65
SMCVA27	¼ Wave vertical no radials	£25.75	£2.65
SMC11V11S	Glass fibre shortened ground plane	£32.95	£2.65
SMC10SE	10M Mobile whip	£15.95	£2.00
RSL-28b	Yaesu 10M mobile whip	£10.65	£2.00
SMCGCCA	Gutter mount and cable	£10.95	£2.00
SMCSOCA	4M cable assembly for 10SE	£5.65	£1.50
FLEXI 10	G. Whip mobile 10-80M	£52.33	£2.35
MULTI-MOBILE	G. Whip mobile 10, 15, 20M	£33.92	£1.85
FLEXIWHIP	G. Whip 10M mobile	£19.21	£1.85
GW BASE	Base for all G. Whip antennas	£6.90	£1.00
SMCT3170L	Twin meter SWR bridge	£16.95	FOC
SMC100LP30	Low pass filter	£6.30	FOC
SMCRU12			
04-06	4 Amp DC power unit	£14.95	£2.35
SP55	Extension L/S	£16.50	FOC

NB. PRICES INCLUDE VAT AT 15%
and carriage by post or Securicor

PUBLICATIONS

	£	P/P
I.P.C. (PRACTICAL WIRELESS)		
Out of Thin Air	1.25	0.75
Passport to Amateur Radio	1.50	0.75
Wires and Waves	3.00	0.90
Are the voltages Correct	1.00	0.50
Introducing R.T.T.Y.	1.50	0.50
R.S.G.B.		
Teleprinter Handbook	11.65	1.35
Radio Communications Handbook	8.95	2.05
Test Equipment (Raio Amateurs)	4.70	1.30
Amateur Radio Techniques	4.75	1.35
HF Antennas for all Locations	4.75	1.35
Guide to Amateur radio (Soft)	2.75	0.75
Radio Amateur Operators Manual	4.25	0.75
1983 Call Book (UK)	2.10	0.80
1984 Call Book (UK)	5.00	0.50
R.A.E. Manual (10th Edition)	2.75	0.75
T.V.I. Manual	1.50	0.50
Morse Code for Radio Amateurs	1.00	0.50
VHF/UHF Manual (3rd Edition)	4.25	2.00
VHF/UHF Manual (4th Edition)	8.50	2.00
Prefix Map	2.25	1.25
Great Circle Map	1.50	1.20
Amateur Radio Logbook	2.30	1.25
S.M.C.		
Countries List	0.35	1.20
Q.R.A. Map (Special Coating)	1.50	1.20
Transparent Overlay 50Km Rings	1.00	
TAB BOOKS		
Hidden Limited Space Antennas	6.95	0.75
Complete Handbook (Transmitters)	6.95	0.75
Secrets of Ham Radio D.X.ing	5.60	0.75
Complete S.W.L. Handbook	9.95	0.85
S.W.L. Antenna Handbook	8.45	0.75
Guide to Scanners and Monitors	6.95	0.85
Radio Communications Receivers	11.75	0.90
Secret Shortwave Spectrum	6.50	0.75
UNIVERSAL ELECTRONICS INC.		
Clandestine Confidential S.W.	6.35	0.85
World Press Frequences (RTTY)	6.35	0.85
RTTY Today, Modern Guide	6.35	0.85
MISCELLANEOUS PUBLISHERS		
Amateur Radio (Stokes/Budd)	8.95	1.30
Log Book (Jaybeam)	2.30	1.25
Log Book (Yaesu)	TBA	

Prices include V.A.T. at 15% (where applicable)
Postage extra. U.K. and B.F.P.O. rates for one-off items only shown. N.B. For larger orders (any mix) p/p may be much lower than sum of individual charges.

ROTATORS

The finest range: be it Kenpro, C.D.E., Channel Master, SMC, has over 19 models to choose from. Ask the experts for the right model to suit your requirements – it should save you money. Write, phone or call.

KR600RC

9502B

FU200	Thro'	3 Core	Light Duty	£49.95
KR250	Bell	6 Core	Lighter Duty	£55.50
9502B	Offset	3 Core	Lighter Duty	£59.50
AR40	Bell	5 Core	Medium Duty	£105.00
KR400	Bell	6 Core	Matches KR500	£101.50
KR500	Thro	6 Core	Elevation	£131.85
AR50	Bell	5 Core	5 Position (AR40)	£113.85
KR400RC	Bell	6 Core	Medium Duty	£121.50
CD45	Bell	8 Core	Heavy Duty	£149.50
KR600RC	Bell	8 Core	Heavy Duty	£173.50
HAM IV	Bell	8 Core	Heavier Duty	£264.50
KR2000RC	Bell	8 Core	Heavier Duty	£346.50
T2X	Bell	8 Core	Very Heavy Duty	£332.35
H300	Bell	8 Core	Digital Readout	£546.25

Control Cable

RC5W	5 Way 40p/mtr	Carriage £1.90
RC6W	6 Way 55p/mtr	Carriage £1.90
RC8W	8 Way 59p/mtr	Carriage £1.90
9523	Support Bearing £18.22 9502b F4200	Carriage £2.50
KC038	Lower Mast Clamp £12.65 KR400 600 etc	Carriage £2.50

Prices including VAT and carriage, but carriage on accessories is extra unless sent with rotators

SCANNING RECEIVER

MS-8400

New from S.M.C. the MS-8400 VHF/UHF microprocessor controlled scanning receiver with 40 programmable memory channels, keyboard entry of frequency or command; automatic band search, AM and FM selectable, 4 selectable scanning steps, priority channel, connections for external antenna, DC supply and loudspeaker. Supplied c/w telescopic antenna mounting bracket, etc.

SPECIFICATIONS

Frequency Range:	Low VHF 68.000 MHz ~ 88.000 MHz Mid VHF 108.000 MHz ~ 136.000 MHz High VHF 136.005 MHz ~ 174.000 MHz UHF 360.000 MHz ~ 512.000 MHz
Scanning steps:	5, 10, 12.5 and 25 KHz VMF (10, 12.5 and 25 KHz UHF)
Channels:	40 programmable memories
Modes:	AM or FM selectable
Scan rate:	Approximately 18 channels per second
Scan delay:	2 seconds Priority sampling: 4 seconds
Audio output:	1.2 Watts
Selectivity:	Better than ~ 60 dB @ ± 25KHz
Power supply:	DC 12V ~ 16V 0.6A max
Memory backup:	9 volt, battery (PP3)
Antenna:	Telescopic antenna or External
Loudspeaker:	2.5" x 4" oval speaker
Size:	190(W) x 250(D) x 85(H) mm
Weight:	1.7kg

£249.00 inc.
Price includes free carriage

MORSE EQUIPMENT

MORSE KEYS			p.p.
HK703	Straight Key	£29.35	£1.20
HK704	Straight Key	£19.95	£1.20
HK706	Straight Key	£16.65	£1.00
HK707	Straight Key	£15.50	£1.00
HK710	Straight Key	£39.95	£1.75
HK808	Straight Key	£49.95	£1.75
HK711	Key Mounting	£32.75	£1.50
BK100	Mechanical Bug	£24.95	£1.75
MK701	Single Lever Paddle	£28.50	£1.60
MK702	Single Lever Paddle	£29.75	£1.60
MK703	Squeeze Key	£28.95	£1.75
MK705	Squeeze Key	£25.65	£1.75
MK706	Squeeze Key	£23.50	£1.75
IKP60	Iambic	£9.95	FOC
HK802	de Luxe Brass Key	£85.85	£2.00
HK803	de Luxe Brass Key	£79.95	£2.00
HK804	de Luxe Brass Key	£79.95	£2.00
MHK831	Super de Luxe squeeze & straight key	£189.00	£3.50
MORSE EQUIPMENT			
KP100	Squeeze 230/13·8V	£79.50	£2.00
KP200	Memory 4096 Multi Ch Mem Back Up 230/13·8V	£169.50	£2.50
D70	Morse Tutor (Datong)	£56.35	FOC
MMS1	Morse Tutor (M/M)	£115.00	FOC
MMS2	Morse Tutor Advanced	£169.00	FOC
MICROWAVE MODULES – RRTY EQUIPMENT			
MM2001	RTTY to Video	£189.00	FOC
MM4001	RTTY Transceiver	£269.00	FOC
MM4001KB	RTTY Tx/Rx keybd	£299.00	FOC
MM1001KB	Morse Keyboard	£135.00	FOC
MM1000KB	ASCII CW conv c/w keybd	£135.00	FOC

PRICES INCLUDE VAT at 15%
Carriage as shown

JAY BEAM

			p/p
4 METRES			
4Y/4M	Yagi 4 element	7dBd £32.78	£2.65
PMH2/4M	Phasing harness 2 way	£17.82	£1.65
2 METRES			
H0/2M	Halo head only	0dBd £6.53	£1.50
HM/2M	Halo with 24" mast	0dBd £7.48	£1.65
C5/2M	Colinear omni vert	4·8dBd £86.25	£2.65
LW5/2M	Yagi 5 element	7·8dBd £15.53	£2.65
LW8/2M	Yagi 8 element	9·5dBd £19.55	£2.65
LW10/2M	Yagi 10 element	10·5dBd £25.30	£2.65
LW16/2M	Yagi 16 element	13·4dBd £37.95	£3.65
PBM10/2M	10 ele Parabeam	11·7dBd £49.45	£3.65
PBM14/2M	14 ele Parabeam	13·7dBd £60.95	£3.65
Q4/2M	Quad 4 element	9·4dBd £31.63	£2.65
Q6/2M	Quad 6 element	10·9dBd £41.40	£2.65
Q8/2M	Quad 8 element	11·9dBd £71.75	£2.65
D5/2M	Yagi 5 over 5 slot	10dBd £27.60	£2.65
D8/2M	Yagi 8 over 8 slot	11·1dBd £37.95	£2.65
5XY/2M	Yagi 5 ele crossed	7·8dBd £29.50	£2.65
8XY/2M	Yagi 8 ele crossed	9·5dBd £38.53	£2.65
10XY/2M	Yagi 10 ele crossed	10·8dBd £43.80	£2.65
PMH2/C	Harness cir polarisation	£11.50	£1.65
PMH2/2M	Harness 2 way 144MHz	£12.65	£1.65
PMH4/2M	Harness 4 way 144MHz	£31.62	£1.65
70 CM			
C8/70	Colinear Vertical	6·1dBd £92.00	£2.65
D8/70	Yagi 8 over 8 slot	12·3dBd £28.18	£2.65
PBM18/70	18 ele Parabeam	13·5dBd £34.50	£2.65
PBM24/70	24 ele Parabeam	15·1dBd £46.00	£2.65
LW24/70	Yagi 24 element	14·8dBd £31.05	£2.65
MBM28/70	28 ele Multibeam	11·5dBd £23.00	£2.65
MBM48/70	48 ele Multibeam	14·0dBd £37.95	£2.65
MBM88/70	88 ele Multibeam	16·3dBd £51.75	£2.65
8XY/70	Yagi 8 ele crossed	10dBd £44.85	£2.65
12XY/70	Yagi 12 ele crossed	12dBd £55.20	£2.65
PMH2/70	Harness 2 way	£12.07	£1.85
PMH4/70	Harness 4 way	£25.78	£1.85
23cm			
CR2/23CM	Corner reflector	13·5dBd £43.13	£2.65
PMH2/23CM	Harness 2 way	£32.78	£1.65

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

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SMC Northern Ireland (0247) 464875

Neath John GW4FOI (0639) 52374 Day, (0639) 2942 Eve

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY REPRESENTING ALL UK RADIO AMATEURS

Founded 1913 Incorporated 1926 Limited by guarantee A member society of the International Amateur Radio Union

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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.

Headquarters and registered office: **Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW**
Telephone (Dialling code 77 from London, 0707 from outside London) 59015. Telex 25280 (RSGBHQ G)
Secretary and general manager: D. A. Evans, G3OUF

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Correspondence to RRs and honorary officers should be addressed directly to them (QTHR), not to RSGB HQ

ANNUAL SUBSCRIPTION RATES

Corporate member: UK and overseas (*Radio Communication* by surface mail): **£16.50 UK associate member under 18: £6.20 Family member: £6.60 UK students over 18 and under 25: £9.30** (Applications should give applicant's age at last renewal date and include evidence of student status)
Affiliated club or society/registered group (UK): £16.50 (including *Radio Communication*); **£9.90** (excluding *Radio Communication*)
(Subscriptions include VAT)

RSGB QSL BUREAU

QSL cards for distribution should be sent to: **Mr E. G. Allen, G3DRN, QSL Bureau manager, 30 Bodnant Gardens, London SW20 0UD**

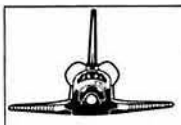
A list of QSL Bureau sub-managers was published in January issue of *Radio Communication*, and amendments will be published under "Amateur Radio News".

RSGB NEWS SERVICES

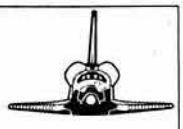
Headline News
Telephone 0707 (77 from London) 59312 for a recording of the latest amateur radio news.

GB2RS Broadcasts
Sunday news broadcasts from stations throughout the UK using the callsign GB2RS on frequencies in the 3·5, 7 and 144MHz bands. Details of frequencies, locations and times were last published in the July 1984 *RSGB News Bulletin*.

Amendments are published under "Amateur Radio News". A full schedule can be obtained free on request by sending a large sae to the Membership Services Dept, RSGB HQ.



Greetings to RSGB 9/28/84 73, de W5LFL, Owen W0ORE Tony



RSGB HEADQUARTERS was visited on 28 September 1984 by Dr Tony England, W0ORE, who is a NASA astronaut. As has been reported in previous issues of *Radio Communication*, Dr England is expected to fly on a space shuttle mission early in 1985, and he hopes to be able to enjoy some amateur radio operation from the shuttle during his off-duty periods.

Dr England was met at London (Gatwick) Airport by the President, Bob Barrett, GW8HEZ, and members of the Blackwood Amateur Radio Society: Dr England gave a lecture at the Welsh Convention on 30 September at the invitation of the latter club. On arrival at headquarters he was met by the general manager, David Evans, G3OUF, and members of headquarters staff, and attended an informal lunch.

RSGB President Bob Barrett, GW8HEZ, with Tony England during his visit

The headquarters station GB3RS then took part in a scheduled contact with W1AW, the headquarters station of the American Radio Relay League at Newington, Connecticut. W1AW was operated by the general manager of the ARRL, David Sumner, K1ZZ, and after a short conversation between the two general managers, Dr England was handed the microphone, by agreement of the DTI, and continued the contact. It emerged in the subsequent conversation that Dr England had not yet visited ARRL headquarters, and there was some amusement at the fact that he had "made it" to RSGB first! Moving on to more important matters, it emerged that another mission specialist crew member on Dr England's shuttle flight is also a radio amateur.

It appears that the precise details of the amateur radio operation on Mission 51-F, scheduled for launch on 17 April 1985, have not yet been finalized. However, Dr England apparently intends to repeat the 144MHz fm operation which was tried out by Dr Owen Garriott, W5LFL, during last

Astronaut Dr Tony England, W0ORE, with his wife at the informal lunch

Tony England outlining the shuttle's flight profile to Arthur Watts, G6UN

November's STS-9 mission. At times when Dr England is not available to operate, there is a possibility that a 144 to 28MHz transposer may be switched into circuit so that 144MHz signals received on board the shuttle will be relayed on 28MHz. Slow-scan television is also likely to be transmitted on 28MHz. We should, however, stress that the final form of the amateur radio operation during Dr England's flight has not yet been arranged, and full information will be given at a later date when it becomes available.

The "no-sked" policy instigated by NASA, which was the source of some disappointment to the RSGB, looks likely to be changed for Dr England's flight. It appears that contacts with specific organizations may well be scheduled, largely for the benefit of the media, and this will be a most welcome alteration.

Dr England departed for Wales at about 4.30pm. Before leaving he was presented with a small English pewter hip-flask by the President and the general manager, with the hope that it might provide him with some sustenance during the shuttle mission! In return, Dr England presented a colour photograph of the shuttle at lift-off during Dr Owen Garriott's mission, signed by both Dr England and Dr Garriott: the signatures are reproduced at the head of this article.

RSGB general manager David Evans, G3OUF showing W0ORE the Society's IBM-38 computer—*mission control!*

The Society hopes that Dr England has a safe and enjoyable flight, with some interesting amateur radio operation while he is off-duty. Further information on the precise details of the mission will be given via the normal Society news outlets. □

Amateur Radio News

News from America

The Federal Communications Commission has denied a request by ARRL to prohibit cable television systems in the USA from operating on frequencies allocated to the amateur service. The ARRL's petition was filed on 12 January 1982, in an effort to contain the very large problems of interference caused by cable tv systems to radio amateurs, and, as a side-effect, the breakthrough of amateur signals into cable systems possessing inadequate screening or using poor installation techniques, low-quality components and inadequate maintenance. Although specific rules exist in the USA which prohibit harmful leakage and interference from cable tv systems, the FCC has had little success in solving the problems because of its limited enforcement resources.

The FCC said that the ARRL request was "excessive", and added that amateur radio and cable tv could co-exist if a concerted effort to resolve interference problems was made. The FCC also referred to the efforts currently being made by the ARRL in conjunction with the National Cable Television Association, which removed the requirement for banning cable tv distribution on amateur frequencies. It said that unless cable operators made diligent efforts to resolve interference, the commission would have no choice but to levy fines for violations.

Pressure on the 220MHz band in the USA is increasing, and there are real fears in the American amateur community that the allocation will be taken away from the amateur service and given to the land mobile service. The actual position is complex, however, with two Petitions for Rule Making having been filed with the FCC by the Land Mobile Communications Council and Sideband Technology Inc, and the ARRL having filed comments in opposition to both. The FCC has also dismissed an ARRL petition which would have allowed Novice operators to use phone in part of the band. It said: "The spectrum requirements for the 220-225MHz band are currently undefined. . .both the FCC and the National Telecommunications & Information Administration are studying possible uses of. . .this part of the spectrum. Thus, it is not appropriate to consider petitions which could have a major impact on the 220MHz band until these matters have been resolved."

There is, of course, no allocation at 220MHz in the UK, but the episode underlines the very real pressures on the vhf and uhf spectrum from would-be alternative users. It appears that, as was the case with the difficulties in Belgium last year, there is an element of "use or lose" in this matter. The UK is not immune from pressures of the kind currently being experienced in the USA and which have been experienced in Belgium, and the Society is keen to see more activity on bands other than 144MHz: it is currently considering ways in which this may be encouraged. Since the threat to the 220MHz band was manifest, amateurs in California have proceeded to fill the allocation with a variety of amateur services, including wideband data transmissions!

As though to rub salt into the wound, the Long Island-based Citizens Communications Coalition has petitioned the FCC to reallocate the 50-54MHz band to expanded cb radio services. The organization has apparently cited the overall lack of amateur activity in the 50MHz band, using specific figures compiled from 12 months of monitoring the band in 40 cities in the USA. It also argues that the "phenomenal growth in. . .11 metre Class D activity" makes it unfair for radio amateurs to hold on to 4MHz of valuable spectrum while ". . .the needs, wants and desires of tens of millions of cb operators" are ignored by the FCC.

Party Funshore?

The Royal Marines Museum is currently attempting to research the history of "Party Funshore". This organization was formed while Operation Overlord (the Allied invasion of Europe during the second world war) was planned, with the duty of handling communications during the Normandy campaign and the subsequent operations in northwest Europe. It consisted of approximately 1,800 Royal Navy and 800 Royal Marines personnel, under the command of Major P. F. Knight, RM.

Records of "Party Funshore" appear to be somewhat lacking, and the museum is anxious to trace the names of the units involved with this organization and their itineraries. Any reader with information is asked to contact: The Director, Royal Marines Museum, RM Corps Secretariat, Royal Marines Eastney, Southsea, Hants PO4 9PX.

24GHz operation?

The Department of Trade & Industry has now made available an application form for permission to operate between 24·05 and 24·25GHz; the form is obtainable from the membership services department at RSGB headquarters on receipt of a second-class stamp.

Seventeen ways of saying "Maidenhead"

The new RSGB locator map encompassing the "Maidenhead" or "Modified G4ANB" locator system is now available from headquarters. It covers roughly the same area as the old "major squares" map and, with an eye to sales overseas, the basic instructions are given in English, French, Czech, Slovak, Swedish, Spanish, Polish, Danish, Italian, Finnish, German, Dutch, Greek, Serbo-Croat, Slovene, Russian and Hungarian. By post, the new map costs £1.58 to members and £1.75 to non-members: over-the-counter prices are £1 and £1.11 respectively.

The new system was described in last month's *Radio Communication*, and it comes into effect on 1 January 1985. IARU Regions 2 and 3 have already indicated their acceptance of the "Maidenhead" system, and as of 1 January 1985 there will therefore be a locator system which is common to the world.

Raised in the House

On 1 July 1984 the Hon Mrs Gwyneth Dunwoody, MP for Crewe and Nantwich, asked the Secretary of State for Social Services what frequencies would be available for ambulances, doctors using radio paging units, and general practitioners also using such units following the removal of present frequency allocations. She also asked which frequencies were to be removed. In reply, Mr Butcher stated that frequencies in the 450-470MHz region, which were currently used for a wide range of fixed point-to-point services, including control of hospital paging and ambulance radio systems, were being replaced by "microwave frequencies or landlines". He added that the spectrum so released would be made available to meet the urgent need of the power and water industries, among others, to introduce automatic monitoring of outstations from central points and for a variety of land-mobile services. These had been seriously constrained by the acute shortage of available frequencies. Some paging systems operating at 27MHz might also require alternative frequencies when the UK adopted the European standard for cb radio, but no decision had yet been taken on relocation.

Region 9 representative

Mr R. W. Jones, G3YMK, has resigned from the position of Region 9 representative as a result of moving to Aberdeen. An election will therefore be necessary to fill the vacancy.

Any five corporate members resident in Region 9 (Cornwall and Devon) may nominate any other qualified corporate member resident in Region 9 for the office of Region 9 representative. Each nominator may not nominate more than one person to fill the vacancy.

Nominations must be made in writing and signed by all the nominators, and delivered, together with the written consent of the nominee to accept office if elected, to: Mr D. A. Evans, Secretary/General Manager, RSGB, Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW, on or before Monday 10 December 1984. All nominations will be acknowledged by return of post.

In the event of more than one person being nominated, a ballot will be held, details of which will be published in the February 1985 issue of *Radio Communication.*

New postage rates

As is well known by now, Post Office charges were increased on 3 September 1984. One implication of this is that envelopes sent to QSL Bureau sub-managers before the increase will in some cases be under-stamped, and those bearing stamps at the old first-class rate will now be sent as though they were second-class mail. Members wishing to receive cards quickly are advised to supply their sub-manager with new stamps to cover the new rates for first-class mail.

Another result of the increase is that the cost of mailing *Radio Communication* to members increased by four per cent to UK addresses and by 12 per cent to overseas destinations by surface mail.

A tv repeater proposal

A number of people have expressed interest in a 1·3GHz tv repeater for the Southampton/Bournemouth area. Several possible locations are being discussed. Suggestions have been made that it may be better to have two repeaters: one for the Poole/Bournemouth area, and one for the Southampton area. This would permit better coverage of the low-lying areas in the central parts of Southampton, Bournemouth and Poole. In order that any proposals can take into account all interested amateurs in the areas concerned, it would be most helpful if those genuinely interested in 1·3GHz tv operation in the areas in question could contact Nick Foot, G4WHO, 47 Mallard Road, Colehill, Wimborne, and let him know of their interest.

Goodbye, Sue

Mrs Sue Newton, our assistant editor, is leaving us in early November to take up an appointment as production editor with a publisher in Colchester, where she lives. We wish her a happy and successful future, and thank her for almost five years' dedicated service to *Radio Communication.*

Her experience will be hard to replace, and we hope that members will bear with us if this loss of some thirty five per cent of editorial staff effort results in a temporarily slimmed-down magazine for the next few months.

Andorra expedition

The Worcester Moonbounce Society has announced that its 1985 dxpedition will be to Andorra. Callsigns will be C30AKA, C30BTA and C30CMV. Activity will be on all bands from 1·8MHz to 1·3GHz, including 50MHz. Skeds can be arranged by writing to G6JNS, QTHR. The dates will be from 15 to 22 April, and the QSL manager will be G6JNS, PO Box 36, Worcester.

Packet via meteors

The recent Perseids meteor shower provided a good opportunity for experimentation with packet radio operation via meteor scatter. Various stations in the USA took part in tests, and W0RPK and K1HTV completed what is believed to be the first packet radio contact on 144MHz using ms. The tests were performed at 1,200 bauds using afsk fm: this mode was used in order to allow as many stations as possible to take part in the tests, although a sacrifice in performance was involved.

Sidebands

The Yaesu Owner's Club has changed its address: it is now at PO Box 47, York YO1 1GA.

We understand that the Austin Rover Montego, like the Maestro mentioned in *Radio Communication* some time ago, may also suffer from rfi problems with its electronic ignition when 144MHz is in use —any comments from members?

A number of members appear to be somewhat careless in mentioning on the air that either they or their friends are on holiday or about to go on holiday—it is understood that there has been a spate of burglaries involving radio amateurs listed in the *Callbook* in a particular part of the country.

Lucky winner of the Lowe Electronics' Open Day free raffle was Mr R. Sim, G8VIB, of Northumberland.

The Rutherford Appleton Laboratory, near Slough, is keen to install an hf station for propagation study purposes—it looks likely that GB3SX, the 28MHz beacon at present at Crowborough, will move to that site, probably with an appropriate change to its callsign.

Updated information on reciprocal licensing in Eire is now available from the membership services department at RSGB headquarters.

Members who served as aircrew during and after the second world war in the RAF or Allied air forces may be interested to learn that the Aircrew Association is attempting to organize an ACA Net on 3·5MHz. Nev Kirk, G3JDK, QTHR, will be pleased to supply further information on receipt of an sae.

Mobile Rallies Calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

3 November
Fourth North Devon Radio Rally. Bradworthy Memorial Hall, Holsworthy. Open 10.30am–5pm. Bring & buy stand etc. Talk-in on 144MHz (S22). Details from G8MXI, QTHR.
18 November—Carmarthen ARS Rally. The West Wales Hospital Club, The Quay, Carmarthen. Open 11am to 5pm. Admission 50p. Trade stands, bookstall, bring & buy, craft and bric-a-brac, licensed bar, full catering. Ample space for visitors. Talk-in on S22. Free car parking. Details from M. Meredith, 50 Caecoed, Llandybie, Ammanford, Dyfed, tel 0269 850803.
9 December
Leeds & District ARS Annual Christmas Rally, Pudsey Civic Centre. Open 11am. Talk-in on S22. Free admission. Rally sec G4ONW, QTHR.
10 March 1985
Northern ARS Association Exhibition & Mobile Rally. Central Hall, Belle Vue, Redgate Lane, Longsight, Manchester M12 4WH. Details from Mr G. Wood, G8NRF, QTHR.
10 March 1985
Pontefract & DARS Components Fair. This rally is aimed at the home-constructor and d-i-y enthusiast. Traders are invited only to sell components, surplus equipment and antennas. No new black box type equipment is allowed. Open 11am–4.30pm, at the Carleton Community Centre, Pontefract, on the A1 between Darlington and Pontefract. Details from G4ISU or G4KMW, both QTHR, tel 0977 792784 or 792654.
25 March 1985
White Rose Rally, The University of Leeds. Details from Alan Bramley, G4NDU, QTHR, or Box 73, Leeds LS1 5AR.
12 May 1985
Swindon Radio & Electronics Rally. Oakfield School, Marlowe Avenue, Swindon, Wilts. Open 10.30am. Talk-in on 144MHz (S22) and 432MHz (SU8/GB3TD). Refreshments, ample parking, cartoons, many other attractions. For further details contact Ken Saunders, G8SFM, QTHR, tel 066689 307.
26 May 1985
East Suffolk Wireless Revival. More details later. Further information from Jack Tootill, G4IFF, QTHR, tel Ipswich (0473) 44047.
9 June 1985
Elvaston Castle Mobile Rally, Elvaston Castle Country Park, 5 miles south-east of Derby on the B5010. Organized by the Nunsfield House ARG. Opens 10am. Talk-in will be provided by GB2ECR on both 144 and 432MHz. All the usual facilities including bring & buy sale and flea market. Full on-site catering facilities. Further details from John Robson, G4PZY, QTHR, tel Derby (0332) 767994, or Ian Cage, G4CTZ, QTHR, tel Derby (0332) 799452. Trade enquiries to Mr R. Woolley, G4HIJ, tel Ashbourne 43241.
25 August 1985
18th Preston Annual Rally, to be held at Lancaster University. Details to follow.

Special Event Station

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

17–18 November, GB0LMC
This station will be operated by members of the McMichael ARS in Stoke Poges, Bucks, from 0900 17 November to 1700 18 November on the 1·8 to 432MHz bands, concentrating on UK contacts. QSL cards will be issued via the bureau or via G2FG, QTHR. It will commemorate the birth 100 years ago of Leslie McMichael, who held the callsign MXA from 1913 until the first world war, and who was one of the founders of the London Wireless Club (later to become the RSGB) in July 1913. He became the first vice-chairman in 1914 and then secretary in 1919. The following year he was licensed as 2FG, and allowed to use up to 10W on 180m. The licence allowed him to contact only three named stations! In 1921, on behalf of the Wireless Society of London he successfully petitioned the Postmaster-General to allow the broadcasting of speech. This led to the establishment of the Marconi Company's station 2MT—which broadcast speech and music for nearly a year—and, soon after, to the formation of the BBC.

Leslie McMichael was one of the few honorary members of the RSGB, and died on his birthday in 1951.

Other Events

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

8 December—RSGB AGM, IEE, Savoy Place, London.
1985
23 March—RSGB National VHF Convention, Sandown Park Racecourse.
13-14 April—RSGB National Convention, National Exhibition Centre, Birmingham.

Council Proceedings

(*Rad Com* October 1984, p841)

Mr G. R. Smith, G4AJJ, has asked us to make it clear that since the Council meeting on 26 May he has apologised to Mr I. Lundegard, G3GJW, withdrawn his allegations and the request for a special meeting under Article 24 to expel Mr Lundegard.

ARTHUR MILNE'S DIAMOND JUBILEE

FEW OF US can claim to have been active amateurs for a golden jubilee of 50 years—fewer yet ever experience the pleasure of celebrating a diamond jubilee of their amateur radio. Arthur Milne, G2MI, has not only held a licence since 1924, he has achieved a place in history for his many unique contributions to the hobby. He was, for example, honorary editor of the *T & R Bulletin*—and earlier, the man who drew many hundreds of its diagrams in the days before this work had to be undertaken professionally. He took over responsibility for the QSL Bureau on the outbreak of war in September 1939, when the RSGB gave up its offices in Victoria Street, and he became contributor of *The Month off the Air* (later, happily, *The Month on the Air* once more) while at the same time putting in many thousands of hours as a Voluntary Interceptor for the Radio Security Service. He has been GB2RS news reader for the London area for an almost incredible 1,300 weekly bulletins, and adding still to the total —for a considerable part of the time using a home-constructed transmitter.

But for those who can sometimes see behind the scenes, there has been much, much more. A career as a Post Office engineer gave Arthur an opportunity to save some of the historic documents linking amateur radio with broadcasting in this country. He was a member of the RSGB Council for many years, was President in 1954, and has never been afraid of expressing forcibly his views on the Society and the policies it should pursue. For many years an ardent dx-operator, phone and cw, home-constructor . . . G2MI has spent 60 years contributing to British amateur radio and in doing so has become one of its main architects . . . indeed, the three British callsigns that were immediately internationally recognized were G6CL, G6CJ and G2MI. Arthur, surprisingly, was not the first to hold the call 2MI—in the early 'twenties it was held by the McMichael company.

It was fitting indeed that for his diamond jubilee celebration—held at the Victory Social Club Hall, immediately adjacent to the address of 29 Kechill Gardens, Hayes, Bromley, that for so many years was the clearing centre for millions upon millions of QSL cards—Arthur and his wife Lucy were flanked by amateur-radio-licensed son G3UMI, grandson G6VMI, son Roger and daughter Janet, and a covey of "two-letter" old-timers including "Dud" Charman, G6CJ, and Louis Varney, G5RV, other

Arthur Milne, G2MI; son Geoff, G3UMI/VP9MI; and grandson G6VMI at the celebration

The celebration cake made by Mary, wife of G3UMI, with help from her daughter Julia. The pattern was taken from G2MI's QSL card and had "CQDX" etc in silver balls around the edge

British callsigns that cross all frontiers. A total of 84 people were at the celebration, among them four past-Presidents of the RSGB, one Council member, and several QSL Bureau sub-managers.

The growing nostalgia for yesteryear's radio, equipment and publications was evident in the interest shown in the 'thirties components: Brown Type A adjustable reed earphones (extremely sensitive but oh so hard on the ears when worn for many hours!); home-built crystal calibrator in the days when this took a large cabinet; three-stage 150W transmitter with a hefty power triode; automatic CQ-sender based on uniselector mechanisms; and a compact suitcase transmitter-receiver built by G2MI to his own design in the late 'forties, though owing something, one suspects, to the concepts of the wartime clandestine sets.

Why is it, one wonders, that it is so much more fascinating, at least for some of us, to examine the memorabilia of a lifetime in amateur radio than to look at just a few more modern black boxes?

For the others, a chance to meet and talk. Eric Trebilcock, BERS195, the world's most diligent and experienced "listener", Stan Cook, G5XB, with his experience as a watcher-out for intruders, with much fascinating information on what goes on in our bands. Bill Craig, G6JJ, whose cw gladdens the ears of those using the cw-ends, and Frances Woolley, G3LWY, of RAIBC fame.

As a visitor, arriving late, my apologies for not knowing or naming all the many (particularly the ladies) who organized the well-laden tables of food and drink, and made the whole event such a happy and enjoyable occasion.

Our gratitude for so much that has been done by Arthur Milne—Mr Amateur Radio—for us all. Long may you continue to look a "youngster" of 50 rather than past your mid-seventies, and that we shall hear that, shall I say "resonant", voice ringing out across the airwaves or in the places where amateurs foregather for many more years.

G3VA

OBITUARIES

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

Mr E. N. Gilbert, G4IDQ
Eric Norman ("Barnacle Bill") Gilbert died on 5 September, aged 71. A master mariner, he volunteered for duty at Dunkirk in the small ships, where, on his third trip, he lost an eye. On losing his sight completely he moved to N Baddesley in 1975, where he studied and sat both the RAE and the morse examination to obtain his licence. He was well known on the air, especially on a number of nets for white stick operators on both hf and vhf. He was a member of the Romsey Blind Club and was an operator of GB3RBC, which he helped to organize to celebrate the 75th anniversary of the Hampshire Association for the Care of the Blind with G8YWA. He was a member of the RAIBC and of the Itchen Valley ARC.

Mr A. Hayton, G4ARV
Alan Hayton died on 25 August. Although blind since a childhood accident he never let this inhibit him. He was an accomplished musician, and was an active radio amateur pursuing at various times everything from NFD and JOTA to construction. Alan was active daily prior to his illness on the lower frequency bands and 144MHz.

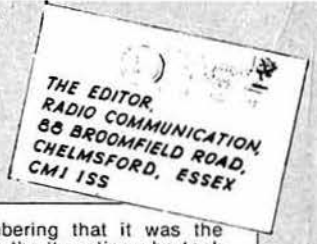
Mr W. Metcalfe, G3VGA
Bill Metcalfe died on 30 May. He was active on hf and vhf until his death, although his special interest was home construction, where the quality of his work was well known.

Mr G. R. Thompson, GW3ELM
Bob Thompson died on 13 August. He was 69 years old and active until his death. He joined the RSGB in June 1945 and was licensed in October 1949, after war service in the RAF as a radar mechanic. He was interested in 144MHz in the late 'forties, and in 1949 was the first GW to work GI on 144MHz. He was a founder member of the Conwy Valley ARC and made a point of helping new members, and for several years ran an RAE class.

Also:

Mr S. N. Andrews, RS21861;
Mr P. S. Brackenbury, RS21546, on 10 August;
Mr W. T. Caton, G3CIR, in August;
Mr L. Chase, G8BHT;
Mr D. T. Evans, G4UKC, on 28 December 1983;
Mr J. Freeborn, RS30721, on 3 June;
Mr E. H. Hammond, RS6211;
Mr R. J. T. Monk, G3FWV, on 20 July;
Mr S. E. Richards, RS22032;
Mr D. S. H. Sharpe, RS85089, on 28 August; and
Mr D. G. Thompson, G3YLB, in October 1983.

Members' Mailbag



PRIDE OR PREJUDICE

Sir—There must be many radio amateurs, myself included, who would wish to dissociate themselves from the nationalistic jingoism that took place on 6 June this year.

For you, in your article, to use a quote from the author, David Irving, a self-confessed admirer of the Nazi Party, I find offensive and in bad taste.

If amateur radio is about self-training in radio techniques then let us keep nationalism, royalty admiration and politics out of it.

Vincent Taylor, G8DWC

Two points should be made here: "nationalistic jingoism" is a subjective judgment, not an abstract truth, and the large number of comments on the GB4DD operation which have been heard and received by the Society suggest that national pride and pleasure in the association of amateur radio with royalty have been the dominant feelings. The second point is that the quotation was not by David Irving: the quotation is a famous one from Hermann Goering and it is cited both in Irving's book on the Luftwaffe and in several other books concerned with the second world war, such as Alfred Price's Instrument's of Darkness *and Cunningham and Rawnsley's* Night Fighter. *No one in their senses denies that war is tragic and wasteful.*

It is through operations such as those by GB4DD that amateur radio operators acquire skills which have many times been shown to be of great value both to the community and to the nation. This alone is considerable justification for them.

Sir—It was good to see amateur radio once again playing its part, by sending a message of goodwill to His Royal Highness the Duke of Edinburgh and receiving a message sent by Her Majesty the Queen.

I would like to tell you that several years ago, on the opening of the Royal Portbury Dock, Bristol, when Her Majesty and HRH sailed up the Bristol Channel in the royal yacht. I signalled a message of loyal greetings to them, by Aldis lamp, from the Portishead Power Station Authorities and the City of Bristol RSGB Group.

The following day we received a telegram of thanks from the Queen's Secretary. A "half at first" for Bristol RSGB Group?!!

The pre-arrangements for the acceptance of the message by the royal yacht were carried out by Brian Goddard, G4FRG.

Ronald G. Foot, G4BKU

LIGHT-BULB RFI

Sir—With reference to the article on electric lamp rfi *Rad Com* August, p 653, and your request for other similar experiences, I wondered if you would be interested in the following?

The article mentioned that light bulb rfi in the UK is so far unknown, but some 25 years ago it was fairly common on television Band 1 and vhf Band 2, the cause being the common filament light bulb. The effect on television was a line of dots across the screen accompanied by a rough buzz on the sound. At the time, the interference was said to be due to self-oscillations taking place within the lamp—nearly always of the vacuum type, the gas filled type seemed not to cause any problems. It was thought that the two ends of the filament and the charge on the inside of the bulb acted in a similar fashion to a triode. The natural frequency of the oscillations varied from one lamp to another over a wide bandwidth.

I well remember a street lamp causing such problems over a radius of several hundreds of yards before the lamp finally failed and the interference cleared. One suggested cure was to fit a magnet around the neck of the bulb in much the same fashion as magnets fitted on valves to prevent Barkhausen oscillations taking place in tv line output stages.

P. T. Knight, G6EPM

This letter stirred memories of a long-forgotten textbook on transmitters which discussed the "Barkhausen effect", and it also reminded one member of staff of an uncommon fault sometimes found in the line-output stage of some television receivers in the 'sixties. In these, a flickering white line down the left-hand side of the picture was sometimes removed by changing the line-output valve (usually a beam tetrode or pentode of the PL36 or PL81 class), and the theory was that the anode and screen grid formed two elements in a "Barkhausen oscillator" in some valves for no very obvious reason. Does anyone know the real reason for this phenomenon?

DO YOU OWN AN FT102?

Sir—Owners of FT102 rigs may have been disconcerted by a recent suggestion in an another publication that some FT102s lacked an important resistor (R84) in the i.f. chain.

Rigs with serial numbers between 2M071000 and 2M071100 were identified. As mine was one of these I checked with Yaesu, and it is fitted—underneath, on the solder side. Attempts to fit a 100kΩ resistor in the holes marked R84 topside will seriously degrade the rig's performance. Subsequent batches have a modified foil pattern and normally mounted components, I believe. Hoping this information will be of use to others.

Sean Quinn, GI4PCQ

WHAT'S IN A NAME

Sir—The editorial in your February issue, and the letters following, lead me to remark my concern over a number of years.

To overcome the matter of credibility I have always referred to myself and associates as "radio enthusiasts". In particular I found it desirable to use this term in connection with the organizing of a "special event" celebration station—invariably the word amateur suggested amateurish—or at best, of lesser importance, and arrangements would have less attention.

There is no doubt that in the outside world we are competing with others—within our own circle we can adopt various cosy titles. If you are a painter you are a painter, and a philatelist is a philatelist. Useful titles come to mind: radio station, radio operator, radio constructor, radio experimenter etc.

The word amateur upon the licence engenders its use—in the 'thirties we were referred to as "experimenter", as stated on the licence of the time. I know of no other licence which has the word amateur. It would be a major step forward to have it removed.

I note the driving licence for the private motorist does not use the word amateur.

Ralph Barrett, G2FQS

PACKET RADIO

Sir—We all take for granted the high standard of articles appearing each month in *Radio Communication*, but surely P. J. Cadman's contribution on data communications in the August issue was an outstanding example of technical writing at its best. Although I had no prior knowledge of packet radio, I found real pleasure in reading the well-turned phrases and I felt at the end that I had learned something new and interesting without pain.

Our hobby may indeed be "amateur" radio communication; our journal certainly is not.

Alan Greaves, G3JOX

Sir—Congratulations on the article on data communication in the August issue. Surely this topic opens up enormous possibilities for the radio amateur. We are using 1,200 baud telephone-type practice on vhf in the Thames Valley with great success.

However, I do hope that Mr Cadman's article does not frighten off any would-be experimenters by his comprehensive survey of current practice on telephone lines, because a large amount of this may well be irrelevant for radio. In Pat Hawker's words, we should keep it simple.

It is worth remembering that it was the amateur enthusiast in the 'twenties who took radio waves from a scientific curiosity into the home, from which broadcasting grew up; and similarly the exponents of computers made little impact for the first 25 years until hobbyists paved the way for the home computer. I have the feeling that the subject of data communication is now ready for a rationalization by people doing it for the right reasons.

If, as we have found, you can send a page of data from one memory to another in a fraction of a minute, do we need to worry about packets and protocols to avoid clashes? If we dedicated just one frequency channel to it, I doubt if we could keep it usefully occupied.

Few people seem to know that there is a frequency allocated to data comms calling, namely 144·675MHz. See you there.

R. J. Redding, G3VMR

Sir—Thank you for the helpful article "An Introduction to Data Communication" in your August issue. May I add a little to the introduction, where it is said that packet radio had its beginnings in the world of computer networks and high-speed data communication.

The idea of packet radio goes back to the early 'sixties where it is generally credited to Paul Baran at the Rand Corporation. Voice conversations between A and B were chopped into short time duration "packets", transmitted over several different lines, then reassembled at the receiving end. One merit of this system was security. An unauthorized listener to one line would only receive a small fraction of the total message. Another advantage was the failure of one line would only result in the loss of a small fraction of the message.

The subject of packet switching is dealt with in a book by Roy Rosner entitled *Distributed Telecommunication Networks*. However, *Radio Communication* is not alone in its references to "packets". In *New Scientist* August 1984, one reads "Packet switching is a data communications technique pioneered in Britain"!

John R. G. Corbett, CEng, G3TWS

Mr Cadman's article has attracted several letters of praise and we are pleased that many members have apparently been inspired to become interested in the "new" mode of packet radio. The RSGB's working group dealing with the subject has already met several times, and we hope to stay in the forefront of developments. A report from our observer at the recent ARRL conference on packet radio is awaited with interest.

Sir—Packet radio test transmissions were successfully conducted on 9 January 1984 between G8XWA/A and G3WRI. The tests were carried out on a frequency of 145·400MHz at a modulation rate of 300 baud with a pseudo-X25 synchronous transmission protocol, and were a spin-off from a research project case study, involving data transmission over commercial vhf radiotelephone systems, which was being undertaken by Paul Brown, G3WRI.

The resulting amateur radio spin-off is a very useful experimental software package which Paul developed for the BBC microcomputer. The experimental package entitled "AMTEXT" enables the BBC microcomputer to be utilized as an "Amateur Radio Terminal for Experimentation in the Transmission of Text", hence the title.

NB. If dummy load tests are considered valid as "firsts" then packet radio tests were conducted by G3WRI as early as October 1983.

Bryn Jones, G8XWA

THANKS!

Sir—First, I would like to thank the Society and members of the staff for the support given to me when I applied for planning permission for the erection of an amateur radio mast at my home. Your booklet on planning permission was a tremendous asset, and your letter of

support was very much appreciated. Planning permission was granted without any problems arising from the application.

Second, I would like to thank all those concerned with the issuing of special event callsigns and congratulate them on the efficient and helpful way in which they processed the callsign GB2EGL for the Royal National Eisteddfod of Wales at Lampeter in the county of Dyfed. The event was a tremendous success, with both tv, radio and newspaper coverage of the special event station throughout the week. The estimated number of people who visited the Eisteddfod this year was in the region of 120,000, therefore I hope that the people of Wales are a little bit more aware of amateur radio and everything that it involves.

Allan J. Jones, GW4VPX

TRAPPED DIPOLE FEEDBACK

Sir—I was surprised to read in the September "Bull" the item on page 742 concerning trapped dipoles.

I would not dispute that KW Electronics was the first company to market a trapped dipole in the UK, and 8KW may well have had the idea during the second world war, but if he had a working prototype in 1954 why did he wait until 1957 before applying for a provisional patent?

I do not wish to denigrate 8KW's great efforts in manufacturing and marketing the "KW" range of equipment, but in the case of the trapped diopole I believe the credit is due to W3DZZ. I certainly built one myself about 1953 to the W3DZZ design published in *QST* or another USA amateur radio magazine, and you could easily put the record straight by reference to the *QST* or *CQ* magazine index.

I always refer to my present trapped dipole as a W3DZZ type using KW Electronics traps.

T. Winchcombe, G6ZH

SAFETY

Sir—In the item "Safety at home" (*Rad Com* September, p740) the last paragraph of the report quoted seems to imply ample safety in the use of 30mA elcbs (rrcbs) in conditions similar to radio shacks and field days.

The last time that I took megger readings my hand-to-hand resistance was 20,000Ω, so on 240V mains the shock current would be 12mA and this would not trip the breaker. I am rather out of touch, but I believe that the "let-go" value on 50Hz is about 6mA, so on 12mA I should not be able to let go and, if working alone, I should soon be dead.

This is a serious problem and I think it would be wise for you to obtain the advice of an expert concerned with the medical rather than the commercial aspects of shock, and publish the results. It would be a pity if anyone is lured into a false sense of security.

H. Du V. Ashcroft, G4CCM

The rccb's chief virtue is that it can quickly clear some types of earth fault which might not blow a fuse: it is illusory to take the view that the installation of an rccb means that all the usual personal safety precautions can be blithely forgotten! There appear to be various shades of opinion in the professional literature concerning the effectiveness of the rccb, both in protection of equipment and enhancement of personal safety, and the Society would welcome some debate on the subject. One certain virtue of the rccb is that it acts as a "no-volt" relay, isolating the equipment if either phase or neutral is lost.

MORE ON Q·V·Q

Sir—For a long time now *Radio Communication* has contained letters debating the qualities of the old and new RAEs. All that this correspondence has seemed to achieve is to cause division among people whose views should be united.

From all this corresondence three items at least seem plain, although some correspondents do not appear to have noticed that:

1. At any one time only one kind of exam is available to a candidate. He has no choice but to take the *only* exam which will satisfy the licensing authority, so to argue that people who pass one would fail another is pointless, as there is no opportunity for comparison.

2. If some of the opinionated "senior amateurs", instead of constantly criticizing the techniques of people they refer to as "ex cbers", were to descend from their ivory towers and possibly point out errors of operation, they would serve their cause better than by criticizing in print. Perhaps G6s and G1s are beneath their dignity?

3. There are as many kinds of amateur as there are licences issued, and the hobby is big enough to cater for us all without fighting over it.

I applaud G4XTA's letter, which seems to point in the right direction; and as for G4DFV, in our area (NE Lancs) I think he would be hard pressed to find many G6 of G1 operators not giving callsigns correctly.

We all have to learn, and I am just glad that the many people in my area who felt that I had made a mistake took the trouble to tell me there and then. Perhaps if he did likewise in his own patch he would have less cause for complaint.

Remember: he who kicks his brother kicks himself.

Malcolm Higgin, G6SPM

Sir—Since the publication of my letter "under the above heading (*Rad Com* May), as I anticipated and expected, a number of letters followed from members either endorsing my views or against them. It was very enlightening to discover whether or not I stood alone in my opinions, and very interesting to discover from which factors of the licensed amateur fraternity came the letters against my views.

It was heartwarming to read letters such as the one from G4ECB, (*Rad Com* July), and G8OPR, (*Rad Com* August), which proved to me that I am not the only person of the same mind. It was also very interesting to note that all letters published which were from members who disagreed with my opinions, were virtually all from recently-licensed people who, from their callsigns, could not possibly add reasonable experience to their arguments regarding the drop in operating standards over the years, due to the simple fact that they haven't been licensed long enough to have experienced this. Also, these people appear to read more into my letter than what was stated. I clearly referred to "some" of the later G1s and G6s, not "tarring all with the same brush" as quoted by G6KGP (*Rad Com* August). All my comments were made "in my opinion" as stated in my original letter. Perhaps, in my opinion, some of these people might benefit from reading the letter properly before putting pen to paper.

In conclusion, I would like to take this opportunity of expressing my thanks to all those members who took time and effort to reply to my letter, whether or not they agreed with my opinions; after all, everyone is entitled to express their own views in *Rad Com*.

D. J. Walters, G4DFV

CAUTIONARY TALE FEEDBACK

Sir—The letter by Dr Patricia Pay in "Members' Mailbag" has prompted me to write to you relating my experience with another type of home study course—one catering for licensed amateurs who, prior to taking the RAE had minimal, and I do mean minimal, electronic knowledge.

I was fortunate in discovering the British National Radio & Electronics School. After perusing their literature I decided to embark on two of their non-academic, theoretical/constructional sources. These were well prepared and presented, and I would wholeheartedly recommend the service that they provide in the above field. The amount of study, as distinct from soldering, should not be underestimated if, like me, one starts from almost zero knowledge.

R. Skinner, G4PMR

Sir—While I agree completely with the final paragraph of Dr Patricia Pay's letter (*Rad Com* August), I think it is a pity that the college was named. Just to give another view, I used the same college. After four months study, I sat the RAE in May 1983 and achieved a pass and a credit in the two papers.

Perhaps Dr Pay relied solely on the college course, and she doesn't disclose her success or failure. I supplemented the course with three RSGB manuals: *RAE Manual*, *Amateur Radio Operating Manual* and *A Guide to Amateur Radio*. These were most useful, and with the college course provided a balanced approach with successful results.

Geof Rawlinson, G4XET

Sir—I am writing in response to Dr Patricia Pay's letter in your August issue about our course for the City & Guild's Radio Amateurs Examination.

Dr Pay in her letter was critical of the amount of course material that was devoted to valves as this no longer appears in the RAE syllabus. In your own comment on Dr Pay's letter you make the point that valves and their techniques are still very relevant in the context of amateur radio, and it is precisely for this reason that the information on valves still appears in our course.

While accepting that some people just want the minimum amount of material to pass their examination, there are many others who find the extra material of considerable assistance and the reported successes of our students confirm this point. Just in the last day or so a student has reported success in both parts of the examination with distinction. Comments received from successful students in the past year include:

"I found the tuition to be first-class."

"Please pass my sincere thanks to my tutor for his guidance and patience in obtaining these good and quick results."

"I am quite sure that had I not been a student with you and gone it alone I would not have been successful. I will certainly recommend your course to other budding hams—a very big thank you."

These remarks confirm that many students found our course just what they require.

The City & Guilds are expected to publish a new syllabus for the examination from 1985, and we will of course be undertaking a full review of our course once this is available and preparing new course material as required.

David M. Young, FCIS, FBIM,
Principal, The Rapid Results College

Mr Young's point is well taken; particularly with reference to high-power operation, there is still no substitute for thermionic devices in amateur radio. Many popular hf band transceivers still use valves for their final power amplifier and driver stages, as do the vast majority of home-built linear amplifiers, and some knowledge of how valves work is obviously necessary for construction and servicing.

QSL CARDS

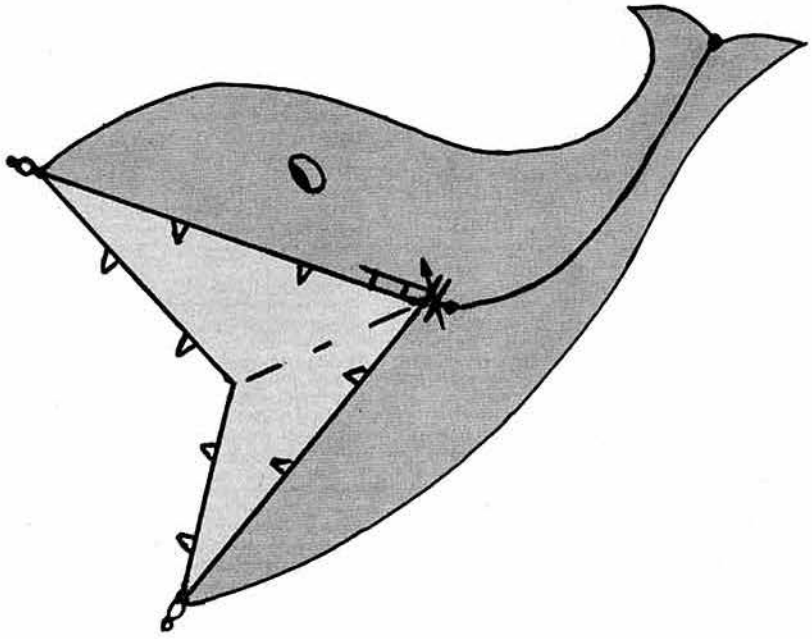
Sir—Many years ago a President of the RSGB betook it upon himself in his Presidential Address, to plead that amateurs should cease to exchange QSL cards as a mere routine. He was completely unsuccessful and I have no illusions that I am likely to improve on his performance. Nevertheless, I would like to make suggestions which might ameliorate the situation where QSL bureaux are clogged with unwanted cards and where some amateurs feel morally obliged to QSL regardless of their own wishes.

When I am told in QSO "please QSL" or what have you, I reply "Sri but no no QSL ere" (in cw, and more fulsomely in other modes). The response varies from a courteous "OK no QSL" to no response when I assume the message is understood; to a repeated "pse QSL" or "my QSL sure" when I give up; to sheer disbelief. One Russian station turned a dull routine QSO into an interesting snappy question and answer session, clearly under the impression that he had a pirate on his hands.

Now many amateurs like to collect QSL cards. Good luck to you, but please do not impose an obligation on your fellows. I suspect that quite a number only want the QSL cards because they are required as proof by the various bodies offering awards. I suggest, therefore, that these bodies should cease to require production or certification of cards as proof and merely retain sensible reserve powers for use in cases of doubt.

Arnold A. H. Moss, G8VF

THE G8PO JAWS ANTENNA



by Cdr J. E. IRONMONGER, OBE, RN(Rtd), G8PO*

Introduction

For many years one of my interests has been the contacting of VKs and ZLs via the long path. The location at G8PO is well sited for dx operation, particularly in a south-westerly direction—the antenna site is 7m above sea level, and the sea is a little over 800m distant.

Previous results on 3·5MHz using a gamma-matched 13m top-loaded vertical have been satisfactory. However, a trapped inverted-V with its apex at 13m has provided only average performance for 7MHz dx.

With the advent of lower sunspot numbers, and the resultant reduction in the muf, my interest turned in 1983 to improving antenna performance on 7MHz. Because the inverted-V has proved useful for contacts via high-angle radiation, I decided to build a second antenna to provide a low angle radiation facility. This is described below.

Development

Various publications covering 7MHz low-angle radiators were reviewed for suitable arrangements, and one of the more promising configurations appeared to be a diamond quad loop, but the mast height required to accommodate the full antenna was not readily available. Nevertheless, I decided to experiment with the facilities available to determine whether reasonable performance was still possible if the bottom of the quad loop was bent out of the vertical plane—particularly as the publications reviewed indicated: (a) at low levels the bottom of a quad loop was ineffective as a low-angle radiator and really only provided a method to feed or excite the top half-wave section; and (b) to achieve all-round looking, radials should be spaced through 360°, otherwise a distorted pattern would result [1], [2].

These statements led me to consider whether the ineffective lower part of the quad loop could be used to advantage as a radial pattern distorter; ie, was it possible to embrace quad loop and groundplane properties in a novel format to give low-angle radiation and some directivity?

The outcome was the evolution of the "jaws" configuration, Fig 1. It can be seen that the bottom of the quad loop, the single "lower jaw" radial, was pulled out from the tower in a south-westerly direction—the direction of best take-off—and fastened at ground level at about 7m from the tower.

The antenna was fed at one corner via a gamma match to give simulated vertical polarization. To provide a reference for comparison a trapped inverted-V was hauled into position on the other side of the tower, at the same height as the top of the loop. The separation between the antennas at their apex being approximately 30cm.

Initially comparative checks were made on reception. The higher local noise on the quad loop indicated that the desired vertical polarization had

Ted Ironmonger will be remembered by older members for his "8PO Special" published in the *RSGB Bulletin* in 1947—from it the "ZL Special" evolved via ZL3MH. His notes on a fixed reversible three-element guy-wire array in 1962 were also interesting. He now feels that, with the take-over of the "black boxes", he should propose a new experimental antenna, if only to give readers the chance to recapture the thrill of trying out something home made.

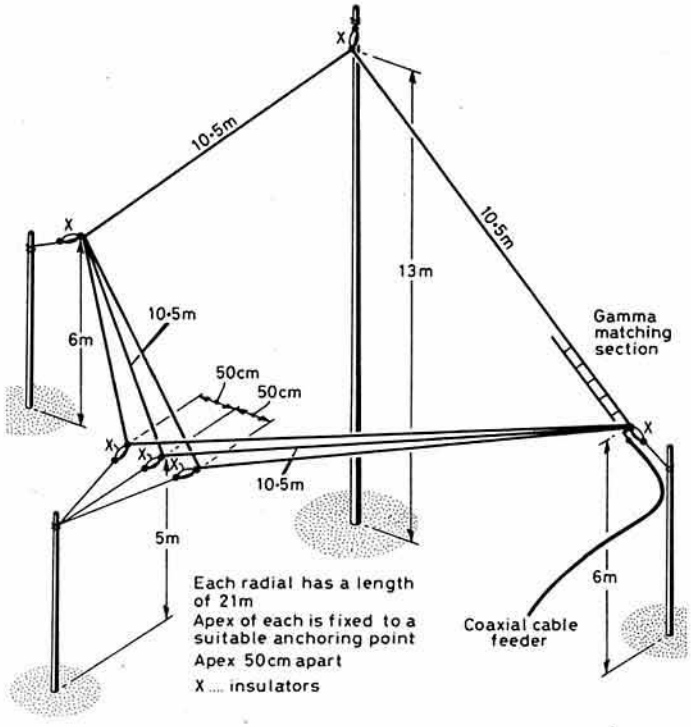


Fig 1. General arrangement of the "jaws" antenna (courtesy G6JP)

* 15 Monks Way, Hill Head, Fareham PO14 3LU.

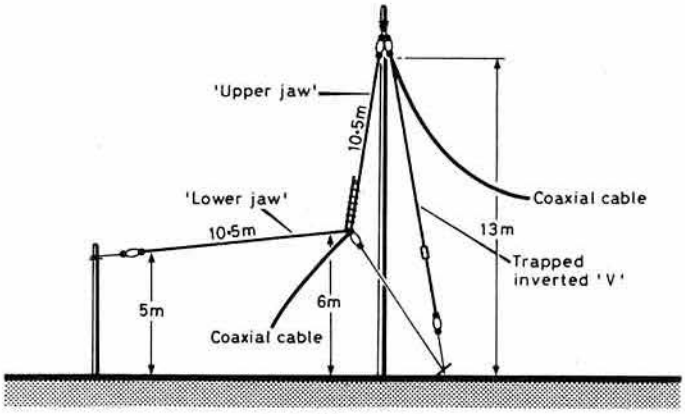


Fig 2. Side elevation

indeed been achieved through corner feeding. For local reception, for example inter-G working, the performance of the antenna varied considerably, depending on the time of the day, skip conditions etc. Over longer distances to the south-west consistently stronger signals were obtained with the loop, especially from VK and ZL. Similar results were experienced on transmission, with the results from European stations being variable due to high angle effects and, on dx paths, consistent superior performance by the loop.

Experiments with radials

The next step was to increase the number of "lower jaw" radials to the antenna. Initially three elements were connected in parallel, again pointing south-west, as shown in Fig 1. The apex of the "lower jaw" was also raised 5m so that the radials were virtually horizontal and clear of surrounding scenery. The gamma match was appropriately readjusted for minimum swr.

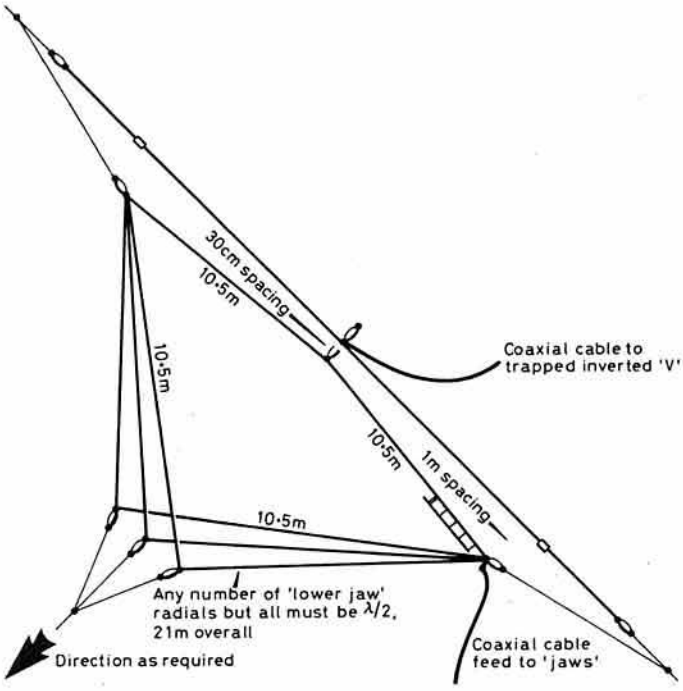


Fig 3. Plan of the arrangement, showing the position of the trapped inverted-V

Early-morning tests to VK and ZL immediately indicated further improvement in performance as compared with the inverted-V reference antenna. Some front-to-back and front-to-side selectivity was also becoming apparent, in the latter case this was due to the two λ/4 vertical elements of the antenna having their current antinodes spaced about 19m apart, and the "lower jaw" radials giving some forward gain.

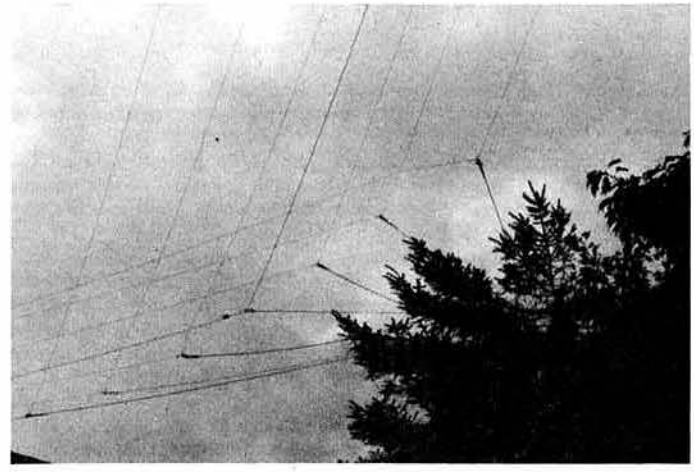
To assess whether the incorporation of extra "lower jaw" radials would be worthwhile, an additional pair were installed. Small lightweight pvc spacers were used to keep the wires separated, as shown in Fig 4. Provided the radials of the antenna were of the same length and kept resonant, the swr could still be adjusted with ease over the band using the gamma-match.

The performance of the five-radial "jaws" was again checked with VK and ZL stations, and a further improvement in signal levels noted. While assessing performance on a morning-to-morning basis on 7MHz long-path is a subjective business, it was felt that with the large number of contacts and comparisons made with regular operators, there were definite indications that development was moving in the right direction—the more radials, the higher the efficiency etc, as for a groundplane. As shown in the photographs, a seven-radial "jaws" lightweight arrangement was eventually tried and proved to be the best to-date. However, from the aesthetic point of view the three-radial "jaws" arrangement looks better, and, because of the law of diminishing returns, is possibly as far as one needs to go. It is interesting that the "seven-radial jaws" appeared to improve 3·5MHz dx in a south-westerly direction—due no doubt to the 150m of 7MHz "radials" in close proximity to the current antinode of the 3·5MHz gamma-matched tower.

Performance

As it was desirable to retain both the inverted-V and the "jaws" antenna, extensive checks were made to assess whether the proximity of either antenna affected the performance of the other. Initially it was expected that for optimum dx performance on 7MHz the inverted-V would need lowering to the ground. However, after four months of trials it was confirmed that both antennas could function effectively on the same mast.

Over a period of 12 weeks some 500 contacts with VK and ZL were made. Many of these were not just exchanges of reports, but lengthy checks, entailing typically 2h of air time every morning over the period. The "jaws" antenna never performed worse than the inverted-V, even when the higher angle of radiation of the latter was possibly more suitable; ie, the "Pederson Ray" effect [2].



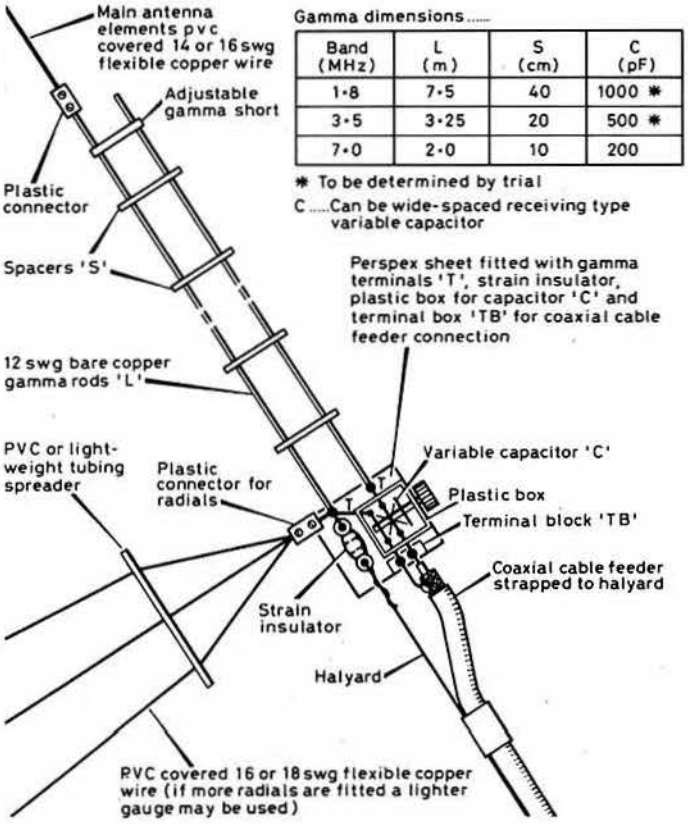
Seven-element lower-jaw radials tethered to a 15ft fir tree

Readers may wonder how a delta loop would compare with the "jaws" system, and trials were made with regard to this. Over a period of seven days, a five-radial "jaws" was checked against a co-sited well-matched delta loop, rigged in place of the inverted-V. The delta loop gave consistently weaker signals in VK and ZL, and was eventually discarded. The main virtues of the delta loop appear to be its simplicity and multi-band facility. However, its radiation is diagonally polarized with either lower corner fed, and perhaps this did not suit my site.

Construction

Figs 2 and 3 are profile sketches of the antenna and indicate the dimensions. The radials should be of stranded insulated wire. Relatively thin wires can be used, as the current will divide between them [1]. This will also reduce weight. While the lower radials would appear to give optimum results when near horizontal, this is not considered to be too critical provided that the tethering point is at least 2m off the ground. Each "radial" must have an overall electrical length of one halfwave, and must be kept spaced from its neighbours. A separation of 30cm between radials at their tethering points was found to be convenient. Insulators should be inserted at all corners of the system, including each radial tethering point, as shown in Fig 1.

The apex of the antenna is shown at 13m, which is the height of the



Gamma dimensions.....

Band (MHz)	L (m)	S (cm)	C (pF)
1·8	7·5	40	1000 *
3·5	3·25	20	500 *
7·0	2·0	10	200

* To be determined by trial

C .....Can be wide-spaced receiving type variable capacitor

Fig 4. Gamma match arrangements and data

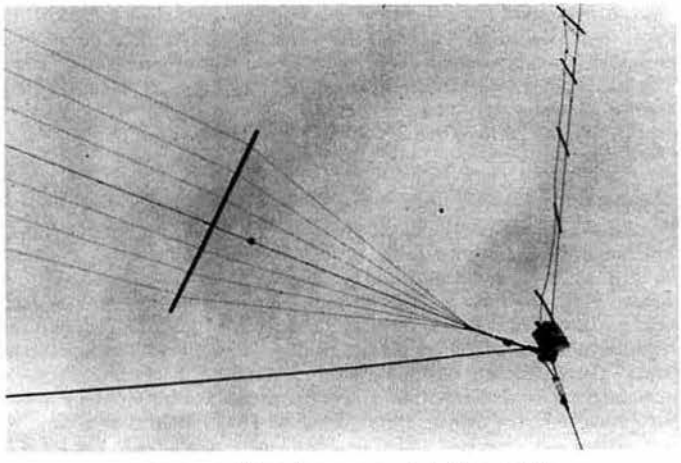
existing mast. This enabled the radials, when horizontal, to be effectively clear of adjacent properties. On an open site the system could possibly be rigged at ground level, with the apex at 8m, although no trials have been carried out with this configuration. This is an interesting area for experimentation, and possibly more relevant to 1·8 and 3·5MHz systems as it would allow the apex to be below 20m. Conversely, if the apex is above one halfwave above ground, the quad loop in its own right may prove just as effective as the "jaws" arrangement.

It is suggested that feeders should be of 52Ω or 75Ω lightweight coaxial cable and cut to electrical halfwaves in length to assist matching; ie, on 7MHz, 15, 30 or 44m. The gamma match arrangement should be as detailed in Fig 4. Setting-up data is available in most antenna books, but can be accomplished using the following procedure:

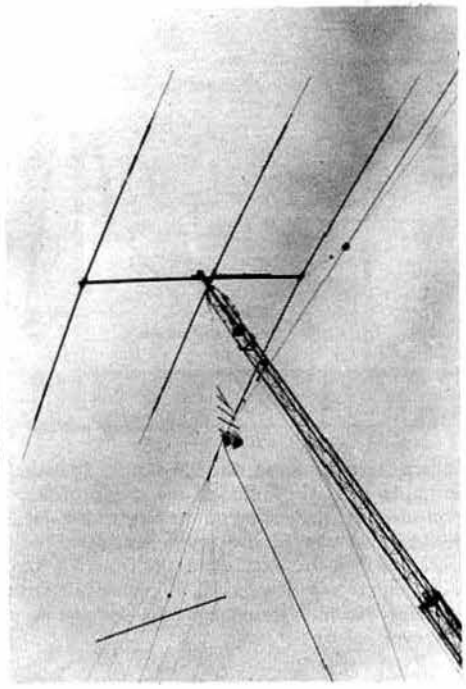
a) Place the gamma short initially at 2m, and with the capacitor at half-mesh, check the swr with the antenna at working height.

b) The capacitor can then be adjusted for minimum swr, entailing dropping the feed corner for each adjustment.

c) If 1:1 swr is not achievable, then move the short down 8cm and repeat the procedure.



Close up of "jaws" gamma-matched feedpoint



Forty-foot mast showing "jaws" feedpoint, trapped inverted-V and gamma-matched/Yagi top-loaded tower

I made no measurements other than those of the wire lengths and swr, but the ease with which 52Ω coaxial cable was matched to the antenna indicates an acceptable state at the feedpoint. The wire lengths and arrangement of the gamma match were taken from standard data and were not found to be critical. In fact the whole antenna, when resonant, proved to be very broadband and easy to tune. As I have no facilities for assessing gain other than the on-air tests as detailed, the following figures, referenced to a trapped inverted-V at the same height, are given as a guide only:

Forward gain	3 to 6dB
Front-to-back ratio	6dB
Front-to-side ratio	6dB

Don't let the above figures be a deterrent because, in practice, due mainly to low-angle radiation, results will prove interesting and worthwhile.

Conclusions

The "jaws" antenna outlined would appear to provide a simple means of simulating a 2 × λ/4-element vertical broadside system, with some directivity, for any band. Its performance is possibly not as good as the real thing, but for the lower frequencies it is much easier to rig.

Postscript

The "jaws" trials were carried out and the data prepared during the period May–August 1983. It is interesting to note that DK9FN's "quad plane", detailed in *TT* October 1983, came to light at about the same time. However, the "jaws" antenna, with its directive facility and gamma-feed arrangement is perhaps a step ahead—and it has been extensively air tested.

Late experiments with a "slim jaw" parasitic reflector

In an effort to improve the front-to-back ratio of the system and so combat the fearsome QRM on 7MHz, a simple reflector has now been incorporated. It takes the form of an insulated backstay tuck-under wire, like a corner reflector, and is easy to rig. The 23m reflector used, slopes for approximately 11m at an angle of 40°, (starting 1·5m down from the top of the mast) to a point 5m above ground, it then bends under the system for 12m. It is finally tethered 3m above ground in line with the apex of the lower jaw radials. It should be pruned for optimum front-to-back. A tucked-under diamond quad loop reflector, with the "slim jaw" paralleled across the apices has also been tried and is even better.

The "jaws" antenna was effective without the reflector, but results are now considered to be above average for a low-level 7MHz array. Front-to-back ratio on reception in the optimum direction compared to the reference

(Continued on p961)

Equipment Review

The Ten-Tec Corsair hf transceiver

by Peter Hart, G3SJX*

The Ten-Tec Corsair

Introduction

The American company Ten-Tec currently manufactures two hf transceivers, the low-cost Argosy (50W), and the top-of-the-range Corsair. The 12V operated Corsair was introduced as the successor to the Omni and features 100W output on all hf amateur allocations on ssb and cw.

Matching accessories include a 12V power unit and remote vfo.

Principal features

The Corsair is fully solidstate, using broadband techniques (no preselector), and covers the hf amateur bands in 12 500kHz ranges. An analogue vfo is used, controlled by a 50mm diameter knob at a tuning rate of about 19kHz/revolution with about 40kHz over-run at both ends of the range. A six-digit l.e.d. readout is provided with megahertz and kilohertz digits in red and the 100Hz digit in green. Operating modes are ssb and cw. There is no provision for a.m. or fm. Two tuning rates are provided for the clarifier (offset), ±1kHz and ±4kHz, operational on receive and/or transmit.

Receiver functions include passband tuning, noise blanker, audio notch filter, fast/slow/off agc, switchable rf amplifier/attenuator, and up to four selectable i.f. bandwidths. 2·4kHz is provided as standard, with 1·8kHz, 500Hz and 250Hz as optional extras. When all four are fitted, the upper three are selectable on ssb and the lower three on cw.

Transmitter functions include speech processor, vox and full cw break-in, with selectable fast or slow receiver recovery. Metering of final stage collector current, forward power, swr and processor level is provided.

The rear panel carries interface connectors (largely phono) for antenna, separate receiver antenna, antenna output to separate receiver, dc power in, speaker, audio input/output, ptt and two auxiliary 12V 2A power outlets. Interfacing to an external vfo and linear is provided and one pole of the bandswitch may be used to control antenna relays etc. The key jack is a phono connector. A 0·25in jack is generally preferred here and provides compatibility with most other transceivers. Unfortunately there is no low level rf output facility, which makes it difficult to use this transceiver with vhf transverters. There is also no external control of alc. A finned heatsink occupies a large proportion of the rear. No fan is provided but a 100 per cent duty cycle at full output power is claimed for up to 20min.

The 12V power supply, model 260, contains a forward-facing speaker and a fast-acting overcurrent trip.

A 50-page owner's manual is provided which gives operating instructions, circuit diagrams and descriptions, alignment instructions and photographs of the boards. DC voltages on all the pins of the semiconductors are given, which can be particularly useful for fault-finding.

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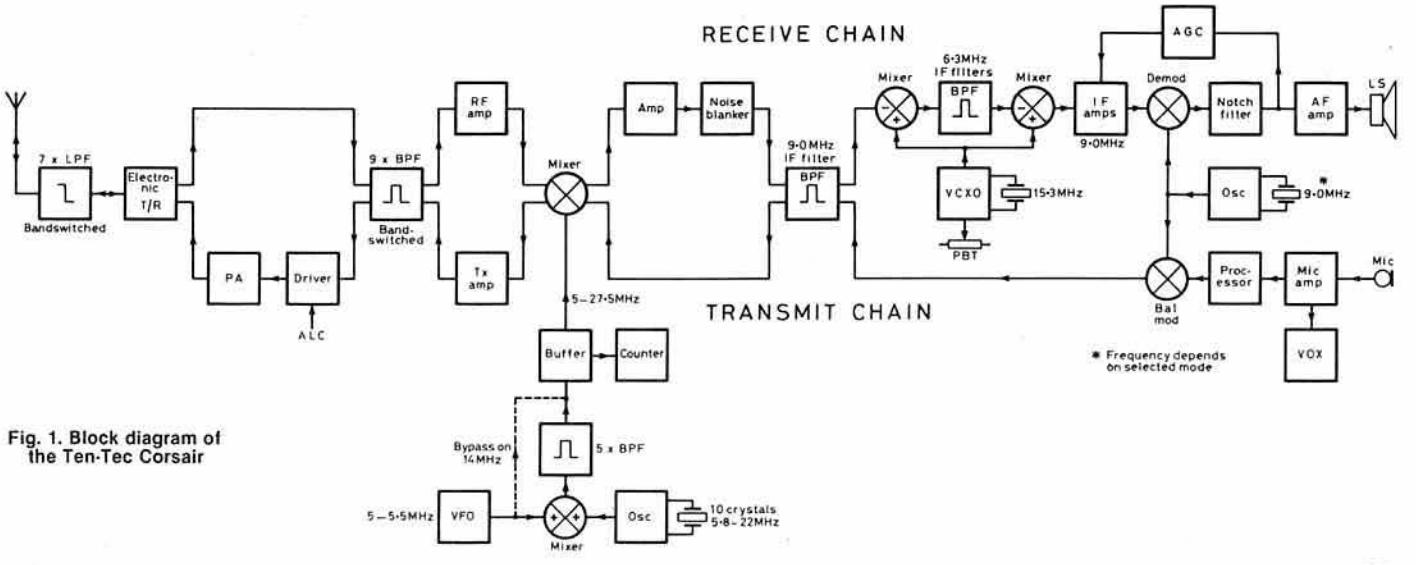


Fig. 1. Block diagram of the Ten-Tec Corsair

Description

The Corsair measures 36(w) by 13(h) by 38cm (d) and weighs 6·4kg. The matching power supply measures 19(w) by 13(h) by 35cm (d) and weighs 6·8kg. An attractive appearance has been achieved, a considerable improvement on earlier generations of Ten-Tec equipment. The circuitry is constructed on about 20 printed circuit boards which are interlinked with miniature multiway plug and sockets and cabling. The chassis comprises a four-sided aluminium box with a central panel on which the majority of the boards are mounted in an easily accessible manner. Screening is provided where necessary. The two-section case is quickly removed. Photographs show the internal construction with screening panels removed. A 7 by 11cm speaker is mounted facing downwards in the bottom panel but a similar-sized forward-facing speaker is mounted in the power supply.

A block diagram of the Corsair is shown in Fig 1. Incoming signals on receive pass through the transmitter bandswitched low pass filters and the electronic pin diode t/r switch to bandpass filters, one for each band. The rf amplifier uses a 2N3866 transmitter bipolar device operating at 10dB gain with transformer negative feedback. This stage may be switched out and replaced with a 10dB attenuator. The first mixer is a balanced Schottky ring, and first i.f. amplifier a further 2N3866 with feedback. The 9MHz i.f. filter is a four-pole 2·4kHz bandwidth crystal ladder filter. This may be optionally replaced by a higher grade eight-pole filter. The second i.f. operates at 6·3MHz with an additional eight-pole crystal ladder filter. Narrower bandwidth six-pole cw filters are optionally selected at this i.f. These ladder filters are assembled on plug-in pcbs using conventional can-mounted crystals and ceramic capacitors, as can be seen in the photograph. Alteration of the second conversion oscillator frequency allows the second i.f. filter to be moved across the passband of the first i.f. filter (passband tuning). An audio notch filter is used and audio-derived agc.

The transmitter is single conversion using the 9MHz filter as the sideband filter, and front-end filtering common to the receiver. An audio speech processor is incorporated. Broadband 12V power amplifiers raise the power output level to 100W nominal. Local oscillator injection for the signal frequency mixer is derived by mixing the vfo covering 5 to 5·5MHz (a permeability-tuned oscillator) with a crystal oscillator, one crystal for each band. On some bands this injection is 9MHz above the signal frequency, and on other bands 9MHz below. This has been done presumably to economise on filtering and to allow five filters to be used to filter the drive for nine bands. The effect of changing from oscillator high to oscillator low is to invert sidebands and change the tuning sense on cw. The international

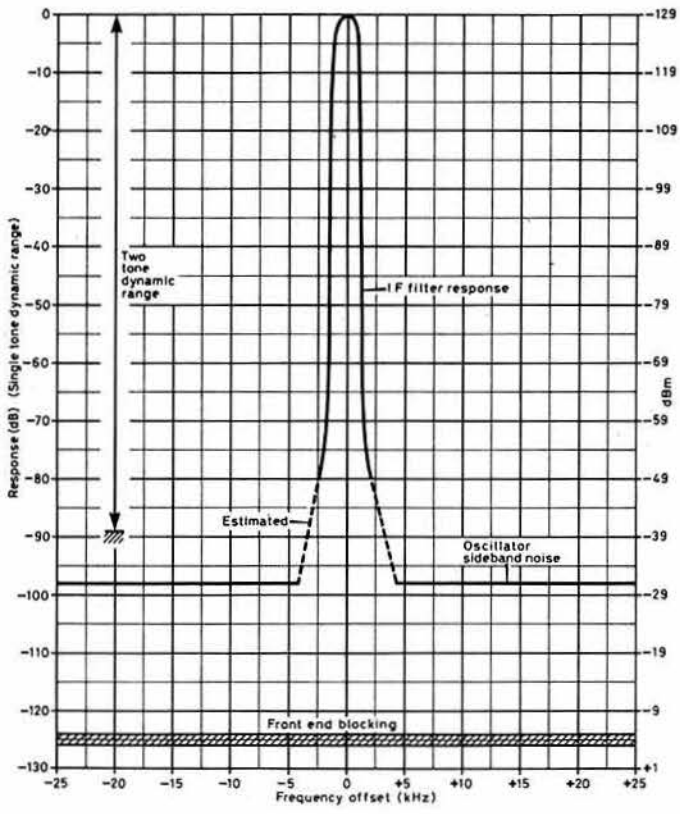


Fig 2. Ten-Tec Corsair effective selectivity curve on usb

Table 1. Receiver measurements

Frequency	Sensitivity on ssb for 10dB s+n:n	Input for S9	Image rejection	9MHz i.f. rejection
1·8MHz	0·35μV (-116dBm)	70μV	98dB	105dB
3·5MHz	0·32μV (-117dBm)	45μV	91dB	111dB
7MHz	0·35μV (-116dBm)	56μV	88dB	73dB
10MHz	0·32μV (-117dBm)	56μV	92dB	66dB
14MHz	0·28μV (-118dBm)	50μV	79dB	83dB
18MHz	0·32μV (-117dBm)	50μV	67dB	84dB
21MHz	0·25μV (-119dBm)	40μV	101dB	88dB
24MHz	0·25μV (-119dBm)	45μV	71dB	80dB
28MHz	0·22μV (-120dBm)	45μV	66dB	81dB

standard is to transmit lsb below 10MHz and usb above. The Corsair transmits the wrong sideband on 10MHz and 18MHz, requiring the mode switch to be set to the inverted sideband position. However, at the present time, ssb is not used on these bands. It could have been avoided by the selection of the appropriate 9MHz carrier insertion crystal by an additional pole on the bandchange switch.

Measurement technique

The measurement technique was similar to that used in previous reviews [1] and [2]. All signal input voltages are given as pd across the antenna terminal and two-tone intermodulation products are quoted with respect to either originating tone. Unless stated otherwise, all measurements were made on ssb, rf amplifier on and 2·4kHz i.f. bandwidth.

Receiver measurements

Sensitivity

Table 1 shows the sensitivity figures with the preamplifier on. These indicate a noise floor of −126 to −130dBm or a noise figure of about 10 to 14dB. These figures are slightly outside the published specification, and while probably sufficient with full-sized antennas may be a little deaf with short mobile whips. With the preamplifier off, the receiver sensitivity was reduced by 13–14dB (1·1–1·6μV for 10dB s+n:n).

S-meter calibration

The input signal level required to give an S9 meter reading is shown in Table 1. With the preamplifier off, these levels are about 14dB greater. On 14MHz the calibration was as follows:

S-reading	Input signal	Relative increase
S2	0·6μV	
S3	0·96μV	4dB
S5	1·9μV	6dB
S7	7μV	11dB
S9	50μV	17dB
S9+20	1·8mV	31dB
S9+40	20mV	21dB

The S9 level is about right, but the linearity is poor.

Spurious responses

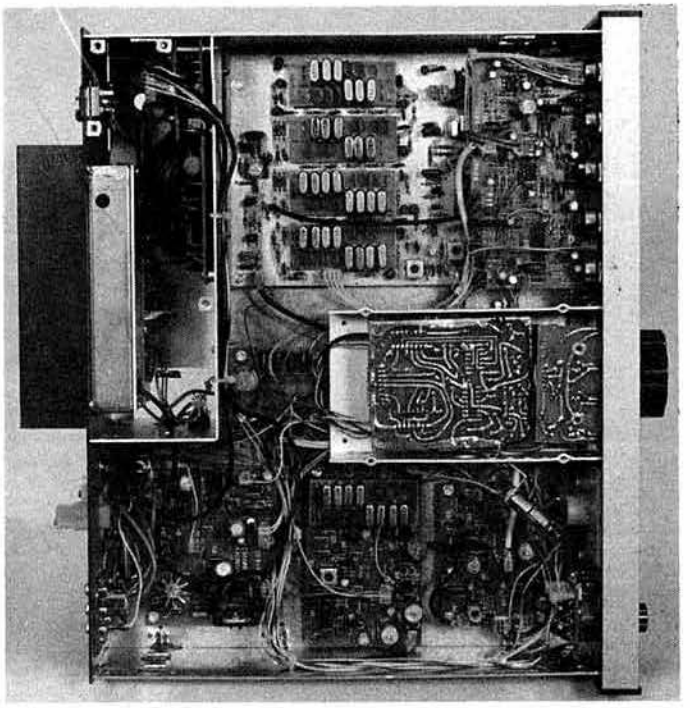
Table 1 shows the image and 9MHz i.f. rejection figures. These are in general just about acceptable, although a few decibels extra image rejection on 24 and 28MHz (image around 6 and 10MHz) and 9MHz i.f. rejection on 10MHz would have been preferable. Rejection of the 6·3MHz i.f. was in excess of 110dB.

With the antenna terminated in 50Ω six spurii were logged, none which would cause any real problems. The strongest was on 18·166MHz (S7), two on 28MHz (S5), one of which can be eliminated by switching to the next higher band.

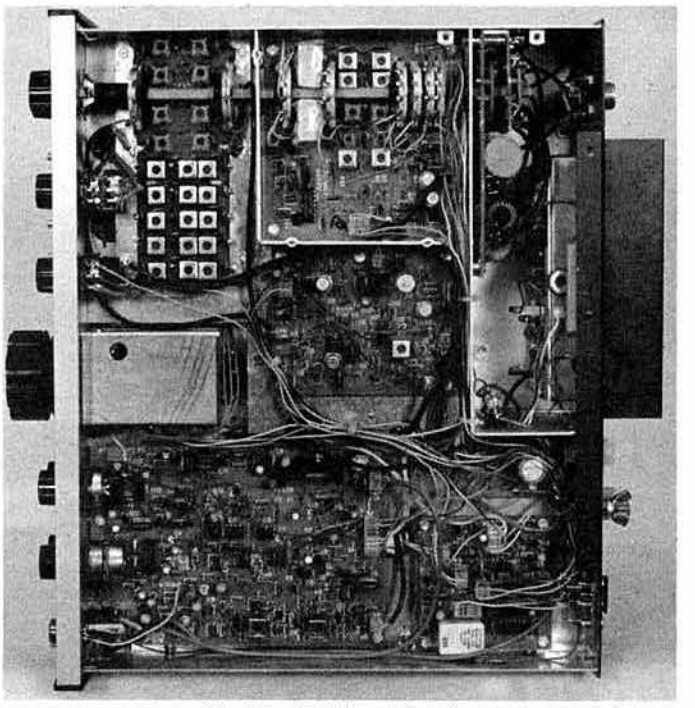
Other spurious responses checked as in [2] corresponding to an S2 meter reading were as follows:

Frequency	Worst response	Other responses
1·8MHz	10mV	Three close in at 70mV
3·5MHz	1·4mV	Three up to 70mV
7MHz	2·2mV	Two up to 70mV
10MHz	40mV	None up to 70mV
14MHz	400μV	Several around 40mV
18MHz	13mV	A few around 70mV
21MHz	70μV	Several 2-30mV
24MHz	400μV	Four around 20mV
28MHz	22μV	Several 2-30mV

Two of the above spurii are likely to cause problems. On 21MHz, 27-27·9MHz appears as an image tuning three times as fast between 21 and 21·3MHz at a level only 40dB down from wanted signals, and resulting in breakthrough from cb stations. This is due to mixing with the third harmonic of the local oscillator (12-12·5MHz) and it should be possible to eliminate it with extra filtering either internal or external to the equipment. A potentially more awkward problem occurs on 28MHz where 29-30MHz appears as an image tuning twice as fast between 28 and 28·5MHz at a level



Top view of the Corsair with covers and screens removed



Bottom view of the Corsair with covers and screens removed

only 30dB down from wanted signals. If fm becomes popular on 29MHz this will cause problems to the cw end of the band. This problem is due to mixing with the second harmonic of the local oscillator (19–19·5MHz) and is too close to the wanted frequency to be eliminated by filtering. Careful balancing of the first mixer may reduce the problem.

AGC performance

The Corsair uses an audio derived hang agc system which results in a rapid recovery following a time delay rather than the more usual exponential recovery. AGC action started around 1μV and the threshold was very soft. A 100dB increase in signal above 3μV resulted in a 9dB increase in audio output. The attack time was about 2ms and the decay time 0·5s (fast) or 1·5s (slow), largely independent of signal level.

Selectivity

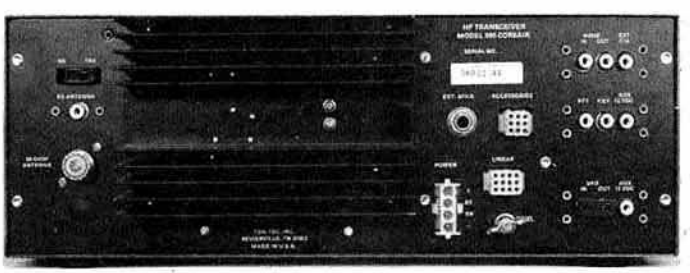
The Corsair obtained for review was equipped with the higher-grade eight-pole 9MHz first i.f. filter, making a total of 16 poles of i.f. selectivity. It was found possible to measure about 80dB down the skirts before signal generator noise became apparent. At this level the filter skirts were widening. Results for the four filters were as follows:

	Filter			
Response	SSB—2·4	SSB—1·8	CW—500	CW—250
– 6dB	2·27kHz	1·79kHz	380Hz	200Hz
– 60dB	2·96kHz	2·71kHz	1·31kHz	660Hz
– 70dB	3·08kHz	2·83kHz	1·51kHz	1·12kHz
– 80dB	4·10kHz	3·29kHz	1·70kHz	1·57kHz

The shape factor of the 2·4kHz ssb filter is excellent.

Reciprocal mixing

Measurements made at 21·4MHz indicated a flat noise plateau at – 98dB in ssb bandwidths, corresponding to a local oscillator noise sideband performance of – 131dBC/Hz. This figure was constant for frequency offsets of 300kHz down to 5kHz, below which the filter skirt response precluded further measurement. This noise probably originates in the mixer or amplifiers of the local oscillator circuitry rather than the oscillator sources themselves, and could possibly be further improved. Close-in this noise performance is unsurpassed by any other amateur transceiver that the author has measured. However, further out this is far from state-of-the-art. It is the author's opinion that it is the immediate adjacent channel performance which is so important for dx or contest working.



Rear view of the Corsair

Blocking

Front-end blocking occurred at input levels of about – 3dBm (160mV). Reciprocal mixing is really the predominating factor.

Third-order intermodulation

A signal spacing of 20kHz was used and resulted in measured third-order intercepts of + 8·5dBm on the lower frequency bands, reducing to 0dBm on 28MHz. This gives a two-tone spurious free dynamic range in ssb bandwidths of 90dB at lower frequencies, reducing to 87dB on 28MHz.

Overall inband linearity was assessed with 200Hz signal spacings [2]. – 40dB intermodulation products were generated with input signals up to 2mV reducing to – 32dB with 25mV signals. This is a good result and is another factor which the author is convinced makes for a clean-sounding dx-winning receiver. The noise blanker did not degrade the intermodulation performance.

Audio

The maximum audio power output before the onset of clipping was 1·6W into an 8Ω load. The distortion was two per cent at 1·5W reducing to one per cent at 300mW output. Maximum audio output could be achieved with 1μV input signal. The audio notch was not evaluated but the specification claims a depth of greater than 50dB tunable between 200Hz and 3·5kHz.

Transmitter measurements

CW power output, harmonics and spurii

Setting the drive according to the manual, the maximum cw power output together with the harmonics and other spurii were:

Frequency	Power output	Harmonics	Other spurii
1·8MHz	93W	– 49dB	Four at – 80dB
3·5MHz	85W	– 50dB	Six – 70 to – 80dB
7MHz	82W	– 60dB	Seven – 70 to – 80dB
10MHz	83W	– 55dB	Several – 65 to – 80dB
14MHz	85W	– 50dB	Several around – 70dB
18MHz	86W	– 51dB	Several – 50 to – 60dB
21MHz	87W	– 53dB	Four at – 50dB, several – 70dB
24MHz	85W	– 54dB	Several – 50 to – 80dB
28MHz	84W	– 52dB	Two at – 40dB, several – 70dB

Figs 3 and 4 show the output spectrum on 24 and 28MHz. The rather high

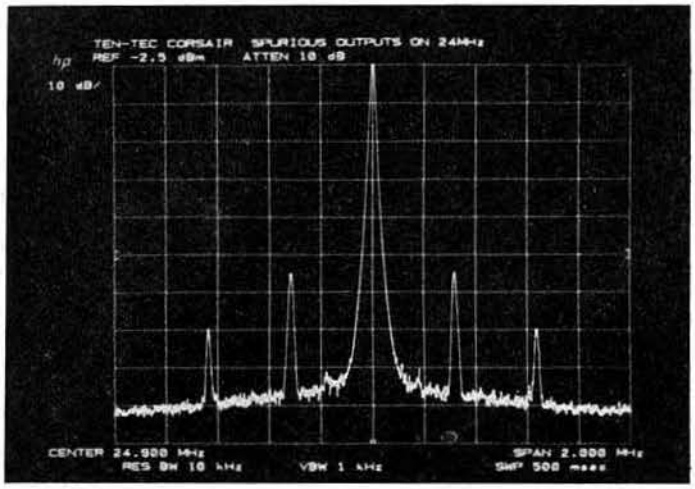


Fig 3. Transmitter output spectrum on 24MHz band. Horizontal span 2MHz. Vertical scale 10dB/division

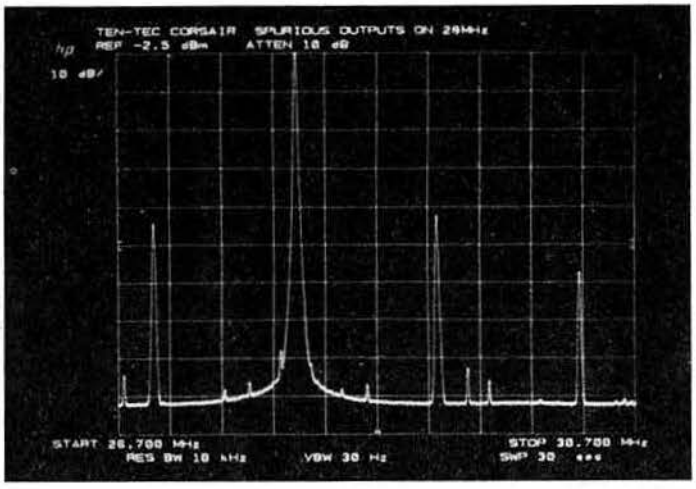


Fig 4. Transmitter output spectrum on 28MHz band. Horizontal span 4MHz. Vertical scale 10dB/division

levels of spurii on 28MHz are a consequence of the local oscillator frequency used, for the same reasons given for the receiver spurii on this band. The drive control gave a smooth control of output power down to a level of less than 100mW.

Fig 5 shows the cw keying envelope when keying at 40wpm. This is nicely rounded with negligible distortion.

SSB power output and distortion

With maximum two-tone audio drive according to the manual, the following results were obtained with the processor off:

Frequency	Power output (p.e.p.)	Third-order ips	Fifth-order ips
1·8MHz	96W	−16dB	−40dB
3·5MHz	88W	−32dB	−45dB
7MHz	84W	−30dB	−40dB
10MHz	84W	−26dB	−36dB
14MHz	85W	−26dB	−34dB
18MHz	86W	−32dB	−40dB
21MHz	88W	−30dB	−38dB
24MHz	85W	−27dB	−38dB
28MHz	85W	−30dB	−38dB

The intermodulation product level at ±10kHz was −56 to −62dB, and at ±20kHz was −72 to −76dB. Reducing the drive slightly results in a dramatic improvement in ip level, particularly on 1·8MHz where the alc level appears to be set a little high.

The processor did not significantly degrade the intermodulation performance.

The carrier suppression was −50 to −70dB depending on audio level, and the sideband suppression with a 1kHz audio tone was −60dB.

Audio

The audio bandwidth was measured as 370Hz–2·6kHz at the −6dB points, and full output could be achieved with 9mV af input at the microphone with the processor off. The audio distortion was about two per cent at full output.

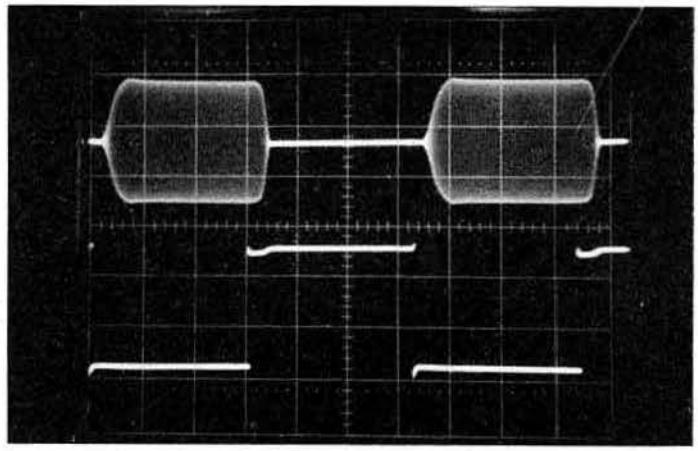


Fig 5. CW keying waveform (bottom) and rf envelope (top) at 40wpm. Horizontal scale 10ms/division

Transmitter noise output

Measurements at full output on 21·4MHz (see [2]) gave a constant noise floor for measured offsets of 5–100kHz of −79dBm/Hz. This corresponds to a level of −95dB with respect to the carrier in a 2·5kHz bandwidth or −129dBC/Hz. This is in reasonable agreement with the receiver reciprocal mixing result.

Operation into mismatched loads

This measurement was not possible as the power supply overcurrent trip operated at power levels above 50W into a 2:1 load vswr. It seems likely that the overcurrent trip level was set too low but this was not checked.

Other measurements

Frequency indication and stability

The frequency drift on 28MHz was 70Hz hf during the first 15min from switch-on, followed by a downwards drift in frequency at a rate of 100Hz/h for the next 2h. This is reasonable for an analogue vfo.

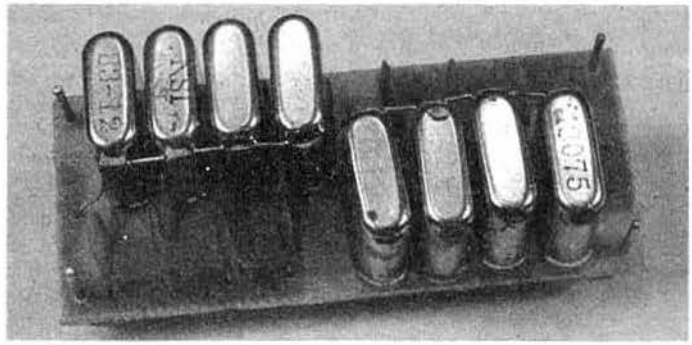
The frequency readout was accurate to within the 100Hz resolution and indicated suppressed carrier on ssb and zerobeat frequency on cw. Hence for a 700Hz cw beat note, the readout will indicate 700Hz high on 1·8, 3·5, 7, 10 and 18MHz and 700Hz low on 14, 21, 24 and 28MHz.

Battery operation

The current consumption on receive at 12V was about 1A. The receiver performed satisfactorily down to 10·5V, below which changes in vfo frequency occurred. The transmit power was down by less than 10W at 10·5V. For operation directly from a 12V battery Ten-Tec recommends the use of a model 1140 circuit breaker to protect the pa against excess current.

On-the-air performance

From the moment of first switching on the Corsair this transceiver had instant appeal. Fast bandchange with no tune-up is very convenient. On receive signals sounded particularly clean with a quiet background even on 7MHz at night. The audio quality was excellent, with low distortion, and this greatly reduced fatigue during extended periods of contest operating.



Eight-pole i.f. ladder filter

The i.f. filters were superb and the narrow offset position (fine irt) very useful on cw. The agc had a very pleasing characteristic, fast in operation but with no overshoot, although the rapid recovery may not appeal to some people. The noise blanker was effective on ignition interference but ineffective on the "woodpecker". The sensitivity was just adequate on 28MHz. Some cb breakthrough was experienced on 21MHz as was predicted from the measurements. A filter would be necessary to cure this problem.

Excellent audio quality reports were received on transmit using the Ten-Tec model 700 handheld microphone. This is an electret condenser microphone with built-in preamp which requires a 4-10V polarizing voltage. This is available on the Corsair microphone socket but for applications where this polarizing voltage is not available, the microphone also incorporates a PP3 9V battery. Most stations generally preferred to have the speech processor switched in. On cw the break-in performance was superb. Fast QSK returns the receiver to full sensitivity immediately, even between dots at 20wpm. Slow QSK gives an immediate return to a lesser sensitivity level followed by full sensitivity after a predetermined delay. This is really useful under crowded contest conditions such as AFS or NFD on 7MHz, and allows the presence of on-channel QRM to be instantly recognized without the distraction from fast QSK under noisy conditions. There was a tendency for the power supply to trip when operating into quite minor mismatches. This could be avoided by reducing the alc level slightly. As stated earlier, it is probable that the trip level was set too low.

The front panel is very simple and easy to use. The main tuning dial has a pleasant "feel" although a deeper and rotatable finger indent would have been an advantage. Ganging of the power on/off with the rf gain control and preamp on/off with that af gain control and not vice versa seems a little illogical. Locating the lock position on the mode switch (cw transmit with key down) is a little dangerous and on a number of occasions resulted in inadvertent transmission.

The Corsair was used for G4ALE/P on HF NFD, and VHF NFD on 70MHz with a transverter, and was acclaimed by all operators for its performance and ease of use.

Conclusions

As an hf transceiver for ssb and cw the Corsair has some very fine features. The i.f. selectivity, close-in dynamic range and overall on-channel linearity are excellent, and these features are most important for serious dx working. CW is not an afterthought as on many transceivers, and the break-in is superb. However, the transceiver is not without problems. The spurii on both receive and transmit are poor, particularly on 28MHz, and cb breakthrough on 21MHz is a problem. These spurii could have been avoided, and also the quirk of the wrong sideband on 10 and 18MHz, if the local oscillator had been generated 9MHz high on *all* bands. This would, however, have increased the cost by requiring two extra crystals and nine bandpass filters in the oscillator path instead of five. Perfection does not come cheap! It is largely for the good features of the Corsair given above, together with the ergonomics of use, that the reviewer has decided to purchase this transceiver and replace the ageing Mk1 FT101, which has given faithful service for many years.

The current prices, including VAT, are: Corsair transceiver, £913.10; model 260 mains psu, £179.40; model 700 handheld microphone, £28.08; optional crystal filters, £45.52 each.

The Corsair is available in the UK from KW Ten-Tec Ltd, Chatham, Kent.

Acknowledgements

The reviewer would like to thank G3RQZ and G3WBN for critical comments on the transmission, and KW Ten-Tec Ltd for the loan of the equipment.

References

[1] "The Icom IC720A hf transceiver", P. J. Hart, G3SJX. *Rad Com* February 1982, pp129-33.

[2] "The Yaesu Musen FT102 hf transceiver", P. J. Hart, G3SJX. *Rad Com* January 1983, pp32-6. □

THE G8PO JAWS ANTENNA

(Continued from p956)

inverted-V, is generally around 20dB—depending on skip conditions and polarization. On transmit, this figure is sometimes reduced due to coupling in the system. However, to retain the most useful antenna switching facility, it is recommended that this be accepted, particularly as gain does not appear to be adversely affected (on transmit, shock excitation takes place but on receive dx is not sufficiently strong, even on the "jaws", to do this.)

ZLs and VKs now give comparative reports of the "jaws" being 1 to 3 S-points up on the inverted-V—but conditions and the "state" of S-meters must be taken into consideration. Reception is also improved; eg, during 7MHz "broadcast jamming periods" the inverted-V can be unusable, while dx in the optimum direction on the "jaws" often remains most readable.

Concerning the polar diagram of the system, this is found to be cardioid with or without the reflector, and gives low-angle coverage from VE round to ZS when looking SW. Maximum signal is, of course, broadside to the array.

Finally, a quickly switchable inverted-V/"jaws" system, giving directivity, vertical and horizontal polarization, is still considered a "listeners delight" and should be tried by swls. I only wish that I had sufficient space to try out this latest configuration on 3·5 and 1·8MHz.

Proposed experiments

1. With the "lower-jaw" radials:

(a) Reversal of directivity by moving the radials through 180°. A simple method using quick connectors could be devised.

(b) Horizontal, sloping and ground-level configurations. Perhaps the angle of radiation could be varied in this way?

(c) Improving directivity by "pulling out" radials in the desired direction by reducing the apex angle; ie, main element spacing—or the reverse to improve front-to-side selectivity.

2. Incorporation of the "jaws" arrangement in guy wires, particularly the tethering of the lower radials.

3. 1·8 and 3·5MHz arrangements. These should be better for dx than inverted-Vs at the same height.

4. Direct feed with coaxial cable, swr being adjusted by trimming the basic "jaws" loop or by coaxial stub. It is suggested that the outer braid of the coaxial cable be connected to the lower radials. Such direct feed would allow a form of multi-band operation—the patterns could be odd but interesting!

5. Utilizing the "throat" of the "jaws" configuration to act as a "corner reflector" on higher-frequency sloping dipoles, 10, 14MHz etc. They can be strung easily between the top of the mast and the apex of the "lower jaw".

Acknowledgements

I wish to thank very many operators for their time and patience in reporting over long periods. In particular VKs 2WC, 2AVA, 3HW, 3RE, 4TM and 5BC; ZLs 1VV, 2ANR, 4AV, 4AW, 4BO and 4IG; and not least the G3AOO 7MHz dx net.

References

[1] "The ground image 'vertical antenna'", Jerry Sevick, W2FM1. "The half-square antenna", Ben Vester, K3BC. *Antenna Anthology*, ARRL.

[2] *ARRL Antenna Hand Book* 1978. P2.26, "Groundplane antennas"; and p1.8, "Single and multi-hop propagation—'Pederson Ray'".

[3] *Quad Antennas*, William Orr, W6SA1. □

Technical Topics

by Pat Hawker, G3VA

TT IS PERHAPS not the medium for discussing semantics but the column has somehow been caught up in what I believe to be a fruitless debate on the terms "amateur radio" and "ham radio". Personally, I feel that, whether we like it or not, you cannot dictate to the media what words they use. No hard-pressed sub-editor is going to spend time devising a dignified headline when he has at hand the conveniently short word "ham" requiring only three letters yet widely recognized (if not fully understood) by many readers. And while "amateur" no longer has the status it carried in the days when cricketers were carefully segregated into "gentlemen" and "players", I cannot believe that many people confuse it with "amateurish". I have been called far worse things than an "amateur" or even than a "ham".

THIS MONTH

A rose by any other name

Norman Sedgewick, G8WV, seems to agree. In an eight-point resumé of this debate he stresses, *inter alia*, that there is nothing wrong in being called "amateurs" and the word certainly does not imply ineptitude in the sporting world; "ham" meaning a bad actor is mainly confined to the theatrical world; nobody objected when the media referred to the excellent work done by "radio hams" in the Falkland Islands in 1982.

But the main point he makes is that amateur radio would in fact lose rather than gain credibility by suggesting to the public or the media that the RAE constitutes a "professional" qualification. This does not mean that amateur radio *experience* is not a valuable and desirable asset to countries in times of emergency etc. As G8WV puts it: "In these days of vulnerable satellite and machine telegraphy, the man who can copy and work *basic* dx with weak and fading signals, and understands the problems presented by radio propagation, is to be far more prized than someone who merely types into a machine. The Russians and their Eastern Bloc allies do not normally pander to minority interests, but they certainly approve of amateur radio in a big way. It is the practical experience of amateurs that gives them 'credibility' not the RAE certificate."

G8WV feels we must be careful not to be confused on this matter by those among us who hold recognized academic and/or professional qualifications; we need to think more about the many who originally had to worry about their chances of ever passing the RAE. Amateur radio always benefited from having many "professionals" within its ranks—but this does *not* mean that an RAE pass carries any real weight with selection or recruitment boards. He questions G3MQU's belief that "a hobby that requires considerable technical qualification deserves dignity".

In the outcome, amateurs are, or should be, judged by what they do and how they conduct themselves on the air. It is no good blaming the media if in fact they sometimes give the impression that an amateur licence is a form of cb, and vice versa, when in reality it is sometimes difficult to distinguish between the two! If cb had existed in 1936, my initial interest in hf radio would possibly have been channelled in that direction. There is nothing to be ashamed of in starting off as a cber.

If we want to show that amateur radio involves "considerable technical qualification" we need perhaps to take more care to keep technical gaffes off the air. As in many other walks of life, the term "dignity" needs to be regarded with circumspection; too often it serves as a substitute for practical knowhow. Let us admit that most of us *enjoy* amateur radio or even hamming but can sometimes laugh at ourselves—and let cb look after its own reputation!

Current probe for open-wire feeders, wire antennas, etc

Dick Kelsall, G4FM, has developed an rf current probe for use with open-wire feeders, switched wire arrays etc, which he has found easier to use than the probe described by Les Moxon, G6XN, in *HF antennas for all locations* page 237. He writes:

"G6XN's twin-loop current probe tends to be very sensitive to its relative position in relation to the wire/element. It is difficult to obtain consistent readings in order to adjust currents in parasitic elements to within 10 per cent, as recommended in the book. Being by profession an electrical engineer, I could not help recalling the old clip-on ac ammeters that looked like a pair of tongs, having a split laminated-core which could be clipped around cables to form a current transformer.

"To attempt precisely the same approach at rf seemed unlikely to work. To split a ferrite toroidal ring core and then hinge it would not be easy. I felt, however, that a ring core with a gap might act reasonably efficiently as an rf current transformer.

"My first attempts to cut a slot with a fine warding file resulted, as anticipated, in a fractured ring! For the second attempt I cast the ring in polyester resin (from the usual glassfibre repair kit) inside a suitable piece of plastic tubing resting on a sheet of glass laminate. The core had first been wound with about 12 turns of 34 or 36swg enamel wire in the usual way. When the resin had set, I was able to file a slot through the resin and ferrite core without difficulty. The slot was taken into the centre of the ring and was of a width to clear the 2mm enamel wire I was using for the beam array and open-wire feeders. The glass-laminate board served as the mounting base for the meter and other components, and also had a short handle attached for easy use. The loading resistance for the current transformer can be adjusted to suit the number of turns or current being measured. The circuit itself (Fig 1) is conventional and needs no comment.

"In practice the device works well and readings are perfectly steady and repeatable. Using a pcb-type edge-potentiometer as the sensitivity control it is easy to adjust with the thumb on the knurled disc.

"I checked the device with a 75W dummy load and found the readings

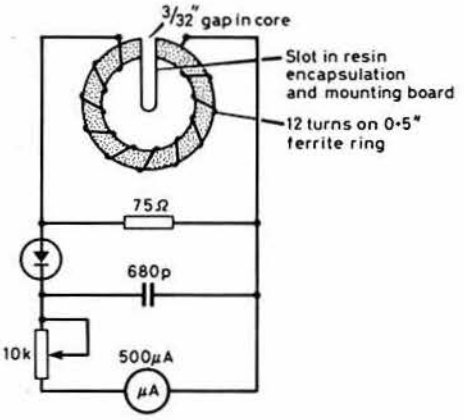


Fig 1. G4FM's rf current probe for use on open-wire feeders and adjustment of wire beam and arrays

adequately consistent for the same power at all frequencies between 3·5 and 28MHz. No doubt someone evolved a similar device years ago, but, since I have found it most useful, the method of construction may interest other members. The device is in regular use when setting up wire antennas at G4FM."

Wire antennas for hf

Rob Gurr, VK5RQ, has sent along a copy of his six-page article "Wire antennas" published in *Amateur Radio* (Australia) September 1984, pp12–8. This provides an excellent survey not only of a large number of hf antennas that can be implemented without the use of rod elements, together with notes on open-wire feeders and a Z-match atu, but also provides a general survey of the components used in the construction of wire antennas; including wire, connectors, masts, guy wires, transmission lines, earthing systems etc.

He discusses dipoles, colinear arrays, broadside arrays, end-fire arrays, noting that variations of these basic types are known in amateur circles under such names as G5RV, ZL-Special, G8PO, W8JK, Lazy-H, Sterba curtain, end-fed Zepp, double-Zepp, extended-Zepp, phased arrays, Franklin, four halfwaves in phase, etc. Undoubtedly many of those who have come into amateur radio with a professional background find the titles given to antennas rather confusing, though of course most are fully explained and described in the various handbooks.

For the moment, it is worth emphasizing VK5RQ's introductory notes: "A large number of recent entrants into the hobby of amateur radio have been indoctrinated with the belief that unless an antenna is made of aluminium tubing, has coaxial cable feedlines, and a popular brand name or type number, it is not worth considering. Regrettably also, they may come to believe that the only useful 'wire antennas' are the rhombic, vee beam and long wires which could not be considered for the average suburban backyard.

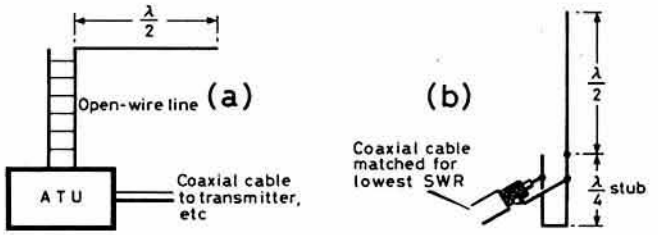


Fig 2. The classical form of Zepp antenna, one of many types discussed by VK5RQ in "Wire antennas". (a) HF version, (b) vhf version for vertical polarization

"Most of the popular commercial antennas have some limiting factor for today's amateur—they cover only one or at the most three narrow frequency bands (ie have low swr over small segments of the spectrum), require good groundplane radial systems, are difficult to tune to alternative frequencies, and in some cases are costly.

"The wire antennas discussed are those which, when erected in a suburban backyard, will give equal or better facilities than an equivalent commercial installation."

The antennas discussed by VK5RG are basically similar to those to be found in the handbooks, though his survey does underline the large number of "wire" systems that are relatively simple to construct and adjust yet are capable of good performance. The purist might have wished to see a faint question mark put against the traditional form of end-fed Zepp, nowadays regarded with some doubt in the absence of a G6CJ-type balun (Fig 3). This has been shown to eliminate the proportion of failures involved in the conventional form, while retaining all the advantages of resonant, open-wire feeder lines for multiband operation. I have the impression that various forms of Zepp and centre-fed dipoles with open-wire resonant feeders are currently enjoying a fresh wave of popularity among those who have not fallen for the aluminium-tubing syndrome.

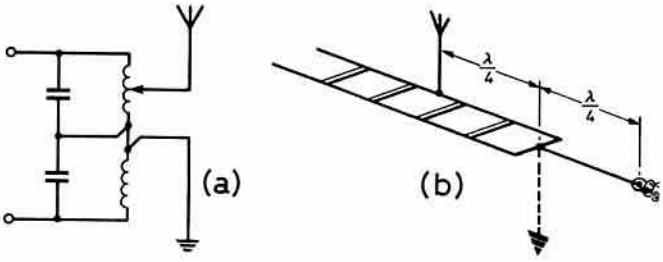


Fig 3. The technique for feeding an unbalanced Zepp antenna from balanced line, as originally recommended by G6CJ and later endorsed by G6XN. It should eliminate the proportion of failures involved in the conventional Zepps of Fig 2, while retaining the advantages of resonant open-wire feeder lines for multiband operation. (a) Electrical equivalent

Multiband loops

A further note from Laurie Margolis, G3UML, praises the multiband dx performance of large wire loop antennas. He writes:

"You have mentioned the 141ft delta loop which I use on 7MHz. This has now accounted for 175 countries on 7MHz ssb, and deserves to be considered seriously as a dx antenna. Initially, however, I did not realize how useful it could be as a multiband system. The loop, fed with tv-style brown 75Ω coaxial cable, loads beautifully on 21 and 14MHz without a tuner and is useful on parts of 28MHz.

"What I find fairly critical is the shape of the loop. I originally tended towards an equilateral loop requiring a top support about 45ft high, more because it looked right than for any other reason. However, matching appears better if the loop is flattened out a bit, though clearly for most people the shape depends more on the available supports than anything else.

"When using the loop multiband, a precise length of loop will be perfect for only one band, so some compromise is needed to give reasonable match on whatever bands are required. My arrangement gives me an swr of about 1·5 on 7,080kHz, 2 on 14·2MHz, 1·6 on 21·2MHz, a not-so-good 2·8 on 28·6MHz, and dropping to 1·8 at 29·1MHz . . . my feeder is about 30ft long and I have found that shorter lengths can prove a little naughty on one or more bands.

"1·8MHz operation is interesting. Again by accident I discovered that if the outer sleeve of the coaxial connector is disconnected at the rig end (so that just the centre pin is touching) there was a near perfect match at 1,940kHz, dropping to an swr of about 2 at 1,835kHz. This could be brought down simply by adding an extra 5ft of wire between the centre pin of the downlead and the connector at the equipment end . . . it has worked out to EA9 and UB5 on 1·8MHz ssb."

The use of loops for multiband operation can be facilitated by using open-wire feeders and an atu providing balanced output, as previously described in *TT*.

Circular polarization and crossed Yagis

The September *TT* included a note from G2HCG on his "Polaplex" device that he believes will provide complete and convenient control of polarization of the wave from crossed-Yagi arrays.

In the course of this note, G2HCG suggested that a conventionally-mounted crossed-Yagi array (ie +) is invariably inhibited by the presence of the mast and feeders, resulting in elliptically-polarized waves. He considered that these effects can be minimized or even eliminated by mounting the elements at 45° to the mast (ie ×).

This viewpoint is strongly challenged by Dr Neill Taylor, G4HLX, who writes:

"You quote G2HCG on the undesirable effect that a metallic mast and feeders have on the polarization of the wave when attempting to generate a circularly-polarized wave using crossed Yagis. The performance in the vertical plane is usually affected by the mast far more than in the horizontal plane, and a somewhat elliptical wave results.

"I was surprised to read G2HCG perpetuating the fallacy that this effect is reduced if the crossed-Yagi is mounted as an × (both sets of elements at 45°) rather than the usual + (one set horizontal, one vertical). The mistake he appears to make (in common with some others) is in believing that it is the elements of the antenna themselves which in some way interact with the mast, whereas it is in fact the vertical component of the generated wave which induces currents in the conductive mast, *however that wave has been produced*. The effect on a circular wave of a vertical mast is the same whether that wave is generated by Yagi arrays in a + or × formation.

"There is a good practical reason for wanting to mount crossed-Yagis in a + formation; namely that when, say, pure horizontal polarization is desired, the feeder to that array can be used alone, bypassing any type of switching or phasing unit that may be employed. No matter how well designed and constructed, this unit is bound to introduce a little loss into the system, and since this inevitably comes before the receiver front-end, *it adds to the noise figure*, where every 0·1dB counts!

"A crossed-Yagi is a popular choice with 144MHz enthusiasts who want to dabble in a number of activities. By mounting it in + formation they can get the best possible performance for tropo dx work by using the horizontal

section alone, connecting both feeders with a phasing section when they want circular polarization for satellites etc. The point is that they are *not* compromising the performance as a circularly-polarized antenna by mounting it in this way, but do risk loss of performance for linear polarization by mounting it as G2HCG suggests and using a phasing unit, unless this is 'ideal' and completely 'loss-free'."

Microphone lore and room acoustics

Brian Davies, G3OYU, read with approval the comments in "Better sounding ssb" (*TT* August, pp674–5). He writes: "As a professional audio engineer it has always grieved me to hear the very poor modulation emanating from many, many amateur stations, both British and foreign. My feeling is that far too many poor signals are due not to the equipment used, but to misuse by the operator.

"It is incredible that few amateurs appear to know how to use a microphone to best advantage, and generally are satisfied with a microphone of very poor quality, often costing less than one per cent of the cost of the average black box. I am convinced that if many of them could crawl right inside the microphone insert they would do so, still further increasing the ubiquitous snap, crackle and pop which the listeners are expected to tolerate.

"None of these factors is necessary on a restricted-frequency communications channel. Nor need a good-quality microphone cost two arms and a leg, relative to the cost of the transceiver.

"For example, with my Trio-930S I use an AKG D320B microphone: at present prices this would cost about nine per cent of that of the tranceiver. Personally I consider this a small cost for the benefits conferred. But if an operator does not wish to spend this amount, electret condenser microphones, as suggested by AG6K, are available; for example, from RS Components at a trade price of around £20, or four per cent of the cost of a £500 transceiver.

"No doubt some may suggest that the output from such microphones would be too low to drive the average amateur transceiver. I can reply only that mine does, even with an output as low as −78dB."

Some years ago, I ran a number of items in *TT* on such factors as room acoustics, acoustic isolation and other matters that become increasingly important for amateurs not satisfied with using low-grade close-speaking microphones.

As someone whose main use of microphones (as opposed to morse keys) has for many years been in connection with broadcasting rather than communications, though leaving the technicalities to studio and facilities engineers, I can endorse G3OYU's comments on the importance of both the microphone and its correct usage in overcoming the snap, crackle and pop syndrome. Unfortunately, there is also a factor over which we can have little control; individual voice characteristics play an important part in determining the "punch" of ssb transmissions, since our vocal chords tend to produce sound in pulses, and it is the width of the pulses, rather than the peak amplitude, that determines the power in our voices—something that has to be recognized by those attempting to control the "balance" of sound with the aid of a peak-reading instrument.

In the 1974–5 *TT* items it was accepted that most amateurs are concerned primarily with *intelligibility* rather than fidelity. There is, for example, the problem that heavy speech processing in increasing the average output tends to bring up unwanted noises during the quiet pauses that punctuate speech.

It was, however, emphasized that, with close-speaking microphones, there are four sound sources that need to be taken into account: the mouth, the nose, the throat and the chest, the last two predominantly low-frequency sources that are reduced by roll-off below 300Hz. In practice, apart from avoidable extraneous noises that include the operator tapping a pencil, kicking the table etc, there are breath noises and explosive speech sounds (eg the poppy "p") to contend with. Remember also that the frequency distribution of close-range speech tends to differ significantly from the same speech at distances of several feet.

Reverberation, resonances etc of the "studio-shack" become important only where an amateur seeks something more akin to broadcast quality. There is of course no reason why this should not be attempted, except perhaps on the most crowded channels. Operators using fm do not always appreciate that the frequency *deviation* determines the loudness/snr of the incoming signal and *not* the audio frequency range. The effect of good amplitude-limiting in a receiver, it should be noted, means that a stronger incoming signal, provided that it is above the threshold, does not sound louder but has an improved signal-to-noise ratio. Basically there is no reason why an fm operator should not aim at good fidelity on local contacts: he does not conserve spectrum by rolling off above 2,500Hz or below 300Hz. Incidentally, many years ago it was recognized when designing receivers for a.m. broadcasting that you should never strive for good lf response unless you also have good hf response, and vice versa. There was, I recall, some magic figure that should be aimed at when multiplying the lower limit with the upper limit (about 1,000,000 if my memory serves me). Thus 300 × 3,300, or 200 × 5,000, or 100 × 10,000 would each provide roughly the most pleasantly-balanced sound for, respectively, ssb bandwidth of 3kHz, 4·8kHz and 9·9kHz. According to this rule-of-thumb there is no point in extending the audio frequencies out to 5,000Hz or beyond if you roll off steeply at 300Hz.

On the subject of using microphones, Roy Rowntree, G3ZQA, contributed some notes to *TT* February 1975 that bear repetition.

He suggested that many amateurs, recognizing the problems of close-speaking microphones, actually tend to speak too far away from the microphone, with the result that room resonances make the speech sound thick, woolly and indistinct and often apparently lacking in top. Since he felt that few amateurs are able to make major alterations to room acoustics and acoustic isolation, more care could be taken to reduce the snap, crackle and popping sounds and at the same time to eliminate the effects of room acoustics simply by learning how to make close-speaking sound better.

He recommended speaking across the microphone and being careful not to blow at it either with nose or mouth. In this way the excess of middle registers seems reduced and speech becomes cleaner and clearer. Additionally, for the listener, this seems to bring the voice from deep behind the loudspeaker grill and in front of the noise. G3ZQA believed that careful use of close-speaking techniques could clean up many of the poor-quality signals.

For professional applications, close-speaking, noise-reducing microphones are fitted with a special case equipped with nose and mouth breath shields made from stainless-steel woven mesh, with the talking distance with respect to the nose and mouth accurately controlled by means of a positioning bar which contacts the speaker's upper lip so that there is always a distance of about 2in between lips and the ribbon of the microphone.

Using an electret microphone

The basic electret condenser microphone gives only a low af output, so that a preamplifier often forms an integral part of the unit. This means that the amplifier needs powering and similarly a polarizing voltage is required for the electret microphone. The result is that in most cases it is not possible to use such a microphone as a direct replacement for dynamic or crystal microphones.

A very simple technique making it possible to use a low-cost miniature electret insert by deriving a 1·5V potential from the ptt line was devised by DJ1XX and published in *TT* April 1981: see Fig 4. Unfortunately, this approach is only possible in a limited number of rigs with relay-switched ptt, and I also remember a reader pointing out that unwanted noise could stem from the diodes. Similarly the 1·5V supply is not always suitable for the built-in amplifier.

H. Laclavere, F8BK (*Radio-REF* June 1984, p549), provides details of a more flexible adapter he uses in conjunction with an electret microphone for the Icom IC2E 144MHz transceiver, but which he claims would be suitable for a number of other equipments: Fig 5. His microphone has a built-in ic amplifier (SM5).

I find the French text a little confusing but the following notes provide a rough outline of his system.

The small 9V battery from which the power is derived should have a life of around two years, with a solidstate "switch" to limit the drain during "receive" to under 5μA. The low dc potential on the external microphone socket of the IC2E is taken to the base of TR1 (npn BC107B silicon transistor); the battery voltage is applied as appropriate to the microphone during transmission via R2 and TR2 (pnp 2N4403 or equivalent). C1/C2 together form a non-polarized electrolytic capacitor and can be replaced by a single 4·7μF non-polarized capacitor if one is available; the capacitor couples the af from the microphone to RV1 and hence to the IC2E via R6. R1, with a value greater than 8·2kΩ, may be required if the switching system proves uncertain. The value of R3 (82kΩ) may have to be reduced. On transmission the dc voltage at point C should be not more

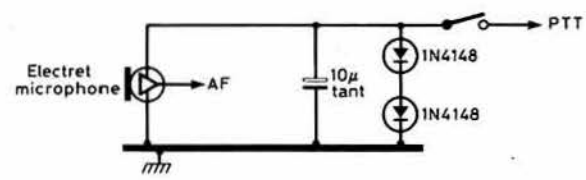


Fig 4 DJ1XK's 1981 method of obtaining a low polarizing voltage for an electret microphone insert, but not suitable for all inserts or all rigs

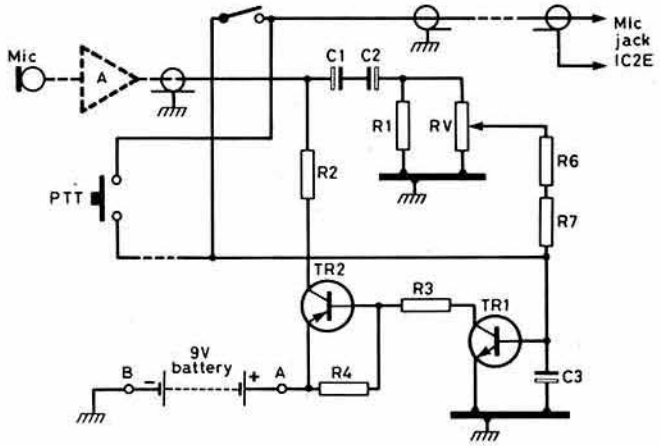


Fig 5. F8BK's arrangement for using an electret microphone having built-in ic preamp on rigs such as the IC2E. Component values R1 see text, R2 1kΩ, R3 82kΩ see text, R4 39kΩ, R6 2kΩ, R7 10kΩ, RV 10kΩ, C1,2 10μF (25V), C3 4·7μF(10V)

than 0·5V less than the battery voltage (ie roughly 8·5V). A 10mA fsd meter should be inserted in series with the battery to check that on transmission the current is between 1 and 6mA, dropping virtually to zero when on receive.

Shortening a dipole antenna

As noted last month, KA7QZK, for his low-budget station, put up a 3λ/2 wire dipole for 3·5MHz, some 390ft span for 3·5MHz, and suspended about 20ft off the ground. Fine for the mountains of Montana but most of us have far less room. For many even a resonant λ/2 dipole is too long on at least some hf bands. The usual trick is to shorten the overall span by letting the last few feet of wire on either side hang or slope downwards, though I have never seen any professional analyses of such dipoles.

Two alternative ways of shortening a dipole element without significantly reducing its performance have been investigated by a team of Japanese engineers at Hosei University, Tokyo: see "Shortening ratios of modified dipole antennas" by Hisamatsu Nakano, Hitoyaki Tagami, Ajihiro Yoshizawa and Junji Yamuchi (IEEE *Trans on Antennas and Propagation*, Vol AP-32, No 4, April 1984, pp385-6). This work apparently follows earlier investigation of bent-arm dipoles and the effects of asymmetric feeding, though the results were published in a journal to which I have no immediate access.

The team points out that there have been a number of attempts to make compact resonant antennas that do not use loading coils or similar lumped loading that inevitably reduces efficiency. They have examined two specific forms of element: the zig-zag dipole and the meander-line dipole (Fig 6).

Briefly, they show that a zigzag element with a wire length of 0·58λ results in a shortening ratio of the span of some 24 per cent yet provides a resonant resistance of 46Ω, entirely suitable for the usual coaxial-cable feed, and with a radiation pattern and efficiency virtually identical with a conventional half-wave (electrical) straight element. The 0·58λ factor is to take account of the many bends, just as the resonance of an inverted-V dipole is normally at a higher frequency than when suspended between two poles.

For the meander-line dipole, using 0·70λ of wire, the shortening ratio can be 30 per cent with a radiation resistance still as high as 43Ω at resonance.

In other words, both these structures can shorten the span by a useful 24 to 30 per cent without significantly degrading efficiency and directivity, but requiring, because of the bends, appreciably more wire to achieve resonance, and undoubtedly imposing more problems in implementing than a straight wire, though one could use two parallel nylon lines as a structure.

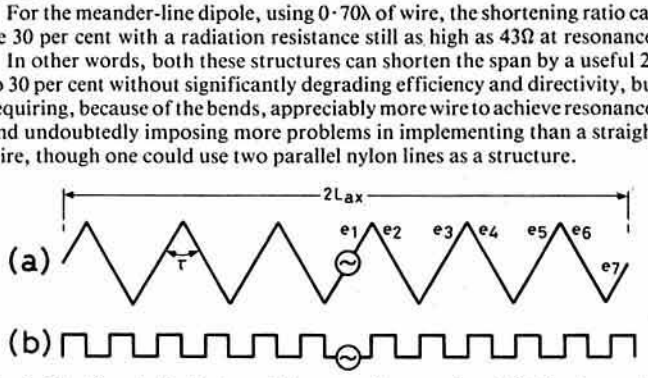


Fig 6. Significant shortening of the overall span of an λ/2 dipole can be achieved without significant loss of efficiency or directivity: (a) zigzag element (e1 = e7 = 0·208λ, e2 = e3 = e4 etc = 0·0416λ); (b) meander line element

G4BZO's Goyder vxo

Ian Butterworth, G4BZO, was interested in G8ZDU's harmonic/overtone vhf oscillator with a crystal across part of a Hartley self-excited oscillator, as he had arrived at a roughly similar arrangement for use in a 7MHz direct-conversion transceiver. In the accompanying notes to the item from G8ZDU (*TT* September, p775), I referred to the "Goyder lock" oscillator as an early form of vxo and was, in fact, a little surprised that G8ZDU made no reference to any variation of frequency when tuning the basic Hartley oscillator.

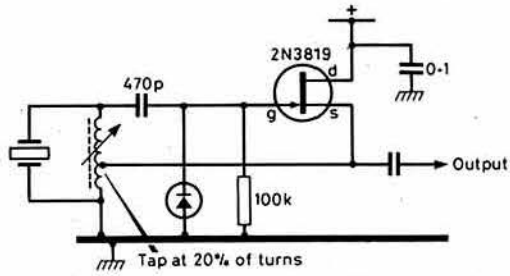


Fig 7. G4BZO's 7MHz vxo based on the application of the Goyder-lock principle to a permeability-tuned Hartley oscillator to provide a range of the order of 7,000-7,025kHz for use in direct-conversion transceivers

On the other hand, G4BZO specifically uses the circuit arrangement of Fig 7 as a means of pulling a 7,030kHz, 10XAJ-type holder, as a vxo covering 7,025 to 6,995kHz. In fact he finds that the oscillator does not "unlock" until a really massive downward shift is attempted. He admits that he bought his crystal from Messrs J. Birkett as a "good puller", but believes that his use of permeability tuning rather than variable capacitance tuning, although less easy to implement, is perhaps the real secret of success.

He believes that many constructors enjoy building direct-conversion transceivers but find the need for a stable and reliable vfo to be the major problem in such simple equipment. He considers this Goyder-type vxo system, with its relatively wide "pulling range", to be an excellent approach that is much easier to build than a really good vfo.

In his case he arrived at the arrangement of Fig 7 almost by serendipity, simply by removing the large-value tuning capacitor from a 1·8MHz Hartley vfo; the self-resonant frequency then becoming about 8·5MHz until the crystal was connected across the coil and gave a "locked" output at 7,025kHz.

Buried hazards

In the September 1980 *TT*, I referred half-jocularly to the sad experiences of a part-time Sheffield student (not a radio amateur!) whose diy building exploits had brought him an unusual degree of media notoriety. In preparing to build a garage he ran into some problems with the foundations and dug his way into £10,000 worth of damage (and personal danger) by: slicing through a power-cable, blacking-out the neighbourhood—*four times*;
chopping through a gas main, so cutting off supplies to a neighbour's home —*four times*;
striking a sewer, blocking it and causing rats to appear—*four times*; and weakening a 20ft high retaining wall.

Although this series of accidents was reported with a degree of hilarity, I stressed that the events underline the buried hazards that may have to be faced when preparing antenna-support foundations, earth mats or buried radials, earth rods etc. This has again been emphasized in a knowledgeable letter from David J. Reynolds, G3ZPF. He writes:

"Although the hazards of overhead power lines (*TT* September) should be obvious to all but the most banal among us (obvious perhaps after the event but the danger may not always be foreseen—G3VA), the hazards of buried services may not be so apparent. In a series of articles for *SWM* I waxed lyrical on the need, when erecting masts and towers, to check for drain runs and gas/electricity runs across the garden before digging large holes. I began to think I might have overdone the warnings until I happened to dig a small hole for a newly-acquired conifer.

"At my new QTH the ground may previously have been a tip (as with many large housing developments) and the garden sub-soil consists largely of clay, rubble and rubbish. Finding digging rather hard going, I thought of borrowing a pick but pressed on with my spade. At a depth of just over 18 inches the spade sliced through the plastic coating of an armoured cable, presumably a local electricity service run. I shudder to think what might have happened if I had been using a pick!"

G3ZPF further elaborated on this theme of buried hazards, and offers the following practical advice:

"When preparing a large base for a mast or tower, ensure that the pressure that will spread downwards from underneath the base does not surcharge any drains, manholes or other surfaces.

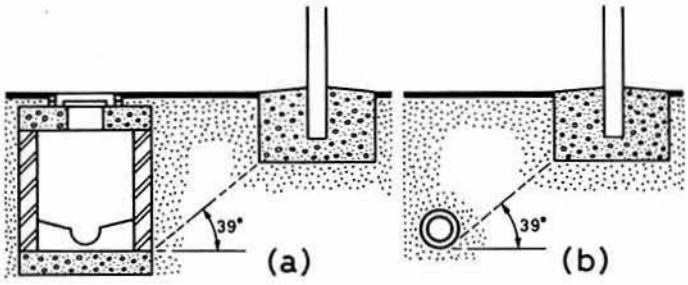


Fig 8. (a) Placement of a mast foundation showing recommended separation from a deep manhole. (b) A similar angle of separation is required from a drain or other buried facility

"Manhole positions will be obvious, but drain runs less so, while gas/electricity service runs will usually be totally invisible. Even if your base pressure does not, in fact, cause any damage, subsequent 'natural' faults of any kind will tend to be attributed to its presence by local authorities etc, who will gleefully present you with the bill for repairs—and they may need to dig up your base in order to carry them out.

"The closest safe approach between the bottom of the 'service facility' and a large tower foundation is at an angle of 39° (not 45° as might be supposed). This is shown in Fig 8. In practice, only relatively large foundations/towers etc are likely to cause damage to the service facilities, but as noted above it may pay you to keep your base well clear of zones that could cause a local authority to suspect it of contributing to any subsequent fault.

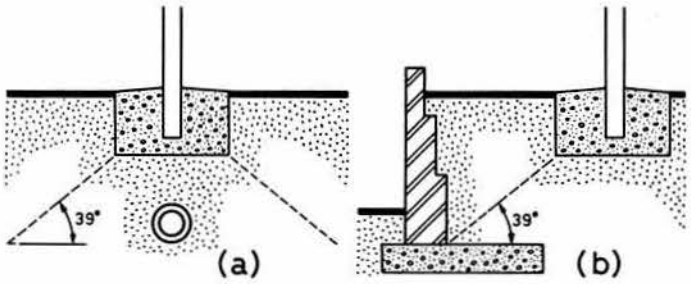


Fig 9.(a) Even a small lightweight mast should not be set up above a facility service run or you could get the blame for any subsequent "natural" damage. (b) Be careful to observe the angle of 39° or less to avoid overloading retaining walls

"Manholes are usually about 1m deep. Bases should be at least 200mm deep in order to be immune from seasonal movements in the ground. On some large housing estates, a few manholes may be considerably more than one metre deep, as shown in Fig 8 (a), requiring significantly further separation from the antenna base.

"Drain and service runs should be located from plans at the local council offices before tackling a major base. Since planning permission is necessary for tall masts, a visit to the council offices may have the further benefit of showing the staff that you are tackling the job efficiently and diligently.

"Avoid putting in bases, even small ones, directly over any pipes and preferably not within the 39° angle zone. On terraced ground be similarly careful not to overload retaining walls (Fig 9)."

Contact bounce and key adjustment

The September *TT* item on better-sounding cw drew attention to the problem of contact bounce when using semi-automatic ("bug") keys. I suggested that there was a significant difference between keys incorporating U-spring damping, and those without it.

Gerry Whitehead, G2ACZ, whose experience of bug keys extends back almost 45 years, both as an amateur and as a ship's radio officer, is not convinced of the need for built-in U-spring damping. He writes nostalgically:

"My first bug was a McElroy bought shortly before the second world war, but unfortunately lost through 'enemy action' in 1940. My next, and still surviving, model was an early Vibroplex acquired in a pawn shop near the waterfront area of New York. It had already seen much use by the time I bought it; I estimate it is now between 60 and 70 years old, probably even more. Over the years it has been used with a variety of ships' transmitters —even spark!, coast-station transmitters, and amateur rigs from the Elizabethan to black boxes. On odd occasions, particularly with some marine transmitters, it has been necessary to key a relay to get round the problem of multi-contact keying; even so, the relay energizing current was usually on the hefty side.

"Although I am aware of the 'scratchy keying syndrome' I have never encountered this problem myself, despite the fact that my ancient Vibroplex does not incorporate any form of U-spring damping. I believe that correct adjustment of a bug key will eliminate some of the less attractive features of such keys.

"Surprisingly, I find many bug key users ask 'what is the correct way to set up this type of key apart from the obvious points?' I cannot recall ever having seen any detailed hints on this subject, but would offer the following suggestions in the light of experience:

"Reduce the movement of contacts and contact arms so that minimum travel is required. Reduce spring tensions to a minimum. If necessary, reduce the length of the springs to do this; in extreme cases make, or obtain, lighter springs.

"Hold the dot paddle in the dot-making position; when the arm stops vibrating, the dot contact should just make a permanent mark.

"As G3DXZ mentions, the bug key is capable of sending morse with character. Personally I am sorry to see the influx of electronic keyers and (to me) that horror of horrors, the keyboard! However, I am told that this is 'progress', and I recall that when I first produced the Vibroplex in an establishment where 'straight' keys were the order of the day, a veteran telegraphist accused me of 'prostituting the art of the telegraphist'!"

For my part I seem to recall having read at some distant date a method of checking "bug" key adjustments by measuring the current through a battery, suitable resistor and meter. If my memory serves me correctly, the key was first held steadily against the dot contact and the current noted. This should be approximately three times the current shown when the dots are being formed, at least with a meter movement having the usual degree of inertia. This procedure agrees with G2ACZ's recommendation that when the arm stops vibrating the contact should be just closed.

However, I am not sure that I agree that even with careful adjustment it is always possible to eliminate contact bounce on some keys. I once spent much time and effort without any success in trying to eliminate the problem on a cheap pre-war key made in Hong Kong. Even the 1949 Eddystone "bug" always seemed to me to be prone to contact bounce.

I can, however, vouch for the strong dislike of old-time British telegraphists for the "bug" or even for the "lightweight" American straight key. In many second world war w/t offices, operators were told not to use bugs. It was even felt rather daring when some of us used them on evening "broadcasts" of traffic to clandestine stations in France, as a change from the large Marconi marine keys provided. (It was also not unknown for coast stations to refuse to accept telegrams sent by unskilled "bug" users on board the numerous USA-built Liberty ships at sea during the immediate post-war years—*Ed*)

Field day woes

The reports of field day events published in *Radio Communication* provide a revealing glimpse of what, in these days of "solidstate reliability", still puts temporary stations off the air despite the fact that most entrants will have tried to think out in advance the weak points of their set-ups in order to forestall disasters.

However, the October issue showed once again that it is by no means easy to keep a station continuously on the air for 24h, particularly in the presence of rain and static, and the inevitable problem of human fallibility. There was, for example, the horrendous story of the 60ft scaffold tower holding a multi-element, multiband array that came crashing down during the night because somebody had forgotten to put the pins in the hinged section. But there was also the more common problem reported by more than a dozen groups of water in the tank of the petrol-electric generator, that Achilles heel of many installations. Also, unsuppressed interference from p-e and diesel generators, faulty electronic keyers with no fall-back manual keys on site, leaking trailer roofs, static-charged rain knocking out semiconductors etc. On vhf/uhf, power-line rfi, computer malfunctions, insufficient petrol, and the usual crop of failures of high-power linears and small-signal preamplifiers. As stations become more complex, the number of potential problems increases, and they often become increasingly difficult to put right quickly. □

AURORAL ACTIVITY

by C. V. SMITH, GM4FZH*

Clive Smith is an electrical engineer by profession, educated at University College, London (BSc(Eng) and the University of Technology, Loughborough (PhD). In 1978 he took up a lecturing post at Thurso Technical College teaching electronics, microelectronics and computing. He is now a freelance lecturer living in the Borders. He has been interested in amateur radio since 1977; holds a 50MHz permit, and is interested in home construction. He is a corresponding member of the Education Committee, and was instrumental in the construction of the repeater GB3OC. He has also run several successful RAE classes.

Introduction

While living in Caithness (YS33d) I was in a prime area for auroral propagation and lucky enough to witness several visual auroras—although not all visual auroras were radio auroras, and vice versa—and this article merely provides an analysis of my observations. Some auroras were no doubt missed for various reasons, so that although the statistics are on the low side, the overall pattern produced will be valid. Others may be prompted to produce a similar analysis, and it would certainly be interesting to compare data from the north, centre and south of Britain.

I am very grateful to members of the auroral warning net who fulfilled their responsibilities of passing information on, and for being able to monitor the joint Leicester University propagation experiment at Bowermadden in Caithness. This very often gave me about 30min warning of an impending radio aurora and allowed me to start the warning chain. The beacons GB3LER, SK4MPI and DL0PR on 144MHz, and GB3SU on 70MHz were also very good indicators.

This report is divided into two parts: (i) an analysis of my observations using amateur bands only; and (ii) a brief look at the information I obtained by monitoring the Leicester University experiment. It has been a problem to know exactly how to present the data and I wish I could have used three-dimensional graphs; the information has been presented in graphical form so that it is easier to see any trends. Exactly what information is worth extracting is not easy to determine. How these results would differ if automatic monitoring equipment were used is not known, but it will be interesting to see the official Leicester University results.

On 144MHz the equipment used consisted of an IC202E plus lunar preamplifier on receive, and a single 4CX250B homebrew amplifier on transmit which delivered a minimum of 80W to UR67 cable feeding an 8-over-8 slot-fed Yagi. Larger antenna arrays were not used due to wind problems. On 70MHz a Yaesu FT101ZD followed by a Microwave Modules transverter was used to feed a four-element beam, while on 50MHz an FT101ZD followed by a homebrew transverter and 4CX250B amplifier (keeping to the legal power limit!) feeding a five-element beam was used. The equipment used to monitor the Leicester University experiment is described later.

Amateur band observations

General analysis

My analysis covers a four-year span from August 1979 to July 1983. The most active period was 1 February 1981 to 31 July 1983—two-and-a-half years in which 62 auroras were observed, giving an occurrence of one every 14·7 days. Many were of the northern type, with only a few stations being worked—usually LA and GM—and were probably never heard in the central belt of Scotland or further south.

Table 1 gives the dates and occurrence of 27 "reasonable"-size auroras that I observed—ie about one every 33 days. Taking into account those that I missed, this will give an average close to one in 27/28 days. It should be noted that there were times when several large events occurred in short periods of time (eg February 1982 and 1983). These events were also interspersed by northern-type auroras where only a few stations were contacted. Fig 1 gives the monthly distribution of the auroras, and shows a possible tendency for greater activity in the winter periods. February 1982 certainly seems remarkable—could this be correlated with any other phenomena?

Table 1. Dates of "reasonable"-size auroras observed (February 1981–June 1983)

Month and year	Date(s)	Occurrence
February 1981	6, 24	2
March 1981	5	1
September 1981	2	1
October 1981	22	1
November 1981	11, 18	2
December 1981	12, 29	2
January 1982	31	1
February 1982	11, 12, 13, 17	4
April 1982	2	1
December 1982	8, 10, 18	3
February 1983	4, 5, 6, 12	4
May 1983	17, 22, 23	3
June 1983	10, 13	2

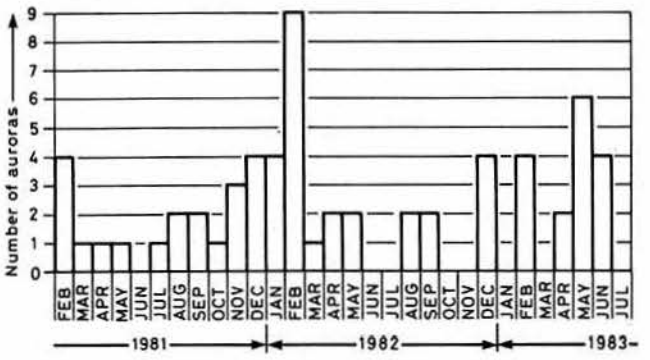


Fig 1. Distribution by month (radio auroras)

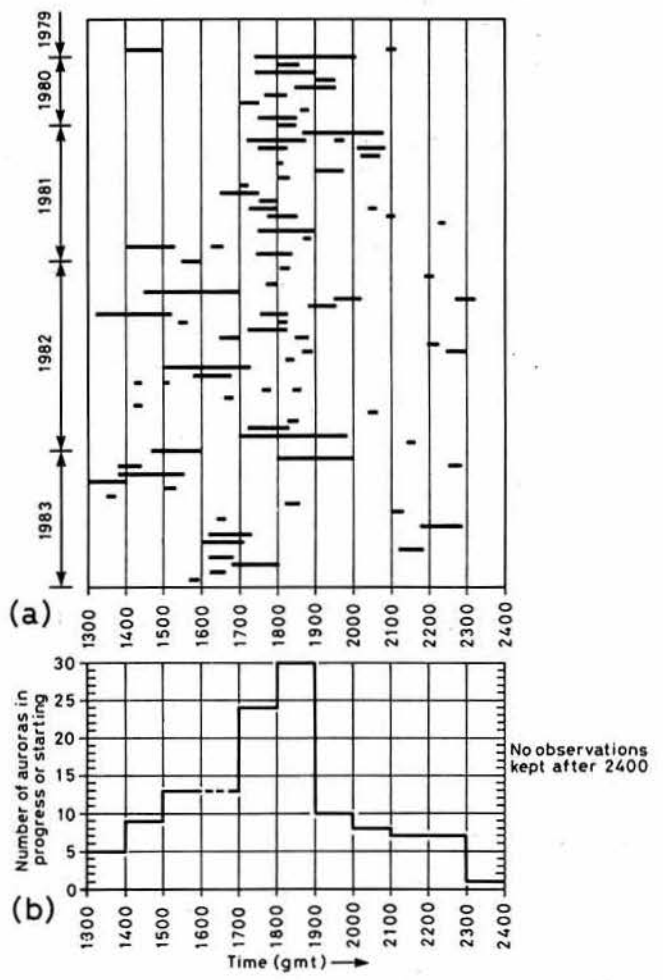


Fig 2. Analysis and frequency of occurrence of auroras with time of day. (a) The scatter. (b) Number of auroras in progress or starting within 1h time slots

*6 North Hermitage Street, Newcastleton, Roxburghshire TD9 0RB.

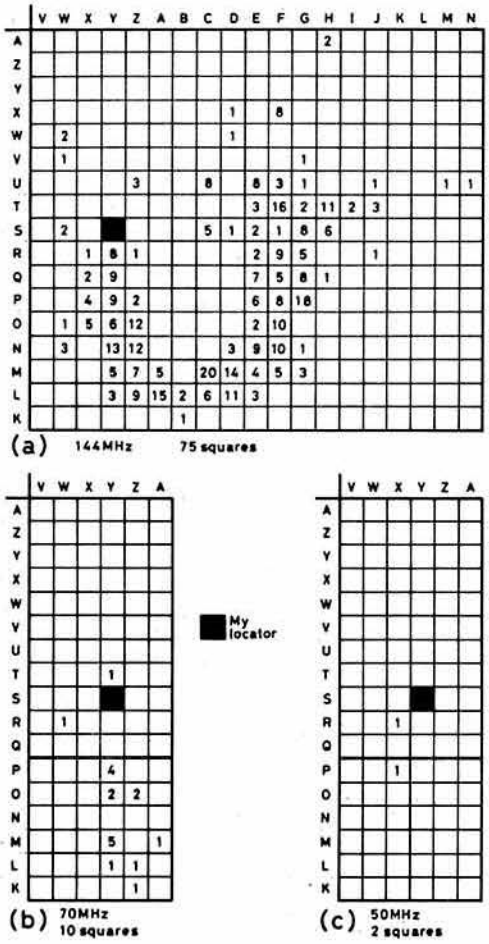


Fig 3. Number of squares worked: (a) 144MHz, (b) 70MHz, (c) 50MHz

It is interesting to note that although the Faeroe Islands were worked, no signals were ever heard from Iceland or countries further west. Are they too far north or is the amateur population so low and 144MHz activity too sparse?

Analysis by time of day

Fig 2 gives an analysis and frequency of occurrence of auroras with time of day: (a) shows the scatter, (b) the number of auroras in progress or starting within 1h time slots. It can be seen that the frequency peaks between 1800 and 1900gmt with a fairly fast tail-off afterwards. From 1300gmt there is a fairly steady build-up (the 1600 to 1700 period is shown dashed as this may have been affected by my arrival-home times). After 2300gmt activity becomes low, and no records were kept for after 2400gmt.

Table 2. Percentage of stations worked by latitude (Europe)

Latitude	Number of contacts	Running total	Percentage	Various locations
A	2	2	0·5	
Z	0	2	0·5	
Y	0	2	0·5	
X	9	11	2·7	
W	3	14	3·4	←Faeroes
V	2	16	3·9	
U	26	42	11	←Shetland Isles
T	37	79	19	←Oslo
S	25	104	25	←Author's locator
R	27	131	32	
Q	35	166	40	
P	47	213	52	←Copenhagen
O	36	249	60	
N	51	300	73	The Midlands
M	63	363	88	←Amsterdam
L	49	412	99	←London
K	1	413	100	

Table 3. Percentage of stations worked by latitude (UK)

Latitude	Number of contacts	Running total	Percentage	Various locations
U	3	3	2·2	
T	0	3	2·2	
S	2	5	3·6	←Author's locator
R	10	15	11	
Q	11	26	19	
P	15	41	30	←Scottish/English border
O	24	65	47	
N	28	93	68	
M	17	110	80	←The Midlands
L	27	137	100	
K	0	137	100	

Analysis by locator square

Figs 3(a), (b) and (c) show the squares worked for the 50, 70 and 144MHz bands. The number in the square denotes the stations worked there (*nb* a station is counted more than once if worked on different auroras). This obviously gives an indication of the likelihood of working a square, and those squares with high numbers correspond to those containing large conurbations (ie higher number of amateurs per unit area), *viz:* CM, Amsterdam; FT, Oslo; AL, part of London; YM/ZM/YN/ZN, the Midlands; GP, Copenhagen.

Tables 2 and 3 give the percentage of stations worked by latitude (ie second letter of locator square) for (a) Europe and (b) UK only, together with various geographic locations. How representative the observations for 50 and 70MHz are is difficult to say, as only about two per cent of my time was spent on those bands for auroral working. The results for 50MHz are especially scanty, due to two factors: (i) the short length of time the permits were issued; and (ii) the restrictive operating times.

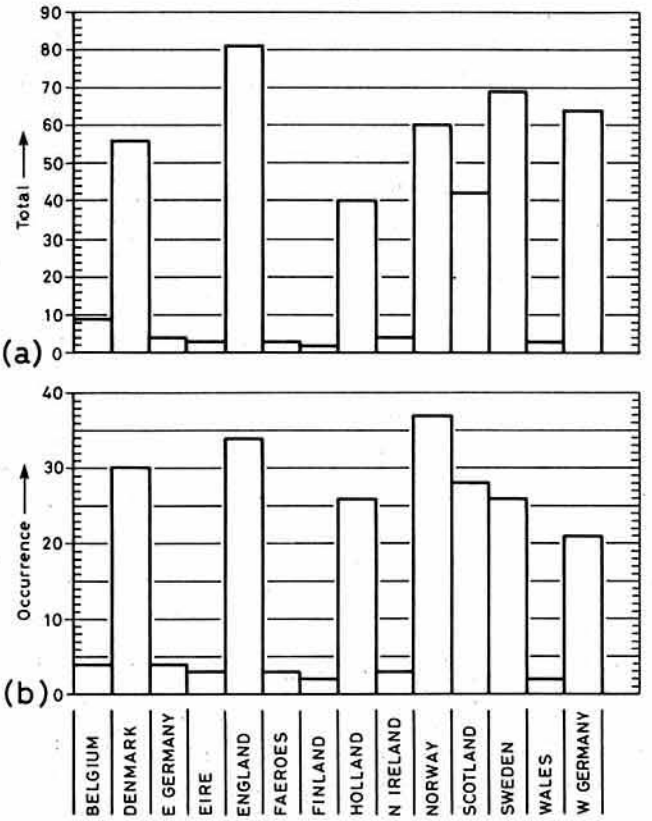


Fig 4. Analysis by country for 144MHz. (a) Total number of contacts per country. (b) Number of times a country was worked (several times per aurora only count as one)

From Tables 2 and 3 it can be seen that at least 80 per cent of the contacts are above —M squares, and —K have only been worked once. Table 3 shows that 30 per cent of the contacts have been north of about the English/Scottish border—an area that contains about 10 per cent of the UK amateur population. From this area to the Midlands about 50 per cent of the total contacts are accumulated, while the south only gave about 20 per cent. The total number of squares worked by aurora only were: 50MHz, 2; 70MHz, 10; 144MHz, 75.

Analysis by country

This has only been carried out for the 144MHz band. Fig 4 shows this; (a) gives the total number of contacts per country, and (b) depicts the number of times a country was worked (several times per aurora only count as one). England shows the highest number of contacts but Norway the highest number of occurrences. This is borne out by the fact that Norway features top on the stations worked on northern-type auroras. This information is shown in Fig 5, where all the auroras listed in Table 1 have been omitted.

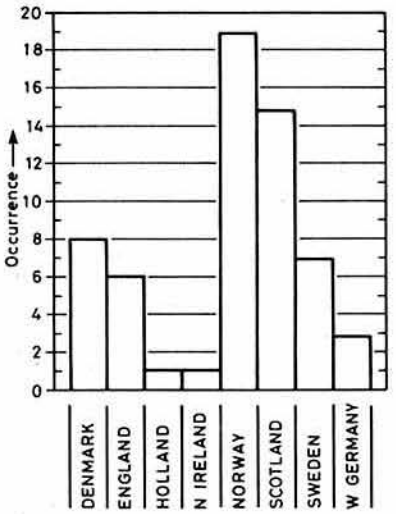


Fig 5. Country analysis for northern-type aurora (144MHz)

What is surprising in this plot is Holland and West Germany: they were definitely auroral type signals—was it auroral-E?; they were also very short-lived openings.

Using Fig 4 the statistics in Table 4 can be deduced, and from this it can be seen that Scotland and Norway come out with the lowest number of contacts per aurora but the highest number of auroras with two or less contacts. These two countries also have a low density of amateurs per unit area.

Table 4. Contacts/occurrence for small auroras

Country	Contacts/ occurrence	Auroras with two or less QSOs
Scotland	1·50	25
Norway	1·62	31
Denmark	1·87	23
Holland	2·05	17
England	2·38	21
Sweden	2·65	13
West Germany	2·81	12

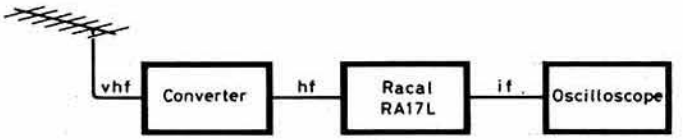


Fig 6. Block diagram for monitoring auroral radar experiment

Leicester University project

It should be stressed that these observations are my own and in no way constitute any official results from the university. This experiment uses radar techniques for auroral monitoring, and it is possible to use these signals to give auroral warning. I treated the equipment as a radar system and looked for reflections using the equipment shown in Fig 6. The oscilloscope gave me the display, which I examined for reflections, which gave me warning of an impending aurora, and by using the oscilloscope timebase I could estimate its distance. I monitored this experiment from November 1981 until June 1982 (and spasmodically afterwards). This was a total of 220 days, and I noted reflections on at least 55 days (and I may have missed some!). This gives auroral reflections on average every four days, and could well be less.

During the intense auroral month of February 1982 I noted reflections on 12 days (the radar was off for six days!) giving reflections every 2·3 days. During this month of high activity six visual auroras were noted, on 10, 11, 12, 13, 14 and 22 February, and some of these coincided with the auroras detailed in Table 1. The impression was that the visual display occurred at the end of the radio aurora.

The typical distance of the auroral reflections was between 960 and 1,100km, and very often with a radio aurora additional reflections at about 550km. From which area were the amateur signals being reflected? I look forward to seeing the analysis carried out by Leicester University with their sophisticated recording and analysis equipment.

Conclusions

I trust the observations produced here are of interest to some auroral stations. The more northerly stations fare better both in number of auroras and stations worked. If other stations can produce similar data it would be interesting to make comparisons. Others wishing to use this data may do so. I now live in the Scottish/English border area, and I hope that I can make an analysis from there. The use of automatic recording equipment would certainly give a much better result over the complete 24h day. □

BOOK REVIEW

Secret Warfare by Pierre Lorain, F2WL. English adaptation by David Kahn, 185 double-column pages. Published in the UK by Orbis Publishing Ltd, 1984. Price £7.99 (hard covers). Published in the USA by Macmillan Publishing Co.

On several occasions in writing about the wartime equipment used for the clandestine radio links with Europe, I have mentioned *Armement Clandestine*, a book published in France in 1972, as a unique and valuable source of information. It has become established as the definitive work on equipment (radio, weapons, aircraft, parachute containers) and techniques (radio, ciphers, secret aircraft landings, German df procedures) used by the Special Operations Executive, 1940-5.

One has only to scan the "wanted" advertisements in each issue of *Radio Communication* to note the interest of collectors in the "suitcase" and pocket radios that were used in extremely hazardous conditions in enemy-occupied territory to maintain links with the UK and North Africa over 40 years ago.

Interest in these "kiss" but remarkably reliable equipments has increased recently, partly as the result of the documentary series on SOE on BBC-1. It is fitting, therefore, that an English-language adaption of Pierre Lorain's carefully-researched book should at last have been published in the UK and the USA, including all of his excellent line drawings. F2WL is by profession an architect but is also a recognized expert on antique weapons—and may also be known to some readers as a 7MHz cw operator who still makes use of a B2 transmitter-receiver, though he was not a wartime "clandestine".

The book provides information on about a dozen of the radio equipments of SOE, a few of the Intelligence (Whaddon) sets supplied to SOE in 1941-2, and the excellent sets built by Polish engineers in the UK and much valued by SOE and Intelligence, as well as by the Polish "Home Army". Among equipments illustrated (some with circuit diagrams) are the A Mk2, 3 Mk2(B2), A Mk3, S-phone, MCR1, 53Mk1, 53/1, Polish AP4 and BP3 and Whaddon "Paraset" (Mk7/B) and Mark 15.

One should stress that equally interesting is the account of the progression of secret agent ciphers from Playfair to double transposition (based on poems) to SOE's unconditionally secure "one time pads."

My only criticism of the book—and I suspect this has arisen in the adaption by David Kahn, who is an acknowledged expert on codes and ciphers rather than radio operating—is that it skims over the very real radio propagation problems that made these links so difficult. With many outstations having available only one or two "day" crystals between about 6-8MHz and possibly one 3MHz "night" crystal, the constantly varying "skip" zones made it frequently difficult to communicate over the short distance to northern France without severe fading and weak signals while working to fixed "skeds" that stayed the same in all seasons. The south of France, over a longer path, could support higher frequencies and tended to be more consistent. Higher frequencies also meant that the short "act of God" antennas used by the agents were more effective.

Pierre Lorain describes the German df techniques used to hunt down the clandestine radios—although it should perhaps be stressed that many more agents were lost as a result of police penetration agents and informers than by df. As mentioned in the BBC programmes, a clandestine operator had to be lucky to last six weeks.

In 1941 a French officer of BCRA (de Gaulle's intelligence and sabotage agency) went into France to investigate the problems of clandestine radio. As a result the British base stations and procedures of Special Communications were improved—but his suggestion that two widely-separated base stations should listen at each "sked" with the contact going to the one who heard the stronger signals was never adopted, possibly due to lack of resources. Yet later the internal Dutch clandestine service adopted this technique with some success, using base stations at both Eindhoven and Nijmegan.

Those of us who had affiliations with rival organizations to SOE recognize and respect the work they did in advancing the techniques of clandestine radio—even if, for various reasons, we rather wished, at the time, that SOE "F Section" had done less to stir up the Germans and their collaborators!

G3VA

4-2-70

*by Ken Willis, G8VR**

ANOTHER VERY BUSY month as far as my mail-bag was concerned, although conditions generally were not startling except for one or two minor openings, one of them fortunately during the 144MHz Trophy and IARU VHF Contest weekend.

Repeater news

Phil Mellor, G4BIK (Huntingdon), reports that the repeater GB3PT (Barkway) on RB12 has been operational as a dual rtty/data repeater since 8 August. GB3PT first became operational as a rtty-only repeater in 1978, but recently data facilities were added on an experimental basis. It is intended to submit a report to RMG in December of this year. The additions in no way affect the normal rtty operation of the system. Tones used are CCITT standard V21, and the repeater operates in answer mode; that is, input 980Hz (data "1") and 1,180Hz (data "0"), output 1,650Hz (data "1") and 1,850Hz (data "0"). Speed used is 300 baud with eight data bits, no parity and two stop bits. The repeater can be accessed on receipt of a data "1" tone on its input, when it will reply with a data "1" on its output, with superimposed 1kHz pip-tone. Through data is not possible until "GB3PT" has been typed in 300 baud data with an eighth bit set to data "0", a sequence that should be possible with any computer which can be used as a data terminal. The pip-tone will then stop to indicate that access has been completed. At the end of an over "KKK" is transmitted and must be received before retransmitting. No timeout is currently fitted. Software was by Dave Bailey, G8OPN, and a modified Maplin modem is used to receive and transmit the data tones. Further information from G4BIK, G8OPN or G8XMS, all QTHR.

GB3SF, the world's first amateur pilot carrier ssb repeater, was switched on at 1800gmt on 14 August from the University of Sheffield, operating on channel RS37 (input 145·185, output 145·785MHz). Both input and output modes are pilot-ssb, the pilot carrier being some 16dB down on total p.e.p. output. A single 3dB colinear antenna is being used with a transmitter power of about 5W p.e.p. Initial reports have been very encouraging, with several successful contacts. Although special equipment is not needed to access and operate this repeater, the full benefits of pilot operation will not be realized without some carrier reinsertion at appropriate level. No doubt the black-box manufacturers will provide for this in the future if the current experiment proves successful and eventually leads to a more widespread use of such systems. Reports would be welcomed by the repeater-keeper and builder, Dr Tony Whitaker, G3RKL, QTHR, to whom also must go congratulations on a clever piece of engineering.

G4EZM (Blackpool) has sent some interesting information on the activities of the Fylde Coast Repeater Group which operates GB3FC on RB2. Last winter the repeater was twice put off the air due to storm damage to the receiver antenna at its very exposed site facing the Irish Sea. Although the damage was repaired by the installation of a heavy-duty commercial four-stack dipole, disaster struck again in November, when a 4in water pipe fractured in the roof space above the equipment and several thousand gallons of water flooded the floor where the repeater stood, destroying the transmitter. Spare equipment was put into service as a stand-by measure, but later cannibalized to get the main repeater back on the air the following month. After this, operation was virtually continuous, but with the need for maintenance calls which convinced the group that equipment and antennas were in need of overhaul. With the aid of Thornton Cleveleys ARC who donated the profits of a junk sale to the group, and Preston ARS who donated space for a repeater stand at the Lancaster rally last August, funds were raised for the overhaul, and a "hot standby" project is now under way based on a Pye 470 transceiver with GB3US logic. This should be operational by Christmas 1984. Experiments are planned with the aim of improving the antenna system to provide enhanced coverage for mobiles in the Fylde Coast area without interference to repeaters working on the same channel.

The Sussex Repeater Group (contact Andy Clark, G8TJQ) organized a successful sale of surplus equipment, and as a result intends to invest in several new projects to improve its repeaters. GB3BR will be completely overhauled and recommence operation from Race Hill, Brighton, with a new logic system, new antenna duplexer array, and new antennas including low-loss feeders. GB3WX is due for a complete rebuild (the original having "passed away") using a Pye 70cm unit as the prime mover. The transceiver configuration will be identical to GB3CP. GB3NX is scheduled to have its transceiver swapped from its present Storno unit to a Pye 70cm model, and have a better antenna duplexer fitted. Finally GB3CP will be fully integrated with its new microprocessor logic and upgraded receiver assembly. Any parts relevant to all or any of these projects would be most welcome, especially ferrite beads and solder-in feedthrough capacitors.

All the above repeater "snippets" provide proof, if any were needed, of the tremendous amount of work carried out by a relatively few individuals in order to provide pleasure for the many repeater users around the world. It is very easy to overlook the efforts of these "back-room boys" (and girls) when grumbling about minor problems or down-time associated with your local "machine", so drop them a line of thanks occasionally to let them know that you care. Better still, send a donation towards the upkeep of the equipment.

Meteor scatter

G3WDG and his wife Petra, G4KGC, are better known for their microwave and eme activities than meteor scatter, but during the Perseids they made a concerted effort to work this mode on 144MHz using a pair of home-brew W2JR eight-element Yagis. Results for a first-time effort were spectacular, with Y22ME, Y41YL, SM5CNQ, HG4YF, OK1KHI, OH0JN, YU3FM, I1KTC and I2FAK being worked, all on cw. From the HG, a 70s burst of rogers was received. None of their ssb skeds were completed, however, and some stations failed to show up. It was obvious on the vhf net at the time of the Perseids that some stations became carried away in making skeds, since they apparently left themselves no time for sleep in a period of 72h or more. This is fine for multi-operator stations but very wearing for the single operator! Petra received a 43 report from the OK and is still trying to figure out what it meant!

Paul, G4IJE, never strays far from the ms scene, and these days is operating a number of regular skeds on both 50 and 144MHz. These provide much useful data on ms conditions, quite apart from enabling one to keep going right through the year when many stations abandon the vhf net, returning only during shower periods. As we have said here many times before, you can work ms all year round if stations at both ends know their business. Paul received a burst of 40s at S7 from I3LGP recently; as he says, "Not bad for sporadic meteors". He has written some sophisticated software to enable him to use his BBC-2 micro as a memory keyer, but finds that the rfi from his computer makes it impossible for him to use it for this purpose. G4YUZ (Hoddesden) finds that he can use Paul's program, however, so there seems to be a variation in the amount of "hash" generated by these micros, unless the station configuration is the culprit. Tony, G4NRV (Kent), has made great improvements in his BBC-2 by having a heavy coat of metal sprayed on to the inside of the plastic cabinet and by paying attention to the earth-bonding points, so he can now operate his micro very close up to the vhf equipment without much interference.

G4IJE had completed 199 ms contacts on 50MHz up to the middle of September. Jeremy, G3IMW (London), has also been working this mode on that band, and has sent some useful data which will be held over until there is space available to publish his graphical results.

The call of UK2RDX, the club station in MT square which is very active on ms, has been changed, according to John, G3IMV, to UR1RWX, so this is the call to listen for on the vhf net if you want that square.

Aurora

John Allaway, who writes *The Month on the Air* feature, was recently appointed secretary of IARU Region 1, an honour which recognizes his dedication to amateur radio and to the Society. One benefit of this appointment, is that he receives from Dex Anderson, W4KM, a translation from the Russian Magazines *Radio* and *Soviet Patriot*, part of which gives much information on what is happening on the vhf/uhf front in the USSR.

In issue 6/84, much information is given on auroras and their detection. UA9XAN and UA9FFQ found that on seven occasions when aurora was

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present, good tropo conditions were also noted, enabling them to work one another by this mode, but if no aurora was present they could not hear one another. RA1ASK who also connects good tropo with an aurora, reports that at the beginning of an aurora there is often a fall-off in tv reception in his area, when the Leningrad station begins to interfere with adjacent channels due to a broadening of signal by auroral scattering. He makes another interesting point: signals from beacons installed on satellites can be useful auroral indicators since they take on a hissing tone when aurora is present; but more important for prediction purposes, the satellite radio visibility time increases by several minutes when compared with its "usual" time. Another point is that auroral contacts on 432MHz are not nearly as rare as I had imagined, especially in those areas where auroras tend to be more intense. *Radio* mentions several auroras of December 1983 when 432MHz contacts were made by USSR amateurs.

Recently I was pleased to have SM6EAN as a visitor and we talked vhf late into the night. He also confirmed that 432MHz auroral contacts were taken more or less for granted in Sweden, and high power is by no means essential for such contacts. One would assume that the aurora needs to be intense, and the location of the stations relative to the event has to be optimum for such contacts to be possible, but there is much evidence to support the view that few 432MHz auroral contacts are made by G stations simply because we do not have enough people using the band during such events. Last month I mentioned the contacts between expedition station GM4SIV/P and some G and PA stations, so next time you hear the familar hissing tone, listen on 432MHz if you are suitably equipped.

UA3MBJ is reported to have mapped the 123 squares which he has worked (437 QSOs) on 144MHz via aurora, and they all fall within an ellipse centred on his QTH. The main axis of the ellipse passes along the geomagnetic parallel and the minor axis along the geomagnetic meridian. This would certainly not hold good for UK stations who took part in the massive auroras of 1982–83 when stations down to the Mediterranean were worked from Britain, but these conditions were somewhat abnormal.

Valuable data to support some of what is written above is provided by John Dunlop, GM6LNM (Port Glasgow). John detected auroras at his location on 24 and 27 August, and he said tropo was very good into Scandinavia for three days between 24 and 26 August. In view of what *Radio* reports, John's comments are fascinating. He says: "24.8.84. Aurora, GB3LER auroral 1500 to 1730. Very northerly, little activity. Tropo opening into LA and OZ. Norwegian repeaters being worked easily from the west coast (of Scotland). Conditions good on 432MHz into LA and OZ."

John also noted auroras on 3, 4 and 5 September. Those on 4, 5 September were quite big ones, penetrating to the south of England, during which Bob, G4XEK/W5MJQ, had his first experience of this mode by working LA1BEA (CS), DL8BAB (EN), DL6FAW (EO) and several PAs, all on a beam heading of 50°. He found the event on 5 September to be of the "weak Scottish type".

Back to John Dunlop's report, he gives an account of what he heard prior to the auroral activity on 4/5 September. He writes: "On both days, before hearing any beacons, I had a high noise level, sometimes S9, beaming to the northeast on 144MHz. The noise level dropped as the aurora became more intense, but came up again as the aurora was just about to disappear. Both events were preceded by "lift" conditions on 144MHz, with English repeaters being heard while mobile *about 3h before the event. I have noticed this many times before.*"

There is much food for thought in all of this. Since we cannot sit by the rig day and night, anything which adds to the fund of knowledge on auroras and their detection can only be good—especially as the sun gets ever deeper into the solar cycle and the probability of really massive events becomes less. Fortunately there have been far more auroras than were expected at this point in the cycle; let's hope that the trend continues.

Indoor antennas

The subject of indoor antennas raised in the September issue, resulted in quite a lot of correspondence and indicated, as I had suspected, that there are many operators who are not able to put up masts outside, and are thus forced to try various methods of "getting out" on vhf other than through their local repeaters.

Ian Poole, G3YWX (Staines), is currently using a 144MHz dipole fixed to the rafters in the roof-space by drawing pins. With a Trio TR7010 delivering a bare 10W to it, he has, by awaiting favourable conditions, worked several stations in the north of France, Wales and the north of England. His best dx so far is to BF square over a distance of some 500 miles. He comments that some years ago he used a home-brew four-element quad indoors on 144MHz and found that it performed very well, being less prone to detuning by nearby objects than conventional Yagis. Using this he had one contact over 500 miles when his transmitter power was a mere 10mW! He strongly advocates "having a go" whatever the apparent difficulties.

Stan Clark, G6NUO (Birmingham) is another who is limited to indoor systems, and in 1983 he built a three-element quad based on a design in the *Radio Communication Handbook* (Vol 2 pp13–6, Table 13–6). Using the quoted spacings of 16in he found it impossible to get a low swr, but later came across a similar design in *SWM* December 1983 with spacings of 14in between director and driven element and 12in between DE and director. He modified his antenna to these dimensions but again failed to get a good match until he removed the director, when all was well! He now uses it on fm with horizontal polarization, feeding it with an IC2-A, and regularly works into Shropshire. He also uses a manual system to rotate the antenna, which is located in the loft, using cord and curtain rail components, bits of pvc pipe etc, and an indicator with the compass points marked out on chipboard. Years ago G8VR used a pulley system in the attic, with a bicycle wheel with tyre removed providing the low "gearing", and pencil marks up the wall along the route of the rope "drive" to indicate the position of the antenna. It was quite silent in operation, and you could go from a beam heading of east to west with a simple pull on the rope in about 2s flat!

Derek Purkiss, G8NNJ (Romford), recommends the ZL-special as a good indoor antenna when space is at a premium. He used a three-element version initially when licensed in 1977, fed from an FT221R, and subsequently changed it for a five-element model which was only 39in long in the boom. Using 10–12W ssb, F, ON, PA, DL and GW were worked with the antenna actually in the shack on a broom-handle mast. When beaming east, he had to fire through three walls of the house from 50ft asl, and 18ft above ground. This antenna was later erected outside, and enabled the 144MHz Standard Award quota to be worked, so it is clearly a useful one despite its small size. Another interesting point is that he could change the three-element version from horizontal to vertical polarization by having it mounted on a suitable pivot. These are some of the interesting things one can do with indoor systems, especially if they are actually beside you in the shack. Note the G8VR/W1 five-element Yagi in the photograph in *4-2-70* September. The ability to elevate the antenna made a tremendous difference to working satellites in near overhead orbits.

Pete Hizzey, G6YLO, writes from what sounds like everyone's dream location (except for radio), namely an 18th-century oak-beamed cottage near Canterbury. He is forced at present to use indoor antennas and use ye olde worlde beams as supports for a seven-element MET Yagi on 144MHz and a 17-element Cue-Dee on 432MHz. On the 144MHz band he has worked, using 10W 19 squares and eight countries (G, GU, GW, F, ON, PA, LX, DL), none of them during big openings. He says that working the GU over a very obstructed path (his house is in a hollow), was as exciting as when he went to his /A location near Dover and worked UA3LAW during this year's Es opening. On 432MHz, Pete has worked seven squares since last year using an Icom 490E with no preamplifier. Just to complete the picture, he has heard out as far as BL and CL squares on 1·3GHz using an indoor antenna on this band too. His message is similar to the others, "Take heart, dx can be worked with patience".

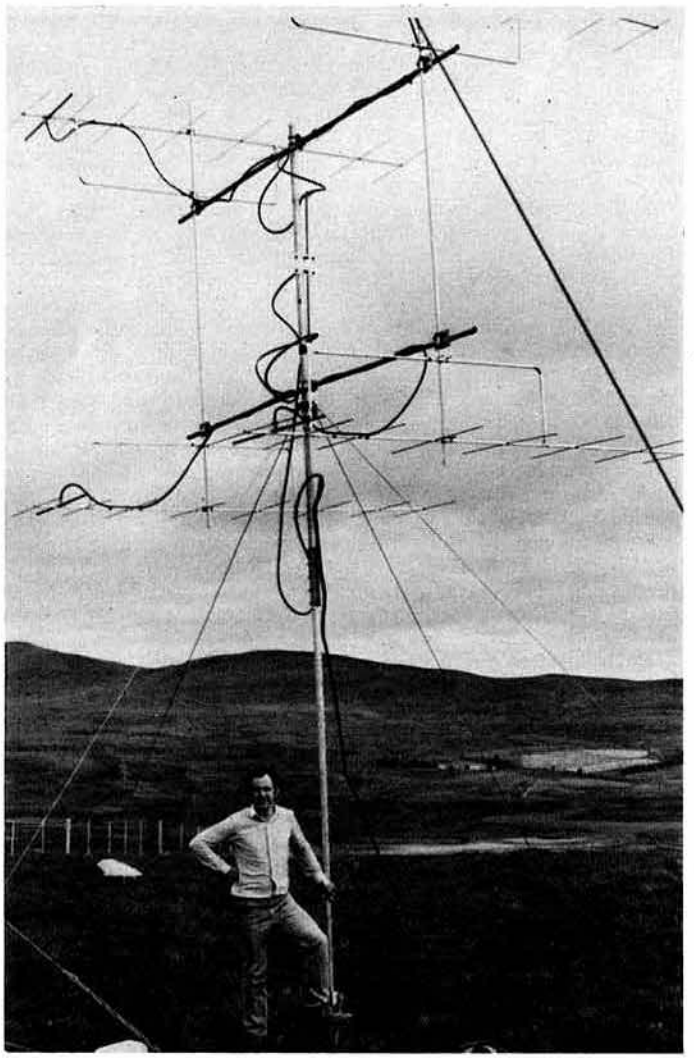
Another 432MHz "indoor" operator is Peter Roberts, GW6AYM, who uses a *Practical Wireless* G2BCX design folded colinear, plus a five-element Yagi built to a design in a *QST* for 1948. They don't make 'em like that any more Peter, more's the pity! He has had some spectacular contacts through repeaters with just 10W from a Trio 8300 despite the fact that his QTH is behind the sand dunes in the middle of Swansea Bay, virtually at sea-level.

A variation on the indoor antenna theme was provided by G4VPV who, while on holiday near Poole, Dorset, tied a 144MHz halo from his car on to the balcony of a flat overlooking the harbour and used it to work locals on cw, ssb and fm. In addition, he worked several GW stations around Cardiff, plus G3OUR/P on the Lizard (XJ) and on the Scillies (WJ). Best of all was EI3VQA/P, a French team operating from WL. Power used throughout was about 20W.

It would be good to hear, From time to time, of unusual indoor or limited-space systems and the results they bring, since most of us can only dream about that 160-element eme array, being tossed about by the winter gales, threatening to bring down the house as well as the mast. Jeeves, kindly turn the broom-handle towards the east.

Expedition round-up

As a pleasant reminder of the good summer weather, reports have been coming in from the expedition teams which do so much to activate rare squares. The photograph on the next page shows the enviable site occupied by the GM4DHF/P and GM4SIV/P ensemble in XS square between 23 July and 3 August. Some of their auroral contacts were reported last month. On tropo, using 144MHz, GM4DHF/P logged over 300 different callsigns with best dx being PA0RDY. G4PCS in the south was worked on an almost nightly basis (Mark will be remembered from his G3UNU operating days),



The GM4DHF/P expedition site in XS square

but Dave, GM4DHF/P, commented that many Dutch stations called, creating their own QRM. The team caught some Es conditions on 24 July when they had a near-miss with I6CTJ (GD) and worked YU2EZA (IG), OE5MKM (HI), YU2SWW (IF), DC/PE0ALM (GI), OE5DML (HI) and OE6WIG (HG). They were called by OE6LOG as the event faded.

Since Dave is a meteor-scatter enthusiast, it is not surprising that this mode was used very effectively from XS square on 144MHz. Fifty-six complete contacts were made (90 percent of those attempted), and the 2·5min periods used apparently proved very popular, allowing many contacts to be completed within 20min, which permitted "tail-end" calls to be accepted. The square was much in demand, especially as random calls were accepted on the "sked" frequency of 144·028MHz after 0300gmt. Some ssb was used, and the team gave I4YNO his best-ever ssb ms dx.

The "other half" of the expedition, GM4SIV/P operating on 432MHz, worked some 70 tropo stations, the best being G4KIY (ZM) at a QRB of some 655km. Dave says he will report more fully later, but to summarize, they worked 96 squares and 21 countries on 144MHz, and 20 squares plus five countries on 432MHz. Other stations in the team were G4YHF and G4ODA.

The Albatross Contest Group expedition to VL square also appears to have been very successful. Paul Tittensor, G4PVM, reports that they operated on 144MHz with callsign EI2VRO/P from "The Old Head of Kinsale", a headland 60m asl with clear take-off between SW and NE. Conditions were generally flat during their stay, with only one tropo "lift" which occurred on 13 August. Using 400W to 2 × 16-element Yagis and a FT221R with 3SK88 preamplifier, 95 meteor-scatter contacts were made with 11 different countries in eight days of operation. Sixteen QSOs were over distances greater than 1,700km, the best dx being YU2CCB/3 (IG) at 1,898km. Three ms contacts were made running only 20W output, and when they worked DF3RU (G) using their full power, he was using a mere 5W. Tropo contacts were also made, the total 144MHz score being 75 squares and 19 countries, the best tropo dx being over a path of 1,658km.

On 432MHz the group operated EI2VRS/P using 4 × 21-element Yagis and 400W of power. Conditions being so very flat, no outstanding dx was worked, although stations around 700km distant were contacted. However, the team attempted two ms skeds with DK1PZ (EL), and signals were copied both ways although no complete contact resulted. This is very good news, since we need much more activity on 432MHz generally (see under "Aurora"), and with more stations on the band using or attempting to use the more "exotic" modes, who knows what will happen?

Back in July, Ken Wood, GM3WCS, made a trip to XQ square for the purpose of activating it for ms operators. The call used was GM4IPK/P, since Andy was also there, plus GM4CXM, GM4TXX and GM6LNM. The site proved to be very "noisy" from an rf point of view, but 65 per cent of all ms skeds were successful, some 16 countries being worked.

Between 6 and 14 August, GW3NYY, G8TFI, GW4LXO and GW6EWA mounted an expedition in XO square operating on 144 and 432MHz and 1·3 and 2·3GHz. The overall score was 1,138 contacts. 62 being on 144MHz ms. On 144MHz 22 countries were worked in 92 squares, while on 432MHz nine countries and 31 squares were locked up. The best 144MHz dx was HG1W/0 (LH) on ms at 2,000km, OH7PI (NW) and OH5LK (NU), all on cw. On tropo the best dx was SM6KJX (GR), SM6CMU (FR) and DK1KO (FN), these being on ssb. On 432MHz, SM6KJX, SM6HYG (FS) and DK2NH (FN) were all worked on ssb. The team found that ms reflections were numerous but short compared with previous years. Many more stations could have been worked on random ssb ms if operators had used the 15s "break" routine. Like the GM4DHF/P expedition, they favoured 2·5min cw periods for ms, and said that this "greatly increased the strike rate". They go so far as to say that the general use of 2·5min periods should perhaps become standard rather than the current 5min. No auroral activity was observed during their stay, nor any sporadic-E, though openings did occur further south at the time. A special QSL card has been printed to confirm contacts with this expedition and square.

Through a press-release, the West Kent ARS (G3WKS) announces plans for an expedition to a location in Eire to attempt "a *direct* contact between Europe and North America" (the words are theirs). They give no other details but seek sponsorship, and it is intended to make video recordings of the expedition for use by clubs. More information is available from the secretary, Nigel Peacock, G4KIU, QTHR. It would be interesting to know just what they have in mind, because if they were to succeed, several of the text-books on propagation might have to be hurriedly revised and even one or two hats digested in view of the results so far achieved by double-hop Es exponents and ms-assisted Es tests. However, the photographs of an aurora taken from a satellite, *4-2-70* May 1984, did show the tail of the event stretching far out over the Atlantic. Let's hope that they keep us informed of progress.

Dave Jones, G4RVJ (North Devon), says that the Exmoor RC, G4SSS, plans an expedition to Lundy Island in June 1985, operating on 144 and 432MHz and 1·3GHz plus hf bands, from a site 450ft asl with a clear take-off in all directions. This operation from XL square will be the first expedition experience of this group, so anyone wishing to write to G4RVJ, QTHR, giving hints and tips on such matters will find the recipients most appreciative. Meteor scatter is planned also. More news nearer the event.

From here and there

Ken, GM3WCS, claims a first on 144MHz for a contact via ms with 4U1ITU between 2300 and 2400gmt on 2 July 1984. Reports of 27 were exchanged. Ken's linear amplifier became unserviceable just prior to the sked so he had to fall back on an old 80W amplifier. He says, as we have so often advocated here before, that "it just shows what can be done with only medium power levels" on ms.

GM3WCS also makes a plea regarding the QSL problem. Having activated XO square during VHF NFD, he was inundated with cards requesting confirmation of the square, but less than half enclosed any sae or stamp to defray the cost of postage of a card direct. Ken says that he will have to use the bureau to send cards to those who sent no form of remuneration, but he makes the general point that operators should be aware of the QSL card burden which falls upon expedition stations who sometimes make hundreds of QSOs during a short period of operation.

Among claimants for the "longest callsign worked (*4-2-70* September) is Andy McClelland, G1FKU/PE (BFPO 28), who, living in a part of the world where three countries meet, was obliged during the course of one 15min contact to sign himself as:

GOLF ONE FOXTROT KILO UNIFORM STROKE PAPA ECHO STROKE MOBILE

OSCAR NOVEMBER NINE MIKE CHARLIE STROKE MOBILE

DELTA CHARLIE STROKE GOLF ONE FOXTROT KILO UNIFORM STROKE MOBILE

He says that the reciprocal licence conditions demand the use of the phonetic alphabet each time, and that the above indicates the different practices of three adjacent licensing authorities for reciprocal licences—the Dutch use a suffix, the Germans use a prefix, while the Belgians give a separate callsign. I raised the matter of our own lengthy callsigns for visiting amateurs with David Pratt, G3KEP, chairman of the RSGB Licensing Advisory Committee, and he said that we are simply following IARU recommendations in this matter, though from what Andy says not all Region 1 countries do so. G6YLO worked DL/HB9CWG/P for another unwieldy one, while Rik Whittaker, G4WAU, worked GW4/HB9CWG/M who was on holiday with his wife in North Wales.

Philip Hocking, G8ZDS (Camborne), claims a "first" for his QSO with EA8XS on 432MHz on 4 July 1984 at 1849gmt. He says the QRB is 2,844km. Pat, GW3KJW (Gwynedd), worked the EA8 on 144MHz at 2303gmt on 5 July. Is this a "first" GW-EA8, or are there other claimants?

Stewart Cooper, G4AFF (Weymouth), has passed on a couple of "clangers" heard on 144MHz recently. The first was: "Conditions are up tonight on fm but not on ssb". The other concerned a station who was told he was "splattering" who responded by saying: "I know, I've had the DTI around and they checked the rig. Deviation was OK, so it must just have a wide carrier". (A variation of "Never mind the quality, just look at my width" perhaps!) Stewart remarks: "What happened to the RAE?" What, indeed?

David, GM6JFP (YS33a), makes a plea on behalf of all operators in YS square (about 60 in all, he says) when he asks GW and G stations to point their beams in that direction more frequently. Stations in YS often hear contacts going on between southern operators but cannot make themselves heard off the back or sides of their beams. As he says, "Surely they cannot all have worked YS". It is an interesting indication of the growth of the hobby if there are now as many as 60 operating in YS! □

EPHEMERIS

Satellite news and views

*by R. O. Phillips, G4IQQ**

Oscar 10

Last month's column carried details of the major revisions made to the operating schedule of Oscar 10; however, last-minute changes and a late implementation meant that the information was somewhat out of date. In fact, what appears to have happened is that AMSAT decided to change to a slightly more conservative schedule to provide longer periods when most of the on-board functions were switched off. It was stressed that the schedule, which was introduced on 3 September, is an interim one and based on analysis of operations during the eclipse season, an expanded operating schedule may be possible later. The details of the interim schedule are as follows:

Mean anomaly	Time (min)	Status
000 - 031	00 - 87	Off
032 - 099	87 - 273	Mode B
100 - 116	273 - 320	Mode L
117 - 189	320 - 520	Mode B
190 - 256	520 - 700	Off

The only departure from the above is that on Sundays the Mode L transponder is not activated so that Mode B is operated continuously from MA 032 to 189—a total of 7h 32min.

The changes to the format of the transmissions carried on the 145·810MHz beacon were also implemented on 3 September. They have been very well received, particularly by those able to copy the rtty transmissions which provide a great deal of data on the satellite itself.

There has been much said about the standard of operating through most of the amateur satellites, and Oscar 10 in particular. One of the major problems has been the use of transmit powers much greater than is necessary, resulting in the suppression of small signals. It is pleasing to report that there has been a noticeable improvement in the situation, at least so far as UK amateurs are concerned. A considerable amount of monitoring has been carried out and the offending stations have been notified of the implications of their actions. The response has, by and large, been very encouraging, and it is to be hoped the lead is followed by others around the world.

UOSAT

Both satellites, Uosat Oscar 9 and Uosat Oscar 11, have continued to function very admirably and no major events have taken place since the last report. As a result of feedback from the many users of Uosat 1, several changes have been made to its operating schedule. The bulletin/Digitalker/1,200bps transmissions will now be carried on Saturday, Sunday and Monday; radiation and ccd camera data will be transmitted on alternate Tuesdays; whole-orbit telemetry survey on Wednesdays, and check-summed telemetry on Thursdays. The bulletin information will continue to be loaded on Fridays, and items of relevant news may be included provided it is sent in writing to arrive at the university no later than 10.30am on that day.

The gravity gradient stabilization of Uosat 2 continues to maintain the spin axis of the spacecraft in the direction of the earth; however, there have been indications that one of the penalties to pay for this stability is an increase in the spin rate. The forces acting on the spacecraft would normally cause its attitude to change, but as this is prevented by the gravity gradient boom, the energy is dissipated by increasing the angular momentum and hence the spin rate. Occasional de-spin manoeuvres will be carried out by the university to keep the spin rate down to below 2min/revolution. Telemetry and data being gathered from the spacecraft to confirm gravity gradient lock stabilisation indicates that libration of the satellite is contained within 20°.

Some further work has been carried out on the ccd camera but no significant images have yet been obtained. No serious problems are suspected; the difficulty seems to be in getting the correct gain setting for the video amplifier. In order to speed up the time to dump the images, the possibility of high speed (ie greater than the 1,200bps used at 145MHz) transmission using the 435·025MHz beacon is being investigated.

Other news

The ARRL has been carrying out some very interesting experiments through the mode B transponder on Oscar 10 using a new voice processing technique. Amplitude compandered sideband (acsb) is a technique that is attracting considerable attention in the commercial satellite world, particularly for mobile applications. Two stages of compression are applied to the transmitted signal and a pilot tone is added to overcome some of the problems of non-trained operators using ssb. The technique is claimed to provide intelligibility improvements of up to 10dB, though little has been said of the effect on the duty cycle of the transmission. Bandwidth is one of the major constraints for commercial systems, and the use of high-duty cycle modulation characteristics is typical; however, for amateur satellites the problem is usually power. One of the applications for the use of acsb is in the provision of good-quality news broadcasts via Oscar 10 and perhaps extended through a network of vhf/uhf repeaters.

Information

In view of the number of letters received over recent months concerning the availability of satellite information, it seems timely to repeat some details of AMSAT-UK. The group, which is an RSGB affiliated society, was set up several years ago to cater for the particular needs of the growing number of amateurs interested in satellite working. The membership currently stands at about 1,800 (not just in the UK) and the secretary is Ron Broadbent, G3AAJ, who can be reached at AMSAT-UK, London E12 5EQ. AMSAT-UK runs weekly satellite information nets each Sunday at 1015am on 3,780kHz ± QRM. The net on the last Sunday of each month is devoted to a review of the previous month's activities and is co-ordinated by Richard Limebear, G3RWL. The nets are established to provide information to anyone interested in satellite communication and are open to members and non-members alike. Detailed information on existing satellites and orbital calendars, are available from AMSAT-UK. Further information may be obtained from G3AAJ, but please include an sae with your enquiry. □

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Microwaves

*by Mike Dixon, G3PFR**

The world-wide locator system

In the October issue of *Rad Com* a full explanation of the recently adopted world-wide locator system, otherwise known as the "Maidenhead" (cw abbreviation loc), to be effective from 1 January 1985 was published. Unfortunately the final division into sub-squares, each measuring 2·5' lat by 5' long, is not accurate enough for microwave purposes. A further division into "microsquares" is proposed: each sub-square to be divided into a grid of 10 by 10 microsquares, each 0·25' lat by 0·5' long, and *numbered* in the same way as the larger squares, ie 00 at the south-west corner, up to 09 at the north-west corner, to 90 at the south-east corner and 99 at the north-east.

A full valid microwave reference would thus become an eight-letter/digit reference such as IO90XA01, the first letters designating the field, the first two digits the square, the following letters the sub-square and the final digits the microsquare. Used in this way the system becomes sufficiently accurate for the majority of microwave contacts, especially those over longer paths and of an international character.

For short path working, particularly at 10GHz and above where extremely narrow beamwidths are used, it may still be necessary to use ngr (national grid reference) to obtain sufficiently accurate results on beam-heading and distance calculation: on a 10km path, for instance, ngr will yield an accuracy of ±0·5° whereas the Maidenhead system could have an uncertainty of ±5° (north-south paths) and ±3° (east-west). Distance calculations show uncertainties of ±5 per cent (north-south) and ±10 per cent (east-west) when using Maidenhead, compared with 0·5 per cent using ngr. For path lengths of 100km each of these uncertainties is reduced by a factor of 10 and both distance and bearing calculations become more meaningful. Thus be prepared to use ngr for (domestic) *calculation* but quote your position in Maidenhead! These uncertainties, incidentally, alter with latitude, and the above example was calculated for about 54° N. The figures were also "rounded" to the nearest whole figure.

Operational news

July and August have been quite eventful months for microwave users, with some quite excellent spells of lift conditions, and many operating reports have been received.

Erwin, DL3ER, reported his first 47GHz QSO with DJ1CR over a distance of 13km. Using 0·5mW generated by doubling from 23·5GHz and a 100mm dish (the base of an old "Butagaz" container, and therefore spherical rather than parabolic) signals were estimated at 15dBn in the 200kHz bandwidth of the 30MHz i.f. The receiver used sub-harmonic mixing, and the dish was fed by a version of the well-known G4ALN "penny feed".

On 1·3GHz Peter, G6YLO, reported "strange" phenomena from St Margaret's, Dover, working GM8BZE (YQ square) with a dish heading of 45° and a DL station on a northerly heading! Tongue-in-cheek he suggested that "either ducting is curved, there is scatter off the Continental anticyclone or someone has sponsored a large reflector on a North Sea oil-rig!". These phenomena were observed on 8 July with temperatures in the eighties, and although conditions appeared excellent Peter found activity somewhat low—had everyone gone to the seaside? He had earlier reported similar odd phenomena from the same site, receiving an unidentified station from ZO square and G4HWA(?) *only* on an easterly heading!

Geoff, GJ4ICD, reported activity using 150W to a single 26-element quad-loop on 1·3GHz. In his first four weeks of operation on the band he had worked 21 squares in four countries, with the best dx to date being F6CIS at 648km. He has plans for 2·3GHz later this year, plus an expansion of his 1·3GHz system. He found the 1·3/2·3GHz contest "a disaster, having one QSO with G3JVL in ZK square only". This appears to contrast quite sharply with the experiences of G3WDG, G4KGC, G4FRE and G4ERP, who operated /P in North Wales and found conditions and activity good, especially on 2·3GHz. Their opinion was that the contest was a resounding success! They made 19 QSOs including four PA0s on 2·3GHz.

On both 1·3 and 2·3GHz Gordon, G8PNN (ZP square), reported excellent conditions on 29 and 30 July. On 1·3GHz his 60W to the choice of a 5ft dish or a 28-element quad-loop yielded six contacts in four squares and four countries (G, GM, PA and ON). With 5W to the 5ft dish on 2·3GHz he managed 12 QSOs in four squares and three countries (G, PA and ON). He has also forwarded a photocopy of a QSL card for a 1·3GHz contact on 25 April 1984 with Y23BD (GM square), and asks whether this is a first? Gordon also reports G4PEC as being active on 1·3GHz from ZP square.

Stuart, GW3XYW, writes to claim a "first", having just received confirmation of his contact with VK5MC on 1·3GHz eme on 12 April 1984. He believes that this is the first GW to VK QSO on this band and mode. Both stations were understood to be using very similar equipment, ie 250–300W, 20ft dishes, W2IMU feed horns and MGF1402 preamplifiers. Other stations worked during April were OE9XXI, OE5JFL, G3LTF, LX1DB and OK1KIR. Stuart says he has now "retired back on to 70cm in order to find someone new to work by eme"!

Jack, G5UM, the microwave awards manager, reports the following awards during August:

1·3GHz	Five squares	G4ROM/P, number 47
	10 squares	G6AWM, number 36
	25 squares	G8FEZ, number 10
10GHz	Five squares	G8HMV/P, number 21

The most remarkable claim, however comes from John, G4BYV, who has established himself firmly at the top of the 2·3GHz "league" with a confirmed 30 squares. Four out of five of the additional stations worked were using dishes and one, OZ2OE, was using a single 35-element quad-loop. The use of cw yet again showed its ability to sustain contact under weak-signal conditions, although some of the reports given were S9 even at several hundred kilometres QRB.

With reference to the new licence schedule it should be noted that, provided that operation on 24GHz is restricted to the band segment 24·00–24·05GHz, prior written consent from the DTI is no longer needed. For operation *above 24·05GHz* permission is still required and an application form is available from the membership services department at RSGB HQ on receipt of a second class stamp, or from the DTI. It is hoped that this slight relaxation of conditions will help in promoting additional 24GHz activity in the very near future.

Both Charlie, G3WDG, and Ian White, G3SEK, commented on the value of using strictly-timed transmitting and receiving schedules while trying to work difficult contacts by "tropo". Such methods are, of course, already used for ms and eme skeds, and should be logically extended into the longer troposcatter skeds. As a result of recent operational experience in the USA Ian noted two things: first, the Americans' enthusiastic adoption of the Maidenhead locator system; and second, the frequent use of timed skeds (and cw) to work the longer distances, even on 432MHz. The key requirements are, he says:

1. A clock or wristwatch accurate to within a few seconds of standard time
2. Transmit/receive periods of one minute, changing on the minute
3. Agreement as to who starts, when, and for how long
4. If the sked fails, return to talkback (or the telephone!) and fix another sked for some time later.

Charlie's comments were similar, and he recently used the system to good effect in carrying out successful contacts from his home QTH (described as a poor location) to XQ and YP squares on 2·3GHz. Without strict procedure neither QSO would have taken place. The simple system described is therefore strongly recommended to all operators working under marginal conditions. The 2·3GHz contacts took, respectively, 2h and 15min to complete—before the first QSO it had taken 30 very difficult minutes on 432MHz to even agree the procedure! In both contacts aircraft scatter played a part, bringing the signals out of near-noise up to short peaks (15 to 30s) of S5 to S8. It would seem that this "mode" can provide a means of working paths of 500 to 700km when conditions are otherwise flat.

Fundamentals

Unfortunately, due to pressure on space created by the wealth of operating news this month, continuation of the "Fundamentals" spot has had to be held over until next month.

Readers are reminded of the microwave "workshop" at Sheffield detailed in last month's *Microwaves*. This has direct bearing on setting-up simple equipment of the type so far described, and will present a first-class opportunity to ensure such equipment is operating at peak performance *and* is on the new frequencies. See you there? □

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SWL News

*by Bob Treacher, BRS 32525**

FIRST, thanks to G3MGL and G8CGK for a couple of corrections to items which appeared in September's column. G3MGL gave the correct interpretation of "55s", which is based on a German pun, and means a wish for lots of contest points. G8CGK pointed out, quite rightly, that the sstv signal is a warbling tone ranging in frequency from 1,200 to 2,300Hz, and not as was reported. Apologies for any embarrassment. G8CGK also offered his help to anyone who is seriously interested in sstv, having been involved with the mode for 25 years.

28MHz slp results

Seven entries were received for these slps, which were organized for weekends during June and July, and they showed that the band was not as devoid of signals as most correspondents thought.

Station	23.6	24.6	30.6	1.7	7.7	14.7	15.7	21.7	22.7	28.7
BRS52543	312	0	781	12	0	0	2860	1095	2751	126
BRS25429	115	1139	0	0	0	0	826	0	845	0
BRS8841	0	300	450	0	50	0	544	98	288	0
BRS44395	15	416	468	0	0	0	0	0	0	0
BRS32525	0	295	0	0	0	0	0	0	0	0
BRS62088	0	0	295	0	0	0	0	0	0	0
G4RJC	0	0	18	0	2	0	0	2	0	6

Much useful data was included with the logs. Martin Parry, BRS52543, Dave Whitaker, BRS25429, and Robert Small, BRS8841, all battled bravely in at least four periods, while John Goodrick, BRS44395, conceded gracefully after the third. It was very comforting to receive a log from G4RJC, while your scribe and his xyl managed but one session each when holidays and domestic QRM did not take priority. The 23 June session provided only nine countries, EA8APD being the only station outside Europe. The session on the 14th produced LU, PY and 7X2, together with the usual crop of EAs. Dave and Robert were copying many Scandinavians as well as UP2 and UR2, but Martin's log shows none. On 30 June he logged four HB9s, and a goodly number of OE, HA and YU, which did not appear in the other logs. Robert caught A92EB and a solitary CT1 to go with W4MAT/SV9 and SV1TY. On 1 July Martin heard an EA5, an EA7 and two Gs in 2h listening. The other logs showed a mixture of nothing heard or inactivity. Robert only found one EA, YU, I, F and IS0 during 2h listening on 7 July. G4RJC worked IS0AEW, but monitored the band for the period, putting out numerous CQs without reply. He found the period on 14 July more frustrating, making many CQs without any replies. Conditions the following day were good, with much to be heard. Dave logged EA6, UH8, 5B4 and UF6. Martin logged 71 stations in the two hours, including 7X2 and those heard by Dave. He also found reasonable activity on 21 July, logging 37 stations, including 13 EAs and six Fs, together with EA8 and some UAs in the last 15min. The same good Es conditions of 15 July were repeated on the 22nd and Martin again plundered 67 stations. The logs contained the same mixture of EA, YU, F, DL, SM and I as before, plus a few Y2, HB9, HAs and a UO5, but two ZS stations and a 4Z4 heard by Dave were the only dx stations logged.

All in all, those who took part enjoyed the skill factor and, to an extent, the patience involved in monitoring 28MHz during a period of summer doldrums and sporadic-E activity.

VHF news

At the time of writing, conditions at vhf were still pretty abysmal, with only one modest tropospheric lift to speak of, which was during the 144MHz Trophy Contest. Dave Whitaker certainly seemed to have fared the best from his QTH in North Yorkshire. At our QTH in London the dx was quite weak and some juicy dx which was 59 in AL41b was inaudible on the other side of the hill in AL41a. It was particularly distressing to be told of activity from HB0 which just could not be heard at this QTH. Just like Es! Dave managed G4VWH/P in XJ and F6HBP/P in CF for two new squares. Six stations were heard over the 1,000km mark, which helped Dave's fine claimed score of 1,745. During the event 34 locator squares in 11 countries were heard. Martin Parry logged stations in XJ and XI for new squares and also caught dx in BJ, ZH and BF for the best dx during any contest on vhf to date. On brief visits to the shack my xyl, BRS62088, heard F5HV/P (DG51f), F6EAH/P (DG51h), F6HNX/P (AG79d), F6HMQ/P (XI50c) and F6BWY/P (BF35g). Her first eight loggings netted her over 150 contest points. Unfortunately, the family had to take precedence! Harold Moss, BRS18529, had got onto 144MHz by courtesy of a Microwave Modules converter, a Mutek preamp and a vertical antenna. The September contest was Harold's first on vhf and he managed GM4YXI (YO), several Fs, PA0s and ONs.

On 22 August, before the contest, Dave Whitaker heard his first dx on 432MHz, logging an SM7 in GP square and LA4IW (CS19f), together with around 50 PA0s. QSLs were coming back quickly, illustrating well the fact that reports at uhf are well received around G. On 144MHz the good conditions favoured the GMs, with GM1BLC/P and GM1BST/P both in XQ80d, GM4SUF/P in XS square, and GM6LXN in YS22f. However, the best dx he heard this summer was OY9JD (WV11b), who was doing brisk business into the Low Countries. We are all suitably impressed . . . and envious, Mr Whitaker!

HF news

The big news centres on the CE0AA operation from San Felix. The operators had been heard during September on 3·5MHz (at 0300) through to 21MHz, and for many the call was a much needed rarity. It was Dave, BRS25429's last country, and I now need only three all-time—VU5, 3Y and 7O. For Robert Small, BRS8841, it was number 319 all-time.

All the other hf news seems rather insignificant following the CE0, but for those who have not been listening for as long as we established dxers, other dx is equally important. Douglas Johnstone, BRS54163, mentioned 7MHz signals from CE1OW, PP7HW, TG9YG and VU2CVP, while 14MHz produced FR7CY, HP1XJL and 6Y5CA. Don Piccirillo, BRS52868, using an HRO and AD370 antenna, copied EA8UU, OY7ML, UQ2GM and VE1ZZ on 1·8MHz, and VK2BWI and W6DDO on 3·5MHz. 14MHz provided HC2SL and VE0MAR. 21MHz had remained open until 2145 during mid-September, with CE3MDC, K6XN/8P6, PZ1DC and TF3JF all being good copy. Both Brad, BRS1066, and Cliff, BRS10906, reported conditions as being "pretty dismal", with just the odd ray of dx for the taking. A35MP and KH6AQ on 14MHz were mentioned. Harold, BRS18529, concentrating on 7MHz, had heard HZ, VP8 and 9M2 to boost his score for the year. Martin, BRS52543, just mentioned KH6XX at 0539 on 7MHz ssb on 4 September. Robert, BRS8841, reported August as the worst month that he could recall for dx. Best dx seemed to have been 4K0B, 5W1DZ, ZK2RS and BY5RA, all on 14MHz.

SSTV

Les Hobson, BRS84809, continued to monitor sstv signals and sent me photographs of some of the pictures he had copied. A colour monitor had been added to the shack. The sstv write-up in September did prompt several listeners to contact Les. Away from the sstv channels, Les had copied YI1BGD, AL7CQ, 5N4BHF and CE3NR.

Finale

Space has beaten me again. News, views and table updates for January 1985 should reach me no later than Tuesday 20 November, with late news by 27 November. □

1984 HF Countries Table
(Starting score 150)

Station	DXCC	28	21	14	7	3·5	1·8	Total
			G-listings					
BRS8841	244	86	189	216	148	134	41	814
BRS52543	228	101	148	191	142	132	46	760
BRS48909	224	92	152	186	140	123	48	741
BRS25429	219	110	135	179	125	132	53	734
BRS10906	205	72	137	169	89	90	11	568
BRS31879	178	103	119	131	99	73	41	566
BRS44395	—	92	143	126	92	60	45	558
BRS1066	173	69	133	137	86	55	53	533
BRS18529	132	1	59	56	70	89	16	291
BRS50134	149	4	8	13	106	103	36	270
ARS53844	—	—	—	—	88	96	30	214
BRS44984	—	23	36	65	42	40	0	206
BRS44083	119	26	38	76	20	17	1	178
RS49875	94	31	50	42	28	20	3	174
			DX listings					
ORS45992	226	119	147	199	72	60	4	601

1984 UHF/VHF Table

Station	QTH loc	70MHz Squares	70MHz DXCC	144MHz Squares	144MHz DXCC	432MHz Squares	432MHz DXCC	Total	via*
BRS52543	YN	26	7	74	19	15	6	147	a-d
BRS32525	AL	—	—	67	23	21	7	118	a,b,d
BRS25429	ZN	—	—	64	15	25	9	113	a,b
BRS62088	AL	—	—	25	8	8	3	44	a,b,d
RS49875	YN	—	—	13	5	2	2	22	a
BRS18529	AL	—	—	15	5	—	—	20	a
FE8957	BF	—	—	9	2	—	—	11	a

*a = tropo; b = Es; c = Ar; d = MS.

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The Month on The Air

*by John Allaway, G3FKM**

THE RECENT DECISION taken by the IARU Region 1 Conference to recommend a standard size for QSL cards has been welcomed by G3DME who feels that it can't happen too soon! He considers that some standardisation of the written callsigns which show the destinations of cards would also be welcome. However, he does have one point which he would like to raise; that is, the sending to him, by foreign societies, of cards not destined for UK amateurs. It is apparently the habit in some quarters to send to the RSGB any cards for past or present members of the Commonwealth with the result that Ted is inundated with QSL cards for A2, A9, VP, VQ, VS, ZB, ZC, ZF etc, and anything else which is difficult to dispose of which seems to get labelled "via RSGB".

Another case of piracy—this time Ann Babbage, G4YKK, is being troubled by stations using both her old (G6YKK) and new callsigns; the former in northern England and the latter in the London area. Both voices are male.

CQ magazine reports a quite extraordinary achievement: the award of a DXCC 300 Milliwatt certificate—No 1 on ssb to W8ILC—"the first operator in the history of amateur radio to present QSL proof of two-way contacts with 300 ARRL DXCC countries". Presumably this latter feat does not apply to 300mW working!

Maurice Cote, K1HDO, is very anxious to trace David Keeler, who was on the air from Libya in 1969 as 5A1TK. He has already screened the UK calls in the *Callbook* and found four Keelers but not the one he is looking for. Can anyone help please?

DX news

John, G4PKP, is in Zimbabwe for a few weeks and hopes to be on the air from there. He says that he will be found mostly around 14,180kHz.

UB5WAD began operation from Guinea-Bissau on 8 September. He has been worked on 14MHz ssb and should be there for a year. His callsign is J5WAD, and he asks for QSLs via UA4PW. 9U5JB is back in Burundi and keeping schedules with ON5NT every Sunday at 0830 on 21,410kHz. 9X5BJ is newly licensed and has an FT1 and Windom antenna—a beam is planned. From Zaire 9Q5JE is active once more, mostly on Mondays from 1500 on 21,345kHz.

SU1ER reports that he will be on 14,275—14,280kHz daily between 1600 and 2000 for a few months. 6W1HF has a new quad antenna and is a good signal around 1900 most days near 21,300kHz. ZD9CA is reported to like joining in Snooky's Net at 1800 on Sundays on 21,336kHz.

The *Long Island DX Bulletin* reports that the rarely-activated county of Kalawao, on Molokai Is in KH6, will be on the air possibly early this month.

DXpress says that there is a good chance that OE6EEG will be on the air from South Yemen soon. Those looking for Mongolia on the lower frequency bands will be interested to know that JT1AO has promised daily activity on 3·5 and 7MHz for the rest of this year.

Derrick, G4BWP, has returned to Kuwait for his final visit. He returns to the UK around mid-December, and during his stay he has managed contacts with several stations on all nine bands 1·8 to 28MHz. HZ1AB intends to look for Europe on 1·8MHz on Wednesdays and Thursdays between 2000 and 2400—his frequencies will probably include 1,821, 1,828, 1,831, 1,842 and 1,850kHz. He makes schedules daily on 14,185kHz at 1800 for his 1·8MHz contacts.

DXNL says that A51PN now lives at Phuntsholing, Bhutan, but is not on the air.

Activity from China seems to be on the increase. BY5RA, with an operator who speaks good English, now seems to keep schedules with DU9RG on 14,180kHz at 1200 on Wednesdays, Saturdays, and sometimes on Fridays. His signal seems to peak in the UK at around 1345. The same station also frequents 14,030 or 21,030kHz between 1330 and 1500 almost daily. BY4AA and BY1PK also appear in the 14,030–14,050kHz slot around the same time. BY1PK now has rtty equipment, and this may be operated by JA1BPK who was expected to visit Beijing soon after this column was written.

KD7P/KH2 operates most days from 1900 to 2000 between 3,503 and 3,505kHz, and after 2000 on 7,005kHz looking for Europe. KG6RN keeps a schedule with his QSL manager IT9TQH every day on 14,235kHz at 2030, and otherwise he is often found between 1900 and 2100 on 14,202kHz. From Saipan AH0AC frequents 14,235kHz from about 0500, and at weekends also at 1230.

DX News Sheet reports receipt of a letter from AH3AA/KH9 who says that AH9AB and he are still on Wake Is but rather inactive because there is no mains power to the main shack at present—they are now operating from their living quarters using wire antennas. They hope to be back with proper signals soon and will try to work into Europe. VR6KY and FW8AF are said to be regular participants in the KB7SO net on 14,240kHz at 0500 on Tuesdays. AH8A in American Samoa can be found near 14,305kHz after 0400, and 3D2MP in Fiji has started to appear on 14,200kHz at 0600 and at 1200.

Renewed activity from Macquarie Is was due from early October. VK0GC promises to be active on all bands, with the emphasis on 1·8, 3·5, and 7MHz.

Overseas news

F6GPA writes to say that he has now received a number of QSL cards for different YASME operations all together in one envelope. He had sent his own direct plus one irc for each. He also mentions that rather slow cards have now arrived from 7P8CR, 4K1D, Y83ANT and VE3LKU/HI8.

John Gudgeon, ZC4ZL/G4MDU, has sent news of the ZC4EPI, Episcopi Radio Club station. This consists of an FT902DM and three V-beams, one of which is directed to the UK, another points east and the third points south. Each is 350ft long. The club meets each Thursday evening on 21,385kHz. The resident operators include ZC4HA (Andy), ZC4SM (Steve), ZC4JE (Jim) and ZC4AB (Alan). ZC4JE has a BBC computer and has it connected for rtty. ZC4HA is hoping to become active on Oscar 10 in order to keep more reliable schedules back into the UK.

G4ROM, G6TXA/SM0 and G5MUR/SM0 visited the amateur radio station SK0TM located in the Museum of Science & Technology in Stockholm this summer, and were made most welcome and given the use of the equipment for over three hours. The station is well equipped with a Drake TR7A and linear which feeds a TH6DXX beam. Other gear includes a Trio 9000 and 432MHz equipment which is to be used for operating via satellites, and the station also has some commercial teleprinter equipment which can run at 50 to 100 baud. The museum is open from 10am to 4pm on weekdays and noon to 4pm at weekends.

Norman Richardson, VK4BHJ (formerly G5HJ), has been living in the Brisbane area for the past three years. He notes that he has been making regular contacts with Europe via the chordal-hop on 14MHz—a path which he believes should never fail— but that this had not been happening for 10 days or so before he wrote. Norman has now been on the air for 59 years.

G6TXA/SM0 (l) and G5MUR/SM0 (r) on a visit to the Museum of Science & Technology, Stockholm (see "Overseas news")

*10 Knightlow Road, Birmingham B17 8QB

The Sidmouth ARS operating and logging team at the observatory where they will operate GB2UST. L to r: (seated) Paul, G1EEK; Graham, G4NVH; (standing) Steve, swl; Big John, G6YWX; Mick, G1IAR; Dave, G6XUV; Bob, G6SMY; Dick, G6BJL; Mick, swl; Laurie, G2BIM; John, G6YTL; and John, swl. *Photo:* G3ADV (see "The *Mayflower* event")

The *Mayflower* event

The commemorative station WA1NPO will be on the air on America's Thanksgiving Day, Thursday 22 November, and will be looking for contacts with UK stations. For the fourth year WA1NPO will be located near Plymouth, Massachusetts, in a living-history museum which vividly depicts life in Plymouth Colony, the first English settlement to be permanently established in the new world. The museum's exhibits include a reproduction of the pilgrim village as it existed in 1627, and a full-size replica of the *Mayflower*.

On the UK side, a complimentary station, GB2UST, will be operated by Sidmouth ARS from the astronomical observatory 200ft above the town.

The operating schedule at WA1NPO will be: 14,180 or 14,255kHz from 1300 to 1400; 14,180kHz cw from 1400 to 1500; 14,180 or 14,255kHz from 1500 to 1600; 14,345kHz from 1600 to 2000; 21,260kHz from 1300 to 1430; and 21,385kHz from 1730 to 2000.

An attractive certificate featuring the *Mayflower* will be available for confirmed contacts, on receipt of QSL and three ircs sent to: Whitman ARC, Box 48, Whitman, Mass, 02382, USA.

Chinese callsigns

The *Long Island DX Bulletin* recently carried the following table of the allocations of callsigns within the People's Republic of China (which was attributed to JA1UT):

BY1AA—BY1ZZZ Beijing	BY4RA—BY4ZZZ Jiangsu	BY8AA—BY8IZZ Sichuan
BY2AA-BY2IZZ Hei Long Jian	BY5AA—BY5IZZ Zhejian	BY8JA—BY8QZZ Guizhou
BY2JA—BY2QZZ Jilin	BY5JA—BY5QZZ Jiangxi	BY8RA—BY8ZZZ Yunnan
BY2RA—BY2ZZZ Liaoning	BY5RA—BY5ZZZ Fuzian	BY9AA—BY9FZZ Ningxia
BY3AA—BY3FZZ Tianjin	BY6AA—BY6IZZ Henan	BY9GA—BY9LZZ Quinghai
BY3GA—BY3LZZ Nei Mongol Z	BY6JA—BY6QZZ Anhui	BY9MA—BY9SZZ Shaanxi
BY3MA—BY3SZZ Hebei	BY6RA—BY6ZZZ Hubei	BY9TA—BY9ZZZ Gansu
BY3TA—BY3ZZZ Shanxi	BY7AA—BY7IZZ Hunan	BY0AA—BY0MZZ Xinjian
BY4AA—BY4IZZ Shanghai	BY7JA—BY7QZZ Guanxi	BY0NA—BY0ZZZ Xizang
BY4JA—BY4QZZ Shandong	BY7RA—BY7ZZZ Guangdon	

This should prove useful in trying to identify new Chinese stations.

DXCC

A news release dated 18 September released by ARRL says "The ARRL Awards Committee met today to consider the recommendation of the DXAC to delete the Baker, Howland, and American Phoenix Islands DXCC listing, and to add a new DXCC country, Baker and Howland. The Committee rejected this proposed action by a vote of six to one. Therefore, the present listing remains but will no longer include the American Phoenix Is, since sole jurisdiction has been under the Republic of Kiribati since September 23, 1983. Thus, no deletion or addition to the DXCC list will occur."

Expeditions

The *Long Island DX Bulletin* says that a joint French Polynesian/USA expedition to Clipperton Is will leave San Diego on 27 March and reach the island on 3 or 4 April.

WA2HZR will be in V9 from 21 to 28 November, S8 from 29 November to 5 December, and S4 and ZS afterwards. All operation will be on cw.

Iris and Lloyd Colvin were due to leave for Africa last month and will be there until April 1985. They will attempt to operate from as many small countries as possible—all located in south and south-east Africa. They request one QSO per band per mode per country.

SSTV

Congratulations to Richard Thurlow, G3WW, who has now worked more than 2,000 stations on sstv and is wondering if this is a world record? In addition to this he worked his 112th country when contacting TF3LJI on 7 May. Richard is looking for contacts with stations transmitting the new 24s single-frame or Robot 12s single-frame colour pictures on any permitted band, and he is also wondering what happened to the UK 3·5MHz Sunday morning sstv net. The European sstv net meets on 7,040kHz at 0730 Mondays to Fridays. Sad news is that Joe Hawkins, president of Robot Research Inc, died on 26 August.

Welcome

To the following who joined RSGB during August: AG8C, AJ9H, DK6HP, EI6FP, F6AML, K2KNW, K2OA, KB4ZW, KD5QV, KC6W, KF6NO, K7HVV, KA8UCO, K9BPT, K0CJ, KA0HZV, KC0RX, LA1IE, N6PP, OH1PV, VE3OLY, VE7FJE, VK2KAI, VK6AOK, WA1VMA, W3BHC, WB3DYX, W4WD, W4ZB, WA6ERB, WA6GAH, WA6QPL, WB6EYN, W7AOL, WA8VFA and 9V1NG.

Awards

Worked All VK Call Areas

Available to those who have confirmed contact or have confirmed listener reports from one VK0, one VK1, one VK8, one VK9, three each from VK2, VK3, VK4, VK5, VK6, and VK7 since 1 January 1946. Send list showing date, time, signal report, mode, band and, in the case of mobile or portable stations, location. This must be certified by the awards manager of a national society (G3KDB in the case of RSGB). There is no charge, but sufficient ircs should be enclosed to pay the postage on QSL cards should they be submitted. The application should be sent to the new WIA awards manager, H. D. Spence, 44 Mosaic St, Shelley, 6155 W Australia.

The CHK Award

For licensed amateurs/listeners who have worked/heard at least 25 different HK (Colombian) stations.

The ZHK Award

For licensed amateurs/listeners who have worked/heard at least eight of the 10 Colombian call areas. Both this and the previous award cost 20 ircs for delivery by airmail. Send applications to LCRA, Apartado 584, Bogota, Colombia.

Salisbury Award

Ten points required for working stations in Salisbury and area since 1 August 1983. Three points are gained by working club station G3FKF, two for other club members, and one for any other station in the area of Ordnance Survey map 184. Send log extracts showing date, mode, and time of contacts plus £1 or five ircs to G2FIX, QTHR or G4POF (G8XWP). *NB:* repeater contacts do not count.

1984 28MHz Table

G3XQU—140	G4NXG/M—65	GM4LKJ—35
G4SKI—109	G3XTT—59	G3KSH—26
G4VJK—100	G3WVG—58 (cw)	G4RHW—23
G3KDB—98 (cw)	5B4DN—55	G4FVK—22
G4MUW—97 (ssb)	G4OTU—51	G4SXK—20
G4RAB—95 (ssb)	GW4TEJ—51	GM3CHX—19
G4TTR—91	G4GOF—51	GI4PCQ—17
G3SXW—88 (cw)	GM4CHX—47	G4RWP—14
G3TXF—85 (cw)	GW4OFO—39	G4LZZ—10 (ssb)
G4PEL—83	G4OBK—38	G2FQR—2
G4DXW—72	G4SDZ—36	

QTH CORNER

BV0W	via W4WJ, 19700 NW 5th Court, Miami, Fla, 33169, USA.
CE0AA	Box 700, Santiago, Chile.
ET3PS	DJ9ZB, F. Langner, Carl-Kistnerstr 19, D-7800 Freiburg, FR Germany.
F0ICR/FO8	via I3EJ, R. Oppio, Via Monti Lessini 46, 37132 Verona, Italy.
F0ILU	G6NHY, 21 Rockwood Crescent, Hucknell, Notts NG15 6PW.
FT8XA	F6FYD, Y. Delatouche, 128 route des Breuil, 17300 Rochefort, France.
J5WAD	Via UA4PW.
P29JS	PO Box 515, Konedobu, Papua New Guinea.
S42HZR	(see WA2HZR/V9)
S8HZR	(see WA2HZR/V9)
WA2HZR/V9	D. Church, Box 592, Mexico, NY, 13114, USA.
VK9/Mellish Reef	VK2WU, PO Box 31, Winmalee, NSW 2777, Australia.
VQ9SK	WB6SKS, 533 Dolittle Av, San Diego, Cal, 92154, USA.
3D2MP	Box 5324, Suva, Fiji.
3V8AM	DF6RF, A. Fohringer, Ottrichstr 14, D-8400 Regensburg, FR Germany.
9Q5JE	DL0HT, via W. Gielssen, Depkenstr 1, D-2800 Bremen 1, FR Germany.
9X5BJ	PO Box 626, Kigali, Rwanda.

The Kenyan Award
The Radio Society of Kenya will issue this to any licensed amateur living outside Kenya who has acquired 10 points—by working members of RSK (two points) or with the club station 5Z4RS (five points). All contacts must have been made after 31 December 1977, and all bands/modes may have been used. Send "log book photocopies" witnessed and signed by a responsible official of a local club plus US$5 or 10 ircs. A self-addressed adhesive label should be enclosed and the application addressed to the Radio Society of Kenya, PO Box 45681, Nairobi, Kenya—please mark the envelope "Kenyan Award" in the top left corner. (Note that this new award has no relationship to any previous award issued from East Africa.) Air mail delivery will be provided if a fee of US$10 or 20 ircs is submitted.

Contests

All Austrian Contest

1900 17 November to 0600 18 November.
CW only. 1,810-1,850kHz. Exchange RST and serial QSO number (from 001). Each QSO counts one point. The multipliers are: two for each Austrian district area (OE1-OE9) and one for each other prefix worked. Send completed logs to: OeVSV, "AOEC — 1984", PO Box 999, A-1014 Vienna, Austria, no later than 31 December 1984. The winner will be awarded a cup and an award, the second to the fifth will receive a pennant and an award, and the leader in each country will receive a diploma.

Results of the **PACC Contest 1984** have been received and UK scores are as follows: **G2HLU** (7,215 points), **GM3KLA** (6,854), G3ESF (5,554), **GW3MPB** (4,917), G4IQM (4,536), G3HRY (3,036), G4VKW (2,800), G4KHM (2,400), G4UPS (2,204), G3ZRH (1,876), G3TXF (1,352), GM8SQ (1,323), GW4BKG (1,121), and G4ISK (360). In the listener section **RS44984** scored 360 points.

EA DX CW Contest
1600 1 December to 1600 2 December
1·8 to 28MHz (no WARC bands). CW only. Single- and multi-operator (single-transmitter) sections. Exchange RST and QSO number. Spanish stations will send RST and province code (Ceuta and Melilla, CE and ML, count as two separate provinces). Each QSO for European entrants counts one point, and for others three. The multiplier is the total of Spanish provinces worked on each band added together. Logs should show date, gmt, exchange sent and received, if new multiplier, and points. A summary sheet should be included and should give callsign, name and address, category, operator(s), total of QSOs, multipliers and points on each band, and the usual signed declaration. Entries should be sent to URE, PO Box 220, Madrid, Spain, postmarked no later than 15 January 1985. There are trophies and awards for continental leaders and awards for winners in each DXCC country. (Spanish provinces and districts are: EA1—AV, BU, C, LE, LO, LU, O, OR, P, PO, S, SA, SG, SO, VA, ZA; EA2—BI, HU, NA, SS, TE, VI, Z; EA3—B, GE, L, T; EA4—BA, CC, CR, CU, GU, M, TO; EA5—A, AB, CS, MU, V; EA6—PM; EA7—AL, CA, CO, GR, H, J, MA, SE; EA8—GC, TF; EA9—CE, ML.)

The OK DX Contest
0000 to 2400 11 November
1·8 to 28MHz cw and phone but not cross-mode. Exchange RS/T plus ITU zone (UK is 27). A station may be worked once only on each band, three points are gained by working Czechoslovakian stations and one for working others. The multiplier is the total of ITU zones worked on each band. There are single-operator single- and multi-band, and multi-operator multi-band categories.

Peter, better known as 9V1TL, operating from the QTH of V85GA as VS5I during the Brunei independence celebrations. *Photo:* V85GF

Separate logs must be kept for each band and should show date, time, station worked, sent and received numbers, points claimed, and if multiplier. The usual signed statement should be enclosed and logs must be posted before 31 December 1984 to: CRC, PO Box 69, 113 27 Praha, Czechoslovakia.

Results of the **1984 ARRL International DX Contest** have been published and are as follows:

PHONE SECTION—SINGLE OPERATOR

Callsign	Band	Points	Callsign	Band	Points
G2QT	All	171,264	**GM4KHE**	7MHz	1,440
G3IMW	All	34,200	**G3FXB**	14MHz	235,872
G4WGM	All	33,372	G3XWZ	14MHz	38,745
G2AOL	All	15,228	**GW4BKG**	21MHz	162,180
G6QQ	All	13,818	**G3NT**	21MHz	15,984
G3WQG	All	8,880	**GM4CHX**	21MHz	12,036
G3CWL	All	810	**G5DSD**	21MHz	10,080

(G3IMW, G3WOG, and G3CWL were in the QRP section)

MULTI-OPERATOR
GJ3DVC 37,050 points.

CW SECTION—SINGLE OPERATOR

Callsign	Band	Points	Callsign	Band	Points
G3UFY	All	544,644	G3VMY	All	26,700
GU3HFN	All	509,880	G6QQ	All	24,534
G2QT	All	317,832	**GM8SP**	All	11,562
G4UPS	All	237,948	G6NK	All	10,656
G3ESF	All	198,465	G2AJB	All	7,488
GW3JI	All	186,000	**G4CNY**	3·5MHz	35,862
G4VGK	All	114,540	G3TXF	3·5MHz	4,536
G3APN	All	110,544	**G3XWZ**	7MHz	30,510
G3CWW	All	94,581	G5DSD	7MHz	1,512
G3CRF	All	28,152	G4OTY	7MHz	1,404
G4EBO	All	27,150	**G3CWL/A**	14MHz	1,050

(G2QT, G4EBO, G3VMY, and G3CWL/A were in the QRP section)

MULTI-OPERATOR
G3FXB 1,770,390 points G3ASR 429,420 points

Results of the **1983 CQ WWDX Contest (Phone)** have appeared in *CQ* and UK scores are as follows:

SINGLE-OPERATOR

Callsign	Band	Points	Callsign	Band	Points
GM4GPN	All	178,422	**G3FXB**	14MHz	982,432
GM3BCL	All	108,854	G4CNY	14MHz	609,168
GM4JFS	All	85,683	**GM3SFH**	14MHz	13,916
G2AJB	All	31,501	**GM4KHE**	7MHz	7,860
G6QQ	All	17,538	**G4VGK**	7MHz	4,469
GM8SQ	All	480	**G3XWZ/A**	3·5MHz	30,016
G3UFY	28MHz	38,955	G3IMW	3·5MHz	9,858
GM4CHX	28MHz	5,783	**G3XTT**	1·8MHz	5,457
G3SJX	21MHz	184,338	**GW4IOI**	1·8MHz	4,940

In the multi-operator, single-transmitter category **GI4MWA** scored 7,475 points, and in the multi-operator, multi-transmitter class **GB4ANT** 7,393,106 points, and G3RRS 3,906,672 points. Certificate winners are listed in bold type.

Around the bands

G8KG has kindly provided another report this month in order to get back into step. He writes: "The trough in solar activity reported last month continued into September with the 27-day average solar flux remaining within a point or so of 83 sfu for over 50 days. In the middle of the month there was a week during which there were no spots on the side of the sun facing Earth and this is the second time this has occurred during the decline of Cycle 21, the previous occasion being at the end of November 1983.

Last month a slip of the pen led to the misleading statement that in recent years short-term variations have had a period of approximately 11 months. This should have been approximately 11 solar rotations, ie about 290-300 days, or a little short of 10 months. Note that the interval between the November 1983 and September 1984 "spotless" periods was 297 days.

It is probable that by the time this report appears in print activity will have climbed well clear of the present trough and will be heading for a minor peak early in 1985."

Contributors to this month's column included G2HKU, G3YY, G5JL, GJ3EML, G3GVV, GM3HBT, G3s KSH, NWG, SED, YRM, G4s EHQ, GOF, GW4KGR, GM4KHE, G4s LRS, UOL, UYR, WNZ, G5CFJ, and RS10906.

Stations listed in italics were using A1A.

1·8MHz. **0300** *RB5ISO.* **0400** *KH8ACI, N4WM.* **2100** *IV3DVN.* **2200** *UL7FEA.*

3·5MHz. **0200** 8P6TQ. **0400** *FG7CP, HK1BYM, ZS6s AK, BSZ.* **0500** *LUs 3MCO, 6AMW, 9ABO, PY1ZAE, ZL1AIZ.* **2100** W3TB/TF, PY1RR. **2200** VK6LK. **2300** *OY7ML.*

7MHz. **0400** ZL1AIM. **0500** *CE1FLQ, CX3AN, HI, HH2VO, HK, LU, NP4P, OA, PZ, VP2MIX, W6-W7, YV, ZL, ZS2s MK, NJ.* **0600** CE, CX, FY7AN, *HC,* KH6XX, *KL7H,* OA, PY, YV, ZF1LA, *ZL1-ZL4,* ZP7CO, 4K1GAG, 5N3RTF. **0700** C53RTP. **1700** VK3AJJ, ZL1AAQ. **1800** *YB2DI, 9M2CO.* **2200** C31OF, CE6ELS, OD5IZ, *F0IRK/TK,* VK6IR, 5N8BAV. **2300** YB2BLI.

10MHz. **0500** *ZL1CH.* **0600** *K9SUP, OA4SS, VK2s BKH, HN, VK3XU, VK4NN, ZL1BUU, ZL3.* **0700** *VKs 2DUY, 3RJ, 4ACU, VM4AAA.* **0800** *VK2, VK3.* **1100** *WA4RGH.* **1700** *W2GDV, W3PZW.* **1800** *G6ZY/EA6, 4X4WF.* **2000** *VE3UT, 4X6GP, 5B4PW.* **2200** *JA6HW. W1-W4.* **2300** *W7BNK/0.*

14MHz. **0000** *PZ0CJ, YS4BFD.* **0600** A35MP, AL7BL, KH6AQ. **0700** *TU2DD,* VK. **0800** AH6CS, *JA,* JY5CD, *KL7, VY1,* 3D2MP, 5W1DZ. **1000** *DL1GK/HB0,* SU1AS. **1200** AP2AU, JA, VE8RCS. **1300** FR7AG, *VP9XA.* **1400** JT8UEF, W6-W7. **1500** V85GT, VS6CT, *9M2BH.* **1600** 1Z9A, 3V8AM, 8Q7AV. **1700** VQ9SK, VU2DJM. **1800** A71BJ, D68AM, *JX5DW,* JY5CI, W6-W7, XK1FG. **1900** AP2MQ, CE0AA, FH4AA, AI5P/TF, P29LP, 4K0B, 9V1VS. **2000** HV2VO, VP8s

LT, MT. 4K1GAG, 9Q5MA. **2100** V44KA, ZL3JO. **2200** CY0SAB, *KP2J*, K7SPU, PJ8UQ.

18MHz. 0700 *F, ZS6AVM.* **0800** *DL, G, GM, I, IS, ZS6BMS, 4X4WF.* **1300** *IS0OMH, 5B4PW.* **1400** *LU1DOW* (to 1800). **1800** *LU7ER.*

21MHz. 0800 *HL5OC, HZ1AB, JA, VK, VQ9DX, VU, ZS.* **1000** VU2TF. **1100** *VQ9DX.* **1200** OD5YU. **1300** ZL7AXI/C. **1400** *A92ED, J28EB,* YC3TT, 5Z4PR. **1800** *TA1MN, T77C.* **1900** S79MC, TU2NA, TZ6FE, *5N0HAS.* **2000** CE0AA. **2100** FM, HK, HP, W1–W4. 9Y4BA.

24MHz 0800 *ZS6BMS.* **0900—1500** *DL, OE, PA.*

28MHz 1200 *ZS6PN.* **1800** EL2AK, *LU, PY,* VP8ML.

Many thanks to all contributors and to the following for news items extracted: *DX'press* (PA0GAM), *CQ Magazine* (W1WY), *DXNL* (DL3RK), the *DX Bulletin* (K1IN), the *Long Island DX Bulletin* (W2IYX), *DX News Sheet* (G3XTT/G3ZAY), the *Ex-G Radio Club Bulletin* (GI3OEN/W6), *Long Skip* (VE3GCO) and the *Lynx DX Group Bulletin* (EA2JG/EA3CBQ).

All items for **January** issue to reach G3FKM no later than **30 November** —please note that this is very early on account of the holiday season. □

HF propagation predictions for November 1984

Using the table

The time is presented vertically at two-hour intervals 00(00)gmt to 22(00)gmt for each band, ie $\frac{0}{0}$ = 0000, $\frac{0}{2}$ = 0200, $\frac{0}{4}$ = 0400 etc.

The probability of signals being heard is given on a 0 (indicated by a dot) to 9 scale; the higher the number the greater the probability, with 1 meaning 10 to 19 per cent of days, and so on. Additionally 50MHz F-layer and 1·8MHz openings are indicated by a dagger (†) sign in the 28 and 3·5MHz columns respectively. The higher probability figures are printed in BLACK, lower probability in RED and lowest probability in GREEN type.

	28MHz				21MHz				14MHz				10MHz				7MHz				3·5MHz			
GMT	000	001	111	122	000	001	111	122	000	001	111	122	000	001	111	122	000	001	111	122	000	001	111	122
	024	680	246	802	024	680	246	802	024	680	246	802	024	680	246	802	024	680	246	802	024	680	246	802
EUROPE																								
Moscow	.	24	42	.	.	78	872	.	.	488	888	2	431	766	668	843	886	543	346	898	††	4	2	.	3	†††
Malta	.	23	22	.	.	78	775	.	1	487	889	51	563	865	568	964	†††	3	.	3	†††					
Gibraltar	.	1	11	.	.	37	664	.	.	88	889	6	242	476	667	962	898	853	335	898	†††	†2	.	2	5††	
Iceland	.	.	11	.	.	3	653	.	.	48	889	3	11	.	77	778	83	773	264	456	886	†††	†32	.	24	5††	
ASIA																								
Osaka	.	.	.	.	.	4	.	.	.	175	111	.	.	.	353	335	521	.	121	124	773	.	.	.	.	45	
Hong Kong	.	34	.	.	.	88	5	.	.	366	652	.	1	.	33	346	532	1	.	11	124	785	.	.	.	.	4†2
Bangkok	.	46	5	.	.	278	821	.	.	246	667	1	2	.	13	347	642	2	.	1	124	787	.	.	.	.	4†4
Singapore	.	56	52	.	.	278	871	.	.	236	677	1	2	.	13	347	644	1	.	1	114	786	.	.	.	.	4†3
New Delhi	.	55	4	.	.	378	83	.	.	336	663	.	521	.	13	346	445	73	.	.	114	788	4	.	.	.	4††
Teheran	.	55	53	.	.	488	881	.	1	1	544	677	2	754	311	347	756	873	.	.	14	788	†4	.	.	.	4††
Colombo	.	56	53	.	.	378	882	.	.	224	678	2	32	.	1	347	756	51	.	.	14	788	2	.	.	.	4††
Bahrain	.	65	53	.	.	577	881	.	211	533	677	311	864	2	.	346	866	872	.	.	14	788	†4	.	.	.	45†
Cyprus	.	66	651	.	.	498	996	.	332	766	689	622	887	533	457	987	996	311	135	898	††	3	.	.	2	5††
Aden	.	65	55	.	.	466	885	.	3	1	422	468	522	844	1	.	146	887	872	.	.	14	788	†4	.	.	.	45†
OCEANIA																								
Suva (S)	.	.	.	.	.	2	43	.	.	.	36	675	1	.	.	54	346	4	.	.	131	124	2	.	.	.	.	.	.	.
Suva (L)	.	1	.	.	.	65	21	31	121	476	554	741	.	2	553	235	51	.	.	221	13	2	.	.	.	.	.	.	.
Wellington (S)	.	.	1	.	.	15	63	.	.	.	76	675	.	.	.	154	346	3	.	.	131	124	2	.	.	.	.	.	.	.
Wellington (L)	.	.	.	.	.	2	.	1	122	274	212	542	.	1	353	235	42	.	.	121	13	1	.	.	.	.	.	.	.
Sydney (S)	33	21	.	.	.	188	76	.	.	.	476	676	1	.	.	253	347	51	.	.	21	124	62	.	.	.	.	3	.	.
Sydney (L)	.	.	.	.	.	22	.	1	.	1	76	431	551	.	.	153	334	731	.	.	31	13	51	.	.	.	.	2	.	.
Perth	.	56	41	.	.	388	862	.	.	.	246	678	2	1	.	13	347	753	.	.	1	14	762	.	.	.	.	44	.	.
Honolulu	.	.	.	.	.	.	.	.	.	.	1	1	4	4	.	1	.	42	326	41	.	13	231	114	1	.	.	2	4	.	.
AFRICA																								
Seychelles	.	34	551	.	.	466	885	.	311	222	568	622	852	.	.	246	887	84	.	.	14	788	†	.	.	.	4††	
Mauritius	.	55	551	.	.	466	886	.	321	222	468	632	852	.	.	146	888	72	.	.	14	788	4	.	.	.	4††	
Nairobi	.	66	562	.	.	466	787	1	441	422	368	843	984	1	.	36	898	872	.	.	13	788	†4	.	.	.	4††	
Harare	.	24	574	.	.	256	688	2	551	422	258	864	984	1	.	26	899	872	.	.	3	788	†4	.	.	.	4††	
Capetown	.	13	676	.	.	156	688	4	551	522	236	876	985	2	.	13	799	873	.	.	1	488	†4	.	.	.	25†	
Lagos	.	67	776	.	.	87	778	51	572	552	236	986	997	52	.	3	799	888	3	.	1	588	5†5	.	.	.	2††	
Ascension Is	.	36	547	1	.	77	668	61	474	263	224	786	999	63	.	1	489	888	51	.	.	269	†††	2	.	.	4†	
Dakar	.	27	767	1	.	78	778	61	465	174	225	785	899	641	.	2	589	888	62	.	.	279	55†	3	.	.	4†	
Las Palmas	.	16	655	.	.	79	889	5	243	287	667	973	898	764	335	799	989	842	112	589	†††	5	.	.	2††	
S AMERICA																								
South Shetland	.	1	233	1	.	56	777	51	354	176	543	454	577	553	211	134	345	421	.	1	.	2	.	.	.	.	.	.	.
Falkland Is	.	3	256	1	.	47	777	51	355	176	422	354	788	653	1	.	24	577	621	.	.	2	244	3	.	.	.	.	.	.
Rio de Janeiro	.	3	223	1	.	17	556	51	355	175	222	464	899	652	.	.	147	889	62	.	.	15	†††	4	.	.	.	2	.	.
Buenos Aires	.	2	225	1	.	47	656	51	244	76	322	243	799	553	1	.	25	789	621	.	.	2	4††	4	.	.	.	.	.	.
Lima	.	.	655	1	.	.	876	51	112	2	632	232	577	223	3	.	13	688	631	.	.	1	3††	4	.	.	.	.	.	.
Bogota	.	.	554	1	.	.	876	41	1	14	632	241	567	243	3	.	24	788	631	.	.	2	5†5	4	.	.	.	.	.	.
N AMERICA																								
Barbados	.	1	555	1	.	5	866	51	112	16	522	352	667	243	2	.	37	887	631	.	.	15	††5	4	.	.	.	2	.	.
Jamaica	.	.	344	1	.	.	776	4	.	13	642	241	555	143	31	.	24	787	531	1	.	3	5†5	4	.	.	.	.	.	.
Bermuda	.	.	344	1	.	1	877	5	.	6	643	551	555	144	311	246	.	888	531	1	.	15	†††	4	.	.	.	2	.	.
New York	.	.	143	.	.	.	587	4	.	3	665	551	444	.	23	332	245	888	431	1	.	15	†††	4	.	.	.	2	.	.
Mexico	.	.	43	.	.	.	87	3	.	1	463	22	344	.	52	33	.	2	488	431	11	.	1	††	4	.	.	.	.	.
Montreal	.	.	133	.	.	.	587	4	.	3	665	65	443	.	24	333	345	888	431	11	.	125	†††	4	.	.	.	2	.	.
Denver	.	.	1	.	.	.	26	2	.	.	66	53	342	.	2	243	222	487	331	111	.	1	2††	4	.	.	.	.	.	.
Los Angeles	.	.	1	.	.	.	5	2	.	.	46	42	232	.	31	43	211	267	231	111	.	.	4†	4	.	.	.	.	.	.
Vancouver	.	.	.	.	.	.	1	1	.	.	16	52	231	.	21	35	332	367	231	112	111	.	3†	4	.	.	.	.	.	.
Fairbanks	.	.	.	.	.	.	.	.	.	1	114	41	23	.	43	236	642	344	231	114	322	.	23	3	.	.	.	.	.	.

The provisional mean sunspot number for August 1984 issued by the Sunspot Index Data Centre, Brussels, was 24·8. The maximum daily sunspot number was 49 on 26 August, and the minimum was 9 on 19 August. The predicted smoothed sunspot numbers for November, December, January and February are, respectively: (classical method) 42, 40, 38 and 37; (SIDC adjusted values) 34, 32, 30 and 29.

Contest News

August 1,296/2,320MHz Contest results

This new event in the contest calendar was well received by all. Activity was good, particularly on 2,320MHz, and many contacts were completed in excess of 500km. GW4ERP expressed a typical comment—"Good fun, very interesting and superb weather—what more could one ask for!".

Propagation was generally above average throughout the contest, although the pattern of it varied up and down the country. Whereas stations in the south found conditions very good just before the contest, then deteriorating rapidly after the start, GM8MBP found little assistance until the last hour, when seven PA stations were worked, giving the best overall contest dx. Stations located in-between were favoured by good propagation throughout.

However, the general consensus was that some alteration of the timing to include the "dawn lift" would be advantageous, and this will be given consideration for next time.

Certificates will be awarded to the winner and runner-up, where appropriate, in each section, and to the overall winners.

G3VPK

SECTION F OVERALL RESULTS

Posn	Entrant	Square	Total points	Band position 1,296MHz	Band position 2,320MHz
1	G4KDH	AL	1,818	2	1
2	G8PNN	ZP	1,624	1	3
3	G8VLL	AM	1,203	3	2
4	G4NQC	ZL	854	5	4
5	G4CQR	AL	424	4	—
6	G3ZTR	ZO	338	7	—
7	G4LRT	ZM	271	11	5
8	G6LZZ	YN	72	12	—

1,296MHz SECTION F RESULTS

Posn	Callsign	Points	QSOs	QTH	Power	Best dx	Km
1	G8PNN	14,278	30	ZP52	+18	PA3AOH	655
2	G4KDH	11,683	55	AL34	+20	DD8DA	456
3	G8VLL	7,326	32	AM27	+20	G3PBV	405
4	G4CQR	6,061	44	AL71	+20	PA0EZ	368
5	G4NQC	5,681	43	ZL50	+20	PA3AOH	438
6	G4MGR	5,153	35	YN55	+17	PA0WWM	521
7	G3ZTR	4,823	15	ZO79	+10	ON6OO	455
8	G8ZQB	4,521	28	ZM35	+10	G3AUS	283
9	G8KAX	3,680	25	AL13	+19	PE1JSE	286
10	G3COJ	2,106	18	ZL37	+12	PA0WWM	358
11	G4LRT	1,699	18	ZM45	+15	G4PRJ/P	201
12	G6LZZ	1,026	10	YN15	+8	G4NQC	330
13	G6CMV	952	10	YM69	+5	G4ALE/P	235

2,320MHz SECTION F RESULTS

Posn	Callsign	Points	QSOs	QTH	Power	Best dx	Km
1	G4KDH	4,738	20	AL34	+17	PE1CQQ	398
2	G8VLL	3,268·5	15	AM27	+12	GW4LXO/P	314
3	G8PNN	2,954	6	ZP52	+7	PA2DRV	555
4	G4NQC	2,157·5	13	ZL50	+5	PA0EZ	367
5	G4LRT	722	7	ZM45	+10	G3SBV/P	173

SECTION O OVERALL RESULTS

Posn	Entrant	Square	Total points	Band position 1,296MHz	Band position 2,320MHz
1	Sheppey Western CG	YL	1,992	2	1
2	Addiscombe ARC	AL	1,905	1	2
3	Cotswold & Big M CG	YN	1,783	3	3
4	G3WOH/G4APA/G4NVA	ZN	1,237	4	4

1,296MHz SECTION O RESULTS

Posn	Callsign	Points	QSOs	QTH	Power	Bext dx	Km
1	G4ALE/P	17,382	85	AL45	+25	G8PNN	462
2	GW4NXO/P	17,240	74	YL25	+22	PA3AOH	662
3	GW4ERP/P	15,520	68	YN75	+20	PA0RDY	546
4	G4NVA/P	9,102	47	ZN53	+14	PA0EZ	468
5	GM8MBP/P	5,394	8	YQ08	+2	PE1DCD	730
6	G4PRJ/P	3,911	22	AK12	+3	GW4ERP/P	342
7	G3IGQ/P	3,351	37	AL51	+13	PA0PLY	335
8	G6JNS/M	41	1	YM48	+0	G6CMV	41

2,320MHz SECTION O RESULTS

Posn	Callsign	Points	QSOs	QTH	Power	Best dx	Km
1	GW4LXO'P	5,906	21	YL25	+16	PA0EZ	567
2	G3SBV/P	5,345	26	AL45	+13	G8PNN	462
3	GW3WDG/P	5,256	19	YN75	+18	PE1GHG	536
4	G3WOH/P	4,213	18	ZN53	+12	PA0EZ	468
5	G3OHM/P	1,378	11	YM60	+12	G3SBV/P	228

Checklog received from PE1EWR for 1,296MHz.

28MHz CW Cumulative Contests

The next set of cumulative contests will be the 28MHz cw "activity" sessions during November and December. These will be on similar lines to the September phone event and will include a county code exchange to help those striving for the WABC award.

1. Sections. a) Single-operator stations, **b)** Club stations, and **c)** Receiving stations. Entrants must be members of the RSGB.

2. When. Between 2000 and 2200gmt, Monday 12 November, Tuesday 20 November, Wednesday 28 November, Thursday 6 December and Friday 16 December. (Best three sessions will count.)

3. Frequency and mode. 28·0 to 28·1MHz cw only.

4. Exchange. RST, number (commencing with 001 for each session) and county code (see *Rad Com* January 1984).

5. Points. Each completed contact with a UK or foreign station is worth three points (see below for Receiving section).

6. Awards. Certificates will be awarded to the two leading stations in the single-operator section and to the leading club entry. Further certificates will be awarded at the discretion of the committee to the newly-licensed entrant and to the "old timer" who submit the best logs.

7. Logs. Should be headed with the callsign, name and address of the entrant, the county code sent, and should show the section being entered. For those who wish to be considered for the "newcomer" or "old-timer" certificates, the date that the operator was first licensed should be shown. Entries from clubs should show the callsigns of all the operators and confirm that they are members of the RSGB. In addition to incoming and outgoing RST and number, the received county code must be included. No cover sheet is required, but logs should be on the standard RSGB contest log sheets. Computer derived logs will only be accepted if they are presented to the same size, line spacing and tabulation as in the standard RSGB log sheets.

8. Address for logs. HF Contests Committee, c/o G6LX, 279 Addiscombe Road, Croydon CR0 7HY. All logs must be postmarked no later than Monday 7 January 1985.

9. Receiving section. Rules for the transmitting section (above) will apply, except that logs from swl entrants should show both callsigns, report, serial number and county code sent. A certificate will be awarded to the swl with the best score.

Mid-Thames DF Qualifying Event results

True to form on the day the antennas were to be erected the heavens opened following a period of warm dry weather. On 15 July some mercy was shown for the 25 teams that assembled at Coombe Hill, the day being almost ideal for df—not too warm and sufficiently overcast and damp to keep away the bulk of Sunday drivers.

Station A, operated by Bill North, G3TRY, was located near Tring on the Ridgeway Path some 7km from the start. Bill was located 100ft up a 45° slope, which was extremely slippery due to the recent rain. This provided some much needed exercise for the bulk of the competitors—the antenna doing its work of leading them down the hill.

Station B, operated by Phil Perkins, G3OUV, was just over 10km SW of the start, also close to the Ridgeway Path near Chinnor. This transmitter was located in the middle of a mass of thicket which was surrounded by a further thicket about 1km in any direction comprising brambles, nettles, blackthorn etc, most of which the organizer thought was impenetrable, although some competitors proved otherwise.

The navigator of one team, having found the transmitter, used the pre-arranged code words but failed to attract the set holder, who set off away from the transmitter whenever a transmission commenced. There were fortunately no ladies present to hear the ensuing Anglo-Saxon translations of Popeye, Olive Oil etc.

About 60 sat down for food and drink at the Rose & Crown to listen to George Whenham and Chris Wells tell how easy the entire episode had been.

Posn	Name	Club	Time of arrival Station A	Time of arrival Station B
1	G. Whenham	Coventry	1537	1450·5
2	C. M. Wells	Mid-Thames	1538	1448·5
3	I. Butson	Chelmsford	1418	1540·5
4	B. Bristow	Mid-Thames	1431	1541
5	M. Hawkins	Chelmsford	1443	1543
	A. Simmons	Mid-Thames	1431	1543
7	W. L. Pechey	Mid-Thames	1543·5	1448
8	C. Plummer	Mid-Thames	1545	1456·5
9	P. Clarke	Chelmsford	1550	1445·5
10	R. Vickers	Slade	1551	1450
11	T. Judd	Mid-Thames	1432	1554
12	M. Easterbrook	Dartford	1432	1554·5
13	F. E. Mepham	Mid-Thames	1432	1555
14	D. Newman	Slade	1605	1443
15	P. Lisle	Mid-Thames	1607	1513·5
16	D. Holland	S Manchester	1613	1528
17	J. Armitage	S Manchester	1614	1513
18	E. L. Mollart	Mid-Thames	1450	1622
19	A. Williams	Chelmsford	1455	1622·5
20	B. Poole	Mid-Thames	1451	1625·5
21	T. C. Gage	Mid-Thames	1504	1626
22	N. Woodley	Mid-Thames	1446	1626·5
23	S. Carey	Dartford	1627	1540
24	A. Butcher	Chelmsford	1504	—

One competitor failed to find either transmitter.
C. Wells and B. Bristow qualified for the National Final.

South Manchester DF Qualifying Event results

Fifteen teams assembled at Heaton Park on 5 August for the sixth qualifying event. The weather was typical for Manchester, warm and sunny! Approximate bearings were given for both stations due to an attack of Murphy's Law. The majority of teams chose the B transmitter as their first.

Station A, G3FVA/P, was located some 12 miles SW of the start, operated by Dave Holland, and hidden on waste land by a disused brickworks. This area was much feared by local club competitors (none of whom went there) and noted for giant man-eating mosquitoes. The 1·5km of assorted antennas through brambles, swamps etc added to the fun! Competitors were heard in the area at 1430, their location could be determined by their exclamations of different colours of antenna wire. However, the station was not located until 1510 when Trevor Gage arrived, and politely asked the best way "in" so as not to damage the covering undergrowth!

Station B, G3UHF/P, operated by Dave Bolton and Chris Ward, was located some 12 miles NW of the start, in a wooded area covering the sides of a hill overlooking a reservoir. Again lots of antenna wire was the order of the day. The operators estimated that several competitors spent a good half-hour

following it (the wrong way). A series of 104 steps and a 10min run were not appreciated by the more "senior" competitors, nor was a cliff some attempted to climb. First to arrive was Arthur Butcher at 1442.

After the event an excellent buffet tea was laid on by Mary Holland at the club headquarters in Sale (a noose had been installed for the organizer, however competitors were prevailed upon not to lynch him because it was Sunday, and also because it might be messy). The results were then announced. The South Manchester RC would like to thank all who attended, also operators, and especially Mary for the much appreciated tea.

Posn	Name	Club	Time of arrival Station A	Station B
1	R. Parsons	Burton-on-Trent	1611	1442
2	A. Butcher	Chelmsford	1621	1442
3	E. L. Mollart	Mid-Thames	1624	1525
4	T. Judd	Mid-Thames	1625	1514
5	C. Wells	Mid-Thames	1627	1522
6	T. C. Gage	Mid-Thames	1510	—
7	G. Whenham	Coventry	1515	—
8	J. Armitage	South Manchester	—	1517
9	C. McKenzie	South Manchester	—	1522
10	C. Merry	Dartford Heath	—	1524
11	T. Winter	South Manchester	—	1524·5
12	D. E. Newman	Slade	1532	—
13	D. Yorke	South Manchester	—	1534
14	R. Vickers	Slade	1547	—
15	N. Woodley	Mid-Thames	—	1621

R. Parsons and E. L. Mollart qualified for the National Final.

Salisbury DF Qualifying Event results

Twenty-three teams assembled at Bokerley Ditch on 19 August for the start of Salisbury's df qualifying event.

Station A, G2FIX/P, probably caused some concern. It was only 2·5 miles from the start, running low power—with many choice sites along its westerly beam heading. How far into the wilds of Branborne Chase for the 2pm cross bearing?

Station B, G3FKF/P, was nine miles east, beyond the traditional "chalke-hills" on the edge of a wide stretch of Salisbury's Avon. Due to the arc of the river cross bearings, unless taken close, would not clearly indicate which side! However, it was a warm day, and some competitors managed to paddle across (water lapping armpits!).

Over 60 people were at the activity centre for an excellent tea which was arranged by Pam (xyl of G4SXQ), Lorna (xyl of G8ODM) and helpers. Thanks to all the operators and to Sir Evan Nepean, G5YN, who again managed the event.

The Salisbury R&ES appreciates the great support given by the many competitors from all over the country.

Posn	Name	Club	Time of arrival Station A	Station B
1	B. Bristow	Mid-Thames	1431	1554
2	T. Gage	Mid-Thames	1509	1606
3	G. Whenham	Coventry	1453	1607
4	P. Lisle	Mid-Thames	1438·5	1608
5	W. North	Mid-Thames	1436	1609
6	T. Judd	Mid-Thames	1438	1610
7	S. Holly	Salisbury	1433	1610·5
8	G. Plummer	Mid-Thames	1435	1611
9	D. Holland	S Manchester	1613	1517
10	I. Deacon	Dartford Heath	1501·5	1614
11	G. Foster	Stratford-on-Avon	1436·5	1615
12	C. Merry	Dartford Heath	1531	1620
13	E. Mollart	Mid-Thames	1627	1512
14	R. Goodearl	Mid-Thames	1525	1630
15	P. Yeates	Salisbury	1437	—
16	A. Butcher	Chelmsford	1437·5	—
17	B. Poole	Mid-Thames	1439	—
18	D. Newman	Slade	1439·5	—
19	N. Underwood	Salisbury	1501	—
20	P. Woollett	Dartford Heath	1502	—
21	F. Mepham	Mid-Thames	1509·5	—
22	N. Woodley	Mid-Thames	1510	—
23	W. Pechey	Mid-Thames	1525·5	—

T. Judd and S. Holly qualify for the National Final.

Bert Simmonds Memorial DF Trophy results

Posn	Name	1	2	3	4	5	6	7	8	Total
1	G. Whenham	—	—	—	9	9	—	4	2	24
2	T. Gage	9	—	4	—	—	1	6	—	20
3	M. Hawkins	2	4	9	3	1	—	—	—	19
4	A. Butcher	—	—	3	6	—	6	—	—	15
5	I. Butson	—	9	—	—	4	—	—	—	13
6	B. Bristow	—	—	—	—	3	—	9	—	12
7	C. Wells	—	3	—	—	6	2	—	—	11
	D. Newman	—	2	—	—	—	—	—	9	11
9	P. Lisle	—	—	6	1	—	—	3	—	10
10	R. Parsons	—	—	—	—	—	9	—	—	9
11	D. Brocks	6	—	—	—	—	—	—	—	6
	W. Pechey	—	6	—	—	—	—	—	—	6
	A. Simmons	3	1	—	—	2	—	—	—	6
	P. Tyler	—	—	—	—	—	—	—	6	6
	A. Williams	4	—	—	2	—	—	—	—	6
16	A. Judd	—	—	—	—	—	3	1	—	4
	E. Mollart	—	—	—	—	—	4	—	—	4
	C. Plummer	—	—	—	—	—	—	—	4	4
	D. Yorke	—	—	—	4	—	—	—	—	4
20	N. Woodley	—	—	—	—	—	—	—	3	3
21	F. Mepham	—	—	2	—	—	—	—	—	2
	W. North	—	—	—	—	—	—	2	—	2
23	B. Poole	—	—	—	—	—	—	—	1	1
	R. Shepherd	1	—	—	—	—	—	—	—	1
	P. Woollett	—	—	1	—	—	—	—	—	1

1 = Oxford 2 = Coventry 3 = Dartford Heath 4 = Northampton 5 = Mid-Thames 6 = S Manchester 7 = Salisbury 8 = Chelmsford

Contests Calendar

1-7 November	HA-QRP *(Rules in October* MOTA*)*
2, 18 November	1,296MHz Cumulative (Parts 2 & 3) *(Rules in August issue)*
3-4 November	144MHz CW & Marconi Memorial *(Rules in August issue)*
4 November	LF CW WAB*
4 November	Cray Valley 144MHz *(Rules in November issue)*
5 November-3 December	BARTG Cumulative *(Rules in November issue)*
11 November	OK DX *(Rules in November* MOTA*)*
10-11 November	European DX (RTTY) *(Rules in July* MOTA*)*
10-11 November	2nd 1·8MHz *(Rules in October issue)*
10, 26 November	432MHz Cumulative (Parts 3 & 4) *(Rules in August issue)*
17-18 November	All Austrian *(Rules in November* MOTA*)*
17, 25 November	Verulam Clubs *(Rules in November issue)*
12, 20, 28 November 6-14 December	28MHz Cumulatives *(Rules in November issue)*
24-25 November	CQ WW DX (Phone) *(Rules in October* MOTA*)*
1-2 December	EA DX CW *(Rules in November* MOTA*)*
2 December	144MHz Fixed *(Rules in October issue)*
16 December	70MHz CW *(Rules in October issue)*
1985 January-February	BATC ATV Winter Cumulative *(Rules in CQ-TV)*
2-3 February	7MHz (Phone) *(Rules in September issue)*
23-24 February	7MHz (CW) *(Rules in September issue)*
9 March	Commonwealth *(Rules in October issue)*

** Rules, logsheets and other information from Steve Lawrence, 7 Ashfield Road, Market Harborough, Leics.*

Chelmsford/Colchester DF Qualifying Event results

Under a threatening sky 21 teams assembled at Fordham Heath on Sunday 9 September for the last qualifying event of 1984. The operators ensured that all teams got plenty of exercise by siting both stations over 0·5 mile from the nearest road.

The A station, G3WMM/P, was located 16 miles east of the start in dense blackthorn at Strandlands on the southern bank of the River Stour. A decoy car, parked at the corner of nearby Stour Wood, caused some teams to leave their cars over a mile from the transmitter.

For the B station, G4HKC/P chose a site near Tiptree, about six miles south of the start. The transmitter operated on reduced power but still provided the stronger signal. A long antenna with multiple tee-ins led competitors to investigate several rather muddy and prickly areas.

Competitors and operators were fortunate to gain the shelter of the Prince of Wales public house, Great Totham, before a violent thunderstorm occurred. While the rain pelted down all enjoyed an excellent tea.

Posn	Name	Club	Time of arrival Station A	Station B
1	D. Newman	Slade	1436	1552
2	P. Tyler	Mid-Thames	1452	1554
3	C. Plummer	Mid-Thames	1450	1555
4	N. Woodley	Mid-Thames	1454	1600
5	G. Whenham	Coventry	1455	1600·25
6	B. Poole	Mid-Thames	1453	1600·5
7	C. Merry	Dartford Heath	1608	1430
8	E. Mollart	Mid-Thames	1612	1425
9	A. Williams	Braintree	1509	1613
10	A. Judd	Oxford	1614	1435
11	P. Clark	Chelmsford	1617	1420
12	T. Gage	Mid-Thames	1508	1621
13	P. Larbalestier	Colchester	1455	1621·5
14	R. DeLaRue	Colchester	1456	1621·75
15	R. Goodearl	Mid-Thames	1455·5	1622
16	B. Mepham	Mid-Thames	1524	1629
17	W. Pechey	Mid-Thames	1517	1630
18	R. Emeny	Colchester	1524·5	—
19	P. Woollett	Dartford Heath	1612·5	—
20	P. Cranmer	Colchester	1630	—
21	G. Foster	Stratford	—	—

D. Newman and P. Tyler qualify for the National Final.

Errata

In the 7MHz section of the January 1984 Cumulatives the log of G4FNC was inadvertently confused with that of G3RZP. The results table for this section should therefore show G4FNC in joint 11th position in place of G3RZP. Also, in the caption to the photograph on p891 of the October issue the callsign G4BUO should have read G4BJQ. Apologies to the owners of both callsigns.

Verulam "Clubs" Contest 1984 rules

Section 1: 2000-0000gmt 17 November **Section 2:** 0900-1300gmt 25 November

The rules of this contest have been revised and prospective entrants are advised to write to Mrs H. Claytonsmith, G4JKS, 115 Marshalswick Lane, St Albans, Herts, enclosing an sae, for a copy of the revised rules. Entries should also be sent to this address, postmarked not later than 10 December 1984.

Cray Valley 144MHz Activity Weekend

1000-1400gmt, Sunday 4 November 1984

Rules of this contest can be obtained from Graeme Caselton, G6CSY, 19 Cowden Road, Orpington, BR6 0TP, on receipt of an sae. Logs should also be sent to this address, postmarked not later than 20 November 1984.

BARTG 144 & 432MHz Cumulative RTTY Contest 1984 rules

5, 12, 19, 26 November and 3 December 1984, 2000-2200gmt. Rules for this contest, which are similar to those of previous years, can be obtained from the BARTG Contest Manager, 464 Whippendell Road, Watford, Herts WD1 7PT, on receipt of an sae. Logs should also be sent to this address, and should be postmarked no later than 12 January 1985.

Club News

The following is the latest information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue. Basic unchanged information on other affiliated organizations will be published again in the January 1985 issue.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the **January 1985** issue should reach them by **20 November** and for the **February 1985** issue by **11 December.**

Club programmes are given in order of date, subject, time and place of the meeting. All callsigns of club secretaries and other contacts are QTHR (correct in the current *RSGB Call Book*) unless otherwise stated.

All clubs welcome visitors and would be pleased to hear from potential new members.

REGION 1—RR B. Donn, G3XSN, 7 Thurne Way, Liverpool L25 4SQ. Tel 051-722 3644.

Ainsdale (AARC)—6, 20 November (Normal meetings at Scout HQ, Marine Drive), 13, 27 November (Natter nights, Mount Pleasant Hotel, Manchester Road), 11, 25 November (DF hunts, Sunday, 1100). Sec D. Norris, G4TUP, tel 35947.

Barnoldswick (Rolls-Royce ARC)—7 November (AGM, starts 8pm). Sunday mornings construction class, 11.30am. Rolls-Royce Sports & Social Club. Sunday, 30 June 1985 (Mobile rally). Sec Leslie Logan, G4ILG, tel 0282 812288.

Blackburn (East Lancs ARS)—6 November (Home construction), 4 December (AGM), 7.30pm. First Tuesday of each month, formal meeting, last Tuesday, social gathering, Conservative Club, Cliffe Street, Rishton, Blackburn. Pro Stuart Westall, G6LXU.

Bury (BRS)—Tuesdays, 13 November, ("Home pcb manufacture", by Laurence Jones, G4KLT and team, including practical demonstrations), 11 December (AGM, with wine & cheese to follow), 8pm. Mosses Centre, Cecil Street, Bury. Sec Brian Tyldsley, G4TBT, tel 24254. Newcomers are invited to contact G4TBT.

Chester (C&DRS)—13 November (Natter night & club on the air), 20 November (To be announced), 27 November ("Aerial planning permission and contest working", by Ron Stone, GW3YDX), 11 December (Annual construction contest), 18 December ("Xmas meeting, buffet, xyls and yls welcome. Tickets from G4EZO), 10 January 1985 (AGM), 17 January (Construction contest winners), Chester Union Football Club, Hare Lane, Vicars Cross, Chester. Details from Alan Warne, G4EZO, tel Chester 40055.

Fylde (FARS)—6 November ("Morse code, its history, general usage and value to the amateur", by Frank Whitehead, G4CSA), 20 November (Equipment sale), 4 December ("Radio Astronomy", by Ken Porter, G3KEN), 18 December (Party at the Kite Club), 1 January (No meeting), 15 January (AGM), 7.45pm. Kite Club, Blackpool Airport, Sec H. Fenton, G8GG, Pro F. Whitehead, tel 0253 737680.

Oldham (OARC)—Mondays, 12 November ("Map reading", by Dave, G6GYU), 8.30pm. Wheatsheaf Hotel, Derker Street, Oldham. Sec Fiona Butterworth, G4SPX, tel 061-652 8862.

Stockport (SRS)—Second and fourth Wednesday in the month. The middle Wednesday is informal and is devoted to morse classes by Joel Weaving, G3OWW, at 8pm. Morse brush-up before main meetings, 7 to 8pm. 14 November (G3FYE Memorial lecture, Rev George Dobbs, G3RJV, on working QRP), 21 November (Morse practice & informal evening), 28 November (Construction competition), 12 December (AGM), 19 December (Morse practice and informal evening), 8.15pm Blossoms Hotel, Wellington Road South, Stockport. Sec Mel Betts, G4FFW, tel 061-224 7880.

Tarporley (Mid-Cheshire ARS)—7 November ("G4WPO Damion"), 14 November (Talk on small boats), 21 November ("Amateur awards—what they look like and how to qualify for them", Hans, G4XFD), 28 November ("HF operating", by Dave, G4CAX), 19 December (Homebrew construction night) 7.30pm. The Cotebrook Village Hall, off the A49, Cotebrook, nr Tarporley. Sec Rick Dodd, G8PNL.

The RR wishes to thank all those people who wrote and telephoned, congratulating him on his appointment, which he sincerely appreciates.

REGION 2—RR P. N. Butterfield, G4AAQ, 43 Lynwood Crescent, Pontefract WF8 3QT, West Yorks. Tel 0977 791071.

Barnsley (UK FM Group Northern)—4 November (AGM), 7.30pm. The Royal Hotel, Barnsley. Details from sec G4LUE.

Hull (World Association of Christian Radio Amateurs & Listeners)—The annual conference was a great success with a number of overseas visitors. Recent new members include G1DEM, G3UQD, G3XNX, G4HMF, G4IEB, G4TSQ, G4WYL and G6DBP. Please note there is a WACRAL award available for working members on the air, who now number over 600 worldwide. Check on 3,777kHz Wednesday and Sunday mornings. Details from L. D. Colley, G3AGX, tel Hull 822276.

Leeds (White Rose RS)—Wednesdays, 14 November, (Oscar 10 satellite video by RSGB), 28 November (Visit by a well-known components trader combined with pea and pie supper), 12 December (Christmas radio quiz against any other club in Region 2), 8pm. Moortown Rugby Football Club, Moss Valley, Alwoodly, Leeds 17. PR sec G3KWT, tel Leeds (0532) 688821.

Maltby (MARS)—2 November ("70cm linear", by G6OYL), 9 November (Mini lectures by G4BVV/G4TVD/G3ZVG), 16 November (Visit by Radio Interference Service), 23 November ("Getting on 2m cheap", by G4BVV), 30 November (Amtor, by G3XTL), 7 December ("Using test equipment", by G3XXN), 7pm. Old School Buildings, Church Lane, Maltby. Details from I. Abel, G3ZHI, tel Rotherham 814911.

Pontefract (P&DARS)—2 November (Ceilidh), 22 November (Antique evening!), 6 December (Talk on radio control modelling), 13 December (Christmas party), 7.30pm. It has been good to see the club supporting a multitude of public functions with special event stations. Keep up the PR!! New members always welcome. CW classes on Mondays. Carleton Community Centre, Carleton, Pontefract. Details from sec, Ron Tams, G4TCG.

Spen Valley (SVARS)—Thursdays, 1 November (Committee/project), 15 November (Night on the lights—Aldis lamps), 29 November ("Moonbounce", by G4DZU), 13 December (Christmas gathering), 8pm. Old Bank Working Mens Club, Mirfield. Details from T. Clough, G4PHR.

Would secs please note that news must be sent in by deadline each month for inclusion. Old news is no use! Owing to unforseen problems, it is unlikely that a regional meeting will be held prior to Christmas. Would all area representatives please contact RR on a regular basis so we get the opportunity to discuss regional business.

REGION 3—G. Ross, G8MWR, 81 Ringwood Highway, Coventry CV2 2GT. Tel Coventry (0203) 616941.

Atherstone (AARC)—Second and third Thursday in each month. 17 November (AGM), 7.30pm. Tudor Centre, Coleshill Road, Atherstone. Sec G6BEO, tel 0455 212051.

Birmingham (South Birmingham RS)—14 November (AGM), lecture first Wednesday in each month, night on the air every Thursday, morse classes and construction group every Friday, 7.30pm. Hampstead House, Fairfax Road, West Heath, Birmingham. Sec G8RGQ, tel 021-459 8312.

Bromsgrove (BARS)—Second Tuesday in each month, 8pm. Rigby Lane School, Bromsgrove. Sec G4LVK, tel 021-445 2088.

Bromsgrove (B&DARS)—Fridays. 9 November (Surplus sale), 8pm. Avoncroft Art Centre, Bromsgrove. Sec G4NWQ, tel 021-476 6965.

Burton-on-Trent (BoTARS)—Wednesdays, 8pm. Stapenhill Institute, Main Street, Stapenhill. Sec G3ACR, tel Burton 43118.

Coventry (CTCARS)—Winfray Annexe, Technical College, Coventry. Sec G8MWR, tel 616941.

Droitwich (DARC)—First Monday in the month, 8.30pm. Scout HQ, Station Rd, Droitwich. Sec G4FHP, tel 02993 3818.

Dudley (DARC)—5 November (Committee meeting and natter night), 19 November ("Starting on microwaves", by Glen Ross, G8MWR), 7.45pm. Central Library, Dudley. Sec G4SQP, tel Codsall 5636.

Halesowen (MEBARC)—First and fourth Tuesdays in each month. 13 November ("Clandestine radio", by Douglas, G3BA), 27 November (General meeting), 8pm. MEBHQ Social Club, Mucklow Hill, Halesowen. Sec G4RWH, tel 021-747 8784.

Hereford (HARS)—First and third Fridays in the month, 8pm. 9 November (The WAB award), 23 November (Junk sale). Lord Scudamore School, Friar Street, Hereford. Sec G4CNY, tel 273237.

Lichfield (ChadRC)—Naval Club, Burton Old Road, Lichfield. Sec G4ESK, tel 751584.

Malvern Hill (MHRC)—Second Tuesday in the month, 7.30pm. Red Lion Inn, St Annes Road, Malvern. Sec G4GFX, tel 62900.

Much Wenlock (MWARS)—Second and fourth Monday in each month, 8.30pm. Raven Hotel, Much Wenlock. Sec G3ZSL, tel Bridgnorth 861332.

Redditch (RRC)—8 November (Video "Two pioneers of radio"), 22 November (Natter night), 8pm. WRVS Centre, Ludlow Road, Redditch. Sec G3EVT, tel Alcester 762041.

Shrewsbury (SARS)—1 November (Natter night), 8 November ("Planning permission", by G4HFX), 15 November (Natter night), 22 November (Talk by G6GNP), 29 November (Natter night), 8pm. Albert Hotel, Smithfield Way, Shrewsbury. Sec G3UQH, tel 83375.

Solihull (SARS)—The Manor House, High Street, Solihull. Sec G6HSZ, tel 021-742 3378.

Stoke-on-Trent (North Staffs ARS)—Mondays, 7.30pm. Harold Clowes Community Centre, Dawlish Road, Stoke-on-Trent. Sec G8FGR.

Stourbridge (StARS)—5 November (Natter night), 19 November (Surplus equipment sale), 8pm. The Garibaldi, Cross Street, Stourbridge. Sec G8JTL, tel 593 4019.

Stratford-on-Avon (SoAARC)—The Control Tower, Bearley Radio Station, nr Stratford. Sec G8OVC, tel 750584.

Sutton Coldfield (SCARS)—12 November (Natter night), 26 November (AGM). Central Library, Sutton Coldfield. Sec G8TUR, tel 021-353 2061.

Tamworth (TARS)—Second Monday in each month, 8pm. The Rugby Club, Cotton Green, Tamworth. Sec G4BKA, tel 283952.

Telford (TARS)—Wednesdays, 8pm. Phoenix Centre, Webb Crescent, Dawley. Sec G8UGL, tel 584173.

Tenbury (TARS)—Every other Tuesday, 8pm. The Barn, Pool House, Hanley Childe, Tenbury Wells. Sec G6PQX, tel Kyre 274.

Warwick (Mid-Warks ARS)—First and third Tuesdays in the month, 8pm. 13 November (Natter night), 27 November (RSGB films). St John HQ, 61 Emscote Rd, Warwick. Sec G4TIL, tel 092681 4765.

Wolverhampton (WARS)—Mondays, 8pm. Chamber of Commerce, 93 Tettenhall Road, Wolverhampton. Sec G6AKN, tel 782883.

Wenlock (WARS)—12 November (Natter night), 26 November (Talk on receivers by G3PVZ), 30 November (Brewery visit (special event!)), 8pm. Sec G3ZSL, tel 07462 861332.

Willenhall (WARS)—Alternate Wednesdays, 8pm. Saracens Head, Bloxwich Rd Sth, Willenhall. Sec G4FAQ, tel Wolverhampton 730300.

Wordsley (WRC)—1 November (Introduction to Pye Telecommunications), 15 November (Natter night), 29 November (Crime prevention for the radio amateur). Vine Inn, Camp Hill, Wordsley. Sec G4VJU, tel Creadley Heath 635969.

Wythall (WRC)—Wythall House, Silver Street, Wythall. Sec G4SMA, tel 021-444 2427.

Please note. This listing contains all new information I have on clubs in Region 3. If your club is not included would you please let me know any new details as soon as possible. *RR3.*

REGION 4—RR M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel Derby (0332) 556875.

Buxton (BARS)—13 November (AGM, all paid-up members are asked to attend, 8pm prompt), 27 November ("Wartime communication", by Ron Plant, G5CP), 8pm. Egerton Hotel, St Johns Road,

Buxton. Sec Dave Cooper, G6MIF, tel Buxton 6174.
Grantham (GRC)—20 November (AGM), 8pm. Shirley Croft Hotel, Harrowby Road, Grantham. Sec John Kirton, G8WWJ, tel Grantham 65743.
Lincoln (LSWC)—14 November ("Traffic light, past & present", by Brian Wells, Lincoln City Council), 28 November (Activity night/night on the air), 8pm. City Engineers Club, Waterside South, Lincoln. Sec Pam Rose, G4STO, tel Gainsborough 788356.
Mansfield (MARS)—2 November ("Repeaters", by Geoff Dover, G4AFJ), 20 November (Natter night), 8pm. Victoria Social Club, Princes Street, Mansfield. Sec Keith Lawson, G4AAH.
Nottingham (ARCON)—1 November (Forum), 8 November ("Antenna expts", by G3KDQ), 15 November (Activity night), 22 November ("Keyers", by G2FUB), 29 November (The other man's shack), 7.30pm. Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham. Sec Jim Towle, G4PJZ, tel Nottingham 624764.
Ollerton (Dukeries ARS)—Sundays, 2pm. Labour Hall, New Ollerton. New sec Gladys Jones, 104 Newark Road, New Ollerton, Nottingham.
Spalding (S&DARS)—9 November (G2BQC memorial construction contest), 8pm. Maple Room, White Hart Hotel, Market Place, Spalding. Sec Betty Whitley, G6YBL, tel Spalding 2781.
Worksop (WARS)—8 November (Interclub quiz night with Maltby ARC), 22 November (Junk sale), every other Thursday evening (Social get together), 8pm. Old Ship Inn, Market Place, Worksop. Sec G. Barker, G4PPM, tel Worksop 486935.

REGION 5—RR J. S. Allen, 77 Rosslyn Crescent, Luton LU3 2AT. Tel 0582 508515, or at work on 0582 21151, ext 570.
Dunstable Downs (DDRC)—9 November (Talk by an engineer from the Central Electricity Generating Board), 23 November (Two films, "Aerial circus" and "Secret Listeners"), 8pm. Chews House, Dunstable Downs. Sec Phil Morris, G6EES.
Milton Keynes (MKARS)—12 November (Bring & Buy—junk sale). Lovatt Hall. Sec G3ZPA.
Peterborough (GPARC)—22 November (A talk has been arranged, the speaker to be announced on RSGB News), 7.30pm. Southfields Junior School, Stanground, Sec Frank, G4NRJ.
Shefford (S&DRS)—1 November ("Outside broadcasting at Farnborough '84", a talk by Ron Chown of the BBC), 8 November ("Inside the chip —semiconductor manufacture", a talk by Howard, G8LSA), 15 November ("Security alarms", a talk by Gerald, G6PTB), 17 November (Club dinner —venue to be arranged), 22 November (A homebrew transceiver for the hf bands", by Lorin Knight, G2DXK). Church Hall, Amptill Road. Sec Alan, G4PSO.
Wellingbrough (Nene Valley RC)—7 November (Lecture "An introduction to satellite working", by Clive, G4ENB), 14 November (Garex parts stall), 21 November (Technical discussion evening), 28 November (Ladies night and buffet evening), 8pm. Dolben Arms, Finedon, nr Wellingborough. Sec L. Parker, G4PLJ.

Not a lot of news this month, due, I think to new club secretaries taking over after the summer break. Could these secretaries please get in touch with me with details of their forthcoming programmes, thank you. *G3DOT.*

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HA3 7EA. Tel Penn (049481) 4240.
Aylesbury (AVARC)—13 November (Details to be announced), 11 December (Club Christmas Social). For details contact Mrs C. Clare, 9 Conigre, Chinnor, Oxford OX9 4JY, tel 0844 51461.
High Wycombe (Chiltern ARC)—For details of meetings to come join the club net, Thursday evenings, 8pm, on S20, otherwise contact sec Ron Ray, 21 Parish Piece, Holmer Green, High Wycombe, Bucks, tel High Wycombe 712020.
Oxford (RAFARS)—The club has arranged a social evening and dinner for 24 November. Although the date has been fixed, they are not sure of the venue at this stage, so will anyone interested please phone Stuart Wilkins, G3HMJ, tel Oxford 58498. Monthly net, last Sunday in each month on 3·710MHz, starting 1145h. Details of club meetings from Eric Palmer, G3FVC, Oxford AR, tel Maidenhead 20107.
Slough (Burnham Beeches RC)—First and third Monday in each month, 5 November (Talk on "Moonraker" by G4HMG), 9 November (Talk on "Andorra expedition", by G4NNS/G8APZ), 8pm. St John Ambulance HQ, Burlington Road, Slough. Sec, G6DVC.

REGION 7—RR R. Sykes, G3NFV, 16 The Ridgeway, Fetcham, Leatherhead, Surrey KT22 9AZ. Tel 0372 372587.
Ashford (Echelford ARS)—Second Monday and last Thursday in each month, 12 November ("RF filter design", by Bob Crane, G4PHS), 7.30 for 8pm. The Hall, St Martins Court, Kingston Crescent, Ashford, Middlesex. Sec Bob Crane, tel 01-977 4157.
Biggin Hill (BHARC)—20 November ("RSGB", by John Nelson), 8pm. St Marks Church Hall, Church Road, Biggin Hill. Sec Ian Mitchell, G4NSD.
Croydon (Surrey Radio Contact Club)—5 November ("Equipment evaluation" (for *Rad Com* reports)" by Peter Hart, G3SJX), 7.45 for 8pm. TS Terra Nova, 34 The Waldrons, South Croydon.
Guildford (G&DARS)—9 November (A talk by Tony Cockle, G3IEE), 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec Lew Bright, G4BHQ.
Guildford (UHF Repeater Group)—8 November (Open evening, bring & buy stall, demonstrations of microwave, amateur tv, computers), from 7.30pm. Burpham Village Hall, Burpham Lane, Burpham. Details from Colin Durbridge, G4EML.

Will clubs not included please let me have details of their future programme and the name of the secretary or contact. *73, RR7.*

REGION 8—RR M. Elliott, G4VEC, 20 Haysel, Sittingbourne, Kent ME10 4QE. Tel 0795 70132.
Canterbury (East Kent ARS)—1 November (Talk and demonstration of Decca-Racal radar by Gerald, G6VRI), 15 November (Natter night), 7.30 for 8pm. Cabin Youth Centre, Kings Road, Herne Bay. Details from Wally Broad, G8GTF, tel Canterbury 63104.
Crawley (CARC)—14 November (Informal meeting at QTH G8YCY), 21 November (Committee meeting at QTH G4XHF), 28 November (Junk sale at Trinity Church Hall), 7pm. Trinity Church Hall, Ifield, Details from David, G4IQM, tel Crawley 882641.
Dartford (DDFC)—6 November (Pre-hunt meeting, Horse & Groom PH), 11 November (Club hunt). Pre-hunt Tuesdays, meetings held at Horse & Groom PH, Leyton Cross, Dartford, Heath, Dartford, Kent. Details from Pete, G8DYF tel Greenhithe 844467.
Eastbourne (Southdown ARS)—5 November (Talk by George North, G2LL, on Oscar 10), 7.30pm. Chaseley Home, South Cliff, Eastbourne. Details from Peter, G8IQO, tel Eastbourne 763123.
Hastings (HERC)—21 November ("Recce and image processing", by Ron Fulton. Don't miss this one, there have been many changes since the last one three years ago), 7.45pm. West Hill Community Centre, Croft Road, Hastings. Club room, Fridays, 8pm. Ashdown Farm Community Centre, Downey Close, Hastings. Details from Dave, G4NVQ, tel Hastings 420608.
Swale (SARC)—19 November (Junk sale), 12 November (Committee meeting), 23 November (Social & dinner (prov)). Ivy Leaf Club, 52 Dover Street, Sittingbourne. Details from Brian Hancock, G4NPM, tel Minster 873147.
Tunbridge Wells (West Kent ARS)—Fridays, 2 November (Surplus equipment sale), 16 November ("Adventures in amateur radio, talk by Viv Slight, G6SX), 30 November ("QRP", Talk by Chris Page, G4BUE), Informals on 9 and 23 November, 8pm. Adult Centre Annexe, Quarry Road, Tunbridge Wells. Details from Brian Guinnessy, G4MXL, tel 0892 32877.

REGION 10—RR E. J. Case, GW4HWR, 2 Abbey Close, Tyrhiw, Taffswell, Mid-Glam CF5 7RS. Tel 0222 810368.
Cardiff (CRSGBG)—12 November (Film show), 7.30pm. Pantmawr Hotel, Tyla Teg, Pantmawr Estate, Whitchurch, Cardiff. Sec Cyril Laws, GW6ZHP, tel Cowbridge 3212.
Chepstow (C&DARS)—Tuesdays, 7.30pm. Chepstow Leisure Centre. Club net every Sunday at 8pm, 144MHz. Chairman Bert Frowen, GW8PTI, sec Alan Purnell, GW6NJY.
Swansea (SARS)—First and third Thursdays in each month, 7.30pm. Lecture room N, Applied Sciences Building, Swansea University. 15 November (Trip to Mumbles coastguard station, the maritime rescue co-ordination centre for the west of UK. Numbers limited so contact sec asap if interested). 6 December (AGM. Buffet after meeting). Details from sec Roger Williams, GW4HSH, tel Swansea 404422.

REGION 11—RR B. H. Green, GW2FLZ, 1 Clwyd Court, Tan-y-Bryn Road, Colwyn Bay, Clwyd LL28 4AH. Tel 0492 49288.
Colwyn Bay (Conwy Valley ARC) (GW6TM)—8 November (Junk sale), 8pm. Green Lawns Hotel, Bay View Road. Sec Mr J. N. Wright, GW4KGI, tel 0745 823674, deputy sec Mr N. Vickars-Harris, GW6ZZL, tel 0492 636376.
Hawarden (Alyn & Deeside ARS) (GW3TZR)—1 November ("10,000 miles around New Zealand", by George Butler, GW6YKM), 8 November (Committee meeting), 15 and 29 November (Two talks by Gordon Adams, G3LEQ, "Propagation 1 and 2"). Shotton Conservative Club, King George Street, Shotton, Deeside. Sec Mr M. McIntosh, GW3IEQ, tel 0244 549154.
Porthmadog (P&DARS)—15 November (Talk by Keith, GW8WNB, "DX tv"), 8pm. Queen's Hotel, Porthmadog. Sec Mrs L. Jones, GW4WKQ, Henllys Back, Llanbedrog, Pwllheli, Gwynedd LL53 7PG, tel 0758 740445.
Rhyl (R&DARC) (GW4ARC)—5 November (Activity night), 19 November (Talk by Roy Stubbs, GW8XLL, and atv demonstration), 7.30pm. 1st Rhyl Scout HQ, Tynewydd Road, Rhyl. Note new sec M. Allington, GW1AKT, tel 9170 469.

REGION 12—RR M. R. Hobson, GM8KPH, 17 Well Brae, Pitlochry, Perthshire PH16 5HH. Tel 0796 2140.
Aberdeen (AARS)—2 November (Junk sale), 16 November (AGM), 23 November (President's address), 30 November (Videos from RSGB Audio/Visual Library), 7 December (Junk sale), 7.30pm. Club Rooms, 35 Thistle Lane, Aberdeen. Details from sec Don Travis, GM4GXD, tel 04676 251.
Caithness (CARS)—14 November (AGM), 7.30pm. Loch Watten Hotel, Watten (midway between Thurso and Wick). Sec Iain Morrison, GM4MIM, tel 0995 3960.
Invergordon (Easter Ross ARC)—Fridays, 7.30pm. Community Room, South Lodge School, Invergordon. The club now has a new sec, Sue MacLennan, GM4UMA, tel 06678 244, from whom further details may be obtained.

REGION 14—RR T. G. Wylie, GM4FDM, Torran mhor, 3 Kings Crescent, Elderslie, Strathclyde PA5 9AD. Tel Johnstone (0505) 22749.
Dumfries (D&GREC)—First and third Mondays in each month, 8pm. Cargenholm Hotel, Newabbey Road, Dumfries. Sec Derek Harkness, GM4NNK, 4 Lochar Drive, Larchfield, Dumfries DG1 4HS, tel Dumfries (0387) 64957.
Glasgow (WOSARS)—Fridays, 2 November ("Weather satellites" by Angus, GM4JYZ), 7.30pm. 22 Robertson Street. Morse classes by John, GM4LGM. Details from sec GM4NUN, tel 041-639 3095.
Greenock (G&DARC)—Tuesdays and Fridays, 7pm. Club Room, 22 Inverkip Street, Greenock. Friday RAE class by Alan, GM3DOD. Details from Dave, GM1AHR, tel Greenock 25075.
Kilmarnock (K&LARC)—Tuesdays, 7.30pm. The Broomhill Hotel, London Road, Kilmarnock. Details from Len, GM6JIC, tel Kilmarnock (0563) 34383.
Motherwell (Mid-Lanark ARS)—Fridays, 7.30pm. Wrangholm Hall, Community Centre, Jerviston Street, Motherwell. New sec Ann, GM4UXX, tel Wishaw (0698) 350926.
Stirling (S&DARS)—Second and fourth Wednesdays in each month. YMCA, 9A Barnton Street, Stirling. Morse classes by Tom, GM4RTN, on Tuesdays. RAE class. Details from Pat, GM4SWG, tel 0786 824810.
Central Scotland FM Newsletter. Subscribers please note last date for items for publication is 30 November, to GM8LBC, 9 Dunlop Court, Low Waters, Hamilton, ML3 7YJ (not QTHR).

REGION 15—RR J. T. Barnes, GI3USS, Whitegables, 95 Crawfordsburn Road, Bangor, Co Down BT19 1BJ. Tel 0247 3948.
Ballyclare (East Antrim ARC) (GI4KKK)—Second Tuesday in each month, 8pm. Fairview Primary School, Hillmount Avenue, Ballyclare. Officers:

Chairman, GI4JXM, sec GI4PRH, treasurer, GI4SQL, and committee, GI4BWM and GI4LKA. Details from GI4PRH, tel Ballyclare 41655.

Ballymena (BARC)—Tuesday, 8pm, morse tuition. Wednesdays, 8pm. RAE tuition. Thursdays, 8pm, club night. Sundays, 4pm, club activity. 70 Nursery Road, Gracehill. Sec GI4HZN.

The club recently staged a special event station expedition to Rathlin Island, operating with the callsign GB2MRI, to commemorate the Marconi and Kemp first practical morse transmissions in 1898 to Ballycastle, reporting to Lloyds in London via Ballycastle, on approaching shipping to British waters from the North Atlantic.

The stations were set up and operated on all bands to 432MHz, and contacts were made with most parts of the world. Of special interest was the two-way fast scan colour television transmissions betweeen the island, Ballycastle, and Portrush, which were very successful.

Banbridge (Mid-Ulster ARC)—Second Sunday in each month, 3pm. QTH of GI4BAC, Banbridge. Officers: chairman, GI8KXU; treasurer, GI3WEM: assistant treasurer, GI4GUH: sec GI4SJQ: ass sec GI4BDL, morse organizer, GI3CVH. Details from GI4SJQ, tel 0762 334648.

Bangor (B&DARS) (GI3XRQ)—First Friday in each month, 8pm. Sands Hotel, Seacliffe Road, Bangor. New committee: sec/pro GI4OCK, treasurer GI3USS, GI4NAE, GI3TLT, GI8KZT, GI4POC, GI4JTF, GI3XEQ, GI4LZS, GI3KDR, chairman GI4CXO, and GI3MBB. Programme being arranged including annual surplus sale in Co-op Hall, Market Street, Bangor, on 2 November, 7.30pm.

Enniskillen (Lough Erne ARC)—Third Monday in each month. Railway Hotel, Enniskillen. At their agm on 17 September new officers and committee were elected. Chairman, GI4PCY: sec GI4CZW; treasurer, GI4UHA; committee, GI4NRE, GI1GVZ, and GI1BTB. Auditors, GI4TPI, and GI4UHP. Programme being arranged. Details from GI4CZW.

Lisburn (Lagan Valley ARS) (GI4GTY)—Second Monday in each month, September to June inclusive, 7.30pm. Rathvarna Teachers' Centre, Pond Park Road, Lisburn. At their agm on 10 September new officers and committee were elected. Chairman, GI4LKG; vice-chairman, GI1GKI; treasurer, GI4GCN; sec, GI6UFU; committee, GI4TCS, GI4PSK, GI4XTC; GI4XIR, and GI1EWF. Programme being arranged. Details from GI6UFU.

Moy (Armagh & Dungannon DARC)—Second Tuesday in each month, 8pm. The premises of the Pony Club, Killymann Street, Moy. Programme for coming season includes lecture on "Weather satellites", constructors' night, and other items. Details from sec GI8RNX.

REGION 16—RR Alan Owen, G4HMF, 102 Constable Road, Ipswich, Suffolk.

Braintree (B&DARS)—7 November (HF aerials), 21 November (Junk sale). **Note:** change of venue: now meets at 7.30 for 8pm on first and third Wednesdays in each month. St Peter's Church Hall, St Peter's Street, off Bocking End. Sec Leslie Whitehead, G6XJC, 24 Gilchrest Way, Braintree CM7 7SY, tel 0376 23813.

Chelmsford (CARS)—6 November ("RTTY/Amtor/packet", by Ian Wade). Details from Andrew Mead, G4KQE, tel Witham 512316, or Silver End 83094.

Colchester (CRA)—1 November ("Hypnotherapy", by Albert Smith), 15 November ("Aerials for the lower frequencies", by Tony, G8ZWX), 29 November (New Zealand through the lens of G3PMX), 7.30pm. Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 851189.

Felixstowe (F&DARS)—Welcome to this newly affiliated club. 12 November (Junk sale), 8pm. Alternate Mondays. North Sea Hotel. Sec Ernie Long, G3MJS, tel Felixstowe 272426.

Great Yarmouth (GYARC)—8 November ("Airborne communications", by G3TWE), 22 November (AGM and construction contest), 6 December (RAE revision), 7.30 for 8pm. STC Social Club, Beevor Road, Great Yarmouth. Sec A. D. Besford, G3NHU, 2A Halt Road, Caister, tel Great Yarmouth 721173.

Ipswich (IRC)—31 October (Surplus equipment sale, Barrack Corner, URC Church Hall) 14 November ("Weather fronts and radio propagation", by G4BJO), 21 November (Autumn social), 8pm. Club Room, Rose & Crown, Norwich Road. Details from Jack Tootill, G4IFF, tel Ipswich 44047.

Leiston (LARS)—6 November (AGM), 4 December (Film show), 7.30 for 8pm. Sizewell Power Station Sports & Social Club, St George's Avenue, Leiston. Sec Mrs I. Westcott-Freeman, G6ORK, tel Leiston 831597. Chairman, G3MYA, tel Leiston 830777.

Loughton (L&DRAS)—9 November (G4ONP on the air), 23 November ("VHF to hf transverter", by Ray, G8DBR), 7 December (CW practice), 7.30pm. Loughton Hall, Rectory Lane. Details from C. Knowles, G6FWT, tel 01-508 7190.

Stowmarket (S&DARS)—5 November ("Getting started on 23 and 13", by G3ZQU), 3 December (Christmas social). **Note:** Change of venue: Maltings Entertainment Centre, 7.30pm. First Monday in each month. Details from Jim Lowe, G8SCB, tel Needham Market 721296.

Vange (VARS)—29 November (Cheese and wine), 7.30pm. Main Hall, Barstable Tenants' Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

REGION 17—RR T. Emery, Wilverley, Old Lyndhurst Road, Cadnam, Southampton SO4 2NL.

Basingstoke (BARC)—13 November (Constructor's competition, to be judged by G3SHQ), 7.30pm. The Village Hall (opposite The Swan), Sherborne St John, Basingstoke. Chairman G4WIZ, tel Tadley 5185.

Basingstoke (Repeater Holding Group)—6 November (AGM), 7.30pm. Chineham House, Shakespeare Road, off Popley Way, Basingstoke. Chairman G4PSX.

Bournemouth (BRS)—2 November ("Aerial radiation patterns", by G3GC), 16 November ("Delta loops", by G6XME), 7.30pm. Kinson Community Centre, Kinson, Bournemouth. Sec G4EKE, tel 0202 877945.

Eastleigh (Itchen Valley ARS)—9 November (Quiz night), 23 November (Surplus equipment sale), 7.30pm. The Scout Hut, Brickfield Lane, Chandlers Ford. Sec G6DIA, tel 0703 863039.

Fareham (F&DRS)—Wednesdays, 14 November ("Funny detectors", by G6NZ), 28 November ("Tests on your radio", by G4ITF and G8UXW), 7.30pm. Morse classes 7pm, before meetings. Portchester Community Centre, Portchester. Sec G4ITG, tel Fareham 234904.

Farnborough (F&DRS)—14 November (AGM), 28 November (Chairman's evening), 7.30pm. Railway Enthusiasts Club, Access Road, Farnborough. Pro G4MBZ, tel Farnborough 837581.

Horndean (H&DARC)—5 November (Film show presented by G4WQZ), 7.30pm. Merchiston Hall, London Road, Horndean. Sec G4OFG.

Jersey (JARS)—Fridays, 8pm. Sundays 10am. Morse classes on Tuesdays. hope to run an RAE class this winter. Le Hocq Tower, St Clement. Sec GJ4TXB, tel 24328.

Liphook (Three Counties ARC)—7 November ("Fast scan tv", by G8LES), 21 November ("Hints and tips on home construction", by Mr I. Poole), 8pm. Railway Hotel, Liphook, Sec G4VKC, tel Liphook 723415.

Southampton (SARS)—Result of recent AGM: chairman, G4JHD; treasurer, G6MHW; Sec G6CPE, tel Romsey 514811. Wednesdays, 7.30pm. Contact G6CPE for venue.

Southampton (Waterside SWC)—13 November (Informal) 27 November ("Oscar", by G3OZT), 7.30pm. Fawley and District Community Centre, Blackfield, contact G6DLJ, tel 0703 891975.

Swindon (S&DARC)—1 November ("Raynet", by G8SXD), 15 November (Thamesdown Repeater Group), 29 November (Construction competition), natter nights on 8 and 22 November. **Note:** All meetings now at Oakfield School, Marlowe Avenue, Swindon, at 7.30pm. Pro G4ZAZ.

Weymouth (SDRS)—6 November (Film night), 7.30pm. Army Bridging Camp, Wyke Regis. Sec G6KHD.

Ballymena ARC, GI3FFF, recently made a special event expedition to Rathlin Island. Seen here are, l to r: Jim, GI4NNM; Willie, GI4KUM; Robert, GI4ZFX; Graham, GI4SFZ; Angela; ORR, GI4TRX; Isaac, GI4POV; Wilson, GI4VBZ, Alex, GI4OUE; Seamus, GI4OZT; Tommy, GI3UHL; Jeff, GI4HCN; Wilfred, GI4OGQ; Bertie, GI4DCC; Tommy, GI4VJZ; Aubrey, GI4TOR; David; and Willie, GI6FTW

Wimborne (FRARS)—Sundays, 25 November (AGM), 7.30pm. Flight Refuelling Social Club, Merley, Wimborne. Sec G4YTA, tel 0202 882271.
Winchester (WARC)—17 November (Talk by British Telecom), 7.30pm. The Log Cabin, Stockbridge Road, Winchester. Sec G3SHQ, tel Twyford 713003.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Tel 01-989 6741.

Cheshunt (C&DARC)—7 November ("Modern tv receiver design", by P. Tingey, BBC), 14 November (Natter night), 21 November (AGM), 28 November (Natter night), 8.15pm prompt. Church Room, Church Lane, Wormley, nr Cheshunt, Herts. There is a club magazine, *Hamster*. Details from Roger Frisby, G4OAA, tel 09924 64795.
Chiswick (ABCARC)—20 November (The new schedule and the IARU Region 1 Conference—discussion), 7.30pm. The Committee Room, Chiswick Town Hall, London, W4. Sec W. G. Dyer, G3GEH, tel 01-992 3778.
Edgware (E&DRS)—8 November (Emmet key evening (dummy load/power meter)), 22 November ("Pro video tape recording", by Alan Masson, G3PSF). The Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Sec J. Cobley, tel Hatfield 64342.
Ealing (E&DARS)—Tuesdays, 7.30pm. Hanwell Community Centre, 71a Northcroft Road, W13 (nets on S9, SU49). Varied interests across the radio spectrum, Apple and Beeb users. Rtty on site. 4 December ("Packet radio", by I. Wade, G3NRW). Sec Anton, G4SCR, tel 01-997 1416. This club has just got back on line after a fire at the club house. They need support from local amateurs.
Havering (H&DARC)—7 November (Informal), 14 November (Surplus equipment sale), 21 November (Informal), 28 November (Details to be announced), 8pm. Fairkytes Arts Centre, Billet Lane, Hornchurch, Essex. Info from G4UQR, tel Upminster 26904.
Hillingdon (HARC)—Tuesdays, 8pm. Treaty House, Uxbridge. This club has recently become affiliated to RSGB and welcomes newcomers wishing to talk amateur radio. The sec is Howard, G6STI, tel 01-561 2917. You will be made most welcome at this new club.
St Albans (Verulam ARC)—13 November (Informal), 27 November ("Operating procedures", by Alan Gray, G4DJX), 7.45 for 8pm. RAFA HQ, New Kent Road, St Albans. Sec Hilary, G4JKS, tel St Albans 59318. This club is holding a "Clubs Contest" on 17 and 25 November. Details from sec.
Southgate (SARC)—8 November (Construction contest and films), 8pm. St Thomas Church Hall, Prince George Avenue, London N14. Details from R. Snary, G4OBE.
Watford (WRC) (RS853552)—7 November (A talk by John Nelson of the RSGB), 21 November (Informal), 8pm. Tudor Arms, Bushey Mill Lane, N Watford. Details from Gordon, G8XXV, tel 01-950 3611.
Wanstead (WRSGBG)—The group has now reformed and hopes to provide a liaison meeting place for all the local clubs in the area. The next meeting is on 18 November, at Wanstead House, The Green, Wanstead, London E11. Details from Tony Martin, G4VIF, tel 01-594 0291.

REGION 20—RR N. F. O'Brien, G3LP, 26 Southfield Road, Gloucester GL4 9UD. Tel 0452 34890.

Bath (B&D ARC)—14, 28 November, 7.45pm. Englishcombe Inn, Englishcombe Lane Bath. Club station G4TMH regularly operating. Full details from Trevor Whitehead, tel Bath 319150, or sec Mike Mason, tel Bath 311046.
Bristol (BARC)—6 November (Aerial theory lecture), 13 November (RTTY night, on the air), 20 November (The good old days of radio), 27 November (Computer night), 1 December (Kingswood Christmas Fare special event station GB4KCF), 7.30pm. YMCA, Park Road, Kingswood, Bristol. Details from Trevor Cockram, G8GFZ, or Alan Williams, G3ZKI, tel 0272 553020.
Bristol (North Bristol ARC)—2 November (Committee meeting), 9 November (Junk sale), 16 November (Horizon electronics open), 23 November (Rag chewing night), 30 November (Talk by the CEGB), 7pm. SHE, 7 Braemar Crescent, Northville, Bristol. Full details from Ted Bidmead, G4EUV, incl advancd morse class by Phil Brouder, G3ZJH.
Bristol (South Bristol ARC)—7 November (Informal talk—"GWR steam engines", by Ron Gardener), 14 November (10m fm activity night, Kevin, G8BDZ), 21 November (Top band activity night), 28 November ("Pocket phones revisited", by Mark, G4SDR), 7.30pm. Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol BS14 0LN. Details from Len Baker, G4RZY, tel 0272 834282.
Cheltenham (CARA)—2 November (Junk sale), 16 November (Natter night), 7.30pm. Stanton Room, Charlton Kings Library, Cheltenham. Details from John Holt, G3GWW.
Cheltenham (Smiths Industries RS)—1, 15 and 29 November. Club House, Newlands, Bishops Cleeve. Full details from Roger Hawkins, G8UJG.
Gloucester (GARS)—7 November ("Get going on 4 and 6m", by G4CIB), 14, 21 and 28 November (Natter nights), 7.30pm. St John Ambulance Headquarters, Heathville Road, Gloucester. Details from Nick Negus, G6AWT.
Portishead (Gordano ARG)—28 November ("Airborne radio systems—continued", by Mr John Park, CAA), 7.30pm. Ship Hotel, Down Road, Portishead. 30 November (Mediaeval evening), Cadbury Country Club, Yatton. Come and meet the wife, £10.50 per person. Full details from John Davies, G3LJD.
Stroud (S&DARS)—6, 13, 20, 27 November (Natter nights), 7.30pm. Scout HQ, Parliament Street, Bisley Road, Stroud. Details from Mike Mills, G3TEV.
Thornbury (T&DARC)—7 November ("2m antennas", talk by G8AZT), 7.30pm. White Horse Inn, Groves End (A38). Full details from Alan Jones, G8AZT.
Weston-super-Mare (WsMARS)—12 November ("Radio technical topics", presented by Mr Walter Titmuss), 7.30pm. Rugby Club (off Drove Road), Weston-super-Mare. Details from Dave Restrick, G4/KA0NGP, tel W-s-M 28482.
Yeovil (Y&DARC)—1 November ("The Mendip repeaters", by G3VEH), 8 November ("Magneto-ionic splitting of radio waves", by G3MYM), 15 November ("A vfo QRP transmitter", by G3MYM), 22 November ("Use of Smith charts in designing gamma matches", by G6XME), 29 November (RAE revision and natter night), 7.30pm. Recreation Centre, Chilton Grove, Yeovil. Full details from Eric H. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, tel 0935 75533.

If your club does not appear above—please chase your secretary.

Members' Ads

CONDITIONS OF ACCEPTANCE

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB only. They must be submitted on the Members' Ad form printed on the back of a *recent* address label carrier used to mail *Rad Com* to the advertiser: this will automatically provide proof of membership and should not be more than two months old. No acknowledgement of receipt will be sent, and advertisements not clearly worded or punctuated, or which do not comply with the conditions of acceptance, will be returned. No correspondence concerning this service will be entered into.

The advertisements must be limited to items of amateur radio equipment or interest, but houses, vehicles etc of which they form part may be included. Items unrelated to amateur radio, including items of citizens band equipment, will not be accepted.

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.

Warning. Members are advised that they should, as far as possible, ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The "purchase" of goods legally owned by a finance company could result in the "purchaser" losing both the goods and the cash paid.

The current rate is £1 for 40 words or less: advertisements containing more than 40 words will cost an additional £1 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

Closing dates in 1984 for issues in brackets, are: **22 November** (January 1985).

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS
Do not post to RSGB HQ or Advertising officer.

FOR SALE

QRT sale: Trio TS930S, mic MC42S, £950. Trio TS830S, SP230, MC30S mic, £575. Edometer Mk2, £25. Yaesu QTR24 world clock, £10. Phones YH55, £6. All boxed, as new, 18AVT-W8, £30. Good cond. Buyers to collect please. G4BXY, QTHR.

Slide, mint cond, £2.50. Small clock radio, unused, £7.50. AM2708 eprom ic, still in sealed pack, £1.50. Telefunken automatic mic, w/shield, service manual, imp, 75Ω freq range 70-18,000Hz, mint cond, £8.50. All offers considered. G6XRB, 38 Old Hall Road, Tingley, Wakefield WF3 1QE.

NATO vhf rx, £45. Tuning units; 36MHz-12GHz, 35mm film monitor unit, reading manuals, £65. NEMS-Clarks range extender, Jaybeam 2XY/2M, new, £30. GC rtty rx, £65. 400 USA military manuals rx/tx. Jennings vacuum variable capacitors. 2C39A valves. RS46829. Tel 0942 55948.

TS120S cw, VF120, PS30, £450. G-whip, 40–10m, £25. All plus carriage. G3UJE. Tel 0565 873205.

10m fm tx/rx LCL 2740FM, as new cond, superior filter fitted, electrically perfect, mic, manual, mtg bracket, £35. Ex-a.m. heavy duty knife-switch dpdt, open type, £5. Class-D wavemeter, 240V operation, manual, £12. G3KZU, QTHR. Tel 0865 63000.

Sharp MZ80K, 48K of memory, comp with i/o box, £300 worth of games and business programs, hardly used, £275 ono. G4KMF, QTHR. Tel Orpington (0689) 29324, evenings, 01-283 5347, daytime.

Collins KWM2A, 516F2 psu, £485. 75S1, 32S1, 516F2, psu, manuals, £450. G4OPF, QTHR.

Eddystone 770U uhf rx, continuous tuning up to 550MHz, exc sensitivity, internal psu, rugged construction, manual, circuit diagrams, leads, etc, new cond, £75. Delivery extra. G4GTU, QTHR. Tel Steve, 09062 76570 (West Sussex).

Ten fm rigs, DNT M40FM, modified to 29·310 to 29·700MHz, brand new, warranted, £33 each. Scooper 2m scanner, 10 channels, £30 ono. Kenwood atu AT130, unopened, £70. G4SNO. Tel 0562 884824, evenings or weekends.

MM transverter, 2m to 70cm repeater version, comp with 10W and 3W attenuators, £165 ono. Unfinished 25W 2m linear, W&D, case, offers? G4IDE rtty system, unbuilt, offers? G8XCL, QTHR. Tel Ian, Lydd (Kent) (0679) 20954, anytime.

Collins KWM2, vgc, best tx/rx 30SI linear, 30LI linear, both vgc, all items used regular. *Wanted:* Vibroplex EK1 brass racer. 60ft P60 hd tower. TH6 or TH7 beam ant. Tel Derby 557705.

Yaesu FT480R, £270. Icom FT4E, £120. 7XY Jaybeam, Hirschmann rotator, £50. Toyo 2m/70cm wattmeter, £25. Toyo 100W 500MHz dummy load, £20. Bench psu for 480R, £20. Much RG213/U Kabelmetal cable, 50p/m. G8BEA, QTHR. Tel Orpington 26469.

Sommerkamp FLDX500 and FRDX500, vgc, spare valves, £225. Will sell tx separately. G6DKE. Tel Sudbury (Suffolk) 73238.

Icom IC240 2m fm tx/rx, manual, £110. Gutter mount cw lead, PL259, λ/4 whip, 2m, £8. G3SZS, QTHR. Tel 0452 713761, evenings.

HW101 hf tx/rx, 100W op, ssb/cw, vgc, manual, power supply, £210 ono, or swap for FT790 plus cash difference or FT780. W.H.Y? Buyer must collect. G1EZJ, 52 Spode Street, Stoke-on-Trent. Tel 0782 46570, ask for Chris.

One Trio JR310, £90. One LAR swl Omni-match atu, £34. Tel Wood, Clochan 378.

Trio TS820S, £375 cash. Transformer, 20–0–20V, 10A, £4. 27V 7A, £3. Creed 7B, ST5 board wkg, £25. 7·5V 10A power supply, £3. 8in dome bell, 24V, £1.50. Buyer to collect the above items. G4NTY, QTHR. Tel 061-790 7673, after 6pm.

Yaesu FT207R 2m tx/rx, NC3 deluxe charger/ac adapter, small charger, helical, λ/4 whip ants, external mic/spkr, all as new, used very little, mainly on rx, bargain at £159 ono. G4GIG, QTHR.

Swap: Jaybeam 10XY beam, as new cond, sell for £35, or swap for 29 fm rig. G6ZOH, QTHR. Tel Harvey, 061-740 7708.

Revox A77 professional reel-to-reel tape deck, HS version, 7·5/15ips, as new, old morse keys, a.m. type D, solid brass, Admiralty buzzer repeater and key unit pattern 1271. G3UQZ, QTHR. Tel 021-373 8806.

Tono 9000, rtty, cw Ascii terminal unit, Centronics port, light pen, exc cond, only £400. Free delivery 50 miles radius Manchester. Pay petrol expenses if further. G5MUR, QTHR. Tel Khee Chan, 061-225 5202, evenings.

Swan 350, vox, xtal calib, 410 vfo, manual, £290 ono. G3TWJ, QTHR. Tel 01-688 3408 (nr Croydon).

Microscope, Baker, London, three oculars, four objectives, turret head, mechanical stage, mirror, condenser illuminator, black & chrome, wood case, £110. Carriage paid UK. G3JMO. Tel Redcar (0642) 486155.

Multi 700E 25W 2m transceiver, mic, £150. FT707, comp with mic, FR707 power supply, £475. FT707 100W version, all mint cond, hardly used, owner reverting to rtty. G3XSZ, QTHR. Tel Reigate 46051, after 7pm or weekends.

Icom IC740 tx/rx, fitted internal power supply, as new, one year old, used little, mostly on rx, going QRP homebrew, cost £900, will sell for £675 ono. G4GIG, QTHR.

MM2001 rtty to tv converter, £100. ATV tx, 70cm, camera lens monitor, £200. G4GIQ, QTHR. Tel Northwich 45584.

PET 3032 computer, accessories, programs, £350 ono. Seikosha GP80A printer, IEEE 488 interface, £120 ono. *Wanted:* CBM 8050 disk drive, 4040 drive, swop or w.h.y? G4ANP, QTHR. Tel 0709 893995.

FT290R, nicads, charger, portable Tonna, £200. Slow scan converter (sstv to fstv) ZL1LH design, homebuilt on pcb, works well, £90 ono. Dr Morecroft, Southampton (0703) 777222, after 6pm.

R600, immac cond, just over a year old, very rarely used, £160 secures. G4MPE, QTHR. Tel Congleton 70594, daytime, 061-499 3355, ext 3202.

Fan, 100V, suitable for FT101, FLDX500 etc, £8. Single swr meter, £7. 6JS6C, Toshiba, used little, matched pair, £8. 10 valves: 6U8 (2), 6AN8 (2), 6CB6 (1), 12AU7 (1), 6BA6 (2), 12BY7A (1), 6AW8A (1), £10. All items plus postage. G4DHE, QTHR. Tel 02572 78630.

Icom IC745, latest hf tx/rx, comp with FL44A ssbn, fm unit, marker, three weeks old, boxed, totally as new, cost £966, accept £735 ono. Deliver anywhere in UK. Tel 01-998 4936, evenings.

BBC 32k morse tuition programs, incl random allsorts, 100 plain language 3min tests, 70 cw abbreviations/punctuation, save/playback of text typed in, output to speaker or oscillator; learn and pass fast! D. Brandon, G4UXD, 1 Woodlands Road, Chester CH4 8LB.

Going QRT. FT101 Mk2, fan, G3LLL clipper, 201 mic, spare driver, pa valve, immac cond, £275. Hygain TH3 Jnr, balun, CDE45 rotator, 100ft RG8U, eight-core control cable, £250. 30ft Hamtower lattice mast, £200. Homebrew 10–2m transverter, £50. 500W d load, £15. Standard radio pi roller coaster, atu, £25. Avo valve tester, £20. Dawe Instruments audio analyser, £10. Heathkit IO18U oscilloscope, £25. RF signal generator, £15. GDO, £15. G-whip 160–80m mobile whip, £10. Various mags. All ono. Tel 0203 471841, after 7pm.

IC720A, cw filter, mic, etc, mint, £700. *Wanted:* Swan Astro 103 bx. Possible exchange? Fraser, G4BJM. Tel 0908 567362.

IEEE488 to RS232C interface for Commodore machines to printer etc, Small Systems Eng Ltd device, £50. Tel Alan, G6IVB, 0734 790373, day, 0734 875166, evening.

Comp Yaesu 757 station. Save hundreds of pounds. 7S7GX tx/rx, 757HD heavy duty power supply, FC757 auto atu, current price, £1,143, offers over £950. All in new cond. Demonstration arranged. Tel Phil, Gravesend (0474) 63224, anytime.

FT101ZD, fm option, fan, exc cond, hardly used, £475 ono. FRG7 rx, exc cond, £125. Search 9, 2m rx, £35. Shure 444D mic, £20. MM144/100S linear, £85. DRAE 12A psu, £50. Dragon 32K, joysticks, software, £85. G4LGE. Tel 0344 773837.

Microwave Modules MMT 432/144R, 70cm transverter, £120. Grundig Satellit 1400, £85. Sony ICR4800 pocket medium/short wave rx, £35. Search 11 2m scanner, six xtals, vfo, £30. Palm four, seven xtals, case, £99. G8IQV, QTHR. Tel Maidenhead (0628) 23738.

Yaesu FT290R multimode, Mutek board, nicads, carrying case, new mobile mount, scanning mic, Microwave Modules 144·30LS linear, charger, £275. Take 25W mobile tx/rx part exchange. G1GUA NOT QTHR. Tel Cosham (Hants) 370576.

FT1, almost new, incl all extra boards, cw filters, fm, memories, nicads, fan, silencer kit, keyer, belonged to the late G4OFS, sadly he did not use it much, new, £1,600, £1,150. FC902 atu, £90. Much more. Tel Alan 0734 790373, day.

Type 558P amateur band frequency meter by General Radio Company, Mass, USA. Believed c.1925, orig, comp in wood case, incl lovely camphor smell! What offers? *Wanted:* info on circuits. Building Russian satellite television reception. G3RDA, QTHR. Tel 0705 594821.

Kenwood Trio R599S all band hf rx, in exc cond, good reason for sale, £160, incl delivery. Interested? Tel 0532 484030, anytime after 6pm, Monday to Friday.

FT707, with fm, £390. FP707 psu, £90. FC707 atu, £75. All vgc and boxed, FV707DM vfo, £90. All ono, or £575 the lot. Datong asp speech processor, £50 ono. Would consider FT757 for the lot. Tel Tim, Reading (0734) 866122.

Shimizu SS105S 10W hf tx/rx, ssb, cw, fm, tx/rx 3·5–30MHz, ideal for transverting, perfect wkg order, looks as new, £275. New FT757GX forces sale. G4ILO. Tel Colchester 572685.

40ft Versatower, post mount, 18 months old, incl top rotator housing, telescope, luffing winches, belonged to G4OFS, was not cemented in, £295. Buyer collects. Tel Alan, G6IVB, 0734 790373, day, or 0734 875166, evening.

Morse keyboard. Oscilloscope, Telequipment S51 or similar. Two valveholders for 807s and/or 813s, also valves. Marine tx for 80m, cw, mcw, Ocean Span or similar. E-Zee Match or KW Supermatch atu twin paddle unit. G4AYG, QTHR.

TS130V, TS120V, FT707S in gwo. Consider exchange for FT290R plus cash. Contact Dr Morecroft (bleep) Southampton (0703) 777222, after 6pm.

Lack of space forces sale: either Collins or Kenwood hf gear must go. Collins S-line 32S3 tx, 75S3 rx, £600. TS530S tx/rx, DFC230 frequency controller, as new, £525. Pye Europa MF5U tx, 70cm, £20. G4RGJ, QTHR. Tel Worcester 421908.

Datong morse tutor, new battery fitted one week before passed my test, use this to pass your morse test, purchased new April 1984, £40. Doug Mackay. Tel 0795 535186.

Icom IC25B 2m 25W fm mobile, scanning mic, vgc, £160. G6YHE, QTHR. Tel 09323 49187.

Trio TS820 hf tx/rx, 240V, 12V digital freq display, cw filter, £290. G4IAG, Woodview, Breach Oak Lane, Corley Ash, Coventry.

Shack clearance: hf chokes, wide-spaced tuning condensers, hf thermocouple meters, 3 and 12A, milli-ammeters, voltmeters, all ranges from 1mA to 7,500V dc. All panel type. Tel 08277 2348.

Welz CP5 trapped vertical antenna, 80–10m, not WARC, comp with radials, £70 ono. Prefer buyer to collect or carriage extra. Swops considered. G4TMO. Tel Swindon (0793) 783461.

Trio 7800 2m 25W fm mobile/base station, hi/low power etc, orig packing, manual, £175. G4UAW, QTHR. Tel 09062 2594.

Lattice mast, 4 × 10ft sections, £10 each. 2 × 9-el fixed Tonnas, £10 each. 144MHz Tonna, two-way power splitter, £20. G6NMK, QTHR. Tel 0366 388713.

TS530S 100W 160/10m tx/rx, few hours use only, £395 ovno. FT77S 10W 80/10m tx/rx, hardly used, fm, £335 ovno. FT790R 70cm multimode, matching FL7010 10W linear, unused, £255. All mint without mods. Tel Ken, Dunstable (Beds) (0582) 606983.

SEM Transmatch tuner, 160–10m, Ezitune fitted, £65. 2DYM six-trap dipole for 40–20–15–10m, not used in open, £50. Sephton, 16 Bloemfontein Avenue, Shepherds Bush, London W12 7BL. Tel 01-749 1454.

Yaesu FR50B rx, vgc, £50. HF5V vertical antenna, 10–20m, £35. Sig gen, £10. Tel Southampton (0703) 843746.

JIL SX200N scanning rx, 26–512MHz, comp with power supply, all accessories, manual etc, unmarked, vgc, £190, including mainland p&p. G4TXA, QTHR. Tel 0257 424593.

Over 1,200 radio, tv, etc service sheets for sale. Best offer secures. Sephton, 16 Bloemfontein Avenue, Shepherds Bush, London W12 7BL. Tel 01-749 1454.

2m six-over-six skeleton slot antenna, pole, remote turning control gear, all cables, £35. Heathkit RF1V sig gen, mint, £28. East Kent location. G8BJP, QTHR. Tel 0843 31069, evenings.

Drake C-line, R4C rx, T4XC tx, M5-4 psu, matching separates super cond, realigned, new valves, etc, £575. Trio TS520SE hf base rig, exc cond, £375. FRG7 rx, vgc, £125. Liner 2 ssb 2m mobile, vgc, £65. Tel Dave, Hornchurch (04024) 57722.

Welz diamond CP5 trap vertical, 80 to 10, five self-supporting radials at 90°, ok on balconies or mast, weight 10lb, height 177in, radials 71in, well engineered, one year old, £75. G3HKH. Tel Weybridge 47112.

FDK430 expander (70cm transverter for the FDK750E), £175. Would consider parting with my FDK750E to drive the above in part exchange for another 2m multimode rig. MML 432/50W linear/preamp, £80. Jaybeam MBM 48/70cm, £20. Jaybeam 14-el long Yagi, 2m horizontal eight-el vertical, could be split to make two separate antennas, £20. G4WAS, QTHR as G8MPB. Tel Ken, Bloxwich (near Walsall) 75057, anytime.

FT901DM, immac, replaced by 902, £500. G2RO, QTHR. Tel Kingsbridge (Devon) 580616.

Crowbar protection for 12/24V, psus to 50A max, full kit, instructions, £12.50 each. Large Variac, 20A cont, 0–270V, £35. Few Pye AM10D Cambridges, dashmount, high band, vgc, £25 each. G3LGK, QTHR. Tel 0773 833142 (Derbyshire).

Trio TS130S, used little, exc cond, mic, swr/power meter, five-band G-whip antenna, £460 ono, or exchange 2m handheld plus cash. G4RDU, QTHR. Tel Leigh (0942) 729516.

Kenwood TS530S, perfect cond, used very little, reason for sale, no time to operate! Rig has 10m i.f. output on rear for transverter but no time to build transverter! Reluctant sale, £480. G4RKF, QTHR. Tel Brian, Oxford (0865) 66466/244600.

FT707 tx/rx, £325. FP707 psu, £90. FV707 ext vfo/memory, £90. FC700 atu, £60. YM36 mic, with scan control, £20. All vgc. Comp system, £550. Can be seen working. G4MD. Tel Paul, Kidderminster 743641.

Trio 2200G, nicads, charger, xtalled R0, RR0, R4–7, S14, S20–23, 144·800, serviced by Lowe

Electronics in February 1984, perfect wkg order, £80. Buyer to collect, or agreed carriage extra. Mk3 19 set, any offers? G6EDD, QTHR. Tel 0763 42876 (Herts).

Cortex 16 bit computer (Powertran), 64k ram, superb 24k Basic, cassette, RS232 interfaces, professional keyboard, attractive metal case, documentation, F'disks can be fitted internally, cost £350, asking £225 incl carriage. G4LKI, QTHR. Tel 0963 70587, evenings, before 9pm, or weekends.

R820, Trio Kenwood communication rx, transceives with TS820, immac, £350 ono. G3GIQ, QTHR. Tel 01-567 6389.

Good home wanted for homebrew valve equipment: hf band rx, Electroniques, turret tuning. Top band tx/rx, a.m./cw. Free to callers. G3OSU, 20 Stembridge Road, SE20. Tel 01-659 3237.

Sommerkamp TS788DX, 28-30MHz multimode tx/rx, 170W p.e.p., scanning spkr mic, £200. Linear amp, 3-30MHz, variable input, 200W p.e.p., £50. G6YOG, QTHR. Tel 01-668 8459.

Icom IC740, as new, fitted internal psu, £590. SM5 desk mic, £17. HW12A single band tx/rx, ac/dc supplies, mic, mobile bracket, vgc, spares, £125. GM3MQO, QTHR. Tel 0292 79245.

Yaesu FRG7700, good cond, service manual, £230 ono. *Wanted:* Junkers hand key. G8HNN. Tel Worcs 20742.

FT102, fm board fitted, £500. FL2100Z linear, £350. FTV107R transverter, 2m module fitted, £50. MD1 desk mic, £25. FF501DX lowpass filter, £12. All approx 1yr old and well looked after. Buyer to arrange collection. Tel Wrexham (0978) 262718.

Yaesu FRG7700 rx, a.m., fm, ssb, cw modes, exc cond, one owner, £200. G4ZHB. Tel Southampton 555025, evenings.

FT767 Sommerkamp (Yaesu FT707), eight bands, 10-80m, £295. 8·5in teleprinter paper, £1 per roll. Two 12ft, 2in diameter aluminium poles, £10 each. G6VS, 71 Hey Park, Huyton, Merseyside L36 6HS. Tel 051-480 6603.

Microwave Modules 70cm linear, 432/30LS, 1W or 3W input, 30W out, £95 ono. Mobile mount for FT290R, £15. Both mint and boxed. G6LZO, QTHR. Tel Bradford (0274) 679754.

Trio TR9000, 2m all modes, hardly used, £250. G8KHI NOT QTHR. Tel Robert, Stevenage (0438) 728022.

KW2000, KW psu/spkr unit, spare set of valves, modification instructions, handbook, £150. Omega (G3WPO Comms) i.f. board, QRP pa, cw filter, preselector, logic switching unit, S-meter, all professionally built, £100 ono. G6RDU, QTHR. Tel Malvern (06845) 68676, after 6pm.

HQ1 minibeam, incl spare spokes, balun, good cond, used little, £65. Prefer buyer inspects/collects. G3RLN, QTHR. Tel Tewkesbury 296769.

Trio TS130V, VFO120, SP120 psu, narrow filter, deluxe knobs fitted, Daiwa CNW419 atu, all in Trio display frame, mint, £550 ono. Hi-mound autokeyer morse key, £45. HF5-HF vertical, £30. SR9 vhf rx, £30. G4OUR NOT QTHR. Tel 021-550 7440.

Trio TS430S fm board, filters, mic, immac cond, cost new, £870, hardly used, still with eight months' guarantee, £650. Reason for sale, need cash for TS930S. G4WDZ NOT QTHR. 4 Buckley Road, Eynesbury, St Neots, Cambs. Tel 0480 218032.

Icom IC720A, cw filter, immac, £650. ICPS20, £120. Shure 526T, £45. MM 50MHz converter, £25. Shinwa CP80 dot matrix printer, £150. RA17, £120. HQ1 minibeam, £65. All items ono. G3EFB NOT QTHR. Tel Maidenhead 75567.

MML 144/100LS 2m amplifier, 1/3W input, 100W + output, 12V supply, as new, recently retuned (under guarantee) at factory, £125, incl carriage. G4LKI, QTHR. Tel 0963 70587, evenings before 9pm, or weekends.

Standard C58, CPB58 25W linear, mobile mounting tray, comp 2m set-up, £280 ono. G. Rusby, G6AHS. Tel 0296 34455, 9am-5pm, or 084421 4886, after 6pm.

FT725RVH, 2m fm mobile, used once since new, dealer fitted pa, 25W, 12·5kHz spacing, four memories, scanning, priority channels, 144-146MHz, comp with base mic, mobile antenna, £125 ono. G4MGD, QTHR. Tel Ashley, Canvey Island (0268) 685160.

Trio R820 rx, amateur and bc bands, this rx has the lot, i.f. shift, vbt, notch filter etc, mint cond, £375. 7ft glassfibre 2in diameter tube, mil spec, £15. 70cm 18-el Parabeam, new, £25. Hi-Q hf balun, new, £9. 400 Ω non-inductive resistors, 80W, eight make 640W dummy load, £2 each. All items are in superb cond. Carriage extra. Tel 0202 522796, after 6pm.

IC2E, used little, exc cond, orig packaging, boxed, manual, circuit diagram, belt clip etc, £120 ono. Tel David Mason, Standish (0257) 422951.

FT200, FP200, all 10m xtals, good cond, wkg well, £200. Buyer collects/arranges carriage. G4LUF, QTHR. Tel Swindon 782787, after 6pm.

FT101Z Yaesu hf tx/rx, recently overhauled, new output valves fitted, £375 ovno. G1EOO, 219 Moor Lane, Chessington, Surrey. Tel Ray, 01-397 9403.

FT901DM, used little, as new, orig packing, not WARC, fm, fsk, memory, audio processor, iambic keyer, mains, battery, psus, £450. G4LEV. Tel Brighton (0273) 27571.

Kenwood TS120S, noise cancelling mic, cw filter, exc cond, £310. Trio 2300, nicads, charger, helical, £105. Yaesu 227R, £120 ono. Kenwood 820, cw filter, good wkg order, £360. GW3XJC. Tel 0656 733729.

Trio 2500 2m handheld, used little, £180. Tel Jim Hanna, Ballymena (0266) 891408, evenings only.

Tandy TRS80-3 computer, 16k ram cassette loading, provision for internal single or dual disc drive, expansion to 64k ram, boxed, as new, all user manuals, £300 ono. G8XOY, QTHR. Tel 021-308 5875.

FT101E, mic, leads, cw filter, £350. FV101 vfo, £75. FC301 atu, £75. YD844 mic/stand, £35. Trio 2400 2m handheld, charger, £150. GW4VUC. Tel Cwmbran (Gwent) (06333) 4577.

FT401B, new pas, fitted by main agents, as new, 560W input, handbook, box, could deliver from Penzance to Aberdeen, main road, £250 ono. G4XCV. Tel Martin, Penzance 788652.

Free auto base charger/power supply, NC8, if you purchase both of my synthesized handhelds for £300 or individually FT208R nicads, charger, £160. FT708R, 70cm, nicads, £160. NC8 charger, £35. VGC, boxed, handbooks. G4MBZ, QTHR. Tel Farnborough (0252) 837581, evenings.

HQ1 mini beam, nine months, £65, or exchange five-band vertical, HF5V with radials, CP5, or similar. Tel Pete, 04555 57263 (Leics).

Drake R4C rx, vgc, incl 1·5kHz filter, 160m xtal, manual, matching Drake spkr, one of the best rxs ever made, £280. G4IDL, QTHR. Tel 0709 874100.

Standard C5800 multimode, 2m, 25W, boxed, mint, never used mobile, £250 ono. FT101ZFM Mk3, WARC, transverter, 300Hz cw, fan filter, 10 fm narrow filters (rx), noise cancelling mic, mint, hardly used, £510 ono. Swiss quad, unused, £30 ono. GM4MOA, QTHR. Tel 0542 32093.

Z-Match, professionally built, Hamgear preselector PM11DX/78, offers. G4MU, QTHR. Tel Northampton (0604) 582951.

Yaesu FRG7, immac cond, incl pair Ross headphones, £145 ono. G8XRE, QTHR. Tel Eastleigh 619722, ext 345, business hours, Hythe (Hants) 842704, evening.

Clearout: scope 546, £125. Philips vvm 1GHz head, £25. Avo vvm, £10. PDP8S, tally reader, £110. UK101 8k, £25. Radar altimeter, £10. 62 set tx/rx, £10. 12-18GHz microwave bits, vhf tx/rx bits, hf linear kit, £15. Tel 0705 596058, evenings.

Fifteen comp volumes *T & R Bulletins,* issued between 1927 and 1950, also some incomplete volumes, eight complete volumes *Radio Communication,* 1975 to 1982, three complete volumes *Shortwave Magazine* 1947 to 1949. G5UY, QTHR. Tel Redhill (Surrey) 62689.

Eddystone 940, almost mint cond, some spare valves, circuit diag, hardly used, £110 ono. *Wanted:* linear amp, preferably FL2100Z, or others considered. G3OFJ, QTHR. Tel Headley Down (Hants) 712947.

Yaesu YR901 cw rtty reader, Ascii, Yaesu YR901 keyboard, VVM1 monitor, £350 the lot. Buyer collects or carriage extra. Icom 2E, ICBP3, ICDC1 packs, £100 ono. G4OWM, QTHR. Tel 01-647 8399, after 5pm, anytime, Friday-Monday.

Trio 9130, as new, £350 ono. Commodore 64 logbook programs, stores dates, times, callsigns, modes and frequency in log type columns, pages and tape files, will search page files for callsigns, comp with full instructions, £4 each. GW6UWU, QTHR. Cheques payable to R. P. Wood. Tel 028 686304.

Trio 2300, comp with case, nicads, charger, no mods, never opened, gwo, boxed, one year old, £95. G6ZHE, QTHR. Tel Richmond (Yorks) 3489.

Complete hf station: Heathkit SB303 rx, SB401 tx, matching SB600 spkr, multi-band vertical, 60ft of coaxial cable, £300 the lot. G4TPM, QTHR. Tel 01-953 0991.

R216, ex-Army, 19-157MHz, a.m./fm/cw, ac psu, handbook, good cond, £85. Automatic atu, 30-76MHz, 0·5-70W, handbook, £95. Plessey C42 S/No3, £40. Pye AM10D 6ch on 70·26MHz, exc cond, £30. Lattice tower, 30ft, base, integral climbing rungs, £95. G4NCE, QTHR. Tel 021-357 6139.

KW Vespa tx Mk2, comp with psu, Shure 444 mic, KW E-Zee Match atu, good cond, 6LQ6 in pa, £125. G4MVS, QTHR. Tel 01-644 8249.

Grundig Satellit 3000 21-band communications rx, digital freq display, field strength meter, built-in ssb unit, 24h quartz lcd clock, superb 7·5W audio output, £140. Two Pye Cambridges, unmodded, £20 each. Tel Stockton (0642) 583572.

Heathkit SB630 station console, comprising 24h clock, swr bridge, phone patch, identification timer, all in one neat unit, £25. *Wanted:* Collins vfo type 312B5 (please, somebody must have one to spare!). Good home promised! GI4GNZ, QTHR. Tel 0266 880740.

Publications: few copies *Amateur & Popular Wireless,* 1924, 1925; *Wireless Construction* 1924; *Radio News* (USA), 1924; instruction books AR88D; Admiralty tx 87M(8C); TCS15; Burndept BE201; test equipment IE-19-A (USA); Creed 75 printer; 47 tape printer; reperf attachments; cam unit type 3; Marconi sig gen TF144H; Marconi rx CR150/3; *Rad Coms, SWM* 'seventies—'eighties; *Wireless World* 1945-65, excluding two copies, including six bound volumes. Highest bids take, plus post. G3LSD, QTHR. Tel 0752 51245.

300 baud acoustic coupled Modem RS232 output, £45. RS232 interface for Spectrum (Maplin), £15. RTTY decoder, comp with eight-digit display, manual, list of frequencies, £50. G6VQW, QTHR. Tel Leamington (0926) 25430.

FT902D, SP901 matching spkr, mint cond, cw orig packing, £560. Daiwa RM940 remote mobile mic, cw windshields, £20. Bremi 10m 40W amp, £20. Yaesu YD844A desk mic, £12. All in A1 cond. G4RRN, QTHR. Tel 0263 512736, evenings.

Sagem asr tty and rtty tu, 45/50/75 bauds, 70 rolls paper, wkg, incl micro interface, £50. Printer matrix, 300/150/50 bauds, Ascii or baudot (switchable), £75. Keyboards, ex-computer, 86 keys, good for micro/rtty uses, £5. G4PEY. Tel Horsham (0403) 69835.

FT480R, comp with box, manual, mobile mount, 6A psu, 5/8 2m mag mount, T-tone, all hardly used, £285. Cushcraft 14-el 2m boomer, UR67 feeder, connector, exc cond, £45. G8DJQ. Tel Witnesham (nr Ipswich) (047385) 719, evenings and weekends.

Hitachi Shibaden professional electronic view finder camera model FP71U, £85. Fujinon C-mount zoom lens, 1:2/14-70, £38. 30ft antenna tower, £50. G4UVZ, QTHR. Tel 0823 42751.

SX200N scanner, £225. Hameg HM307 10MHz scope, £125. Both mint, boxed, with manuals. Dymar fm hand portable, xtalled 164MHz, spare battery, charger, ideal for 2m, £30. AR88D, £40. X-band snap varactors, £1 each. *Wanted:* FT790 or similar. G8GTD, QTHR. Tel Belper 820445.

Icom R70 with fm and Yaesu atu, as new, £350. Tel Colchester (0206) 851343.

Trio 9000 2m ssb/cw tx/rx, 10W, previous model to 9130, mint cond, £270. Yaesu FT7 10-80m ssb/cw tx/rx, 10W mobile/base, full 28-30MHz coverage, vox, £250. Yaesu FL110 hf linear, 10/100W, 12V, £120. Racal RA117E gen cov rx, case, £250. RA218, matching sideband converter, fine tuner, £50. MA79 matching tx unit, £250. MA152 matching swr meter, trip unit, £30. Set of 25 new spare valves for 117E/79 series, £40. CT501 16-215MHz wobbulator in 14 ranges, designed for RA117/MA79 series servicing, £120. Cossor CDU150 30MHz dual beam scope, £180. Marconi TF801D 10-480MHz sig gen, £180. All items ono or carry locally etc. Most handbooks supplied. G4PXW. Tel Maidstone (0622) 51844, after 6pm.

Cushcraft 432-20T cross Yagi, 435MHz centre tuning for Oscar 10, brand new, £35. Ringo Ranger 2 2m new vertical, £36. G4XHF. Tel Crawley (0293) 515201, evenings.

"Making your own linear": Heath SB220 outer cabinet, front and rear panels, switches, fan, matching knobs, offers. Comdel speech processor, as new, £20. Electro-voice 600D dynamic mobile mic, bargain, £15. 4X150A valves, new, and used, offers. G3DAM (Evesham).

RX, National Panasonic DR29, mains battery, digital display on lw, mw, vhf/fm, sw to 30MHz, a.m. and ssb, two bandwidths, can also be used as an intercom pa, £130 ono. G4XIV NOT QTHR. Tel 0904 792208, weekends.

TR2400 2m handheld, charger, nicads, case, mint cond, £125. Yaesu FRDX400 amateur band rx, hf, 2m 6m, exc cond, £100. G1IYJ. Tel 01-391 0514 (Surrey), evenings.

Yaesu FT10Z, £450. FC902, £100. FRG7, £120. All with boxes and instructions. G4LAY. Tel Grimsby (0472) 825834.

FT707, FC707, TB3 three-el tribander, KR600RC, coaxial, rotator cable, beam, rotator, two months old, £595. No jesters please. G4WNO. Tel Bill, 0908 368761.

FTDX401, two spare pa, mic, Z-Match, £165. SC146A 2m port nicads, £40. Avo 8 Mk5 case, new leads etc, £70. HF5, 80-10, radial kit, near new, £45. 2m mobile 6ch, 25W, £35. 2 x 70cm pocket-phones, nicads, one set fault, £30. JVC port tele, radio vhf/mw/sw, mains/12V or battery, £70. G3OJA, QTHR. Tel 061-445 1026.

HW100 Heathkit hf tx/rx, 10-80m, SB600 spkr, HP23 power supply, Shure insert mic, handbook, in good cond, in regular use, £130. G4RSC, QTHR. Tel Reading (0734) 871330.

AR88, wkg, two manuals, AR88, and AR88D, buyer arranges collection, £30 ono. G4SZE, QTHR, 115 Musgrave Road, Bolton, Lancs BL1 4MW.

Yaesu FP700 ac psu, £80. TET MV3BH three-band vertical, unused, £25. Free delivery W Midlands area. G4SDK. Tel Pete, 021-300 7438, office hours.

Icom IC240, new cond, comp with manual, £80 ono. G6PEJ. Tel Alsager (09363) 5628.

FL200B ssb tx, FR100B rx, £185. HQ1 mini quad, 10-15-20m, £50. Bush solidstate bw 20in televison, £10. All in gwo. G4OOW, QTHR. Tel Hinckley (0455) 612091, after 6.30pm.

TS430S, purchased from approved supplier, fitted with all filter options plus fm, cost at June prices £920, carriage extra. No offers! G4LZK, QTHR. Tel 073-73 61426 (East Surrey).

Trio 2300, cased, nicads, charger, helical whip, boxed, 5λ/8 magmount Jaybeam, CS/2M colinear feeder, 10dB Pye pa module, £200. Murphy B40 communications rx, £60. STE AT222 2m a.m./fm/cw tx, speech compression vfo/xtal, 1W, QRP, £60. AR20 vhf a.m./fm/vfo/xtal rx, needs new CA3089 i/circuit to repair, cased, deviation and S-meters, needs completion, £50. Eddystone 358X spares, £20. G3RKK rx for repair, £30. Valves incl QQVO6/40, QQVO3/10, £30. Avo 7, £5. Other spares. G8OYY NOT QTHR. Tel Jerry, 0342 24397, evenings after 6pm, weekends.

Trio TR9130 2m 25W multimode, one-year-old, £350. Datong PC1 gen cov converter, £90 ono. Selling to buy hf rig. Tel Little Chalfont 3720, ask for Terry.

Trio JR599/TX599 Custom Special matched separates, comp with SP5D spkr, connectors for tx/rx operation, 2m converter for rx and manuals, all in orig packing, £325. G4BRG, QTHR. Tel 01-529 3803.

Vic 20 computer, connecting cables, ics eprom software program for rtty, cw, Amtor, Ascii, £85. G6PO, QTHR. Tel 0253 885893.

SSTV monitor (5FP7) Spacemark, incl test cassette, circuits, connects to ls socket, exc cond, £47.50 ono. Clearance, 5λ/8 and λ/4 Bantex mobile antennas, λ/4 bnc whips (IC2E?) at cost prices. SAE list. G6IYD, QTHR. Tel 0233 22506.

Drake MN7 atu, £75. TR2300, £85. 2m eight-el Yagi, as new, £8. AR40 rotator, control box, £35. Pair 8in CDC disc drives, cased, psu, can be seen working, £200. G3XXM, QTHR. Tel Biggleswade 315440.

TR7010 2m ssb/cw mobile or base rig, £65, or swap for 8271 disc controller for BBC B computer. G4VHF NOT QTHR. Tel Bedford 751763.

Loose leaf valve manuals, three Ediswan, three Mullard, four RCA, two Ferranti, five *Radio & Television Servicing,* one folder blueprints, two 350mA rf meters, matching pair, new, two roller coasters, one hf, one lf. G3OXV, QTHR. Tel Daventry 702265.

FT101/FL277, exc quality leather carrying case specially made for Yaesu FT101 (any model) or Sommerkamp FL277, lockable (with keys) and with carrying handle, £25. Taylor, G3UCT, 8 Government House Road, York YO3 6LU. Tel York (0904) 28777.

Belcom LS20/XE handtalkie, 1W, 500, 100mW, only used since February, boxed, immac cond, still under guarantee, comp with soft case, rubber duck, and two sets of brand new nicads, £110 ono. Buyer collects or will send. GM4YED NOT QTHR. Tel 0383 824382, after 5pm.

B2, psu wavemeter, psu rf unit 24, fifty years accumulated junk, suit constructor or museum, offers. G3DU, QTHR. Tel 01-997 7514.

Shack clearance: Kenwood DM81 dip meter, £20. Marconi valve voltmeter, £15. MM 70cm 2m converter, £10. Resistor substitute boxes, 1Ω-1mΩ, £5. GWM 2m tx/rx boards with data etc, £10. Marconi valve deviation meter, offers. G6PLL, QTHR. Tel Arundel 882662.

Yaesu FT227R 2m fm tx/rx, fully synthesized, exc cond, £110. G8JEN. Tel Romsey (0794) 513208.

Hilomast mast, pneumatic, telescopic, three section, 35ft fully extended, many extras such as guys, brackets, stakes, etc, £325. FT207R, only £85. G4JYH, QTHR. Tel 01-886 0126, daytime.

Regency M100 scanner, 66/512, mains/12V dc, £100. Pye air band mobile, 129·7, AM10B, £40. AM10D glider band mobile, 130·1, 130·4, £50. GEC mains base station, 130·1, 130·4, small neat set, £50. GU3HKV, QTHR. Tel 0481 47278, 6/7pm only, please.

Yaesu SP102 spkr, nearly new, £35. Trio SP230 spkr, £15. Mizuho APM1 bandpass and notch filter, £15. All items plus postage. Sony ICF6700W rx in good cond, a.m./ssb/cw, sorry no information on that model, buyer inspects and collects or carriage extra, £125 ono. R. N. Carrick, 31 Fairfield Lane, Barrow-in-Furness, Cumbria.

IC2E owners. Just returned from JA-land with IC2E dc-dc converter, mobile mount, built-in 25W amplifier, would make good base station conversion. Hi-low power switch, 3A on transmit, no more flat batteries, £98. G4OBN. Tel Stewart, Basingstoke (0256) 83528.

FT290, mobile mount, charger, £150. MM144/30 linear, both used little, £35. Trio MC50 mic, £18. Datong D75 processor with ps, £25. Packer AT145 2m atu, £12. Five-el 70cm quad, £10. 10m flexiwhip with 15m, 40m coils and mount, £20. Tonna 3·7m portable mast, £12. CPV5M-2M base colinear, £12. SMC25B 70cm mobile, £7. SMC78SF 7λ/8 mobile, £9. All in new cond. Tel Dunstable (0582) 606983, mornings preferably.

KW2000B, psu, Shure 201 mic, vgc, orig packing, £190. Buyer collects or pays carriage. G3KMR, Etal, Cornhill-on-Tweed, Northumberland TD12 4TR. Tel Crookham (089082) 306.

FT290RD, Mutek front end, flexible whip, nicads, charger, soft carrying case, mobile mounting bracket, 20W modular electronics linear, 7λ/8 Oscar mobile antenna, Altai swr meter, £240, the lot, but will split. G6PLL, QTHR. Tel Arundel 882662.

Yaesu FRG7000 digital display, gen cov communications rx, handbook, orig packaging, very good cond, £145. Microwave Modules 144/28MHz converter, good cond, £10. Stephens James Mk2, multituner atu, good cond, £12. All ono. Tel Hagley (0562) (West Midlands) 886272.

FLDX400, FRDX400S, superb performers, as new, incl spkr, £250. Buyer collects. LP filter, £6. Cowl gill motor, power pack, £25. CT432 xtal calibrator, £15. Other gear. G3IPM, QTHR.

AR88D manual and spare valves, £50. Marconi TF995A/2 vhf sig gen, £75. TF1041B valve voltmeter, £30. Hewlett Packard automatic noise figure meter, £40. Valves QQVO2/6, QQVO3/10, QQVO3/20A, QQVO7/50, all items good cond. G4AEQ NOT QTHR. Tel 0522 682272, after 6pm.

Racal RA117E hf rx, rack mounting, exc cond, technical handbook, £200 ono. Buyer collects. Taylor, G1CHD. Tel Lutterworth (04555) 2781.

Two hf linears, one Maxline ML212 a.m./ssb preamp, input 1/10W, output 7MHz/100W, 14MHz/85W, 30MHz/50W, four output settings, £60. Second linear Zetagi B70 26-30MHz, a.m./ssb, 60/120W, £21. Written output details for Maxline, sae. G4WLD. Tel John, 01-857 8096.

Collins 75S3B w/e fetrons, 1·5, 0·5 filts, makes rice-boxes look rubbish, £250. G3UQH, QTHR. Tel 0743 81425.

Mains transformers, four, rs universal, standard primary, secondaries (twice) 1V, 3V, 9V, 27V, all at 1A. *Wanted:* cheap Z-Match or components for hb. G4XMK NOT QTHR. Tel Oxted (08833) 4718.

Rad Com, comp 1959-80 incl, offers. N. C. Billingham, 16 Crowborough Road, Saltdean, Brighton. Tel 0273 37100.

6883B/8032A/8552 RCA valve, 12V 6146, unused, £4. Hi-imp desk mic and stand, £8. Audio generator, 10-100k battery driven, £25. Teleprinter rolls, two-ply, £1 each. Black ribbons, 75p. Mobile magnetic mount, £5. Sun 5λ/8 2m whip, £5. G3RDG, QTHR. Tel 01-455 8831.

Comp hf station, used receive only, Icom 730, gen coverage tx/rx, mic, Icom PS15 power supply, Yaesu FC707 atu, boxed, full instructions, all as new, £650 ono. G6ZVI, QTHR. Tel Bolton (Lancs) 56992.

Andrews spun aluminium dish, 1·8m, 0·25F, support spider, el-az mount, horn support tripod, £275. BW video monitor, 18in, video and sync inputs, suitable satellite tv, £14. Sanyo micro cassette recorder, new, hardly used, £26. G3CQU, QTHR. Tel 01-660 5474.

Bird Thruline model 43 wattmeter, £85. Plug-in element, 2-30MHz, 250W, £25. Trio YK88C, 500Hz cw filter, £22. YK88SN narrow ssb, £24. Both new, boxed, Shure 201 hand mic, £10. Buyer collect or postage extra. Tel 0635 22680 (Berks), evenings.

Copper switchgear wire, pvc covered, unused 100m reels, 2 x 6mm² 48A, £10 each. 2 x 10mm² 68A, £15 each. 5 x 1mm² single, £3 each. £50 the lot. G4XMK NOT QTHR. Tel Oxted (08833) 4718.

Bearcat 220FB vhf/uhf scanning rx, 20 memories, good cond, £150. ZX81 computer and accessories, hardly used, £30. Inspection welcome. Buyer collects or pays carriage. BRS40217. Tel Derek, 0689 31028, between 7 and 9pm please.

Gem quad, two-el antenna, balun, £100. *Wanted:* HF linear, KW1000 or KW600 preferred, but others welcome if price is right. G4MHS, QTHR. Tel 0303 50652.

Free Sony 405 bw reel-to-reel video tape recorder if you buy Sony 405 tv camera, lens, Sony 405 bw tv/mon, cables, two tapes, mic, spare videcon, vtr needs slight attention, £50. Buyer collects. G3JDK, QTHR. Tel Wickersley 541606.

Yaesu FT707 and FC707, £385. 25A 13·5V psu, £45. Sony ICF2001 rx, £85. G6GXO, QTHR. Tel Charlie, Harlow 417791.

Icom ICR70, immac, no fm, orig packing, used about 3h, save over £100 on new price, £450. Little. Tel Penryn 73636, office hours, Falmouth 319045, evenings.

Yaesu FT208R 2m handheld, charger, nicads, case, good cond, original boxing, £140. Reason for sale, poor student needs to boost grant. GI6PBA, QTHR. Tel Paul, Belfast (0232) 615424.

Daiwa CNA1001 automatic atu, all bands, 3·5-30MHz, £100 ono. 2m linear MML144/100LS, 1 or 3W in, 100W out, preamp, £110 ono. G4VMX, QTHR. Tel 0908 611906, evenings.

FT757GX, FC757AT, few months old, boxed, £825 ono, or will part exchange for FT902DM or FT101ZD with fm or w.h.y? Also require G4MH mini beam. Tel Rugby 815506.

FT767DX, FC700 atu, both vgc, will split, £390 ovno. G4JNE NOT QTHR. Tel 0733 239143.

Drake TR7A tx/rx, HP7 psu, in exc cond, genuine reason for sale, G4MH minibeam, £45. G4DIC, QTHR. Tel Hinckley 636315.

Icom IC451E 70cm all modes, immac cond, £450 ono. Tel Groves, 0923 43650, after 8pm.

FDK Multi 700EX, vgc, ideal 2m mobile, very rugged, all leads included, offers in region of £130. G6LLN, QTHR. Tel Ian, 0328 3307, after 6pm.

40ft tiltover telescopic tower, framed base type, Westower 2S/FBP, requires 1m³ concrete base, mint cond, only two years old, genuine reason for sale, cost new over £500, accept £350 ono. Buyer arranges transport. G4OCO, QTHR. Tel 0295 61534.

Yaesu FT7 tx/rx, mobile mounting bracket, £235. Trio DM800 dip meter, 0·7 to 250MHz, £35. Tel 04536 3994.

Alda 103 American mobile tx/rx, 80, 40, 20m, manual, £195. Eddystone 880/2 rx, 0·5-30MHz, 30 bands, £200. Standard C5800 2m fm, ssb, as new, £300. Trio TM401A 70cm fm, £280. Part exch? *Wanted:* FT480, FT7, SX42 rx. G4AFY, QTHR. Tel Kidderminster 753358.

Liner 430, Liner 2 matching hb psu, £150. 700E, £110. Burndept uhf tx/rxs, 12V, 5W, one wkg RB0, £40; one wkg, no xtals, £25. MM 70cm converter, 144MHz i.f., £10. 2m converter, 4-6MHz i.f., £10. G8GON. Tel Exmouth (0395) 264872.

Linear amplifier with preamp, Lunar model 2M30-160P for 2m, up to 25W in, 160W out, new, unused, £130. Tel 0624 22342, evenings.

Datong morse tutor D70, £35. G4VUX. Tel Graham, Watford (0923) 776254.

2m 100W pa, Microwave Modules MML 144/100, as new, £95. Tel Petersfield (0730) 64059, evenings.

FT290R 2m all mode, carrying case, charger, nicads, mobile mount bracket, Mutek preamplifier, £215. G4RRG. Tel Worcester (0905) 352110.

Fully operational Drake station: stroke victim now unable to operate. T4XC, AC4 ps, R4C, 15 sw bc xtals, 1·5 cw filter. YO100 monitorscope, modified for R4C, MS4LS, Comdel speech processor, ps, two pairs unused matched 6JB6 pa valves, unused co relay, operating manuals for all units, buyer collects, seen working, comp, £650. G2ALO, QTHR. Tel Storrington (West Sussex) 2146.

FT101Z nine-band, fm, comp with fan, desk mic, spare (new) valves, cond as new, £390 for quick sale. G4LVP, QTHR. Tel Hitchin (0462) 58728.

Marconi CR300 rx, 15kHz-25MHz, variable bandwidth, exc cond, variable voltage power supply, circuit diagram, ideal first receiver, sensible offers accepted. Tel Chertsey 64796.

Electronic keyer with memory, side tone, volume control, £25. Antenna noise bridge, £5. Audio signal generator, £5. Heathkit gdo up to 60MHz, £10. Approx 40ft of 5/8in 52Ω coaxial, never used, £6. Very heavy 12V 20A transformer, £3. Standard 19in panel, undrilled, cabinet, £3. Various BBC computer tapes, 25p each. AF peak and notch filter, £5. All plus carriage. G3KUF, QTHR or tel Terry, 0272 296407, days, or 027581 3648, evenings and weekends.

Datong D70 morse tutor, £35. G4PEZ. Tel Louth (0507) 602379.

FT101E, Welz SP200 meter, Amtec atu, all almost as new, £400. G4GFW, 9 Heron Court Road, Bournemouth. Tel Bournemouth (0202) 25110.

RSGB and SW mags, 1947 to date. Hygain vertical model, 18V, 10-80 meters, offers. *Wanted:* projector lamp A1/201. G2HMV, QTHR. Tel 01-764 4747, mornings.

Yaesu FT101Z tx/rx, nine bands, fm, fan, mic, £450. FC902 atu, £85. Prefer not to split. G4OVG, QTHR. Tel Stanford-le-Hope 642312, after 6.30pm.

Trio 9130 2m multimode trans, 25W, new June 1984, used very little, boxed, £375, sorry no offers. G1BAR, QTHR. Tel South Benfleet 57500, after 6pm.

Yaesu: rx FR101D amateur plus sw broadcast bands, tx FL101RF with rf proc, spare pa valves, SP101, superb cond, £425. Pye W25FM, 10ch, incl control box, 29·7-50MHz, 45W, as new, £50. G3NVO, QTHR. Tel 0635 63692.

Yaesu FT102 line-up, SP102, FC102, FT102, FV102DM, MD1, fm board, narrow ssb filter fitted, save £350, sell at £950, no offers. G4OLC. Tel 0670 855953 (Northumberland).

PF8 pocketphone, exc cond, working on SU8, comp with nicads, circuit diagrams, £80, plus postage. Tel 021-360 9307.

Datong D70 morse tutor, three months old, in box, £39. BNOS LPM 144-10-100 2m linear amp, two months old, instructions, guarantee, £129. G4ZIR. Tel 0981 540568, evenings.

MM4001 rtty tx/rx, RCA keyboard, Ascii, unmarked, reason sale, bought new computer, seen working, £199. G4KRZ, QTHR. Tel Austin, 0722 29737.

G4MH, 10-15-20 minibeam, good cond, two or three spokes broken, £25. G4VPD, QTHR.

Sale or swop: FT101ZD, nice cond, nine bands, mic, fan, new 6146s, pa, orig pkg, spare 6146Bs, £450, or swop for FT77, FT707, TS130S. *Wanted:* FDK Multi 750E. Letters only at first, stamp refunded. G2DCF, QTHR Manchester.

Antenna wire, new, multi-strand, 7/22 swg cadmium copper antenna wire, suitable G5RV, long wire, dipole etc, 150ft, £4, postage £1.72. Longer lengths supplied at pro-rata price. SASE for sample. G3WMM, QTHR. Tel Colchester (0206) 842453.

Trio TS130S hf tx/rx, 200W, fitted extra 300Hz and 1·8kHz filters, mic, £435. PS30 matching psu, £65. Eddystone 1830/1 solidstate rx, 120kHz-30MHz, vgc, £350. TS75 frequency meter, similar BC221, 85-1,000MHz, orig psu, £30. All carriage extra. GW3JAZ. Tel Gresford (097883) 2584.

Full duplex self-switching autodial modem, touch selectors (very sophisticated), cost when new believed to be over £500, as new, exchange for computer/ham gear, w.h.y? Anything considered. G6MMG, QTHR. Tel Dave, 051-430 9167 (Merseyside).

Yaesu FT708R 70cm handheld, as new, with following accessories, spkr/mic, mains charger, mobile mount, mobile psu, mobile co-linear, 5-el Yagi, £160 the lot. G4UWK, QTHR. Tel 062-982 3072, evenings/weekends.

Robot 400 sstv tx/rx, not kit, as new, £340. 70cm Standard C78, 10W pa, CMB8 mobile bracket, power charger, £175. G6DYD. Tel 01-462 2222.

TS520, fitted cw filter, mint cond, £275. G4CLV, QTHR. Tel 0323 841879.

Versatower, P60, good cond, £250. Tel Lymm 6545.

Sale, going temporarily QRT: hf/vhf/uhf rigs, masts, linears, video, etc, everything must go. Yaesu FT-ONE, the ultimate rig, fm, memory units fitted, used very little, orig packing, pristine cond, new cost now over £1,600, £995. P60, 60ft tower, post mount, with remote controlled electric winch, incl 120ft cable, £299 two 16ft ali poles, £10. Daiwa rotator, 180ft cable, £95. Hygain TH3JNR hf beam, £99. Drake AK75 all band wire, £10. 2m 14-el Parabeam, £25. Vertical 80/10 base coil, damaged, £3. 70cm 15-el quad loop, £10. 180ft RG8, good quality, £20. KW1000, 1kW hf linear, £225. 2m 4CX250, 600W linear, psu, relay switching, £225. KW107 Supermatch, hf atu, pwr meter, £99. Hansen swr meter, £5. Grid dip meter, £15. MMT144/28 transverter, £65. MMT432/28S transverter, £99. Trio SP5D spkr, £10. Trio LF30A lo-pass filter, £15. Lo-pass filter, £3. Shure 444D desk mic, £30. Yaesu YM38 scan mic, £15. MMA 144V 2m rf sw preamp, £20. 12-14V psu, 25A, very stable, £40. Frequency counter, built inside 12-14V psu, 7A, £40. JVC GXN5 colour video camera, very good quality in low light conditions, (10 lux), with Hitachi 6500 portable video, comp with spare batts, charger, etc, £950 (may split). MMC435/600 tv converter, £15. MTV atv tx, £99. Baird 43 thruline power meter, £99. Elements 100/250MHz, 25W, 100/250MHz, 250W, 2/30MHz 250W, all £20. 95/125MHz 1W, £15. Various leads, coaxial relays, bnc, N-type, adaptors, five years *Rad Com*, £10, or free to deserving cause. Dave Roberts, G4GSR. Tel 051-227 1919, day, 051-428 1845, evening (Liverpool).

Drake R4B, T4XB, psu, £285 ono. G4KTZ, QTHR. Tel 01-443 0231, evenings.

Marine type loudspeaker, 4-8Ω, grey mottle, 5in diameter, £4. Oil-filled smoothing choke, "Gresham" 20H 250mA 190Ω, £3. Eddystone 750 alignment details, circuit, £2. NC121 rx instruction manual, £2. Codar AT5 manual, £2. Post extra. G3MBL, QTHR. Tel 01-445 4321.

IC271E, few weeks old, £525. IC471E, likewise, AG1, £625. ICPS15, £80, £70 with rig. MM400KBD rtty tx/rx, £175. FT708R, spkr/mic, NC8, £200. New 9in monitor, £55. Part exchange poss. *Wanted:* FTV107R or similar. 23cm transverter. Tel Rayleigh (0268) 774089, after 3pm.

90W 144MHz amp, 2·5W in, £80. AEI vhf base, MD951, new, £10 ono. *Wanted:* SK620s, 800-0-800V transformer (·5A+). G6HKS, QTHR. Tel Wisbech 584640.

Fed up with QRP? W1SL 2m amp, 700W+ out, no problem in kit form, you build, cw 2X4CX250, reason for selling going QRO! No offers till 10th of month. Phone and haggle. GW8VHI. Tel Reg, 0639 821308.

HQ1 mini quad, 2ft stub mast, vgc, £70. SMC T3-170L relative power/swr meter, £5. Heathkit four-way coaxial antenna switch, £5. G4JYK, QTHR. Tel Congleton 77356.

Mains transformers, output 14·5V twice 14g wire, £9. Another 26V 10A, 12V 1A, £6. 2-807 valves with ceramic holders, £3 pair. Collectors item, early valve GEC xtal calibrator, (Salford Instruments) 100/1000/5000kHz, £8. G3MBL, QTHR N12. Tel 01-445 4321.

KW2000B, matching psu, manual, £150. K. Parker, G3PKR, 21 Lundy Drive, Hayes, Middx.

FDK Multi 2700 2m ssb, fm, a.m., cw, tx/rx, vfo/synthesizer, fitted Oscar converter, hb, mint cond, £260. Consider exchange for two-manual electronic organ. G3RXW, QTHR. Tel Hitchin 812611.

FT207R 2m fm synthesized portable, orig packing, helical, carrying case, NC1A base charger, PA2 dc adaptor, FDK M700E, 2m fm synthesized 25W, orig packing, accessories, both exc cond, £120 each. G8OGY, QTHR. Tel 01-936 2224, day, 0245 442043, evening.

New connectors for Andrew LDF50 heliax coaxial cable, one L44N, one L44W, £7 each plus £1 postage. GM4HKW, QTHR. Tel Kirriemuir (0575) 73455.

Sharp MZ80K, 48k memory, Basic, Sharp, Pascal, with documentation, Knight's Pascal, big Basic, no modifications, mint cond, £250. G1CBE. Tel Nottingham (0602) 259775.

Heathkit solidstate SB303 rx, SB401 tx, 80-10 transceive capability, mic, manuals, professionally built, immac, £275. Blower fan, 240V a.c., shaded pole, Mycalex, suitable linear, continuous rated, 45cfm double intake, £2.50. Hams interpreter, spare copy, £1.50. Assorted manuals. G3ANK, QTHR. Tel 0202 486141.

Tempo 2002 (similar 6N2), 2m very high power linear, virtually new, £890 or offers. Pet 2001, large keyboard, 16k personal computer, cassette, £190. Icom IC225 2m fm 10W mobile, 25kHz synthesized, £95. MMT432/144R, £125. MM4000KB rtty tx/rx, £190. G8AYN. Tel 04555 57790.

TS820 digital, just checked by Lowes, 10MHz mod fitted, £420. G3ZTR, QTHR. Tel Bridlington (0262) 674337.

Mosley triband beam, 20-15-10 TA33JR, £50 ono. 2m 9XY Tonna, £20 or swap co-linear. *Wanted:* hf 10-80m vertical, 2m handheld, or 2m linear. Will part exchange, cash etc. G4VAF, QTHR. Tel Brighton 775689.

Eddystone S870A gen cov rx, mint cond, bfo model, ideal swl, 11 by 6 by 8ins deep, incl built-in spkr, £70. G4ILR, QTHR. Tel Cromer 761612, after 6pm.

Mirage B3016 linear amplifier, 25W in, 160W out, no marks or mods, fm/vhf, ssb, £120. G8WTM, QTHR. Tel Chelmsford 466915.

Power supply, 13V, 17A, £60. 144MHz 100W linear, £70. Computer monitors (composite video), £25. Sinclair QL morse tutor program, £10. Electron morse tutor, £6. Texas dot matrix printer, RS232, £140. G8KMV, QTHR. Tel Stevenage (0438) 354689, evenings.

Yaesu FT107M, psu, mic, latest model, all new bands, mint, boxed, exchange for smaller mobile. W.H.Y? G3MXO. Tel 021-788 0518.

Yaesu FT280 2m multimode, same as FT480R, mobile bracket, mic, orig packing, £225 ono. G1IYJ. Tel 01-391 0514, evenings.

FT101Z, exchange for FT707 or similar. Radsoft rtty, unused prog for TRS80, £55. TRS80 with monitor screen, lots software, £150. Test equipment etc. SAE for list. Moving to wee QTH. G4RWL. Tel 0965 51466.

WANTED

Mk123 spy set in good wkg order. G4RJC, QTHR. Tel 04022 21523, evenings, not Sundays.

Three Bright emitters type R4. TL120 linear amplifier. G3BEX, QTHR. Tel 049 46 5097.

Kenwood AT200 antenna tuner for TS520SE. G4KHT, QTHR. Tel Tony, Hull (0482) 852216, after 6pm, or work, 0482 223141, ext 3457.

For the Wireless Museum: old radio books, magazines, catalogues, QSL cards, manuals, service sheets, *Radio Times*, call books, valves, knobs! Component car radios, test gear, pickups, beehive/letter neon, meters, spkrs. details pse to hon curator, G3KPO, QTHR. Tel 0983 62513.

Versatower, FT102, heavy duty linear, heavy duty rotator, 40m monobander, bencher paddle, Shure 444. Ant switch. G3UJE. Tel 0565 873205.

Service kit for Drake TR7. G4PAI. Tel 0202 872354.

Manual for WS9 Mk3, power input and output, plugs, junction box, etc. Would exchange 1155N, gwo, 1155A, comp, not working, early RAF wavemeter for WS22 or WS19 working station. G4LQZ. Tel Pete, 0235 34037 (Oxon), evenings, or 0235 45407, daytime.

T.E.T. HB33SP three-el tribander beam, good price for good cond. Tel Harvey, 061-740 7708.

Versatower or similar. Post mounted will do. Will service or repair if price right. G4IWF. Tel 021-353 1733.

Have eight-pole 250Hz xtal filter for FT101, TS520 etc. Would exchange for same five-pole 500Hz. John Tye, G4BYV, QTHR. Tel 036283 8142.

To complete working Gee system: control panel type 3, power unit type 285, indicator type 62 or 95, any cond, for working 1154/5 system: loop antenna type 3. Second world war aircraft or nav eqpt manuals. W.H.Y? Ken Brooks, G3XSJ. Tel Bristol 685280.

Tower, planning permission granted for 60ft, will consider any galvanized lattice tilt-over tower in good cond. Also seeking heavy duty rotor for tower mounting and hf beam or quad, anything considered. GW3XJQ, QTHR. Tel 09945 267, evenings and weekends.

Urgently required: mains transformer part T3/1117 for KW Vanguard Mk2 tx. Circuit diagram for Yaesu FC300C antenna tuner, plus operating information. Buy or borrow. Gerrard Kelly, G3CBF, "Linden" Dashpers, Brixham, Devon TQ5 9LJ.

TS130V or TS120V in good cond please. G4HHA NOT QTHR. Tel Ipswich (0473) 79935.

Circuit diagram to photocopy and return for Radar oscilloscope model 301, made by Waveforms Ltd, 'sixties vintage. Urgently needed. Chris, G4JAG, 18 Cherry Tree Way, Helmshore, Rossendale, Lancs BB4 4JZ. Tel Rossendale (0706) 229930, evenings only.

Racal RA1217. Can any kind person lend me Racal's operating and technical manuals for this receiver. I will pay all costs involved. G4ZAO. Tel Taunton (0823) 53904.

Apple 2, information on suppliers of amateur radio related software. G4VJK, QTHR. Tel 02934 3556.

Hewlett Packard thermistor mount type 478A and connecting cable. Lambert, c/o G8UWS, QTHR. Tel 0303 77205.

4CX250 bases, SK600, SK610, and SK620A. Chimneys. Snail blowers and 4CX250 valves. G8KBQ, QTHR. Tel John, 0458 34105.

Yaesu FC902 atu or Trio AT230 atu. Good price for first class unit. Would anyone sell a DG5 to me? Harvey Jackson. Tel Lowick (Cumbria) (0229) 85669.

FT220 manual, circuit diagram or any help for alignment of club rig. Expenses reimbursed. For TS520SE: DG5 digital unit, TV502 transverter. GW6ZUQ, QTHR. Tel 02912 6867, evenings, 0272 277104, days.

TR9130 or FT290R. Swap for comp dark room, Envoy enlarger, 35mm, 2¼ by 3¼ lamp house, electronic exposure timer, stack of paper. Reg, G1IHN.

Buy or borrow English-French QSO language instruction. G3DFB, QTHR. Tel 0565 2325.

Pre-1940 domestic radio sets in good mechanical cond. G4OOW, QTHR. Tel Hinckley (0455) 612091, after 6pm.

WAS1 in-line power meter, swr bridge, made by Warp Corporation, Japan, circuit diagram please, cost gladly refunded. Valves, TH41 also required. Price? G3MMK, QTHR. Tel Bradford (0274) 672796.

Drake L7E linear, must be mint cond. Would consider Trio TL922 or Drake L75E. G3RLN, QTHR. Tel 0684 296769.

Advance 10MHz timer counter type TC10 manual/circuits to buy or copy. WS21, second world war tx/rx circuits/manual, buy or copy. G4XQD, QTHR. Tel 0376 519160.

Heathkit HW8 QRP tx/rx, unmodified, good wkg order. G3BPE, QTHR. Tel 0474 23372.

FDK Multi 700EX 2m fm tx/rx, 25W, in gwc, mic, manual, £130 region. Circuit or manual for Dymar af μV meter, type 705. GW8SGA. Tel Deeside (Clwyd) 818961.

60A at approx 15V continuous rating transformer, 240V input. G3ORB, QTHR. Tel Byfleet (09323) 42406.

Accessories and information for open reel tape recorders, especially for Philips type EL3542. Accessories such as EL3992110 headphones, EL3948 101 connecting lead, and suitable plugs eagerly wanted. Spare valves, especially EM81, EZ80, ECL82, ECC83, EF86. Replacement erase and/or main tape head for above recorder. If anyone can recommend a book giving general information on open reel machines, this would be appreciated, as would splicing/repair tape supplier's address. All replies answered. Kevin Lewis, c/o 32 Victoria Road, Salisbury, Wilts SP1 3NG.

Yaesu DC200/250 psu for portable/field use of FT200. G3YJR, 188 Stannington View Road, Sheffield S10 1ST. Tel 0742 662887, evenings, 306511, ext 492, daytime.

8877. Chimney to suit 5V, 10A transformer. 240V i.p. G6OYL, QTHR. Tel 0709 546474, after 5pm.

Units, C11 ssb, C13, C13 hp, C42, mains psu for C11/R210. Other Larkspur units, manuals, "A" harness boxes. 13 Northumberland Road, Leamington Spa, CV32 6HE. Tel Alan, 0926 24705.

Set of ballbearings for Marconi marine key type 365A. GM3KPD, QTHR.

LDF 5-50 or 4-50 with or without connectors. Wideband vhf/uhf antenna multicoupler. G6EII. Tel Allan, 0925 572332.

FT-ONE, FC902, AT230 or similar, FTV 10m with 144MHz module. TET three-el mini beam and Shure 444. Cash waiting for right equipment. RS84614. Tel Clive, 0279 28857 (Essex).

Ex-British Post Office morse key, 610, with large knob. Replies to GW4JKR, QTHR. Tel 0248 715582.

Yaesu FTV901R transverter, top price paid for unit in good cond. Will collect or pay carriage. G1JPY, QTHR. Tel Reading (0734) 698261.

Trio TS530S, Daiwa CN520, 2X500PF rx type variable capacitor. G3RB, QTHR. Tel Tyneside (091) 253 0504.

Silence cover for Creed 7E/RP. Radial kit H5FR. G3ZOG, QTHR. Tel 0783 280080, 7-9pm or weekends.

FV400S vfo circuit diagram or manual, will purchase or pay costs to borrow for copying. G4MTC, QTHR. Tel 043-471 2642.

Suitcase tx/rxs: any spares, incomplete or damaged sets. WS (Canadian) No29, particularly any connecting leads for this set. Any orig ex-WD manuals or instruction books for any sets (Army only). Taylor, G3UCT, 8 Government House Road, York. Tel York (0904) 29777.

HRO rx with plug-in coils. Must be in mint cond and not to be modified. Colomor Electronics, 170 Goldhawk Road, London W12 8HN. Tel 01-743 0899.

FT101ZD Mk3, in mint cond, with or without ancillary equipment such as vfo, atu, etc. Also need YH55 phones, YE7A mic. Price and details please to G3KMR, Etal, Cornhill-on-Tweed, Northumberland TD12 4TR.

Looking for TI99/4A owners to exchange programs and info for radio amateur use. Contact T. Keil, EI6BLB, QTHR.

Any information on FT101E tx/rx. Willing to pay, even photostatic copied. Ex-G8CQC, R. Mills, 48 Lady Bank, Birch Hill, Bracknell, Berks. Tel Bracknell 482894.

Sig gen to cover 23cm, pneumatic pump-up mast. Complete volumes of *VHF Communications* magazines. *For sale:* MM 100W linear and high performance 2m converter, new. Jaybeam colinear for 2m. G4AKL, QTHR. Tel 0327 857350.

Frequency scale for AR88LF (not AR88D), 75kHz to 31MHz (approx). G4BEE/A NOT QTHR. Tel 0254 831211, after 6.30pm (Lancs).

Mast tower, tilt, telescopic, winch, mobile, ie on wheels, rotator if possible. 4-to-1 balun 1k+; 3·5-70cm, swr and power meter to 1k. G2DYM balun spider quad, 2-el, 152·0MHz. Tel Scarisbrick 880345.

Yaesu YO901 multiscope to complement FT102, must be comp with manual, and in wkg order, good price for top class eqpt. GM4UZY, QTHR. Tel 0674 73944, after 6pm.

Mk123 tx/rx. Could collect within 50 mile radius. Please write or phone (after 6pm). D. T. Price, G3LYU, 16 Dorset Avenue, Glenfield, Leics LE3 8BB. Tel 0533 876459.

40ft lattice tower, fixings if poss, rotator and 3-el triband Yagi, 10-15-20m, in Essex area. Will collect. G4VVQ, 7 White Cottage, Fuller Street, Fairstead, Nr Chelmsford, Essex.

Heathkit oscilloscope mode OS2. Does anyone have any info, circuit diagrams, handbook or workshop manual for this equipment which I could buy/borrow to copy. Your costs refunded. G6TNW, QTHR. Tel Ian, 0480 72591, evenings.

Packer 432MHz antenna tuning unit, good price paid, up to new value for as-new unit. Two or three-way coaxial switch useable at 432MHz (eg SA450 diecast or DRAE uhf types). G8GZZ, QTHR. Tel Ned, Woking (04862) 23506.

TR9500 Trio 70cm multimode tx/rx, must be in good cond, possibly with some accessories. Please leave telephone message for Richard Jones, GW4MPX, 0492 81519.

FT225RD, preferably with Mutek front end, must be mint cond for cash, or TS130S and MC33 mic, PS30 psu, also wanted, HW8. Please contact after 31 October. Tom Avery, G4MSB NOT QTHR. 33 Vicarage Close, Worle, Weston-Super-Mare, Avon. Tel 0934 512698.

FT290R, nicads, charger etc, must be good wkg order, price paid around £200. G4GSC, QTHR. Tel Staines 51898.

HQ1 minibeam and rotator, suitable for above. Must be in first class cond. G3BKG, QTHR. Tel 02216 6394.

Yaesu FC902 atu or similar atu. Must take coaxial and wire feeders. G4ZIR. Tel 0981 540568, evenings.

Transverters to 4m, 2m and 70cm from 28MHz. Any make considered but valve gear must include psu. Garry Orford, G4FRO, QTHR. Tel Bristol 426851, work, 47112, home.

Lattice tower required. Telescopic galvanized heavy duty, about 40ft when fully extended, write or phone. G1CDO, QTHR. Tel Roy, Hemsworth (0977) 612814.

Drake linear amp L4B or L7. Alpha lin amp, TH7 conv kit or TH7 ant. 60ft tower, hd, must be good. Tel Derby 557705.

Hallicrafters Super Defiant hf rx, service manual or alignment procedure for this rx. Buy, borrow or copy, all expenses reimbursed. *For sale:* new, boxed 813 valve, £5, plus carriage. G4JDH, QTHR. Tel Brentwood (0277) 231461, evenings or weekends.

Handbook/circuit and service info for B40 (57141B) rx. Spare knobs etc also required. Circuits/info for design of quality audio mixers; monitoring and earthing arrangements especially important. Several valves also required. Chris Wheeler, G6YAH, QTHR. Tel Reigate 41510.

Anything T1083, coils etc, Dynamotor MP5B or MP5A24, key MT11B, tx TA2J24, resistance type 52, R1355 for spares, indicator 62, RF24, left right meter, any units TR1143, TR1196, controller type 4, willing to rebuild w.h.y? Parsonage, 52 Bramble Lane, Mansfield, Notts.

Correspondence and/or schedule with owner of ATR6800 rtty machine (V122 basic module and application module 2). Exchange of programs for Amstrad CP464. G3AAG NOT QTHR. Tel Liss 892143 (Hampshire).

3CX1500/8877 valves are needed at reasonable prices. New or surplus, does not matter. Ivan Stauning, OZ7IS, Bartholinstraede 20, DK-2630 Tästrup, Denmark. Tel 4502-646789.

Pre-1952 television, pre-1940 domestic radios. Circuit diagram for Siemens domestic set 14W. G4OOW, QTHR. Tel Hinckley (0455) 612091, after 7pm.

Yaesu FTV901R three-band transverter, Creed 444, working cond. LG300 psu with cable. Good cond please. Carriage by arrangement. Price, details to G3FPJ, Alan Littlewood, Marrolomeda, Holne, Newton Abbot, Devon. Tel Poundsgate 413.

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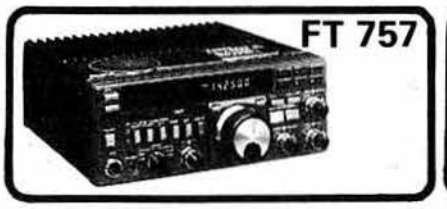

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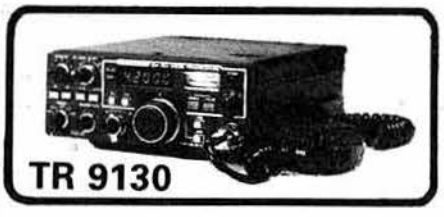

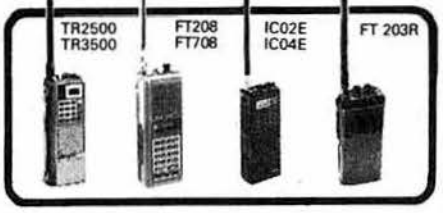

STOP PRESS

NEW RANGE FROM TRIO

Trio have just introduced a comprehensive new range of products for the latter half of 1984. The line-up includes 4 new handhelds. The **TR-2600E/TR-3600E** (2m/70cm) pair are both compact and lightweight yet feature extremely advanced technology. Key features include **DCS•**, LCD display with built-in S meter, 10 memories, memory scan, programmable band scan and much, much more. The **TH-21E/TH-41E** (2m/70cm) handhelds are ultra-compact (57w × 120h × 28dmm) but still combine maximum performance and operating convenience. Features include switchable RF output (1W Hi-150mW Lo), thumbwheel frequency selection, repeater offset/simplex switch and an optional headset with VOX. Read the spec on this and you will see that it is an incredible performer in a tiny package.

The **TR-50** is a portable FM transceiver for 1200 MHz. It is microprocessor controlled to give maximum flexibility combined with a host of features; 1 Watt output, 5 memory channels, memory scan, programmable band scan, priority channel, 5 digit LCD display with S/RF meter, repeater offset and reverse switch and R.I.T. A remarkable radio!

The **TM211E/TM 411E** (2m/70cm) pair have been designed specifically for the mobile environment. They are very compact and lightweight but still deliver 25 Watts. Their front panels can be tilted upwards for greater visibility and the controls are designed for ease of operation. Other features include dual VFOs, 5 memories, memory scan, programmable band scan, priority watch, a highly visible yellow led display, a high quality external speaker (supplied), microphone test function, repeater offset and reverse repeater switches and **DCS.•**

Last but definitely not least, the **TS-711E/TS-811E** (2m/70cms) pair. These all mode transceivers feature ease of operation combined with a compact size. Some of the key features are:- **DCS•**, 10Hz step dual VFOs, multi-function fluorescent tube digital display, 40 multi-function memory channels (that store frequency, mode, repeater offset and tone), memory scan, programmable band scan, mode scan, channel 'quick-step' tuning, I.F. shift; speech processor and an optional voice synthesizer unit.

NEW HANDHELD FROM YAESU – THE FT-209R

By blending the best qualities of the FT-207R and the FT-208R with the latest advances in microprocessor design and microminiature manufacturing, the **FT-209R** offers a wealth of features in a package that is smaller and lighter than any previous CPU controlled transceiver. It provides 3.5W RF output or 350mW in the low power mode. There are ten memory channels which will store the frequency and a standard or non-standard repeater shift. Simplex or reverse repeater is available at the touch of a button. Scanning capabilities include step programmable full or partial band or memory bank scanning for busy or clear; skip or select channel exclusive scanning; calling channel, select memory or dial priority scanning monitoring. Plus many other keypad programmable unique and useful features. The operating status is shown at a glance on the fat ½ inch LCD display. The **FT-209R** also features Yaesu's Power Saver System, a programmable facility that momentarily activates the receiver at selected intervals to check a selected channel. This greatly extends battery life over standard squelched reception, a major consideration with handheld operation. The S/RF meter on the front panel doubles as a battery condition meter. Several optional extras are available for this model, including a headset that will work with the set's built-in Vox system.

All of these radios are so new that we don't have pictures of them yet, but by the time you read this, we should have sets in stock. They all have far more features than we have been able to squeeze into the space available – so call in and try them for yourself.

• DCS.

Digital Code Squelch is a revolutionary new idea from Trio. Not to be confused with CTCSS, **DCS** *recognises 100,000 different 5 digit code signals which makes it possible for each station to have its own 'private call' mode, as well as 'group call' and 'common call'. A 6 digit maximum Amateur station call sign can also be programmed in ASC11 code and transmitted in conjunction with the* **DCS** *code.*

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All prices include delivery (UK only) and VAT at 15%. Independent reviews shown in (brackets).

AUDIO FILTERS

SRB2 Automatic Woodpecker Blanker as seen on a well-known TV science programme. (SWM Sept. 83, Ham Radio Feb. 84, World Radio TV Handbook 84). **£86.25**

ANF Advanced stand-alone automatic **whistle removal** filter for SSB, plus CW filter. (SWM July 83, Ham Radio Oct. 83, R&EW July 83). **£67.85**

FL2 SSB/CW/RTTY **Variable audio filter.** (Rad Com, Aug. 80) **£89.70**

FL3 SSB/CW/RTTY audio filter (as in FL2) plus **automatic** whistle remover. **£129.37**

FL2/A Fully assembled PCB module with hardware and instructions to convert FL2 to FL3. **£39.67**

RF SPEECH PROCESSORS

ASP The fully automatic **definitive RF Speech Processor** ("73" July 81) **£82.80**

D75 Manually controlled RF speech processor **£56.35**

D75/K Uncased version of D75 **£40.70**

MORSE EQUIPMENT

D70 The **"go-anywhere"** Morse Tutor. The PP3 battery supplied should last you until the exam! **£56.35**

MK Deluxe **Self contained** keyboard morse sender with memories. (SWM April 82, Amateur Radio April 83) **£137.42**

RADIO DIRECTION FINDER

This system turns any NBFM rig into a radio direction finder **which really works.** It is currently in use from HF to UHF by Government Departments, professionals of all kinds, and **amateur DFers** (Rad. Com. Jan. 84, Citizens Band Jan. 83).

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Other companies also make converters and preamps. When you choose **check the "fine print"** first. You can trust Datong to "do it right".

VLF Receiver 0 to 500kHz on your 28 to 28.5MHz receiver. **£29.90**

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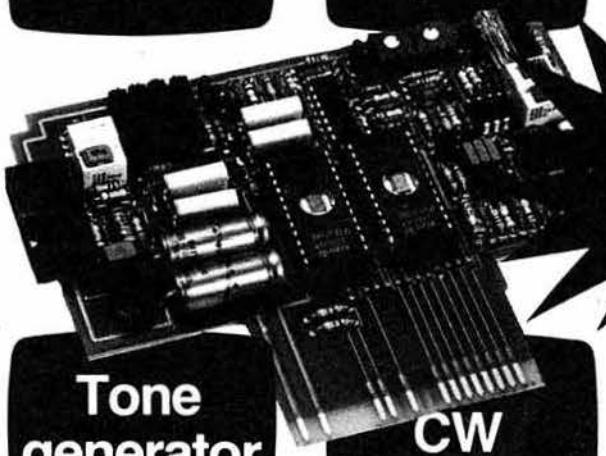

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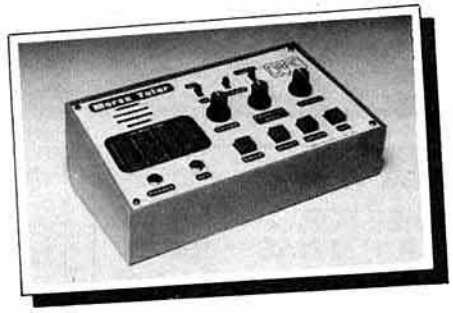

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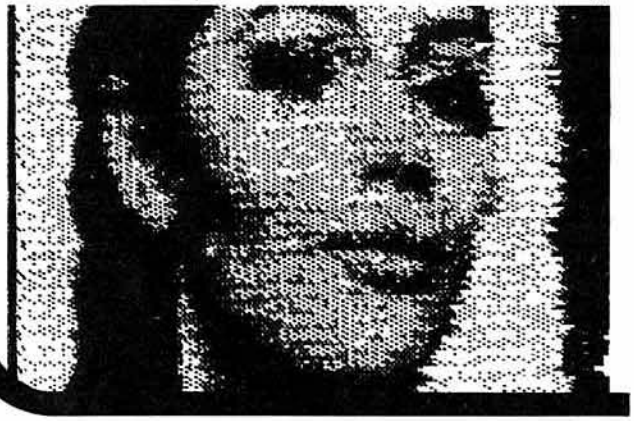

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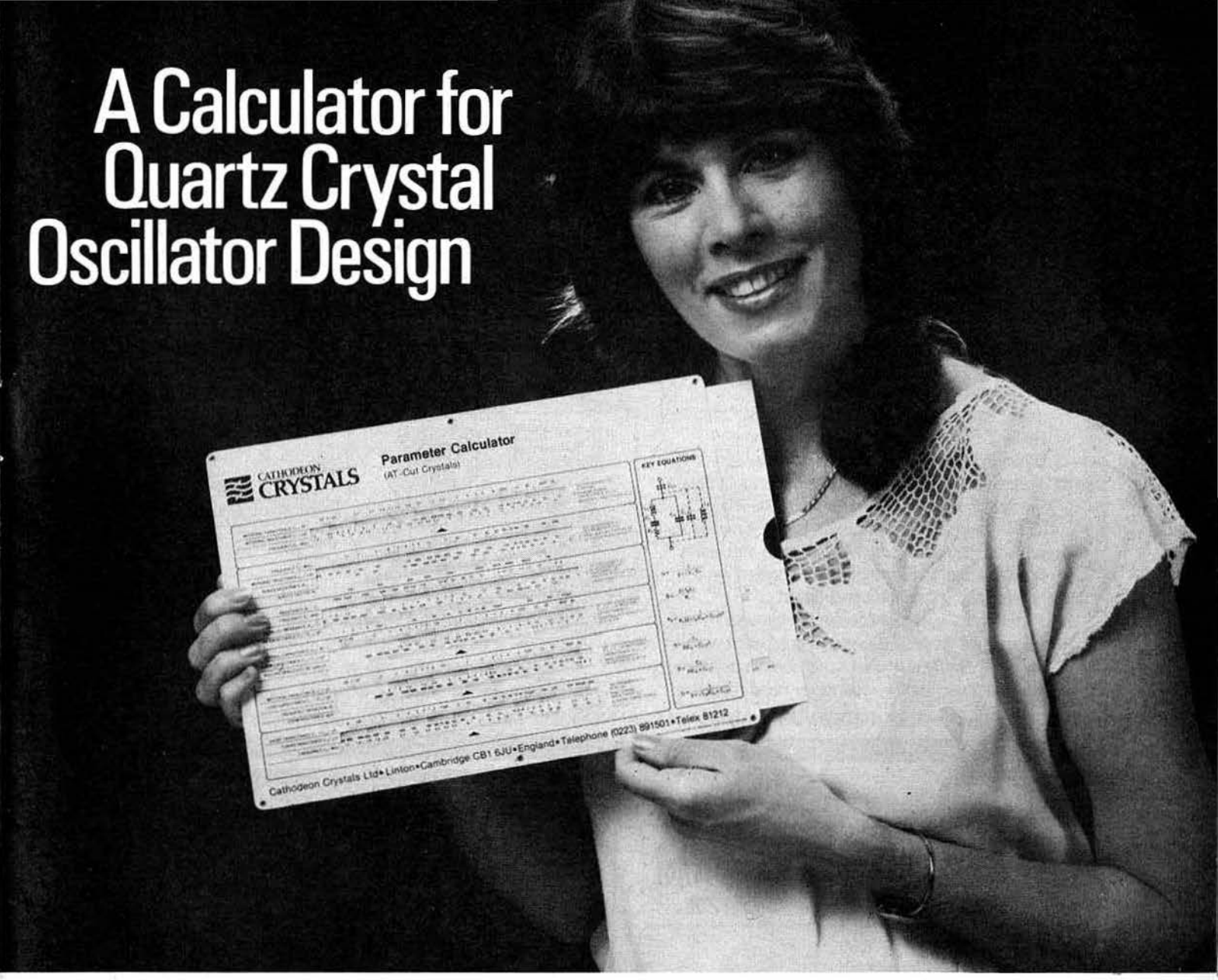

A crystal has only got two legs so it must be simple. Just how wrong can you be! Let's take Motional Capacitance for example. The Motional Capacitance of the Nth order mode can be calculated from the crystal admittance:

$$Y_N = \frac{4b\ell i\omega\mathcal{E}_{22}}{2h}\ (1 + \hat{k}_{26}^2) + \frac{4i\omega\mathcal{E}_{22}\cdot 4\hat{k}_{26}^2 \mathrm{Sin}^2\,\bar{\xi}_{N\tau}\,\ell\,\mathrm{Sin}^2\,\bar{y}_{N\varepsilon}\,b}{[(\omega_{N\tau\varepsilon}^2/\omega^2)-1]\,N^2\pi^2\bar{\xi}_{N\varepsilon}^2\bar{y}_{N\varepsilon}^2 L_{N\tau\varepsilon}\,h}$$

After a little interesting manipulation, this reduces to:

$$C_N = 16\mathcal{E}_{22}\hat{k}_{26}^2\,\mathrm{Sin}^2\,\bar{\xi}_{N\tau}\,\ell\,\mathrm{Sin}^2\,\bar{y}_{N\varepsilon}\,b/N^2\pi^2\bar{\xi}_{N\tau}^2\bar{y}_{N\varepsilon}^2 L_{N\tau\varepsilon}\,h$$

This fun equation can then be evaluated for C_1. Similiar procedures are required for the other components of the equivalent circuit.

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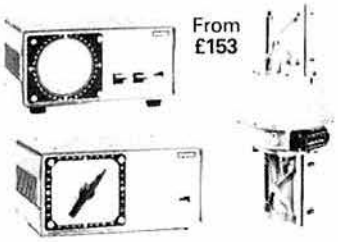

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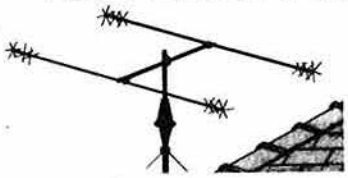

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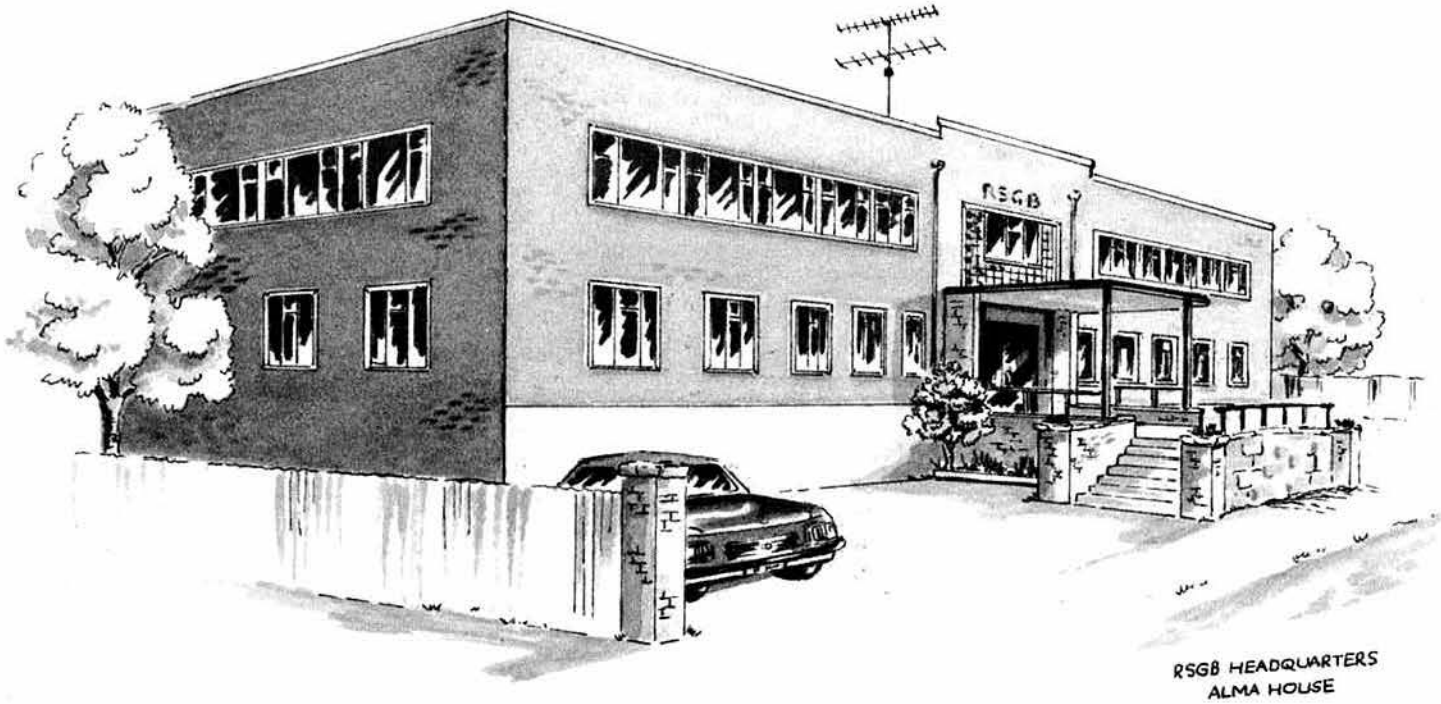
Carriage:—Items under £10—£1.00; Over £10—£1.50; Larger aerials £4; Rigs £3; Securicor £6.

RADIO SOCIETY OF GREAT BRITAIN



RSGB HEADQUARTERS
ALMA HOUSE

REPORT & ACCOUNTS
and
THE YEAR IN REVIEW

for the year ended 30 June 1984

Radio Society of Great Britain

(COMPANY LIMITED BY GUARANTEE)

ALMA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTS, EN6 3JW

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

COUNCIL (1 July 1983 to 30 June 1984)

President
R. G. Barrett, GW8HEZ

Executive vice-President
J. Heathershaw (Mrs), G4CHH

Immediate past-President
D. E. Baptiste, CBE

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

Members
E. J. Allaway, MB, ChB, MRCS, LRCP, G3FKM*
J. T. Barnes, GI3USS††
J. Bazley, G3HCT*
D. S. Evans, PhD, BSc, FIM, G3RPE**
K. A. M. Fisher, TEng(CEI), MIPRE, G3WSN*
G. A. Griffiths, BA, CEng, G3STG*
F. D. Hall, GM8BZX
L. N. G. Hawkyard, G5HD
H. M. Holmden, G4KCC
G. R. Jessop, CEng, MIERE, G6JP
I. J. Kyle, GI8AYZ†
T. I. Lundegard, G3GJW
W. J. McClintock, G3VPK
B. O'Brien, G2AMV**
H. S. Pinchin, BSc, MBIM, G3VPE
D. M. Pratt, BTech, CEng, MIEE, MIERE, G3KEP
G. R. Smith, BSc, MB1M, G4AJJ**
D. M. Thomas, GW3RWX†††
K. E. V. Willis, BSc, ARCS, CEng, MIEE, G8VR

†Resigned March 1984
*Retired 31 December 1983
**Elected 1 January 1984
††Co-opted May 1984
†††Co-opted January 1984

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-EIGHTH ANNUAL GENERAL MEETING of the Society will take place at the Institution of Electrical Engineers, Savoy Place, London WC2, at 2pm on Saturday 8 December 1984 for the transaction of the undermentioned business:

1. To receive and, if approved, confirm the minutes of the fifty-seventh annual general meeting circulated with the March 1984 issue of *Radio Communication*.

2. To receive and consider the accounts for the year ended 30 June 1984, 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 1985. In the event of any successful candidate(s) being of the age of 70 or over it will be necessary for their appointment(s) to be confirmed by the meeting.

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 1984

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 subsidiaries for the year ended 30 June 1984 which are set out on Pages *iv* to *viii*. The income and expenditure account shows a deficit on the year on ordinary activities before taxation of £42,934. Provision for Corporation Tax absorbs another £7,308 making the total deficit for the year after taxation £50,242 which is deducted from the Society's accumulated funds.

The deficit on ordinary operations for the year was budgeted at £28,000. During the year the Society's basis for calculating and accounting for Value Added Tax on subscription income was reviewed by HM Customs & Excise with the result that the proportion of subscriptions chargeable to VAT was increased. This had the effect of increasing the tax payable by a little over £3,300. Other items contributing to the increased deficit over budget included a sum of £8,900 expended on further renovations and improvements to Alma House, a greater than forecast fall in the level of advertising carried in *Radio Communication*, an increase in the level of expenditure on Society publicity and advertising, and a larger than forecast deficit on the Society's own exhibition events and the cost of participation in other rallies and exhibitions.

Subscription income was very much in line with forecast for the year after allowing for the effects of the increase in VAT. The Society is now required to account for Value Added Tax on all its subscriptions at a slightly higher rate than hitherto. The net effect in terms of a full year is that approximately £8,000 additional VAT is payable out of subscriptions. That figure takes into account the increased rates of subscriptions that became payable from 1 July 1984.

Advertising revenue for the first half of the year under review was very close to the expected figures. However, the level of advertising fell away in the second half of the year, and the immediate effect—coupled with the increased editorial content of *Radio Communication*—was that the net cost of *Radio Communication* to the Society was £30,000 in excess of the budgeted figure.

The level of sales of books and other products through the year remained buoyant, with the result that the gross income was a little under £15,000 greater than in the previous year. Other income, which comprised almost wholly bank interest received, was again a little higher.

Headquarters expenses overall showed a decrease on the previous year, even after absorbing the additional sums expended on renovations and improvements. Administration expenses generally, in total, were a little up on the previous year. This grouping includes staff costs which relates to all staff other than those directly engaged on book production and distribution, *Radio Communication* and the QSL Bureau. As stated in Note 6 to the accounts, the total number of staff engaged on headquarters administration including membership services, at the end of the year was 22—an increase of two compared with 1983.

Finance costs were down this year but embraced an increase in bank charges largely offset by a reduction in the provision required for bad debts.

Under the heading of membership services, the increased costs of *Radio Communication* have already been referred to, and the other principal increases under this heading are in connection with rallies, exhibitions and publicity and the costs of committee, regional and Council meetings. In connection with rallies and exhibitions, Note 9 to the accounts shows that the cost increased by £3,000 over the previous year, and that Society publicity and advertising was a little under £7,000 greater than at the previous year. In the year of the space shuttle, great efforts were made to obtain the maximum amount of publicity for the Society but inevitably at some cost.

Despite the deficit for the year, the balance sheet of the Society continues to show a strong position. Your attention is drawn to Note 12 to the accounts which refers to the Society's contractual liability to expend a further £45,000 to complete the purchase of land adjacent to Alma House. This transaction was due to have been completed in October 1984, but at the request of the vendors the time limit has been extended by up to a further 12 months. The outline forecast and budget for 1984–5 indicates a probable further deficit in the region of £20,000 for the year, and is based on realistic assumptions with regard to advertising revenue and a lower level of book sales. Council is taking appropriate steps to contain expenses and, wherever possible, generate increased income. They look forward with confidence to the year 1984–5.

RADIO SOCIETY OF GREAT BRITAIN

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 30 JUNE 1984

	Notes	1984 £	1984 £	1983 £	1983 £
INCOME					
Subscriptions	(1)		461,095		*423,735*
Advertising	(1)		205,739		*243,312*
Book sales			316,282		*301,459*
Other income	(5)		22,259		*20,112*
TOTAL INCOME			£1,005,375		*£988,618*
EXPENDITURE					
Cost of book sales					
Cost of printing and distribution		170,433		*159,460*	
Costs of editing and despatch staff		50,750	221,183	*50,451*	*209,911*
Headquarters					
Rates, lighting, heating and cleaning		17,382		*19,751*	
Repairs and maintenance		13,891	31,273	*14,436*	*34,187*
Administration					
Staff costs		173,418		*167,785*	
Pension		—		*100*	
Telephone, postage, printing and stationery		82,925		*76,952*	
Insurance		7,643		*5,505*	
Hire and maintenance of equipment	(7)	54,202		*47,993*	
Depreciation of fixed assets	(1)	19,573		*25,750*	
Audit fees		8,000		*7,625*	
Legal and professional fees		8,614		*1,410*	
General expenses		5,431		*8,840*	
Preliminary expenses of subsidiary		—	359,806	*241*	*342,201*
Finance					
Bank interest		205		*657*	
Bank charges		4,362		*2,512*	
Bad debt provision		(1,746)	2,821	*1,998*	*5,167*
Membership services					
Radio Communication	(8)	327,292		*285,236*	
Certificates, awards, trophies, etc		2,820		*4,573*	
QSL Bureau		16,316		*11,179*	
Beacons, repeaters, satellites and Intruder Watch		5,160		*3,419*	
IARU Region 1 contribution and levy		7,011		*5,218*	
Rallies, exhibitions and publicity	(9)	29,438		*18,584*	
Cost of committee, regional and Council meetings		42,075		*38,205*	
Cost of international meetings and conferences		3,114	433,226	*1,218*	*367,632*
TOTAL EXPENDITURE			£1,048,309		*£959,098*
(DEFICIT)/SURPLUS ON ORDINARY ACTIVITIES BEFORE TAXATION					
[all of which (1983 surplus £29,963) arises in the Society]			(42,934)		*29,520*
Less Provision for taxation thereon at 30% (*1983: 38%*)	(10)				
Corporation tax		(7,956)		*(11,469)*	
Deferred tax		648	(7,308)	*2,170*	*(9,299)*
(DEFICIT)/SURPLUS ON ORDINARY ACTIVITIES AFTER TAXATION			(50,242)		*20,221*
EXTRAORDINARY ITEM					
Surplus on disposal of freehold property			—		*216,898*
(DEFICIT)/SURPLUS FOR YEAR			£(50,242)		*£237,119*

RADIO SOCIETY OF GREAT BRITAIN

BALANCE SHEETS AT 30 JUNE 1984

	Notes	1984 The Society £	1984 The Society and subsidiaries £	1983 The Society £	1983 The Society and subsidiaries £
FIXED ASSETS					
Tangible assets	(1) (2)	384,867	384,867	389,104	389,104
Investments	(3)	200	—	200	—
		385,067	384,867	389,304	389,104
CURRENT ASSETS					
Stocks, at lower of cost and net realizable value		143,546	143,546	160,995	160,995
Trade debtors		61,788	61,788	56,531	56,531
Other debtors		8,580	8,580	4,420	4,420
Prepayments and accrued income		51,671	51,671	38,826	38,826
Cash at bank and in hand		106,784	108,858	130,156	132,230
		372,369	374,443	390,928	393,002
CREDITORS: AMOUNTS FALLING DUE WITHIN ONE YEAR					
Trade creditors		(49,197)	(49,197)	(41,989)	(41,989)
Amounts due to subsidiary companies		(215,567)	—	(215,792)	—
Corporation tax		(10,656)	(10,656)	(13,018)	(13,018)
Other taxation and social security		(11,498)	(11,498)	(7,388)	(7,388)
Other creditors		(19,358)	(20,602)	(11,418)	(12,887)
Accruals and deferred income		(36,067)	(36,067)	(39,351)	(39,351)
		(342,343)	(128,020)	(328,956)	(114,633)
Subscriptions in advance		(222,947)	(222,947)	(205,176)	(205,176)
		(565,290)	(350,967)	(534,132)	(319,809)
NET CURRENT ASSETS/(LIABILITIES)		(192,921)	23,476	(143,204)	73,193
Total assets less current liabilities		192,146	408,343	246,100	462,297
CREDITORS: AMOUNTS FALLING DUE AFTER MORE THAN ONE YEAR					
Corporation tax payable 1 January 1986		(8,000)	(8,000)	(10,700)	(10,700)
		184,146	400,343	235,400	451,597
PROVISIONS FOR LIABILITIES AND CHARGES					
Deferred taxation	(1)(10)	(2,000)	(2,000)	(2,648)	(2,648)
		£182,146	£398,343	£232,752	£448,949
ACCUMULATED FUNDS					
Income and expenditure account					
Balance at 1 July 1983		230,558	446,755	209,894	209,636
(Deficit)/Surplus for year		(50,242)	(50,242)	20,664	237,119
		180,316	396,513	230,558	446,755
Legacy fund	(4)	1,830	1,830	2,194	2,194
		£182,146	£398,343	£232,752	£448,949

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

Approved by the Council on 20 September 1984, and signed on its behalf by:

R. G. BARRETT, *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.
   (b) Advertising income is the gross amount receivable for advertisements in *Radio Communication*.
   (c) Depreciation—tangible fixed assets, except freehold land, are written off using the straight-line method over their estimated useful lives at the following rates based on cost:
   Freehold buildings — 2 per cent per annum
   Furniture — 10 per cent per annum
   Equipment — 20–25 per cent per annum
   Computer — 20 per cent per annum
   (d) Deferred taxation has been provided using the liability method in respect of timing differences which are not expected to continue for the foreseeable future.
   (e) Since a consolidated income and expenditure account is submitted, no such account for the Society alone has been presented.

2. Tangible fixed assets

	Freehold land and buildings	Furniture, equipment and computer programming	Total
Cost	£	£	£
At 1 July 1983	367,572	73,800	441,372
Additions	—	15,336	15,336
Disposals	—	(5,363)	(5,363)
At 30 June 1984	£367,572	£83,773	£451,345
Depreciation			
At 1 July 1983	6,351	45,917	52,268
Charge for the year	6,351	13,222	19,573
On disposals	—	(5,363)	(5,363)
	£12,702	£53,776	£66,478
Net book value			
At 30 June 1984	£354,870	£29,997	£384,867
At 1 July 1983	£361,221	£27,883	£389,104

Freehold land included above amounts to £50,000

3. Fixed asset investments

	1984	*1983*
	£	*£*
Shares in group companies at cost	£200	*£200*

The subsidiaries, both of which are wholly owned, are Lambda Investment Company Limited (an investment company) and RSGB (Raynet) Limited, which has been dormant since incorporation.

4. Legacy fund

	1984	*1983*
	£	*£*
Balance at 1 July 1983	2,194	*2,513*
Donations received	69	*111*
Payments made in accordance with donors' directions	(433)	*(430)*
Balance at 30 June 1984	£1,830	*£2,194*

5. Other income includes bank interest of £21,099 (*1983: £19,119*).

6. Staff costs

	1984	*1983*
	£	*£*
Wages and salaries	236,187	*216,956*
Social security costs	24,581	*22,589*
Pension costs	4,558	*4,365*
	£265,326	*£243,910*

The average number of persons employed by the Society was 29 (*1983: 26*), divided into the following categories:

	1984	*1983*
Headquarters	22	*20*
Radio Communication	4	*4*
QSL Bureau	2	*1*
Advertising	1	*1*
	29	26

7. Hire of equipment amounted to £24,378 (*1983: £19,217*). Under leasing arrangements in connection with the IBM38 computer, the Society has a commitment to pay £19,216 annually until 31 December 1987.

8. *Radio Communication* expenses comprise the whole of the costs of printing and distribution, the cost of editorial and advertising staff and the Chelmsford office.

9. Rallies, exhibitions and publicity expenses comprise:

	1984 £	*1983 £*
Society publicity and advertising	17,710	*9,872*
Deficit on the Society's own events and the cost of participation in other rallies and exhibitions	11,728	*8,712*
	£29,438	*£18,584*

Book sales totalling £44,193 gross (*1983: £33,465*) made at rallies and exhibitions have been accounted for under income from book sales.

10. The Society is liable to pay corporation tax on its investment and trading income. Tax deferred owing to the effects of capital allowances has been provided for in full. The potential taxation liability, not provided for in these accounts, in respect of capital gains rolled over is £65,000. The taxation charge has been reduced by £1,834 (*1983: £2,510*) as a result of stock relief.

11. The Society administers certain prize and memorial funds, totalling £629 (*1983: £572*) which are not included in these accounts.

12. Capital commitments contracted for at 30 June 1984 amounted to £45,000, in respect of the purchase of land adjacent to the Society's headquarters at Alma House (*1983: £45,000*). Capital commitments approved but not contracted for, amounted to £5,000 (*1983–£NIL*).

CONSOLIDATED STATEMENT OF SOURCE AND APPLICATION OF FUNDS FOR THE YEAR ENDED 30 JUNE 1984

	1984 £	*1983 £*
SOURCE OF FUNDS		
(Deficit)/Surplus for the year before taxation	(42,934)	*29,520*
Payments made (less donations received) from legacy fund	(364)	*(319)*
Adjustment for items not involving the movement of funds:		
Depreciation (including losses on disposals)	19,573	*25,750*
Total absorbed by/generated from operations	(23,725)	*54,951*
OTHER SOURCE		
Proceeds from sale of property less expenses incurred	—	*258,573*
	(23,725)	*313,524*
APPLICATION OF FUNDS		
Purchase of fixed assets, less proceeds of sale	(15,336)	*(366,675)*
Corporation tax paid	(13,018)	*(5,954)*
	(£52,079)	*(£59,105)*
INCREASE IN WORKING CAPITAL		
Stocks	(17,449)	*40,473*
Debtors, prepayments and accrued income	22,262	*(9,070)*
Creditors accruals, deferred income, and subscriptions in advance	(33,520)	*(25,415)*
	(28,707)	*5,988*
MOVEMENT IN NET LIQUID FUNDS		
Cash balances	(23,372)	*(65,093)*
	(£52,079)	*(£59,105)*

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

We have audited the accounts set out on pages *iv* to *vii* in accordance with approved auditing standards.

In our opinion the accounts, which have been prepared under the historical cost convention, give a true and fair view of the state of affairs of the Society and its subsidiaries at 30 June 1984 and of their deficit of income and of their source and application of funds for the year ended on that date and comply with the Companies Acts 1948 to 1981.

4 Chiswell Street, London EC1Y 4XB.
26 September 1984

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 1984. The company did not trade during the year and the directors recommend that the balance on revenue account be carried forward. The directors who served during this year were Messrs L. E. Newnham (chairman), G. R. Jessop and P. F. D Cornish.

On behalf of the Board: D. A. Evans, *Secretary*

BALANCE SHEET AT 30 JUNE 1984 and REVENUE ACCOUNT FOR THE YEAR ENDED ON THAT DATE

	1984 £	*1983 £*
CURRENT ASSETS		
Amount due from holding company	215,467	*215,692*
Bank balance	2,074	*2,074*
	217,541	*217,766*
CREDITORS		
Amounts falling due within one year		
Creditors	1,244	*1,469*
TOTAL ASSETS LESS CURRENT LIABILITIES	£216,297	*£216,297*
CAPITAL AND RESERVES		
SHARE CAPITAL		
Authorised, issued and fully paid		
100 shares of £1 each	100	*100*
REVENUE ACCOUNT	216,197	*216,197*
	£216,297	*£216,297*

The company, which is a wholly-owned subsidiary of Radio Society of Great Britain (a company incorporated in Great Britain), did not trade during the year.

Approved by the Board on 20 September 1984 and signed on its behalf by: *L. E. Newnham*, director
P. F. D. Cornish, FCA, director

REPORT OF THE AUDITORS TO THE MEMBERS OF LAMBDA INVESTMENT COMPANY LIMITED

We have audited the accounts set out above in accordance with approved auditing standards.

In our opinion, the accounts give a true and fair view of the state of the Company's affairs at 30 June 1984 and of the result for the year ended on that date and comply with the Companies Acts 1948 to 1981.

4 Chiswell Street, London EC1Y 4XB
26 September 1984

EDWARD MOORE & SONS
Chartered Accountants

THE YEAR IN REVIEW

Some of the activities of the Society in the year ended 30 June 1984

GENERAL MANAGER'S REPORT

MAIN POINTS

The Society has again made good progress during the year under review. Membership increased from 33,868 to 36,148, which represents an increase of 6·73 per cent. The turnover also increased, in this case by just over three per cent, and for the first time exceeded £1m. Sales of publications again increased, although there is a clear need for new books for today's newcomers to amateur radio.

1983–4 represents the first full financial year during which we have been able to take advantage of the facilities offered by the new headquarters building. The main result has been the continued increase in the proportion of headquarters staff effort which could be devoted directly to amateur radio. This is reflected in a number of areas, including an increased number of pages in *Radio Communication* devoted to amateur radio news items, the appointment of a full-time technical officer and an additional membership services officer, an expanded main exhibition, and much increased effort on antenna planning problems and especially on licensing matters.

The Society planned to make a loss during the year because it wished to invest some of the money it had gained by way of a surplus in previous years on improving services to members. In the event, these improvements took place, but a drop in advertisement income meant that our actual deficit was greater than budgeted. The financial report on *piii* gives further details.

Significant (and somewhat unexpected) effort has been put into establishing a first-class headquarters station, initially intended to take advantage of the publicity associated with the space shuttle. Since then, it has proved a valuable investment for demonstrating amateur radio to influential visitors.

AFTER THE MOVE

At the beginning of the 1983–4 financial year, the Society had occupied its new headquarters building in Potters Bar for seven months. During this period there had been only just enough time to get over the move itself and sort out the inevitable problems. The year under review therefore can be regarded as the first full year during which we could begin to reap the benefits of the move.

The main advantage of the new building is the increased space and better working conditions. This has permitted much simplification and greater effectiveness of operation. The overall benefits are the sum of many small advantages which are too detailed to describe in a report of this nature. However, two examples can be given by way of illustration. First, the stock of all our books is now held at headquarters where they are readily accessible. Previously they had to be stored by the printers at various places around the country because of the shortage of storage space at Doughty Street; this meant that small and frequent deliveries had to be made to top up stocks—an expensive process in both direct costs and staff time. A second example is associated with the installation in March 1983 of the IBM38 computer to replace the existing IBM34. Because there was sufficient space available in the new building, it was possible to run both machines in parallel for several months so that the changeover from one to the other could be done in the most effective way with minimum disturbance. We literally could not have fitted the second machine into the Doughty Street premises.

The increased space has also meant that two long-awaited extra staff could be employed. These were the Society's first ever technical officer, complete with workshop, and an additional membership services officer. This extra effort, together with the not inconsiderable staff effort resulting from the improved effectiveness referred to above, meant that again this year it has been possible to increase the amount of staff effort devoted to amateur radio rather than to pure administration. Some of the results of this extra effort are:

(a) The generation of additional material for *Radio Communication*, including editorials, expanded news section, answers to members' letters, and the *RSGB News Bulletin* which is the fastest way to provide written news to all members.
(b) Improving links with the media by exploiting, for example, the space shuttle operation.
(c) The transfer of Raynet record-keeping to the new headquarters data processing system.
(d) Staff effort to assist with the production of the *Raynet Manual* and its in-house typesetting.
(e) Production of another newsletter—the *VHF-UHF Newsletter*
(f) Providing data processing assistance to the VHF Contests Committee.
(g) Preparation for the 50MHz beacon GB3NHQ to be established at headquarters.
(h) BBC-B/IBM38 interfacing.
(i) Issuing of special event licences on behalf of the DTI.
(j) Establishing the headquarters station, which is operational from hf to 430MHz.

Many of the above actions must be looked at as an investment for the future. For example, one result of the BBC-B/IBM38 interfacing is that it is now possible for authors to produce material using a BBC microcomputer and word-processor, and for this material to be directly transferred to the IBM38 for editing and subsequent printing. Our handling of the special event licences may be the first of a number of special facilities that may become possible only because RSGB is prepared to take responsibility for their administration. The headquarters station, in addition to its obvious value as a link with members, has already proved invaluable in demonstrating amateur radio to the media, and visitors such as staff from the DTI and Post Office. Several of the above items are taken up in more detail in other sections of this report and in the reports of committee chairmen.

It will be clear to all that the role of headquarters has continuously expanded and changed over the years, and will continue to do so in the future. For this reason it is essential that all the staff must cope with all the problems that appear, which implies a flexible approach to their work. Their efforts in this direction are very much appreciated.

INTERNATIONAL MATTERS

The main international event of the year was, of course, the IARU Region 1 Conference held in Sicily. Again, the RSGB played a major role in the conference, in terms of providing both officers and papers; in fact, the Society was responsible for producing 44 of the 180 papers that were the basis of the conference. This represented a signficant workload for the Society, since it involved a number of committees, particularly the IARU Committee which had to arrange additional meetings to co-ordinate the RSGB effort. Headquarters was obviously involved with this work and in organizing the travel arrangements for the UK delegation.

The already strong links between the Society and the IARU Region 1 were strengthened by the appointment of Dr E. J. Allaway, G3FKM, as Region 1 secretary. We wish him well in this most responsible post. During the year, the constitution of the IARU was revised and has now been accepted. This may well have future implications for the Society.

Liaison with other national societies, particularly those in Europe, has meant that both the 1983 and 1984 RSGB Presidents have attended a number of foreign functions. In addition, the RSGB received visits from a number of other societies; notable visitors to headquarters during the year have included JA1AN, president of the Japanese Amateur Radio League; TF3KB, president of the Icelandic society; SV1AN, president of the Greek society; VU2MY, from one of the larger societies in India; YB0BZZ, from the Indonesian society; 9L1YL, the secretary of the Sierra Leone society; and A4XKB and A4XJT from the Royal Omani society. In addition, the Society was pleased to welcome a number of staff and volunteers from the ARRL who were on vacation in the UK. These included Paul Rinaldo, W4RI, senior technical editor; Sandy Gerli, AC1Y, assistant advertising manager; Bob Reif, W1XP, representing the ARRL at the Society's VHF Convention; and Betsy Doane, K1EIC, of the ARRL traffic network. Of the 350 visitors received at headquarters during the year, 1 in 10 was from overseas. Maintaining links with other national societies is mutually beneficial, for it gives us an opportunity to observe the activities of other countries in our quest for common goals.

LIAISON WITH THE RRD

Liaison between the RSGB and the Radio Regulatory Department of the DTI is an essential part of the Society's ongoing work. A considerable amount of effort is devoted to the objective of continuing to review the conditions under which UK amateurs are licensed with a view to making improvements and refinements. The Society's Council, its Licensing Advisory Committee, and the Society's general manager/secretary are involved in licensing work, as are a number of other Society committees including the HF, VHF, Microwave and Raynet Committees. The venue for the regular RSGB/DTI meetings now alternates between Waterloo Bridge House and RSGB headquarters. When DTI staff visit us it provides an opportunity for the Society to show-off specific features of amateur radio, and on several occasions during the year headquarters staff have been able to demonstrate a number of facets of amateur radio, including Amtor, rtty and satellite communications. Such interaction is highly desirable. Contact with the licensing authority is by necessity on a daily basis, and RRD staff have clearly spent a considerable amount of time reacting with the Society in order to negotiate on a wide range of subjects.

It is evident that from the DTI point of view, the period July 1983 to June 1984 has to some extent been dominated by the transfer of licence records from a manual record-keeping system at Waterloo Bridge House to a computer based system at the Amateur Radio Licensing Unit, part of the Post Office, at Chesterfield, Derbyshire. Inevitably the time spent by DTI staff on the transfer of records has affected the time available for other liaison work, but the advantages which will accrue from a computerized licensing system will benefit the amateur radio community at large in many ways. For example, even during peak periods it should now be possible to issue an amateur radio licence within 10 working days and, in addition, the licence renewal work and changes of address should be processed more efficiently. The RSGB has been involved in discussions concerning the new forms which will be associated with the computerized record system. From 1 October 1984 the licence renewal validation document will be of a size which can be carried around in one's wallet —a feature which has been requested by the Society for many years. It will also be suitable for use when applying for a reciprocal licence.

A number of rather fundamental issues have been discussed during the year. The **1984 Telecommunications Act** finally received the Royal assent on 12 April 1984, with those provisions which relate to wireless telegraphy becoming effective on 16 July 1984. This Act will have significance for radio amateurs, especially in the area of spectrum abuse, and an important meeting with the DTI at the end of the year under review concentrated on the main problems of spectrum abuse which affect the

amateur bands. This is not a new problem by any means, but one which requires much concerted effort at considerable cost to produce any tangible benefits. While the resources available to combat spectrum abuse are unquestionably the limiting factor, progress is being made and the Society expects to see some benefits from the new legislation.

The Telecommunications Act has also provided a new stimulus to the discussion of **rf immunity** problems. In this context the Society has interacted with the DTI on a number of cases where difficulties arose, in order to help provide a workable solution. The transfer of the Radio Interference Service of British Telecom to the DTI, when it was renamed the **Radio Investigation Service,** was also discussed in conjunction with the new Telecommunications Act.

The Society continued its watching brief on **cable television.** This became a major topic for discussion in early 1984 when radio amateurs in Milton Keynes, Buckinghamshire, reported hearing signals from their local cable tv system on the 144MHz band. After visits to the town by RSGB and DTI staff, and the involvement of the local MP, the cable system finally closed down and changed to a new frequency which did not affect licensed radio amateurs. Clearly, the Society's involvement in this proved to be beneficial.

Another example of the Society monitoring matters which might affect radio amateurs was in connection with the selection of intermediate frequencies for **direct broadcast satellite receivers** intended for domestic use. Members of the Society's Microwave Committee became heavily involved, working alongside the DTI on a BREMA sub-committee. A summary of the results of this work was prepared for publication in the July 1984 issue of *Radio Communication*.

During February 1983 the Home Office issued 40 **special permits** to allow operation between 50 and 52MHz outside normal tv broadcasting hours. Having seen this experiment operate successfully for some 10 months, the DTI agreed to grant a further 60 permits in December 1983. This agreement only came about because the Society was prepared to co-ordinate applications on behalf of the DTI. The subject of the future use of a part of the spectrum around 50MHz on a more general basis continued to be discussed during the year, as did the operation of a permanent 50MHz beacon station to be located at RSGB headquarters. The Society expects to see the 60 additional 50MHz permits issued later in 1984 and further progress on the future use of 50MHz during 1985.

On 19 September 1983 the RSGB commenced issuing **special event callsigns** on behalf of the DTI at no cost to recipients. Since 1977, when the RSGB re-negotiated the GB callsign facility, the Society had undertaken the work involved, but the RRD had actually issued the licences. The Society has issued just under 1,000 "letters of variation" permitting the use of a GB special event callsign since September 1983.

From 8 June 1984, the DTI authorized, by means of a Gazette Notice, a number of changes to the UK amateur licence which permitted operation of an amateur station under conditions of emergency. This change to the licence also benefited **Raynet operation** and was brought about following much negotiation with the DTI. Details were reported in the June 1984 issue of *Radio Communication*.

During the year under review, the Society also made progress with the DTI over a wide range of other matters, including: reciprocal/mutual licensing, morse testing, unmanned df transmitters, repeaters and beacons, civil defence, the future of Band 1, morse for Class B licensees, crossband working, licence documentation, and other forms of licensing.

Finally, the DTI/RSGB working group continued its work during the year on the revised **Schedule** which was to become effective on 10 September 1984.

THE SOCIETY AND THE MEDIA

A dominant feature of the year under review was the first amateur radio operation in space, and we make no apology for featuring the event in this report. Even with the benefit of hindsight, it was always obvious that the STS-9 space shuttle flight, with mission specialist Dr Owen Garriott, W5LFL, operating amateur radio while orbiting the earth, would be of more than passing interest to the media. From the point of view of presenting amateur radio to the public at large in a favourable light, the STS-9 mission received more media attention than any other amateur radio-related event for many years: it will be considered in further detail later.

The Society's approach to its relationship with broadcast and newspaper media is, first, to assume that amateur radio is specially placed in its ability to bring high technology into the home environment and to make communication with the other side of the world possible as a result of individual creativity. It is also assumed that radio amateurs have skills which are unusual and desirable and which can often be used in the public interest. The other important part of the Society's role in this area is to do everything possible to point out the differences between amateur radio and other social uses of radio such as cb, since it remains an unfortunate fact that the media all too frequently bracket amateur radio with cb radio in the context of lurid and technically inaccurate headlines. To the media, a "radio ham" is anyone from a licensed leading light of the amateur world bouncing signals off the moon or relaying news from the Falkland Islands during the invasion, to a "cb operator" running high power to a decidedly illegal antenna array and stirring up enormous local antipathy and resentment as a result of massive breakthrough. The Society takes the view that the identity of amateur radio is of the first importance to the credibility of the hobby at national and international level, and that the Tony Hancock image, however humorous in content, is not beneficial to the amateur radio movement in a wider context. In an age of communication satellites, international subscriber dialling and a shrinking world—the "global village"—the ability of amateur radio to offer communication is not sufficient to guarantee public credibility. To a large extent amateur radio must now seek to present itself, in addition, as technically valid, exploratory and innovative.

The STS-9 shuttle mission presented the Society with an excellent opportunity to capitalise on these things. Before the mission a series of press releases was sent to national newspapers and broadcasters: these outlined the nature of the mission, gave an overview of amateur radio's history and technical capabilities, and added a potted biography of Dr Owen Garriott. The major thrust of the material sent out was that this was the first time that an ordinary citizen would have the chance to speak directly to an astronaut in earth orbit and that the credibility of amateur radio was such that a body with the status and uniqueness of NASA was prepared to permit such operations. Additionally, information packs containing all the above material and the best available operational data were sent to RSGB representatives and affiliated clubs, groups and societies for use with their local news media. These were to prove a great success, and altogether 79 local newspapers ran stories on local club involvement with the shuttle mission and, in many cases, used the text of the press release word-for-word.

In the meantime the headquarters station GB3RS was being fully refurbished in anticipation of national television networks wishing to film attempts to contact the shuttle "live". This duly took place, with substantial items being carried on the BBC "Sixty Minutes" news programme at about 6.15pm on two occasions, and brief items being featured on the 9pm news later in the evening. Interviews were given by headquarters staff for use in network radio, with both Radio 1 and Radio 4 running several lengthy items on the shuttle mission. The BBC World Service carried several items, including an interview for the magazine programme "Outlook", and the prestigious programme "Science in Action" also featured the event. The average audience for both of these is thought to be some 35 million. Several foreign-language transmissions in the BBC External Services also used headquarters-supplied material in translation with recorded actuality.

Independent local radio stations also showed great interest, and a total of 37 stations ran material consisting of either interviews with headquarters staff or programmes made in conjunction with local clubs and societies. Three cases of "spin-off", in the form of full-length feature programmes about amateur radio, took place, and material was supplied by headquarters. Another spin-off was a semi-regular series on amateur radio which ran for a time on one of the London ilr stations.

Some national newspapers carried the story, notably the *Daily Telegraph*; but, as is often the case, the factual information was frequently inaccurate and lacking in basic comprehension of amateur radio and the importance of the STS-9 mission. A vast amount of effort and time has been spent at headquarters during the year in trying to change this situation, but the majority of news editors seem determined to reduce any mildly technical issue to its lowest terms and manage to distort the facts wildly in so doing. The Society's view of the standards of newspaper journalism remains a jaundiced one, not only as a result of the shuttle mission but as a consequence of their handling of the majority of amateur radio issues, from breakthrough to planning appeals—all too often the "Tony Hancock" effect is paramount. Members sometimes complain that the Society is not doing enough in this area, but we have come to the regrettable conclusion that only time and applied pressure will change the perception of amateur radio by news editors. Headquarters, RSGB respresentatives in the field and local clubs must all work in conjunction if this is ever to be achieved.

In a sense, there is something of a tightrope to be walked in the area of the Society's relationship with the media. It is at least arguable that amateur radio should not seek too much publicity: it is better that radio amateurs should be left to go about their business. The example of cb should serve as a warning: the cb lobby sought, and got, a good deal of publicity in the early days when legalisation was in prospect, but it is now obvious that the media's tendency to see in primary colours has rebounded and that cb radio now has faintly disreputable associations for most media producers. The Society would prefer to err on the side of conservatism in its relationship with media outlets, on the grounds that there is, after all, such a thing as a bad press and it is preferable to have little publicity than the wrong sort of publicity. It is with this in mind that the RSGB's efforts continue.

MEMBERSHIP CONTACT

It has been a feature of the past few years that more members want more information from RSGB. The new headquarters meant that the Society could employ the additional staff needed to cope with the extra demands. However, the desire for more information prompted several actions: the distribution of the monthly *Council Letter* to all affiliated clubs, the production of more display panels for use at exhibitions and rallies, more headquarters lectures to clubs, and the introduction of a Prestel mailbox. At the end of the year the Society was considering the possibility of providing some form of output which could be used by members with home computers—this could be achieved either by the Society becoming an "information provider" on Prestel or by utilizing an in-house system accessible by telephone, or both. Obviously such means of providing detailed information would have advantages.

As well as providing information, the Society needs feedback from its members. One important means of interaction, for both members of headquarters staff and volunteer representatives, is to visit amateur radio clubs and groups up and down the country: on these occasions the work of the Society can be discussed and various important topics of the day can be given an airing. Such events are conventionally known as "lectures", although they inevitably turn into lively seminars wherein misunderstandings are resolved, misconceptions quickly despatched, and the Society is seen to resemble any other organization trying to do its best for its members—as opposed to a remote body at several removes from the hobby in which it is supposed to be concerned. The evening on which "the man from the RSGB" pays a visit to the club is usually the one in which accumulated myths are demolished and the Society is seen, after all, to have a human face.

During the year under review, headquarters staff have visited a total of 32 clubs with a geographical spread between Bournemouth, on the south coast of England, and Lerwick in the Shetland Islands. This included a "grand tour" of the north of Scotland in June, during which radio amateurs in no less than 10 clubs heard the current state of play in the Society: on several occasions the sessions did not end until after midnight, with a good deal of discussion and debate having taken place during

the course of the evening. Several clubs have commented that the "lectures" were most valuable and welcome.

As always, however, the process is essentially two-way. In the case of the lectures to clubs and groups in the north of Scotland, the Society took home some well-made points about how conditions in that part of the UK differ from those in the south, and some very valuable lessons were learned. Indeed, this is always the case: the lecturer inevitably takes away impressions, feelings and new knowledge, and this is translated in some cases into direct action to resolve a problem. It is also transmuted into new insights into the needs of the grass-roots amateur, and Society policy can then be formulated with these in mind.

Considerations of cost and resources mean that the society cannot always guarantee to provide lecturers to every club which requests them: for the coming year the policy is to make lectures as cost-effective as possible by requesting clubs in a given local area to combine for the evening. With this in mind, staff and volunteers will be pleased to accept requests for lectures in any part of the country.

Clubs visited by headquarters staff in the course of the year included those at Lymington, Coventry, Dover, Harlow, Crystal Palace, Aylesbury, the Nene Valley, East Kent, Medway, Hatfield, Brighton, Dundee, Perth, Forfar, Aberdeen, Peterhead, Caithness, Lerwick, Elgin, Inverness, Invergordon, Chesham, Worthing, Ipswich, Stowmarket, St Albans and Maltby.

Membership

During December 1983 the Society's membership passed 35,000 members, which represented a 75 per cent increase in membership in six years. Membership during the 1983–4 financial year increased from 33,868 to 36,148; a 6·73 per cent rise which compares favourably with the 5·13 per cent rise in the previous year.

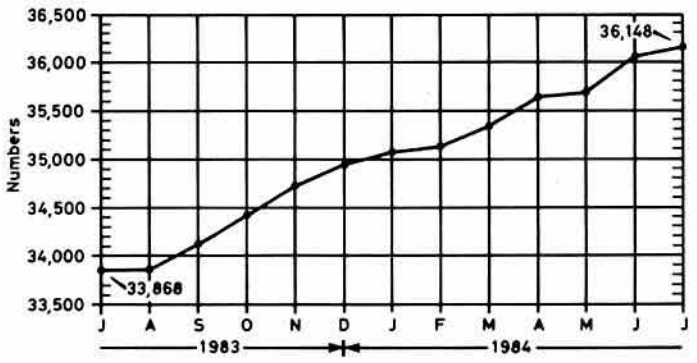
The table of "new members by month" gives information going back to 1978–9 for comparative purposes.

At the end of the year, 53·6 per cent of UK licensed amateurs were members of the Society.

New members by month

Month	1983–4	1982–3	1981–2	1980–1	1979–80	1978–9
July	377	540	540	291	213	214
August	352	446	414	295	307	311
September	481	509	836	679	210	249
October	653	558	626	288	400	379
November	513	192	549	581	455	483
December	321	458	558	280	328	140
January	439	511	313	483	539	510
February	401	468	419	529	320	301
March	517	795	436	320	316	415
April	524	365	478	491	439	226
May	335	355	283	437	342	339
June	588	301	285	696	346	366
TOTAL	5,521					

Membership graph



RADIO COMMUNICATION

The changes made to the layout and content of the magazine from the June 1983 issue have now been running for a full year, and this review provides an opportunity to assess their impact. The changes have been welcomed enthusiastically by the membership at large, particularly the additional space for news, comment and readers' letters. The increased input from headquarters and our many other sources resulted in a 14 per cent increase in the number of editorial pages (691 compared with 606 in the preceding 12 months), with a consequent substantial increase in the workload of our limited number of specialist editorial staff. There is no doubt that the sheer amount of text content of our editorial pages exceeds that of any other UK amateur radio magazine, and the editorial staff are to be congratulated on having coped with this further increase in their workload and for ensuring that every issue has been despatched on schedule throughout the year.

There is, of course, a price to be paid for all these improvements, and the limitations imposed by staffing levels and the Society's budget must not be ignored. It is appropriate to note in this respect that for the second year running the advertising content has continued to decline (down 24 per cent on last year) so that a greater proportion of the cost of producing the magazine has had to be financed by other sources of Society income.

Nevertheless we are sure that the majority of members feel that the magazine is excellent value for their money, and we look forward to other innovations and improvements during the year ahead.

SOCIETY AFFAIRS

The Society's 49th President, Mr D. E. Baptiste, CBE, completed his term of office at the end of 1983. Because of his professional work involving radio communication at international conferences over many years, he was able to add a new dimension to the functioning of Council meetings, and was able to make the Society's Forward Planning Group operate in a very special way; his qualities of leadership greatly enhancing the Society's work at many levels.

Mr R. G. Barrett, GW8HEZ, became the Society's 50th President on 1 January 1984. He was officially installed as President in the prestigious surroundings of Cardiff Castle on 14 January 1984.

There were five vacancies for the 1984 Council. Of the three vacancies for ordinary members, two were filled by Dr D. S. Evans, G3RPE, and Mr B. O'Brien, G2AMV, both of whom were returned to Council having gained 2,516 and 2,316 votes respectively —both having stood down from Council for one year in 1983 under Article 26. The third vacancy was filled by Mr G. R. Smith, G4AJJ, who gained 1,912 votes.

Mrs Joan Heathershaw, G4CHH, was returned to Council unopposed for Zone A, but the vacancy for Wales, Zone E, was not filled as no nominations were put forward by this zone. The casual vacancy which thus existed in Zone E was subsequently filled by ex-Council member Mr D. M. Thomas, GW3RWX.

Attendance at Council meetings

	1983			1984		
	13.8	29.9	12.11	14.1	22.3	26.5
Dr E. J. Allaway, G3FKM	×	×	×			
Mr D. E. Baptiste, CBE	×	×	×	×	×	×
Mr J. T. Barnes, GI3USS				Co-opted May		
Mr R. G. Barrett, GW8HEZ	–	–	×	×	×	×
Mr J. Bazley, G3HCT	–	×	×			
Mr P. F. D. Cornish, G3COR	–	–	–	–	–	×
Dr D. S. Evans, G3RPE				×	×	–
Mr K. A. M. Fisher, G3WSN	–	×	–			
Mr G. A. Griffiths, G3STG	×	×	×			
Mr F. D. Hall, GM8BZX	×	×	–	×	×	×
Mr L. N. G. Hawkyard, G5HD	×	×	×	×	×	×
Mrs J. Heathershaw, G4CHH	×	×	×	×	×	×
Mr H. M. Holmden, G4KCC	×	–	×	×	×	×
Mr G. R. Jessop, G6JP	×	×	–	×	×	×
Mr I. J. Kyle, GI8AYZ	×	×	–	×	×	Resigned
Mr T. I. Lundegard, G3GJW	×	×	×	×	×	×
Mr W. J. McClintock, G3VPK	×	×	×	×	–	×
Mr B. O'Brien, G2AMV				×	×	×
Mr H. S. Pinchin, G3VPE	×	×	×	×	×	×
Mr D. M. Pratt, G3KEP	×	–	×	–	×	×
Mr G. R. Smith, G4AJJ				×	×	×
Mr D. M. Thomas, GW3RWX	Co-opted January				×	–
Mr K. E. V. Willis, G8VR	×	×	×	–	×	–

Four Council members did not continue their membership of Council in 1984. Dr E. J. Allaway, G3FKM, and Mr J. Bazley, G3HCT, had not been eligible for re-election under Article 26, while Mr K. A. M. Fisher, G3WSN, had decided not to stand again for Council due to work commitments. Mr G. A. Griffiths, G3STG, had not been re-elected. All four had given excellent service on the Society's Council, and intended to retain their close links with the Society in various ways.

At the first Council meeting in 1984, Mrs J. Heathershaw, G4CHH, was elected executive vice-President for the year.

In the year under review, Council met six times: information on the work of Council and the highlights of the work of its committees continue to be recorded in *Radio Communication* under "Council Proceedings". Council and its 16 committees held a total of 141 meetings during the period 1 July 1983 to 30 June 1984. To illustrate the enormous amount of work that goes on in the background, the total of 141 sets of minutes which were produced involved some 30,000 pages of A4 paper. The expertise and hard work put in by the members of the Society's committees, honorary officers, representatives and other volunteers continues to be a main source of strength and prestige for the Society.

AND FINALLY. . .

To remind members, here are some statistics on the number of volunteers involved in RSGB work, and some headquarters statistics. There are 18 Council members; 20 regional representatives; 77 area representatives, 237 committee members on 16 committees; 611 affiliated clubs, societies and groups; 57 GB2RS newsreaders: 13 members of the Planning Panel; 51 QSL Bureau sub-managers; 9 honorary officers; 13 intruder watchers; 18 AROS listeners; 33 beacon keepers; 73 slow-morse transmitters; and 149 repeater keepers. RSGB headquarters despatches some 10,000 leaflets per annum, plus letters, membership cards subscription reminders, book orders, newsletters etc, which number in excess of 150,000 each year. The RSGB QSL Bureau processed some 2·4 million QSL cards. Headquarters has over 100 leaflets and some 500 different standard letters to help and advise members. On the headquarters data processing equipment there are now over 100,000 disk accesses and some 3,000 changes to files in a typical working day. Some surprising statistics, but they help to illustrate the very large effort which is put into amateur radio by both staff and volunteers on your behalf.

COMMITTEE REPORTS

Education

Committee: GM4FZH*, G2CVV*, G3HB, G3LCK, GW4HWR, GM8BZX, GW4JNE, G6NZ, G3FVC, G2WC, G3SZJ, G8MW (died Sept 1983)

The death of the chairman, G. C. Oxley, G8MW, in September 1983, is reported with great regret. The vice-chairman, F. C. Ward, G2CVV, has retired due to ill-health and has become a corresponding member of the committee.

Lectures on the background of amateur radio were given by members of the committee at the Science Museum and at the Amateur Radio Convention at the NEC, Birmingham. At NEC there was also a discussion with RAE tutors, at which a representative of the City & Guilds of London Institute was present.

Liaison with the Association of Science Education is being fostered. This is the organization to which many school science teachers belong. It is considered to be an important exercise in view of the increasing involvement of even very young children with computers at school, which could well be to the detriment of their later interest in amateur radio.

There has been revision of the *RAE Manual*, mainly to cover changes in the licence conditions as appropriate. A revised version of the manual taking account of these changes up to September 1984 is expected to be available early in October. Most of the revisions to take account of syllabus changes in 1986 have been completed.

A new publication, *How to pass the Radio Amateurs Examination*, is being prepared by members of the committee. This will include a number of sample RAE-type question papers. It is hoped that this will be available in late November.

Progress on a new edition of *RAE Revision Notes* has been very slow for a number of reasons. However, this is probably an advantage in that a new edition of this previously very successful publication can be based on a later edition of the *RAE Manual*.

G. L. Benbow, G3HB, chairman

EMC

Committee: G4BYA, G2FLB, G3HCQ, G3MUX, G3PLB, G3HLF, G2YS, G3AEZ, G3BLE*, GU3YIZ*, G4FWM*, G4DXA*, G3VWK*, GM4ITK*.

The committee has again successfully carried out its principal function of dealing with the many and varied difficulties that members have with interference both to and by the amateur service.

Membership of the main committee has not yet attained the hoped-for strength of 12 necessary to deal with an increasingly wider range of both interference problems and equipment. Any Society members with emc experience will be welcome to fill the present three vacancies and should contact the vice-chairman.

The policy decided last year of having a committee representative in every RSGB zone to help with the interference problems of individual members of the Society in their zone is working, but representatives are still required in Zones B, C, E and F. These are corresponding committee members who liaise with the main committee, and queries to be dealt with in the zones should be passed to the vice-chairman in the usual way. Again, any Society member in any of the above zones who is willing to take on a corresponding member's job should contact the vice-chairman.

Meetings of both the main committee and the ad-hoc working groups have been held during the year. The working groups have made considerable progress with both the new emc manual and the next RSGB Convention presentation, and it is hoped that groups will take up new work during 1984/5. A deadline has been set for contributions to the new emc manual—the committee has decided that it must go to print in 1985. Material presently available for the manual is very nearly sufficient, and committee members have agreed to make further contributions to complete it.

While the change of name from "Interference" to "Electromagnetic compatibility" came about largely to bring us into line with current world thinking on the subject, it is a more positive title reflecting our aim of achieving compatibility between the amateur, and the increasing volume of electronic equipment being introduced into nearly every aspect of our daily life.

Finally, I would like to record my thanks to all the members of the committee for their help, advice and time during the year. We all hope to be able to provide help and counsel in this coming year, both technical and social, and to become increasingly involved with emc activities in the UK.

Sheila Gabriel, G3HCQ, vice-chairman

Exhibition & Rally

Committee: G5HD, G3TDR, G4HHB, G3VPK, G3MVV, G3SZJ, G8ENO.

The committee met each month during the year under review. The greater part of its work was taken up in organizing the second National Amateur Radio Convention at Birmingham. This event proved as successful as the first, and has set the seal on the decision to hold the Society's major event of the year in the centre of England.

Planning for NEC '85 is at an advanced stage. Half of the available stand space has already been sold, and it is anticipated that the third National Amateur Radio Convention at Birmingham will be even bigger than the 1984 show.

The National Rally at Woburn was again enlarged in order to accommodate the growing numbers of dealers who wish to exhibit, with attendance figures in the order of 7,000. Woburn remains one of the most popular rallies in the calendar.

Committee members attended numerous events throughout the country in order to get an overall picture of the exhibition and rally scene. One pointer emerges from this, which is that too many rallies are taking place during the year, and major dealer support is on the decline!

May I record a vote of thanks to the committee members for all their work during the year, and to all the committees who attended the national convention and contributed so much to the event.

Norman Miller, G3MVV, chairman

Finance & Staff

Committee: G3FKM, G3COR, G3RPE, G4CHH, G2AMV, G3VPE.

The Committee met 11 times during the year. The most important matter discussed was the establishment of a contributory staff pension scheme. This is on target to commence on 1 December 1984. It will enable RSGB to offer to both existing and prospective members of the staff an attractive scheme comparable with that operated by other organizations.

In last year's report mention was made of discussions to facilitate the handling by the Society of bequests and donations. This is being progressed and may take the form of a trust fund.

Staff have continued to settle in at Potters Bar successfully. The larger premises have enabled the Society to effect long-overdue increases in staff. These included the appointment of a technical officer, additional staff in the membership services department, and a replacement member of staff to deal with the circulation and production of books.

Those present at the annual general meeting in 1983 will recall the discussions regarding the re-naming of the Potters Bar headquarters. The committee put forward to Council a recommendation to call the building "Lambda House". Older members will recall the formation of a subsidiary company, Lambda Investments Ltd, at the time of the purchase of the Doughty Street premises. Newer members may like to be reminded that Lambda is the Greek letter used as a convention to denote wavelength.

A regular feature of the Finance & Staff Committee meetings is a regular report from the honorary treasurer, together with interim figures and comparisons with budgets. A matter which affects all members is, of course, the level of subscriptions. During the year it was agreed that these must be increased. Nevertheless it was gratifying to be able to recommend to Council an increase slightly less than the level of inflation since the last adjustment.

The committee has looked again at the qualifications necessary to achieve a reduced or waived subscription. Changes have been suggested to Council, details of which will be published shortly. Routine agenda items included the annual staff review, recommendations for honoraria, and regular reports from the secretary/general manager on matters relating to staff and finance.

Once again it is the chairman's pleasure to thank all members of the committee for their invaluable contributions, and also the secretary/general manager for his co-operation.

Basil O'Brien, G2AMV, chairman

HF

Committee: G3FKM, G3ZAY, G3KMA, G3HCT, G3XTT, G3SJX, G3AAE, G4BUO, G3GIQ, G3NKS, G6LX*, G3GVV*, G3GJW*, G3KDB*, G3DME*.

During the period under review the HF Committee met on eight occasions, and in addition its members spent many hours on committee business, studying and preparing papers, and liaising with RSGB hq and other committees.

G4CNY resigned at the beginning of the period, having served on the committee since its formation in 1978. Thanks are due to him for his sterling service. New members G3KMA, G3HCT (re-joined) and G3SJX were welcomed during the year.

The period was a particularly busy one for the committee, with several major agenda items consuming much time at successive meetings.

The HF Convention was again organized in conjunction with the RSGB's National Amateur Radio Convention at the NEC, Birmingham, and was judged to be a success (a full report appeared in the August 1984 issue of *Radio Communication*). However, alternative arrangements are being considered with a view to improving the social aspect in future years.

Another major activity concerned the 1984 IARU Region 1 Conference. A number of papers were prepared and the committee reviewed those submitted by other IARU member societies in order to brief the RSGB's delegates to the conference.

One particular disappointment arising from the conference was the rejection of the RSGB's proposals for band planning and repeaters in the band 29·55 to 29·70MHz. In spite of this, the committee remains convinced that a lead needs to be taken because of the rapidly increasing level of activity on this band, following the appearance of modified ex-cb equipment. It is aware of the need to protect existing users of that part of the 28MHz band. In conjunction with the RMG proposals for a limited number (possibly four) of experimental 29MHz fm repeaters are being considered. The experiment—if approved by the appropriate authorities—should

enable the committee to present a stronger and factually supported case to the next IARU Region 1 Conference to be held in 1987.

The committee embarked upon a major review and restructuring of the Society's hf awards programme, which began with the announcement of the new Commonwealth Century Club Award. In preparation for this review, the RSGB's Countries List and Commonwealth Call Area List were revised and up-dated, and copies are now available through RSGB Publications (Sales) in the form of band-check lists.

Other matters discussed by the committee included an hf (cw) novice licence (proposals were forwarded to the Licensing Advisory Committee (LAC), desirable improvements to the Class A licence (also submitted to the LAC), and the generation of articles on hf subjects for *Radio Communication*. In conjunction with RSGB hq staff the committee actively pursued the possibility that Operation Raleigh might assist with dxpeditions to certain rare DXCC countries.

The retiring chairman wishes to place on record his appreciation of the time and effort expended by committee members, and thanks them for their support. He offers his successor every success for the future.

D. Thom, G3NKS, chairman

HF Contests

Committee: G3FKM, G6LX, G3KDB, G3NKS*, G3OZF, G3RJV*, G3SJX, G3TXF, G3XDY*, G4BUO, G4DJX, G4RWW, RS20249, RS32525.

The workload continued to increase both in regard to contest administration and contest adjudication. There were 10 formal meetings during the year to decide on contest rules, correspondence and policy. In addition, a number of informal contest adjudication and results meetings were held. During the 12 months under review, a total of over 2,300 logs have been checked and over 500 pieces of correspondence have been handled by the committee.

The committee manned a contest information stand at the NEC exhibition, and members were present at the IARU Region 1 Conference and at the HF Convention. Members visited a number of clubs and societies to talk on contest matters, and also produced articles for *Rad Com* and other RSGB publications.

We were sad to lose two very hard-working committee members—G3XTJ, who died in August 1983, and G3KKQ, who retired after a number of years as committee secretary. We were joined by G4RWW in November 1983, and she has since become the committee secretary. The chairman of the HF Committee, G3NKS, rejoined us as a corresponding member. The committee also has close links with the IARU and VHF Contests Committee via cross-membership. Our thanks are extended to the df co-ordinator, Eric Mollart, for his assistance in organizing the many df contests, to the Rev G. C. Dobbs, G3RJV, for his advice and guidance on QRP contest matters, and to the RSGB hq staff who assisted with contest stationery and provided other help as required.

Ron Glaisher, G6LX, chairman

IARU

Committee: G3FKM, G3ZNU, G3HCT, G3BYW, G3RPE, G3WSN, G6LX, G5CO, G3GVV, G4KGC, G3DME*, G5XB*, G3VPK*, G8PB*, G4IQQ*, Ms H. M. Normant.

The committee met on nine occasions, its principal task being preparation for the International Amateur Radio Union Region I Conference. This took the form of the analysis of papers submitted by RSGB committees; reference to, and discussion with, those committees concerning the contents of the papers; study of papers submitted by other national societies, with special reference to their implication, their connection with RSGB-originated papers and with RSGB policy; allocation of papers to each member of the conference delegation; and agreement of policy on papers.

The IARU Region I Conference was held at Cefalu, Sicily, from 8 to 13 April. ARI, the Italian society, was the host. It is to be congratulated for the excellence of its organization. The RSGB delegation comprised the following: Committee A (hf and administration)—Tim Hughes, G3GVV, who was delegation leader, John Bazley, G3HCT, and Ron Glaisher, G6LX. Committee B (vhf and microwaves)—Malcolm Appleby, G3ZNU, Dain Evans, G3RPE, Keith Fisher, G3WSN, and Petra Suckling, G4KGC.

Other IARU Committee members who were present in an IARU capacity were John Allaway (chairman, Region I HF Working Group), Eric Godsmark (secretary, Region I), and Alan Taylor (IARU beacon co-ordinator). Heather Norman and John Morris, GM4ANB, both attended on behalf of Region I, acting as secretaries of Committees A and B respectively—demanding tasks which brought them the gratitude of everyone who was there. A full report of the conference appeared in *Rad Com*, September 1984.

R. J. Hughes, G3GVV, chairman

Licensing Advisory

Committee: G3FKM, G3ZNU, G3HCT, G3RPE, G3WSN, G3YGF, G3STG, G4CHH, G4FJN, G3KEP.

Eight meetings of the full committee have been held during the year. In addition, there have been quarterly meetings and meetings for specific topics with the Radio Regulatory Division of the Department of Trade & Industry.

During the year the new schedule to the licence has been developed with a view to making the licence more easily understood. This work will continue in 1985, and major revisions will be made to the wording of the main body of the licence. For many years the Society has been conscious of the need for a much more professional-looking UK amateur licence. The committee has been involved with the DTI in preparing a new licence format, which is currently being introduced.

Recommendations have been made to allow Class B licensees to use morse for practice purposes, and it is hoped that this facility will be introduced for an experimental period quite soon. As part of the recommendations guidelines have been prepared to reduce the possibility of interference to existing cw operators. These guidelines will be published in *Radio Communication*, and arrangements are being made for them to be issued with new Class B licences.

Following the success of the 40 experimental permits for 50MHz, the DTI has agreed that the number of permits can be increased to 100.

The committee is in continual dialogue with the DTI with regard to the problems of intruders, interference and general spectrum abuse on the amateur bands. The DTI would welcome closer links with the Observation Service and Intruder Watch, and it is planned to give greater publicity to successful prosecutions. Representatives of the committee have been involved with the problems of cable television, and in discussions regarding direct broadcasting by satellite. The problems envisaged with intermediate frequencies falling within or near amateur bands are being closely watched.

The committee is grateful for the many comments and suggestions which have been received in connection with "novice" licensing and amateur licensing in general. All these comments are now being considered with the intention of making proposals for the future.

Some of the other matters currently under discussion include: beacons and repeaters, European licensing, crossband working, morse testing, special research permits and the use of df transmitters.

D. M. Pratt, G3KEP, chairman

Membership & Representation

Committee: G2AMV, GW2FLZ, G3FKM, G3RPE, GW3RWX, GI3USS, G3VPE, G3VPK, G4ADD, G4CHH, G5HD, GM8BZX, GW8HEZ, Ms H. M. Normant.

Successful open meetings were arranged by the committee in Region 2 at Leeds, and in Region 1, at Chester. The format for these meetings was changed this year such that all members in a region were invited to attend, and the meetings were held on Saturday afternoons instead of Saturday evenings. A further open meeting will have been held in Region 20 at Bristol before this report is published.

The committee considered many applications from new clubs and societies for affiliation to the Society. A new procedure was introduced whereby new clubs and societies must include "amateur radio" in their titles and constitutions unless special circumstances, which must be approved by Council, allow this to be waived.

The three-yearly elections for regional representatives and area representatives were held this year, and 50 per cent of the regional representatives were new appointments. Prior to the regional representatives' conference in November 1983, the representatives were shown around RSGB hq and given useful background information by the general manager. A similar arrangement will be made in 1984 for the benefit of the new regional representatives. The committee intends to develop the training available for regional representatives in future.

The committee is responsible for the appointment of newsreaders for GB2RS and the broad terms of the content of GB2RS. An attempt has been made this year to reach a compromise between too little news and scripts that are too long to be read in full on 3·5MHz where all local club news items are intended to be read.

Current work of the committee includes an assessment of the needs of recently licensed members in the mid-'eighties, and ideas from readers of this report would be welcomed by the chairman.

I record my thanks to the members of the committee for their efforts, to Heather Norman of RSGB hq for her assistance and liaison, and to the general manager for his co-operation.

Henry S. Pinchin, G3VPE, chairman

Microwave

Committee: G3ZNU*, G4CNV*, G3JHM*, G3RWL*, G3XDV*, G8AGN, G4KNZ, G3PFR, G3RPE, G3YGF, G4FSG, G4FRE, G3WDG, G4KGC, G3JVL, G8CIU

The committee has been strengthened by the addition of two members to specifically cover "the middle bands" (2·3, 3·4 and 5·7GHz), and the 10GHz band.

The potential threat from direct broadcast satellite i.fs was identified by the committee and a case prepared explaining the pitfalls. The Society was delighted when BREMA subsequently recommended a first i.f. not covering an amateur band. We now await manufacturers adopting the recommendation!

The committee has continued to maintain and improve the comprehensive Microwave Beacon Service within the UK with the valuable assistance of the beacon-keepers.

A number of microwave round tables have been organized around the country, and lectures and displays of working equipment given at the VHF Convention and the NEC exhibition.

For the IARU conference in April 1984 the committee prepared and presented seven papers.

The highly popular Microwave Component Service was introduced with a loan from the Society—this has proved so successful that an increased amount of money has been made available.

Considerable progress has been made in producing equipment to enable contacts to be made on 47GHz.

P. G. Murchie, G4FSG, chairman

Propagation Studies

Committee: G3BYW, G3LTP, G2FKZ, G3DME, G3HTF, G3JVL, G4AQI, DJ5DT*, F8SH, G2AHU*, G3GVV*, G3NAQ*, G3USF*.

The Propagation Studies Committee has continued with all the routine work of past years, which includes the supply of weekly solar/geophysical data summaries for the GB2RS news bulletins, the monthly table of hf propagation predictions published in *Radio Communication*, and the regular analyses of hf beacon reception which provide running checks of the effectiveness of the forecasts.

A second tape/slide lecture on auroral propagation has been completed. Another, based on a series of photographs of the aurora as seen from space, purchased from NASA, is nearly ready for release.

The committee provided lecturers for the VHF Convention and the National Amateur Radio Exhibition, and contributed three papers to the IARU Region I Conference in Sicily.

Three professional meetings were attended: a Royal Society Colloquium on current research in radio science and engineering; a discussion on mid-latitude sporadic-E propagation organized by the Rutherford Appleton Laboratory, and a solar/terrestrial predictions workshop held in Paris, at which a paper was presented. Representation on CCIR Study Groups 5 and 6 has been maintained.

The committee is engaged in an in-depth study of logs submitted by holders of 50MHz experimental permits. Returns in connection with the vhf sporadic-E project have been fewer than expected, but it is too early to judge whether this indicates a falling-off in enthusiasm on the part of our observers or a decline in the number of events.

R. G. Flavell, G3LTP, chairman

Raynet

Committee: G3XC, G3STG, G4CHH, G8CAC, G4AVV, G3VPE, G4KAR, G3TJP, G3FKM, G3WSN, G3RPE, G4FLQ†, G8LWY*, G6AJF*, G3KWT*, G3PYN*, GW3ZXI*, G4MWO*, G3IIR*, GI3USS*, GM3RFA*, Mrs Taff Crane (who died in March 1984), Mrs Jane Balestrini.

During the year Raynet lost the services of two long-serving members who had worked very hard for many years in the service of the network. Eric Yeomanson, past-chairman and zonal representative, and Taff Crane, membership registration secretary, both working for Raynet until shortly before their deaths.

The year has seen many developments in Raynet organization and activities. The publication of a rules document has been welcomed, as has the recent release of the 1984 edition of the *Raynet Manual*. The production of the manual has taken up much of the effort of the committee members during the year under review, and the new document has been quickly recognized as a useful source of authoritative guidance and suggestions for every member's bookshelf.

No less an achievement was the scheme to transfer all membership records to the Society's computer at RSGB hq. Plans for this relocation were already well advanced at the turn of the year, when Taff was forced to relinquish her duties, and Dave Lankshear, G3TJP, undertook to maintain the records during the interim period. The computerization of records, and the new format of membership cards, has found wide acceptance among members, while the benefits of easier access to information are now becoming apparent.

The network has continued to serve the user services throughout the year, both in exercise and in real emergency situations, and the changes in licence conditions published towards the end of the period have made the opportunities for service by members to the community much more flexible.

The members' service in support of county emergency planning officers has come under attack in some quarters, but the network's position remains that individual members and groups are at liberty to decide what level of activity they wish to undertake in support of each of the users.

The move by groups away from usage of 144·875MHz has been completed, and occupancy of frequencies in the 432MHz band has increased. The use of rtty for message handling at vhf and uhf has increased during the year, with growing numbers of groups acquiring equipment from Suffolk Raynet and elsewhere. During the period over 50 talk-through permits have been issued which have been used for engineering development tests and to improve the service offered to the user.

The symposia sessions held at the HF Convention proved very helpful, and more sessions are planned for the forthcoming year. Furthermore, the zonal representative scheme, which has completed its first three-year period, has lived up to its early promise to improve communication between members, and the committee looks forward to a further period of successful operation, with particular attention being paid to the user services at national level.

G. A. Griffiths, G3STG, chairman

Repeater Management Group

Members: G3LEQ, G3ZNU*, GM8LBC, G4KNZ*, G3XDV, G4AFJ, G8HVV, GM8KPH*, G4FSG*, G4IVV*, G4EFO, G3VZV, G4CCC.

On the recommendation of the Society's Forward Planning Group, the Repeater Working Group of the VHF Committee became a committee in its own right in July 1983, and was renamed the Repeater Management Group.

Early in the year, corresponding members GI8AYZ and G6KMM resigned. They are thanked for their past efforts. Two new corresponding members were recruited—GM8KPH to improve liaison with the north of Scotland, and G4IVV to maintain close links with BARTG.

The RMG's original role was to vet new repeater proposals, and this continued, with some 70 applications being processed, though many were dropped by their proposers at an early stage. Six uhf and 18 vhf proposals stayed the course and were submitted to the Department of Trade & Industry for licensing. New licensing guidelines were agreed with the DTI, and although some improvements were made the DTI's very time-consuming clearance procedures proved frustrating.

Several 29MHz repeater applications were received. Discussions took place with the HF Committee resulting in a draft specification and bandplan, and it is hoped that a few experimental repeaters will be licensed in 1985. A similar exercise took place with the Microwave Committee with a view to submitting proposals to add 10GHz receivers to a few 433MHz repeaters.

The committee's other main role is management of, and support for, the licensed repeater networks. This is an on-going job and would remain even if there were no new repeater applications. The number of licensed repeaters increased by 34 to 207, including five atv units and the pilot-ssb experiment—both UK firsts. The number of operational repeaters also increased, and this included three tv repeaters and several 1·3GHz repeater/beacons. Technical advice was made available to repeater groups, and encouragement and assistance were offered to those commissioning new units, or who had faults resulting in a long "downtime". A number of technical pamphlets were produced, and a *Radio Communication* article was published entitled "Providing local coverage on vhf and uhf".

The RMG processed 13 proposals to change repeater sites, channels or callsigns, and suffered criticism from those groups who found it hard to believe that most changes take as long to clear with the DTI as new repeaters (about eight months). In addition, three new groups were given franchises to operate existing repeaters. This is similar in principle to the IBA franchise system in that the RSGB is the licensee and it permits local groups to operate repeaters on its behalf. A re-allocation is needed where the old group loses interest or, as in one case this year, the Society feels that a repeater is not being run in accordance with licence conditions.

Several cases of co-channel interference were investigated, but in most instances the cause was the misuse of repeaters by fixed stations working "dx". This is beyond the RMG's power to deal with. In some cases a channel change resolved co-channel interference problems. The public liability insurance policy taken out on behalf of all repeater groups was greatly improved this year at no direct cost to repeater groups.

Open meetings were held in London, Poole and Inverness, the latter proving costly but well attended. A large number of talks was given to clubs by RMG members, and manned display stands were put on at the VHF Convention and the NEC. In addition, eight seven-hour committee meetings were held.

Repeater lists and maps are available from RSGB Publications (Sales)—these are kept up to date by the RMG. The list, which is held on the data processor at RSGB hq, has some 10 changes made to it each week, and the vhf and uhf maps were completely revised in April. Work progressed on the production of maps showing the service areas of operational repeaters, and it is hoped that these will be available to members in 1985.

At the Second IEE Conference on spectrum conservation techniques a paper entitled "The amateur 433MHz repeater network" was presented, and a spin-off was an invitation to give an informal talk on amateur repeaters at an IEE summer school attended by commercial repeater users.

Two papers were submitted to the IARU Region 1 Conference, both concerning uhf repeater channels. The conference was unable to resolve the problems of co-existence between the UK's "RB" channels and the European "RU" channels, and a meeting of repeater managers from OZ, PA, ON and G is planned.

It is regretted that the newsletter for repeater groups, *Repeater Report* did not appear this year owing to pressure of other work. It is intended that the publication will be on a better footing next year.

Work for 1984/5 will include devising specifications for data repeaters (including packet data), trying to encourage the use of uhf and microwave repeaters, and examining ways of linking repeaters. It is also expected that there will be more direct practical involvement with repeater groups.

Pressure of work has been such that it can take some time for letters to be answered. Correspondents are asked to deal, if possible, directly with the RMG member responsible for their repeater or area rather than with the chairman. It is hoped that this will improve efficiency in the next year.

Mike Dennison, G3XDV, chairman

Technical & Publications

Committee: G4FAW, G3RPE, G3YGF, G3SJX, G3VA*, G4GYO, Mr A. W. Hutchinson†, Ms H. M. Norman†.

During the year the committee met 10 times. In addition there were two special meetings to discuss particular books, together with liaison meetings for individual publications.

Several significant changes have been made to that most important membership service, *Radio Communication*, with the objective of making it a more effective link with members. These have included generating editorials (which, in general, have provoked a positive response); giving greater emphasis to members' letters and including replies where appropriate; and expanding the news section. All the changes have been well received. However, there is of course a price to be paid—the more pages used to cover these aspects, the fewer there are available for other purposes. One of the tasks for the coming year will be to review the balance of the magazine to ensure optimum use of the space available.

An important step has been the introduction of the *RSGB News Bulletin* as a loose insert from the December 1983 issue onwards. The copy date for this is about seven day before the posting date, which means that it probably represents the most up-to-date news service of any magazine.

A perennial problem for any publication is not so much obtaining material but obtaining the right material. It is a fundamental difficulty: those who are prepared to write naturally wish to describe topics that interest them, and not necessarily topics that others would wish to see. However, some progress has been made in trying to get around this point. The amount of committee effort devoted to the refereeing of articles has been substantially increased with the objective of speeding-up the process, at the same time offering constructive comments in more detail to less experienced authors. The Society has appointed its first full-time technical officer whose duties are specifically to produce technical material with the interests of the newcomer in mind; the first of several projects currently being undertaken is nearing publication. The establishment of a "QRP" column is already beginning to generate technical material in this area. Finally, an article giving information and advice on writing for the RSGB has been drafted and will be available shortly.

An appeal from the committee for members' views on a number of questions arising from the rapid growth of computing resulted in a most useful return, a summary of which will have been published by the time this review is read. One result has been the establishing of a regular computing feature compiled by GM4ANB, the first of which will be published in October 1984.

During the year attention has started to focus on packet radio. A working party has met to determine some of the implications of this important development and will produce a formal report in due course.

A second most important area of committee interest is that of books. A major difficulty has been that of recruiting a replacement for G4FTJ who left to set up his own publishing business. As with articles for *Radio Communication*, there appears to be increasing difficulty in finding authors who are prepared to take on the responsibility of producing books or even chapters of books. The committee is exploring ways of breaking down publications into smaller packages which are easier and quicker to produce. A second problem is that new books are required which suit the newcomer who, these days, often has a quite different background than hitherto. Both problems are being urgently considered.

Dain Evans, G3RPE, chairman

VHF

Committee: G3ZNU, G3COJ, G4ASR, G3XDV*, * G5KW*, G3WSN, G4WHO, G8GGP, G8GOJ*, G3GVV*, G5UM*, G4KAR*, G3RWL*, G3VPK, GM4ANB, G4FSG*, G3VZV*, G3FZL, G3RKL*, G8VR, G3UUT*, G4CCC.

In the year since July 1983 the committee has been expanded, with the addition of G4WHO, G8GGP and G4ASR. When the Repeater Management Group was given full committee status, G4CCC replaced G3XDV as the RMG representative.

One of the major activities of the year was preparation for the IARU Region 1 Conference in April. The committee submitted a number of papers to the conference and examined in detail all papers on vhf topics from other societies. The VHF Committee chairman and vhf manager both attended the conference as RSGB delegates. At the conference the "Maidenhead" locator system was formally adopted, to be implemented from January 1985. Following the conference the committee ensured that maps, computer programs and magazine articles would be available to members in good time.

The VHF Convention continues to be highly successful, the attendance of nearly 2,300 somewhat exceeding expectations. The hard work put in by members of the committee, particularly G3FZL, and by the Exhibition & Rally Committee, ensured that the event ran smoothly. For the first time ever there was no evening function, as the spiralling expense and falling attendance made it uneconomic.

The committee participated in the National Amateur Radio Convention at the NEC in Birmingham, manning a committee stand and organizing two lectures on each of the days. Reaction to the lectures was very good, and interest in the stand favourable.

Towards the end of the year the committee launched the *VHF/UHF Newsletter*, edited by G4ASR. The newsletter is aimed at the more serious vhf and uhf operator, and covers all bands from 50 to 432MHz. Initial reaction has been very good, and subscription levels are encouraging.

Particular thanks are due to G3COJ, G3UUT and the many beacon keepers throughout the country for the ever-increasing beacon network, to G8VR as the *4-2-70* contributor, and to G5UM for his continued valuable service as VHF Awards Manager.

Malcolm Appleby, G3ZNU, chairman

VHF Contests

Committee: G3VPK, G3LCH, G3XDY, G2HIF, G3FZL, G4KGC, G4HWA, G4ERP, G4JLG, G6LX*, G3KKQ*, G3WDG*, BRS32525*.

The committee sets the rules for, and adjudicates 25 contests during the year, on all bands from 70MHz to 24GHz. Some major changes were made to the contests calendar for 1984 after a thorough review last year, and the committee will be following up the feedback resulting from these changes. Perhaps the greatest change was the abandonment of the need to send both QTH and QTH locator in the contest exchange, and this seems to have met with general approval. The move of the 432MHz and 1,296MHz Trophy Contests to June has increased the number of entries received, and the re-instatement of a mid-May 144MHz event proved popular. Some further rebalancing of the contests calendar may still be needed to reduce the number of events squeezed into the summer months. Feedback from the introduction of multipliers for the low power contests and a new 1,296/2,320MHz contest is awaited. Early reactions to the changes from the VHF Contests Forum at the VHF Convention and on the committee stand at the NEC seemed favourable.

Allegations of bad signals remain a major problem that the committee faces. So far this year a number of warnings have been issued, and one station disqualified.

The RSGB is the organizing society for the IARU Region 1 VHF/UHF/SHF Contest in 1984, held in September and October. Preparations for this contest are well advanced, with special computer software under development to simplify analysis of the 2,000 logs expected.

Following the IARU Region 1 Conference decision on locator systems, all entrants for contests in 1985 must use the new "Maidenhead" locator system. This will mean that computer scoring programs will need some modification, and that all stations should determine their new locator.

The committee takes this opportunity to thank the vhf awards manager, Jack Hum, G5UM, for processing the winners and runners-up certificates, a major task on some of the bigger multi-section contests.

John Quarmby, G3XDY, chairman

* Corresponding member † Staff member

REPORTS FROM THE . . .

. . . Amateur Radio Observation Service organizer

Reports continue to be sent out to UK radio amateurs who are discovered by the team of observers to be operating outside the terms of their licence. The principal objective of the observation service is to provide guidance before any approaches are made from the Radio Investigation Service. Guidance is also given to people who persistently disregard bandplanning to the detriment of other band users.

Plans are being made to improve the effectiveness of AROS, and several suggestions received from the observers and from others are being considered at present. The DTI has specifically requested that the Society, through its observation service and Intruder Watch, should play a greater part in tackling the problems of intruders, interference and general spectrum abuse on the amateur bands. More publicity is being given about successful prosecutions for radio offences, and it has been suggested that Council might wish to consider expulsion from the Society in appropriate cases.

D. M. Pratt, G3KEP

. . . Audio Visual Library co-ordinator

The popularity of this service to affiliated clubs, groups and societies remains high with the total of hirings of 290 in 1983–4 year being slightly up on that of the previous year.

A number of modern additions have been made to the library, such as *Space Shuttle* and *JRR1 Visit to China*, but at the same time some very old tapes have been withdrawn.

It is hoped that in the near future last year's suggested policy of an overhaul of the library will take place to provide better quality items. In particular, VHS cassettes will be made from 16mm films where this is possible, as this system is by far the most popular.

On balance, the Audio Visual Library is now progressing quite well, giving satisfaction to the affiliated societies for whom the service is intended. An sae is always appreciated!

R. G. Aukland, G2PA

. . . HF awards manager

Analysis of hf awards issued during the year:

	G	EU	North America	South America	Asia	Africa	Oceania	Total
WBC	38	99	5	2	47	5	7	203
CDXC	5	7	3	—	3	—	2	20
IARU	74	118	10	6	21	4	13	246
DXLCA	3	43	—	—	4	—	1	51
BCRTA	9	28	4	2	14	1	5	63
BCRRA	1	15	—	—	2	—	1	19
WAC	87	—	—	—	—	—	—	87
	217	310	22	10	91	10	29	689

During the period under review the number of certificates issued overall showed a decrease since last year, but once again the number of certificates issued to our own membership increased.

The re-designed IARU certificate has been in use for several months now. Rather surprisingly we are still waiting to issue the first 28MHz Counties Award.

May I once again remind applicants to follow these very simple rules:

1. Always send a stamped, self-addressed envelope for return of your QSL cards when applying for awards or for verification for overseas awards.

2. Always send proof of RSGB membership when applying for awards.

Finally, the address of the Society's hf awards manager is: PO Box 73, Lichfield, Staffs WS13 6UJ, to whom applications and requests for information should be sent, *not* to headquarters, G5GH or G3FKM.

P. A. Miles, G3KDB

. . . HF manager

During the period under review a great deal of work was undertaken in preparation for the IARU Region 1 Conference, which took place in April 1984, and brief reports of the hf matters discussed there will have been read elsewhere. Once again personal contact was kept up with representatives of many other societies during attendances at meetings in all three IARU regions and at Cefalu.

Since April the very controversial decision taken at Cefalu to investigate the possibility of amalgamating the IARU Region 1 HF Field Day (phone) with the non-IARU cw event, so popular in our own country, has caused much discussion and correspondence. Voting on the motion to consider the action was an example of an apparently democratic decision arrived at by the votes of a majority of societies who have limited interest in the September event. Hopefully the next meeting of hf managers in March 1985 will address the problem with its more informed eye and recognize the potential difficulties which would arise for both hf and vhf contestants.

During the early part of 1984 the possible introduction of IARU-type ARDF (which involves 3·5 and 144MHz) came very much nearer following negotiations with the DTI over the licensing of unmanned low-power transmitters.

John Allaway, G3FKM

. . . Microwave manager

The spectrum managers have two main responsibilities: that of ensuring as far as possible that the international aspects of their part of the spectrum are in good shape; and that of liaison within the UK. The latter involves both liaison within the Society, such as being a working member of the appropriate committees, and also with outside bodies. During the year, this work has continued in its normal manner.

The international situation has been dominated by the IARU Region 1 Conference held in Sicily in April. As at previous conferences, the RSGB continued to play a leading role, both by producing many of the papers submitted for discussion, and by the RSGB microwave manager being invited to chair the microwave stream of the conference. In this work the great assistance of the second RSGB delegate, G4KGC, is gratefully acknowledged.

While the microwave bands in general are in an encouraging position, two areas in particular continue to require attention. First, the spectrum from 1 to 10GHz is of increasing commercial importance, and consequently the amateur allocations are particularly vulnerable. Much of the activity at the IARU conference involved trying to move towards some sort of worldwide agreement on microwave allocations so that we can continue to enjoy common working frequencies. The second problem is the need to exploit our millimetric allocations to demonstrate our capacity to make a contribution to what is currently the sharp end of the development of radio. I am pleased to report progress on both topics.

One of the reasons why the RSGB has played a leading role in the development of microwaves over recent years is that it recognized the need to separate microwave administration from that of vhf—the problems to be handled are vastly different. A similar step urgently needs to be taken on an international scale to ensure that problems such as those described above can be tackled more effectively.

Dain Evans, G3RPE

. . . Slow Morse Practice Transmissions organizer

During the year a survey was carried out involving all slow morse operators. This had two objectives. It enabled the published list to be brought right up-to-date, and encouraged (if necessary) a move to the appropriate designated frequency within the 144MHz bandplan. The co-operation was most encouraging, and now the majority of transmissions do conform to the plan. Where another channel is used, there is a very good reason for so doing. Newcomers to the service who wish to use 144MHz will be required to use either 144·250 or 145·250MHz as applicable. This new policy will succeed only if other users play their part and clear the channels when they are needed for slow morse transmissions.

M. A. C. MacBrayne, G3KGU

. . . VHF manager

The last year has undoubtedly been dominated by the Region 1 Conference held in Cefalu in April. The Society presented a number of papers which were vhf-orientated. Despite the considerable time taken in preparation for the conference the resulting proposals indicate the complexities of our activity. Thanks are due to a large number of members for the work they have done. The VHF Committee has been engaged on many matters. The VHF Convention was very popular and gave everyone the chance to meet and exchange views, as well as to purchase components for current projects.

The 50MHz propagation research experiment has provided a wealth of information, and with the proposed extension in the number of permits further data may well be of considerable value. Regrettably there has been a delay in the issue of the new permits, but the Society was advised that the selection might take place during October. There is great interest from Region 1 in the work being undertaken on 50MHz. Thanks are due to all who are participating in this.

A number of our allocations remain at risk from other services, and this is one of the subjects being studied closely by the Region 1 societies, in the hope that we will be able to retain the common frequency allocations which are so important to the Amateur Service.

Our repeater network and vhf contests demand considerable attention, and thanks to the work of the respective committees both matters are well managed.

We can look forward to the advancement in equipment and techniques on one hand, and still receive satisfaction from the construction of ancillary accessories. General operating procedures are in the main good, but some need to review the standard of operating. Adherence to band plans remains essential for the well-being of all who use our allocations if we are to remain efficient in the use of the spectrum.

K. A. M. Fisher, G3WSN

. . . VHF awards manager

Analysis of vhf/uhf and microwave awards issued during the year.

Four Metres & Down certificates (last year's issues in parentheses)

Category	Number	Total issued
70MHz Standard Transmitting	1 (2)	144
70MHz Senior Transmitting	1 (2)	50
144MHz Transmitting	30 (33)	679
144MHz Senior Transmitting	16 (13)	213
144MHz Standard Receiving	0 (1)	39
144MHz Senior Receiving	0 (1)	5
432MHz Standard Transmitting	9 (14)	196
432MHz Senior Transmitting	8 (9)	97
432MHz Receiving	1 (1)	9
432MHz Senior Receiving	0 (0)	1
1·3GHz Standard Transmitting	12 (7)	52
1·3GHz Senior Transmitting	3 (1)	9
1·3GHz Receiving	0 (0)	1
Supreme Award (qualification: three Senior or two Senior plus one 1·3GHz)	9 (5)	55
Microwave Distance Awards for initial contact beyond specified QRB		
1·3GHz 600km	23 (16)	78
2·3GHz 500km	7 (2)	12
3·4GHz 400km	1 (1)	3
5·6GHz 300km	1 (0)	1
10GHz 150km	7 (8)	70

Total of Four Metres & Down certificates issued for the year: 129 (116)

QTH Squares awards (last year's issues in parentheses)

70MHz 20 squares and 4 countries	3 (2)		8
144MHz 40 squares and 10 countries	43 (46)		176
144MHz 60 squares and 15 countries	20 (27)	stickers	75
144MHz 80/18	18 (14)	stickers	44
144MHz 100/20	17 (17)	stickers	49
144MHz 125/20	8 (2)	stickers	13
144MHz 150/20	0 (3)	stickers	6
144MHz 175/20	1 (4)	stickers	5
144MHz 200/30	2 (2)	stickers	4
144MHz 250/35	0 (0)	sticker	1
144MHz Receiving BRS32525 has now reached 125 squares and 20 countries.			
432MHz 30 squares and 6 countries	11 (4)		34
432MHz 40/10	10 (5)	stickers	22
432MHz 50/13	4 (5)	stickers	12
432MHz 60/15	7 (5)	stickers	12
432MHz 70/15	6 (1)	stickers	8
432MHz 80/15	2 (0)	stickers	3

Total: 57 initial certificates issued (52) and 95 stickers (87).

Microwave Squares award

1·3GHz 5 squares: basic certificate	15 (7)	45
1·3GHz 10 squares stickers for above	14 (6)	35
1·3GHz 15 squares stickers	6 (4)	20
1·3GHz 20 squares stickers	7 (6)	16
1·3GHz 25 squares stickers	2 (5)	9
1·3GHz 30 squares stickers	3 (4)	9
1·3GHz 35 squares stickers	3 (2)	4
1·3GHz 40 squares stickers	3 (2)	6
1·3GHz 45 squares stickers	1 (0)	1
1·3GHz 50 squares stickers	1 (1)	2
1·3GHz 60 squares stickers	0 (1)	1
2·3GHz 5 squares stickers	2 (3)	7
2·3GHz 10 squares stickers	0 (1)	2
2·3GHz 15 squares stickers	1 (0)	1
2·3GHz 20 squares stickers	1 (1)	2
2·3GHz 25 squares stickers	1 (0)	1
3·4GHz 5 squares stickers	1 (0)	1
3·4GHz 10 squares stickers	1 (0)	1
10GHz 5 squares stickers	1 (5)	21

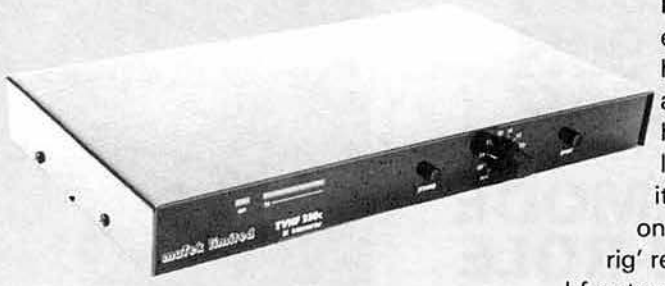
Total: 63 microwave certificates and subsequent stickers compares with 48 issued in 1982–3 and 26 in 1981–2, a further indication of the great increase in interest and activity on these bands.

The total of 344 proficiency awards issued during 1983–4 shows an increase of 41 over the previous year.

In addition to these, the vhf/uhf awards manager has also issued a large number of winners' and runners-up certificates to successful competitors in RSGB contests, on the instructions of the Society's VHF Contests Committee. Numerous claims for overseas awards (eg, Veron VHF 25) have been scrutinised before forwarding to the appropriate national society.

Jack Hum, G5UM

Dynamic Performers!



TVHF 230c
HF Transverter

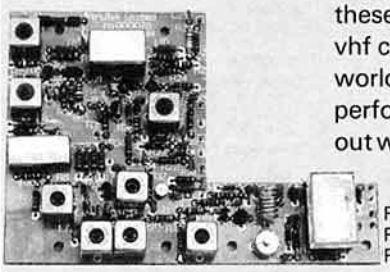
If you own a good 144MHz transceiver and want to experience the wonders of hf, our innovative 144MHz to hf transverter will give you access to all the current hf amateur bands, for a fraction of the price of a comparable hf rig. Don't compare our design with the technically limited offerings of others: if your vhf transceiver is up to it, eg. a modern 'base station' or an earlier transceiver with one of our front-ends fitted, the TVHF 230c will give you 'big rig' receive performance together with a very solid, clean 10W hf output. **£334.90 inc. VAT (£5.00 p&p)**

If you're one of the lucky few with a 6m licence, you may find a phone call to your advantage, as the saying goes!

muTek limited make a very wide range of preamplifiers for professional and amateur applications at frequencies ranging from hf through to microwaves. Our amateur range includes the 'best in the world' GFBA 144e 2m masthead mounting GaAsfet amplifier. This uses a very advanced non-dissipative feedback circuit which allows retention of the intrinsically low noise figure of the fet whilst achieving dynamic performance approaching 10dB better than any of the opposition. Incidentally, all of our preamplifiers are individually tested for noise performance using modern professional equipment driven by people who care about and understand what they're doing. Additionally, the more expensive amplifiers are individually tested for dynamic performance. A consequence of this is that although we may quote 'typical' figures for many parameters, these can usually be taken as worst case!

		£ inc VAT
SLNA50s	50MHz rf switched preamp 0.9dB nf/15dB gain	44.90
SLA144s	144MHz rf switched preamp 0.9dB nf/15dB gain	39.90
SLNA144u	unswitched SLNA144s	22.40
SLNA144ub	unboxed SLNA144u	13.70
SLNA145sb	FT290 preamplifier	27.40
SBLA144e	250W through-power masthead 144MHz preamp	89.90*
GFBA144e	1000W through-power masthead GaAsfet 144MHzz preamplifier 0.9dB nf/13dB gain	139.90*
TLNA432ub	Bipolar 432MHz low-noise preamplifer board	20.40
TLNA432u	Bipolar 432MHz low-noise preamplifier (boxed)	29.00
GLNA432e	GaAsfet 432MHz masthead—mounting preamp 250W through-power handling 0.9dB nf	149.90*
BBBA500u	20-500MHz 'scanner' low-noise preamplifer	32.90

£1.50 p&p except items * £2.50 p&p



The concept of replacement front-ends for commercial amateur vhf transceivers was pioneered by muTek, and we're still the world's leading manufacturer of these. muTek front-ends are an essential part of the armoury of the majority of vhf contest winners, both here and in many other countries around the world. Even if contests bore the pants off you the extra dynamic performance and excellent sensitivity mean that sorting the dx out when the band is busy is very much easier.

		£ inc VAT
RPCB144ub	FT221/225 replacement front-end	74.90
RPCB251ub	IC211/251 replacement front-end	79.90
RPCB271ub	IC271E (not H) replacement front-end	89.90

muTek limited products are designed and manufactured in England's hi-tech 'sunshine belt'! We take an old-fashioned pride in producing high technology radio frequency electronics.

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FT-690R

MULTIMODE MULTI-ROLE VHF/UHF TRANSCEIVERS

MULTIMODE OPERATION
Never before possible from such a compact package, true multimode – USB, LSB, CW & FM – operation is yours to enjoy. With CW and SSB activity at an all-time high, you will not be left out of the satellite or DX action and you can still ragchew on FM simplex or even via a repeater (inbuilt shift and 1750Hz tone burst).

ADVANCED MICRO CONTROL
Advances in microprocessor circuitry allows selectable synthesizer steps, up/down scanning from the microphone, priority channel operation, and ten memories (with memory scan), all called up with fingertip ease.

LCD DISPLAY
A large, newly developed Liquid Crystal Display provides readout of the operating frequency, and an indication of a number of the control functions. It is highly readable under conditions of bright sunlight and is backed up by a lamp for night-time operation.

PROGRAMMABLE SYNTHESIZER
The optimum synthesizer steps for SSB/CW or FM operation are very different. That's why Yaesu gives you the flexibility of two synthesizer steps per mode: 100Hz or 1kHz per step on SSB and CW, and 12½/25kHz (2m), 25/100kHz (70cm). When changing modes from SSB/CW to FM, your transceiver is automatically set to the nearest standard channel when you start scanning or tuning.

TEN MEMORY CHANNELS
As many as ten frequencies may be stored into memory, for instant recall. The priority feature allows you to check a favourite frequency every few seconds, with automatic halting (FM mode) when the channel is clear or busy, as desired. Memory backup is provided by a built-in lithium cell, with an estimated lifetime of five years.

DUAL VFO SYSTEM
These transceivers feature a digitally synthesized dual VFO system which provides tremendous flexibility in day to day operation. For example, one VFO may be set up in the SSB portion of the band, and the other in the FM sub-band, for immediate QSY when changing modes.

CONVENIENT FEATURES
Among the many features adding to the convenience of the transceiver is a supplied portable antenna, a high-performance noise blanker, a high/low power switch, and a battery condition meter. A clarifier (offset tuning) allows you to follow unstable or Doppler-shifted signals.

FT690R
In addition to the two metre and 70 centimetre units detailed here, the FT690R six metre (50-54MHz) transceiver completes *for the time being*, the range. The general specifications are similar but modes are USB-CW-AM-FM, power is 2½W PEP (0.8W AM – for which a 4kHz filter is fitted). Further details on request.

GENERAL FEATURES

Modes of operation:
SSB (USB, LSB) CW & FM

Frequency response:
300-2,700Hz @ –6dB

Carrier Suppression:
Better than –40dB

Sideband Suppression:
Better than –40dB

FM Deviation:
± 5kHz (max)

Tone burst frequency:
1,750Hz

Selectivity:
SSB/CW: 2.4kHz @ –6dB
4.1kHz @ –60dB
FM : 14 kHz @ –6dB
25 kHz @ –60dB

Image rejection:
Better than –60dB

Audio output:
1 Watt @ 10% THD

Audio output impedance:
8 Ohms

Dimensions:
58H × 150W × 195D mm
1.3kg (without cells)

Power requirements:
8 × C size dry cells
8 × C size Nicad cells
External 8.5-15.2VDC
Memory backup: Lithium cell

Microphone: (YM47 supplied)
600 ohms ppt with scan

ACCESSORIES

YM49
Remote speaker mic

YM50
DTMF keyboard mic

MMB11
Mobile mounting bracket

FL2010
2 metre 10W amplifier

FL6010
6M 10W amplifier

CSC1A
Vinyl carrying case

NC11C
Battery charger

YHA15
Helical antenna (FT290R)

FT-290R

Frequency coverage (MHz):
144-146 or 144-148

Synthesizer steps:
SSB/CW: 100Hz/1kHz
FM : 12.5/25kHz

Current consumption:
70mA receive
800mA Tx (2.5 W RF FM)

Antenna:
SO239 on rear
Telescopic ¼ Wave supplied

RECEIVER

Intermediate frequencies:
1st IF 10.81MHz
2nd IF 455kHz (FM)

Sensitivity (better than):
SSB/CW : 0.5μV for 20dB S/N
FM : 0.25μ for 12dB SINAD

TRANSMITTER

Power Output:
2.5 Watts at 12VDC

Spurious radiation:
Better than –60dB

Repeater split:
600kHz (+ and –)

FT-790R

Frequency coverage:
430-440MHz

Synthesizer steps:
SSB/CW: 100Hz/kHz
FM : 25/100kHz

Current consumption:
100mA receive
750mA Tx (1W RF FM)

Antenna:
BNC on top panel
¼ Wave flexi supplied

RECEIVER

Intermediate frequencies:
1st IF 67.3MHz
2nd IF 10.7MHz
3rd IF 455kHz (FM)

Sensitivity (better than):
SSB/CW : 0.16μV for 10dB S/N
FM : 0.25μV for 12dB SINAD

TRANSMITTER

Power Output:
1 Watt at 12VDC

Spurious radiation:
Better than –50dB

Repeater split:
1.6MHz (input listen)

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