

Radio Communication

November 1988



**RSGB 75th ANNIVERSARY SOUVENIRS
ORDER IN TIME FOR CHRISTMAS**

KENWOOD



TS-680S — Performance plus

Plus what? Well, as avid ad. watchers will realise, the TS-680S bears a truly remarkable resemblance to the successful TS-140S, as indeed it should, because they are basically the same animal under the skin, and that is why the TS-680S has all the performance of the TS-140S plus the added feature of the 6 metre band.

Kenwood seem to have timed the introduction of the TS-680S extremely well because reports indicate that we are on the run up to a splendid sunspot cycle, and under those conditions six metres is an amazing band. The potential for DX on six metres is really high, and chatting "across the pond" is like a cross town net on an otherwise silent band.

My original comments on the TS-140S concentrated on its value for money, and in this respect the TS-140S represents the perfect balance between performance, features, and price. For the man who wants to extend his amateur radio horizons that bit further, the TS-680S does this admirably. The TS-140S currently costs £862; the TS-680S £985. I'll let you decide whether six metres appeals to you enough to warrant the difference. It's certainly more cost effective than adding a transverter.

As always, a comprehensive colour brochure is available from us, which gives full details of both the TS-140S and TS-680S. If you want to have "hands-on" experience, the managers of our branches around the country will be delighted to assist, as will any of the appointed Kenwood dealers. For the record, the only appointed dealer in London (apart from our own branch at Eastcote) is Radio Shack, in Broadhurst Gardens. Anyone else offering you Kenwood equipment in London has no connection at all with the UK sales and service network for Kenwood.

TS-680S £985 inc vat

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE

Telephone 0629 580800 (4 lines)

Sole Appointed UK Distributor for KENWOOD Amateur Radio

Others May Try to Imitate, But...

Only One Can Be The Best



Morse Code - Baudot - ASCII - AMTOR - Packet - Facsimile - Navtex

It's a lesson you learn very early in life. Many can be good, some may be better, but only one can be the best. The PK-232 is the best multi-mode data controller you can buy.

1 Versatility

The PK-232 should be listed in the amateur radio dictionary under the word Versatile. One data controller that can transmit and receive in six digital modes, and can be used with almost every computer or data terminal. You can even monitor Navtex, the new marine weather and navigational system. Don't forget two radio ports for both VHF and HF, and a no compromise VHF/HF/CW internal modem with an eight pole bandpass filter followed by a limiter discriminator with automatic threshold control.

The internal decoding program (SIAMtm) feature can even identify different types of signals for you, including some simple types of RTTY encryption. The only software your computer needs is a terminal program.



PC Pakratt Packet TX/RX Display



Facsimile Screen Display

2 Software Support

While you can use most modem or communications programs with the PK-232, AEA has two very special packages available exclusively for the PK-232....PC Pakratt with Fax for IBM PC and compatible computers, and Com Pakratt with Fax for the Commodore 64 and 128.

Each package includes a terminal program with split screen display, QSO buffer, disk storage of received data, and printer operation, and a second program for transmission/reception and screen display of facsimile signals. The IBM programs are on 5-1/4" disk and the Commodore programs are plug-in ROM cartridges.

3 Proven Winner

No matter what computer or terminal you plan to use, the PK-232 is the best choice for a multi-mode data controller. Over 20,000 amateurs around the world have on-air tested the PK-232 for you. They, along with most major U.S. amateur magazines, have reviewed the PK-232 and found it to be a good value and excellent addition to the ham station.

No other multi-mode controller offers the features and performance of the PK-232. Don't be fooled by imitations. Ask your friends, or call the local amateur radio store. We're confident the PK-232 reputation will convince you that it's time to order your very own PK-232.

Call an authorized AEA dealer today. You deserve the best you can buy, you deserve the PK-232.

ICS Electronics Ltd.

P.O. Box 2

Arundel

West Sussex BN18 ONX

Telephone: 024 365 655

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DESIGNED AND
MANUFACTURED

Two metre transceivers that you have been waiting for **AMR 1000/S**



A

t last, a genuinely new and highly innovative development is available in amateur radio equipment with the introduction of the Navico AMR 1000 range of transceivers. You, the radio enthusiast, now have the choice of fully featured British built equipment, plus a full range of accessories that offer the best in the world for quality, performance and value.

Navico is already known and trusted throughout the world by professionals in marine communications, where absolute reliability is vital.

Now the Navico skill and experience has been applied to the world of amateur radio, resulting in two-metre transceivers that are not just variations on existing equipment, but have been designed with the operating needs of you, the user, as a priority. The AMR 1000 and 1000S have the look, the feel, and the features that radio hams have been asking for. These include:-

- Instant access to IARU FM band plan channels - a unique Navico development
- Intelligent tone burst - another innovative "first"
- Advanced design that gives uncluttered, ergonomic ease of use and the unique reversible panel

that allows for correct mounting in any location

- A choice of models that doesn't force you to buy features you don't need.

This quality British designed and manufactured unit is available now at prices starting from just £247.25 (inc VAT)

NAVICO

PRIORITY INFORMATION REQUEST

For full details send to:
Navico, Star Lane, Margate, Kent
CT9 4NP, United Kingdom
Telephone: 0843 290007

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ADDRESS _____

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The professionals in amateur radio

NOVEMBER 1988

VOLUME 64

No 11

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Headline News

Tel 0707 59312 for a recording of the latest amateur radio news

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Computer contact (1,200/75 bauds)

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RSGB on Prestel page 8107

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FRONT COVER

Some of the 75th Anniversary Souvenir
Christmas Gifts available from RSGB.
See leaflet inside for details.

Radio Communication

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Technical articles on subjects of amateur interest are always welcome and should be sent to: The Editor, *Radio Communication*, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

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.

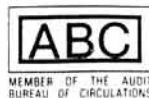
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The editor will be pleased to send intending authors a manuscript preparation guide and to give any other advice and assistance requested.

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

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

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GREAT BRITAIN 1988



36,070 copies per
issue average
circulation in 1987

VHF/UHF the Kenwood way



You may have noticed that for the past six months I have tended to concentrate the advertising on HF equipment, which seems a little unfair to Kenwood because their unquestioned excellence in the HF line also extends to VHF and UHF equipment and techniques.

As an example, take that sector of the market occupied by the VHF/UHF FM mobile rig. All the major manufacturers (some minor ones as well) produce FM mobile boxes, and on the face of it they all seem the same. However, they are not all brothers under the skin, and Kenwood apply their engineering skills to great effect in this most competitive area. The TM-221E and 421E are good examples of the Kenwood approach, and I have often said "How do they do it?"

Do what? Condense so much power and performance into such tiny packages. The TM-221E and TM-421E represent the sensible and well considered use of technology by Kenwood to give the user probably the best 2 metre and 70 centimetre FM mobile transceivers that it is possible to buy.

The technology in question is the use of surface mount (often called "chip") components wherever possible. These tiny things are mounted directly on the surface of a printed circuit board, minimising space and wiring. They also have a further advantage in that the use of fully automatic assembly techniques gives cost savings for the customer. These components are not simply resistors and capacitors, but include integrated circuit packages and transistors, so everything is reduced in scale.

The result in the case (pun intended) of the TM-221E and 421E is a package measuring only 140(W) x 40(H) x 179(D) mm; or if like me you use a wooden ruler dated 1941, 5.5 x 1.6 x 7 inches. In this package lies a receiver second to none (see the Chris Lorek review in HRT magazine), and a transmitter capable of 45 watts on 2m, or 35 watts on 70cm in the case of the TM-421E.

Both transceivers, in true Kenwood tradition are extremely easy to use, with all information displayed on a bright orange backlit LCD and control operations which are delightfully simple and logical. 14 memory channels are provided and each memory holds not only the

frequency but also any repeater shift required, and even whether or not you require a tone burst. If you reside in the Great Wen and want to try out 12.5kHz channel spacing, it is all provided: 5, 10, 12.5, 20, and 25kHz at the touch of a button; and of course the receivers are fitted with the recommended "F" filter bandwidth to handle 12.5 and 25kHz channel spacings. Attention to detail is Kenwood's hallmark.

If you want to do things in style, you can mount the TM-221 and 421 together in a common bracket, and go even further by using the RC-10 remote controller (which really needs a full ad. of its own). The RC-10 is unique in that it looks exactly like a cellphone handset, but contains full remote control facilities for the TM-221/421E (and also incidentally the TM-721E dual band mobile).

Of course the Kenwood VHF/UHF story doesn't end with these two mobiles, and the new TH-25/45 hand held transceivers are creating a stir in the market place, let alone the TM-721E dual band mobile, the TS-711E/811E top of the range multi-mode home stations and the TR-751E/851E multi-mode mobiles.

Since it is quite difficult to cover all aspects of the equipment in a small ad. why not send off for the full Kenwood catalogue, using the coupon on the other page, and make a request for full information on any particular rig you may fancy. We will return much interesting reading for your perusal. The information is free, but the Post Office demand payment for carrying it and they no longer accept penny blacks, so if you include £1 that should cover it.

TM-221E	£317	TS-711E	£898
TM-421E	£352	TS-811E	£998
TM-721E	£699	TR-751E	£599
RC-10	£169	TR-851E	£699

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines)
Sole Appointed UK Distributor for KENWOOD Amateur Radio



NRD-525 from JRC

The NRD-525 is a most remarkable receiver; probably the most praised, and certainly the most sought after receiver by professionals and hobbyists alike. Of course, it comes from a most remarkable company, JRC, who have been making radio communications equipment since 1915 and are now one of the world's largest manufacturers in the field.

The NRD-525 impresses by its discreet command of the incoming signal, whether it be a weak CW station, or a megawatt broadcaster – and better still the weak CW alongside a megawatt broadcaster. From 90kHz to 34MHz, in any mode, and even up to VHF and UHF with an optional converter, the NRD-525 simply dominates with sheer performance.

Why not ask us for full details of the NRD-525, and read why it has to be the receiver you would like to own one day.

NRD-525 £1095 inc VAT.



JST-135 from JRC

We waited a long time to see the JST-135 transceiver, but it was worth the wait. Whether you use the JST-135 as a complete station in its own right, or couple it to the NRD-525 to make what must surely be the ultimate HF station, you cannot fail to be impressed.

The attention given to detail design is truly exceptional, and the JRC designers have constructed the JST-135 up to the highest standards, not down to a price. Owning such a transceiver is the dream of most radio amateurs, and an orderly queue is already forming for the first deliveries.

As in the case of the NRD-525, it is totally impossible to describe this transceiver in a few short words, so I won't even try. We have prepared an information pack on these two remarkable JRC products and it is available on request.

JST-135 £1195 inc VAT.

DAIWA meters.

CN410M... 3.5 to 150 MHz, forward 15/150 W, reflected 5/50 W, SO239 connectors... £61.72 inc vat, carriage £1.50.

CN460M... 140 to 450 MHz, forward 15/150 W, reflected 5/50 W, SO239 connectors... £65.40 inc vat, carriage £1.50.

NS448 with remote head... 900 to 1300 MHz, forward 5/20W, reflected 1.6/6 W, N type connections... £86.60 inc vat, carriage £2.50.

NS660P with switchable meter reading (average, normal PEP and hold PEP) and provision for optional remote head (U66V), 1.8 to 150 MHz, forward 15/150/1500 W, SO239 connectors... £115.00 inc vat, carriage £2.50.

U66V remote head, 140/525 MHz, max 300 W, N type connectors... £55.27 inc vat, carriage £1.50.

SC20 extension cable for U66V, approx 20 metres long... £29.21 inc VAT, carriage £1.50.

CN410M

NS660P

NS448

CN460M

THIS AND THAT

LOWE SHOPS

Our Head Office is at Matlock, but we have conveniently placed branches around the country. Each branch is run by a manager who is an active radio amateur and also keen to help you. He normally stocks everything in our extensive range and can demonstrate all major items of radio equipment to you. NOTE though that all mail orders and general enquiries must be sent to Head Office at Matlock. Call in to your nearest branch soon.

In Glasgow, at 4/5 Queen Margaret Rd., (off Queen Margaret Drive). Tel. 041 945 2626.

In Darlington, at 56 North Road. Tel. 0325 486121.

In Cambridge, at 162 High St., Chesterton. Tel. 0223 311230.

In Cardiff, at South Wales Carpets, Clifton St. Tel. 0222 464154.

In London, at 223 Field End Rd., Eastcote, Middx. Tel. 01 429 3256.

In Bournemouth, at 27 Gillam Rd., Northbourne. Tel. 0202 577760.

Branches are normally open from Tuesday to Saturday inclusive, with lunch breaks to suit local conditions. If in doubt, just ring us at Matlock.

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE
Telephone 0629 580800 (4 lines)

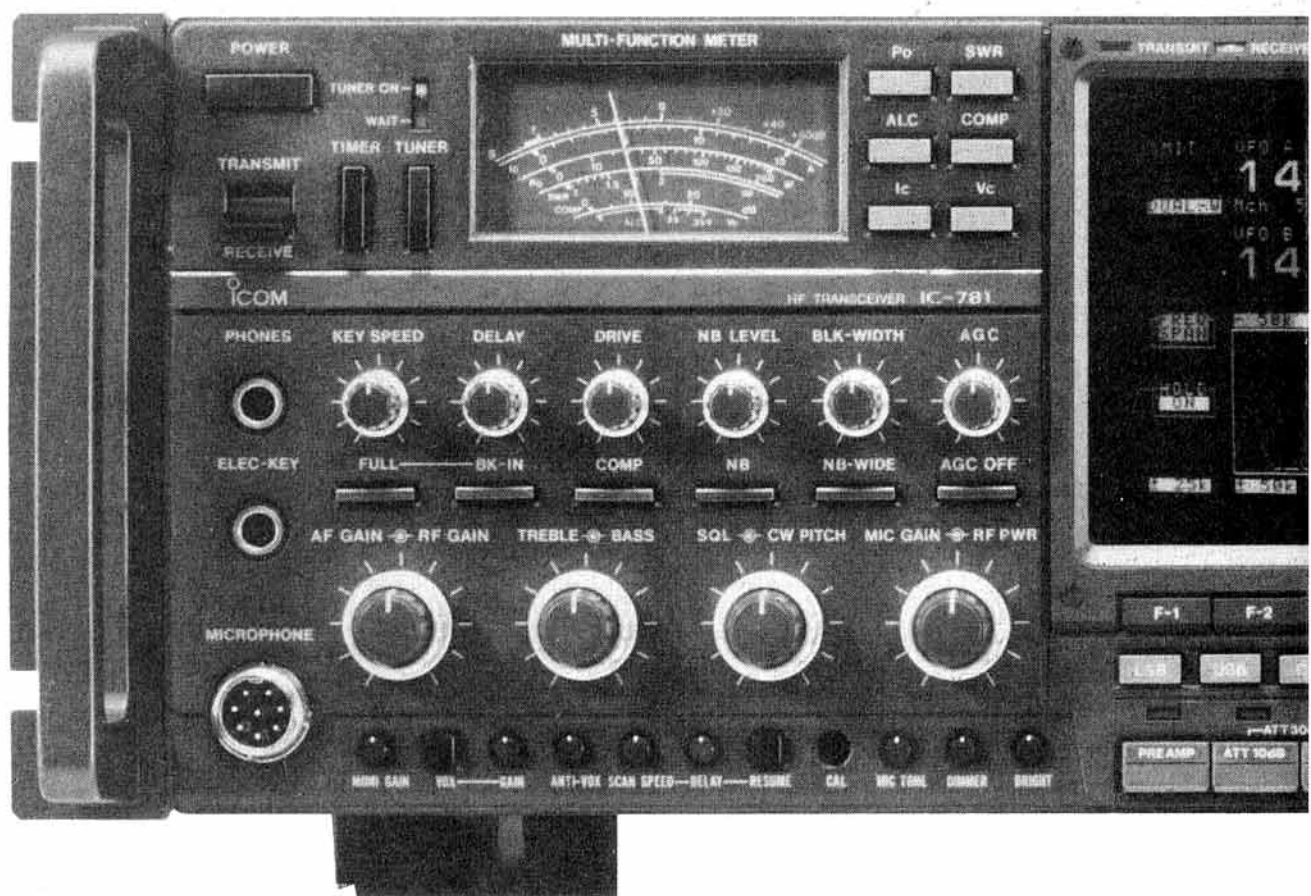
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R.C.

ICOM

LOOK TO THE FUTURE WITH



Features:

- AC power supply
- Automatic antenna tuner
- Multi function CRT display
- Twin passband tuning
- Dual-watch
- 99 memories

Advanced engineering from ICOM has produced the most sophisticated Amateur HF transceiver on the market today, whether DX'ing, contesting or simply enjoying top performance the IC-781 is a top of the line performer. A unique multi-functional CRT displays frequencies, modes, memory contents, operating notes, RIT, two menu and seventeen optional screens. The soft orange display also serves as a display for DATA modes such as RTTY, AMTOR and PACKET.

The PAN display continuously indicates all signal activities and pile-ups with your operating frequency in the centre. Selectable frequency spans of 50kHz, 100kHz and 200kHz. Vertical range indicates relative signal strength. Twin passband tuning with separate controls for second and third IF stages increases selectivity and narrows bandwidth, independently varies low and high frequency response or functions as a IF shift.

Icom (UK) Ltd.

Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

Count on us!

HF TRANSCEIVER IC-781



The IC-781 has a dual-watch function which allows simultaneous receive of two frequencies in the same band. Balance controls adjust VFO A/B receive strength levels. This feature is especially useful on Dx-expeditions or contests to check band activity or to tune in your next contact. The newly developed ICOM DDS (Direct Signal Synthesizer) system is incorporated to provide a fast transceiver lock-up time. This is essential for data communication systems.

The IC-781 communication system includes a built-in 100% AC supply, high speed automatic antenna tuner, iambic keyer, semi-automatic, or full QSK CW break in to 60 wpm, audio peaking filter, RF speech processor, multi-scanning plus much more. Look into the future of Amateur communications, ICOM products will be setting the pace others try to follow. For more information on the IC-781 contact your local authorised ICOM dealer or phone ICOM (UK) Ltd direct.

- SSB, CW, FM, AM, RTTY
- 160-10m/general coverage receiver
- Direct keyboard entry
- 150 watt output
- QSK up to 60 wpm
- CI-V communications interface

Helpline: Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.

Datapost: Despatch on same day whenever possible.

Access & Barclaycard: Telephone orders taken by our mail order dept, instant credit & interest-free H.P.



muTek limited

R.F. technology

muTek limited . . . the Story Continues

Those of you who read my note in Radcom earlier in the year will have gathered that I wasn't optimistic about the possibility of any future production of muTek products, or indeed of any high performance amateur radio equipment in the UK. Certainly, I wasn't (and am still not!) interested in doing anything other than rf/analogue circuit design and consultancy. However, a few weeks after that note appeared, I had a phone call from Mike Dorsett, G6GEJ, asking if he could discuss the purchase of the Company.

I'd had phone calls like that before, but Mike, along, seemed to have the right background in both engineering and business terms, and so we arranged a meeting. Mike made the long journey from Nottingham to Bradworthy, and over a good lunch at the Coach and Horses at Buckland Brewer we came to an amicable agreement.

Without wishing to give too much of the game away, the muTek product line will be reappearing over the next few months in an updated form. As part of my agreement with Mike, I will be revising most of the designs before they go into production, and this will mean that he will be able to exploit the latest technologies and devices.

One of the aspects of muTek's reputation in the past was our determination to quote (and achieve!) realistic performance figures. This won't change! If anything, Mike, is even more fussy about such things, and you can look forward to the 'new' muTek products acquiring an even finer reputation.

73,

Chris Bartram G4DGU

In taking over muTek from Jane and Chris, I was faced with the somewhat formidable task of returning the Company and its product range to the market, without compromising on the high standard of quality by which muTek achieved its reputation.

Technology has moved forward very considerably from the first days of muTek, and there is much advantage to be gained in various areas. This will require a great amount of time and effort to be spent in redesigning certain areas of the product range. This will be a gradual process and more products will be added to the range over the next few months.

New products will also be appearing, extending the original range and also updating some of the older designs. The original product range will continue to be supported, and those of you who have equipment in need of service or repair can send it to the address below, or to Barenheath (see Rad Com, March '88)

The Company is now based in the Midlands area and I intend to cover a good selection of rallies next season.

Please note our new address and telephone number, also that our main office hours are from 6 till 9 pm.

73 de Mike Dorsett G6GEJ

The New Product Range

Transverters

TVVF 50c	£275
TVHF 230c	P.O.A.

Low Noise Amplifiers

SLNA 144s	£45
SLNA 322s	P.O.A.

Front End Boards

RPCB 144ub	P.O.A.
SLNA 145sb	P.O.A.

Postage & Packing

Transverters	£5
Premaps	£2.50

Guarantee

Satisfaction or money back. If you are not satisfied with the performance of our products, we want to know why.

muTek limited guarantees its products against faulty parts or workmanship for 12 months.

Damage caused by application of R.F. power in excess of the specified level voids this warranty.

Technical Help

If you have problems with our products, then please write to the address below describing the problem.

Patch leads for connecting your system together are available to order.

muTek limited - the rf technology company



P.O. Box 24, Long Eaton, Nottingham NG10 4NQ

0602 72967

ARE COMMUNICATIONS

—YAESU—

YAESU FT747GX "ECONOMY" HF TRANSCEIVER

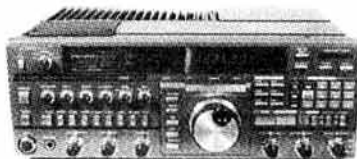
An HF transceiver with built-in general coverage receiver. All mode, including FM as an option, for less than the price of a 2m multimode?



Offered without am or cw filters at a super discounted price of £579

YAESU FT767GX HF + 2m + 6m + 70cms

Despite being YAESU's most expensive transceiver for HF operation, it continues to outsell all other HF equipment marketed by A.R.E. All band, all mode, built-in automatic tuning unit, power supply, general coverage receiver, digital power/SWR meter, full 100w output, optional 2m/6m/70cms modules, which just plug in.



DISCOUNT PRICE: £1,369 including Free MHIBB scanning mic.

Also available with one or all VHF modules fitted at a discounted price.

PHONE
01-997-4476

KENWOOD



Kenwood TS680S HF and SIX metre Transceiver

Since our introduction of this remarkable transceiver last year, October 1987 to be precise, many of these are now in use throughout the U.K. From 160m to 10m, including the ever-popular 6m band and a General-Coverage Receiver. Price: £929.00 including MC43S microphone.



Kenwood TS440S HF Transceiver

Now available once again from ARE Communications the excellent Kenwood TS440S. General Coverage Receiver 100W output between Top band and 10m. FM fitted as standard. Auto Tuning Unit optional extra. Offered at a discount price of £1,039.00, with ATU £1,199.00.

ICOM

Icom IC32E Dual Band Handie

Direct competition to the STANDARD C500, the ICOM IC32E offers excellent facilities utilising all existing ICOM accessories. Ideal for the IC2E/O2E owner. Similar specification to the C500. Frequency range: 138-174MHz (RX only) and 410-455MHz (RX only).

Price: £389



Icom IC3210E Dual Bander 2m/70cm

Easy to use, easy to look at, the new Icom IC3210E. Just compare the uncluttered front panel lay-out with other dual banders, to see how simple it is to operate. Look at these features:

- * Frequency VHF: 138 to 174MHz (RX Only)† (Track tuned better than .3uV)
 - * Frequency UHF: 400 to 479MHz (RH Only)†
 - * TX/RX 144-146/430-440MHz
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 - * Full dual band duplex
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 - * Pocket beep via optional ctcss
 - * Programmable ctcss UT40 (optional)
 - * Priority watch
 - * No duplexer required
 - * 20 Double spaced memory channels
 - * 25 Watts output on both bands
 - † Modified free if specified during order.
- Available now
at only £499.00

Opening Hours Mon/Fri 9.30 to 5.30 Saturday by appointment.

Now that Leicester is over, we can put our shop premises in London back together to display an even wider range of new and used Amateur Radio Equipment. Our direct Importing from our agents in Japan guarantees you excellent prices, together with our two fully equipped workshops, offering fast turn-around on repairs.

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- ★ 144-146MHz (Rx. option 140-170MHz)
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- ★ Programmable Scanning & Priority channel
- ★ 12.5kHz & 25kHz steps.
- ★ Includes microphone & mobile mount.
- ★ Bright LCD display
- ★ Reverse repeater etc.

Designed for optimum performance combined with small size, the ALINCO ALR-22E reaches new heights in both technical performance and value for money. We've managed to keep the price down to a level that cannot be matched by any other manufacturer although we believe that a small increase will shortly be made to the price. What better time therefore, than now to purchase one of these super rigs. You won't see prices like this again! Technically it's superb and inside it looks very much like some of its more expensive competitors! Measuring only 5.5" x 6.5" it will fit into most places and if you ask, we will extend the frequency range to cover 140-170MHz on receive. We could bore you with the specification but frankly it's just the same as all the others (apart from the price of course). We could tell you about all the various features it has, but again its not much different from the competition. Lets be honest, apart from being some £100 cheaper than some of its competitors and having an extended receiver coverage, it really is like most other rigs. So if money is no object and you only want 144-146MHz coverage, you probably won't be interested in the ALR-22E. If on the other hand these things are important to you, why not send for the full colour brochure today.

2m FM Mobile ALR-22E



Order now to
beat the price rise

£249


- ★ 2M FM 144-146MHz
- ★ RX 140-170MHz!
- ★ 3 Watts output
- ★ Battery Saver
- ★ 10 memories
- ★ LCD Readout
- ★ S-meter
- ★ Tone Burst
- ★ Priority
- ★ 12.5KHz steps
- ★ 12v DC operation!

Another winner from ALINCO. A true handy transceiver with no extras to buy! Unlike its competitors, you get the nicad pack (500mAh) AC charger, and provisions for direct 12v DC charge. Measuring 168 x 61 x 30mm it's a beauty! Optional accessories include speaker-mic, mobile bracket and high power packs. Get the facts today!

DJ-100E 2M FM

NEW

IN STOCK



£219

ALD-24E 2m/70cm Dual Band FM

See colour photo on front cover



£449

- ★ 2m/70cm. Full duplex operation.
- ★ 25 watts FM on both bands.
- ★ Single antenna socket output.
- ★ 21 memories & 2 "call" channels".
- ★ Programmable scanning and priority.
- ★ 12.5KHz & 25KHz steps.
- ★ Includes all hardware & microphone.
- ★ Bright LCD readout.
- ★ Reverse repeater operation.
- ★ 12 months warranty parts & labour.

OTHER ALINCO ITEMS

ALR22HE 50 watt	299.00
ALR72E 70cm mobile	299.00
MM1 mobile mounts	10.95
ALX2E 2m h'held	189.00
EBP3N Batt pack	28.95
EBP2N Batt pack	23.00
EDH10 DC to DC	16.95
ESC5 Case and clip	15.50
EDC2 Cigar charge cable	6.50
ELH230D11 30w Amp	75.00
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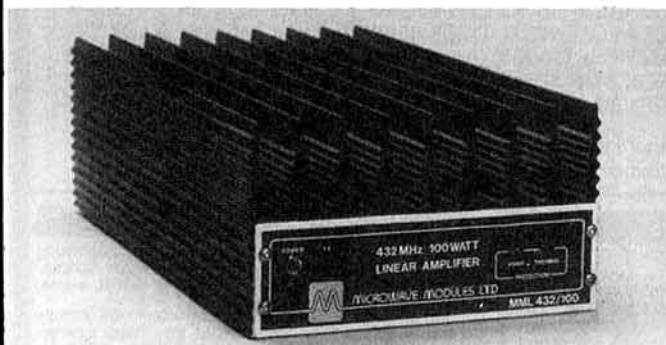
MICROWAVE MODULES LIMITED

THE COMPANY...

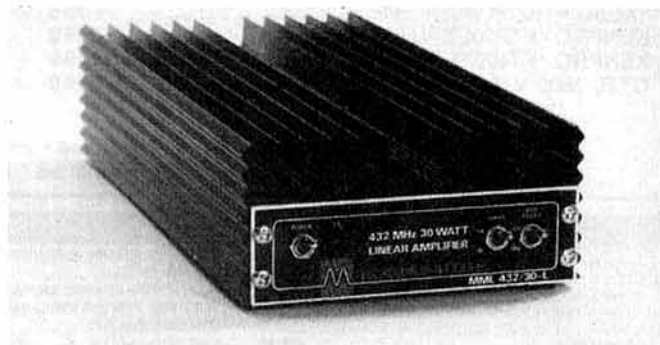
MICROWAVE MODULES LIMITED is a British manufacturing Company, established over 18 years ago, and currently employs over 40 staff in its two modern factories. The Company currently manufactures on an annual basis more than £1,000,000 of radio equipment, all of which has been designed and manufactured in the UK.

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MML432/100



MML432/30 L

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The FT4700RH has a dual receive facility provided with independent squelch control and mixing balance so you can listen for calls on one band while working the other.

All the latest scanning functions are included as well as 10 memories on each band.

FT4700RH**ONLY****£675 inc VAT****YAESU HAS SERIOUS LISTENERS**

Yaesu's serious about giving you better ways to tune into the world around you. And whether it's for local activity or worldwide DX, you'll find our VHF, UHF and HF transceivers are the superior choice for all your listening needs.

The FRG9600. A high grade VHF/UHF Scanning Receiver. The FRG9600 is not just another scanner and it's easy to see why; with continuous coverage from 60-905MHz.

You have more operating modes; Upper and Lower Sidebands; CW, AM Wide & Narrow and FM Wide & Narrow.

Store any frequency and its related mode into any of the 99 memories. Scan the memories, or in between them, stepping in either 5, 10, 12½, 25 or 100kHz steps or simply "Dial Up" the frequency using the Colour Coded Keypad.

There's also for your information and pleasure a 24hr clock, LCD readout, Signal Strength Meter, Optional Computer Interface and AC Adaptor.

The FRG8800. HF Receiver, altogether a better way to listen to the world. If you're looking for a 'Total Receiver System' then the FRG8800 is for you.

With continuous worldwide coverage from 150kHz to 30MHz and local coverage from 118 to 174MHz with the optional VHF Converter.

Listen in on any mode; Upper and Lower Sideband, CW, AM Wide and Narrow or FM.

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P.W. NOV 88



FT747GX

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- ★ General Coverage Receiver
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- ★ Large Clear LCD Display
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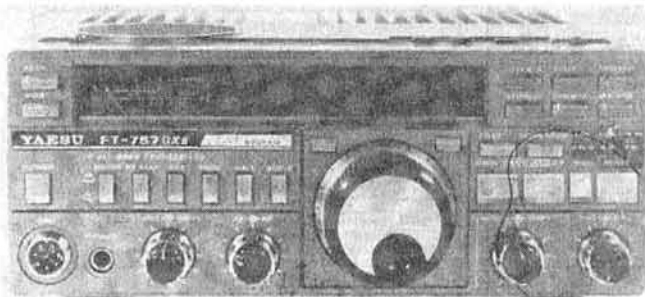


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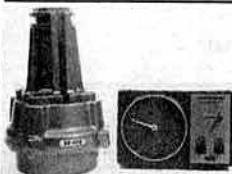
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MORSE KEYS

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HK710	Straight Key	£39.95	£1.75
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MK706	Squeeze Key	£30.48	£1.75
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358	70cms 3 x 5/8 foldover	£33.73

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GPV SS	2m 2 x 5/8 H/Duty	£45.50
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GP714	70cms	£88.20
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Affiliated club or society/registered group (UK): £20.50 (including Radio Communication): £12.30 (excluding Radio Communication) (Subscriptions include VAT where applicable)

Membership application forms available from RSGB HQ



YES AND NO TO PROJECT YEAR? – FIRST REACTIONS

These remarks are addressed to those who have NOT taken the Society's Project YEAR to their hearts, for whatever reason, in the way in which the Society's Council had hoped.

Since publishing the Project YEAR feature and consultative questionnaire in the September issue of Radcom, the project has received massive support. In fact over 85% of returns to date enthusiastically support Project YEAR and the concept of a beginners' licence. In addition, a large number of good, well thought out, ideas have been put forward. The processing of all this valuable input will take time, but a report will be issued as soon as possible.

From those who do not support the Society's initiative for the future there have been three main criticisms.

First: a lower level of entry into amateur radio will degrade operating standards. In reply the Society has already noted that in other countries where similar types of beginners' licences have been introduced, there is no real evidence to even suggest that operating standards have been eroded in any way. Beginners who have been trained from the very beginning in good operating procedures and disciplines have tended to carry these fundamental skills with them throughout their amateur careers. Those trained in the forces will no doubt be able to testify to this basic principle. It is a fact that to pass the present RAE the candidate need not necessarily have been taught or been practised in basic operating procedures. The course proposed for the beginners' licence does require that these basic skills are mastered and tested. In other countries where a beginners' licence, similar to the RSGB concept has been introduced, operating standards have improved, not worsened!

Second: there's a fear that licensed beginners will dominate the already over-crowded bands. Anyone suspicious of this is asked to read the Project YEAR feature again. It is emphatically NOT the Society's intention to place beginners on the crowded portions of the amateur bands. The plan is to put beginners, with crystal controlled equipment, into small sections of the under-utilised spectrum or into bands, or parts of bands, which, dare we say it, are hardly used at all. In the latter case the presence of more amateurs might actually help us to retain existing allocations; 50MHz could be a prime example.

Third: there is the emotive jibe that "if people can't bother to take the RAE, like I did, then they don't deserve to go on the air". To someone looking for a pastime, sport or hobby as a means of relaxation amateur radio is not that easy to get into. Most other leisure pursuits can be tried and tested relatively quickly and relatively cheaply – borrow a badminton racket and have a go – if you don't like it little is lost. Not so with amateur radio for the real enjoyment only comes when you have learnt something about it and have probably spent a little money on some basic equipment. With so many easy-to-get-into activities these days it is hardly surprising that so few people discover the enjoyment that amateur radio can offer. Tell the beginner that after a year of night school he might get a transmitting licence and that equipment is X hundreds of pounds and you have quite an off-putting recipe.

Some say that the RAE is easy. Whether it is or is not, to any individual is not the point. It is the commitment of time to something which might not be liked at the end of the day which represents the barrier to beginners, not the standard of the exam itself. To those with a high level of motivation the RAE and Morse test do not represent a barrier, but today there are all too few of these people to take the hobby forward, as we know it, into the 21st century. Today numbers do count and it is essential to keep the hobby buoyant if it is to survive.

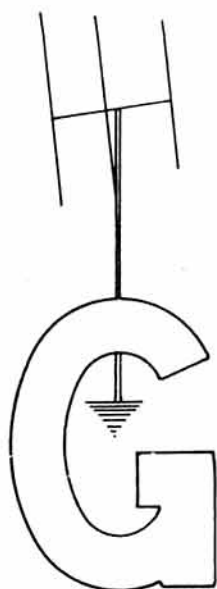
Amateur radio societies over the world need to widen the appeal of amateur radio. Societies need to ensure that amateur radio can be tried and tested so that the examinations required represent a challenge not a barrier. All societies know that every radio amateur will suffer if initiatives such as Project YEAR do not reach fruition.

To the majority of readers may I say on behalf of Council, "Keep up the good work". Many clubs and individuals are clearly behind the Project YEAR initiative and some very exciting things are beginning to happen.

David Evans, G3OUF

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Signal	R535 "Airband"	249.00	(—)

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Sony	PRO-80 Receiver AMF/FM/SSB 115kHz-223MHz	349.00	(—)
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ANTENNA TUNER UNITS		£	(c&p)
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Kenwood	TH 215E Handheld	252.13	(—)
Kenwood	TR 751E 25w multimode	599.00	(—)
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Kenwood	TM 221ES 45w FM Mobile	317.30	(—)
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Yaesu	FT 211RH 45w FM Mobile	309.00	(—)
Yaesu	FT 290Rli multimode	429.00	(—)
Yaesu	FT23R Handheld + FN B10	254.50	(—)
Yaesu	FT736R Multimode VHF/UHF base	1450.00	(—)
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Icom	IC 20GE Handheld	265.00	(—)
Icom	IC 02E Handheld	279.00	(—)
Icom	IC 228E 25w FM Mobile	365.00	(—)
Icom	IC 275E Base Station inc PSU	1069.00	(—)
Icom	IC 3210E 2M/70cm FM mobile	499.00	(—)
Icom	Micro 2 Handheld	249.00	(—)

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Kenwood	TH 405E Handheld	273.18	(—)
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SP 40	Mobile Speaker	21.06	(1.00)
CS100	Mobile Speaker	15.53	(1.00)
HS 7	Miniature Headphones	15.80	(1.00)
YH 77	Light de Luxe Headphones	19.99	(1.00)
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CD660	CW and RTTY De-Coder	264.97	(2.50)
KPC2	Kantronics Packet Communicator	159.00	(2.50)
AEA	PK-232 6 mode Terminal Unit	269.95	(2.50)
Kent Morse Key Kits		29.50	(2.50)
Kent Twin-paddle Morse Key Kits		38.50	(2.50)

ANTENNA BITS		£	(c&p)
HI-Q Balun 1:1 5kW PEP		13.95	(1.00)
Bricomm Balun 4:1 1kW		13.80	(1.00)
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NEWS BULLETIN

DTI clarifies

third-party & digital situation

— RSGB comments

Further to last month's news items, the DTI has now produced press releases which outline the official position on third-party and digital communications. Here are the pertinent extracts;

"Following discussions with the Radio Society of Great Britain in response to a number of enquiries concerning third party traffic, the DTI has issued a statement clarifying the position for radio amateurs operating in the UK.

"The main principle that should be borne in mind when considering third party traffic is that the Amateur Service exists on the understanding that it is used 'for the purpose of self-training, inter-communication and technical investigations carried out by amateurs' (see RR53). Third Party Traffic should be regarded under two separate headings:

- * the passing of messages on behalf of other licensed radio amateurs; and
- * the passing of messages on behalf of non-licensed people or organisations.

"The DTI is content to accept that the passing of messages on behalf of other licensed radio amateurs (at home and abroad) does not contravene the prohibition against third party traffic to be found in the International Radio Regulations (see RR2733). Clause 8(1) of the

licence now makes explicit provisions for this. Regulation 2733 is intended to prevent the Amateur Service being used for commercial (unlicensed traffic). If UK radio amateurs were to pass messages on behalf of unlicensed people or organisations thereby providing a service then a breach of the Telecommunications Act 1984 would take place.

"The passing of third party messages initiated by or intended for unlicensed persons is permitted under the terms of the amateur radio licence under three very limited circumstances. The first two fall under the sub-heading of and are permissible as part of 'self training' by the radio amateur:

- * During Special Events: a 'Special Event Station' is established by a licensee with the authority of a Letter of Variation administered by the RSGB on behalf of the Department. That Variation permits the licensed amateur's station to be used by unlicensed third parties for two minute periods only and then only to discuss trivial matters of personal interest;
- * At the request of a 'User Service' for the purpose of self-training for natural disaster planning and other exercises promoted by the User Services. (User

Services are defined in the licence and are to include the British Red Cross Society, the St John Ambulance Brigade, the St Andrew's Ambulance Association, the County, Chief, Regional or Islands Emergency Planning Officer or any United Kingdom Police force, fire or ambulance service, health authority, government department or public utility); and

- * In the event of natural disasters where the established lines of communication have failed (RR 510). Under these circumstances the amateur may, without reference to 'User Services', pass messages on behalf of third parties until the normal communications systems have been restored. Such messages should only relate to matters directly concerned with relief of distress and should be kept as short as possible to avoid further congestion of the airwaves.

"The bands identified for this purpose are: 3.5 MHz, 7 MHz, 10 MHz, 14 MHz, 18 MHz, 21MHz, 24 MHz and 144MHz."

Comment:

The implications of this statement of DTI policy are far-reaching. The main thrust of it is, of course, to
(cont over)

permit the operation of digital repeaters in the UK. However, there is another important effect of the statement, which is that it permits the handling of international amateur third-party traffic. You'll be interested to know that this puts the UK ahead of many other countries in the world (including the USA) where all third-party traffic - amateur or not - is lumped into one, and such traffic may only be legally passed between countries where third-party traffic reciprocal agreements exist between their respective governments. Good, eh?

So much for third-party, what about digital? Well again here are the relevant bits of the press release.

"The ... changes to the amateur radio licences ... will facilitate the use of the latest digital techniques including Packet Radio, Radio Teletype (RTTY) and Amateur Teleprinting over Radio (AMTOR).

"The changes will enable radio amateurs to:

- * use their stations for automatic digital communications;
- * receive and transmit digital communications along a chain of amateur stations;
- * allow such operation to be conducted unattended;
- * keep a modified log to accommodate the speed of operation and complexity of chains involved in this form of communication.

"Most amateurs will not be allowed to operate a mailbox or bulletin board (a facility which receives and stores messages for or on behalf of other licensed amateurs for retransmission at a later time on the request of and to the intended recipient of the message). The use of an individual's amateur radio station to receive his own personal messages is permitted.

"The amended licences explicitly permit licensees to record and retransmit messages from other licensed amateur stations including the relaying of messages along a chain of such stations (see also Press Notice on Amateur Radio: Third Party Traffic).

"The licences also provide for the unattended operation of digital communications although this is limited to:

1. the frequency band 50-51 MHz,

with a maximum power of 10dBW erp carrier or pep; and

2. the frequency bands 144-146 MHz, the sub-band 436.6-436.8 MHz, the bands 2310-2450 MHz, 3400-3475 MHz, 5650-5680 MHz, 5755-5765 MHz, 5820-5850 MHz, the sub-bands 10,000-10,250 MHz, 10,270-10,300 MHz, and 10,400-10,450 MHz, the bands 10,450-10,500 MHz, 24,000-24,050 MHz and all bands above 47,000 MHz listed in the Schedule to the Amateur Licence, with a maximum power of 14dBW erp carrier or pep.

"There are special provisions for logging the automatic operation of digital communications. Automatic operation is taken as including both unattended operation and the use of the station as an intermediate link in a chain of stations. The requirement to record call signs is waived for automatic operations involving digital communications. It is not necessary to record each and every contact or message passed, although the licensee must still record the time of commencement and shutdown of operation of the station.

"A more general change in the way logs may be kept has also been announced. From now on a log need only be in 'permanent' form rather than in a book ('indelible....not loose leaf'). This means that logs may now be kept on magnetic disc or tape. In either case logbooks or log discs/tapes should only be used for the purpose of keeping a log and there should be no gaps between entries.

"Some changes have been made to the requirement for identification to facilitate digital communications. Identification, which is required at least every 15 minutes, must be made in the type of transmission being used for the message. However, identification in Morse or telephony is required for periods during which transmissions are made lasting 30 minutes or more; Class B licensees may now use Morse in addition to telephony for identification purposes.

Mailboxes/bulletin boards

"The DTI has agreed with the RSGB a procedure for the licensing of mailboxes/bulletin boards." "... the RSGB will distribute notices varying the

licence conditions of individual amateurs so as to authorise them to establish such a facility. (There will also be provision for microwave linking of mailboxes/bulletin boards).

"Applications for this notice of variation should be sent to the RSGB, which will remain responsible for the co-ordination of such facilities to avoid possible congestion of amateur frequencies.

"Amateurs authorised by a notice of variation to operate their stations as a mailbox/bulletin board will identify their stations using a special GB7 prefix, allocated by the RSGB, ie GB7 + 3 letters. (GB7 + 2 letters will denote digital communication repeaters).

"Operation of an amateur radio station as a mailbox/bulletin board without a notice of variation will be unlicensed use."

Comment:

Here again, these changes represent a significant step forward in amateur licensing. The regulations apply to all types of digital communications and are non-specific. This will have the effect of neatly sidestepping the difficulties experienced in some countries where a relatively small development (such as 'NET-ROM') has been declared illegal simply because the regulations did not envisage it. The requirement for Morse identification is not a new one - it has always been in the licence. However, it's been relaxed. A Morse ident is required only once every 30 minutes, instead of 15 prior to 30/9/88, and may be at any speed instead of being restricted to 20 words per minute previously.

Incidentally, Siskin Electronics has responded to the legalisation of packet radio by announcing a new EPROM for the TNC200, TNC220, Micropower 2, and Tiny 2, etc, TNCs, which includes Morse identification. Further details can be obtained from Siskin Electronics on 0703 849962.

REMEMBER:

*These new conditions
apply now, but the
rest of the new licence
doesn't come into
effect until
1 January 1989*

Helplines

'Helplines' is designed to help put people in touch with each other. If you have a problem, there is more than likely someone out there who has the solution; if you are looking for an old colleague or amateur friend, there could be a reader who has some news of their whereabouts; if you have solved a particular problem, write and tell others. 'Helplines' is here to help you and to give you the opportunity of helping others. Write to us marking your envelope "Helplines - News Bulletin" and we'll do what we can to get the message out. But above all, please let us know what success you had!

RSGB HISTORIAN APPOINTED:

In an age of rapid technical advancement and innovation, it's all too easy to forget the amateur radio successes of the past. It's important that these past successes (and failures) are recorded and noted for posterity. With this in mind, it is with great pleasure that the Council of the RSGB announces the appointment of Mr George Jessop, G6JP, as the Society's official Historian following its meeting on 29 September. It is also fitting that this appointment has been made during the Society's 75th Anniversary year.

Anyone who has any records, material or equipment of a historical interest is asked to make direct contact with George initially. His address is:-

32 North View
Eastcote
Pinner
Middx HA5 1PE

CLUB OF FRIENDSHIP II:

Back in April last year, G3IFN wrote to 'Helplines' about the Club of Friendship which is devoted to promoting friendship between UK and USSR amateurs. He's written to us again and has this to say;

"Further to the notice published in 'Helplines' April 1987....I would like to thank all those persons who wrote to me - many of whom are now members (of the club).

"Following several communications with the secretaries of the Central Radio Club and the Radiosports Federation of the USSR, the Club of Friendship has received

approval of its aims. Mr Efremov expresses the views of the RSF as follows; 'We think that the formation of such a club is a very important step which will contribute to strengthening of international contacts, broadening the mutual and friendly relations between our radio amateurs and of our two countries'.

"Leo, UT5IB, the USSR co-ordinator, can often be heard on Sundays at 19 hours GMT between 14.060 MHz and 14.070 MHz. Mike, RC2CB, can also be heard working or calling 'CQ - G' between these two frequencies but his days and times of operation are more variable."

Short-wave listeners or licensed amateurs who would like to know more about the 'Club of Friendship' are invited to contact the UK Co-ordinator:-

Ken Norvall, G3IFN
24 Ryedene
Vange
Basildon
Essex SS16 4SY

NEW RAIBC PHONE NUMBER:

The Radio Amateur Invalid & Blind Club is pleased to announce the installation of a new telephone 'help-line' on 01-346 5372. The line will be open between 10am and 5pm, and between 8pm and 10pm each day to provide advice, help and assistance to RAIBC members, representatives and supporters. The line will be manned as much as possible during those hours but on occasions there may not be anyone available to take calls personally, in which case, an answer machine will be put on-line.

MEMORY KEYS FOR DX-PEDITION:

In next month's News Bulletin there will be an item about next February's unsupported attempt to reach the North Pole. Lawrence and Morag Howell will again be providing the base communications facility on Ward Hunt Island as well as undertaking a number of propagation experiments. In connection with these experiments, Lawrence, GM4DMA, is urgently in need of a memory keyer with a loop facility which will operate up to MS speeds of around 1000 characters per minute and ideally it should run on 12V or 24V. However, there is one snag - there is no guarantee

that you'll get it back! It may fall through the ice as some of the equipment did during the Trans-Polar Ski Trek. So, in effect, it's not so much a loan as a donation!

Having said that, if you still feel you could help, please contact Lawrence on 0224 576155 ext 274, during office hours.

SONS OF THE DESERT?

Not the Laurel & Hardy appreciation society but a request from Al, FELJUD for any ex-members of the French Foreign Legion to contact him with regard to the possibility of setting up a club associated with the Legion. If you'd like to know more, please write to:-

Albert Krulls, FELJUD
14 Rue des Aubepines
59700 Marcq en Baroeul
France

MORE HELP FOR S.LINCS RAYNET:

Would you be willing to help your community in the case of a disaster?

Why not be trained to cope with such a situation and join RAYNET, the Radio Amateur Emergency Network?

The South Lincs Group urgently needs more volunteer members to cover the South Lincolnshire area. If you'd like to help or if you'd like more information, please contact Tony, G1DZQ (QTHR) or telephone 0205-722727 for more details.

THE RICHARD III SOCIETY:

No, its not Cockney rhyming slang..... We've had a letter from an amateur in Florida who is looking for a British amateur and fellow member of the above society. He would like to make initial contact by letter and then arrange skeds for contacts over the air. If you happen to be a member and would like to meet regularly on the air, please contact:-

John H McMillan, K4QOP
7726 SW 53rd Pl
Gainesville
Florida 32608
USA

More from 'Helplines' next month including where to get your chassis bent or custom-made and many more useful bits of information.

"We want information....."

The Patron speaks The DTI replies

As promised last month, here is the text of the speeches given by His Royal Highness Prince Philip, The Duke of Edinburgh, KG, Patron of the Radio Society of Great Britain and Mr M V Coolican, Head of Branch (B2), Department of Trade & Industry, at the opening ceremony of the RSGB's 75th Anniversary National Convention in the Lucas Centre, National Exhibition Centre, Birmingham on Friday 15 July 1988.

His Royal Highness opened the proceedings and had this to say;

"It has been some time since my last appearance as Patron of the Radio Society of Great Britain. In fact it was in 1966 at the opening of the National Exhibition in London. Now this may look rather like a dereliction of duty but in my opinion Patrons should hover benignly over their charges rather like guardian angels and should only become involved on very special occasions and obviously the 75th Anniversary is just such an occasion and I'm delighted to manifest myself with this celebration. When I accepted the invitation I thought I'd just check up to see when I became Patron of this Society and I was astonished to find that I'd been hovering over it ever since 1952. My quick calculation reveals that this was 36 years ago and if you multiply 36 by 2 it comes out at 72, or very nearly half the life-span of the Society. I calculate further that if I live that long I'll make the half-life of the Society in 1991. I am not really very sure why I was invited to become Patron because, while I have caused a great deal to be transmitted over the air I can't claim the distinction of ever having been a 'ham'. The nearest I've come to that elevated status, apart from operating one of those jabber-boxes which used to be known as walkie-talkies was when I invested in a crystal and whisker receiver while I was at school; but of course none of this has got very much to do with the 75th Anniversary of the Society.

"I dare say that radio amateurs would have struggled along without the help of the Society but the hobby would never have reached the standards or the popularity that it has today. Furthermore the Society

can be proud of its contribution to the development of this hobby world-wide and for the part it plays in the International Amateur Radio Union.

"1913 is quite a long time ago and I can just imagine the excitement it must have caused when the first amateur discovered that wireless telegraphy really worked and that they could, I imagine sometimes, communicate with others at a considerable distance. Of course the equipment has vastly improved over the years and the chances of making contact with others are probably that much better but I suspect that the excitement and the sense of achievement is as great as ever. And that excitement must have been much enhanced when the 'ham' finds that he can put his skills to practical use in times of war or emergency.

"But perhaps the greatest satisfaction for the young enthusiast comes with the discovery that this hobby has provided a way into an interesting and rewarding job, and that's why I am delighted to inaugurate the Society's Anniversary Project 'Youth into Electronics via Amateur Radio', or 'YEAR'. Now I've come across some pretty contorted titles designed to produce a particular acronym but this must be in a class by itself! But whatever the scheme is called it's a thoroughly good idea and I hope it will be most successful.

"Now I still have two further duties to perform. I suppose if you only get the services of the Patron every 22 years you might just as well make the most of it! First the opening of the 75th Anniversary National Convention. However, I must say that I'm a little surprised that the Society thought it was necessary to invite delegates to come all the way Birmingham for its National Convention - I can't help feeling that it would have been more appropriate to conduct your discussions over the airwaves! However, now that you are here I can only hope that you all enjoy the experience and that you will go home with a more accurate mental picture of some of the people with whom you have been communicating for years. I trust that seeing a familiar callsign in the flesh has not shattered too many illusions! Now you now

have my permission to begin the Convention.

"But finally, the 75th Anniversary Exhibition, and I suppose the organisers know what they're doing but I think I can think of few things more likely to cause frustration or unhappiness. Frustration because you covet so many of the new and exciting pieces of equipment on display because unhappiness because if you happen to buy any of it you'll probably realise on the way home that you can't afford it! So with that Government Health Warning as it were, it gives me great pleasure to declare the Exhibition open. So YEAR is launched, the Convention is free to begin and the Exhibition is open. So let the 75th Anniversary festivities commence with the transmission of 73s to all those members here and overseas who are listening to these proceedings."

Mr Coolican of the Department of Trade & Industry then took the rostrum to introduce the Young Amateur of the Year for 1988. He had this to say;

"Your Royal Highness, Mr. President, Ladies and Gentlemen. It was a year ago that the Under Secretary of State for Industry and Consumer Affairs, Mr. John Butcher, announced the sponsorship, together with the RSGB, of the Young Amateur of the Year Award. In the year that has followed, in my work, I have had plenty of opportunity to see that the Radio Industry, and in particular the Mobile Radio Industry, is becoming increasingly concerned at the lack of trained technicians and engineers. It is becoming even more concerned by the lack of people in schools, universities and colleges, with adequate qualifications to enter the profession. It was because of that concern that the Department was so happy to sponsor this Award and it was also because of that concern that the Mobile Radio Users Association, when they heard of the Award, asked if they too could join in sponsorship. Naturally, both myself and the Society were happy that they should do so.

"The reason that they have joined in and the reason the Department was so keen on supporting the project and indeed on supporting Project Y.E.A.R., is that amateur radio

has traditionally been the route for many people into the Radio Industry. It is particularly appropriate on the 75th Anniversary, to mark that Anniversary by setting up an award that we hope will encourage others to follow that path into Radio.

"In the 75 years of the Society's existence the progress of Radio for all its purposes, has changed beyond recognition and much of the credit for that change rests directly with amateurs and the experiments they conducted over the years. Also with those many people who entered the Radio Industry having first been alerted to this hobby by the RSGB. Amateur radio fulfils other functions though than creating new radio engineers. It plays a significant and worthwhile role in trying to bridge some of those many barriers and walls that the rest of us so happily put up each day between groups of people. It also, more pertinently perhaps, plays a valuable role in seeking to help people in times of emergency, sometimes a dramatic intervention in a sea wreck, sometimes in helping with major calamities.

"In making the Award the Department has sought to seek people who are demonstrating an ability and awareness in all three aspects of amateur radio that I have enumerated. In looking at those who have submitted applications it soon became clear that one person did stand out among the others for the all-round application of those ideals. Andrew Keeble from Norwich has been in amateur radio for three years and in those three years he has demonstrated great enthusiasm in using radio, in building his own equipment, in maintaining it and in repairing it. He has also made great efforts to encourage other people to participate in the hobby. He has used the hobby to try and promote his other activities - in Scouting and his membership of the St. John Ambulance Brigade. On that score he demonstrates, I think, the use of amateur radio for persistence and help for others. With that background it is not perhaps surprising that he has become an active member of Raynet. It is also a fact that he was prudent enough in his application to say that he had an interest in entering the Radio Industry and a combination of all those factors made him an irresistible choice.

THE NEW LICENCE - POINTS FROM THE POSTBAG

Well, notwithstanding the delays and general mayhem created by the postal strike, letters about the new licence have continued to flop on to the mat here at HQ and we've been kept busy reading them and preparing some answers. This month we'll continue our look at some matters arising and see if we can shed some light in dark corners.

First of all, quite a few folks asked whether you use /M or /P for pedestrian operation, and is logging required? The relevant bits of the licence are as follows:

1(9)c equates pedestrian and mobile operation. 7(4) requires that /M is used when mobile.

Therefore, the answer is that you sign /M when operating as a pedestrian.

What about logging? 6(1) requires that a log be kept of operation at the main address and all temporary locations. But - note that this does not include mobile. However, Note R states that no log need be kept for mobile and maritime mobile operation.

Therefore pedestrian operation, as part of mobile operation, does not require a log to be kept.

A number of members asked whether the station must identify every 30 mins in CW. 7(1)f requires that the station identify in cw or telephony at the end of each 30 min period

"The prizes to be awarded come in several shapes and sizes. The Department will entertain Andrew for a day at our Radio Monitoring Station so that he may see some of the work that makes it possible for all of us to use the airwaves. The Mobile Radio Users Association have very kindly agreed to finance a stay at Wray Castle for one of their radio courses. We have perhaps a more immediately appreciable token of the Department's appreciation in the form of a cheque for £200.00 and as a more lasting memento, a certificate signed by the Minister. It is my very great pleasure, Sir, to ask you as Patron of the Society to present that award to Andrew now."

His Royal Highness presented the Award to Andrew Keeble, G1XYE, and, following a few private words with him, was himself presented with one of the RSGB's RC14 receivers by the Society's President Sir Richard Davies, KCVO, G2XM.

during which transmissions are sent. So there'll be an ident of some sort, whether it's in Morse or telephony, at least every 30 minutes. The idea is to help the DTI and also other amateurs to identify stations using more specialised or advanced modes.

Was there a misprint in the last item? Er - well, yes Your Honour, there was. In Section 2(4)a on unattended operation, "1,250-1,270" should have read "10250-10270". Sorry folks.

The item about 28 MHz equipment dominated the postbag, of course - last month's item in the Bulletin dealt with most of the matters arising and we hope it's clarified the issue. Our position goes something like this. The ability to build equipment for the amateur bands or to modify surplus equipment was felt to be a very basic and fundamental part of the hobby, and this legislation was felt to strike at the foundation of amateur radio. Several did not see why it needed to cover the amateur band at all. Others pointed out the problems which would occur with the Novice licence which was likely to involve single-band equipment for 28MHz.

We are in the throes of producing a list of the detailed points arising out of this legislation, which will be sent to the DTI along with a request for clarification.

ANNUAL GENERAL MEETING

2 pm, 10 December 1988
The Renold Building,
UMIST, Manchester

Doors open 11.30am for
registration and booksales.
Please try to arrive in good time,
at least by 1.45 pm.
Cafeteria open 11.30 am - 1.30 pm
for lunchtime snacks & refreshments.

The installation of
Dr Julian Gannaway, G3YGF
as the Society's 1989 President
will take place on
Saturday, 10 December 1988, in
the Barnes Wallis Building, UMIST
8 pm for 8.15 pm

Tickets £8.50 each
from the Circulation Dept., RSGB HQ
by 2 December latest

Around the Groups

The deadline for the JANUARY issue is Wednesday 23 NOVEMBER latest, but if you can send items in earlier it would be much appreciated.



We kick off this month's 'Around the Groups' with a report from Kevin Fox, G4MDQ, the Secretary of the Workshop Amateur Radio Society, on the opening of WARS's new purpose-built club house. Here's what Kevin has to say;

"Saturday 24 September saw the culmination of twelve month's hard work by the members of the Workshop Amateur Radio Society. At 2pm, in brilliant autumn sunshine, Councillor Mrs Emma Bloomer, Chairman of the Bassetlaw District Council, cut the red, white and blue riband which was stretched across the entrance to the WARS's new club house and headquarters.

"Present at the opening ceremony were leading members of Bassetlaw District Council, Mrs Joan Heathershaw, G4CHH, the Immediate Past-president of the RSGB, representatives of the local business community who helped with the project, and four German amateurs from Workshop's twin town of Phungstadt, together with the General Management Committee of WARS and club members.

"Once inside the luxurious new headquarters, Mr George Pool, G0DKQ, Chairman of WARS, welcomed all the visitors and thanked them for attending. Mr Pool explained to those present how WARS would be taking the RSGB's Project Y.E.A.R initiative firmly on board by

visiting schools in the Bassetlaw area to demonstrate amateur radio to young people and talk about career opportunities in the electronics field. He went on to talk about how WARS would also be running an RAE (Radio Amateurs' Examination) course thereby filling in a gap left by the withdrawal of the North Nottinghamshire College from RAE tuition. Mr Pool concluded by detailing the excellent work carried out by the RAYNET organisation and in particular, the 288 Group Bassetlaw RAYNET. He explained how 98% of the Bassetlaw group was on the air and ready for action within 6 minutes after being called out by the County Emergency Planning Officer during a recent gale-force winds alert. Almost all of 288 Group Bassetlaw RAYNET are members of the Workshop Amateur Radio Society.

"Councillor Mrs Bloomer paid tribute to the members of WARS who had taken a derelict shell

of a building in a conservation area and, by their own hard work, tenacity and vision, had turned it into a thoroughly modern and luxurious headquarters.

"Mrs Joan Heathershaw, G4CHH, representing the RSGB, made a speech congratulating the members of the Workshop club. She told those councillors and guests present that the Workshop Amateur Radio Society was continuing the work started by Marconi, who was himself a member of the RSGB, by creating a centre to encourage the youth of today and tomorrow into a career in electronics via amateur radio.

"After the speeches, Mrs Bloomer and Mrs Heathershaw were invited behind the bar to pull the first pints of beer for the members."

Many thanks to Kevin for that report and very best wishes for the future to the Workshop Amateur Radio Society.



Serving the first pints at the opening of the Workshop Amateur Radio Society's new headquarters. Left to right, Councillor Mrs Emma Bloomer, Chairman of the Bassetlaw District Council; Mrs Carol Gee, G4ZUN, Secretary of the WARS; Mr John Huggins, G0DZX; and Mrs Joan Heathershaw, G4CHH, Immediate Past-president of the Radio Society of Great Britain. (Photo: Kevin Fox, G4MDQ)

VERULAM ARC - PROJECT YEAR SUCCESS:

The RSGB's Project Y.E.A.R has sparked much enthusiasm amongst many affiliated clubs and societies. The Verulam ARC, based in St.Albans, launched itself into the project by holding an amateur radio activity evening Tuesday 11 October.

The Chairman of the club, G4JKS said that the evening had been "a phenomenal success" and that "the turn-out has surpassed all expectations, despite the atrocious weather." In fact, some 82 youngsters aged between 8 and 17 years converged on the RAFA HQ, New Kent Road from youth organisations and schools within a 30 mile radius of St.Albans. The groups were accompanied by 20 adults and they all enjoyed an evening of 'hands-on' electronics and radio activities.

The evening began with an overview of amateur radio and Project Y.E.A.R, followed by an hour of activities with youngsters becoming totally absorbed in soldering, short-wave listening, constructing crystal sets, sending CW, watching weather satellites and speaking to other amateurs via the special event station GB75YIR.

Following the success of its first Project Y.E.A.R venture, the Verulam ARC plans to start a new Junior Section to provide tutorial sessions for the proposed 'Student' licence, already being formulated for 1989.

The Society has heard of a number of similar activities and events being run or planned by other clubs as part of Project Y.E.A.R. Some have been successful, others not so. During the early part of next year we hope to publish some hints and tips to help clubs with the planning of such events. In the meantime, we'd like to hear from any clubs who have attempted similar projects - successful or not. In particular, we'd like a post-mortem of your event giving your views on what you think was right with the planning and where, if anywhere, you think you went wrong. This will provide us with valuable input in the preparation of guidelines for similar events.

AMSAT-UK NEWS:

Early last month, AMSAT-UK announced the funding of a launch opportunity by means of a £5,000 donation to AMSAT-DL. The transfer of funds was completed during the first week of October following discussions between the AMSAT-UK Committee and the President of AMSAT-DL at Marberg, Germany.

The donation was given to assist the Marberg-based team in obtaining a launch opportunity for the forthcoming phase 3-D amateur radio satellite being designed for the 1992 time-frame. To obtain such a launch opportunity, £12,000 was required to be placed 'on the barrel' before 10 October 1988. This had to be done if a launch was to be secured and building commenced. Consequently, AMSAT-UK's funds have now been depleted somewhat but it is hoped that assistance with the funding will be forthcoming during the next few months. Donations gratefully accepted and should be sent to AMSAT-UK, London E12 5EQ.

JARL, the Japanese Amateur Radio League, announced in mid-October that because of a malfunction in the power controller of Fuji-OSCAR 13, operation of the satellite should be suspended until at least 15 November to allow investigation into the problem.

RAIBC NEWS:

Following the announcement that the Radio Amateur Invalid & Blind Club has been issued with a permanent special call sign, namely GB1IBC, the club is pleased to inform members that it now has five more regular nets. These are all on 145.30 MHz and take place on the following days from the following locations. The net controller is in brackets and all times are local:-

Belfast - Wed 9.30pm (GI4GVS)
Bournemouth - Fri 8pm (G4OBL)
Manchester - Tues 7.30pm (G8TOE)
S.Devon - Tues - 8pm (G7AWQ)
S.Wales - Sun 7.30pm (GW0INW)

Fiona McKenzie (XYL of Angus, G3OSS) was elected Secretary of RAIBC at the August AGM and copies of the new Constitution are available to RAIBC members only direct from Fiona at G3OSS, QTHR. Incidentally, RAIBC has recently applied for charity status.

BARTG NEWS:

Annual General Meeting.

The Annual General Meeting of the British Amateur Radio Teleprinter Group takes place at the Churchill Room, London House, Mecklenburgh Square, London WC1 on Saturday 5 November, starting at 2pm.

One of the issues to be discussed at the meeting will be the proposal to change the group's name by replacing the word 'Teleprinter' with 'Teledata' since BARTG is no longer solely concerned with mechanical RTTY but also encompasses computer RTTY, packet

radio, AMTOR and FAX. BARTG would like to hear the views of as many of its members as possible and urges them to attend this year's AGM to voice those views.

The venue (London House) is close to the junction of Grays Inn Road and Guildford Street, just a few minutes walk from Kings Cross/St Pancras British Rail and Underground Stations and similarly from Russell Square Underground Station on the Piccadilly Line. Refreshments will be provided and further details can be obtained from BARTG's Secretary & Publicity Officer;

Ian Brothwell, G4EAN
56 Arnot Hill Road
Arnold
Nottingham NG5 6LQ

New Publication.

In the response to a demand for an inexpensive guide to packet radio, BARTG has recently published the 'Beginners Guide to Packet Radio'. This 28-page A5 booklet was written by Mike Martin, G4VRQ, who is a member of BARTG and has written about packet radio in BARTG's quarterly journal 'Datacom'. The topics covered in the guide include;

- the history of packet radio
- the equipment required
- the software/protocols
- connecting up the station
- setting TNC parameters
- how to use it on-air
- digipeaters/beacons
- bulletin board systems
- a glossary of terms

The 'Beginners Guide to Packet Radio' is available at 95p plus 20p postage & packing from:-

Mr J Beedie, GW6MOK
BARTG Components Manager
'Ffynnonlas'
Salem
Llandeilo
Dyfed SA19 7NP

GB2ATG.

Bob Andrews, G1JZJ, the co-ordinator of the GB2ATG news service has recently moved. His new address is:-

52 Linridge Road
Erdington
Birmingham B23 7HX

Bob is pleased to receive any items of amateur radio news, particularly relating to radio data activity such as RTTY, Packet or FAX, for possible transmission.

GB2ATG is operated by a dedicated group of volunteers (like



The Ballymena ARC, G13FFF, ran the special event station GB2MRI on Rathlin Island (6 miles off NE Co. Antrim) between 3 and 7 August this year. The island covers about 6 sq. miles, is L-shaped and has a population of around 100 people. During the 4 days spent on the island, which has no distributed mains supply, over 500 contacts were made including regular morning contacts with stations in Australia. Seen in the photograph are - (Top row left to right) Isaac, G14POV; Owen, G11XND; Ian; Stan, G14VJC; Aubry, G14TOR; Hugh, G10JEV and Albert, G14CRL, (Front row left to right) David, G10ITJ; Billy, G14KUM; Tommy, G14VJZ and Jeff, G14HCN. (Photo: G14POV)

the RSGB's GB2RS news service) and as such the schedule is subject to change. Because of this, Bob is always on the lookout for more volunteers to join the team.

GB2ATG is transmitted on the 1st and 3rd Sunday of each month on the following frequencies:-

3590 kHz
14.090 MHz
144.600 MHz

The most up to date schedule is published in each issue of BARTG's quarterly journal 'Datacom'.

JOTA NEWS:

Just a few days before the start of last month's JOTA event we received a letter from Garth Morrison, the Chief Scout, who wanted to pass on his appreciation for the support and help which the Scout Movement receives each year from UK radio amateurs during JOTA weekend. Mr Morrison had this to say to those amateurs;

"Jamboree On The Air is one of the most important events in the Scout calendar and I am delighted to learn that over 350 amateur radio stations in the United Kingdom will be taking part during the coming weekend.

"A large number of people, including many who are not directly associated with Scouting, will be giving up their time and making their

equipment and expertise available so that thousands of young people will be able to communicate nationally and internationally with some of the 24 million Scouts and Guides in the world.

"Through this message, I should like to thank everyone making the 31st Jamboree On The Air possible and send my best wishes to them and also to all Scouts and Guides taking part."

Garth Morrison, Chief Scout.
15 October, 1988.

GB50RAF AT LINCOLN HAMFEST REPORT:

The Lincoln Hamfest took place on 11 September and Ernie Knight, G4NVD, ran the special GB50RAF call sign from the site over that weekend. Many contacts were made during the period, but perhaps the most interesting was one with the RAF Club station in the Falkland Islands, VP8RAF. The station was contacted in the 20m, 15m and 10m bands and the operator, Howard, G4ZZR, is normally based at RAF Digby in Lincolnshire. Howard also has his own VP8 call sign, VP8BRY, and can be found operating on 28.525 MHz between 15h and 17h GMT daily and on 21.295 MHz on Sundays at around 19h GMT.

Propagation was reported to be 'very strange' over the weekend with many German stations being worked on 2m SSB, even though GB50RAF was only using a halo. UK stations were quite weak on SSB but

on FM reports of 59+ were being exchanged, and this time the antenna was a colinear.

Many RAFARS members from the Lincolnshire area operated the station and a good time was had by all.

NEW AMATEUR RADIO GROUP:

The Scottish Tourist Board (Radio Amateur) Expedition Group has recently been formed and expects to begin activities early next year.

The aims of the group are to activate amateur radio stations from various historic, unusual or particularly 'Scottish' locations in Scotland and to make the general public more aware of amateur radio since all of the stations will be open to the public.

Members of the group will be taken from all parts of Scotland and so far they plan to run stations at two malt whisky distilleries, a World Heritage stie, a Robert Burns Station, a very rare castle and on an island. A full list of the events will be available in February. A special PO Box address will be arranged soon but, in the meantime, further details can be obtained from Paddy, GM3TMH (QTHR).

THE GODIVA AWARD:

The Coventry Amateur Radio Society is pleased to announce its new 'Godiva Award'. Unfortunately it doesn't mean what you hoped, and you don't have to be naked and operating mobile from the back of a horse to achieve it....

The award is open to all licensed amateurs and short wave listeners who make contact with or hear Coventry ARS club (G2ASF or G7ASF) or special event call signs, call signs of club members or of any station located within the Coventry City boundary to achieve the required number of points as follows;

UK Stations - 20 points
European Stations - 15 points
Other stations - 10 points

These points can be obtained by working or hearing the following;

CARS club/event call signs - 5
CARS members call signs - 2
Other Coventry call signs - 1

All contacts must have been made after 1 January 1988 and contacts via repeaters will not be acceptable. A log extract, signed and verified by two other amateurs is required and there is no time limit for achieving the award. QSL cards are not required.

Endorsements are available for

a) achievement on a single band, b) achievement using a single mode, or c) achievement using QRP (ie, less than 5W). All certificates will be numbered and entries, together with a fee of £1.50 made payable to 'Coventry Amateur Radio Society', should be sent to:-

J Ward, G4HHT
3 Shirley Road
Coventry CV2 2EL

GB75RLD:

To celebrate the 75th Anniversary of the RSGB, two members of Radio Link Derby Hospital Broadcasting will be running the special event callsign GB75RLD from the outside broadcast caravan at the City Hospital, Derby from Thursday 1 to Sunday 4 December inclusive. Operation will be between 19 and 2030 hours on the Thursday and Friday, between 10 and 17 hours on the Saturday and between 10 and 15 hours on the Sunday. Activity will be on 144 MHz only.

The aim of the station is to promote amateur radio and hospital radio to the general public and to give other amateurs the opportunity to work another GB75 station for the RSGB 75 Award. It is hoped that in excess of 200 stations will be worked during the event and each station contacted will receive a special QSL card via the bureau, as will SWLs for sending valid reports of contacts made. Representatives of other local organisations will visit the station during its period of activity.

Radio Link was formed in April 1974 and 'broadcasts' for 50 hours per week to the City Hospital, Derbyshire Royal Infirmary, Derbyshire Children's Hospital and the Kingsway Hospital. Its studios are located at the City Hospital in Uttoxeter Road, Derby.

PARRAMATTA BICENTENARY AWARD:

The 'First Fleet' arrived in Australia on 26 January 1788 landing at Farm (Sydney) Cove and setting up a colony on the site. The need to commence farming was most urgent and Parramatta area was selected. The first settlers arrived there on 2 November 1788.

Parramatta is the only other area on the Australian mainland that celebrates its bicentenary in the same year as Australia generally. It has many historic sites and buildings and special stations will operate from 11 of these sites until 4 December. The award is available to any amateur who makes contact with the station 10 of these locations.

The station will operate for 3 days at each of the locations between 21 hours and 09 hours UTC

giving 12 hours operation each day. The last 3 days have been designated as 'catch-up' days to allow entrants another opportunity to make contact if required. The operating periods will be sub-divided to give ample opportunity to work the stations on as many bands as possible. The times, frequencies and sites schedule is as follows:-

Times/frequencies:

21-23 hours UTC;
14.088 MHz CW
14.188 MHz SSB

23-01 hours UTC;
21.088 MHz CW
21.188 MHz SSB

01-03 hours UTC;
3500 kHz CW/SSB

03-05 hours UTC;
7008 kHz CW
7088 kHz SSB

05-09 hours UTC;
14.088 MHz CW
14.188 MHz SSB

Sites & Dates:

Parramatta City; 31/10-2/11
Old Post Office; 2-4/11
Lancer Barracks; 5-7/11
Old Governm't House; 11-13/11
Governors Bath House; 14-16/11
First Observatory; 17-19/11
Parramatta Pk Gate Hse; 20-22/11
Elizabeth Farm Cottage; 23-25/11
Hambleton Cottage; 26-28/11

Experimental Farm; 29/11-1/12
Catch-up Days; 2-4/12 2359h UTC

To be eligible for the award, logs must be kept and a copy of log entries in sequence according to UTC times, dates and frequencies will be accepted. In addition, a declaration must be completed and submitted with the payment of A\$3.50 for surface mail or A\$5.00 for airmail made by mint Australian postage stamps, money order, postal notes/postal orders, certified cheques or IRCs (dated 1988 or 1989) to the appropriate value. Entries must arrive no later than 30 June 1989 and should be sent to:-

The Chairman
Parramatta Bicentennial ARG
PO Box 883
Parramatta 2150
New South Wales
Australia

OMAN'S NATIONAL DAY:

The Royal Omani Amateur Radio Society has written with details of the amateur radio activity planned for Oman's 18th National Day.

Between 02 hours GMT on Monday 14 November and 20 hours GMT on Sunday 20 November all A4 licensed members of ROARS will use the suffix -/ND (National Day) during their normal operation from their own QTH. The ROARS HQ station will operate throughout the period using the special event callsign A4XND.

To mark the occasion further, an award will be offered to any licensed amateur or short-wave



Colin Simpson, GI4PRH, Chairman of the East Antrim ARC (right) seen here presenting a gift to Jason Woodward, GIOHYD, on the occasion of his leaving for university in England. Recently, Jason achieved firsts in Northern Ireland in A-level physics and applied maths.

listener who works or hears five Omani stations using the -/ND suffix on any band using any mode. A certified log extract together with 10 IRCs should be sent to:-

The Awards Manager
ROARS
PO Box 981
Muscat
Sultanate of Oman

ALARA CONTEST 1988:

The Australian Ladies Amateur Radio Association's 1988 Contest takes place on Saturday 12 November. The contest is open to all licensed amateurs and short wave listeners throughout the world and will run for 24 hours starting at 0001 hours UTC and ending at 2359 hours UTC.

Operation will be in the 80m, 40m, 20m, 15m and 10m bands only using phone and CW. YLs may work any other station but OMs may work YLs only. The following frequencies are suggested for easier location of contacts;

3525 - 3590 kHz
7100 - 7120 kHz (NOT UK)
14.060 - 14.235 MHz
21.100 - 21.200 MHz
21.350 - 21.370 MHz
28.100 - 28.350 MHz
28.500 - 28.600 MHz

Each station may be worked twice on each band, once on phone and once on CW. No net or list operation is permitted, nor is crossband operation permitted.

The scoring of the contest is as follows;

Phone:-

ALARA members - 5 points
YL non-members - 4 points
OMs - 3 points

CW:-

Double the above points

SWL:-

ALARA members - 5 points
YL non-members - 4 points

Logs must be signed and show the full name, callsign and address of the operator together with the total number of points claimed. Logs must be legible (NO carbon copies) and sent to:-

Mrs Marlene Perry, VK3JAW
218 Ninth Street
Mildura 3500
Victoria
Australia

...to arrive no later than 31 December 1988. Logs will not be returned.

More news from home and abroad next month in 'Around the Groups'.

RSGB LOTTERY - REMINDER:

In the centre of July's Radio Communication we published a 4-page pull-out giving details of the RSGB Lottery. In order to stimulate sales of lottery tickets further and possibly to swell the funds of your local club, we have decided to offer a cash prize of £100.00 for the highest sale of tickets in two categories as follows;

- 1) For the top-selling club, group or society.
- 2) For the top-selling individual.

When you have sold your tickets, make a note of the ticket numbers and return the counterfoils to RSGB Headquarters. If you require more tickets to sell, simply fill in the coupon in the centre-fold and enclose it with the counterfoils or enclose a note requesting how ever many more books you would like.

You should submit a list of tickets sold, by number, to the Secretary at RSGB Headquarters and mark your envelope clearly in the top left corner with the total number of tickets sold.

All ticket counterfoils and a cheque or postal order made out to RSGB for the appropriate amount MUST be returned to RSGB Headquarters by first post on the closing date, Friday 2 December 1988 LATEST! Counterfoils received after the closing date will not be entered into the lottery draw.

The draw will take place at the RSGB's Annual General Meeting to be held on Saturday 10 December 1988 at the University of Manchester Institute of Science and Technology.

RSGB 75 AWARD:

Many of you have already achieved the required number of contacts or points for this award and have sent your log extracts to John Harvey, G4IVJ. We'd like to thank all of you and, to put your minds at rest, the certificates should be in the post in time for Christmas.

The main problem has been finalising the design of the certificate since we wanted to make it a little bit special. One of the hold-ups has been the reply to a letter asking permission to reproduce a particular signature on the certificate. We're still hopeful that we'll receive a favourable reply but, in the meantime, production has been held up. We don't want to give the game away at this stage but applicants will also receive a special surprise with their certificate. We think it will be well worth the wait and we'd like to apologise for the delay.

If you haven't yet managed to collect the required contacts or points, there are still a few weeks left before the closing date of 31 December 1988 and applications for the RSGB 75 Award should be sent to John by 1 April 1989 latest. (See p762 of last month's RadCom for full details).

RIS - LATEST STATISTICS:

The DTI's Radio Investigation Service has just released details of prosecutions and subsequent fines and costs for the period between April and June 1988. They read as follows:-

People prosecuted - 38
Number convicted - 38
Total fines - £8,604
Total costs - £4,414
Forfeiture orders - 30
Warning letters - 133

QRZ 120 GHz ?:

While we have a number of microwave allocations in the existing licence - 24, 47, 76, 142, 248GHz, for example - there are one or two others which are mentioned in the International Radio Regulations but which are not yet included in the UK licence. One of these is the 120 GHz band (actually 119.98-120.02 GHz). DTI have recently indicated that they would be willing to consider granting permits for this band on a case by case basis. The DTI or RSGB would be pleased to hear from anyone interested in activating this band.

AURORAL ODDITY:

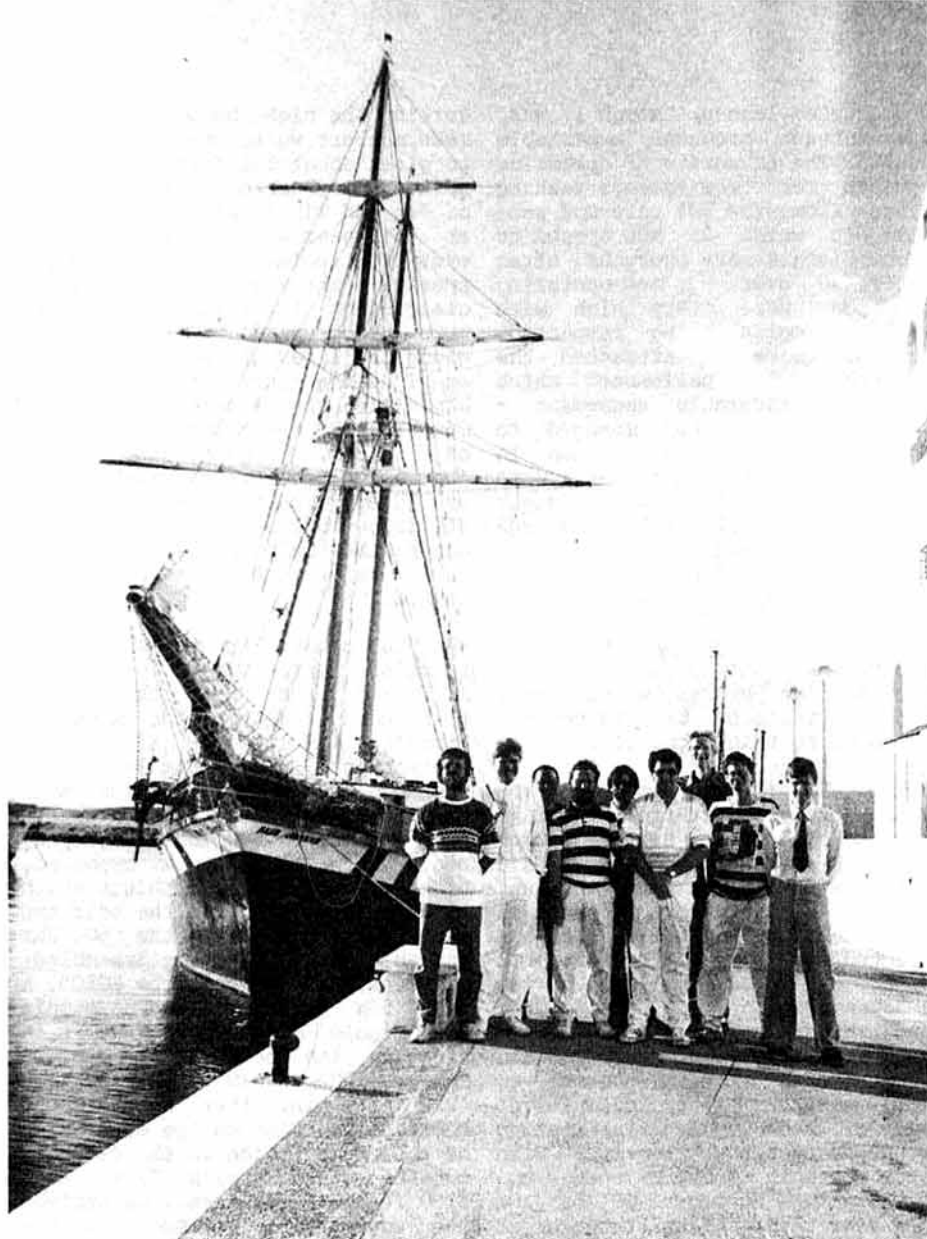
Is the Bulletin Editor going barmy or does something very odd seem to happen to the polar pattern of your 144 MHz antenna during some auroras as well? On 10 October there was quite a good auroral opening, and your scribe took time out from tapping away at the keyboard to work some DX. UQ2GND and UP1BWR were both good signals at times, and on both of them something rather odd seemed to be happening. Although they were both about 55A at Chateau 'FRX, this was only true over about a 10 degree beamwidth - either side of that they dropped right out. It was as though the 2 X 17-eles had momentarily been replaced by something far sharper. Anyone else seen this? Answers on a postcard...

COUNCIL BRIEFS:

Copies of 'Council Briefs' for the Council meetings held on 12 March, 12 May, 9 July and 29 September, are available from the Secretary, at RSGB HQ on receipt of an A4-sized 28p self-addressed envelope.

The Squarebashers invade Gibraltar 2

by
Tim Kirby
G4VXE



You'll remember that last month we left you with the proverbial cliffhanger as ZB2IQ poised to burst into action on 50 MHz. This month we complete the story.....

We'd picked the first two weeks in June for the DXpedition on the basis that it was the time most likely to provide good sporadic E on the VHF bands. Well, that was the theory - but even the most optimistic amongst us wouldn't have gone quite so far as to predict a major opening on 50 and 70 MHz within 2.5 hours of our arrival in ZB2! In the VHF Newsletter which came out after the expedition was over, Dave Butler speculated that perhaps we'd sprinkled magic dust out of the aircraft taking us: that information is of course highly classified!

We didn't manage to work G2ANT initially, although he was about a million dB over S9; unfortunately neither the mic nor the key could

be found before he faded out! However, we were to work Bill many times in the course of our sojourn. The first contact of the DXpedition took place at 1540Z on 31 May 1988 on 50 MHz, with GW4HBK. G4VXE and GW4LXO manned the subsequent pile-up, whilst out in the sun the two Daves, 'ROU and 'FRE, got on with the job of assembling the 70 MHz antenna. Inside, John 'HGT and Kelvin 'TTU were delving around in the cavernous recesses of The Trunk (see last issue) for the constituent parts of the 70 MHz station. By 1615 we were hearing band noise...yes, here comes GB3BUX, a steady 10 over 9. The first 70 MHz contact happened at 1620Z with G3PWK, and indeed propagation on that band proved so good that we started to have pangs of anxiety which soon turned to panic - was 144 MHz going to open up without us being ready? All hands on deck: feeder was hastily attached to the 144 MHz beam and Dave 'ROU told to act as an impromptu antenna mast (well, he's

tall and thin). However, a quick handscan produced no results, and indeed propagation on 50 MHz had disappeared by 1745. Just as well, actually, because pangs of hunger were now striking at frequent intervals. This matter was attended to and we were soon back on the air. At 1945 the 50 MHz band opened to the Netherlands, and our contact with PA3AMF was the first on that band between ZB2 and PA. At the same time the "locals", i.e. 9H1, were S9 and stayed that way almost all evening, which allowed us to get to know them.

During this time, incidentally, Walt 'NYY and Richard had been setting up the HF station. This was comparatively simple, consisting of an Icom IC740 for the main station and a Yaesu FT707 (kindly lent by SMC) for use on the 14 and 28 MHz VHF nets. The first HF antenna to see the light of day was a 14 MHz dipole stretched between the wall of the apartment behind us (actually the manager's...) and another mast on our balcony. In traditional Square Basher style, the insulator used at one end was a plastic milk bottle. Using this super skyhook, Walt set to on 14 MHz CW and was soon up to his ears in a mega-monster pile-up of Europeans. A couple of hours later, it was time for some 14 MHz SSB. The apparatus was set up and the "QSO machine" consisting of Richard, GW8TVX, was wheeled into place. This man is truly amazing and unexcelled; all you have to do is sit him in front of a rig, provide him with a bottomless supply of wine gums and watch him go! Incidentally, if you're one of those who worked us on that first evening and you're thinking that you could have sworn the operator

gave his name as "Dave", you're not wrong. We twigged this after a while and asked 'TVX what he was up to. He replied that it seemed the proper thing to do, since the licence holder for ZB2IQ was a Dave and anyway it was quicker to say Dave than Richard....oh well.

By this time night had fallen and a number of Square Bashers had adjourned to the bar to bask in the rosy glow which comes with a day's work well done. The rest of us were about to join them when we suddenly remembered something. Before leaving the UK we had made a 144 MHz meteor scatter sked with Colin, GODAZ; fine, no problem, but we hadn't yet sorted out a non-human mounting for the 144 MHz antenna and it seemed unnecessarily cruel to make 'ROU stand and hold it for the entire duration of the sked. Given that the one mast so far erected supported the 3-element yagis for both 50 and 70 MHz and that it already looked a bit overloaded, it was clear that one of them would have to come down. Since a) the 70 MHz addicts were in the bar and b) those of us doing the work prefer 50 MHz, the decision as to which one more or less took itself. Indeed, when the revellers got back there was an almighty crash as they tripped over the 70 MHz beam reposing on the floor. Next morning (at 0500Z - urgh) we opened our 144 MHz account by means of a completed MS QSO with Colin. Conditions weren't that good, and indeed at one stage Tim was threatening to phone Colin to find out whether he was QRV or not! Happily, we finally completed.

After breakfast it was time to attack the problem of the antenna farm. Another mast was erected and the 50 MHz beam moved to the top of it. The existing mast was extended to support the 14-element for 144 MHz and the 3-ele for 70 MHz. We then added an HF6V vertical for the HF bands, which was supported by a discarded (honest) sunshade stand retrieved from the beach, and dipoles for 14 and 28 MHz. By this time the balcony was beginning to look as though it was the forward base for a search for extraterrestrial intelligence, or that the RAF was having an exercise and had moved its communications centre to a wartime /A location! As a matter of fact, the performance of the vertical HF antenna wasn't exactly stunning; we decided to erect a supplementary long wire running north from the apartment and making intermediate use of a number of handy supports including what looked suspiciously like a naval winch. The end of the wire, which was about 100' long, was tied off on some rocks on the shoreline.

Undoubted lash-up though it was, this antenna produced remarkable results. The favourite HF operating sessions for crew members seeking refuge from the VHF pile-ups were those in which 21 MHz opened to Japan. Signals were enormous, often 10 or 20 over 9, and operating standards were very high with selective calls being respected. Once or twice we attracted the inevitable DX "policemen" which caused considerable amusement - especially when they managed to pass on our QSL information in Japanese! We couldn't muster a word of Japanese ourselves, although our resident linguist Walt did manage to make a considerable number of contacts in Russian. What with the aerial farm, Walt's frequent repetition of "Nikolai Ydrich Ydrich" in giving the QSL information and copious use of other Russian phrases, we must have given visitors or passers-by something to think about....

Back on VHF, 50 MHz proved to be quite amazing. Apart from two days of total and utter silence, when there was nothing to do except lie on the beach and soak up the sun, we had openings to various parts of Europe on 50 MHz daily. We had expected something of the sort, but the frequency and magnitude of the Es openings on this band were astonishing; all in all we had something like 1800 contacts and our list of UK stations active on "six" must be pretty definitive! One of the many interesting phenomena was the frequency with which the path to Cyprus opened up. Most mornings at around 09 or 10Z we'd hear 5B4CY coming through at well over S9 - and quite often the Malta beacon 9H1SIX would be audible at the same time. Is this evidence of double-hop or chordal propagation of some sort? We also had our suspicions about the 50 MHz path from Gibraltar to Sweden, Norway and Finland. It was no problem making crossband contacts with several stations including Jan, OH1ZAA, whilst at the same time being able to work into Holland - a nice and convenient "halfway house" along the path. Interest in 50 MHz throughout Europe was exceedingly high and a considerable number of crossband QSOs were made, not to mention one or two surprises "in-band", as it were! All in all, we had 50/28 MHz crossband contacts with G, GW, F, PA, DL, OZ, SM, LA, OH, HB9, I, YU, EA and 4X.

Perhaps the most memorable part of the operation on 50 MHz was the events of 7 June. In the course of 50 MHz contacts with the UK, nearly every station told us all about the USA stations which they'd been

working the night before; just to make matters worse Dave 'ASR called to gloat about the fact that he'd worked KP4 (Puerto Rico). The sound of Jon and Tim grinding their teeth at this news was clearly audible over the noise from the rig's speaker - and you didn't need to be clairvoyant to divine that they were preoccupied with thoughts along the lines of "what the **** am I doing stuck out here on a DXpedition when I need KP4 on six?" Come teatime the atmosphere was one of gloom, despondency and depression - but wait, what's this on 28 MHz? Spanish and Portuguese stations working into the USA. Who's that calling us? It's Ted, 'UPS - he's heard a weak US station on 50.110!

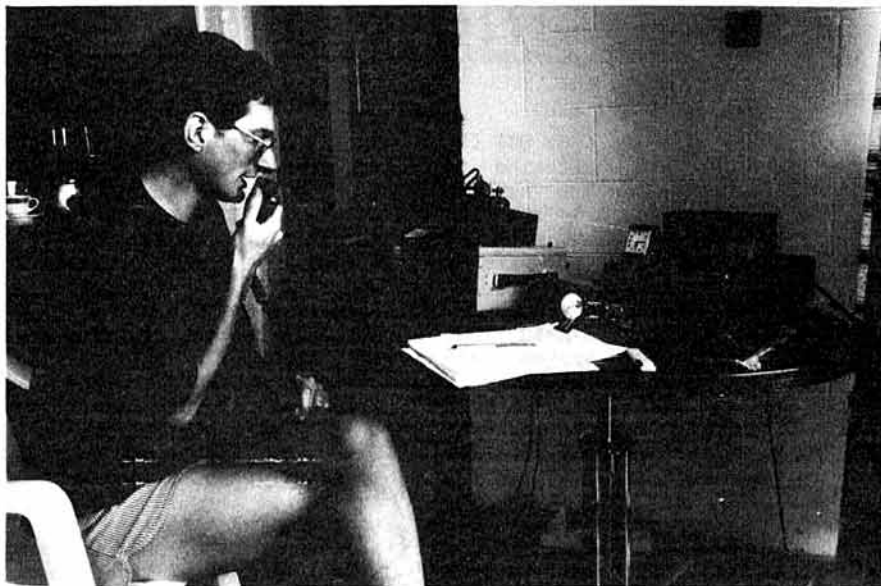
What to do now? From the ZB2IQ site there's a little bit of a problem in firing 50 MHz RF at the USA - it's known locally as the Rock of Gibraltar. Solution - a portable 'detachment'. The scramble bell is sounded and after a quick meal consisting of a "Derbyshire Curry" (the recipe is to close your eyes, reach into the kitchen cupboard, grab the first five things which come to hand, bring to the boil and add curry powder) the 50 MHz portable gear is hastily assembled; it consists of an Icom IC505, a BNOS 50W amplifier and a simple wire dipole. Without ceremony it is slung in the boot of the car and Messrs 'ROU, 'LXO, 'TTU, 'TVX and 'VXE pile in; they set sail for their destination on the other side of the Rock, which is the car park outside St Michael's Cave, some 1100 ft above sea level. On arrival the equipment is plumbed in to the car electrics and we confront the first problem; how to support the antenna? A "No Waiting" sign is identified as being suitable for one end of the DX Dipole, but what to do with the other end? Richard surveys the scene and then dives into the bushes brandishing a fearsome-looking knife; he shortly emerges with a large stick which is tied to some railings to form the other support for the monster megabeam. It is connected up and we hold our breath as the rig is switched on.

Tune around - all quiet. Oh...this is worrying - our street credibility with the other team members will collapse if we return without a contact. We start calling CQ DX on .110, but after ten minutes or so of this we don't seem to be getting anywhere - no, wait, hold on, what's that? There's something there, a weak SSB signal. Slowly, agonisingly slowly, it comes up in strength - what's the call? - missed it - yes, FP/KA3B on St Pierre! He's gone over and Tim

tries a reply on CW. Back to receive - "QRZ, there's someone calling, QRZ DX Europe?". Slowly and deliberately Tim spells out the callsign ZB2/G4VXE/P several times - but Harry still hasn't got it, he's got the G4VXE/P bit but not the all-important prefix. Signals are improving and we try again on SSB - yes, he's got it! We swap reports and have a quick chat. Harry promises to inform the East Coast lads that we're about and wishes us good DX; he signs and we press on. Shortly afterwards we hear Harry talking to Bob, WA10UB, but Bob doesn't seem to be hearing us. We listen, listen and listen some more and for a whole hour we hear nothing - perhaps the band has closed or maybe propagation is moving around. At 2006 we hear brief signals from WA1RVH but we don't manage a QSO - and for the next 25 minutes we hear a few tantalizing snatches on .110. Finally, at 2039, we make a CW two-way with VE1BNN - it's a bit scratchy but we manage to complete. Another twenty minutes of white noise - aha, here's KB4CSE in South Carolina. She hears our CW but says she doesn't understand it! Someone who does, though, is K4CKS in Georgia, who can't believe he's landed a ZB2. In the next half-hour we manage a further 8 or 9 contacts, including most of the big guns in the W1 and VE1 call areas. But by 2200Z the band has definitely closed; we wait for another half-hour just in case but no joy, so we strike camp and return to base. We tell our tale to the cynics who stayed behind - they go quiet, at least for a time!

The one major disappointment as far as 50 MHz was concerned was that we didn't make any contacts with stations in Africa. Despite a good deal of listening by both ourselves and Mike, ZD8MB, very little was heard; the Ascension beacon, ZD8VHF, was heard for about twenty seconds around breakfast-time by 'ROU but that was it.

The 70 MHz band provided contacts on most days, and in total we had about 200 QSOs on the band. It was disappointing that we didn't manage to have a contact with GM, but we were gratified to note that a number of stations appear to have hastily resurrected or constructed gear for 70 MHz especially to work us. In fact, when we worked Geoff, G3NAQ, he told us that we were the first contact he'd had with his new transverter. There was also a fair amount of interest from Continental stations in working us crossband on 70 MHz, although a few more would have been nice!



What about 144 MHz? This always looked mouth-watering, since although Jimmy, ZB2EL, has been active, there were quite a few "firsts" up for grabs. Luckily, we were to experience some extremely interesting propagation on this band. When you read the propagation textbooks, you get the idea that all the different modes - tropo, Es, FAI - are very distinct. However, in practice it sometimes isn't at all apparent what mode of propagation is allowing a contact to be made. On a number of occasions we were beaming north-east over the Med and working into Sardinia and the Rome area. Whether this was some form of super-tropo or Es we'll never know, but one thing is for sure - on 144 MHz from ZB2 in June a DX opening is never very far away. We had expected to do quite a bit of MS but in the event we only had about a dozen MS QSOs - the reason for the small number will become clear later! Reflections were pretty variable but it was generally possible to make the contact if the distant station was well-equipped.

We were, of course, hoping for some 144 MHz Es and we weren't disappointed. The first occurred on 2 June when, with Kelvin operating, there was a three-minute opening to F, G and GW. Kelvin did a first-class job of working eight stations, but we became a trifle suspicious when we discovered that the majority of them were in Kelvin's home town of Blackwood! Walt commented that some local Spanish-speaking stations were rather mystified by this opening, having heard nothing at all. In the course of the next few days there was the odd opening to Malta, but the one we'd been waiting for

turned up on 5 June. This began with an element of farce. Jon and Tim had been operating the 144 MHz station and were relieved for lunch by Walt and Dave; they returned to find that a Dutch station had been worked via Es. Various comments along the lines of "what, one little PA0, is that all, did you have a nice snooze?" were made and there was a certain amount of repartee. With the air of someone being forced to work impossibly hard to make up for the dilatoriness of his colleagues, Jon picked up the mic and announced "QRZ? ZB2IQ". To everyone's astonishment G3LQR replied at S9+++ and in the next hour we worked about a hundred G stations in the Midlands and eastern England. The best DX in this opening was GLAWP in Northumberland.

The most spectacular 144 MHz Es opening occurred on the 7th - it lasted about four hours and we worked over 400 stations in I, YU, YO, HA, OK, OE, Y, DL, SP, HB9, ON, PA, F and GW. The opening conveniently spanned lunchtime in Europe, which enabled those at work to return home, work us and nip back to the office, etc, without the boss being any the wiser! One who did this was PA0JMV, who worked us from home and then again whilst he was mobile on the way back to the works QTH! In the course of this opening we worked something in excess of 70 stations who would otherwise have been demanding MS skeds, which made life considerably easier. Whilst listening around, incidentally, we also learned the standard Spanish way of tuning amplifiers. They don't say "waaahlo" in Spain, they say "hoooooola" - which is kept up for about twenty seconds whilst every

Talking Point

Contest scoring - time for a change?

In the course of a 144 MHz QSO the other week we were nattering to Brian Sheepwash, GI4KIS - he who briefly held the Region 1 144 MHz tropo record for a contact with EA8 until that incredible opening a couple of months ago. Brian brought up the topic of how VHF and UHF contests are scored and said that he thought the present system could be better. It sounded like a subject well worth an airing in these pages, so Brian's arm was twisted to write something down and here it is:

"The present systems of scoring VHF contests are quite arbitrary and came about because a simple system of scoring many contacts using nothing more complicated than a map and ruler was required. If you had worked a large number of stations, the time taken to do this was enormous - typically three or four evenings' work for two people. Nowadays, of course, the advent of the home computer has changed this situation dramatically, and the same task takes only a couple of hours; before that, however, any extra complication to the way a contest was scored would have been unthinkable.

"I feel that the time has now come to abandon the old system of scoring contests and to devise a new one based on the laws of propagation.

"The current systems are linear; for example 1 km = 1 point, 10 km = 10 points, 100 km = 100 points and so on, and the radial-ring system is also linear if you present it graphically. These are sometimes modified by multipliers or favoured areas. My argument is that linear systems of scoring are inherently flawed. According to the textbooks, the field intensity of a radio wave is inversely proportional to the square of the distance from its source. This implies that, in a uniform medium and assuming a loss-free path, a receiver which is twice as far away as another from a transmitter will receive a quarter of the field strength. In practice there is a path loss, which in dB amounts to $(32.45 + 20 \log \text{ frequency in MHz} + 20 \log \text{ distance in km})$.

"Were we to base our contest scoring systems either on the inverse square law itself or the path loss formula, they would be much more related to scientific fact. As near as makes no difference you'd end up with scoring of the form 1 km = 1 point, 10 km = 100 points, 100 km = 10,000 points. Critics would argue that we would end up dealing with very large numbers, but I would argue that we do that all the time in radio anyway so it's hardly an insurmountable problem.

"After all, what are we actually measuring in contests?

"There are many variables - site, power, antenna, operating skill or simply the amount of fun you have - and there's probably no absolute answer. However, if we adopted the "ISL" scoring system we would at least have a fair basis for comparison between stations and might one day have a standard by which we could measure our abilities. The alternative is to continue with a situation in which local contest groups don't bother to go out because there are no incentives to do so apart from the fun and giving some points to mega-stations.

"I am not an expert, only a dedicated VHF operator, but I feel that the challenge must go out for a new contest scoring system. I have presented just one possibility but perhaps there could be, for example, a handicapping system by which - for instance - all stations could be "normalized" to 1 watt to a dipole and weighting the results accordingly. The question is, what do you want from contests and do you think it's time for a change?"

Well - sounds interesting to us, so how about some answers on a postcard? We'll also sound out the VHF Contest Committee and see what they've got to say on the subject - watch this space.

(cont from previous page col.3)

knob on the PA is twiddled for maximum smoke! It would be tempting to observe that there aren't many clean and narrow 144 MHz SSB signals in Spain, except that we might want to go back there some day....

Several thousand QSOs were made on HF, so all in all the DXpedition made in excess of 7000 contacts altogether. We had a wonderful 'holiday', a chance to play radio from a prime DX location whilst enjoying the Mediterranean sunshine. As a matter of fact, it was easy to spot the most active operators - they were the ones with the palest skin!

As you might imagine, the DXpedition had its lighter moments. G4VXE complained vociferously about

BCI to his Walkman whilst soaking up the sun on the beach - well, what do you expect if you sunbathe underneath the HF antenna? G8TFI discovered a wonderful new method of making a flame-thrower, which is to whistle into the mic and watch flames pouring out of the driven element. Some of the team took a day trip to the Spanish North African enclave of Ceuta, just down the road; for some bizarre geopolitical reason it turned out to possess a Chinese restaurant, and the chance to visit this establishment could not - of course - be missed. One team member, who shall remain nameless (the one with the EA reciprocal licence) was talking to us on his hand-held and signing GW**/EA9/BY - it took some time for the penny to drop....

So that's the story - or at least the printable bit of it - of ZB2IQ.

A number of individuals and organisations are gratefully thanked for their assistance, notably BNOS, Alan Kelly Communications, SMC, Dewsbury Electronics, G3JVL, the Gibraltar Beach Hotel, Air Europe, Jimmy ZB2BL, Jim ZBOD, ZBOF and Colin GODAZ. A particular vote of thanks must go to Don, G6CMV, who ran the Square Bashers Information Line so admirably. Finally, our thanks to all those who made the trip such fun. After ZB2IQ, where do we go next? Watch this space!

PS - by the time you read this G4VXE will not be QTHR, so the QSL information for ZB2IQ is via G4VXE at the Bureau. Direct cards ONLY may be sent to PO Box 136, Cardiff, Wales CF4 6YL.

NEXT MONTH: We go to the far north!

On 9 September 1978, the first-ever AMTOR QSO took place over a 200 km path between Peter Martinez, G3PLX and David Wicks, G3YYD on two metres. The era of error correcting data communication between amateur radio stations had begun. This is the tenth birthday of the mode. So how has it progressed, and where is it going?

The Early Days of Amtor

The original TOR (Teleprinter Over Radio) system was developed by Philips in the Netherlands in the early 1970s. It was designed to provide reliable low error rate telex communication with ships at sea. Early systems were physically large and expensive, but by the mid-1970s SITOR, as it was called, had come into widespread use in ship-shore communication throughout the world. The specification of the system became an international standard when it was published by the CCIR as their recommendation 476. G3PLX heard those SITOR signals on the air and, to satisfy his curiosity, worked out how to decode them. Coincidentally, single chip microprocessors were just becoming cheap enough for home enthusiasts to use, so Peter programmed the Motorola 6800 to provide send/receive "AMTOR" (he coined the name) communication. The only difference between AMTOR and SITOR is in the selective calling procedure: four letters rather than five figures. The firmware was sent to G3YYD, and from there, the first Amtor contact took place.

The problem then was how to get the rest of the world interested in the mode, when most licence conditions did not permit it and most radio amateurs were profoundly uninterested in computers. It was an uphill task, which Peter single-handedly took upon his shoulders, though as time passed and more and more enthusiasts began to use the mode, his task was eased. At the same time, he steadily improved the software he had developed through countless hours of on air testing. There were many gaps in the CCIR specification which had to be filled by trial and error to ensure optimum operation under all circumstances.

In 'Radio Communication' of August 1979, he published his first article: "Amtor, an improved radioteletype system, using a microprocessor". In this, G3PLX described the theory behind the mode and published a generic software listing, hoping that others would program their computers to enable them to join the mode. He was over-optimistic. In reality, there were few people

willing to rise to the challenge of writing real time software in assembler language for this purpose, so in 1980 Peter described a complete single-board microcomputer implementation in "Amtor, the easy way" in Radio Communication, June/July 1980. This board was made available by GPW Electronics Ltd in both kit and assembled form as the 'Mark I Amtor Board', later to be superseded by an improved Mark II version. Both of these boards permitted an existing radioteletype station to be converted very simply to Amtor. The terminal interface of this board operated in five-unit Baudot code. Many hundreds of boards were sold around the globe and soon there was a substantial fraternity of amateurs exchanging data on Amtor, mostly around 14.075 MHz.

Much of this early activity was either illegal or on a special permit basis, though as time passed most national societies successfully negotiated with their administrations to have data transmission formally licenced.

This very much paved the way for the subsequent legislative acceptance of Packet Radio. As time advanced, more and more computerised Amtor HF mailboxes appeared. A precursor to what has subsequently developed in Packet.

In 1983, the first multi-mode Amtor converter with a home computer ASCII serial interface was introduced by ICS Electronics Ltd., The AMT-1. This was later replaced by the AMT-2, and software to run directly on specific computers, such as MBA-TOR for the Commodore 64 from AEA Inc. appeared. All of the firmware for the above products was written directly by G3PLX or in close cooperation with him. Several American companies tried to write Amtor programs at this stage, but most of them discovered that the task was not at all straightforward and a number of implementations with bugs of one kind or another appeared. This may be one reason why Amtor remains to this day more widely used in Europe than in North America, and G3PLX's early software still remains the standard by which other implementations are still judged. It is perhaps interesting to contrast the early days of Amtor in the UK with the early days of Packet Radio in the United States. There, a relatively large team of people in Tucson, Arizona shared the design responsibility and also the onerous publicity tasks for the new mode, aided by the enthusiastic help of the ARRL.

The common factors between Amtor and Packet were that they were both developed by individuals prepared to invest almost infinite time and

Happy Birthday AMTOR

by
Alan Clemmetson
G3VZJ

patience in pursuit of their goal, and that the earliest widespread implementations of both modes were from self-assembled kits of parts. In Amtor, each seven-bit character has three data bits of one polarity and four of the other. There are 35 such combinations available and any received character which does not meet this bit ratio test is rejected as incorrect. Corruption from one valid character to another valid character is possible, but very unlikely. At high signal to noise ratios, some character errors can be seen, however. There are two Amtor modes. FEC is a broadcast mode, where all characters are sent twice: Thus if one character is corrupted, there is a good chance of its repeat getting through. This mode has error detection, but not error correction. It is typically used for CQ calls. ARQ operates between two stations in mutual contact and has full error correction as well as detection. Characters are sent in bursts, three at a time, and are repeated until the receiving station acknowledges correct receipt, at which time the next block of three characters are sent, and so on. The beauty of this system is that the blocks of information are very short and error detection is character based, rather than block based. This means that a noise burst or momentary fade might at most ruin three characters. Longer blocks with address and checksum data present might not get through at all under similar circumstances. The mode is essentially very narrow bandwidth (300 Hz) and the data rate is 100 bauds - more than adequate for most messages. Complex automatic techniques are built in to ensure that both stations recover correctly. Amtor contacts can be extremely impressive. Worldwide contacts at very low power levels are possible, and often solid contacts can be had with stations which cannot be heard in the noise. I would go so far as to say that under extreme circumstances, Amtor is probably better than CW at getting the message through.

Amtor Operating Procedure

Once the station has been correctly set up, operating procedure on Amtor is very straightforward, and without the complex command requirements of packet radio. However, observing a few basic operating rules makes life easier for other band users. Call CQ in FEC on the calling channel (14.075 MHz on 20 metres) and then QSY as soon as contact is made. Either call the station again after QSYing or disable the transmitter whilst

performing the operation. The so called 'Hot QSY' where both stations move up the band together is very anti-social. In the event of a frequency error, the initial calling station (the Master) should use his RIT to correct it. If the initially called (SLAVE) station wishes to correct the situation, he may use his main tuning dial. This procedure prevents the two stations from chasing each other up and down the band!

The present state of the art

Amtor is now a fully accepted mode in the world of amateur radio. In the early days, a high proportion of transceivers had inadequate transmit/receive changeover speeds and needed some modification to function properly with Amtor. Today, all new transceivers are designed with Amtor in mind, so the newcomer can plug his system together in the certain knowledge that it will work first time. At least in Northern Europe, there is now more Amtor activity on the LF bands than RTTY activity, and around the world over 30 Amtor HF mailboxes are operating day and night. All but seven of these are in Europe, although only two are believed to be formally licenced by their national authorities. Most of these mailboxes continually scan a large number of channels on a number of bands looking for calls and a few of them now have automatic gateways into the VHF packet network.

Amtor versus Packet

Whilst Packet Radio has some advantages in strong signal, short distance VHF communication, Amtor remains by far the superior mode for weak-signal HF operation when fading and interference are present. A direct comparison between the modes is difficult, because they are fundamentally different in nature and set out to achieve different objectives. However, these are what I believe to be the main issues:

Firstly, error rates on Packet are lower than on Amtor. However if signals are weak or there is a lot of QSB or QRM, Amtor will probably get through when Packet will not. Amtor will work well over poor paths at low power levels. Packet requires signal strengths which would be otherwise adequate for a voice contact. Over a good path, data rates are higher on Packet than with Amtor. Packet has collision avoidance capability so that many QSOs can be made on the same channel at the same time. This does have the effect of

slowing down the average data rate, however. The 'latency' of Packet is a lot longer than Amtor. By this, I mean that you have to do a lot more typing before the data goes out on Packet. This, added to the effects of congested channels, removes a lot of the immediacy from Packet QSOs. Packet can thus be fairly cumbersome for live two way contacts. Its real strength is in high speed messaging. Exchange of binary computer files via Packet is fairly straightforward via Amtor it is difficult without some kind of coding procedure. Amtor is restricted to upper case characters only. Packet gives the choice of upper and lower case.

Generally speaking, Amtor is used with HF SSB radio equipment and Packet is used with VHF FM radio equipment. There is in fact a very strong analogy with voice communication. When one would normally use SSB communication for speech, Amtor is probably best for data; when one would normally use VHF FM for speech, Packet is probably best for data. Despite the fact that the nominal data rate of Packet is higher than for Amtor, exchange of data will almost always be faster via Amtor than via Packet Radio on the HF bands - except maybe on 10 metres at the peak of the sunspot cycle. At the end of the day, I believe that it is best to use each mode for its proper purpose. This summer, for example, I have enjoyed using Packet and Amtor at the same time - sailing along the Norwegian fjords whilst typing away on a lap computer and exchanging messages with a friend in England via a single hop on Amtor on 7 MHz to a mailbox which automatically translated the message into Packet and sent it via two hops on two metres to its recipient. Perfect two-way operation was achieved every day.

Equipment

Today, there are a number of multi-mode controllers around which give the user a choice of mode, so that Packet Radio and Amtor can each be used in their proper context. Beware, however, that some of these have filtering systems in their demodulators which have a bandwidth which was designed for HF Packet Radio. This is too wide for Amtor, and weak-signal performance is inevitably compromised. Many of those whose introduction to Amtor has been via this route will not have experienced its true benefits.

What of the future?

Amtor needs more publicity. Anyone

who thinks that HF packet is wonderful simply hasn't been persuaded to try Amtor! The above is a statement based on practical on-air experience. A direct comparison of error rates and data rates between the two modes with simulated QSB and QRM would be a very useful exercise. Is any disinterested party with the necessary equipment willing to give it a try? One of the more useful aspects of Amtor is the availability of HF mailboxes. Publicity of these is impaired due to the fact that most are not yet officially licensed. National Societies need to take up this issue with their local administrations with just the same vigour with which they have approached Packet repeater and mailbox licencing. There is no definitive book on Amtor. A series of excellent articles have been published over the years, but for anyone currently entering the hobby, these are long since out of print. They should be brought together in one volume. More work needs to be done on linking together HF Amtor mailboxes and VHF Packet mailboxes, both from the standpoint of long distance access to local Packet networks and in linking separated local packet networks together. The problems involved in this area are not at all straightforward, and meetings between Packet and Amtor exponents are needed in order to sort out interchange standards. One of the problems is that the Amtor code set is much more restricted than the Packet code set. In particular a protocol for sending binary files over Amtor links requires definition. Those who intend to spend many hours during the next sunspot maximum looking for difficult and rare intercontinental propagation paths on six metres might like to consider setting up skeds via Amtor and watching the TV whilst the home computer does all the work! This way, I suspect that more openings will be spotted and six metre enthusiasts will have less strain on their domestic relationships. It is currently more expensive for a beginner to start out in Amtor than in Packet Radio. A new generation of commercial low cost Amtor only equipment is needed.

It would be very useful indeed if the Amateur Radio community could somehow provide some kind of independent test and verification service to ensure that no inadequate or flawed Amtor implementations ever reach the market. These act very much to the detriment of the mode. The 'missing gaps' in the CCIR recommendation

476 which G3PLX filled in during his early work require documentation in the public domain. The above issues need to be addressed by National Societies, Packet Radio enthusiasts, Amtor enthusiasts and by manufacturers alike. There is no doubt in my mind that Amtor has yet to reach its full potential and that there is room for much more yet to be achieved. However, everyone must realise that Amtor and Packet are not competitive modes: they are complimentary.

Postscript

After putting more than his fair share of time and energy into our hobby over the years, Peter Martinez has decided to celebrate the 10th anniversary of Amtor in his own way: he is getting married! I am sure that I am joined by many thousands of grateful Amtor operators all over the world in wishing Peter and Iris many happy years together.

Bibliography

These are some of the definitive magazine articles on Amtor which have appeared over the years:-

"Amtor, an improved radio-teleprinter system, using a microprocessor" by J.P. Martinez, Radio Communication, August 1979.

"Amtor, the easy way" by J.P. Martinez, Radio Communication, June/July 1980

"Amtor - a progress report" by Peter Martinez, Radio Communication, September 1981.

"The application of AMTOR in the Amateur Radio global message-handling network" by J.P. Martinez, RSGB Data Symposium, July 1988.

"Amtor und Packet-Radio - ein Leistungsvergleich" by Guenter M. Koenig, CQ-DL, May 1988

"A User's Guide To Amtor Operation" by Paul Newland, QST, October 1985,

"Z-Amtor: An Advanced AMTOR Code Converter" by Paul Newland, QST, February 1984

"Amtor How-To" by Norman J. Sternberg, 73 Magazine, August 1984

"Amtor, an Improved Error-Free RTTY System", by J.P. Martinez, QST, June 1981.

PS

Watch out for the special bumper Christmas edition of the Bulletin next month, including the customary (and absolutely appalling) Quiz - this one is guaranteed to send your blood pressure straight through the roof! Also, a little board game for you to play....

Heard on 430 MHz last week, "oh yes, this is a superb QTH for all band because the top of this hill is permanently in the tropopause". Hmmm - the International Standard Atmosphere definition puts the start of the tropopause at 36,000 ft, at which the temperature is -56.5 degrees C. Bet his masthead preamp is quiet.....

Anglia TV weatherman Jim Bacon, G3YLA, says "thank you" to those who have sent him Sporadic E logs but he's still after more data. Jim would particularly like to receive information about what you worked on 10 July 1988. Please, please, turn up your 144 MHz logs for that date and let Jim have the details - it might be your info that cracks the Es mystery once and for all.

Events Diary

CLUB NEWS

DEADLINE - Items for inclusion in the JANUARY issue must be sent to HQ marked "Club News - Bulletin" to be received by Wednesday 30 NOVEMBER latest.

If news is received by the published deadline, it will appear in the listing. It is your responsibility to ensure that items are sent to HQ in good time, either direct or via your RLO. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

AVON:

- * Bath & DARC - 9, VHF night on the air; 23, talk.
- * Bristol RSCG Group - 28, annual home construction contest.
- * North Bristol ARC - 11, HF activity night; 18, 144MHz activity night; 25, Morse key display.
- * South Bristol ARC - 2, members' 35mm slide evening; 9, 2m CW evening; 16, top band activity evening; 23, free ice-cream evening; 30, bring & buy/junk sale.
- * Thornbury & DARC - 8, quiz night.
- * Weston-super-Mare ARC - 28, constructors night.

BEDFORDSHIRE:

- * Dunstable Downs RC - 11, RAE & schools open evening; 12, CB2WGC at Waford Girls Grammar School; 15, visit to Harpenden Club; 25, visit by G4KJJ the local RSGB Liaison Officer. Details Tony (not OTHR) tel: 0582-508259.
- * Shefford & DARC - 17, talk "Firework Manufacture" by Rev.R.Lancaster.

BERKSHIRE:

- * Reading & DARC - 8, talk "Berkshire Downs Repeaters" by G4CCC and G8DOR; 22, AGM.

BORDERS:

- * Border ARC - *ADDRESS CHANGE FOR SECRETARY* Mrs M Bottomley, G11RN, 1 Greenside Cottages, Ladykirk, Berwickshire.

BUCKINGHAMSHIRE:

- * Aylesbury Vale RS - 2, talk "The Best Rigs of the Year" by G3OSS.
- * Burnham Beeches RC - 7, data symposium; 21, talk & demo "How linear is your linear?" by G3WZT.
- * High Wycombe ARC - *NEW* Meets 2nd Thursday of each month at Unit 2, Fryers Works, Abercrombie Avenue, High Wycombe. Details G2DRT tel: 0494-814240.

CAMBRIDGESHIRE:

- * Cambridge & DARC - 4, talk "Why Does My Computer Crash?" by G0GPX; 11, night on the air; 18, talk "You're Spreading All Over the Band, Old Man!" by G4BAO; 25, night on the air.
- * Hunts RS - 3, talk "An History of Electronic Warfare" by G4ZUP; 17, talk "So You Think You Can Solder?" by G0GPX.

CLWYD:

- * Allyn & Deeside ARC - 8, talk & demo "Oscilloscopes" by G4BGG; 22, Clwyd RLO G4W4GF to answer queries on RSGB.
- * Conwy Valley ARC - *NEW SECRETARY* Norman G4W4G tel: 0745-823674.

CUMBRIA:

- * South Lakeland ARC - 8, HF operating at Dowdales.

DEVON:

- * Exeter ARC - 14, talk "Field Day" by G3LHJ.
- * North Devon RC - 2, talk "Latest Developments in Hybrid Chips" by Mr Hamlyn.
- * Torbay ARC - 26, open forum with Dave, G4BQH, local RSGB Liaison Officer.

DORSET:

- * Poole RAS - 25, review and videos.
- * South Dorset RS - 1, talk "Suitcase Radio" by G3ETA.

ESSEX:

- * Braintree & DARS - 7, talk "Working in the South Atlantic (Antarctica)" by Dave Clarke, G7AHX.
- * Chelmsford ARC - 1, junk sale.
- * Chelmsford RAS - *NEW VENUE* Room 52, Gilbert School, High Woods, off Severalls Lane, Colchester. Now meets alternate Thursdays. Details G3FIJ tel: 0206-851159.

- * Loughton & DARS - 18, film show. films from the past years of the Club and 1988 Field Weekend. Hosts - J. Atkinson, G3OPA & J. Short, G1DJL.
- * Southend & DRS - 4, talk & slides "Southend past and present" by Mr. K.R. Simms; 11, talk "Servicing amateur equipment and the correct use of equipment" by Bob, G6AKL; 18, talk "Underwater exploration - the search for Dunwich, the city under the sea" by Mr. G.K.I. Cousins; 25, station on the air.

GREATER LONDON:

- * Acton, Brentford & Chiswick ARC - 15, talk "My trips to Korea" by G3KPC.
- * Clifton ARS - *NEW VENUE* The Duke of Albany public house, junction of Gellatly Road, Kitto Road & Drakefield Road, New Cross, London SE14.
- * Edgware & District RS - 10, physics lecture; 24, quiz.
- * Harrow ARS - *NEW VENUE* Harrow Arts Centre, Uxbridge Rd, Hatch End.
- * Wimbledon & DARS - 11, talk "The Noise Bridge and Its Use" by G3DWW; 25, talk "The Dip Oscillator & its Use" by G3ESH.

GREATER MANCHESTER:

- * Eccles & DARS - 1, Lecture "Critical Path Analysis" by G6LZC.
- * South Manchester RC - 4, visit to TV Switching Centre, Manchester; 11, talk "Olde Tyme Field Days" by H.W. Hally, G2HW; 18, annual dinner; 28, club visit to computer centre.
- * Stockport RS - 9, construction competition; 23, talk "Underwater DXing" by G4SYC.

HAMPSHIRE:

- * Basingstoke ARC - 7, constructors' competition.
- * Fareham & DARC - *NEW SECRETARY* Bob Reeves, G8VOI.
- * Farnborough & DARS - 9 AGM; 23, chairman's evening.
- * Horndean & DARC - 3, junk sale.
- * Itchen Valley ARC - 11, talk "Electrification of British Rail" by G8CON; 25, talk "The New Licence" by G3KWU.
- * Southampton ARC - *NEW SECRETARY* G1VGA tel: 0703-554900.
- * Three Counties ARC - 9, fire communications - Hampshire Fire Service; 23, Worked All Britain Awards - WAB Group.
- * UK FM (Southern) Repeater Holding Group - 14, AGM at The Swan, Alton, Hants starting 7.30pm. Details Mrs Wood tel: 0962-51362.
- * Victory Contest Group - *NEW* meets occasionally at the Red Lion, Southwick nr Portsmouth. Details Chris tel: Emsworth 374283.
- * Waterside SWRC - *NEW SECRETARY* Ray Palmer, G3YJJ tel: 0703-894200. Meets at Blackfield Community Centre.

HEREFORD & WORCESTER:

- * Bromsgrove ARS - *NEW SECRETARY* G4OHJ tel: 0789-773286.
- * Bromsgrove & DARC - *NEW VENUE* The Grasshopper public house, Stoke Heath, South Bromsgrove at 8pm.
- * Vale of Evesham RAC - 3, talk "St. Kilda - the Island on the Edge of the World" by G4WBR.

HERTFORDSHIRE:

- * Cheshunt & DARC - 2, Talk by David Evans, G3OUF.
- * Dynamics Hatfield Club ARS - 18, bring & buy, auction, junk sale.
- * Stevenage & DARS - 1, computer evening.
- * Verulam ARC - 27, "The Great ERC Race" inter-club activity. Clubs participating: Welwyn/Hatfield, Southgate, Edgware, Dunstable Downs & Verulam.
- * Welwyn-Hatfield ARC - 7, construction competition; 21, members' soapbox.

ISLE OF MAN:

- * Isle of Man ARC - *NEW* meets 8pm at Howstrake Hotel, Harbour Road, Onchan, IoM. Details G4GWQ tel: 0624-22295.

KENT:

- * Bredhurst R & TS - 10, talk "Simple RX" by Rev. Dobbs, G3RJV; 24, construction contest.
- * SE Kent (YMCA) ARC - 9, talk "The Role of the Royal Signals" by D. Murphy, Troop Cmdr. 858 Troop; 23, simple side band.

LANCASHIRE:

- * Bury RS - 8, surplus equipment sale.
- * East Lancs ARC - 1, home construction competition.
- * Fylde ARS - 10, equipment sale.
- * Wigan & DARC - *NEW VENUE* Tuesdays 8pm at Tipping's Arms, Poolstock Lane, Wigan, tel: CODYT 0942-47416.
- * Hyre ARS - 7, pie & peas social night; 21, AGM plus pie & peas; 25, Dinner. (More food? - Ed)

LEICESTER:

- * Leicester RS - 7, HF/VHF night on the air; 14, HF/VHF activity night; 28, HF/VHF night on the air.
- * Melton Mowbray ARS - 18, talk "Construction Techniques" by G4NNZ.

LINCOLNSHIRE:

- * RAF Waddington ARC - *REFORMED* meets Tuesdays 7pm at Newell House, RAF Waddington. Details Phil Gray tel: Coningsby 42581 ext 315 or Dave Bloomfield tel: Coningsby 42581 ext 760.

MERSEYSIDE:

- * St. Helens & DARC - *NEW SECRETARY* Carol Wainwright, GOCXT tel: 0744-813589.

NORFOLK:

- * Norfolk ARC - *NEW SECRETARY* CCraig Joly G0BGD. 9, quiz "In trivial pursuit of radio"; 23, talk "Early days of SSB" by Ken Thompson, G3AMF.

NORTH YORKSHIRE:

- * York RC - 2, University of York - Electronics; 9, junk night; 16, Pye to 70cms (Andy G1UVK); 23, cheese & wine; 30, G4YRC on air.

NOTTINGHAMSHIRE:

- * Mansfield ARS - 11, video evening; 25, talk "Contest Operating" by G3TBK.
- * Worksop ARS - 8, Call my Bluff (home v Maltby); 25, Call my Bluff (away v Maltby).

ORKNEY:

- * Orkney Group - 2, talk/demo "Packet Radio" by G4TYU.

OXFORDSHIRE:

- * Banbury ARS - *NEW VENUE* 2nd/4th Wednesdays 7.30pm at the Three Pigeons, Castle Street, Banbury. Details G1110 tel: 0295-51774.

POWYS:

- * South Powys ARC - 1, HF propagation.

SHROPSHIRE:

- * Salop ARS - 3, talk "Fibre Optics" by G3UDA; 17, talk "The Great Welsh Wireless Station" by G3MZY; 24, HF night on the air.
- * Telford & DARS - 2, Morse class & club station; 9, Alaskan slide show; 16, construction; 23, talk "Satellites" by G3MWQ; 30, talk "Learning Morse" by G3UKV.

SOMERSET:

- * Mid-Somerset ARC - 4, AGM; 18, visit to Portishead Radio Station, Highbridge.
- * Yeovil ARC - 3, talk "The Full Wave Dipole" by G3MYM; 10, talk "Zener Diode Voltage Stabiliser" by G3MYM; 17, talk "Product Detectors" by G3MYM.

SOUTH YORKSHIRE:

- * Sheffield ARC - 7, talk "Another Man's Hobby" by Sid Thackery; 14, film/video show.

SUFFOLK:

- * Felixstowe & DARS - 28, ten pin bowling, RAF Bentwaters.
- * Ipswich DARS - *NEW VENUE* Red Lion, Bramford Road, Ipswich; 9, junk sale; 30, "Guess What is in the Bag".

SURREY:

- * Dorking & DARS - 8, talk "HF antennas" by G4WOT; 22, talk on A. Johns' travels by G3AEZ.
- * Kingston & DARS - 16, AGM and construction contest.
- * 308 ARC - 22, junk sale.

WARWICKSHIRE:

- * Mid-Warwickshire ARS - 8, video night RSGB; 22, technical topics by members.
- * Rugby ARS - 5, fireworks & barbecue; 8, activity night; 15, talk/demo "Packet Radio" by G4MTP and G4JTY; 29, test gear night.
- * Stratford-upon-Avon & DRC - 14, talk "St. Kilda on the Edge of the World" by G4WBR; 28, technical topics.

WEST MIDLANDS:

- * Coventry ARS - 4, Guy Fawkes supper; 11, morse tuition & night on the air; 18, DIY forum & club project discussion; 25, morse tuition & night on the air.
- * South Birmingham RS - 2, AGM.
- * Wordsley RC - 10, lecture by Bill Watkins, G6YAC; 24, HF activity night - G4WRA.

WEST SUSSEX:

- * Horsham ARC - 3, talk "Know Your Sporadic E" by G3NAQ.
- * Mid-Sussex ARS - 3, fireworks/on the air; 10, talk; 24, talk.

Events Diary

WEST YORKSHIRE:

- * Halifax & DARS - 15, talk "Antennas" by John, G3BBD.
- * Keighley ARS - 29, films.
- * North Wakefield RC - 10, on the air.
- * Pontefract & DARS - 3, Talk "Contest Operating" by Dave, G4OSY; 17, talk "P.C.B.s" by Dave Wilcox; 24, on air.
- * Spenn Valley ARS - 3, home construction - G4ZVB; 17 the RSGB LO - G3ZXZ.
- * Todmorden & DARS - 7, visit & demo by Lowe Electronics.
- * Wakefield & DRS - 1, practical evening; 8 pie & pea supper at G4OVW, 8 pm; 15, members on air HF contest; 29, practical evening.

WILTSHIRE:

- * Chippenham & DARC - *NEW SECRETARY* J Barrington G4ZUV.

MOBILE RALLIES

This is a list of all rallies, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Bulletin'.

5 NOVEMBER

- * 8th North Devon Radio Rally - Bradworthy Hall, near Holsworthy. Opens 10.30am, bring & buy stall, talk-in on S22. Details C8MX1 (OTHR).

5/6 NOVEMBER

- * North Wales Radio Rally - Canolfan Abercony Centre, Llandudno. Trade stands and other attractions. Details Tony Wilkinson G4PVU, tel: 0492-49121 or 75666.

13 NOVEMBER

- * Bishop Auckland Radio Rally - The Civic Hall, Shildon, Co.Durham. *NEW VENUE* Trade stands, bring & buy stall, refreshments & bar, talk-in on S22. Details Morris G4OHZ, tel: 0325-311645.
- * West Kent ARS Tonbridge Rally - Angel Centre, Tonbridge. Opens at 10.30am, usual traders, bring & buy, refreshments. Talk-in on S22, SU8 and 10m FM by G8OWKS. Details Nigel G4KIU, tel: 0892-515321 or 515432.
- * West Manchester RC Winter Rally - Bolton Sports & Leisure centre, Silverwell Street, Bolton. Usual traders and attractions. Details David G1100, tel: 0204-24104, evenings.

20 NOVEMBER

- * Bridgend & DARC Rally - Bridgend Recreation Centre, Angel Street, Bridgend, Mid-Glamorgan. Opens at 11am (10.30am for disabled), usual traders and attractions, bar, improved refreshment facilities, free parking, Morse tests (MUST be booked with RSGB in advance), talk-in on S22. Details Mike G6XCG, tel: 0656-724041.

27 NOVEMBER

- * Verulam ARC Christmas Rally - St.Albans City Hall. Usual traders and attractions, lots of pre-Christmas bargains. Details G4JKS tel: St.Albans 59318. Trade - Watford 52959.

11 DECEMBER (PROVISIONAL)

- * Leeds & DARS Christmas Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey, nr Leeds. Details Harry G4WYD, tel: 0274-685039.

1989 RALLIES

22 JANUARY

- * Oldham Mobile Rally - Queen Elizabeth Hall, Civic Centre, Oldham. Usual trade stands, large bring & buy, refreshments and bars. Easy access for disabled visitors. Free parking. Details Kathy G4ZEP tel: 061-624 7354.

29 JANUARY

- * NARSA Rally - Norbreck Castle Exhibition Centre, Blackpool. Details Peter G6CGF, tel: 051-630 5790.

IN BRIEF - More details later.

25 FEBRUARY

- * Rainham Radio Rally - Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham, Kent. Details Bob, G1LKE tel: 0634-362154.

4 MARCH

- * The Blue Star Radio Rally - High Gosforth Park (Newcastle Racecourse). Details Terry, G6VEG tel: 091-264 8196.

12 MARCH

- * Trafford Rally - *NEW VENUE* The G-MEX Centre, Manchester. Details Graham G11JK tel: 061-748 9804.
- * Pontefract & DARS 9th Annual Components Fair - Details Colin G0AAO tel: 0977-43101.

19 MARCH

- * South Essex ARS Mobile Rally - The Paddocks Community Centre, Long Road, Canvey Is. Details Ken G0BBN tel: 0268-755350.
- * Mid-Devon Rally - Pannier Market, Tiverton. Details G4TSM, Mid-Devon Rally, PO Box 3, Tiverton, Devon.

2 APRIL

- * White Rose Rally - Leeds University. Details A.S Kessler, G4DXA, PO Box 73, Leeds, LS1 5AR.

7 MAY

- * Southend & District Mobile Rally - Roachway Youth Centre, Rochford, Essex. Details Ted G4TUO tel: 0702-202129.

14 MAY

- * Drayton Manor Mobile Radio Rally - Drayton Manor Park, Tamworth, Staffs. Details Norman G8BHE, tel: 021-422 9787.

21 MAY

- * 32nd Northern Mobile Rally - Great Yorkshire Showground, Harrogate, North Yorkshire. Details Harry G3C00.

28 MAY

- * 13th East Suffolk Wireless Revival - Civil Service Sportsground, Bucklesham, nr. Ipswich. Details Jack, G4IFF tel: 0473-464047.
- * 6th Anglo-Scottish Rally - Tait Hall, Kelso. Details Bruce, G4U1B.

29 MAY

- * Doncaster Radio Rally - Bircotes Sports Centre, near Bawtry, Doncaster. Details Audrey Wilson tel: 0302-721259 or 0302-857526.

11 JUNE

- * Elvaston Castle Mobile Rally - Elvaston Country Park near Derby. Details John G4PZY tel: 0332-767994. Trade Peter G3WU tel: 0332-700265 evenings.

18 JUNE

- * Denby Dale ARS Rally - venue to be advised. Details Gerald Edinburgh tel: 0484-602905.

2 JULY

- * Pontefract Racecourse Rally & Fair - Details Colin G0AAO tel: 0977-43101.

8/9 JULY

- * 2nd RSGB DATA SYMPOSIUM - Harrow School, north west London. Further details later from RSGB.

29/30 JULY

- * 4th AMSAT-UK Colloquium - University of Surrey, Guildford. Details G3AAJ tel: 01-989 6741.

27 AUGUST

- * Torbay Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3KZJ (QTHR).

3 SEPTEMBER

- * 22nd Preston ARS Rally - University of Lancaster. Details Godfrey, G3DWQ tel: 0772-53810.

10 SEPTEMBER

- * Vange ARS Rally - Nicholas School, Basildon. Details G4NVT tel: 0268-43025 or Mrs Thompson tel: 0268-552606.

24 SEPTEMBER

- * Harlow Mobile Rally - Harlow Sports Centre. Details G4MIS tel: 0279-722622 evenings or G4KVR tel: 0279-22365 daytime.

OTHER EVENTS

10 DECEMBER

- * RSGB ANNUAL GENERAL MEETING - Main Theatre C16, C Floor, Renold Building, University of Manchester Institute of Science & Technology, Sackville Street, Manchester M60. Meeting commences 2pm sharp. Doors open from 11.30am for registration. Bookstall open from 11.30am to 1.45pm only. Cafeteria open for lunchtime snacks/refreshments before the meeting between 11.30am and 1.30pm and for teas/coffees during the break.
- * RSGB PRESIDENTIAL INSTALLATION - 8pm for 8.15pm. Barnes-Wallis Building, UMIST (see notice in News Bulletin for full details).

GB CALLS

The list below shows ALL the special event stations licensed for operation during this month and early next month, (as at press date)

It is taken direct from the GB Calls file on the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1 to 28 days.

* ALL "GB75" PREFIX CALLSIGNS *
* VALID FOR RSGB 75 AWARD *

THROUGHOUT 1988:

- GB75RS - 75 (ANNIVERSARY) RADIO SOCIETY (GB): RSGB HQ, Lambda House, Potters Bar.

1 NOVEMBER:

- GB0BBB - Brighton Boys Brigade.
- GB0CDN - Grid: SZ 295 849
- GB0CDP - Portchester Castle, Hants.
- GB0MDC - Macclesfield & DARC, Cheshire.
- GB1RCW - Raynet Group Wigan, Lancs.
- GB2BFQ - Belfast Festival at Queens.
- GB4CGS - Cardinal Griffin School, Staffs.
- GB6BBB - Brighton Boys Brigade.

2 NOVEMBER:

- GB75MBG - Mounts Bay ARG, Penzance.

3 NOVEMBER:

- GB5HC - 50th Horsham Club, W.Sussex.
- GB75BE - Business Enterprise '88, Brentwood.
- GB75WFX - Kingsthorpe Community Centre, Northants.

4 NOVEMBER:

- GB0CDX - Grid: SZ 339 879
- GB21VS - 91st Leicester Scout HQ.
- GB2MSR - 1st Douglas Scout HQ, Isle of Man.

5 NOVEMBER:

- GB0CDS - Grid: SU 628 069
- GB0DNC - Edward St Community Centre, Argyll.
- GB1CDS - Grid: SU 628069
- GB2CPF - Cheshire Police Force.
- GB75PZ - Mounts Bay ARG, Penzance.

6 NOVEMBER:

- GB2CDV - Grid: SZ 569 786

7 NOVEMBER:

- GB75BCH - Ballee High School, Co.Antrim.
- GB75PPC - Prior Park College, Avon.

8 NOVEMBER:

- GB75USA - Darley ARC, Harrogate, N.Yorks.

10 NOVEMBER:

- GB2CDU - Grid: SZ 627 588

11 NOVEMBER:

- GB4RZF - Raynet Zone 4, Cambridge.
- GB500 - Paisley 500, Scotland.

12 NOVEMBER:

- GB2WGG - Watford Girls Grammar School.
- GB4BTS - BT Technical Centre, Stone, Staffs.
- GB5ORAF - RAF Waddington ARC, Lincoln.
- GB75WKS - West Kent ARS.

13 NOVEMBER:

- GB8RRR - Red Rose Rally, Bolton.

16 NOVEMBER:

- GB4ATC - ATC HQ, Wimbledon, London SW19.

17 NOVEMBER:

- GB0CIN - Children In Need, BBC, Birmingham.

18 NOVEMBER:

- GB1ECN - Children In Need, Essex.
- GB4CIN - Children In Need, Wolverhampton.
- GB75CIN - Children In Need, Arlesey, Beds.

19 NOVEMBER:

- GB0EAS - Halifax CP School, Suffolk.

21 NOVEMBER:

- GB1CDY - Grid: SU 617 001

25 NOVEMBER:

- GB75WMS - West Moors School, Dorset.

1 DECEMBER:

- GB0CDN - Grid: SZ 295 849
- GB0CDP - Portchester Castle, Hants.
- GB0NIN - The 'Ninian' Lat:60 54'N Long:01 25'E.
- GB1MRS - Macclesfield RS, Cheshire.
- GB1RFC - Royal Flying Corps, Leicester.
- GB1RSG - Royal Star & Garter Home, Surrey.
- GB6AQ - Tops CW Club, Tyne & Wear.
- GB75DC - Drummonds Centre, Colchester, Essex.
- GB75NR - Nunsfield House Community Centre, Derby.
- GB75RLD - City Hospital, Derby.

3 DECEMBER:

- GB0CDS - Grid: SU 628 069
- GB1CDS - Grid: SU 628 069

4 DECEMBER:

- GB0CDX - Grid: SZ 339 879
- GB2CDV - Grid: SZ 569 786
- GB75DH - Dunnet Head, Scotland.
- GB75NN - Merchant Navy, Northampton.
- GB75RN - Royal Navy, HMS Mercury, Hants.

6 DECEMBER:

- GB75USA - Darley ARC, Harrogate, N.Yorks.

8 DECEMBER:

- GB2CDU - Grid: SZ 627 588

SHOULD WE PACK MORE CHANNELS IN ?

**A SPECULATIVE PROPOSAL FOR 12.5KHZ
CHANNEL SPACING ON 144MHZ
BY ANGUS MCKENZIE G3OSS**

For some while there has been talk in the amateur radio movement about fm channel spacing, and whether we ought to adopt a 12.5kHz spacing standard rather than the currently-used 25kHz spacing standard. When fm usage went through its rapid expansion in the early 70's, the 25kHz standard was adopted because it was commercial practice in Europe, and much surplus equipment was already set up for it. Now that commercial users have switched to 12.5kHz several years ago, it is only natural that amateurs should consider following suit.

Things, however, are not that straightforward. There is a very large number of fm rigs in the field working to the 25kHz standard, and it is not certain what difficulties would be caused in effecting a change. It would certainly provide more channels, easing congestion, but what of performance? Rumours have abounded that 12.5kHz is 3dB worse than 25kHz, but others argue the reverse!

Would it be possible for the two standards to co-exist with a minimum of mutual problems between them? One thing is certain – the problems facing amateurs are quite different from those solved in the professional field.

With all this uncertainty, the VHF Committee recently decided to initiate an in-depth study into the whole problem, and asked Angus McKenzie to lead it. This report represents the end of the first stage in the study – the technical fact finding and initial analysis. The next stage is to gauge reaction from the amateur population. The report floats a number of ideas; some may be considered controversial, but as yet no decisions have been taken. *Don't take this report as RSGB policy yet!*

PREFACE by Malcolm Appleby G3ZNU (Chairman, VHF Committee)

12.5kHz CHANNELISATION ON 144MHz

During the last 25 years there have been several important changes to band planning, all of which initially caused a certain amount of expense and trouble, but which ultimately proved advantageous to operators. The introduction of ssb around 145.3MHz, with the abandonment of the original area band plan, was definitely an advantage, and promoted the use of vfo's and co-channel operation of QSOs, thus saving band space. Later, fm developed with favoured frequencies, including 144.48MHz, for example. Many rigs were crystal channelised on six frequencies or so, but these all had to be re-crystalised with the introduction of repeaters, and the new band plan above 145MHz. Hundreds of Liner 2s had to be re-crystalised from 145.3MHz down to 144.3MHz to conform to the new ssb allocation below 144.5MHz. This released 145.3MHz, and

the segment around this frequency, for fm channels. Beacons used to be at various frequencies across the entire band, but eventually they were all grouped between 144.845 and 144.99MHz. The satellite band was originally around 145MHz, but this shifted to the top of the band by agreement with IARU.

The proposal to double the channel density appeared pretty daunting at first, but as the months went by, the VHF Committee recognised the urgency for a study. Taking a broad view of the 144MHz band, there are not enough fm simplex channels available in at least three large areas of the UK, specifically Greater London/Home Counties, West Midlands, and Merseyside/Greater Manchester. A close examination of the band segment 145.0 to 145.775, (Table 1) shows that there are only eight simplex frequencies available without reservation. Six

have some reservation, and two channels have serious reservations in their usage. Moreover, 17 channels cannot be used for simplex, as they are set aside as repeater inputs/outputs or various calling frequencies. The serious congestion that sometimes exists in many highly populated urban areas is a nuisance to 144MHz fm users, and this article deals with various ways in which the problem can be alleviated.

THE PRESENT SITUATION

Taking the Greater London area as the most obvious example, there are frequent periods in which several QSOs are in progress on the same frequency, where the capture ratio phenomenon has to be used, hopefully, to reject unwanted stations. Many nets are now occurring on either 12.5kHz channels, referred to as X channels, or on channels spaced rather haphazardly perhaps ± 10 kHz from 25kHz channels.

Quite often amateurs can be heard using frequencies in the beacon and satellite bands in sheer desperation, and just as alarming is the occasional use of frequencies below 144.5MHz for fm. The sheer size of the problem in congested areas, particularly in London, is causing some amateurs to use non-recommended channels. Many modern rigs can accommodate the X channels physically, but hardly any are set up electronically for compatible X channel usage, ie, they have too high a peak deviation, and the incorrect if filters.

There is no problem at all with fm on the 432MHz band, fortunately, but the fact is that most fm operation is on 144MHz.

BAND USAGE

The officially channelised part of the band from 145.000 to 145.775MHz is not subject to much misuse, and only rarely have modes other than fm been heard in this section. The band from 144.500 to 144.845MHz has, however, been designated "all modes non-channelised". All the frequencies in this section designated for specific users are, for convenience, chosen to be at 25kHz. Almost all fm rigs on the market can accommodate 25kHz steps, and are thus fully compatible, but many nets have chosen to use frequencies in between the 25kHz steps in order to try to find a space somewhere, but since some of these frequencies are offset by only 10kHz, rather than 12.5kHz, severe interference problems are arising. During the last three years or so, many nets on 12.5kHz frequencies have been introduced in between the 25kHz ones to get over the problem, which has become more severe as one 25kHz frequency after another has been set aside for special usage, eg 144.650MHz for packet repeaters, and 145.300 for afsk rtty. All too frequently, inexperienced amateurs have even used the beacon band and repeater output channels when they cannot hear signals in these segments, forgetting that others may well suffer serious interference by such usage. Some amateurs, who have used 12.5kHz X channels in desperation, have caused interference to 25kHz channelled stations by using excessive deviation, and through receiver i.f. bandwidths being too wide.

SOME SUGGESTED REMEDIES

There are three main solutions to consider for alleviating the problem. There is no reason why all three could not be employed at the same

TABLE 1
FM Channel Information on 144MHz Band

Availability key:

A: FM simplex is totally unacceptable.

B: FM simplex is only acceptable if it is not even likely that the channel might be in use in your area.

C: Useable for FM simplex, provided channel is not in use locally.

D: FM simplex can be used at any time within the normal licence conditions.

144-500	B	SSTV calling	NOT OFFICIAL CHANNELS
144-525	C	used by HF DX warning net	
144-550	D		
144-575	D		
144-600	B	RTTY calling and working	
144-625	B	Misc. data working	
144-650	A	packet repeaters	
144-675	A	packet working	
144-700	A	fax calling	
144-725	D		
144-750	B	ATV talkback, calling and working	CHANNELS USED
144-775	C	Raynet working	
144-800	C	" "	
144-825	C	" "	
144-850	C	" " (within beacon band)	
144-875	C	within beacon band	
144-900	A	beacons	
144-925	A	" "	
144-950	A	" "	
144-975	A	" "	
145-000	A	repeater input	
145-025	A	" "	
145-050	A	" "	
145-075	A	" "	
145-100	A	" "	
145-125	A	" "	
145-150	A	" "	
145-175	A	" "	
145-200 (S8)	C	Raynet	
145-225 (S9)	C	used by Raynet occasionally	
145-250 (S10)	C	slow morse practice	
145-275 (S11)	D		
145-300 (S12)	B	RTTY AFSK	
145-325 (S13)	D		
145-350 (S14)	C	used by RAIB National Net	
145-375 (S15)	D		
145-400 (S16)	D		
145-425 (S17)	D		
145-450 (S18)	D		
145-475 (S19)	D		
145-500 (S20)	A	FM simplex calling channel. No QSOs, always QSY	
145-525 (S21)	C	GB2RS Sundays, and on some other occasions	
145-550 (S22)	C	talk in to various events	
145-575 (S23)	D		
145-600 (R0)	A	repeater output	
145-625 (R1)	A	" "	
145-650 (R2)	A	" "	
145-675 (R3)	A	" "	
145-700 (R4)	A	" "	
145-725 (R5)	A	" "	
145-750 (R6)	A	" "	
145-775 (R7)	A	" "	
145-800 (R)	B	occasional use from satellites	
Availability	A (totally unavailable)		17
	B (serious reservations)		2
	C (slight reservations)		6
	D (completely available)		8

NB: Availability D could become approx 42 channels with 12.5kHz channelling.

time, for each could have a significant effect on the problem.

1). Encourage more amateurs to use the 432MHz band at times of high 144MHz band usage.

This would be an excellent solution, but the disadvantage is that rigs for the 432MHz band are more expensive, and coverage is generally poorer, which significantly decreases the potential range for any given station, mobile or fixed. It would be difficult to encourage a dramatic increase in activity on a band that is, frankly, rather poorly populated at the moment,

even in the London area.

2). Use significantly lower power levels on 144MHz in urban areas at times of high band usage.

It is appreciated that poorly located stations may need higher powers and better receivers than those in better locations. A mandatory power limitation for fm in urban areas would be unwise, but amateurs could be persuaded to use lower powers than they already do for a higher percentage of their contacts. This would allow many more QSOs to be co-channel, without significant interference. Many amateurs already

are using less power, but this is only a partial solution to the problem.

3). Change over to a nominal lighter channelling standard for fm operation on the 144MHz band.

This solution has already been adopted in the US with the approval and use of 15kHz channelling instead of 30kHz. Considering the overall quality of the system, 15kHz is probably the closest channelling that can be used with most existing rigs without major modifications. However, a change to 15kHz would seem to be unwise, because it would be more complex to achieve than 12.5kHz channelling, bearing in mind existing 25kHz channelling in the UK and Europe. Most new rigs do have a 12.5kHz channelling facility, although not many have appropriate filters. Yaesu and Icom filters are all basically designed for 25kHz channelling, but some Trio rigs are normally fitted with "F" filters suitable for 15kHz channelling. (See appendix for filters.)

If the 12.5kHz option is considered, there would be a total of 24 potential simplex/fm data, etc, channels, together with eight new repeater channels, all between 145.0 and 145.7875MHz. There's no doubt that 12.5kHz channelling would alleviate the problem quite well.

MODIFICATIONS TO RIGS

Rigs which at present exclude the selection of X channels may well be modifiable by changing synthesiser crystals, microprocessors, or microprocessor connections. Many rigs can be switched to within $\pm 500\text{Hz}$ of the correct X channelling, which should be adequate. Whereas rigs using "F" filters might have just acceptable selectivity, the large majority having "E" filters will require "F" or "G" filters as a replacement. Some rigs will benefit strongly by having the first i.f. roofing filter changed to a narrower type too. The main synthesiser crystal, or conversion crystal, may have to be readjusted for improved frequency accuracy. Although some rigs may physically be modifiable, frequency displays could be awkward to modify.

Transmitter deviation will have to be readjusted for around 3kHz nominal, and 3.5kHz absolute max. Some tone burst deviations will require separate adjustment. Mic amp gains may also need adjustment, and in some cases fixed resistors may need to be changed for ideal results. A few rigs will require additional hf roll-off above 3kHz to avoid high modulation indices. Very careful readjustment of discriminators may also be necessary, in some cases, to improve system distortion, capture ratio, and ignition interference rejection. In a few instances slightly more audio gain will be required on rx when full audio gain is inadequate to fully drive the output amplifier. It is hoped that most amateurs will be capable of performing these mods, but there is no doubt that traders will have much work to do during a change-over period!

COMPATIBILITY OF RIGS THAT CANNOT BE MODIFIED FOR X CHANNEL USE

Rigs in this category will at least require deviation reduction on tx in order to avoid causing interference to those using X channels. They will need a narrower i.f. filter so that their users will not themselves receive interference from X channel transmissions; an unmodified rig of this

type will reproduce some spitchiness and interference from adjacent X channels. Amateurs moving from an urban area where they were used to using X channels could inadvertently cause problems to others in areas of low amateur populations where many unmodified rigs may still exist. Tact will be needed here, because wider deviations will also interfere with the use of X channels by visitors. A willingness to QSY readily will be the key.

COMPROMISE BETWEEN RX SELECTIVITY, SYSTEM QUALITY AND TX DEVIATION/RESPONSE

The overall system signal-to-noise ratio varies directly with the system deviation and the square root of the selectivity bandwidth. The available frequency response is also dependent upon selectivity, because high frequency sidebands reduce as filter bandwidth is decreased. If we choose the normal PMR standards of 2.5kHz maximum deviation, and "H" filters with around 6kHz bandwidth, there will be a significant degradation of overall signal-to-noise ratio and subjective sensitivity. However, for an amateur radio service we do not need the almost 100% protection required by PMR, and therefore a degree of adjacent channel interference is tolerable. This will allow greater flexibility, less expensive grade of filtering, and slightly higher deviation in the system, which reduces the effects of the change on overall system quality. A choice of around 3kHz nominal deviation, with 3.5kHz absolute max, and filters of around 10 to 20kHz bandwidth, will allow a degree of compatibility when modified rigs interact with unmodified ones. This should lead to rather less criticism of the change. Repeater inputs and outputs will be subject to tighter tolerances, especially of output deviation, to enhance the separation of adjacent channel repeaters.

FACTORS FOR A CHANGE

- 1) Potentially over 24 working simplex channels without reservations, instead of the existing 8.
- 2) Any simplex channel adopted by a local group would be less likely to be opened up by casual users or visitors.
- 3) More repeater channels would be available, and hence a larger number of repeaters could be operated in the largest conurbations to spread the load.
- 4) The additional repeater channels could allow a reduction in the number of co-channelled repeaters covering partly shared areas, eg GB3VA/GB3KN and GB3SN/GB3DA. It is most unfortunate that many stations receive two repeaters on the same frequency at almost equal strength on a mobile whip.

APPENDIX MURATA FILTER CLASSIFICATION

Suffix	6dB bandwidth
E	15kHz
F	12kHz
G	9kHz
H	6kHz
HT	6kHz

Insertion loss usually between 4 and 8dB. IF 455kHz. 60dB bandwidth dependent on prefix type. Input/output impedance usually between 1.5K and 2K ohms. Selectivity highly dependent on quality of filter designated usually by final letter of first prefix group.

5) Any amateur using one of 24, rather than 8, channels should be more able to have a QSO with a distant station without interference, as the frequency would be more likely to be free. It might be thought desirable to recommend 25kHz channels for more distant QSOs, and X channels for more local ones.

6) Develop a system to have wide coverage repeaters on 25kHz channels, while reducing X channels for coverage repeaters, allowing a higher density of them in a large area.

7) The slightly reduced system quality on 144MHz might well encourage many amateurs to make more use of 432MHz with its higher deviation potential, and the wider allowable frequency response than 144MHz.

8) More use could be made of the new automatic channel identification, QSY, and rig identification systems, which have been introduced by various Japanese manufacturers. There would be more point in seriously considering the use of sub-audible tone squelch and other facilities, as any given channel is more likely to be free from casual use. A group of stations could make good use of these facilities if their channel is less likely to be interrupted.

9) The provision of so many additional channels would be a strong discouragement to the use of inappropriate frequencies for simplex operation, thus giving better protection to the beacon, satellite and SSB band segments.

10) At present, stations using X channels tend to cause interference to those on 25kHz ones. X channel stations with reduced deviation will definitely cause less interference even to 25kHz channel users with unmodified rigs.

AGAINST A CHANGE OF CHANNELLING

1) Some rigs cannot be modified to cope with X channels. They may even be crystal controlled independently for each channel, but the cost of crystals is now very high, and some rigs would not have enough spare positions to cope with additional repeaters etc.

2) Some rigs would be difficult to modify, and narrower i.f. filters may not be available or viable for them.

3) Although many rigs could be converted at a low cost by their owners, dealers might well charge £20 or more – mostly for labour – which would be a burden for some.

4) The necessity of conversion would cause a degree of resentment by many amateurs, especially those living in areas of low activity.

5) Modifications may have to include a degree of additional audio hf filtering on tx, as well as lowering the deviation.

6) Developing a system to have wide coverage repeaters on 25kHz channels, while reducing X channels for coverage repeaters, allowing a higher density of them in a large area.

7) The overall system audio quality would tend to be degraded with a slightly reduced frequency response in some cases, and perhaps an inferior subjective sensitivity. There would be approximately 1.5dB SINAD sensitivity degradation. This could be partly offset by more attention to the use of pre-amps, and the gradual change from old rigs to new ones. The peak distortion of 12.5kHz compatible stations will be somewhat higher at high modulation frequencies, even with lower deviations. A careful choice of rx filter bandwidths will be required.

8) Amateurs using old rigs may note degraded signal-to-noise ratios when working stations with the decreased transmitted deviation. They will also be subject to more interference from stations using X channels in their vicinity.

9) Repeaters will all have to be modified to cope with the new channelling. This may have to include improvements in frequency accuracy.

10) There may be a few complaints about the reduced fringe area coverage of repeaters. Again, this can be partly offset by improvements in receivers and antennas.

11) Much help will be required in organising deviation meters to be on tap at rallies, conventions and various club meetings to allow as many amateurs as possible to readjust transmitted deviation. Insurance premiums may be required to cover use of expensive equipment.

12) The bulk purchase of quantities of new i.f. filters compatible with a reasonable selection of rigs may have to be funded initially by clubs.

13) Traders would have to be encouraged to look into as many modifications as possible, and perform them as reasonably as possible, and without too much delay. This may mean the adoption of a programme which will prolong the overall time in which a changeover is made.

14) Dual band rigs modified for 12.5kHz channelling on 144MHz will give a degraded potential system quality when used on 432MHz. This will be to the disadvantage of rigs such as the Yaesu FT2700, Icom IC3200, and Kenwood TS770, TS780, TW4000A and TW4100E. Even the Yaesu FT727 dual band walkie talkie will be compromised.

15) Susceptibility to ignition noise will be increased, and capture ratio is likely to be degraded slightly with the change to narrower spacing.

IN CONCLUSION

The encouragement to shift to 432MHz operation should be pursued, although an increase in 432MHz band popularity will probably be rather too slow to help the 144MHz situation. The use of lower power may well help in some areas, and it is hoped that as many fm users as possible will try and use lower power to reduce congestion, especially in London. It's fully realised that regular nets with members over a very large area, such as my own RAIBC Friday night net on 145.35MHz, require the use of more power to allow every net member to hear everyone else. Rechannelling at 12.5kHz intervals seems to be the best single solution for the reasons outlined, and straw polls already show that the shift to 12.5kHz channelling would be a lot more acceptable now than a few years ago. Polls in urban areas, especially in London, show high percentages in favour, and no poll has been less than 50% pro a change. Polls have been made in rural as well as urban areas.

The VHF Committee will appreciate constructive comments about the 12.5kHz project from amateurs who regularly use the fm part of the band. We all feel it important to look to the future, and the new channelling scheme would allow much more scope on the band, which in turn might well encourage more people to take an interest in amateur radio. Any changeover would not be easy, but with good will on all sides, it could be accomplished effectively. Comments should be addressed to the author, G3OSS, QTHR.

TECHNICAL TOPICS

PAT HAWKER · G3VA

SOLDERING – THE BASIC CRAFT

Being myself an abuser rather than a user of tools, I still recall with admiration an excellent series of articles 'In the workshop' by Donex (the late Ken Alford, G2DX) in the *RSGB Bulletin* back in 1950, introduced as follows: "It has long been considered a fundamental principle of Amateur Radio that every enthusiast should be capable of constructing the apparatus used in his or her station, even if, in practice, commercial equipment is employed. . . . It is in the field of construction and practical design that the amateur still possesses one great advantage over his professional colleague: he is not constantly confronted with the necessity of cutting down the time spent on production in order to reduce labour costs. . . . There still remains almost unlimited opportunities in the development of amateur equipment; for example, full advantage is not yet being taken of the wide range of miniaturised components now available, perhaps because of the additional skill in construction. . . . So before the amateur can establish a tradition of craftsmanship – and that surely should be his aim – it is necessary to acquire a sound knowledge of the fundamental processes involved in the construction of radio equipment: the use and care of tools; the handling of metal; tapping; soldering; and the basic elements of sound workshop practice."

Donex devoted his second article (February 1950) entirely to "the technique of soldering" – still the most important workshop skill needed by everyone from practical experimenter and designer, through kit construction to the all-factory-built-equipment installer. But although the basics of soldering electronic components has remained unchanged since 1950, the introduction of printed component boards and heat-sensitive and current-leakage sensitive semiconductors, wave-soldering techniques in commercial production, etc has changed the emphasis and increased the degree of skill involved. Yet even today, intermittent faults arising from 'dry joints' remain a common problem.

In his 1985 book *Soldering and Brazing*, "Tubal Cain" (Tom Walshaw, ex-G2PI) notes that soldering electronic equipment differs from the fabrication of engineering models, etc: "First, the parts are small, often very small indeed. Second, the components are, in the main, very vulnerable to heat. Thirdly, the slightest trace of corrosion will almost certainly cause failure of the device after a while. Finally, stray electric currents can damage many of the devices used, and as no electric soldering iron operating at mains voltages is entirely free from leakage this may cause problems. . . ."

"Corrosion is avoided by using nothing but resin flux and the special 'electronics grade' cored solder for all joints. Active flux should never be needed, as the component terminations are almost universally treated to make them easily 'wetted' by solder. . . . Bear in mind that there are few joints which will never need 'unsol-

dering'. It is a golden rule that where possible all wires and terminations should 'stay put by themselves' before soldering, but to crimp over a wire end to a perforated tag (etc) is asking for trouble later. . . . A small but hot soldering bit must be used, so that the joint can be made very quickly, prolonged application of heat may ruin the component. . . . For pebs a fine bit may be necessary with nothing larger than 22 gauge flux-cored solder. For components very sensitive to heat (transistors, diodes, ic devices etc) use a

heat shunt. This may require three hands, and proper clip-on heat sinks costing only a few pence (or made from spring brass) are a useful alternative.

"The most common fault is 'dry' joints, due to imperfect 'wetting' of the solder; such joints are the most common cause of 'noise' in electronic circuitry. 'Cold joints' in which the solder is rough and nobbly, caused as a rule by overworking the soldering iron, which should be hot enough (with the bit clean enough) to melt the

50MHz VCRI – A CASE HISTORY

Jerry Sanderson, G2DBT notes the recent *TT* references to the continuing problem of interference to the output of domestic video cassette recorders, and contributes a case-history of his experience of 50MHz breakthrough that affected two models: a Sanyo VTC-5000 (Betamax format); and Hitachi VT14E (VHS format). He writes:

"After reports from my neighbour of interference to his Hitachi vcr, I found that my own Sanyo model was also affected in the same way; this enabled me to get my own house in order first. My 50MHz transmissions caused breakthrough only on audio, and only on playback. I had no reported breakthrough on hf and only very low level interference on 144MHz which could be removed by removing the vcr antenna plug. There was no interference to vision on the associated tv set or to the record mode. The level of the audio breakthrough, although unintelligible, could be classed as very annoying, usually requiring abandoning the use of the vcr while transmitting on 50MHz.

"My transmitting set-up was as follows: (a) hf bands, 120watts to G5RV-antenna at a height of 27ft; (b) 144MHz, FT290R plus 2N6084 home-made linear amplifier with bandpass clean-up filter and five-element Yagi antenna on rotator in roof-space; (c) 50MHz, TS10V hf transceiver with *Practical Wireless* transverter with 100MHz series pi-type trap filter in output feeding 20watt underrun 6146B valve linear amplifier with pi-tank network followed by a 100MHz coaxial stub filter and a pi-type low-pass filter then three-element homebrew Yagi antenna with gamma matching at 30ft, designed from the NBS parameters (ARRL Handbook). Approximate distance from 50MHz antenna to Sanyo vcr 35ft, and to Hitachi vcr 60ft.

"My first efforts to cure the 50MHz audio breakthrough involved several types of filters: high-pass, braid-breaker (both capacitive and inductive), coax wound on RSGB toroid cores (10 turns to two cores) and toroid cores on the vcr mains lead while the other filters were tried. All to no avail. Transmitter output was carefully checked with a wavemeter but no spurious emissions were found between 1.5 and 250MHz; only the 50MHz carrier.

"These negative results suggested that the interfering signal was being picked up within the vcr (plastic case!). Not having a suitably large

metal box available, the vcr was completely encased in 450mm-wide aluminium kitchen foil. This completely cured the problem but only when the foil was earthed to the outer sleeve of the antenna socket at the rear of the vcr. If the foil were connected only to the base screen plate, the interference increased, suggesting that the foil then acted as antenna. A check with a multimeter showed that a very low resistance dc path existed between the two screens, but not at rf.

"A final cure was effected by strapping together the screened box behind the antenna input socket, the base plate and the screen over the tape-transport. This was done using the shortest possible lengths (3-4in) of braiding from an offcut of RG58U coaxial cable. Surprisingly, both recorders, although of different makers and formats, used very similar mechanical layouts and both suffered the same problems with their screens, with the result that the same cure worked for both. The Sanyo recorder was also modified by connecting a 470pF capacitor from the input of the audio-amplifier ic to earth. This was found necessary with the Hitachi recorder as the reduction of interference with the straps installed was already deemed sufficient, and there seemed no point in tempting fate!

"On both vcr's interference was reduced by about 90 per cent by the use of the straps; breakthrough could then be heard only faintly, during totally silent periods of a tape, whilst monitoring two feet from the loudspeaker. As a bonus, vision interference from the village overhead power distribution and the Eastleigh airport radar were also greatly reduced during replay."

An important lesson to be learned from this case history is the vital need, particularly at vhf and above, to ensure that all screens and shielding, including the shield of screened cables, really are at zero rf potential. This point was made in connection with cable booting in the April *TT* (p267) where Fig 8 shows clearly that any (drain) wire connecting a cable shield to the equipment 'chassis' will have an inductive reactance that results in rf voltages on the cable shielding, and hence radiating. It is worth keeping in mind that a straight 1in length of 23swg wire has an inductive reactance at 100MHz of about 16ohms.

solder wire almost instantaneously... Another fault is a 'burnt joint' due to applying the bit too long so that the copper foil parts from the pcb substrate. 'Solder bridges' where excess solder forms a conducting path between adjacent strips of foil can be removed (in the absence of a desoldering tool) by fluxing a piece of clean stranded wire (or better a piece of copper braiding from an offcut of coaxial cable) then heating the offending solder and applying the end of the stranded wire or braid."

Donex defined a 'dry joint' as one in which the solder is 'adhered' to the connection by a layer of undiffused resin, thereby introducing resistance into the circuit. "This can vary from a few to an infinite number of ohms. The main cause is an iron too cool or not applied long enough. The remedy is to locate the area of the fault and then reheat every joint in the neighbourhood with a hot, clean iron." In effect the solder must 'wet' to clean surfaces on both the wire and the termination in order to make an electrically good joint. The particular problem with 'dry' joints is that they may form a mechanically secure joint, with the electrical resistance showing up only intermittently.

Construction or servicing of pcbs calls for considerable skill and care in soldering. The use of a large (50-60watt) iron can cause blistering and damage to laminated boards and semiconductors. Use a low-wattage (under about 35W) iron with a small point or wedge bit and 60/40 resin-cored solder. Use the solder sparingly to avoid causing solder bridges which may prove difficult to clear. Other useful tools include a soft wire brush, a pair of diagonal wire cutters, a pair of long nose pliers, a small wire 'pick' (soldering aid), a needle point probe for circuit testing and a magnifying glass for detection of small cracks.

Be very careful, when removing faulty components from pcbs, not to cause breaks in the foil. Avoid applying excessive bending pressure to the boards as this may cause breaks in the foil. Make sure that any small particles of solder are not left sticking to the board. Remove such particles with a cloth dipped in solvent.

REDUCING SCREENED CABLE LEAKAGE

It has been noted several times in *TT* that the effective coverage of the outer copper braiding on typical television coaxial downlead cables has been progressively reduced in order to neutralise the rising cost of copper. This has relatively little effect on the performance of the cables as transmission lines but it does mean that many cables are 'leaky' in respect of their shielding properties, both ingoing and outgoing. The percentage coverage of the copper braid may now be only 60 per cent or less, although high-quality cables manufactured to meet milspec/defspec requirements may have a braid coverage of the order of 95 per cent or so. Coaxial cable may thus not be the optimum solution for use as a shielded cable when dealing with emc problems, for example radiation from or into digital equipment including home computers etc.

M.A. Sanders, G3CRH draws attention to an article 'Choosing a screen' by R.G. Sarney of Anixter UK Ltd (UK agents for Belden cables) in an issue of the *Cable Buyers' Guide*. This notes that: "Digital computing devices are prone

SHORT LOADED HARMONIC DIPOLES

Gerald Stacey, G3MCK draws attention to an article 'Multi-band antennas using loading coils' by William J Lattin, W4JRW which appeared in *QST*, April 1961 (pp43, 148, 150). Although this was more than a quarter of a century ago, the information remains valid, fresh to many, and possibly of interest to those amateurs who have not the space available to put up resonant half-wave dipoles yet wish to use a co-ax feeder without requiring the use of an atu.

W4JRW recalled a Bureau of Standards Circular C74 (*Radio Instruments and Measurements*) first published in 1924 which showed that while the use of loading coils decreases the natural resonant frequency of antennas, it means that the harmonic frequencies are no longer integral multiples of the fundamental, as in the case of the conventional unloaded resonant antenna. An inductively loaded antenna also represents a higher Q system, decreasing the operational bandwidth over which an swr of, say, less than 2:1 can be achieved.

In his article, W4JRW showed that with careful placement of two 120µH loading coils (low-loss construction, close-wound with No 18 Nyclad wire on bakelite tubing 7/16in outside diameter, 14in long) it is possible to achieve a low swr on both the (American) 3.5 and 7MHz bands, with an overall span of around 80ft, without the use of 'tuned' traps.

For European operation, there is the problem that the optimum results achieved by W4JRW represented resonant frequencies more suited to the extended American (Region 2) bands (3.5-4.0MHz and 7.0-7.3MHz) than our restricted (Region 1) bands. However it would seem that with some experimentation, and parameters approximately as in Fig 1 (a), it should be possible to achieve a satisfactorily low swr over the Region 1 bands.

W4JRW stresses that: "There are no capacitors to break down as in traps and the 120µH coils have been used with a kilowatt transmitter input with no difficulty." He also adds: "We have not found any exact formulae to determine the relationship between the lengths of wire, loading coils and the two (resonant) frequencies. The antennas are very simple to adjust with a grid-dip meter coupled to a single-turn loop connected to the feed terminals, as quite small changes in the wire lengths result in appreciable

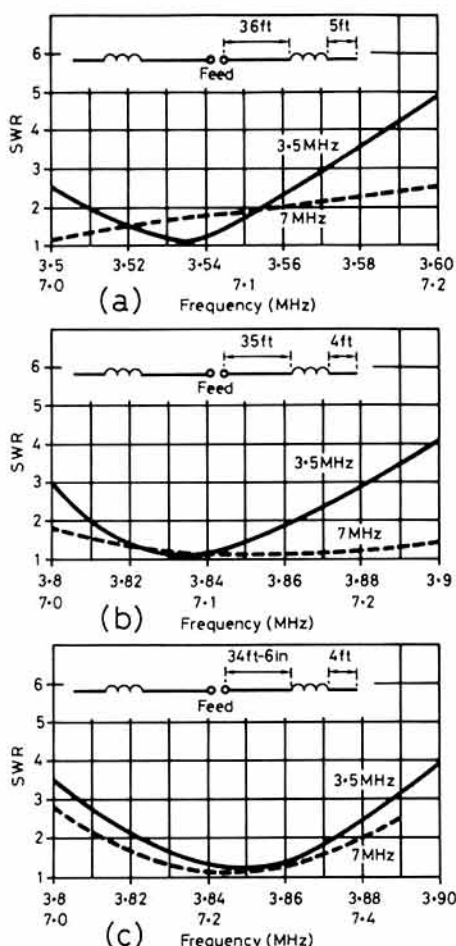


FIG 1. THREE VERSIONS OF THE W4JRW (1961) TWO-BAND LOADED DIPOLES USING TWO 120µH LOADING COILS (SEE TEXT), ILLUSTRATING THE EFFECT OF SMALL VARIATIONS IN THE DIMENSIONS.

in resonant frequencies.

"This principle can be extended: that is, by using two sets of coils, operation on three frequencies is possible, on four frequencies with three sets of coils, and so on. However these get very complicated to adjust, since the second set of loading coils changes operation of the first set somewhat, and the adjustment process gets rather tedious.

to a wide range of interference problems, both as receivers and emitters. In the USA, the FCC has addressed this problem with Docket 20780 which governs emission limits for both industrial

(class A) and consumer (class B) digital computing systems. . . . These regulations do not apply in the UK, but it can only be a matter of time before similar regulations are drafted."

TABLE 1
Comparison of various forms of shielding for rf cables

	Copper Braid	Copper Wrapped	Aluminium Polyester
Shield effectiveness at audio frequencies	good	good	excellent
Shield effectiveness at radio frequencies	good	poor	excellent
Normal % coverage	60-95	90-97	100
Fatigue life	good	fair	poor
Tensile strength	excellent	good	poor
Termination method	comb & pigtail	good	drain wire
Limpness	good	good	fair
Cost*	most	more	less

*Relative assuming maximum coverage on braid and spiral wrapped shield

Source Anixter UK Ltd

MULTIBAND NON-LOADED DIPOLE

Where an atu is used with open-wire transmission line it becomes possible to resonate a centre-fed dipole antenna system on virtually any frequency. Lorin Knight, G2DXK admits that the principle used in his all-band hf antenna is nothing new, but the method of construction and the location of the atu should be of interest to those amateurs who do not wish to have open-wire feeders extending all the way into the domestic environment. He writes:

"Instead of the traditional 14swg hard-drawn copper wire, I use a black pvc-covered stranded wire (14 x 0.2mm, overall diameter 1.5mm). This wire has one-fifth the weight, is considerably cheaper, is easier to handle, is almost invisible when up in the air – and is not noticeably inferior in performance. Instead of the traditional glass or porcelain insulators I use 12-inch lengths of 1.5mm diameter monofil nylon line – also lighter, cheaper and practically invisible.

to have negligible effect on the performance.

"I have an atu in the shed and a coaxial cable feed from there to the house. (This means that I have to go out to the shed every time I want to tune up the antenna for a different band but as I do not change bands all that often this is no great hardship.) The atu is homemade and has a separate plug-in coil assembly for each band from 3.5 to 28MHz (see Fig 3). Each coil assembly has written on it the relevant capacitor settings so that band-changing is a fairly simple operation.

"It will be noted that on 3.5MHz the active part of the antenna is only a quarter-wave long, but this does not prevent it from loading up and operating very satisfactorily. On 7MHz the antenna is a simple half-wave dipole; on 14MHz it acts as two half-waves in phase, giving some gain in the broadside direction. On the other bands it has multiple-lobe polar diagrams."

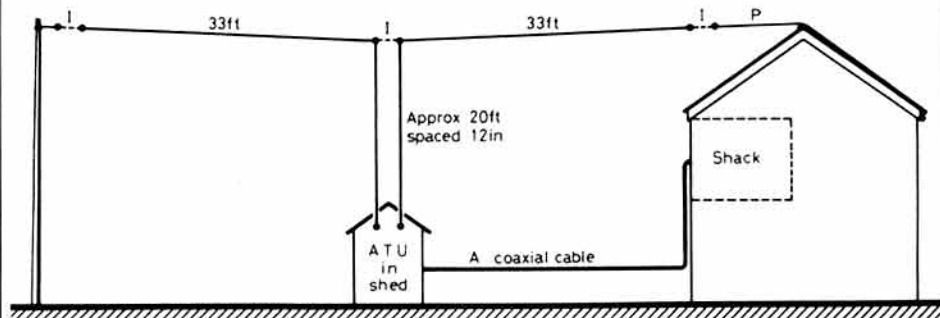


FIG 2. G2DXK'S MULTIBAND DIPOLE ANTENNA. I REPRESENTS INSULATORS COMPRISING 12IN LENGTHS OF NYLON LINE. P IS LENGTH OF POLYPROPYLENE CORD THROWN OVER ROOF AND ANCHORED TO EAVES.

"The feeder wires drop down to two standoff insulators mounted 12 inches apart on my garden shed which, very conveniently, stands right under the centre of the antenna: Fig 2. The wires are cut so that they are under slight tension and they maintain a nominal spacing of 12 inches without the use of any spreaders. In a very strong wind the actual spacing half-way up the feeder can fluctuate $\pm 2''$ or so, but this appears

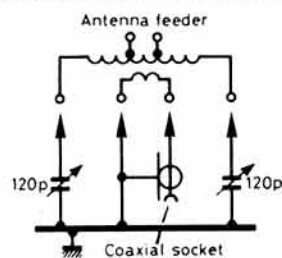


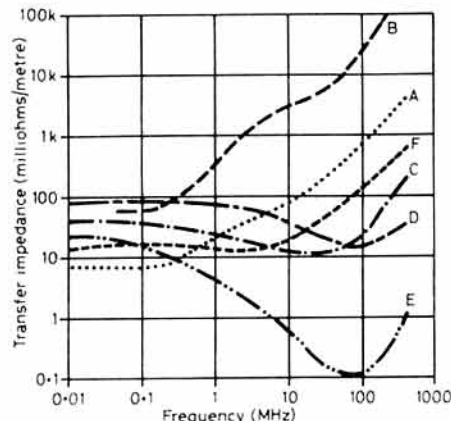
FIG 3. THE ATU USED WITH THE MULTIBAND DIPOLE IS SITED IMMEDIATELY UNDER THE CENTRE OF THE DIPOLE.

R.G. Sarney notes that there are several methods of screening cables to reduce rfi problems but not all are equally effective. He lists the most common cable screens as wire, braid, foil tape with an aluminium coating and drain wire, and spiral wire shields. Table 1, from his article, compares the properties and costs of various types of shielded cables based on samples from the Beldon range. Foil screens usually comprise a layer of aluminium deposited on a polyester tape, then wrapped helically around a cable with a longitudinal copper drain wire used to terminate the screens. The Beldon cables of this type use a longitudinally applied screen which may have a shorting 'z' fold providing metal-to-metal contact so that the cable closely simulates the optimum 'metal-tube' form of screen, highly

FIG 4. TEST RESULTS OF MEASURING 'TRANSFER IMPEDANCE' OF SIX DIFFERENT SHIELDED CABLES AT DIFFERENT FREQUENCIES. A, 95% COPPER BRAID (BELDON 8221); B, 91% TINNED COPPER SPIRAL (BELDON 9456); C, FOIL WITH FOUR SPIRAL DRAIN WIRES (BELDON 9234); D, FOIL WITH 95% ALUMINIUM BRAID (BELDON 81008); E, FOIL/ALUMINIUM-BRAID/FOIL (BELDON DUOBAND PLUS, 9052); F, OPTIMISED BRAID. NOTE THE LOWER THE VALUE OF TRANSFER IMPEDANCE THE MORE EFFECTIVE THE SCREENING.

effective in preventing rf leakage into or out of the cable. Screening performance of such cables can be better than braid from audio to radio frequencies.

One way of comparing shielding effectiveness is by measuring the 'transfer impedance' of the



shield in terms of milliohms per metre. This represents the voltage per unit length generated on one surface of a shield by a longitudinal disturbing or interfering current on the other surface. The lower the transfer impedance the more effective the shielding. Fig 4, from R.G. Sarney's article illustrates the transfer impedance of six forms of shielded cable over a wide frequency range. The example A of copper braid cable represents a high-grade cable with 95 per cent copper coverage; consumer-type coaxial cables would have appreciably higher transfer impedances towards the higher-frequency end of the radio spectrum.

MORE SPECTRUM ANALYSER IDEAS

The low-cost spectrum analyser adapter described by Al Helfrick, K2BLA in *RF Design* (January 1988, see *TT* April, July, August and September) continues to attract attention and demands further coverage. But first, some information on how this design originated and the reason why the 'spread' of characteristics of the wired-in ic devices etc has given rise to problems to those building replicas of this design.

Who better to explain the background to this useful concept than the original designer? K2BLA writes: "I never realised that the design would achieve so much world-wide attention. A few notes of explanation are in order. First, I had no intention of the spectrum analyser becoming a constructional article. I designed the unit as an entry for the annual *RF Design* contest over the period of a weekend to see how few common parts could be used to generate a workable spectrum analyser. Therefore there is no printed circuit board and the only unit built to this specification was mine. I can, however, offer insight into solutions of some of the more common problems that have been reported to me by constructors.

"First, since the unit was built without a circuit board, the distributed capacitance and inductance of a pcb layout is not present. The breadboard is constructed with the chips 'on their backs with their feet in the air' a technique that, many years ago, I called 'dead-bug construction'. The leads to the components, especially those in the oscillators, are very short. This is necessary to obtain the required tuning range for the first local oscillator.

"There is one error on the schematic. The coil L4 does not return to the 5V supply but through a 1000pF capacitor to ground. There are no other errors and I recently checked the actual circuit to the schematic to be sure. Because many of the tuned circuits are well into the vhf region and will be affected by the internal capacitances of the wiring, each builder will have to tailor the coils for his own situation.

"The spectrum analyser described in *QST* ("An inexpensive spectrum analyser for the radio amateur" by Al Helfrick, K2BLA, *QST*, November 1985) is being made available in kit form by A&A Engineering (see *TT*, September 1988, p680). This unit has a zero to 400 or 450MHz range, depending on the converter used, and has a dynamic range of about 60dB, again depending on the converter. A&A had some early start-up problems but I understand they are now shipping units."

The 1985 design used an American catv tuner as the front-end converter. D.P.T. Evans.

GW31VK has combined some ideas from the 1985 *QST* and 1988 *RF Design* articles and also of his own to achieve a unit covering 0-400MHz with a sensitivity of about 30 μ V and a resolution of 150kHz. Improving the resolution beyond this introduced problems caused by a lower sweep rate needed giving rise to display flicker. He writes:

"Having obtained the specified parts, some with considerable difficulty, for the *RF Design* model, I assembled them on a pcb. Although it was possible to make IC1a oscillate to 245MHz, with suitable component values, it proved impossible to obtain a 100MHz sweep. About 30MHz was the maximum sweep obtained. Incidentally a Mullard BB809 variable capacitance diode performed slightly better than the specified MV209 in this circuit. The remainder of the circuit worked satisfactorily but because of the above problems it was decided to try a different approach.

"Fig 5 shows the overall block diagram and Fig 6 the circuit diagram of the basic unit. If the basic analyser of Fig 6 is constructed first (ie, tv tuner, MC3356 and TLO84 sweep generator) one has immediately a working display of the uhf television bands IV-V and this gives confidence that everything is going well. I made my first one in about two hours using a breadboard (I already had suitable power supplies). The final circuit was built on standard stripboard all the difficult parts already made in the tv tuner.

Points of note: Power supplies required are +12V, -12V, +5V and +33V. The +33V supply should be well established and well smoothed in order to prevent horizontal drift and jitter on the display. Do not use tv varicap supply regulators such as the TAA550 as they are not good enough in this application. The zener diodes in the BFX85 collector improve sweep linearity. The age potentiometer provides about 30dB of input level control. The frequency of the crystal used with the MC3356 is not critical, anywhere in the range 40.7 to 50.7MHz should prove suitable. The tuner i.f is

HIGH-POWER TETRODES LIVE ON

H. A. Sanders, G3CRH sends along the final part of a series of articles on broadcast transmitters that appeared in the trade journal *International Broadcasting* (Part 3, Transmitter tubes: the tetrode, January/February 1988 issue). This article by James Wood is concerned primarily with the very high-power tetrodes developed and still manufactured by Brown Boveri, English Electric, Philips, Thomson-CSF and Varian-Eimac; for example, the Thomson super-power TH526 with a rated dissipation of 1500kW! An important modern development has been the development, in an increasingly solidstate era, of the Thomson 'Pyrobolec' grid, using pyrolitic graphite (crystallised carbon). This material has very good mechanical stability with its mechanical strength *increasing* with increasing temperature.

But it is also pointed out that the post-war development by Varian-Eimac of the more familiar 4CX250B "revolutionised all previous design concepts . . . the interesting thing is the way in which all modern tetrodes at medium power levels have retained a close resemblance to the 4CX250B". Later, James Wood comments: "The uhf tetrode is championed by many

senior engineers . . . sadly though, the theory of vacuum tubes is no longer taught in most universities . . . we have a new generation of transmitter design engineers many of whom have an engineering education limited to the application of solidstate technology . . . Critics of the power grid tetrode are mainly those engineers who are not directly familiar with them, but have heard stories of short life."

Unlike solistade, catastrophic failure is rare with tetrodes, although he notes that their life can be shortened by (a) inadequate cooling of the anode and electrode seals; (b) excessive (or inadequate - G3VA) filament supply voltage; (c) overdriving the control grid; (d) incorrect screen supply voltage or current; and (4) too lightly loaded output stage (a factor often overlooked by amateurs who may believe that this actually prolongs the life of the valve - G3VA).

James Wood adds: "These factors are effects rather than causes. The real cause of shortened tube life can boil down to either a badly designed transmitter stage, or a badly maintained transmitter. No amount of loving care and maintenance can ever remedy a substandard transmitter design."

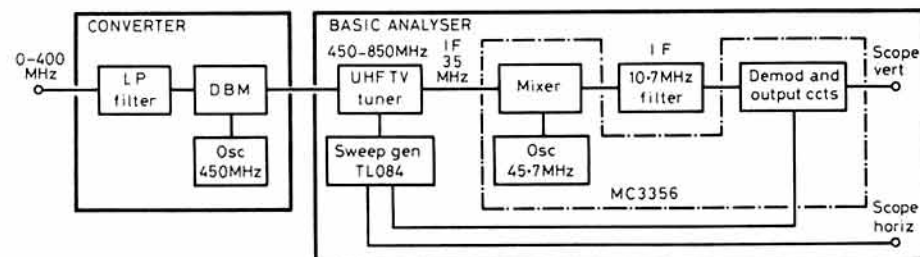


FIG 5. BLOCK DIAGRAM OF GW3IVK'S SPECTRUM ANALYSER UNIT.

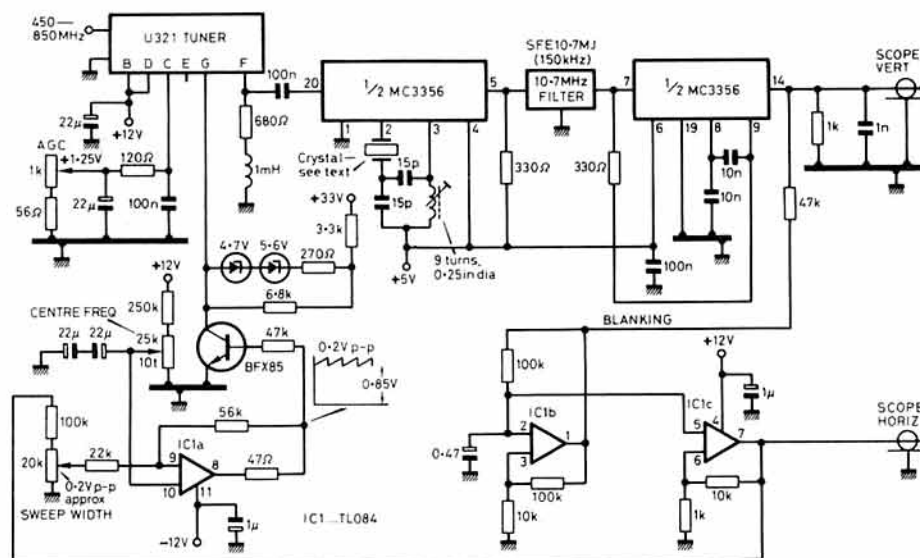


FIG 6. CIRCUIT DIAGRAM OF THE BASIC ANALYSER SECTION.

broad and may be peaked for maximum with its output trimmer. Use a ten-turn potentiometer for the centre-frequency control. If the unit is set

to the test waveforms shown, then success should be immediate. My final version included a switched sweep-width control with six positions, maximum 50MHz/div, minimum 0.5MHz/div. The tv tuner used is a Philips U321 (available from P. M. Components).

The 0-400MHz converter (Fig 7) is quite simple. The diode bridge mixer (dbm) is readily available. Mount it on double-sided copper-clad board, with suitable holes and clearances on the appropriate pins. Note that in this application the input is taken to the i.f port and the output taken from the rf port as indicated in Fig 7. The local oscillator uses a BFW10 jfet device, mounted on the same board close to the dbm. The output level at 450MHz was rather less than 0dBm. The mixer requires +7dBm oscillator

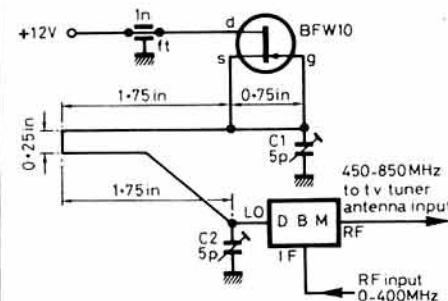


FIG 7. FRONT-END CONVERTER SECTION OF THE GW3IVK ANALYSER.

power for optimum but the lower level did not appear to cause any problems. Use thick tinned copper wire for the tuning lines. Adjust C1 for frequency, again not critical but around 450MHz. The oscillator output is displayed on the basic analyser at the bottom end of the uhf tv Band IV. Adjust C2 for maximum output using this display.

"The input low-pass filter, 0-450MHz, was included as a precaution to prevent direct breakthrough from strong signals in the uhf tv bands. The completed spectrum analyser adapter is inexpensive, easy to make and surprisingly good." If required, further details can be obtained from: D.P.T. Evans, GW3IVK, 11 Hill View, Bryn-y-Baal, Mold, Clwyd, CH7 6SL.

The importance when using the original design of reducing to an absolute minimum the stray reactances in the connections to off-the-shelf MC3356 and NE602 devices is underlined by the experience of Ted Elliott, G3BYY. As he puts it: "Maybe some samples of the MC3356 are reliable up to beyond 260MHz but my NE602, no matter what L or C I tried would not go above 140MHz." G3BYY used 'ugly' construction with most components on the earth plane side and hard-wiring underneath, probably less strays than with a pcb, but probably rather more than would be the case with K2BLA's 'dead bug construction'. However he finds his unit - now boxed up - very useful and providing hours of delightful fiddling. He feels that K2BLA has provided a well-thought-out product, and that to try to improve just one aspect would be a waste of time: "every portion is working at a level of performance where nothing is wasted."

He has settled for coverage 0-105MHz with linearity reasonable to 70MHz; above that the space between the 10MHz markers increases considerably. With a 3ft piece of wire on the input acting as a makeshift antenna, his six major Band 2 fm broadcast signals produce pips about 50mV in amplitude; between 0-20MHz there is a solid wedge of signals; around 27MHz cb signals coming and going, similarly two-way mobiles around 80-90MHz. His final modifications were: L2 2t, 3/16in id 20swg 3/16in long. C6 4pF (2-2pF and 1-8pF in parallel). He found it essential to increase voltage on the first half of the MC3356 to 13-8-14V. The original display circuitry suited his Trio CS-1560A scope perfectly. With only a single-range scan he sees no point in reducing the bandwidth of the i.f below 250kHz which represents a blip only 0.25mm wide, less than the spot size. With a much reduced sweep there would, he feels, be too much jitter in view of the rather crude method of sweeping the frequency by means of a variable capacitance diode. He praises the service he obtained from The Chip Shop in Stockport (see May TT).

12V HEAVY-DUTY SWITCHING

Derek Alexander, G4GVM makes good use of the suggestion by Dick Rollema, PA0SE (TT, December 1987, p910) of using a car radio antenna not only for broadcast reception but also with a 144MHz mobile transceiver. However, in his case, he had to find a way of raising his automatic broadcast antenna when required for 144MHz without first having to switch on the car radio.

HINTS

Les Cobb, G3UI passes along a word of caution from Dr L. M. Dougherty, a keen astronomer of considerable repute and former Head of Physics at Huddersfield Polytechnic, on the 'kilner jar magnetometer' of G3UKV TT, based on the 1983 BAA 'Recording jamjar magnetometer' originally described by H. R. Hatfield. Dr Dougherty and a colleague constructed one of these instruments, as near as possible to the original 1983 specification. They carefully evaluated it over a considerable period and came to the conclusion that while it may well be an instrument worthy of experiment, the results need to be interpreted with great care. For example the temperature coefficient was found to be some 64 times the typical daily magnetometer range in the UK. Dr Dougherty is currently working on a device designed to minimise such variations.

The intense solar flare which occurred last June is believed to have been the reason why hundreds of homing pigeons released in Central France failed to return to their lofts in the north of England. The flare caused a temporary distortion of the Earth's magnetic field on which the remarkable navigational abilities of pigeons is thought to depend.

The September TT included a tip on using pilot bulbs as rf indicators for antennas in lieu of the once widely-available thermocouple rf ammeters. An alternative approach, recommended by Les Cobb G3UI is to use a toroid core wound with a few turns of wire, slipped over the feeder, with a diode rectifier and

voltmeter. He considers that has the advantage of being indestructible and also provides a remote reading facility.

R S Andrews G3 BNG notes that many amateurs use the standard form of jack plug (known, for example, as the Air Ministry Phone/Mic Jack Plug AM No IOH986 with 1/4in diameter shaft) used with a two-contact socket (AM IOH/1049). The panel mounting bush of the socket bears a black bakelite hexagon casting which, if undue force is used to tighten or loosen the bush, is liable to crack and break off, thus leaving the brass entry to the bush exposed, rendering the socket unsuitable for panel mounting. He writes: "This may easily be repaired by removing the brass locking nut from the mounting bush of a defunct potentiometer, soldering it over the exposed brass bush end, and then seating a brass 1/4in washer over the two as in Fig 9. This renders the socket serviceable again."

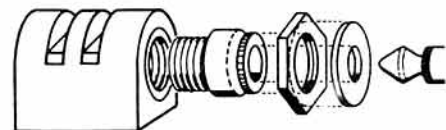


FIG 9. G3UI'S METHOD OF REPAIRING A BROKEN PANEL MOUNTING BUSH OF A STANDARD JACK SOCKET.

W3SHP (QST "Hints & Kinks") has found that when winding coils a useful tip is to wind double-stick transparent tape on the former before beginning the winding. Then if you relax your pull before anchoring the winding the turns will still stay put.

AND TIPS

G4GVM found that the current required to raise the antenna was 75mA and feared that this

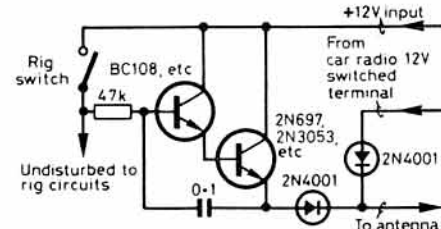


FIG 8. G4GVM'S METHOD OF RAISING HIS CAR RADIO ANTENNA WITHOUT SWITCHING ON THE CAR RADIO OR ADDING ANY SIGNIFICANT EXTRA SWITCHING CURRENT TO HIS 144MHz TRANSCEIVER. THE SAME CIRCUIT CONFIGURATION COULD FIND OTHER APPLICATIONS WHERE A SUBSTANTIAL CURRENT NEEDS TO BE SWITCHED FROM A VERY SMALL ONE.

MEMORY BATTERIES IN YAESU RIGS

Kjell Ström, PA/SM6CPI of Yaesu Europe BV adds to the comments on GM4SVM's worries about the memory back-up battery for the Yaesu FT-290R (and FT-290R II): see August TT with comments in September TT. He writes: "These worries are completely without foundation since all the vital software for all Yaesu radios is in rom (read-only-memory) devices and cannot be erased. The only slight inconvenience that will be caused by a discharged back-up battery in FT-290R is that the radio falls back to the default mode and frequency and that it cannot keep other data in its memory when it is being switched off. All other functions are avail-

able regardless of the state of the back-up battery. There is even a switch provided in the circuit so that battery life can be preserved when the radio is stored for a longer time.

While G4GVM's particular application may seem rather specialised, the circuit configuration and approach could be used for other applications where a substantial current needs to be switched from a very small one.

"There are no tricks involved in replacing the back-up battery; if necessary, just make a note of what you have got stored in the memory, replace the battery and reprogram the radio. Knowing a little bit about human nature quite a few FT-290R owners will wait until one day they find that their radio does not keep memory data. Nothing bad will happen to their Yaesu radio.

"Regarding the dc supply plug: if you have lost the plug which comes with the radio, any Yaesu dealer can supply an exact replacement."

G3TSO's MODULAR HF TRANSCEIVER

BANDS 1-8 THROUGH 30MHz AND 10 WATTS OUTPUT

PART 2



**G3TSO CONCLUDES
HIS EXPLANATION OF
CONSTRUCTION OF EACH
MODULE, DESCRIBES
THEIR ALIGNMENT
AND FINALLY OFFERS
THE OPTIMUM
PROCEDURE FOR TESTING
THE COMPLETE RIG**

**BY MIKE GRIERSON
G3TSO**

TRANSCEIVER PERFORMANCE

General Specification

Single superhet transceiver.
Bandwidth: 2.4kHz @ -6dB, 4.3kHz @ -60dB.
Power Output: Variable from 100mW to 20W pep (ssb) 20W (cw) 100% duty cycle.
Receiver sensitivity: 0.25 μ V for 10dB S+n/n (28MHz).
AGC: typically 3dB change of output for 80dB change of input.
RF amp gain: 15dB.
IF: 9MHz. IF rejection: greater than 60dB.
AF output: 1 watt.

MEASURED PERFORMANCE

Local Oscillator Unit

Band	L.O. Freq	2nd Harmonic	Spurious responses
160	11MHz	-45dB	Greater than -55dB
80	5MHz	-30dB	Greater than -55dB
40	16MHz	-32dB	1 @ -35dB (2x Xtal - vfo) others Greater than -60dB
20	5MHz	-30dB	Greater than -55dB
15	12MHz	-35dB	Greater than -50dB
10A	19MHz	-33dB	1 @ -42dB others greater than -50dB
10B	19.5MHz	-33dB	1 @ -47dB others greater than -50dB
10 10D	20MHz	-33dB	Greater than -50dB

Receiver performance

S-meter calibration using Cirkit 200 μ A S-meter adjusted for fsd at max agc voltage:
Fsd typically 100mV PD.
50 μ V pd gives S8 indication on 160, 80, 15 and 10m bands.
50 μ V pd gives S7½ indication on 40 and 20M.
Receiver sensitivity: 14MHz 0.28 μ V for 10dB S+n/n 28MHz 0.25 μ V for 10dB S+n/n

Receiver Spurious Responses

The following internally generated spurious responses can be heard on the receiver:

- 80 metres: a weak response occurs at 3.6MHz when the vfo is operating at 5.4MHz. This also produces a similar out-of-band response on 20m at 14.4MHz.
- 15 metres: band edge birdie just out of band at 20.997MHz owing to third harmonic of 7MHz xtal. Fourth harmonic of vfo produces a response at 21.333MHz.
- 10 metres: band edge birdie just out of band at 27.997 owing to 2nd harmonic of 14MHz xtal. Similar birdie from 14.460 xtal occurs at 28.92MHz. However, 10C range overlaps this frequency.

Second channel interference

- 80 metres minimum detectable signal on 14MHz: 1mV pd.
- 20 metres minimum detectable signal on 3.5MHz: 300 μ V pd.

Each band was subjected to a 3mV signal across the hf spectrum and no spurious responses were found except for:

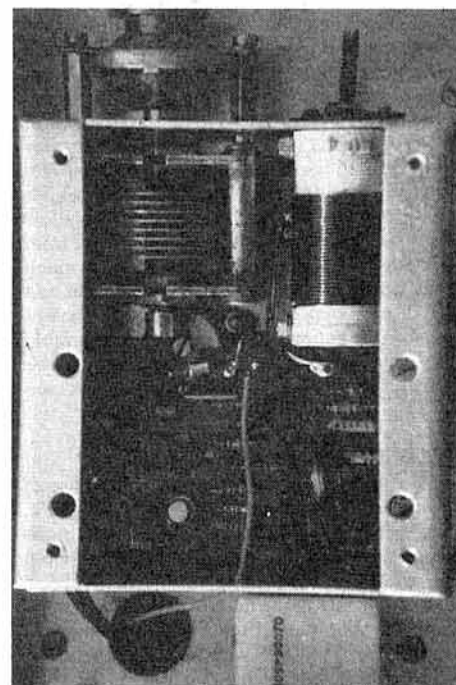
- 15 metres 1 response at 23MHz which disappeared at 300 μ V pd.
- 10 metres 3 responses at 26.5, 27.7 and 30MHz which disappeared at 300 μ V pd.

TRANSMITTER OUTPUT

Band	2nd Harmonic	3rd Harmonic	Spurii
160	-33dB	-42dB	greater than -50db
80	-38dB	-42dB	greater than -60dB
40	-42dB	-60dB	greater than -50dB
20	-50dB	-32dB	greater than -50dB
15	-42dB	-22dB	greater than -50dB

measured at 18 watts output int 50ohms

Bandpass filter alignment is simple and doesn't require masses of expensive test equipment. As few amateurs will have access to a sweep generator an alternative method will be described. Each filter may be tested independently once it is wired up, but the low impedance input should be terminated with a 50ohm resistor and a 10k Ω resistor connected across the output. Using a signal generator and a suitable measuring device such as an oscilloscope or vvm, inject a signal into the input of the filter while monitoring the level at the output. Peak the filter in the middle of the desired band so as to obtain maximum output. Each filter may then be adjusted to broaden the bandwidth by adjusting one coil at the lf end of the band and the other at the hf end of the band. Tuning of each coil in a filter will be interdependent and several adjustments will be necessary to achieve a flat response across the desired band. By



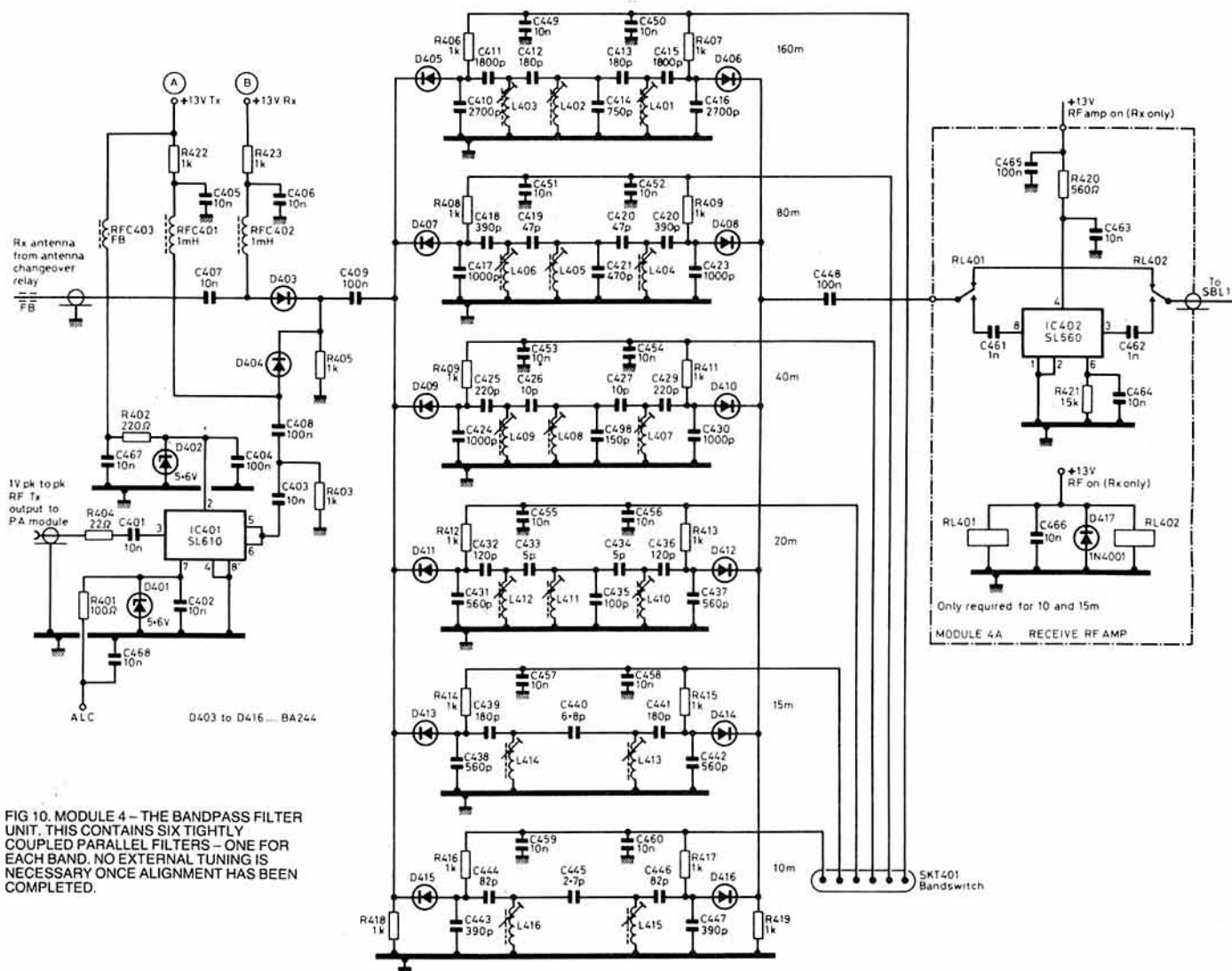


FIG 10. MODULE 4 - THE BANDPASS FILTER UNIT. THIS CONTAINS SIX TIGHTLY COUPLED PARALLEL FILTERS - ONE FOR EACH BAND. NO EXTERNAL TUNING IS NECESSARY ONCE ALIGNMENT HAS BEEN COMPLETED.

sweeping the signal generator across and outside the band the output level should be observed to be as flat as possible up to the band edges and then rapid attenuation of the signal should occur as the generator moves further away from the band edge.

Further alignment of the filters is possible when both oscillators and the mixer are running. With 13V connected to each filter, switching in turn, and the corresponding xtal selected it should be possible to observe the local oscillator signal level at the output of module 3. As the vfo is tuned across its range the output level should be clean, on the correct frequency and fairly constant across the entire band. Minor adjustment of the bandpass filters can be made to achieve a level response. Output from module 3 should be checked into a 50ohm load and should be 500mV. It is, incidentally, quite common for distortion of the waveform to occur when the output is fed directly to the ring mixer. The output level will vary slightly from band to band, but nevertheless is fairly constant. Some adjustment of output level is possible by varying the gain of TR304 by adjustment of R331.

MODULE 4: BAND PASS FILTER UNIT

Before module 1 can be used as a receiver it is necessary to place a suitable band pass filter between the mixer and the antenna. This filter will provide front end selectivity as well as filtering the transmit signal.

Module 4, Fig 10, comprises six band pass filters - one for each band. The filters are bi-directional and consist of a number of tightly coupled parallel tuned circuits, capacitively tapped to provide a 50ohm input and output impedance. The filters are designed to provide a relatively flat response across each band and provide adequate selectivity for receiver operation. On transmit the transfer characteristics are good enough to ensure that only minimal attenuation of the low power transmit signal occurs. No external preselector tuning is provided or necessary once the filters are correctly aligned.

Each filter is selected into circuit by biasing on two BA244 low capacitance switching diodes at either end of the filter. Input and output coupling is capacitive into a common line

between the filters. Toko coils are used throughout and can be selected for their inductance value or rewound from old stock. No complicated taps or coupling windings are employed, each inductor being a straight solenoid.

D403 and 404 provide switching of the transmit and receive signal paths; D403 routes the receive signal from the antenna change-over relay to the filters. On transmit, additional voltage amplification is required after the BPF and D404 routes the transmit signal to IC401, a Plessey SL610 RF amplifier IC whose gain is controlled both manually and by alc action. Output from the SL610 is in the order of 1V rms and is capable of providing adequate drive for the following pa unit. The SL610 operates from a 6V supply provided by D402 from the 13V transmit rail. Alc is applied as a dc bias to pin 7 of the IC which is shunted by D401 a 5V6 zener diode whose purpose is to prevent more than 6V appearing on the ic. When the SL610 is operated into a low impedance load (50ohms) it is important to include a series resistor in the output line to prevent parasitic oscillations occurring. An

ideal value is 100ohms, but this may limit the output voltage too much, in which case it may be lowered slightly. The lowest practical value used so far has been 33ohms. The value of R404 is a compromise between achieving stability and adequate drive. I discovered instability in my prototype when driving a 50MHz transceiver – at full gain the SL610 started to oscillate between 40 and 50MHz and the signal passed

straight through the transceiver. In normal operation it had been removed by the low pass filter. It is important not to overdrive the SL610 as it can limit severely and produce a wonderful flat-topped output which will produce severe distortion when amplified by the following wide-band amplifier.

It is important to use small capacitors for the filter unit and polystyrene types combine high

stability with small size and low cost. Each filter is constructed independently on the single-sided glass fibre pcb (Fig 11) and all filters are connected to SKT401 by fly wires. It is important to ensure that both ends of the same filter are connected to the same pin on SKT401 if they are to switch correctly. The fly wires should be added under the pcb. A layout of module 4 is illustrated in Fig 12.

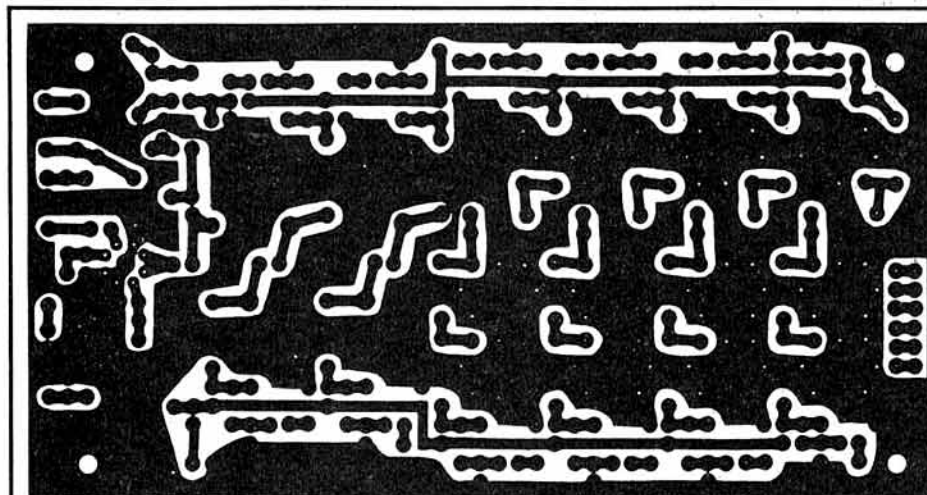


FIG 11. THE BANDPASS FILTER BOARD - ACTUAL SIZE. IT'S MADE FROM SINGLE-SIDED GLASS-FIBRE.

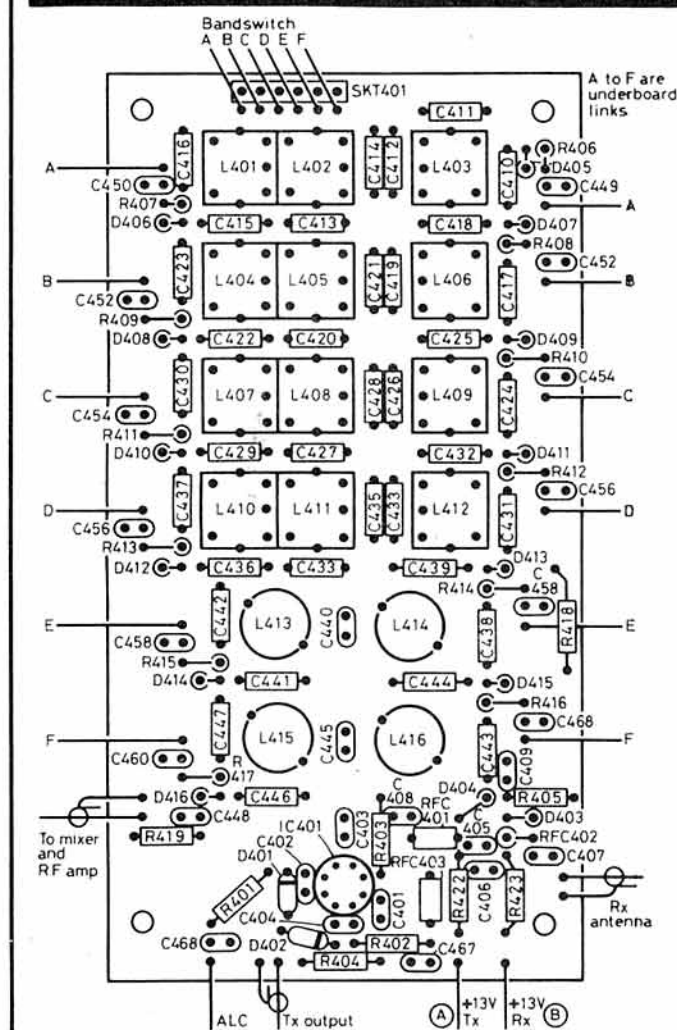


FIG 12. COMPONENT LAYOUT FOR THE BANDPASS FILTER.

MODULE 4	
R404	22R (max 100R)
R401	100R
R402	220R
R403,405,406,407,408,409, 410,411,412,413,414,415, 416,417,418,419,422,423	1k
R420	560R
R421	15k
C401,402,403,405,406,407, 449,450,451,452,453,454, 455,456,457,458,459,460, 463,464,466,467,468	10nF C
C403,404,408,409,448,465	100nF C
C410,416	2700pF poly
C411,495	1800pF poly
C412,413,439,441	180pF poly
C414	750pF poly
C417,423,424,430	1000pF poly
C418,422,443,447	390pF poly
C419,420	47pF poly
C421	270pF poly
C425,429	220pF poly
C426,427	10pF C
C428	150pF poly
C431,437,438,442	560pF poly
C432,436	120pF poly
C433,434	5pF C
C435	100pF poly
C440	6.8pF C
C444,446	82pF poly
C445	2.7pF C
C461,462,	1nF C
D401,402	5.6V zener
D403-D416	BA244
D417	1N4001
IC401	SL610
IC402	SL560
RL401,402	SPCO type OUC
RFC401,402	1mH axial choke
L401,402,403	8μH Toko KANK3334R rewind to 27 turns
L404,405,406	5.8μH Toko KANK3334R (5.5μH)
L407,408,409	2.8μH Toko KXNK4173AO (3μH)
L410,411,412	1.2μH Toko KANK 3335R (1.2μH)
L413m414,415,416	0.45μH Toko S18 0.45μH white

FIG 13. THE PCB LAYOUT FOR MODULE 4A, THE RF AMPLIFIER.

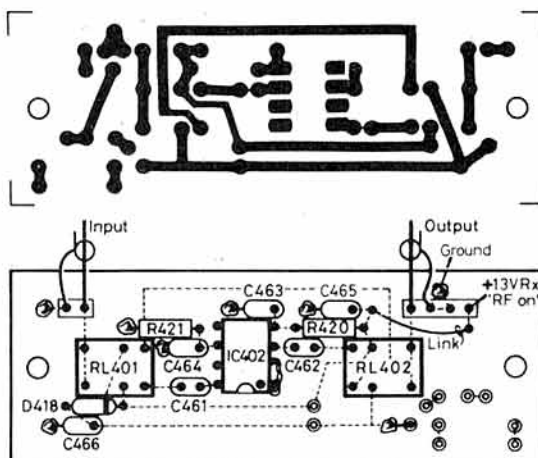


FIG 14. LAYOUT OF THE RF AMP BOARD.

MODULE 4A: RF AMPLIFIER

While not actually part of module 4, the optional receiver rf amplifier is inserted between module 4 and the mixer to provide increased gain on 28 and 21MHz. It is not essential and certainly not required on 14MHz or below.

A Plessey SL560C ic is used as a 50ohm gain block with approximately 15dB gain and is switched into circuit on receive using sub-miniature relays. The rf amp and relays are switched from the 13V receive rail which ensures that the unit drops out on transmit. This is essential as the amplifier is located in a bi-directional signal path. It is also important to ensure the supply to the ic is removed when not in use as the ic is prone to oscillation if it isn't terminated.

CONSTRUCTION

Module 4 is constructed on a 2.5" x 4.75" pcb which could be expanded to allow the inclusion of the new WARC bands if required. The RF amplifier module 4A is housed on a separate double sided pcb measuring 1.0 x 2.75" and is illustrated in Figs 13 and 14.

BPF ALIGNMENT

Alignment of the band pass filters can be achieved simply using a signal generator and a vvm or oscilloscope in the same manner as the filters in module 3, except that both ends of the

filters should be terminated with a 50ohm resistor.

The 1.8 to 14MHz filters comprise three parallel tuned circuits, while the 21MHz and 28MHz filters have only two tuned circuits. The triple-tuned filters have three distinct peaks during alignment and tuning of each circuit is interdependent. The simplest method of alignment is to peak each filter in the centre of the required passband and then increase the bandwidth by adjustment of the input and output tuned circuits towards the hf and lf ends of the band. The centre inductor can then be used to flatten the response across the band. Tuning is fairly critical and small adjustments should be made until a level response is achieved across the desired band. The signal generator should be swept slowly across the band during the alignment process and the output from the filter monitored on either the vvm or oscilloscope. When the generator is swept well away from the required band, the output signal should be rapidly attenuated. Check for the odd response that may appear some way out of band and which may be due to one of the tuned circuits being considerably off resonance. The 21 and 28MHz filters with only two inductors are considerably easier to align.

No adjustment of either the transmit or receive rf amplifiers is necessary or possible, but the gain of the transmit amplifier can be adjusted by means of the manual drive control.

During testing, if no dc bias is applied to pin 7 of the SL610, it will rise to the supply voltage and should be grounded for maximum gain.

MODULE 5: LOW PASS FILTER UNIT

The transmitter rf section employs a broadband amplifier taking signals from the milliwatt region up to the final output of several watts. Before this signal can be fed to an antenna it is essential to remove any unwanted harmonics that may have been generated in the amplifier chain.

Module 5 (Fig 15) comprises of six Chebyshev low pass filters with cut-off frequencies coincident with the top edge of each band segment on the transceiver. Even harmonics will be cancelled to a large extent by the push-pull pa and driver amplifiers, but any residual second harmonic will be further attenuated by the filter. The third harmonic and above will be attenuated by the filter by at least 50dB.

Diode switching of the filters is not practical owing to the higher currents involved, so a series of miniature relays is used to select the desired filter into circuit. All filters not in use are grounded at both ends to prevent stray signal paths for higher frequency products around the filter. All capacitors used in the filters should be of the silver mica type and ideally of at least 350V wkg. Capacitors with a 125V rating can be used at the 20W level but it should always be born in mind that the rf voltage at the antenna skt will rise with increase in power and swr.

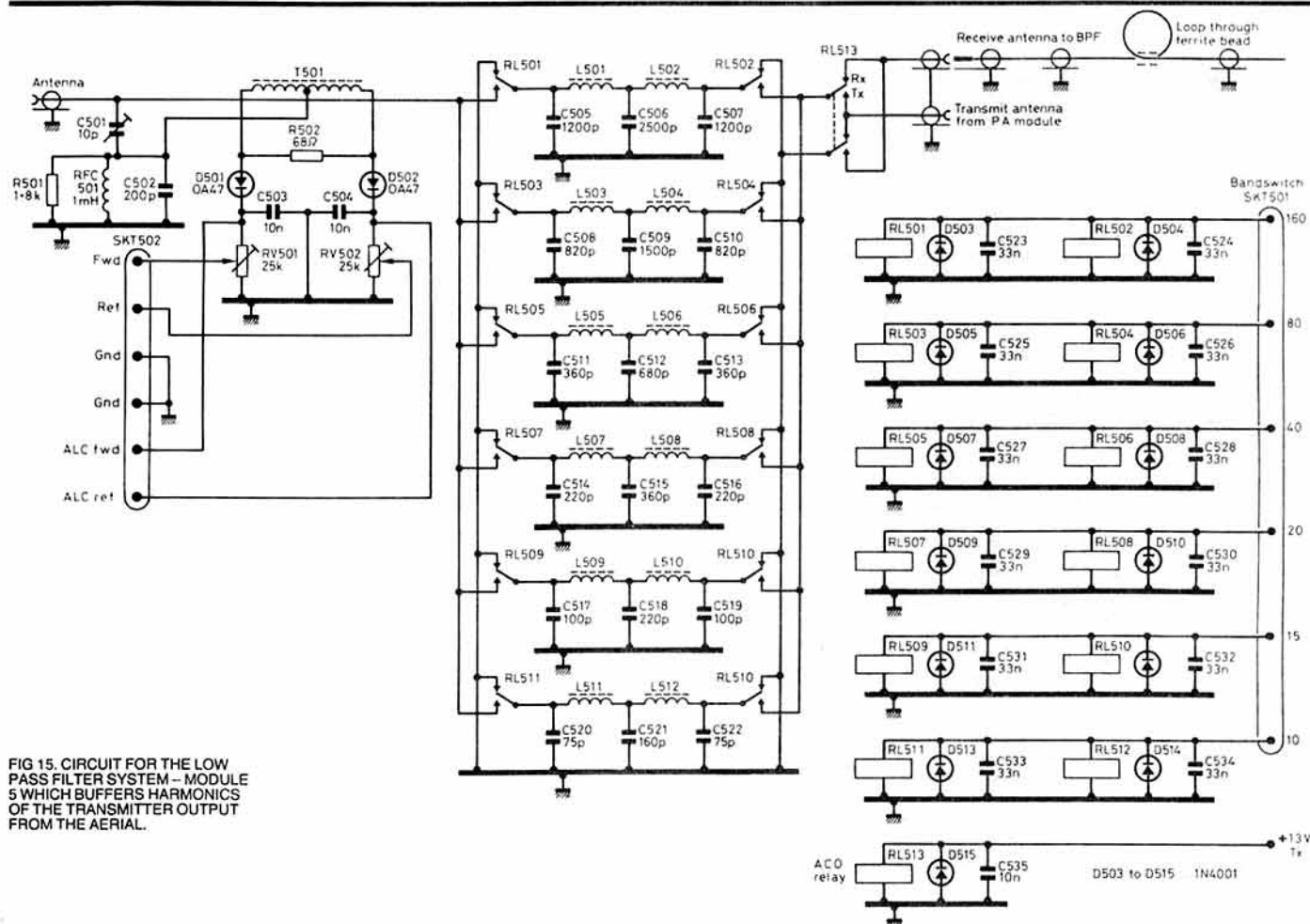


FIG 15. CIRCUIT FOR THE LOW PASS FILTER SYSTEM - MODULE 5 WHICH BUFFERS HARMONICS OF THE TRANSMITTER OUTPUT FROM THE AERIAL.

HF TRANSCEIVER

Capacitor values are critical to correct operation of the filters and must be adhered to. Any values that cannot be obtained should be made up by paralleling two or more capacitors in order to achieve the desired value.

Many commercial designs use elliptic filters which give a greater attenuation of the second and third harmonics. They are, however, slightly more difficult to build if they are to be operated at their optimum performance. With this in mind I chose to use the simpler Chebychev design for home construction. Excellent data on elliptic filters is contained in the latest issue of the *ARRL Handbook* and the extra components could be added to the pcb layout in Fig 16 if desired.

The low pass filters are retained in circuit during receive to provide additional filtering with the result that the antenna change over relay RL513 is located on the transmit side of the filter. This is a dpco type relay and shorts to ground the Rx and Tx lines when not in use. This is particularly important as the Rx ant. line returns to the vicinity of the bpf which is passing low power transmit signals. The use of a heavy duty ferrite bead on this line is also advisable.

An swr detector is included on the lpf unit and serves to provide meter indications of power and reflected power output as well as providing dc

voltages for use by the alc system. The bridge is a current sampling type and therefore not particularly frequency conscious. T501 samples the current in the antenna line which develops a voltage across R502. This is summed with the rf voltage developed across the potential divider C501/C502, producing forward and reflected voltages which are rectified by D501 and D502 before being fed as dc voltages to the alc unit. Potentiometers are provided to scale the Fwd and Ref voltages for presentation to a panel meter. An ic Op-amp with a gain of two is used as a buffer amp to prevent the panel meter loading the bridge and also serves as an S-meter amplifier on receive.

The lpf is constructed on a single-sided glass fibre pcb measuring 3" x 4" (Fig 16). The component density is high and the silver mica capacitors used should be of the modern smaller design rather than the traditional large variety. There is no reason why the pcb layout should not be expanded a little to make more room if required. If operation is contemplated on the WARC bands, then the 14MHz filter can be used on 28MHz, the 21MHz filter on 18MHz and the 28MHz filter on 24MHz. There is no need to build additional filters.

All relays on the lpf board should be capable of carrying the pa output current and a good

MODULE 5

R501	1.8k
R502	68R ½ watt
RV501,502	22-25k trim
C501	10pF ceramic trim
C502	200pF SM
C503,504,505	10nF C
C505,507	1200pF SM 350V
C506	2500pF SM 350V
C508,510	820pF SM 350V
C509	1500pF SM 350V
C511,513,515	360pF SM 350V
C512	680pF SM 350V
C514,516, 518	220pF SM 350V
C517,519	100pF SM 350V
C520,522	75pF SM 350V
C522	160pF SM 350V
C523,524,525,526, 527,528,529,530, 531,532,533,534	332nF C
RL501-RL512	Type 211NA DOO9M20 Surplus at rallies or SMR12 Electrovalue YX94C Maplin
RL513	Type OUB
L501,502	31t 26swg T50-2
L503,504	22t 20swg T50-2
L505,506	18t 20swg T50-2
L507,508	12t 20swg T50-2
L509,510	10t 20swg T50-2
L511,512	9t 20swg T50-2
T501	9t + 9t 26swg bifilar FT37-43 GW3TMP Electronics
D501,502	Matched OA47
D503-D515	1n4001
RFC501	1mH axial choke

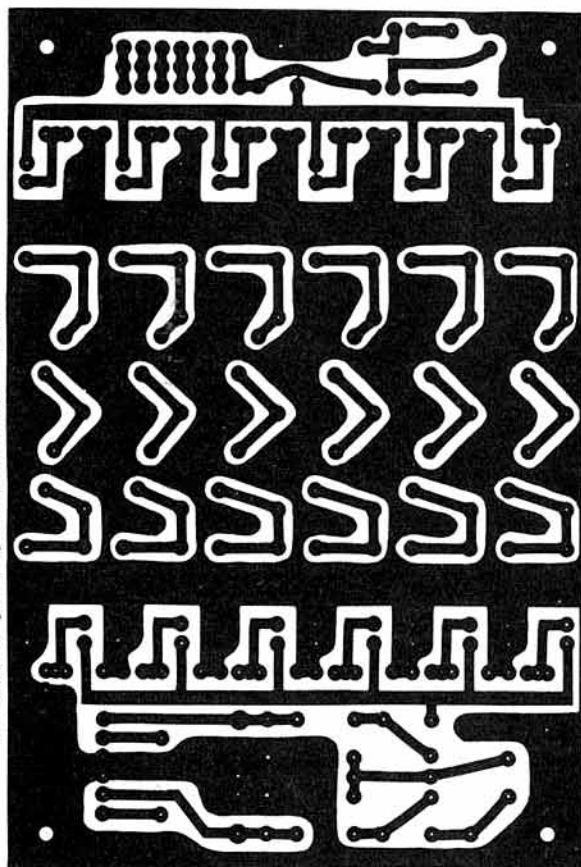
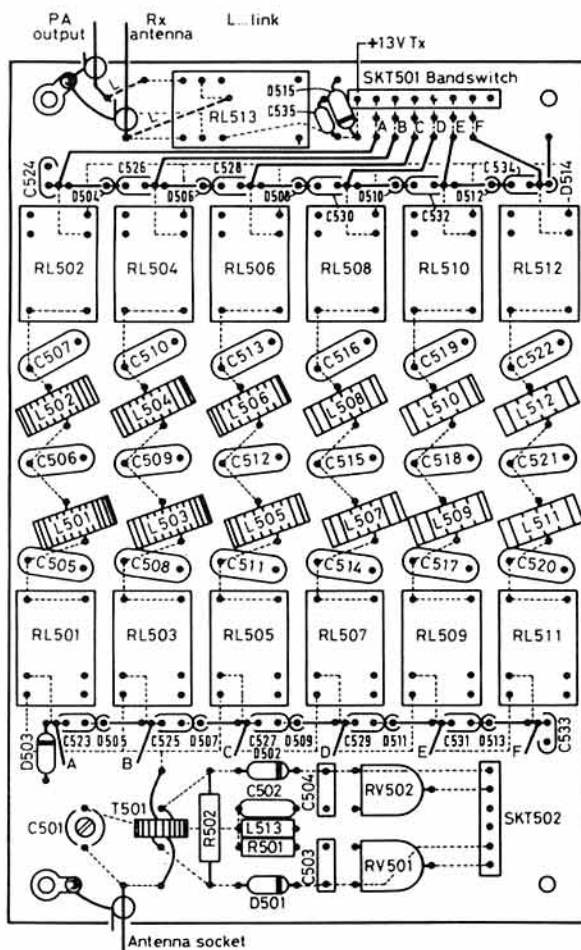


FIG 16.
DESIGN OF
THE LOW
PASS
FILTER
BOARD
(MODULE 5).

FIG 17.
COMPONENT
PLACEMENT
FOR THE LOW
PASS FILTER.



MODULE 6

R601	5.6k	
R602,616,612,	33k	
R603,606,609,610	1M	
R604	3.3k	
R605	22k	
R607	100k	
R608,614,620	10k	
R611,617,618	47k	
R813	1k	
R615	390R	
R619	220k	
VR601	47k preset	
VR602	10k pot lin	
C601,602,603,605		10nF C
C606,608,610,611,612		0.22µF T
C604		1µF T
C607		10µF T
C609		
IC601	MC3401 Watford Electronics	
	or (LM3900)	
TR601	BC109	
D601-606	1N914	
D807	LED	
D608	10V zener	

rating to aim at is two amps. All relays must be shunted by diodes to prevent switching transients and all relay supplies and switching lines must be decoupled to prevent rf pickup.

TESTING AND ALIGNMENT

No alignment of the filters is necessary if they are constructed correctly. A dc path should be checked through each filter when the appropriate relays are activated and the signal path should be checked through the ant. change-over relay. When connected to the bandswitch the lpf relays should operate on changing bands. If power is removed from the board all relays drop out and there is an open circuit across the lpf unit.

The swr unit must be balanced before it can be used, the antenna input should be terminated with a 50ohm dummy load and a transceiver capable of 10W output should be connected to the input of the bridge. C507 is adjusted to null out the voltage appearing at the ref alc terminal.

In some cases it may be necessary to reverse the fwd and ref connections – this will become apparent if the voltage cannot be dipped or nulled. Calibration of the swr meter is a matter of personal choice, however. The meter used has a power scale below the S-meter scale and it was convenient to set the fwd scale for 25 watts fsd. The Rev scale can be made more sensitive if required as the alc system will not allow excessive reverse power to appear.

THE PA UNIT

The pa unit is not given a module number as it is purchased as a complete kit from Cirkit Holdings at a price in the region of £28 + VAT. It comes complete with all components, pcb and full assembly instruction.

The output of IC401 is capable of directly driving the pa to an output of at least 20W on all bands, including 1.8MHz where the drive requirement is slightly higher owing to reduced pa efficiency.

Transmit control of the pa is achieved by switching the 13V bias rail to the two bias regulators while leaving the amplifier connected permanently to the 13V rail.

After some months of operation two minor modifications became necessary. The two 100ohm pa feedback resistors R13 and R14 should be increased to 1W rating as they are prone to overheating. It was also discovered that the pa bias was slow to stabilise when switching to transmit, with the result that the first few words were distorted and the pa was found to be almost in class C. This is easily cured by changing R18 in the bias circuit from 10kΩ to 6k8 giving better regulation.

Since building the transceiver a number of Yaesu 100W pa units have appeared on the market as upgrade kits for the FT107, FT707 and FT77 low power models. They are capable of being driven directly from the IC401 and are ideal for the modular transceiver.

MODULE 6: ALC UNIT

Alc is essential on a multiband transceiver to

PA MODULE

Cirkit 1.6-30MHz HF PA Kit Pt No: 41-00903

MAIN CHASSIS

R1,2,3,4	10k histab
R5,6	1k
R7,8,9	1M
R10	8.2k
RVO1	10k lof AF gain
RVO2	10k lin IRT
RVO3	25k preset
C1	1000µF 25V
C2-8,11	10nF C
C9,10	47nF C
C12	100pF C
C13	1nF C
C14	10µF T
D1	1N4001
D2-13	1N914
LEDs × 3	
FBX	3tFX1115
FB	3t 26-43006301 Fairite
S1	SPCO Fwd/Ref
S2	DPCO Nor/Inv
S3	SPCO RF amp on/off
S4	DPCO IRT on/off
S5	DPCO Power on/off (to carry 5A)
S6	Yaxley 2 wafers 1 pole 11 way
IC1	7808 Reg
IC2	CA3130 meter amp
Meter	200µA 'S' Meter CIRKIT
Plugs and sockets as required.	

ensure a constant output power on all bands and to prevent excessive overdrive on some bands. It can also provide swr protection by reducing the drive level at a predetermined swr.

The alc unit is self-contained and uses a single ic, IC601, which can either be a Motorola MC3401 or the more common LM3900 Quad Norton current comparator. Fwd current from the swr unit is fed via R605 (Fig 18) to IC601b where it is compared with a reference current derived from RV601 through R607. The reference current will determine the alc threshold or maximum gain of the transceiver. If the output level starts to exceed this level the comparator will produce an increasing voltage at the output of IC601b which is fed via a time constant circuit providing a rapid attack and slow decay to IC601c operating as a buffer amp. The output from IC601c is a dc bias which can be used directly to control the gain of IC401 on module 4. An increasing voltage on the alc line reduces the gain of the SL610 and holds the transceiver output power at the level set by RV601. Output from the alc unit is summed with a dc bias obtained from the manual drive control by diodes D604,606 and permits the drive control to override the alc in turn allowing power reduction from the maximum level set by the alc threshold down to about 100mW.

Reverse alc is provided by IC601a which amplifies the rev current obtained from the swr unit and sums it with the fwd current fed to IC601b. The result is that any reflected power will cause greater alc action than that produced by forward power and the output level will be reduced as long as the high swr condition exists. The threshold level for reverse alc action is controlled by the gain of IC601a which can be altered by changing R601.

The fourth stage of the Norton Amp IC601d is used to feed external alc from a linear amplifier into the alc unit in order to control the total system gain. It is designed to take negative-going alc voltages and is compatible with most

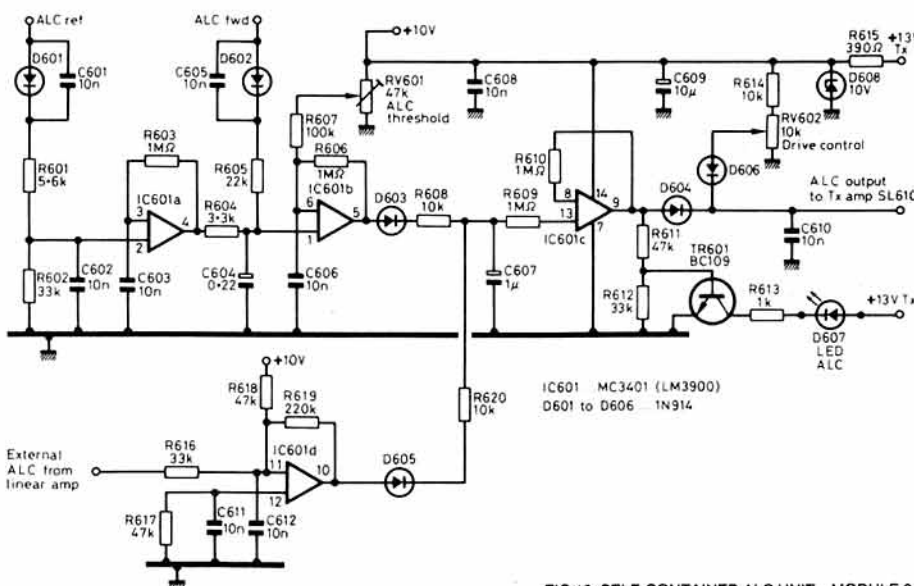


FIG 18. SELF-CONTAINED ALC UNIT - MODULE 6.

valve linear amplifiers. If not required, this stage can be omitted. The alc range required by the SL610 is from 2V to about 4.5V with maximum gain occurring at 2V or below.

CONSTRUCTION AND TESTING

The alc unit is constructed on a glass fibre single-sided pcb measuring 2.4" x 3" (Figs 19, 20). Testing the unit is difficult without the rest of the transceiver and should be completed when everything else is working. With the transmitter producing about 10W into a dummy load and the alc unit in circuit it should be possible to adjust RV601 to a point where the output power starts to reduce. This should also coincide with the illumination of the alc led. If this works, increase the manual gain or drive level for maximum output. The output power should remain at the level preset by RV601 which can now be adjusted to the desired maximum output level - 18 to 20W is ideal for the Cirkit pa unit. When the transmitter is talked up on ssb, the speech peaks will illuminate the alc led but the output should not exceed the preset level. If the alc led illuminates permanently, it is an indication that the transmit gain is a little high and the drive control can be used to reduce the gain to a point where the alc action produces a flickering led.

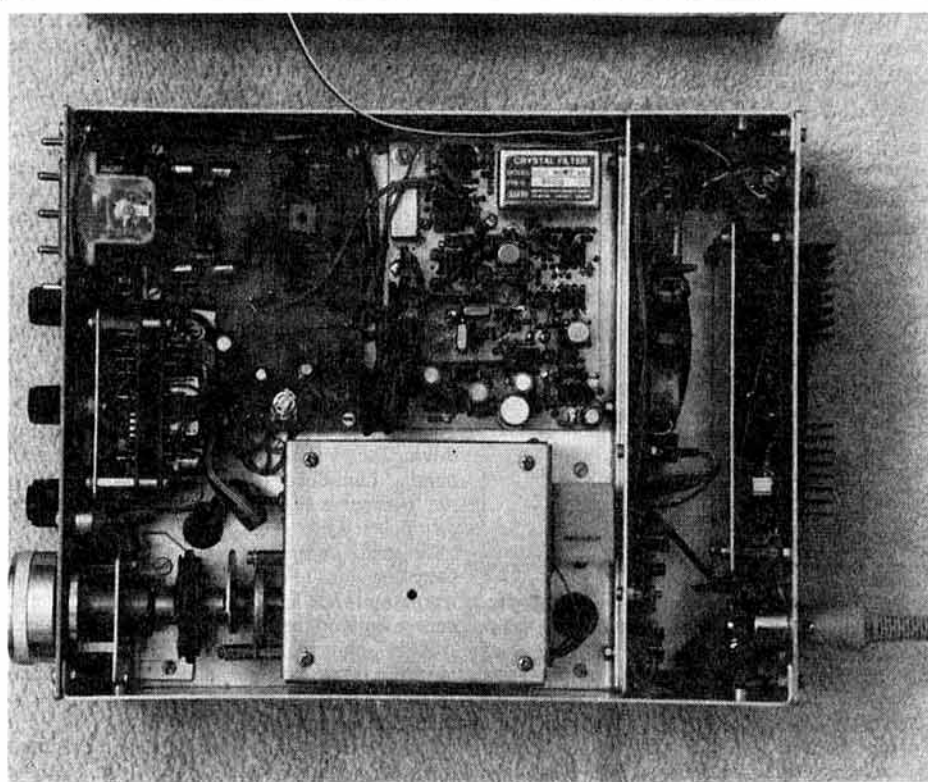
Reverse alc may be checked by increasing the swr by inserting an atu between the output and the dummy load. As the swr is increased so the alc action will rapidly increase and reduce the power output level.

The manual drive control will simply reduce the power from the maximum set by the alc threshold down almost to zero making QRP operation a simple matter and ideal for tuning up an antenna. The alc led will not function when the power is reduced manually as it only indicates when the alc unit is controlling the output level.

MAIN CHASSIS

All modules have been housed in an aluminium chassis which serves as a convenient frame as well as providing an element of screening and heatsinking. Fig 21 illustrates the chassis wiring required to interconnect the modules, plus the associated switching functions.

Bandswitching is achieved with a two wafer Yaxley type switch employing two one pole 11 or 12 way wafers with break before make con-



TOP VIEW SHOWING MODULES 1, 2, WITH 5, 6 AND PA AT REAR

tacts. The rear wafer should be sited close to module 3 where it directly switches the various xtals into circuit. Lead lengths should be kept as short as possible to minimise stray capacitance. The front wafer is used to switch the 13V rail to the various circuits that require bandswitching using multiway ribbon cable via a small junction pcb. This can be fabricated from a strip of Veroboard or be specially made. All switching lines are decoupled to ground at the junction pcb and the various multiway cables are connected to the respective modules using a simple plug and socket system.

The vfo is housed in a metal enclosure which must be securely fastened to the main chassis and tuned with a suitable slow motion drive with a reduction ratio of at least 60:1 for smooth tuning. Either a mechanical dial or a digital frequency counter can be used to display the operating frequency.

An enormous range of possibilities exist for the layout of the transceiver. It can be large to accommodate additional modules and future modifications or miniature if that takes your fancy. My own transceiver was made 9.5" wide, 3.5" high and 12.5" deep, making it ideal for portable working and still smaller than any multiband commercial transceiver. Location of the individual modules is not likely to be critical provided a sensible approach is adopted. The pa unit ideally should be mounted on the rear panel where heat sinking is relatively easy to arrange. A 2.5" x 4" x 0.5" finned heatsink has proved more than adequate and barely runs warm in ssb operation. The lpf unit should also be located near the rear of the unit and should be screened from the remainder of the transceiver.

CONCLUSION

The modules described were originally built in

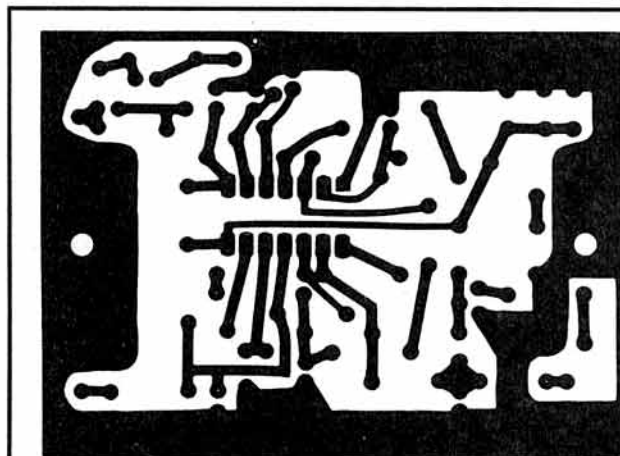


FIG 19. ALC PCB DESIGN - ACTUAL SIZE.

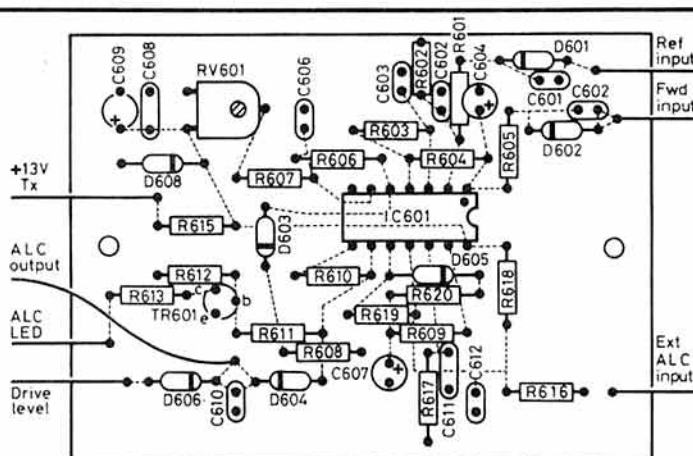


FIG 20. COMPONENT LAYOUTS FOR THE ALC PCB.

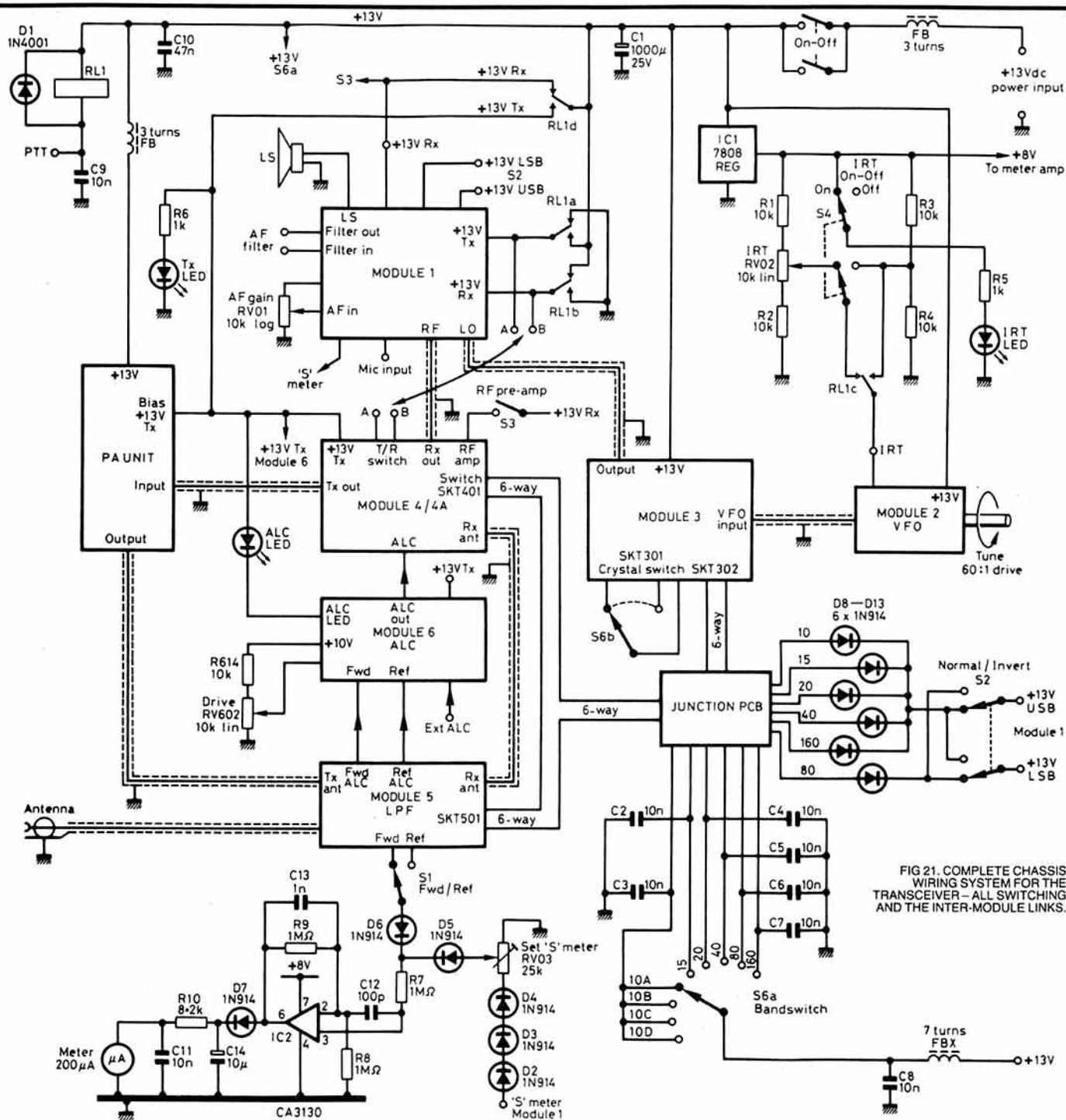


FIG 21. COMPLETE CHASSIS WIRING SYSTEM FOR THE TRANSCEIVER - ALL SWITCHING AND THE INTER-MODULE LINKS.

an attempt to produce a home-constructed multiband amateur transceiver without overcomplication. The results achieved have been far better than originally expected and the home made transceiver is now used in preference to my commercial one. No sophisticated test equipment was used for testing or alignment, but access to a dfm, signal generator and a vvm or oscilloscope is necessary.

The G4CLF module has been built by the author for three separate designs and has performed well in each. The new design of pcb produced an exciter unit that is much easier to

duplicate than the original and has now been successfully copied by four other amateurs.

Each module was constructed and tested independently before final assembly. This was initially done in breadboard form to make sure that it all worked. The chassis was also home constructed and scaled up from the earlier 1-8MHz single band unit. G2CKM has faithfully followed my design and produced a very similar transceiver; this has provided much useful feedback including verification of the circuit diagrams and component lists.

Additional features may be added to the basic

transceiver to suit personal preference and may include such items as a digital frequency counter, speech processor, audio filter, cw sidetone and keying unit and a variety of other add-ons.

No great originality is claimed for the circuitry which has evolved from studying numerous commercial manuals as well as the *ARRL Handbook*. All I can claim is success in making it all work. Hopefully I can inspire others with a little less confidence to have a go at building something that will become their pride and joy for a long time to come.

JOHN ALLAWAY G3FKM

Please accept my apologies for the missing tables and loggings from this month's column. Owing to the postal strike no updated scores have been received and only GJ3EML, G3GVV, and G3YRM managed to make any input to the logs section. Thanks to them for their efforts – and better luck next time!

DX NEWS

Steve, G4UOL, will be on the **Isle of Man** from 20 November until 1 December as GD4UOL/P on all bands, cw only, and can probably be found five kHz above lower band edges. He will take part in the CQWDX Contest (cw).

Dave, KX6DS, expects to be at Ponape in the **Federated States of Micronesia** during the last week in November. He will have the callsign KC6TO and will be on all bands from 1.8 to 50MHz with a preference for cw on frequencies near 1,831, 3,505, 7,005, 14,030, 18,030, 21,030, and 50,110kHz. SM7PKK is on a Pacific tour and was due to be in **Niue** for the first week in November; he then moves to **Tonga** on 8 November and remains there until the 24th. After that he will go to **Fiji** and stay until 13 December. *DX News Sheet* says that he should be on the **South Cook Is** between 25 March and 4 April. He has an IC-735, a GPA-40, and wire antennas. On cw he will operate 5kHz above the lower band edges and on ssb on or near 3,795, 7,095, 14,195, 21,295, and 28,595kHz. A visit to **Vanuatu** by a group of Japanese operators, which should have taken place several months ago, has been re-scheduled for December.

DXpress gives advance notice of a big expedition planned to the Pacific area by eight operators and four crew of the 'Varua'. It is intended to visit **Kingman Reef, Palmyra, South Cooks, and Kiribati**. The operators will be a mixture of Americans and Europeans – HB9AEE, HB9AHL, F5II, VE3IEO, NM2L, ZF2KN, and KD2HE are mentioned. The cost will be in the region of US \$50,000 and donations will be welcomed. More information is available from VE3IEO (55 Valecrest Drive, Islington, Toronto, Ont, M9A 4P5, Canada).

Pitcairn Is no longer seems to be rare. VR6CL is reported on 14,141kHz quite often at around 0630 but he doesn't like pile-ups. VR6TC and VR6KB tend to be around 14,146kHz at about the same time. VR6HJ is a lady operator as is VR6MW (who asks for QSLs via K9POX – see QTH Corner).

VP8BRY, on the Falkland Is, is active on 3-5 and 7MHz cw after 2000. Novice stations in **Argentina** are now using the LW prefix and can be found between 28,900 and 29,100kHz. LR1V is a special callsign belonging to the Radio Club of Bariloche – also in Argentina.

BY9GA is reported to have new antennas and to be found fairly often around 1400 in the 14,210kHz area. BY4RB is likely to be found most days after 1100 on 14,032 or 14,190kHz. At weekends the station has been reported on 21,226kHz between 1400 and 1600. *DX-NL* says that V8SSB, in **Brunei** is the daughter of V8SBA and often to be found around 1000 on 14,180kHz.

FT5ZB is due to leave **Amsterdam Is** this month. 4K0F is at the new drifting Polar station

in the Arctic Ocean and will be there for one year. Both cw and ssb operation will take place and QSLs (via UA0QBO) will be sent out beginning in February 1989. C9MKT should still be in **Mozambique** but is due to leave by the end of this month. *DX News Sheet* says that his transmissions are monitored so it is advisable to keep very much to standard amateur topics of conversation when in QSO.

OK1HH has very kindly supplied the information that QSLs for contacts with USSR stations in Antarctica during the period 1980 to 1986 – including 4K1A, 4K1HK, 4K1ANO, UA0ZDA and RA3AR/UA1C – may now be obtained direct from RA3AR (see QTH Corner). Box 146 Cambridge has now closed and QSLs for VP8ANT should now be sent to the address in QTH Corner. QSLs for G3CWI/CE7, G3CWI/CE8, V85NT, JY8NT, and VK9LW should now go to G3CWI, and for GM6UW/P, GT6UW, VK9LX, GJ3ZAY and GM3ZAY to G3ZAY. QSLs for GJ6UW go to G3XTT – see QTH Corner for details.

THAILAND

A report from RAST to the Region III Conference details activity in Thailand at the present time. It confirms that amateur radio became legal again with the signing of the new legislation in August 1987. Permission has been given for the society to operate the club and demonstration hf station every weekend. Since this began (on 17 January 1988) over 10,000 QSOs have been made. There is a contest station at the Asian Institute of Technology and most major contests are entered from there. A new committee, consisting of 15 members, has been elected and is headed by the President, HS1SS. Other callsigns listed include HS1s KR, YL, DC, BV, FAS, BG, DN, AMH, JN, PN, YP, and XX. A group of advisers includes HS1s WB, NG, and WC. New callsigns had yet to be issued to the remainder of the group. RAST points out that the legalisation of amateur radio is a considerable achievement bearing in mind Thailand's neighbours (Burma, Bangladesh, Vietnam and Kampuchea) where it is still 'suspended'. (*DXpress* reports that HS0B is now allowed to operate every day between 1100 and 1400 and that a beam has been installed).

EUROPEAN CW ASSOCIATION

More news from this organisation arrived with the rules for the EUCW Fraternising CW Party. This is that the FISTS CW Club has now become a member of the organisation. To celebrate its first anniversary FISTS was to hold a Straight Key Week in September but unfortunately I did not receive details in time for publication. The FISTS Century Award is given to those who score 100 points by working members in the UK or Europe (one point), outside Europe (two points) or with the club station G0IPX or G0IPX/A (three points). More information from G3ZQS.

Finally – a most useful service is now being provided (I wonder why nobody thought of this before?). There is now a 'phone-a-sked' service for beginners who are nervous about making their first cw contact. There's a list of operators

in the UK and Eire who are willing to help out (including their telephone numbers) available from G3ZQS (George Longden, 119 Cemetery Rd, Darwen, Lancs, BB3 2LZ).

BEACONS

The Czechoslovak Propagation Study Committee has set up its first 28MHz beacon. This is now on 28,282.5kHz and uses the callsign OK0EG. It is using 10W of F1A to an omnidirectional antenna and is located at Hradec Kralove in eastern Bohemia (JO70WE). Its frequency will change later in accordance with the proposed new beacon allocations. Reports would be very welcome and should go to OK2-19518 c/o Frantisek Janda, CS-25165 Ondrejov 266, Czechoslovakia.

There is now a 24MHz beacon in Italy. This began operation on 1 July 1988 on 24,915kHz with 10W to a ground plane antenna. Transmissions are on A1A and the beacon sends the message "VVVde IK6BKK/Beacon QTH Locator JN6KR". Reports would be welcomed and should be sent to Eliseo Chiarucci, via Sterpeti 50, I-61030 Montefelcino (PS), Italy. I4SN, who supplied this information also said that the automatic beacon IY4M has made over 1000 QSOs in the three years since it was set up. These have been mainly with Europe via Es, and by early August the only non-European contacts had been with W1AW, a few VEs and one OD5. A reminder that IY4M is located at Villa Griffone – the site of Marconi's early experiments between 1894 and 1896. It is on 28,195kHz A1A and varies its power between two and 20W at the request of the station it is working. At the end of the message it sends "IY4M robot QRV QRV" followed by a 30s interval during which it will accept calls in the format "VVVVVV IY4M de (callsign repeated three times) K". The call can be made at speeds between 10 and 50wpm and the beacon will reply at the same speed.

CONTESTS

All Austria Contest

1800 20 November – 0700 21 November
1,810-1,950kHz cw only

Single operator and listener sections. Exchange RST and serial QSO number (from 001). Austrian stations will also give a three digit number to indicate their Austrian District Locator (ADL). Each QSO counts one point and the multipliers are the nine OE call-areas and each different ADL worked. Each different prefix worked also counts as a multiplier. Preferably use the AOEC standard log and summary sheets (obtainable from OVSF) or otherwise use A4 size log sheets written on one side only. A summary sheet must be enclosed and this must contain a declaration "I declare that this station was operated strictly in accordance with the rules of the contest as well as with the national radio regulations". Entries must be postmarked no later than 31 December 1988 and sent to OVSF-AOEC 160m, Theresiengasse 11, A-1180 Vienna, Austria. Listeners follow same rules. Note that unmarked duplicates will not count and each one will incur a penalty of five points deducted.

ARRL 160 Metre Contest

2200 3 December – 1600 5 December
1.8MHz cw only. No time limitation.

The object is to work stations in the USA.

Single and multi-operator sections. Give RST, US stations will send ARRL section number. QSOs with W/VE count five points and the multipliers are the ARRL sections and VE provinces (a maximum of 75). Official entry forms are advisable (see below). Entries must be postmarked no later than 4 January 1989.

ARRL 10 Metre Contest

0000 10 December - 2400 11 December

All stations may operate no more than 36h. Single operator mixed mode, phone, or cw, and multi-operator single-transmitter, mixed mode only. Send signal report and serial QSO number (starting from 001). US and VE stations will send report and state or province (DC is a separate state for this purpose). /MM or /AM stations will send their ITU zone. Each complete QSO on ssb counts two points, on cw four. QSOs with US Novice or Technician stations (signing /N or /T) count eight points. The multi-



pliers are the 50 US states, Canadian call areas, dxcc countries (except the USA and Canada), and ITU zones worked. No cross-mode QSOs are allowed. Official ARRL entry forms are recommended - they are available from ARRL, 225 Main St, Newington, Conn, 06111, USA. Logs must show date and time, mode, and exchanges. Multipliers must be marked the first time they are worked. Note that entries with more than 500 QSOs must submit cross-checking (ie 'dupe') sheets. Entries must be postmarked no later than 11 January 1989. Certificates will be awarded to top scorers in each category and in each dxcc country.

EUCW Fraternising CW Party

1500-1700 and 1800-2000 19 November

0700-0900 and 1000-1200 20 November

Licensed amateurs and listeners. Cw only. Activity will take place in specified band



FOUR OLD-TIMERS IN THE SHACK OF VS6HO ON THE OCCASION OF A SPECIAL QSO WITH BY4AOM. LEFT TO RIGHT: MR SIT SUM (AN INDUSTRIALIST SEEING HIS FIRST AMATEUR QSO TAKE PLACE), MR SHING (FORMERLY C1HY, TSUI VS6HO AND DRAKE VS6EK (photo by courtesy VS6HD and G4AJJ)

segments only - (1) between 3,520 and 3,550kHz between 1800 and 2000 on the 19th and 0700 and 0900 on the 20th; (2) during all four sessions between 7,010 and 7,030kHz; (3) between 1500 and 1700 on the 19th and 1000 and 1200 on the 20th in the segment 14,020 - 14,050kHz. I can supply a photocopy of the rules to anyone interested (sase please). The organisers emphasise that this event is not a contest in the strictest sense (although certificates will be awarded to the top three entrants in each class) and that everyone is welcome to join in - whatever his or her capabilities with respect to morse speed or power. The idea is to encourage cw operators of all kinds to meet fellow enthusiasts in a friendly spirit and to demonstrate that cw is alive and well.

Japan Int'l DX Contest

2300 11 November - 2300 12 November

36h operation only. Phone only. Off periods must be at least 1h and marked in log. Single-operator multi, 3.5MHz, 7MHz, 14MHz, 21MHz and 28MHz sections. Also multi-operator multi-band. Work JAs only. QSOs count two points on 3.5 and 28MHz and one on the other bands. The multiplier is the total of Japanese prefectures plus Ogasawara, Minami Torishima and Okino-Torishima worked on each band (maximum 50). Logs as standard showing multipliers first time worked. Postmark before 31 December and send to Five Nine Magazine, Japan International DX Contest, PO B0X 8, Kamata, Tokyo 144, Japan.

PROPAGATION

G8KG's review arrived early this month in order to get through the postal problems, but he did remark that he would probably have nothing more to add in a few more days. He says, "The steady rise in the solar cycle continued during

August with the average solar flux for the month reaching 154 sfu and the daily value peaking at 190 on the final day, while the 27-day average topped 160 sfu, a value last seen in December 1982 at the end of the three years of nearly peak conditions in Cycle 21. The effect of all this was to be seen when the 28MHz band opened to all continents on 31 August - an encouragingly early start to the dx season.

On the basis of the data up to August the cycle is still very close on the heels of Cycle 19 (highest monthly solar flux 286 sfu) though the official forecasts are for a marginally lower peak."

Smithy concluded by saying, "I expect that by about December it will become clear whether or not we may be heading for a record peak but that it will be a high one is beyond any doubt".

HF MANAGERS' MEETING

A meeting of HF Managers took place during the weekend of 3-4 September. A number of issues were discussed and one of these was the naming of 'contest preferred segments' on 7, 21, and 28MHz. As the 7MHz band is so narrow the idea was not pursued and there was little support for trying to limit the amount of band space on 21 and 28MHz which some consider to be ruined during contest weekends. Contest preferred segments already exist on 3.5 and 14MHz and are normally written into contest rules.

A proposal that phone contesters on top band should be asked to keep their operations above 1,840kHz was not adopted and was opposed by DARC, NRRL, RSGB, RSVDDB and SRAL.

The definition of QRP was discussed and also the rather unsatisfactory position of those who enter low power contests with commercially produced 'black boxes' with their gain controls turned down - in fact, a bit against the spirit of the true QRP'er who uses a simple home-

A GROUP OF 'NORTHERN DX'ERS' CELEBRATING THEIR QSOs WITH KH4K, KINGMAN REEF, AND KH5, PALMYRA EXPEDITIONS. LEFT TO RIGHT: BARRY GW4RHW, PHIL G40BK, TOM G4STZ, IAN G4YSN, JOHN G4WXO AND BRIAN G3UJE



constructed transmitter (surely the whole reason for having a low-power section in a contest anyway?)

Alan Taylor, G3DME, reported on plans to set up an URSIgram type service beacon (giving propagation data and forecasts) perhaps transmitting from Sheffield University via a higher than normal UK power transmitter on a frequency outside the Region 1 amateur band (ie above 3.8MHz and possibly around 3.880kHz). This would of course be something also of value to the 'professionals' for which the amateur service could take credit.

RSGB presented a paper which called for measures to encourage more activity on 10MHz. Awards are already allowed for contacts on the band in our Region (but not in Region 2 and hence no dxcc credits) and it was felt that we should try to actually do something about this. Publicity in the shape of activity days, dx weekends, and more magazine articles should be encouraged. The same treatment is also needed for 18 and 24MHz.

The not so very burning issue of making a recommendation suggesting in which order the date should be written on QSLs didn't receive much support and the Region 2 proposal to give dates as year-month-day was rejected. If the month is expressed in words (eg 'Oct' for

October) there seems to be no problem anyway!

It was decided to recommend that the wording of the Region 1 Bandplan on 3.5MHz be changed to show, "In the segment 3.775-3.8MHz intercontinental operation should be given priority."

Packet radio on hf is a somewhat emotive subject at times. There was a lengthy discussion and the outcome was a recommendation that for the time being the following segments be designated preferred areas of activity for packet radio within the existing rtty allocations:

3.5MHz	3.590-3.600MHz
7MHz	No allocation
10MHz	No allocation
14MHz	14.089-14.099MHz
21MHz	21.1-21.120MHz
28MHz	28.12-28.15MHz
	29.2-29.3MHz (NBFM)

NRRL reported on experiments with 1200baud transmission at 2kHz and several societies expressed their support for allowing 1200baud on hf. The meeting was anxious to see that only a very limited number of mailboxes should be used on the hf bands. My personal view is that on 14MHz we have a *fait-accompli* with packet already using the area just above 14.1MHz to a considerable extent. Maybe it would be better to recognise this as a fact of life and accept that this

is going to continue whatever pleas or recommendations are made. The problem is that packet has developed relatively quickly; the result is that agreement on the frequencies that it should use should have been done at international level but would have taken quite a while to take place. It has been overtaken by events. However, for the time being it is our obligation to follow the recommendations listed above.

Closing date for contributions for the January 1989 column will be 1 November 1988.

QTH CORNER	
C9MKT	SM5KDM, L.Hognert, Olandsresan 21, S-72555, Uppsala, Sweden
G3CWI	44 Frencham, Crown Wood, Bracknell, RG12 3TQ
G3XTT	105 Shiplake Bottom, Peppard Common, Henley-on-Thames, RG9 5HJ
G3ZAY	41 Enniskillen Rd, Cambridge, CB4 1SQ
RA3AR	Toivo Laimitainen, PO Box 459, 127349 Moscow, USSR
ST2KR	Box 3552, Khartoum, Sudan
T5GG	via I2MQP, Via Stradella 13, I-20129 Milan, Italy
VP8ANT	(new) via G4ZAY, 12 Rye Close, N.Walsham, Norfolk, NR28 9EY
VR6MW	D.F. Miller, NZ9E, 7462 W.Lawler Av, Niles, Ill, 60648, USA

HF F-LAYER PROPAGATION PREDICTIONS FOR NOVEMBER 1988

The time is presented vertically at two-hour intervals 00(00)gmt for each band, ie 00=0000, 02=0200, 04=0400 etc. The probability of signals being heard is given on a 0 (indicated by a dot) to a 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 plus (+) sign in the 28 and 3-5MHz columns respectively.

Time / GMT	28MHz	24MHz	21MHz	18MHz	14MHz	10MHz	7MHz	3.5MHz
000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122
024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802
** EUROPE								
MOSCOW	79984...	99996...	99999...	49999...	11.787789831	774765568987	987432235899	++42...25++
MALTA	78775...	89887...	99999...	39888...	23.787789973	886854568998	986832236899	++3...3++
GIBRALTAR	27654...	58877...	89995...	99997...	11.188788972	674675557998	998532357999	++52...25+
IRELAND	3664...	6888...	18999...	49996...	8888993...	552.76668985	887533346789	++52...34++
** ASIA								
OSAKA	61...	83...	196...	3871...	1.475422312	1.243235764	2...13672	...34.
HONGKONG	19971...	29983...	38886...	37773...	1.155567631	2...22336885	...13685	...452
BANGKOK	29+83...	48996...	47889...	25778...	2...25568833	4...22336887	1...13687	...454
SINGAPORE	38988...	48996...	46889...	24778...	2...15568833	3...22336887	1...13685	...452
NEW DELHI	3+995...	58997...	56888...	34778...	311114568433	741...1236888	62...13688	3...455
TEHRAN	4+983...	68896...	87789...	75578...	424422568854	8741...1236888	862...13678	53...45+
COLOMBO	4+985...	57897...	45789...	22678...	42...3568954	72...236898	5...13688	2...45+
BAHRAIN	5+888...	68895...	75689...	1.1634789621	6443.1568975	984...236899	861...13678	53...44+
CYPRUS	3+997...	59998...	88899...	11.88789831	664765678986	997532357999	862...124788	++3...44+
ADEN	4+889...	67889...	1.55779621	311233689853	7542...368997	984...36899	861...13678	++3...445
** OCEANIA								
SUVA/S	3651...	6873...	28886...	58888...	7656861...	2432364...	22...131...	...
SUVA/L	331...231	11.6531.452	22.187643763	121.887665852	267545762...	4421254...	11...21...	...
WELLINGTON/S	26641...	48863...	78886...	88888...	27656851...	3432364...	2...131...	...
WELLINGTON/L	1...	1...1	12...122	221164211433	2365334521...	3421253...	1...21...	...
SYDNEY/S	18773...	39885...	59889...	58778...	26556872...	4223673...	1...1351...	2...
SYDNEY/L	1...	32...11	7521.142	1.86421463	75444752...	4212563...	2...24...	...
PERTH	478743...	58986...	57888...	35778...	2...2568953	1...2236884	1...13662	43...
HONOLULU	1...2...361	131.5221661...	25252263...	452...131...	2...
** AFRICA								
SEYCHELLES	4568741...	5678863...	1.545788621	311233689853	852...368997	951...36889	83...13678	5...44+
MAURITIUS	4688872...	5678861...	1.545799731	32.322589964	852...268999	84...36899	62...3688	3...45+
NAIROBI	3888973...	57789932...	21.655689852	531523489983	9832...158999	984...25899	862...3687	53...355
HARARE	25678841...	466789741	32.545589974	65.522269997	9832...37999	984...15899	861...2688	54...35+
CAPETOWN	56789631	1.166789853	43.454568986	761532248999	9943...15899	9851...3699	862...478	53...5+
LAGOS	9+888631	11.98789863	43.385568986	761532248999	99573...16899	99851...3799	7772...588	55...25+
ASCENSION I	78768731	11.87778863	33.85557986	662273225898	99765...2699	99962...389	8784...168	555...35
DAKAR	7+889731	88879862	231.97557985	553.85326898	998462...3799	99974...489	77851...268	5452...43
LAS PALMAS	6998961...	8999983...	1.99889962	231.98888994	786486657899	999864334799	888631...1589	++4...25+
** S. AMERICA								
Bh SHETLAND	35667631	57777752	221.88766775	553.87654577	787475321246	5666421...13	23431...1	...
FALKLAND I	688873...	58777752	221.78755675	453.87532467	8883732...147	788742...147	57751...1	2442...
R DE JANEIRO	175573...	38666751	111.68544675	443.86322487	888373...168	99741...37	87852...15	5452...2
BUENOS AIRES	2666773...	57767751	111.78644574	333.87422364	8882751...37	89742...15	67852...2	4452...
LIMA	...+8872	98774...	2854452	112.14732244	6671455...16	7896422...3	57852...1	2452...
BOGOTA	...+872	98774...	2854452	112.4732254	6571155...37	8895422...5	77752...2	4442...
** N. AMERICA								
BARBADOS	5+8873...	797775...	8854672	112.7622475	6671354...158	9886421...37	77752...5	5542...2
JAMAICA	8+872...	98774...	1865561	111.4742364	556.3551...36	8885432...5	77752...2	4442...
BERMUDA	29+872...	498884...	7876771	111.17754674	556.45521368	8885432...37	77752...15	5442...2
NEW YORK	79961...	89883...	38886...	111.5776673	555.25553367	88844322.136	77752...13	4442...
MEXICO	8861...	19872...	388654	111.2.584332	455.51551.14	888443223...2	37752...	452...
MONTREAL	6961...	189982...	388885	1.577772	554.2554566	888443221236	77652...14	4442...
DENVER	275...	4861...	7873...	77641	453.3.265334	688352232.3	37752...1	442...
LOS ANGELES	64...	4861...	2872...	1...48531	353.31.56223	478352133...1	26752...1	342...
VANCOUVER	12...	34...	672...	1...1774	352.31.47653	577242134323	25752...12	242...
FAIRBANKS	...	1...	23...	1...112461	341.44357753	566253236544	24552...13321	22...

The provisional mean sunspot number for August 1988, issued by the Sunspot Index Data Centre, Brussels, was 111.2. The maximum daily sunspot number was 171 on 9 August and the minimum was 22 on 22 August. The predicted smoothed sunspot number for November, December, January and February are respectively: (classical method) 121, 128, 135 and 141; (SIDC adjusted values) 119, 128, 136 and 143.

- A gleaming new Ford Escort 1.1L car.



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- A Kenwood TS-711E transceiver donated by Lowe Electronics Ltd, or an Amstrad TV/Video



- Yaesu FT770RH 70cm FM Transceiver donated by ARE Communications Ltd.
- SC-1200 printer donated by ICS Electronics Ltd.
- Star Masterkey MKII & CMOS memory keyer donated by Dewsbury Electronics.
- Two antennas of your choice donated by Randam Electronics.
- Two software packages – Tiny-PC and Z-Match – for the PC donated by Number One Systems Ltd.
- Gift vouchers for non-radio amateurs.



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Call sign

Address

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Signature:

KEN WILLIS G8VR

Much of this month's uhf news relates to the 50MHz band once again. However 144MHz also perked up as some fine weather during September produced exceptional tropo conditions. The highlight was the path between the Canaries and the UK which developed during 9/10 September permitting numerous contacts between the UK and EA8, many of them with end-stop signals. It was a surprise to find so many EA8's active on 144MHz. With much of this path being over the sea, these openings are usually assumed to be due to marine ducting, which mostly favours UK stations in GD, EI and GI. However this time the coverage appears to have been much more widespread. The postal strike reduced reports to

a low level, but it is understood that a station as far north as IO68 (WS) square worked EA8, which if true, will be a new UK 144MHz tropo record. However, for IARU Region 1, the archives show that on 9 August 1981, EA8XS was reported to have worked TF6IG in Iceland over a path in excess of 4000 km. In this opening G6DZH worked four EA8's, collecting five new squares since other Spanish prefixes were worked. Keith reduced power to one watt in a contact with EA8BML but was still received at strength five. Reports of contacts with EA8 and other dx locations (not forgetting any fm contacts) will be appreciated to plot the full coverage of this event. The high-pressure system of

19/20 September produced another excellent 144MHz opening to OK, SP, HG, HB9 etc.

REPEATER NEWS

Mike Dennison, the long-time chairman of the Repeater Management group, recently joined RSGB headquarters staff where he now copes with a variety of complex administrative matters. Mike's past contributions to the planning and development of the UK repeater network are well-known and greatly appreciated by those involved in the administrative side of repeaters, so it is good that he will be nearby and in some ways ideally placed for his experience to be tapped when required in the future. The new

Although there's some evidence that the current solar cycle may peak earlier than expected, with the prospect of some super 50MHz dx via F2 propagation, few could have envisaged the events towards the end of August and early in September which showed just what the 50MHz band is capable of when conditions are right. At the time of writing, there have been three or four separate openings involving the UK.

28 AUGUST

G4UPS heard ZS6PW (Pretoria) in beacon mode at about 1603gmt. Shortly afterwards on 50-110, slow cw was copied from ZS6XJ. Soon some South African stations appeared on the band and were worked two-way by G3JVL, G3SED, G4JCC, G4ICD plus two or three others in the Southampton area. The South Africans were ZS6XJ, 6WB, and 6LN (all Transvaal) but there were possibly others. At 1714gmt Ted, G4UPS, telephoned to tell me what was happening. Twenty seconds later I was in the shack – the antenna already turning towards the south. Hearing "qrz" from ZS6XJ, I called. He came straight back. We exchanged details and in less than five minutes he was gone. Thanks, Ted, for a most memorable experience! At G4ICD, ZS signals peaked S9, but at my location, further to the east, signals were very much in and out, though reaching S5-6 on peaks. G4ICD made the first ever ZS-GJ contact for this band, working two of them.

The ZS's also worked into France and Holland, creating quite a pile-up in the process. DL9RM worked ZS6WB and ZS6LN crossband 28/50MHz, and I heard that SZ2DH worked ZS6XJ. During the opening, the Maltese beacon, 9H2SIX, was quite strong in the south of the UK, adding support to the view that this was trans-equatorial propagation (tep) extended by sporadic E at the northern end. No records were broken since – as the illustration shows – some forty years earlier, in April 1948, G5BY in Devon worked ZS7P in Capetown for the first ZS-G two-way contact on 50MHz, at the same time setting a new UK distance record for the band.

29 AUGUST

Following this opening to ZS6, with a close watch being kept towards the south, rewards came on 29 August between 1700 and 1800gmt. It all started when GW3MFY was heard calling a ZS3, after which ZS3AT and ZS3DM in Nami-

bia, which ranks as a separate country for award purposes, appeared on the band. Among the UK stations who worked at least one ZS3 were G4GLT, G3SED, G3COJ, G3JVL, G3SED, G4IJE, G4IGO, G4IIL, G3ZSS and G8BCL. Another ZS3 was heard, together with at least one ZS6. No-one has mentioned any sporadic E on this occasion though again the mode was almost certainly extended tep. Unless there are other claimants, the first G to work ZS3 appears to have been G4IGO for a first-ever ZS3-G contact on the band. Via 28MHz, ZS3AT repor-

28MHz signals from Indonesia, but nothing from the ZS direction. At 1730, ZS6XJ worked 4X4IF and 4X6IF, both crossband 28/50, followed by a contact with Fab, IOHCJ in Rome. Later, Mike heard Eduardo, LU7DZ, talking on 28MHz and they tried a 50MHz test, without result, during which Tim, G4VXE broke in excitedly to say that he could copy LU7DZ's keyer. Over the next hour or so 50MHz history was made, with LU7DZ working eight UK stations two-way on 50MHz. What made it the more interesting was that he transmitted simultaneously on 28 and 50MHz, and with the 28MHz band staying open until nearly 11.00pm clock time, it was possible to follow the action even though Eduardo's 50MHz signals were audible over only a limited part of the country. The first to make it was G1PAM (Cornwall) for an enviable first LU-G. The others worked were G4GLT, G3CCH, G4VXE, G4VXE, G4UXC, G3ZYY, G4AFJ and G6ION. The longest path was to G3CCH (Scunthorpe) estimated at 7051 miles (11,223km) for a new UK distance record on the band. Eduardo said it was "a great day for 6 metres". His friend LU9AEA, only 2km distant, needed consoling because he heard nothing from the UK! Reports varied between S1 and S3. After the event, LU7DZ said that on 27 August, the day before our opening to ZS6, his "season" started when he worked into the southern states of the USA, and there are also reports of a WB4 hearing ZS3AT – both very long paths.

APRIL 1, 1948.

G5BY CALLING

Thurleston Man's 6,000-Miles Contact

Within 24 hours of receiving permission to transmit on the six-metres waveband, Mr. H. L. O'Heffernan, G5BY, of Thurleston, exchanged signals with Mr. Henry Rieder, ZS7P, of Capetown, South Africa, for the first two-way contact on six-metres between this country and South Africa. This was followed a few days later by yet another two-way contact, which lasted over 15 minutes.

Mr. Rieder, who was born in Plymouth, spent his boyhood in Devon.

The 6,000-miles contact with South Africa remains the farthest distance so far accomplished by British experimenters using the six-metres wavelength.

ted having worked 12 Gs and PAO during the opening. After the main event Maureen GW8ZTP is understood to have worked ZS3DM for a first-ever GW-ZS3 contact for this band.

8 SEPTEMBER

Exciting though they were, the events just described were only an overture to some even more remarkable propagation on 8 September. These notes are based on a much more detailed account by Mike Walters, G3JVL. Mike commented on the excellent conditions which prevailed on 28MHz all day, with VK6, VK7 and JA being worked by stations in the UK. During the 24 hours, the 50MHz band opened up between VK6 and Japan for the first time since the Spring equinox. At 1400, Mike noted strong

FRIDAY 9 SEPTEMBER

A more localised opening was reported between the Channel Islands and ZS3 on 9 September when ZS3AT worked GJ6TMM, GJ6GJP and a visitor to the island, GJ4VPM/P, with GJ6TMM making the first-ever ZS-GJ contact for this band. ZS3AT also worked a French station in JN06.

13 SEPTEMBER

A short opening to ZS3 from 2034 to 2055 gmt, when ZS3AT worked G4IGO and G3JVL, appeared to be a class 2 tep event.

14 SEPTEMBER

An opening between 1400 and 1500 gmt in which ZS3AT worked several G's, 2 GJ's, F, PA and SZ appears to have been F2 propagation, suggesting (as G3JVL said) that this cycle will be at least as good as the last one.

chairman of the RMG is Geoff Dover, G4AFJ (Leics). Geoff clearly has interests which extend beyond repeaters, for should you have been listening on the 50MHz band during the evening of 8 September you would have heard him working Argentina over a 7000 mile path; pretty good coverage by any standards!

During the summer a number of packet radio repeaters started up, all on 144-650MHz. At Gloucester, GB7GH was the first to become operational using the GB7 prefix which eventually will be assigned to all data repeaters and mailboxes. Reports on reception of GB7GH would be welcomed by G6AWT. Close on its heels, GB7EA at Bury St. Edmunds started up, and again reports will be appreciated (G4XRK). Then the flood gates seem to have opened with GB7SP, near Paisley (GM3SAN), GB7CS, Central Scotland (GM1VBE) and GB7NU, Western Isles (GM8SAU) all coming on from the north, followed by GB7HZ, Penarth (GW8HEZ) in Wales. DTI announced the approval of further 144MHz packet repeater licences for GB7GL (Glasgow), GB7HP (Portsmouth), GB7LX (Louth), GB7MX (Ipswich) and GB7UX (Bath), so, obviously, this form of data communication is obviously very much a growth area.

Some items from the Leicestershire RG Newsletter, squeezed out of last month's copy owing to lack of space, are of general interest. The group has been able to reduce its annual subscriptions, their strong financial position being helped, in part, from a successful boot sale which made a nice profit. It was also good to read that the LRG chairperson, Maureen, G4RZH, presented a birthday bouquet to none other than Mrs G5UM at the group's agm. See elsewhere this month for news of her OM, G5UM. Another snippet from this excellent newsletter is a simple circuit using a single NE555 chip which will 'time-out' your ptt or send/receive switch, which is very useful in avoiding situations when a carrier might inadvertently be left on, so disabling the repeater. G8VR once did this to the Naugatuck repeater in Connecticut, souring Anglo-American relations until the next shipment of real ale arrived from the UK. LRG members have on more than one occasion been very successful in 'sleuthing' rogue carriers on the input of their repeater.

BEACON NOTES

The Northern Ireland 50MHz beacon GB3NGI was activated on Sunday 20 August, coming up on 50-0625MHz, but this may not be the frequency at which it finally operates. Reception was widespread from the first switch-on, although some problems due to water penetration later caused a shut down for maintenance work.

Geoff Holland, G3GHS reported that the mid-Cornwall Beacon & Repeater Group has received approval for beacons on 50-0425 and 1296-860MHz. These will be added to the GB3CTC beacons already operating in the 70, 144 and 432MHz bands from St. Austell (I070). The new callsign applied for is GB3MCB, and Geoff suggests listening for updated news via the RSGB news bulletins since the existing beacons will have to go qrt while the aeriels are fitted to the new mast, owned by British Gas. It is possible that by now all this will have been accomplished.

METEOR SCATTER

The Leonids shower is due to peak this month. In August I mentioned a meteor scatter prediction computer program by W1JR and AD1C. This gives 20.00gmt 16 November as the probable peak of this shower, but because the prediction is accurate only to plus/minus 12 hours, and the Leonids is a shower of very short duration, it's anyone's guess just when the peak will occur. Predicting peak times is, in any case, always difficult. While astronomers may be able to estimate the peak of the visual shower accurately, where (as opposed to when) it occurs is very important. If the declination of the shower is such that it lies below the radio horizon, it will provide little or no reflections whether or not you are qrv at the peak time.

Looking ahead to next month, a more useful shower, the Geminids, is due to peak at 23.56gmt on 12 December according to the W1JR program. This prediction is again accurate only to plus/minus 12 hours, but in this case the shower effects typically last for as long as three days, so even if the peak is missed, 12 December is a good bet. From another program by DL5MCG, as modified by G4IJE, the best times for the Geminids on 12 December are as shown on the accompanying chart. The good news for workers is that these predicted best times are outside normal working hours, so you won't need the day off to catch that rare dx!

I am still able to provide copies of meteor shower data for the entire year (nearly 200 separate major/minor showers) listing decli-

nation, Right Ascension and ZHR rate (10p stamp plus sae please). Also, for a copy of the W1JR program, send a 5-25" disc formatted 40-track with return postage, preferably a sae or jiffy bag. This program will run on a BBC or Electron micro.

Going back to the Perseids last August, some reports have come in which suggest that this shower was not as poor as I thought (don't tell me that I missed the peak with all this computer information!). On 12 August Steve, G4JCC (Hayling Island) worked Y27BL, Y27BO, I7EWO, I0NLK and I4DCX. Then next day (13 Aug) he worked YU3C, YU2SA, OK3LA and OE3HCO, all these on 144MHz. In the same shower, George G3NOH reported "not a great deal of success", but then went on to say that out of six skeds, five were completed (with GB4VR, HA7PL, YU2CCB, HG3DCX and OE3XCW). Only SP6ASD got away. He also spent "a total of about ten hours on the random cw channel during the dark hours of 10, 11 and 12 August" when he worked HG5PT, SK3LH and OE3JPC. He called OY/SM0KAK for 4-5 hours without success, but nevertheless felt that the shower was a good one although cw activity was low. He learned via the 14MHz vhf net that HG3DXC received 92 second burst from him during their sked, while George received several bursts of about 30 seconds. During listening periods George passed the time making up half a dozen braid breakers and 3-notch filters to combat tv!

GEMINIDS			MAX. 12 December		ZHR 80	RADIANT AT RA 112, DEC 33		
HRS	AZ	EL	N/S	NE/SW	E/W	SE/NW		
00	118	62	XXXXXX	XXXXXX	XXXX	XX		
01	144	69	XXXX	XXXXXX	XXXX	X		
02	181	72		XXXX	XXXXX	XXXX		
03	217	69	XXXX		XXXX	XXXXXX		
04	242	61	XXXXXX	XX	XXXX	XXXXXXX		
05	259	53	XXXXXXXX	XXXXX	XX	XXXXXXXX		
06	271	43	XXXXXXXXXX	XXXXXX		XXXXXXXX		
07	282	34	XXXXXXXXXX	XXXXXX	XX	XXXXXX		
08	292	25	XXXXXX	XXXXXX	XXX	XXX		
09	303	16	XXXXX	XXXXX	XXX	X		
10	313	9	XX	XXX	XX			
11	324	3	X	X	X			
12	336	-2						
13	348	-5						
14	1	-6						
15	13	-5						
16	25	-2						
17	37	3	X		X	X		
18	48	10	XX		XX	XXX		
19	58	17	XXXX	X	XXX	XXXXXX		
20	69	26	XXXXXX	XXX	XXX	XXXXXXX		
21	79	35	XXXXXXXXXX	XXXXX	XX	XXXXXXXXX		
22	90	44	XXXXXXXXXX	XXXXXX		XXXXXXXXX		
23	103	53	XXXXXXXXXX	XXXXXX	XX	XXXXXX		
24	120	62	XXXXXX	XXXXXX	XXXX	XX		

ESTIMATED BEST TIMES FOR MS CONTACTS IN GEMINIDS, 12 DECEMBER 1988. MAX PROBABILITY = 10, zero = below horizon

CT1DTQ reported hearing beacon VP5TI on 50-099MHz, so this is one to add to your list.

G4UPS reported that the only ZS beacons qrv throughout the 24 hours on 50MHz are ZS1STB (50-904) and ZS5SIX (50-075). Ted also said that the ZB2 50MHz beacon has been qrt owing to it having caused tv and telephone interference, so a site change is in progress. Finally, the Icelandic beacon TF3SIX on 50-057, having developed a fault, had been returned to the UK for repairs. It could well be back on the air by now.

JACK HUM, G5UM

As you read this, Jack Hum, G5UM, will be in the process of handing over the duties of VHF/UHF Awards Manager to Ian Cornes, G4OUT. During a long amateur radio career going back to 1927 when he was first licensed, Jack has devoted a vast amount of his spare time and effort in furthering the aims of the RSGB and amateur radio generally, and in encouraging and assisting radio amateurs in every possible way, even though this inevitably kept him off the air more than he might confess. Jack served on the

Council of the RSGB from 1952 until 1959, and in those days when vhf was less popular than it is today, was a founder member of the VHF Committee (1959), serving for some years as its secretary. Older readers will also recall that between 1966 and 1975 Jack wrote the *Four Metres and Down* column in *Radio Communication*. He is still a prolific writer on vhf topics, and a firm believer in the pleasures that can stem from the use of simple home-brew equipment, much of which is to be found in his own station. In recognition of his many and varied contributions to our hobby, Jack was elected an Honorary Vice-President of the RSGB in 1974. A dedicated cw operator, he now plans to be more active on the vhf bands, 70MHz being one of his favourites. If you would like to contact him on the air try the bottom end of the 144MHz band during one the 'Monday night cw activity' sessions which he conceived.

We all benefit from people like G5UM who are prepared to give so much of their time and abilities without tangible rewards, so I am sure you will join with me in saying "thanks for everything, Jack", and in wishing him a happy "second retirement" during which his well-known call is heard more frequently.

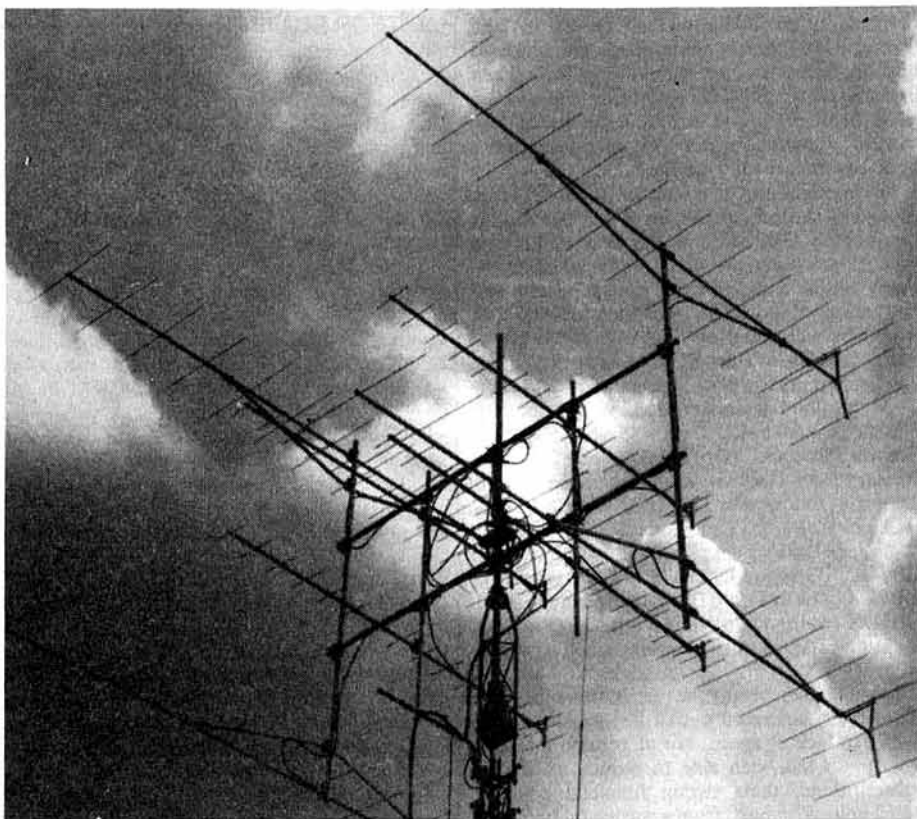
AWARDS

G5UM reported that "another uhf milestone was reached" when Dave, G4FRE (Felixstowe) submitted a claim for the first ever 110 squares and 15 countries worked on 432MHz. Dave also qualified for an ARRL VUCC award with the same batch of cards.

Paul, G4SXU achieved a 'Supreme' by adding a 1-3GHz standard award to his two 'seniors' on 144MHz.

Geoff Grayer, G3NAQ, gained a standard 70MHz award after only two months operation (and no contests!). He said that although warned that he would get only one qso every fortnight on that band, he managed to work nearly 100 different stations in 43 counties and five countries. Geoff uses a home-brew transverter with about 120watts output from a QQVO7-50, feeding a home-brew HB9CV 2-element antenna. He drives this from a TS820S, and so is limited to ssb and cw, but hopes to generate some fm shortly to increase his chances of working new squares and counties. Further proof that there is life on 70MHz was provided by G8CRT (Huntingdon), who clearly has few tvf problems since many of his contacts were made using 2-5watts to an indoor dipole, the remainder with 15watts either to the same antenna or to one of a pair of outside dipoles. He uses a Spectrum transverter driven by a FT290, and last summer worked 2-way into ZB2 and crossband with CT1WW and DL9RM.

To Johnny, G3CCH, went the honour of being the first to gain a 50MHz DX certificate, all contacts but two (Israel and Germany) being two-way on the band. He also received certificates for squares and countries (20) verified. 50MHz dx certificate No.2 went to G6HCV, nine out of 25 of his countries confirmed being via crossband. GJ4ICD holds the first certificates issued for squares and countries worked on the band. Other 50MHz awards went to Clyde G1TCH (Sussex), the first to a Class B licensee, and to husband and wife operators Betty (G1YNR) and Peter (G3KNU) of Scunthorpe whose neat little living-room station I visited.



THIS IS THE FINE ANTENNA SYSTEM AT G0DAZ, WORCESTER, CONSISTING OF A BAY OF FOUR 144MHZ YAGIS PLUS A BAY OF FOUR 432MHZ YAGIS.

FROM HERE

Rob Palmer, G1RFB (IoW), drew attention to work at Southampton University which seems to support theories that sporadic E propagation is caused by shear winds in the upper atmosphere. Rob says that work on Es by the Atmospheric Sciences group of the Physics Department, suggests that this mode of propagation arises from the movement of charged gas particles (ions) in the upper atmosphere, carried along by high-altitude winds. When situations arise in which two adjacent layers move in opposite directions, ions tend to converge at the shear zone between the two streams, producing a very thin, high-density ion layer which serves as a reflecting medium for radio waves. Presumably the reason why Es is mainly confined to summer months is that since upper atmosphere winds penetrate no higher than the E-layer, it is only when this layer is sufficiently ionised that Es will occur. (See also the last issue of Six News in which G3NAQ's paper on sporadic E was reprinted.)

John, G3UHH (N. Humberside), wonders whether his contact with SV0FE (Athens) on 3 June is a "first" SV-G for this band, and indeed if anyone else has reported hearing or working this station.

Some folk certainly manage to travel the world and take their ham radio with them! Hans, CT1DTQ, home call DK2PH, ex-OH2ZAE, wrote from Finland saying that he expected to be back in CT-land and qrv on 50MHz by the

time you read this. He enclosed an interesting report showing many openings between CT and G last summer. If you worked Hans and want to send a card direct, his qsl manager is DK3RV, but the CT bureau will also find him. Hans is in the record books for having made the first ever FP-CT contact on 50MHz on 7 June 1988.

If you have qualified for any RSGB vhf/uhf/microwave award since 1 January 1983, then you almost certainly are eligible to receive an ARRL VHF/UHF Century Club (VUCC) award. Send me a largish sae for particulars and entry forms.

Bud, K2YOF, reports that two qsls which he received in stamped addressed envelopes which he had provided arrived with the corners snipped off, presumably so that the contents could be checked. Another of his locals has had the same experience. Bud wants to ascertain which postal authorities are doing this, so if you have met this situation perhaps you would send me the details.

Clive, G3POI received a letter from WB2CZB confirming that only three two-way 50MHz contacts were made by the PJ0M expedition team, these being with GM3POI/A, G3SED and G4GLT. Pretty good, considering how much closer PJ0 is to the US mainland than the UK. It also says a lot for the way UK operators monitor that band even when conditions seem flat.

—AND THERE—

MIKE DIXON G3PFR

Many things have happened since I processed the September and October columns in late July, just before going away for my summer break. Some are of major importance to the future of microwave operation in the UK, so I've held over the next part of the review "whither on 10GHz?" until next month and hope that this does not present too much discontinuity in the discussion. Indeed, some of the new licence changes will have quite a profound bearing on 10GHz and other bands.

THE NEW LICENCE SCHEDULE

Several important points arise from the new schedule and explanatory notes, covered in full in the August issue of RadCom. Coming into force on 1 January 1989, what do these changes mean to UK microwave operators?

First, three new types of *unattended* operation will be allowed within the terms of your licence and using your own call sign: beacons, telemetry and telecommand for the purposes of (local) station or equipment control and digital (data) communications.

Second, there is no clause or explanatory note which says that any of these modes, including beacon or repeater/beacon operation, are forbidden on the 5.7GHz band. All of these points should provide a considerable fillip to experimental microwave operation, although there are still some slightly irksome restrictions left which, in the fullness of time and with growing experience of operating in the shared bands without interference to primary users, might be negotiated away.

Operation of *attended* 'personal' beacons was discussed here and in the Microwave Newsletter some time ago, together with some ideas for simple beacon equipment. Now the possibilities are considerably widened! The conditions were given in full in the August issue, so I don't intend to reproduce them here.

NEWS FROM SOUTH AFRICA

An interesting letter from my old friend and mentor Arnold, ZS6BMS/G3HBW (Pretoria, RSA), updates progress on 10GHz in the Republic. He has built a couple of NBFM/CW rigs based on the DB1NV driver (VHF Comms) and a MD4901 multiplier. After some difficulty with the DB1NV design, using substitute parts, the boards yielded about 200mW at 1152MHz, boosted to about 900mW by a 2N5944 amplifier before being multiplied to yield 30 to 40mW output. (Arnold, you might have had an easier job if you'd built the G4DDK 001 source and 002 amplifier!!).

A somewhat unusual transceiver approach was then taken: circulators and a common 28.8MHz IF, allowing duplex working on 10368 and 10339MHz, either nbfm or cw. First tests between ZS6AOU (fixed in Arnold's back garden, using a 95cm dish) and ZS6AVC and ZS6BMS (mobile up the Great North Road) gave QSOs at 60km, fm, and 90km, cw, the latter being a "slightly obstructed path". A small dish feed-horn was used at the "mobile" end. A few weeks later an obstructed 180km path was worked and then a 204km fm QSO, both ends now using 95cm front-fed dishes. The latter just

broke the original South African record set seven or eight years ago by Dave, ZS6BNT. One week later a 211km "S9+10 NBFM QSO" between ZS6AVC/ZS6BMS at Highlands Mountain Summit (N. Transvaal) and ZS6AOU, ZS6KO and ZR6AHL in the Magaliesberg - "just about radio-optical under normal conditions. The first contact was between ZS6AVC/6 and ZS6AOU/6 which therefore becomes a new (national) record, albeit of a rather modest kind". Further tests at 252km produced only weak signals "popping out of the noise for a few seconds every few minutes, but this was in the middle of the day with very hot, mixed-up atmospheric conditions and I suspect that it might work in the early morning when things are usually very stable at this time of year" - early August.

The reason why I quote Arnold's letter extensively is that it amply illustrates the point about mid-tech as a halfway house to hi-tech which is covered in a later part of "Whither on 10GHz?"! Congratulations to all operators on some fine initial results, creating a new national record and creating activity where there was previously little - keep up the good work!

As a postscript, Arnold asked about the earliest UK activity on 10GHz. Well, I can answer that one! Autumn of 1949, between G3BAK (now VK5ZO and still active on 10GHz) and G3LZ using klystrons and 70cm talkback! Their work was the subject of a very comprehensive four part article in the 1953 volume of *RSGB Bulletin*.

ONE MAN'S INTERPRETATION AND THE NEED FOR PLANNING

The fact that there are already beacons and repeaters licensed and running in the 1240 to 1325MHz band and beacons in the 10300 to 10400MHz sub-band (both excluded from the *unattended* operation clauses) suggests that *formal* licensing (ie, with an allocated site, channel call sign and close-down procedure) will still be required where *unattended* beacons, repeater-beacons and digital repeaters or link channels are to be licensed in the 23cm band and the various sub-bands in the 10 and 24GHz bands. *Normal* (attended) station operation has not changed. Again, on the face of it, *existing formally licensed* 1-3GHz band devices and 10-4GHz beacons should continue to function, as no instruction to the contrary has been received by any beacon or repeater keepers as far as I am aware. Neither has there been any indication that the international narrowband communication segment at 10368 to 10370MHz, nor the UK wideband segment at 10370 to 10400MHz are affected at this time. The narrowband part of the 24GHz band is still as it was, needing specific written permission for use. This, then, brings the question of further frequency planning for such things as informal, "personal" beacons. My personal view is that much more value will accrue to everyone from a degree of coordination amongst the operators of such devices. It would be wrong to clutter up the weak signal international communications segments of any of the bands where unattended operation is allowed, especially when these are busy during openings and it would also be wrong to inflict personal beacons into the international beacon bands where they could interfere with monitoring and reception of 'regular' DX be-

cons. So what do you, the readers and future users of the new facilities, think about the idea of a common frequency or group of frequencies, say in the "0.300 to 0.400" area, above the bottom of each band in which such operation is permitted? If you have any firm ideas either I, or any other member of the Microwave Committee, would like them as soon as possible, for this will be one of the frequency planning topics discussed in committee very soon. What is finally decided, like most other band plans, will be a 'gentleman's agreement' although, with increasing pressures on our microwave allocations and those of neighbouring administrations, they may have to become mandatory in the fullness of time. This is why I consider we must think and plan NOW!

OTHER NEWS IN BRIEF

Tests made by G3RUH (a UK ground controller for AMSAT) with Oscar 13, mode L, suggest some receiver de-sensing, the satellite needing more power and antenna gain than design. Possibly due to high power terrestrial sources, perhaps high power radar getting into the satellite's receiver. This could well happen to some of the proposed 1-3GHz packet trunk links mentioned some months ago, depending on geographical location and direction of the link relative to any powerful radar source.

Only one microwave award to report, a tripartite claim from G8GRT of Huntingdon who used QRP and small indoor antennas for the awards. His award comprised 10 squares worked on 1-3GHz (No.62), five squares on 2-3GHz (16), and the 2-3GHz distances award (7) for working DK0HT/P. His gear? For eight of the 10 squares on 1-3GHz, 2-5W (later 10W) to a 15/15 RX antenna and 24ele LQY TX antenna, both indoors. The QTH is 90ft ASL. On 2-3GHz, Ron ran 400mW to separate indoor LQY antennas. His comment. "If I'd listened to the experts, I would never have attempted operation on 1-3GHz and certainly not on 2-3GHz" is encouragement to others to have a go, if ever I heard it!

Tom, G3DXJ (Shepherd), was surprised that I didn't have access to the details of 'first' inter-UK countries 10GHz contacts, as he felt sure that Dain, G3RPE, must have archived them. Yes, he certainly did and I can remember reading them, but since neither Dain's records were immediately available nor did my RSGB journals go back that far, I felt it better to ask for information! Tom was involved in some of the firsts and said that there was a GM/GW QSO around 1972 at 190km which probably constituted a European record at that time. His own logs show the first GM/G QSO's on 10/3/74 almost simultaneously between GM3FYB/P - G8HEY/P and GM3DXX/P and Tom himself. GD to mainland contacts on 25/5/74 were from GD3OXX/P to G8BKE/P, GM3DXX/P, GW4ALN/P and, the latter probably not claimed as a two way. There is a record of G18AYZ/P working GM3OXX/P, GM8BKE/P and/or GM8HEY/P on 11/5/75. Other records were set up by GM3OXX/P and GW4BRS/P - 250km on 11/4/74; GW4BRS/P and GM3DXX/P - GM3OXX/P - GM8HEY/P - 323km on 18/5/75 and finally the QSO which stood for some considerable time as a world record, between GW4BRS/P and GM3OXX/P at 510km. ■

SATELLITES

RON BROADBENT G3AAJ

Three events which must be of interest to amateur satellite readers have been announced for the latter part of September. There's the placement into final orbit of the new satellite Oscar 13; AMSAT-UK and the University of Surrey tell us of two UOSATs being built and launched early in 1989 (UOSAT D and E), and AMSAT-NA announce the building and launch of Six Microsats in the 1989-1990 time frame. Details of the latter are the subject of a paper read at the recent AMSAT-UK Colloquium. The complete set of Colloquium Papers can be obtained from AMSAT-UK for a minimal charge.

I must first deal with some facts about Oscar 13 which should enable those of you who are not every-day operators or listeners to this satellite, to get some idea what is happening when you do decide to go onto the Space bands.

The Final 'burn' position of the satellite in space by the AMSAT-DL Team, took place on 21 September. From now on it can be assumed that the satellite is in its intended orbit and will not need to be moved again, even if there is any fuel left in the kick motor for such an event.

With a stable orbit we can now issue a set of Kepler Elements for the computer buffs. These will not need changing for several months, not even to satisfy everyone wanting the latest weekly upgrade to check that 'their' micro is as good as the NASA one! In fact, NASA advise that their two line Kepler Sets are no more accurate than two minutes. Who is checking who? With such a stable orbit as we have on AO-13, who needs two minute accuracy except the Command stations? With a 700-minute orbital period, ie two orbits of the earth every 24 hours, the satellite appears to stay in one spot allowing very long QSOs to be made without beam orientation.

Here is a set of figures which should prove helpful for the next several months:

OSCAR 13

Epoch.	88243.21393379
Incln.	57.5718
RAAN.	241.3717
Ecc.	0.6562933
Arg.	189.7644
MA.	145.2660
MM.	2.09702313
Decay.	-1.07e-06
Ep.Rev.	162

You will, as a part time user, need to know when you can tx/rx via this bird if you find, when you switch on, nothing but a deathly silence. No, your equipment is not kaputt. It is simply that the satellite has most probably switched to another mode of operation. Let me explain, in conjunction with the following table prepared by the Oscar 13 Command stations.

The alternative modes assist the satellite to continue operation despite encountering events like an eclipse of the sun (solar cells need sunlight) and high power merchants depleting the system battery.

For the next several months the Mode of Operation will be as follows, except during periods of engineering work by Command:

Mode	From	To	Info	Duration	MA	Mins
Off	MA241	002	Eclipse	18		48.3
B	MA003	150	-	148		397.0
L	MA151	200	JL option	50		134.1
B	MA201	240	-	40		107.3
S	-	-	Tests option	TBA		-

As simple arithmetic will reveal each MA figure (Mean Anomaly, position of object in the orbit) represents approx 2.68 minutes of time. (256 MA counts for this orbit multiplied by 2.68 gives us approx 688 minutes, or just under 12 hours, from which comes the Mean Motion figure). It is therefore fairly obvious that if you can obtain the MA figure at any instant during the orbit, you can calculate when and how long you have access to the Mode of operation. It so happens that our friends in AMSAT-DL and NA have placed on board, for instant access, a Morse, rtty and psk system which when activated with the correct equipment tells all. Times of CW Bulletins: hour and half hour for five minutes; RTTY Bulletins: quarter to and quarter past the hour; rest of time 400bps, psk.

You need only take the Bulletin once to get the MA and apply it to the current table above, to find out how long you have on each mode. Orbital calendars are also available from AMSAT groups for a small fee to cover printing costs. The RUDAK system has not yet been declared operational because of some problems within the spacecraft itself. It has been suggested by Karl Meinzer DJ4ZC that this could be a cracked pcb track, caused by lift-off, and that this may 'grow' again in the space environment in a few months time.

EXPLANATION OF MODES

Mode B: 70cm up lsb for a 145MHz Downlink usb. Mode L: 1269MHz up for a 435MHz down signal. Mode JL: 144MHz up for 435MHz Downlink. Mode JL: Requested not to be used by those administrations who permit Mode L frequency usage, ie most of Western Europe (more on this subject in a later RadCom). Suffice it to say that the use of Mode JL in the UK can cause problems on the crowded band at the lower end of 2m. Mind you, having said that there is a regulation that states all transmitters should listen on the frequency before operating. It really is a case of engaging brain before opening the mouth. It should also be realised that some administrations have a 144MHz section (Ground to Space). The situation, caused by lack of cooperation at national society and IARU level will resolve itself in the coming months, given some goodwill by users in all countries.

It is to this end that AMSAT UK were asked at the recent RSGB International Satellite Convention in July to collate the present and future Space frequencies planned by designers of spacecraft in the next three to five-year span. The details of such world wide design frequency

usage on spacecraft will then be made available to IARU, AMSAT groups and national societies for future planning of satellite and balloon flights carrying transponders. May I, as the person asked to perform the actual job of collation, please receive the information, even at this late date, from all interested organisations. The date agreed for presentation of the results was JAN 1989.

For those readers who have a micro with an I/O port, may I bring to your attention the system which Oscar 13 transmits that puts data and messages from Command stations into your number-cruncher. It's the system of 400baud psk beacons on 145.812MHz and 435.651MHz (to name a few). If you have the ability to build a very simple pcb with about 10 chips and some software you can have exact details of all the parameters that Oscar 13 is sending to Command Stations across the world at exactly the instant of time transmitted by the spacecraft. Oscar 13 will also instantly tell you where it is in the orbit, the time of transmission, its orbit number, spin rate, battery condition, power output of both transponders, Mode, and a host of other information.

A Frame from my own BBC screen is included as an example. Amsat-UK sell the software and the pcb at a reasonable price for most micros. Credit must be given to Jim Miller, G3RUH, for this fine piece of work, which certainly takes the strain out of wondering where, why and what is going on with AO-13.

10-08-88	OSCAR-13	13-07-26
AMSAT-UK	TELEMETRY	G3AAJ
MODE L	ORBIT 241	MA 165/256
L de VK5AGR 26Sep88 1020UTC. To all readers of the PSK Bulletins: Peter, DB20S has produced an excellent 8-page document called 'AMSAT Oscar-13 Telemetry Block Format' which gives details on how to decode AO-13 PSK telemetry (all 128 channels) plus how to interpret the header information. This will be published in AMSAT-UK magazines.		

THE UOS/AMSAT-UK TRANSPONDER UOSAT-DELTA

Briefly, this will be a Packet Store and Forwarding Transponder on Open access to all radio amateurs having the capability of using Packet TNC's at 9600bps. The system will be similar to that occasionally in operation on JAS-1. It is expected, and certainly will be designed to have a throughput factor of 10 greater than that of JAS-1. This will mean that Packet-man in UK can uplink his message to UOSAT DELTA via his TNC (small modification only needed) and 45 minutes later his message can be read by Packet-man in ZL if he is listening (or on auto). A reply can be placed in the mailbox immediately by the ZL and received on UK Packet-man's VDU 45 minutes later. It's all good stuff, which, and here comes the commercial, needs money. AMSAT-UK have already paid £25,000 to secure the launch, planning and design of this transponder. It is expected that the completed satellite, of which

M de DB20S, 14.9.88: *** OSCAR-13 TRANSPONDER SCHEDULE *** The following general schedule will be in use from Sept. 21 due to seasonal attitude changes from 180/0 to 210/+5.
Mode-B from MA 3 to MA 150 and from MA 200 to MA 240 Mode-JL from MA 150 to MA 200. OFF from MA 240 to MA 3
Further changes are possible and will be published this way.

MIKE SANDERS G8LES

GENERAL

The TV calling frequency of 144.750 is still plagued by packet splash from quite a number of different stations on 144.650MHz. Investigations with a spectrum analyser found carriers popping up off frequency and sliding onto 650. The effect has been noted from handhelds where there is no transmit inhibit, and the synthesiser locks to the intended frequency. I suspect that handhelds are being dedicated to packet use, leaving the main station free for other modes. As it was never the manufacturers' intention for handhelds to be used as main station rigs, I recommend - as politely as possible - that anyone using them in this way checks the transmit 'on' sequence beforehand.

The September contest didn't get the notice it deserved, in part due to my own confusion over publishing dates, and in part to the postal strike. They should have appeared in the September issue prior to the contest; I accept a firm slap on the wrist for getting it all wrong! The contest was, nevertheless, pretty active with well-sited portable stations G8MNY, G8LIR, G7ATV, G6XDY, GW8GKF, G0AVG, GW7ATG, G4DVN, G1XRC and FC1DBN appearing in my log sheets. Conditions were above average, which is extremely out of character; for the last few years we've had a bad run and the word 'contest' has equated with a rain-making ceremony and high winds adding to the troubles for portable stations.

Conditions gradually faded towards dawn, and gave no dawn lift. G8MNY was heard talking about working a Berlin station on 432MHz, which led to everyone asking everyone whether they had worked the Berlin station! The 23cm band proved quite active, with most stations operating on 1249MHz as their equipment is normally used on a repeater input. It must be noted here that the French have great difficulty on this band as they are only allowed to transmit on 1255MHz. This is due to in-band air traffic control radar from the Eiffel Tower suffering tremendous receive interference. From information gathered so far it seems that this system is unable to ignore amateur transmissions, they have these frequency restrictions. The UK has a similar system, but we suspect that the software is better and ignores small amateur carriers as irrelevant information.

One station I worked on 23cm was G4NTS in Weymouth which, if you consult a map, should be impossible. He is hiding behind the hills and normally 23cm cannot work. I had to wait for almost five minutes before witnessing a 2-second burst of his numbers; I have to assume that the transmission was reflected off an aircraft.

A TV contest is a very gentlemanly affair with pauses for a quick comparison of logs between the competing stations.

GETTING STARTED

If you need any help or assistance, call on 144.750MHz. Someone will be there to feed you with information, provided of course you are not in a deep valley in the middle of nowhere. A number of Philips and Japanese tv sets tune down low enough to pick up the response on 70cm; to check, just tune the tv down to the bottom, and fire up your 144MHz rig. Tweak the tv's tuning, and try to get a blank screen without any snow. If you do, then de-key on 144MHz and see whether snow appears. If it does, you can safely conclude that the tv is tuned to the 3rd harmonic of 144MHz.

One station heard recently was producing his carrier with an FT790, 1 watt and driving this into a 10watt Wood and Douglas p.a. Modulation was achieved by applying vision to the collector of the driver transistor via a modulator circuit (W&D again). Almost any 1 watt frequency stable source can be brought in for this purpose. A camera can be built, but any black & white, or colour, new or second-hand one can be used. You can also use your microcomputer, but do heed the warning that a video filter is recommended to restrict the very high video bandwidth available. Without one your video could be far too wide.

FORTOP AND MICROWAVE MODULES MODS

Looking at the on-air performance of these transmitters the colour results seem very poor. Both devices use the same modulator circuit, which contains faults - the sync separator can be corrupted by the colour burst, there is no temperature compensation on the black level, resistor values are too high for reasonable bandwidth on the amplifier, and extra buffer is required instead of a coupling diode and the output stage is overdriven by the modulated transistor. After mods were carried out and an attenuator fitted, a superb waveform was seen on the scope and off-air results improved dramatically. Although the original circuit works, with a few component changes a really good transmission can be achieved. I have the details copied; just send me a sae.

THE P METER

After suffering much unreliable, subjective picture grading I devised an electronic method to provide accurate judgements. A metered

voltage is produced by the circuit devised, and this can become a standard as soon as a panel of observers agree on the voltage level appropriate to a specific quality grade. Using analogue to digital input on a genlocked computer, plus appropriate software, the received grading can be appear as superimposed text on the screen. This method is particularly appropriate to computers because a computer is already likely to exist in order to run the box.

The circuit works by looking at a sample of the noise present during field blanking; this part of the picture is very close to average picture content. Off frequency transmissions, where the syncs are falling out in receive, will quickly show a degradation on the meter. Signals which are simply over-deviated will hold in the assessment range. The percentage of noise, as observed on the scope, will look like this: P5 - none, P4 - 50, P3 - 100, P2 - 150, P1 - 200 (all relative to 1V peak to peak). This demonstrates just how good a tv receiver is at displaying the picture at all.

The circuit applies around 20 microseconds of noise during an unused line at frame blanking to a high frequency weighted amplifier. The output is rectified and buffered to drive a meter, chart recorder or A to D device. A noise-free carrier with no modulation will also measure as a P5, but as this is not a valid tv signal the meter output should be gated with the signal detector. I have circuit diagrams for this; but do note that you must supply it with a locked field sync pulse from the circuitry in the next section. It could even be incorporated in a tv set, if one is available for modification.

REPEATER SIGNAL PROCESSING

Having been involved with the High Wycombe tv repeater GB3HV, and also in sending one station's signal onto another, I am quite used to the reduction in signal performance. Although the receiver is adjusted to best signal on noise, a phase-locked loop is in use for demodulation and this tends to reduce the bandwidth as the signal gets weaker. Stations receiving the repeater at P5 will get colour, but stations receiving P4 and below will not. It is therefore necessary to reprocess the incoming signal, using tv chips, to clean pulses up and provide a constant, reliable locked signal to genlock the repeater computer.

I have made up the appropriate circuitry using somewhat old chips, and am now experimenting with a later chip set. Signals reprocessed are field pulse, line pulse, blankings, colour burst and black level. All of the circuitry is in the heart of my vision mixer, which includes an electronic window so that syncs and bursts cannot be corrupted by badly timed incoming signals. Inserts are then easy. The results are very good, with an incoming P2 grading up to P3 (local signal) and in colour. ■

▶ the A-UK package is part, will be in the region of £300,000. May we suggest that some of the packet groups and individuals who now use our DCE system at UOS (GB3UP) may like to put their hands in pockets and send us a donation for this new device. The DCE was the experiment that started it all off, and a lot of non-members of AMSAT-UK have been using it.

It should also be explained that the Command Station at Surrey which inputs your messages via

DCE was funded to the tune of £10,500 by AMSAT-UK membership. It is *not* funded out of your RSGB Subscriptions. All donations for the new UOSAT D Packet Transponder will be gratefully received by the Hon. Sec, G3AAJ; QTH at top of page. Donations over a fiver will receive a special AMSAT International black on silver lapel badge, and a copy of the design paper on the UOSAT-Delta project. Launch is planned for mid 1989.

Also planned for launch during 1989/90 is a series of small satellites, not all operating in the Amateur spacebands, named MICROSATS. These small satellites are to be built by AMSAT-NA from a design team headed by Jan King, W3EGY. A scale model was brought across the Atlantic by Jan for us to view at the recent Colloquium. Various outside agencies are funding this series of sats including VITA and the WHO. More on this at a later date. ■

BOB TREACHER BRS32525

After being favoured with extra space allocated to the column last month, I have found it difficult getting this column up to the regular quota this month owing largely to the September Post Office dispute. With only a few keen types faxing mail to my office, there is however, space at last for the new 'Antenna' slot and a small technical piece. But first. . .

EA8's ON 144MHz

We often hear of amateurs breaking dx records at vhf when there is a big tropospheric opening. However, nothing is ever said about the distances heard by swls. David Whitaker BRS25429 (IO93) caught openings to EA8 on 9 and 10 September. EA8BML (IL27, 3105km) was heard at 1857, with EA8BEX at 2125 on 9 September. On 10th, EA8BTA (IL18) was audible at 1824. With the current IARU Region 1 tropospheric record on 144MHz currently standing at 3065km likely to have been broken during the opening, David is pleased that his logging of one of the Canary Is. stations at least broke the "old" record.

ANTENNA SLOT

As mentioned in last month's column, I will endeavour to include details on some simple swl antennas over the next few months.

As an opener, let us consider the lengths of wire required to make a half wave dipole. The basic form of antenna is a single wire whose length is approximately equal to half the receive frequency. The half wave dipole is the starting point for many more complex forms of antenna. It is fed at the centre and gives a quarter wave on each side of the feed point. The following for-

mula is sufficiently accurate for an swl making wire antennas for reception of frequencies up to 30MHz:

Length of half wave antenna (feet) =

$$\frac{468}{\text{Freq in MHz}}$$

To give an example for an antenna for 14200kHz the length would be:

$$\frac{468}{14.2} = 32.96\text{ft, or almost 33ft.}$$

Listeners may find the following table of use when calculating the length of a half wave dipole for amateur band listening. The lengths quoted are those using the equation above:

Band	Frequency	Length (ft)
80	3-500	133-71
80	3-600	130-00
80	3-700	126-48
80	3-800	123-15
40	7-000	66-85
40	7-100	65-91
20	14-000	33-42
20	14-100	33-19
20	14-200	32-95
20	14-300	32-72
15	21-000	22-28
15	21-100	22-18
15	21-300	21-97
10	28-000	16-71
10	28-500	16-42

A half wave dipole is able to detect signals coming in from all directions. However, it displays a maximum sensitivity to those signals that arrive broadside to the antenna wire. On paper the maximum sensitivity pattern would look like a 'figure of eight'.

A random, haphazard length of wire for swl'ing is all too common. Such an antenna may be very good on one or two bands, but poor on the others. In most cases, a half wave dipole cut for the frequency you want will out-perform the haphazard length of wire.

Judging from comments on antennas in use by swls, many have half wave dipoles and have much success with them. If you are using a random length of wire at present, why not experiment with a half wave and let me know how it fares in comparison.

Next month I shall consider the benefits of an Inverted Vee Dipole.

TECHNICAL SLOT

Also new this month, the promised technical topic. Thanks to GM1RHV, I can pass on details of an external antenna interface. A circuit diagram will be shown next month.

The idea was the result of searching above broadcast frequencies on a Philips MW/VHF/AIR D1207 receiver. Since only vhf was aerial linked, a dipole for 3-5MHz was used. How?

Since the mw section used a ferrite cored aerial/inductor, simply short the dipole ends, wind that incoming loop around a ferrite rod and tape it parallel to the internal ferrite inductor. This effectively creates a parallel cored balun or rf transformer and rf flux does the rest.

Selectivity requires the use of aerial tuning and one method would be to use a ganged capacitor, one tuning each quarter wave section of the dipole. Attenuation can involve potentiometers, fixed resistors or simply changing inductive coupling efficiency by reducing loop turns, or spacing the inductors further away from each other.

This idea can be used for any external aerial system, long wire, or loop.

HF BANDS

Some swls have told me they have heard stations signing VI88 this year. Some delving has found that these prefixes are being used during 1988 to celebrate Australia's Bicentennial (and so are AX prefixes). It appears that the special call-signs are:

- VI88ACT Australian Capital Territory (VK1)
- VI88NSW New South Wales (VK2)
- VI88VIC Victoria (VK3)
- VI88ABC Victoria (VK3)
- VI88QLD Queensland (VK4)
- VI88XPO World Expo, Brisbane (VK4)
- VI88SA South Australia (VK5)
- VI88WA Western Australia (VK6)
- VI88TAS Tasmania (VK7)
- VI88NT Northern Territories (VK8)

With a couple of months of the year remaining, there is still time to claim the special

THE FIRST SHACK AT THE QTH OF ANNE REED BRS87871 IN CHELTENHAM. THIS ONE COMPRISES A TRIO R600, GLOBAL AT1000 TUNER, AND HOWES AS1-5 FILTER.



National Capital Certificate which is available to swls for hearing Australian and VI88 stations in 1988. You need 20 points to qualify. Each VK station logged counts 1 point while any VI88 station counts 10 points, but you must log VI88ACT. I assume that if you hear VI88ACT plus one other VI88 station you have enough points for the Certificate. To apply, you have to send a log extract and 7 IRC's to VI88ACT Awards Manager, GPO Box 600, Canberra ACT 2601, Australia. Best of luck.

Generally, the hf bands were in very good shape in August. 28MHz provided David Whitaker with TN4NW and P40R for two new countries. It is good to hear of swls who are starting once again to add countries to their all time scores on the band. After a long slumber, we should start hearing some really good stuff – indeed David adds that KH6FOO, JH1MAO/JD1 and KD7P/NH2 have been heard, but none were new. From these parts, ZL4BO was heard at 2035 on 31 August.

21MHz provided VP8BRR (South Georgia) and VP8BRT (South Orkney). The band had also been good to the Pacific with ZK3RVC, KG6ASO and KX6BU heard. 14MHz had provided the usual run of DX from all parts of the globe.

On 7MHz some interesting DX had also been reported. CE0ZAM was a new country for David Whitaker, while J87CD, J52US, and FP5HL had been logged. On 3.5MHz T5GG had been on the band, as well as J52US.

Although somewhat potted, this gives a fair reflection of what had been on offer on the bands. With CQWW last month, I should have plenty of reports soon about what had been heard during those 48 hectic hours.

VHF WATCH

At last, and for almost the first time in 1988, there is some tropospheric DX to report. Conditions at VHF from 6-10 September provided some worthwhile talking points. We have already referred to the EA8 opening, and moving a little nearer home the period gave Mick Toms BRS31976, David Whitaker, myself and Joan BRS62088 some good DX.

Mick was disappointed because there were no new squares on 144MHz, although he did hear both sides of a QSO between EA1YY (XD) and SM7FMX (GP). However, 432MHz gave him seven new squares. He heard F1FHI (ZH), FC1EZQ (JN27), F6HYE/P (DF), F6HEO (BG), DJ6AS (JO52), OZ1JPT (JO64) and DC9BJ (EN).

Mick fared much better during the 6-8 August tropo, catching Y79ZL (HK), SP6PAZ, Y23KO (GM), DL4OBI (running only 200mW from FM square) and LX/DG2KBS/P (JN29) on 144MHz. SM7LAD was a new country on 432MHz.

David copied many stations in South West France and Spain in the September opening, collecting a few new squares in the process. Notable loggings included F6DRO (AD), FC1-BUU (IN94), F6HRY (JN04), FC1JUC/P (JN35), EA1BLA (IN53), EA1EDC (IN63), EA1YY (IN73) and EA2AWD (IN93). All these on 144MHz.



NUMBER TWO NEAT SHACK AT THE QTH OF ANNE REED BRS87871 IN CHELTENHAM. THIS ONE COMPRISES A PAN CRUSADER "X" RECEIVER, SONY ICF2001D AND AR2002 SCANNERS. SOME CB EQUIPMENT IS ALSO SEEN.

I found the opening to be quite ordinary because it was in a direction where most of the squares have been confirmed. However, on 432MHz, three new squares were logged in the shape of F6CGJ (IN78), F6HYE/P (DF11) and F6HEO (BG06).

Joan BRS62088 managed six new squares on 144MHz, including F3CN (JN04) and FC1ADT/P (JN15). Her tally of squares heard on 144MHz has now risen to 71.

1988 PERSEIDS

There are mixed views about this meteor shower this year. Your scribe believes it to be the best for a few years, but Mick Toms considered it poor. David Whittaker listened to me for the first time.

I had booked the 12 August as annual leave and was glad I did because the shower seemed to peak earlier than usual this year. 56 stations were identified on random ssb, some with good bursts which, in many cases, enabled one or two complete qso's to be made during the one burst.

The usual OKs, HAs, OEs and Is were to be found, but the best were SP5EFO (KO02), OY9JD (IP61), SK3LH (JP93), LA8KV (JP52) and GM0EWX (IO67).

Mick heard OK2KZR, SK7JD, HB9LF, EA3DUY, YU3TS, 14YNO and IW5RYK. He

heard one ON calling UV1AS, but heard nothing from the Russian.

David experienced his first Perseids and copied good bursts of up to 10 seconds from HG1YA, I4XCC, YU2EZA and FC1BLL.

MORE QSL MANAGER LISTS

Previous QSL Manager lists which I have offered have been popular. I am pleased to say that a further collection is now available covering stations which have been active in 1988. The lists cost £1 for about 1500 QSL routes and addresses, and you don't even have to send the postage!

FINALE

I have held the tables over this month due to the lack of updates, they will all appear next month. Readers will note from the last two issues that I have had a good response to the request for photographs. My reserve supply is, however, not going to last too long and therefore I will ask again. Remember to put your name and address on the back if you want it returned.

News, views and comment for the January 1989 column should be with me by 11 October. ■

IAN WADE G3NRW

STATION IDENTIFICATION ON PACKET

The new licence regulations coming into effect next year specifically state that the licensee shall transmit the callsign by morse telegraphy or telephony at the end of each 30-minute period. When using packet, it obviously isn't very convenient to pick up the microphone every half hour, so morse code IDentification will probably become the order of the day.

However, most tncs today don't have a cw ID command, so a little work will have to be done to comply with the new regulations. Perhaps the simplest way is to make use of the 'calibrate' command, which is normally used to set up the modem in the tnc. This command switches the tnc into a special test mode, when it is possible to turn the modem tones on and off, and to toggle between the high and low tones.

So all you have to do is add a bit of software to your host computer which switches the tnc to 'calibrate' mode every 30 minutes, then toggles the tones between high and low to correspond to your callsign in morse code (dot and dash times being controlled by software delay loops), and finally switches the tnc back to its original mode. I have done this for my ancient TNC-1 running WA8DED firmware, and it runs just fine. The new licence does not specify the maximum permissible speed for sending the cw I.D., but a speed of about 20wpm is probably reasonable.

WHAT DOES BARTG STAND FOR?

Next year the British Amateur Radio Teleprinter Group (BARTG) celebrates its 30th anniversary, but, according to contributions in the summer issue of BARTG's 'Datacom' magazine, some people are questioning whether the group should continue to include the word 'Teleprinter' in its name. Ian Brothwell, G4EAN, is BARTG's Hon Sec, and he says that Amtor and packet users are put off by the "clanking-oily-noisy-bulky machine" image of BARTG, and wonders whether the group is losing potential members because of that word 'Teleprinter'.

Recognising BARTG's much expanded role in the world of data communications Ian suggests alternatives such as the "British Amateur Radio Teledata Group" or the "British Amateur Radio Data Transmission Group". On the other hand, he says, what's in a name: does it really matter? If you are a BARTG member and have strong feelings on this, you will have the opportunity to express your views at the group's AGM on 5 November at 2pm in the Churchill Room, London House, Mecklenburgh Square, London WC1.

A SOFTWARE TNC FOR THE SPECTRUM

In the July/August issue of the Sinclair Amstrad Radio User Group (SARUG) newsletter there is a report by Howard Benjamin on a new tnc package for the Spectrum 48k micro. Called the "FB-AX25 Packet Radio System", it is believed to be the first package which implements a complete packet radio terminal on the Spectrum entirely in software. The software is supplied on cassette, together with a compact modem which plugs into the rear edge-connector of the

Spectrum. No modifications to the Spectrum are required, and no other equipment is needed apart from a conventional vhf or hf radio. A DIN connector permits connection to the ptt, mic and loudspeaker lines of the radio.

In 'receive' mode the screen is split into several windows, the top line showing the station callsign and real-time clock. The second line shows the channel number in use (up to six channels at one time), and the rest of the top two-thirds of the screen displays incoming text. The bottom part of the screen is used either for command lines to the program or for messages. Transmitted messages are displayed on the upper screen, prefixed with '(S)' so that there is no confusion with incoming text. The screen can be scrolled forwards or backwards to review text in the buffers.

Program parameters can be changed through the use of about 85 commands, but all are initially set up for normal use as default settings. All the features which you would normally expect to find in a hardware tnc are incorporated. Howard claims that the package is not a compromise, and will be economical enough to justify the purchase of a 48k Spectrum for the sole purpose of dedicating it to packet radio. Further developments include a program which will permit full colour pictures to be exchanged between Spectrums using the AX-25 protocol. For more information, send an sae (clearly marked "Packet Info") to Paul Newman, G4INP, SARUG, 3 Red House Lane, Leiston, Suffolk IP16 4JZ. Incidentally, the newsletter also contains a number of other items on using the ZX81, Spectrum and QL for data comms.

MORE FROM IRELAND

Gerry Lawlor, EI9FV, reports again with the latest news of the EI packet scene. On the networking front, the situation now (September) is that Dublin (DUB:E12PKT), Cork (CORK:E13PKT) and Limerick (LRC:E14LRC) are running well with 'TheNet' software - 'TheNet' is a public domain networking software package having similar facilities to the NET/ROM package described in this column in October 1987.

There is a prospect of some more networking activity if the Galway club can get someone to take up their offer of gear. At present it is possible that this may be in the south east, possibly the Mount Leinster repeater at 2700 ft asl. If that goes ahead there would be a good alternative path into the UK, as south-west Wales is well heard from that site.

On the BBS front there is now a new BBS running MBL3.31 in Limerick at EI5WL. Forwarding to it is automatic from Dublin for all Connacht and Munster stations. The Cork node is not a good signal from its restricted location, but will probably be moved shortly to a more elevated site serving the far south west as well, and also providing a good link into the Limerick node which has been a problem up to now. Finally, Gerry says: "Some experiments are planned for 70cm here soon, all being well. But then we have no MOD hassle here, nor Syleidis yet. Aren't we lucky?" You can say that again!

READ MORE ABOUT . . .

A couple of books have come to my attention recently which will be of interest to anyone wanting to look deeper into data comms. The first is "C Programmer's Guide to Serial Communications", by Joe Campbell, and published by Howard Sams. This 654-page epic covers just about everything you need to know about programming serial devices, in a great deal of detail. All the awkward questions which other books avoid, such as problems with timing and error handling, are answered in a painless way in the author's description of a "virtual uart", which he gradually builds up as the book progresses. RS-232 and uart operation are treated in detail, and full descriptions of the XMODEM and Hayes modem protocols are included. If you need to know about the bits and bytes of asynchronous data links, this is your bible.

The other book is one unearthed by G3VXY, devoted entirely to TCP/IP. It's called "Inter-networking With TCP/IP" by Douglas Comer, and published by Prentice-Hall (the ones with the red covers). G3VXY says that it covers the whole thing in a very thorough way, and doesn't assume you are a networking genius. I shall be looking out for a copy.

IT'S A LONG, LONG WAY TO THE END OF LINE

Question 1: How many characters can I include in a packet message before sending a carriage return?

Answer 1: As many as you like. The packet network will handle messages of any length without worrying about carriage returns.

Question 2: That being so, why do people complain that bits of my messages are missing?

Answer 2: Many people use programs and utilities running under MS-DOS or PC-DOS to save and display your messages. Some of these programs and utilities will only handle strings up to 256 characters in length, and expect a carriage return before this limit is reached. If a string is longer than this limit, the excess will be lost. Therefore, to avoid parts of your messages disappearing into that great bit bucket in the sky, you should always be sure to include a carriage return at the end of each line on the screen, or after 255 characters at the very worst.

SAY OUT LOUD 100 TIMES: "END OF LINE MEANS CARRIAGE RETURN"

TELL IT ALL...

Question: I want to send a message to ALL. What should I give as the subject heading?

Answer: Something meaningful. There are far too many bulletins on the network saying simply "HELP" or "WANTED" or "FT290". This conveys nothing useful to anyone browsing through the bulletin board. The result is either that the browser won't bother with your message (in which case you have lost your audience), or that he will read it (and then find out that he wasn't interested anyway, thus clogging up the channel with needless traffic).

SAY OUT LOUD 100 TIMES: "TELL IT ALL IN THE HEADING"

CONTEST NEWS

2-3GHZ TROPHY CONTEST RESULTS

Fixed (Single Operator) Section

Best dx					
Pos	Callsign	Pts	QSOs	Loc	stn kms
1	G8IFT	1369	11	IO82XJ	GU4XUM/P 297
2	G4TAW	1229	10	JO01BI	GW4CBW/P 292
3	G8GTZ	444	5	IO91KF	GW4CBW/P 245
4	G4MGR	27	1	IO83KH	GW4CBW/P 27

ALL OTHER STATIONS SECTION

Best dx					
Pos	Callsign	Pts	QSOs	Loc	stn kms
1	GU4XUM/P	5703	19	IN89VR	PA0EZ 588
2	GW4CBW/P	5442	26	IO83KB	PA0EZ 569
3	G3ZTR/P	552	5	IO94OA	GW4CBW/P 187
4	G3GXI/P	405	5	IO93AO	GW4CBW/P 98

Check Log Received with thanks from G6PHJ.

Comments

Conditions: One station reported reasonable at first, tending to flat, all others said poor or flat. Parallel Lines thought that the contest was too long.

Entries about the same as last year, altogether 37 stations appeared in the logs. Logging was almost perfect (hardly surprising). At least there was a reasonable geographical spread in the entries, and especially pleasing to get an entry from Eccles & District ARC, very close to me!

G4MGR was using a hand-held antenna in the shack, G8GTZ made his first 2-3GHz contacts on the event, and found it "very enjoyable". GU4XUM/P claim the first ever GU/GW contact on 2-3G—presumably so do GW4CBW/P! Also first GU-PA on 2-3GHz, GW4CBW/P suffered "Gale Force" winds (sic), and had to close down early for fear of losing the aerials.

Certificates to GU4XUM/P and G8IFT. Subject to council approval, the G6ZR trophy will be awarded to The Hillbillies (GU4XUM/P).

1-3GHZ TROPHY CONTEST RESULTS

Fixed (Single Operator) Section

Best dx					
Pos	Callsign	Pts	QSOs	Loc	stn kms
1	G4MGR	326	40	IO83KH	GU4HWA/P 403
2	GI40PH	325	26	IO74GN	G3GIM 585
3	G4DEZ	235	36	JO01IN	GW3JXN/A 359
4	G8IFT	207	38	IO82XJ	GU4HWA/P 297
5	G4NBS	181	29	JO02AF	GI40PH 447
6	G4TAW	161	37	JO01BI	GW3JXN/A 326
7	G0CPU	105	23	JO01BS	G4MAW 296
8	G8HHI	84	22	IO91OH	G4MGR 274
9	G3JKV	72	22	IO91UF	G0AWP/P 313
10	G8GTZ	60	18	IO91KI	PA0EZ 450

ALL OTHER STATIONS SECTION

Best dx					
Pos	Callsign	Pts	QSOs	Loc	stn kms
1	GU4HWA/P	1104	90	IN89VR	DL1EBR 627
2	GW4LIP/P	594	69	IO83KB	F6DZK 595
3	G3IGO/P	233	51	IO91XG	GI40PH 515
4	G0AWP/P	167	23	IO94OA	GU4HWA/P 486
5	G3GXI/P	44	14	IO93AO	GW3JXN/A 236
6	G6CSY/P	26	11	IO91XG	GU4HWA/P 230

Check Log Received with thanks from G6PHJ, G3GIM, PE1EWR.

Comments

A tiny increase in entries over last year — one more in the single-op section. Three check logs seems a lot as proportion of 16 entries, and obviously many stations were active throughout the contest. I wonder why they don't enter?

Conditions were reported as reasonable to good at first, but deteriorating later. GU4HWA/P reported a very good tropo opening into Europe (including EA), but it faded out half hour into the contest. (Five PA's and one DL were worked in the first 15 minutes, and only three other PA's were worked in the whole event)

The wind seemed to bother the /P stations. Parallel Lines thought the contest badly timed for a trophy event because it was at the end of a high MS activity week — many groups on expeditions and unable to enter the contest. Would prefer it moved back to June, or linked to the October event. (I favour the latter!)

CONTESTS CALENDAR

RSGB HF CONTESTS

3 Nov	28MHz Cumulative CW/SSB (Rules in September issue)
11 Nov	28MHz Cumulative CW/SSB (Rules in September issue)
19,20 Nov	Second 1-8MHz Contest (Rules in September issue)
1989	
7 Jan	3-5MHz Cumulative
8 Jan	3-5MHz CW Affiliated Societies Team (Rules in October issue)
8 Jan	7MHz Cumulative
9 Jan	1-8MHz Cumulative
14 Jan	7MHz Cumulative
15 Jan	3-5MHz Cumulative
17 Jan	1-8MHz Cumulative
21 Jan	3-5MHz Cumulative
22 Jan	7MHz Cumulative
25 Jan	1-8MHz Cumulative
28 Jan	7MHz Cumulative
29 Jan	3-5MHz Cumulative
2 Feb	1-8MHz Cumulative
4 Feb	3-5MHz Cumulative
5 Feb	7MHz Cumulative
10 Feb	1-8MHz Cumulative
11 Feb	1-8MHz CW
25,26 Feb	7MHz CW (Rules in October issue)
11,12 Mar	Commonwealth Contest
2 Apr	Ropoco 1
10 Apr	28MHz Cumulative
16 Apr	Low Power Fixed
18 Apr	28MHz Cumulative
26 Apr	28MHz Cumulative
4 May	28MHz Cumulative
12 May	28MHz Cumulative
21 May	Region Roundup
3,4 Jun	NFD/Region 1 CW Field Day
24,25 Jun	Summer 1-8MHz
8,9 Jul	SWL
16 Jul	Low Power Field Day
6 Aug	Ropoco 2
20 Aug	Hopscotch
2,3 Sep	SSB Field Day
8 Oct	21/28MHz Phone
9 Oct	28MHz Cumulative
15 Oct	21MHz CW
17 Oct	28MHz Cumulative
25 Oct	28MHz Cumulative
2 Nov	28MHz Cumulative
10 Nov	28MHz Cumulative
18,19 Nov	Second 1-8 MHz CW
2,3 Dec	1-8MHz SSB Clubs

Region Roundup and Hopscotch are under review and may be replaced with similar type events. Please watch RadCom for further information

RSGB VHF CONTESTS

30 Oct	1-3/2-3GHz Cumulative (Rules in August issue)
5,6 Nov	144MHz Cumulative
7 Nov	432MHz Cumulative (Rules in July issue)
12 Nov	Club Cals Contest (Rules in September issue)
15 Nov	1-3/2-3GHz Cumulative (Rules in August issue)
23 Nov	432MHz Cumulative (Rules in August issue)
1 Dec	1-3/2-3GHz Cumulative (Rules in August issue)
4 Dec	144MHz Fixed and AFS and SWL (Rules in August issue)
9 Dec	432MHz Cumulative (Rules in August issue)
11 Dec	70MHz CW (Rules in August issue)
17 Dec	1-3/2-3GHz Cumulative (Rules in August issue)

OTHER CONTESTS

29,30 Oct	CQWW DX SSB Contest (Rules in September issue)
12,13 Nov	OK DX Contest
12,13 Nov	DARC WAE Contest (rtty) (Details in August issue)
19 Nov	RNARS SSB Activity Contest (Details in October issue)
19,20 Nov	OVSF All Austria Contest
20 Nov	RNARS CW Activity Contest (Details in October issue)
26,27 Nov	CQWW DX Contest (cw)
3,4 Dec	URE DX Contest (cw)
3,4 Dec	ARRL 160 Metre Contest (cw)
10,11 Dec	ARRL 10 Metre Contest

Are the Lines hinting about the expedition status of GU4HWA/P? The differential in scores is certainly vast, and the use of 16 antennas is surely not sensible by most people's standards. Without wishing to diminish the achievements of GU4HWA/P, it does seem pretty impractical for most people to put on such a station in GU purely for a single day contest with six entries unless they are there for some other reason.

First place in the fixed section was very close. It was

very bad luck for Tim Crawford, the blind op. from GI, that a single logging error put him one point behind Phil Langford (G4MGR) who had a perfect log. Tim's points per QSO were very high. Logging standards were in general very good.

Congratulations and certificates for G4MGR, GI40PH, and GU4HWA/P. Subject to council approval, the VHF Contests Committee Cup will be awarded to GU4HWA/P. The Hillbillies.

SUMMER 1988 1.8MHz CONTEST RESULTS

A slightly reduced entry this year together with some comments that some stations were conspicuously less strong than they were last year which made operating considerably more pleasant. It was also suggested that the last hour could well be eliminated and the committee will give this consideration when drafting the rules for 1989. The noise level was high and this made copying some of the weaker signals difficult. One entrant complained that few seemed to check whether a frequency was being used before calling "CQ" - he suffered this on three occasions in different parts of the band from the same fellow entrant! Overseas support was again quite good and logs contained details of QSOs with EI, OE, OH, OK, ON, PA, SP, UA3, UA9, UB, UP, UR, and Y.

Maybe a comment from G3HKO is worthy of mention: "Thanks to all participants and the organisers for a well supported event of just about the right length. Its the last time I do a contest immediately after a party..."

G3FKM

UK Section				
Pos	Callsign	Valid QSOs	Bonus	Pts
1	G4BWP*	140	275	695
2	G3SJJ	129	275	662
3	G3PDL	120	255	615
4	G4GIR	113	255	594
5	G3JKS	106	265	583
6	GW4IQI	109	240	567
7	G3ZGC/A	89	195	462
8	G3KKQ	76	205	433
9	G0FDX	70	210	420
	G5MY	75	195	420
11	G0DYX	74	195	417
12	G3SWH	76	170	398
13	GM3RAO	67	195	396
14	G3MCX	68	185	389
15	G0DJF	64	195	387
16	G0EHK	62	195	381
	G4LPK/A	62	195	381
18	GM3UM	61	180	363
19	G3YLC	58	180	354
20	G3GLL	51	180	333
21	GM3CFS	42	200	326
22	G3AWR	53	165	324
23	G3BPM	51	165	318
24	G4IZB	49	170	314
25	G4HSD	44	155	282
26	G3HKO	39	130	247
27	G3GMS	30	120	208
28	G3IQF	26	120	198
29	G3ZRZ	20	85	153
30	G3ILO	14	80	112

*Certificate winner.

Overseas Section				
Pos	Callsign	Valid QSOs	Bonus	Pts
1	ON4UQ*	49	155	302
2	EI5DI*	46	150	288
3	PA2REH*	44	155	287
4	OK1FDY	40	145	265
5	ON6CW	39	130	247
6	SP1PEA	36	140	245
7	PA3AMA	34	130	232
8	PA0HOP	32	130	226
9	Y33VL/P	32	130	226
10	OK1DRO	24	95	167
11	OK1KSF/P	17	75	126
12	OL1BVR/P	16	75	123
13	UP3BU	17	70	121
14	PA3BTH	14	70	112
15	UB5WFJ	14	65	107
	UR1RXB	14	65	107
17	UB5NQ	13	60	99
18	UT5JAJ	11	55	88
19	OE1NDW	6	30	48
	OH1BBF	6	30	48
21	UA9CGA	2	10	16
	UZ3AYT	2	10	16

Check logs were received from G3CXM, G3RZP, G4ECI, G4ICP, LA2UA, LZ1M333, SP1CU, and UA2-125.1078.

REGIONAL ROUND-UP CONTEST 1988

The entry for the regional round-up contest this year was marginally down on last year, despite the HF Contests Committee's decision to shorten the contest to three hours, in response to a number of comments in last year's logs. However, many entrants this year commented favourably on the shorter style of the contest, and the new formula seems to be welcomed.

One area of confusion was the decision of the RSGB to abandon the use of Region numbers. The adjudicator was not aware of this at the time the rules were submitted for publication. Nevertheless, it does not seem to have deterred entrants from sending their traditional RSGB Region number in the contest exchange. The HF Contests Committee will be considering how best to adjust the format of the contest for next year.

The winner for this year is Peter Hobbs, G3LET, who contacted 35 out of the possible 40 Regions. Runner-up was G3NKS with just one fewer region, and two fewer QSOs.

The QRP section was won by Tim Raven, G4AR1, and the receiving section by Brad Bradbury, BRS 1066.

G3OZF

Pos	Callsign	Pts
1	G3LET*	8645
2	G3NKS*	8262
3	G3VYI*	8228
4	G3JKS	7688
5	G4WYG	7440
6	G4EBK	7128
7	G2UG	6732
8	G4KGK	6479
9	G4OGB	6324
10	G4IQM	6231
11	G4GLC	6210
12	G4HZF	5921
13	G5MY	5742
14	G4CWH	5610
15	G4IZZ	5394
16	G4XPE	5070
17	GM3UM	4368
18	G3AWR	4316
19	G3GMS	3952
20	G3DPX	3105
21	G3BPM	2882
22	G4PTE	2484
23	GM0HJV	2373
24	G3LIK	2142

QRP Section		Pts
1	G4ARI*	7038
2	G2HLU*	5040
3	G4UOL*	4704
4	G41FB	3900
5	GW3SB	3744
6	G4SXE	3120
7	G0IDE	1050

Receiving section		Pts
1	BRS1066*	6240
2	BRS2868*	4342

*Certificate winners

432 MHz TROPHY AND SWL

Entries for this event were down again for the second year running. Widespread adverse weather was associated with below average conditions and low activity. These weather conditions were very similar to last year's event. Logging was to a high standard with very few points being lost.

It was nice to see that even while out of the country on holiday Bob G1KDF still managed to enter this contest as EI3VVN/P. Subject to council approval, the 1951 Council Cup will be awarded to the Sheppey Western Contest Group G8TFI/P, operated by G8TFI and G4FRE. Congratulations and certificates go to G8TFI/P, GW8KQW/P, G4JLG and BRS32525.

GM8MJV

Open Section				
No	Callsign	Pts	QSO	Loc
1	G8TFI/P	1593	121	70PP
2	GW8KQW/P	1424	174	82JG
3	GW4LIP/P	1335	166	83KB
4	G3CKR/P	1296	176	93AD
5	G4VIX/P	1029	107	01PU
6	G4SIV/A	749	97	93UK
7	G4UEM/P	585	88	00BT
8	G8AHK/P	478	92	91XG
9	G6CSY/P	315	63	91XG
10	GW4MGR/P	313	59	83JA
11	G4YJL/P	244	59	91PS
12	G0GZQ/P	213	59	91VH
13	G6ZME/P	193	51	82SP
14	G6HLL/P	180	39	83PF
15	EI3VVN/P	53	5	44XE

Fixed Section				
No	Callsign	Pts	QSO	Loc
1	G4JLG	234	47	83TM
2	G8JXV	104	26	91VE
3	G1HLT	99	27	93KD
4	G6YLW	70	12	01HI
5	G3ILO	63	11	81VQ
6	G5UM	58	19	92MP
7	G3YSX	43	11	91WF

SWL				
No	Callsign	Pts	QSO	Loc
1	BRS32525	78	18	01AL
2	BRS31976	58	10	01HO

Checklog: PE1EWR

MARCH 432MHz CONTEST RESULTS

432MHz Single-Operator									
Pos	Callsign	Pts	QSOs	LOC	Pwr	Best DX	Km		
1	G8HH1	711	89	91OH	300	DL9KB	552		
2	G4NBS	293	46	02AF	100	GM4ZUK/A	555		
3	G4APA	245	47	82TD	100	G44ZUK/A	435		
4	G1KDF	227	31	83NN	100	GM4ZUK/A	391		
5	G4FOH	195	32	92XI	8	DL0GS/P	561		
6	G0CLP/P	144	18	84KD	10	G8NEH/P	382		
7	G4XEN	134	20	92PH	50	DL2KBB	501		
8	G6YLW	87	19	01HI	100	G4THB/P	423		
9	G6HXU	57	13	83RF	5	G0FRR/P	289		
10	G6KZP	15	9	91RP	10	G4DRV/P	79		
11	G1TCH	11	5	90WW	10	G0FRR/P	144		
12	G2DHV	4	2	01BK	10	G6YLJ/P	75		

LF CW CUMULATIVE CONTESTS 1989 (1.8, 3.5 AND 7MHz) RULES

Will entrants please note the time changes on the 3.5MHz sessions and the addition of a fifth session on all three contests.

1 Dates and times.

1.8MHz. Monday 9, Tuesday 17, Wednesday 25 January, Thursday 2 and Friday 10 February. All sessions from 2000 to 2200gmt.

3.5MHz. Saturday 7, Sunday 15, Saturday 21, Sunday 29 January and Saturday 4 February. All sessions from 1600 to 1800gmt.

7MHz. Sunday 8, Saturday 14, Sunday 22, Saturday 28 January and Sunday 5 February. All sessions from 1000 to 1200gmt.

Frequencies. All contacts to be made between 1835 and 1865kHz, 3550 and 2550kHz and 7015 and 7040kHz, cw (A1A) only.

2 Eligible Entrants.

All entrants must be members of the RSGB.

3 Sections. Single operator only, all stations must be operated from the same location for each session of the same frequency band. The five sessions on each frequency band count as three separate contests. The swl section has been dropped due to lack of support. (No entries at all last time.)

4 Exchanges. Stations may be contacted World-wide but may be only worked once in each session for points either fixed, mobile or portable. Un-marked duplicate contacts will be penalised at the rate of 10X the claimed score. Contact exchange is RST and serial number starting with 001 on each session.

5 Scoring. Three points for each completed contact, the total contest score is the sum of the best three sessions out of five on each frequency band. Checklogs for the other two sessions are most useful and much appreciated.

6 Logs. Logs recording date, time, gm, callsign of station worked, RST and serial number sent, RST and serial number received and points claimed should be sent to the HF Contests Committee, c/o J. Kennedy G3MCX, 22 Croydon Park Avenue, South Croydon, Surrey, CR2 7HH post marked not later than Monday 27th February, 1989. Only one cover sheet (HFC 2) and signed declaration that the entrant has observed the rules and spirit of the contest per band is required. Duplicate sheets or callsign lists are not necessary.

7 Awards.

Remember each band is a separate contest. (a) The leading station with the best three sessions out of five as selected by the entrant will receive a certificate. Separate certificates will be awarded for each of the bands.

(b) A certificate will be awarded to the entrant with the highest aggregate score from the three contests. Two further certificates may be awarded at the discretion of the Committee.

(i) An Old Timer award, entrants wishing to be considered for this should put the date that they first held a full transmitting licence on their cover sheet.

(ii) To the newly licenced first time entrant with the best log.

Members' Ads

The Conditions of Acceptance are published below the Member's Ad form circulated with every issue of *Radio Communication*.

The current rate is £2.30 for 40 words or less: advertisements containing more than 40 words will cost an additional £2.30 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.

FOR SALE....

EF37A, ECH35, VR150/30, VR105/30, ECC31, ECC32, ECC33, ECC35, 6V6G, KT33C, KT32, 6SN7GT, 6SL7GT, 2N211, Four 12E1. Four 6BG6G, two Siemens S1003. 803 +base. 6P25, FW41500, Two RG1-240A, Two 2V-400A, EL34, CV2666 +base, One E130L, G232, G237. Others Professor. 01-764-5940.

FM-HANDHELD 2M CT1600. Mint, £140. Panasonic Communication rx DR31, £130. Contact G4BVL, QTHR. Tel: 01-244-8110 (after 6pm)

TR10 TS830S, FULL workshop manual, ex condx, £750. Yaesu FT290R Mk1, multiTek frontend, good condx, £235 Sony ICF2001D, hf gen/cov rx, ex condx, boxed, £260. Yaesu FT209RH spkr/mic, case, mint condx, £180. G4MPD, QTHR. Cheshire. Tel: 0606-47552.

FT480R MOBILE MULTIMODE. Checked and serviced by South Midlands Communications. £325ono. G0ASZ, QTHR. Tel: 070-132-797.

YAESU FT707 100W; FC707 atu; FP707 psu/speaker; NO aerials £650. Cash, no rubber paper/time wasters; Must be collected; May accept 2m/70cm home base p/ex. Require 1/3w in, 70cm M/M. Syd, G0E2M, Hants, QTHR. Tel: 042121 4333.

TS711E, 2M MULTIMODE TCVR, vgc, orig pkg, £600. Dressler D200S, 2m linear, vgc, orig pkg, £520. Morsen Electronics rty tu with auto change-over. (in use with CBM64), vgc, £30. Buyer collects or arranges carriage. G4CUS, QTHR. Tel: Battle 3205.

ATU SP3000 BY TAU. Tuning range 1.5-29.5MHz continuous. Input 50-75ohms, output 20-100ohms. Power capability 1.5kw continuous. 3kw PEP dual meters. SWR and forward power, absolutely mint. Boxed, instructions, and G30SS review. £285. G2FZU, QTHR. Tel: (Southwell/Notts) 0636-813847.

ELECTRONIC KEYSER, KATSUMI EK150. Brand new, boxed, instructions. Guarantee card, inputs 100/120V/AC or 11-14V/DC. List £133, sale £85. W2AU 4:1 Balun, 1kW. Brand new, instructions, £15. KW traps 20m as new, pair £15. G2FZU, QTHR. Tel: (Southwell/Notts) 0636-813847.

PS10 DAIWA POWER SUPPLY. Mint, boxed, instructions, £30. Sony CF420L fm/sw/mw/cassette recorder. Mint/boxed £40. Thermocouple meter 6"x4" switched 15/30v. As new, £10. Cassette recorder computer, compatible BEEB connectors. Brand new. Boxed, £20. G2FZU, QTHR. Tel: Southwell 813847.

FT102, BASE MIC. SP102, TB2 antenna, £650. G3GB1. Tel: 0293-25472.

YAESU FL2100Z 1200W LINEAR with orig pkg and manual, £425. Heavy, prefer buyer collects. Yaesu FT290R MK11, little used, boxed, manual, £310. G4HPSF, QTHR. Tel: (Saltcoats) 0294-62955.

FT203R +YH2 +FBA5 -2M fm handle, offers. IC202S 2m ssb, £125. KDK FM202SE 5w/25w 2m mobile 10-mems memory scan, inc preamp. £165. All ex condx. Mark, G1KSP, 0452-712437 (anytime). Also Sony CDP-40, £140ono. As new! (CD player).

DATONG FL3 FILTER £80. Eimac 4CX250B tubes unused £18ea. AR88D £65. Creed 444 teleprinter with homebrew tu £15. Hi-mound bug key, £15. JRC ships money key, £15. Europa-C 2m tsvt, £55. Tel: 036288-506 (Norfolk).

MICROWAVE MODULES 144MHz, 30w linear amplifier 1-3w input. G4URS. Not QTHR. Tel: 0362-860015.

SOMMERKAMP FT730R 70cm fm with tonna 18-ele aerial and rotator, mint condx, with coax cable, £245. G0GVC. Tel: 0204-594584.

IDEAL DATA SYSTEM; Amstrad PC1512 d/drive, colour computer and PK232 multimode terminal unit, £850. Ham International Multimode 11 converted 10w, £65. Eddystone 770R and 770U needs attention, £50. Pye Westminster 10-ch dashmount £25. 19-ele 70cm crossed beam, unused, £25. 9-ele 70cm beam, £10. Trio TR7800 2m fm £150. Call and haggle, but after 6pm. Buyer collects/inspects. G0HVM, Newmarket 72084.

YAESU 101ZD/MK3 +FM +wrc bands, £475. AMT2 +Vic20 Eprom software, £200. C64 software £35. Strumech 30ft wall-mounted tower, auto brake, £325. HQ1 minibeam +rotator £125. EL40X trap dipole +balun, £25. G4LKK. Tel: 021 353 3620.

YAESU FT290R C/W nicads and charger, case, inst manual, mobile mount, and 10-ele crossed yagi, 2m £250 the lot. G0JFE, not QTHR. Tel: (Bolton) 0204-28082.

YAESU FT767GX INC 6m, 2m, and 70cm modules, MH1 mic and RWC synth mods; as new, £1600ono. G3ZSS, not QTHR. Tel: (Cobham) 0932 63552.

EDDYSTONE 730 GEN/COV rx. Fitted with product detector, variable selectivity xtal phasing filter, xtal calibrator. Also internal speaker. £65ono. Buyer to inspect/collect. G3RDX, QTHR, Anglesey. Tel: 0407-830079.

YAESU FT757 GX MK11 6 months old still warranty, £750. Yaesu FTV107R tvtr 2m fitted vgc £150. Yaesu FT760 mint, £300. 15a psu as new, £60. Tel: Gravesend 328163.

KENWOOD SM220 £220ono. AT230, £130ono. AT130 £75ono. DFC230, £75ono. VF0120 £50ono. Tel: 0203-490483 (evenings). G0BVS, QTHR.

TATUNG EINSTEIN COMPUTER and colour monitor. Complete with manuals, software, and dust cover. All as new, £100. No offers. Tel: Brian, 0329-235256.

FT901DE CW FILTER and fm. Recently serviced good order, £500. FT690 inc nicads, charger, case and 3-ele met £250. 2m transverter, 28 IF £75. 432 17-ele MET, 432 reflected power meter. Telford 616166 G0JCN, Martin.

FT221R. FM/CW/SSB/AM. 144-148MHz, with handbook and orig pkg. One owner from new. Minor fault (dirty switch?) Not used last 3 years. 01-640-6020.

TR10 830S, 500Hz filter (cost £48), with 2 spare sets of driver and pa valves (cost £60). Orig pkg. Rig very little used, £800. G4MYX, QTHR. Tel: 0937 832061 (Tadcaster, Yorks).

FT101E (TCVR) FR101 (rcvr inc 2m and 6m) Both digital readout spare 2 new 6JS6C. Ex condx with manual £450. G4ZUX, QTHR. Tel: 0934-512141 (Avon).

TR10 TS520S, VF0520S, HF tx/rx, 160-10 cw filter 250Hz ac/dc psu, gwo. Reason for sale up date of station set up. £400. Tel: 0278 785238. G4SJJ, QTHR.

YAESU FTONE IN EX condx, c/w all filters, fm, memory, keyer, mic, 12v cable and ext card kit. £975. Buyer collect. John, (Hatfield) 07072 64342.

ICOM IC211E 2M base station with RM3 remote controller and multiTek front end. Audio slightly rough on transmit hence £275ono. Eddystone 730/4 hf communications receiver, good working order with manual, £100ono. Tel: 0254 831751 (Lancs). G40BK, QTHR.

EX-CAD SYSTEM HI-RES 14" colour monitor. 0.31mm dot pitch, approx 800 by 600 pixels. 33kHz line freq, 50-60Hz frame freq. vgc, but not fully tested. £125ono or exchange WHY? (Martin, COHDB, QTHR. Tel: 0684-72178.

PYE WESTMINSTER W15FM dash mount. 4m fm-chan xtalled for 70.26MHz. Complete with Pye mic and mobile speaker. Very clean, vgc, £50. Twin paddle morse key with very heavy base. New condx, £21.

G4ICP. Tel: 0376-84478 (Essex).

MHT 70CM TSVTR 144MHz i/p, £90. Xtals for TR2200G R5tx, TR2200 R3tx, R0tx+rx, Zycron FM2512 R1R tx+rx FT202R R5tx+rx, Pye? R18.056MHz+10.36921MHz. £1ea. inc postage. Tel: 04557-3344. G4AFJ, QTHR.

SSTV PROGRAM FOR ATARI st, c/w hardware interface and all leads. Connectors required, new and unused condx. In orig pkg as supplied by J&P Electronics. Sell for £35 inc p&p. Contact G3WCY, QTHR Tel: (Ruislip) 0895-632341.

ICOM IC735 HF RADIO as new, £775, +1com micro 4E with ex-battpack £175. PK232 radio modem with fax £199. All boxed. John, G4HIV. Tel: 0634-724728 (Kent).

RACAL RA1217 TRANSISTORISED HF comms rcvr 1-30MHz 5 IF filters superb rx £320. FT290R, nicads, soft case, charger, mobile mount, all boxed and good condx. £225. Offers QTHR. G4AVJ. Tel: 0823-332898.

SHACK SURPLUS. PSU FOR Vespa G-line cab. £25. Psu 12v/3.5A limited metered £25. Psu 12v/150ma suitable for VFO metered £12.50. Cabinet 12x6.5x8 +blank panels. £10. Howes/ASL5 audio filter. Tight ssb. Superb cw nicely boxed. £12.50. WPO para audio equaliser. £22. Datong RFA £22. Heath reg. PSU 1-400v/100ma 6.3v/12.6v twin-meters. List £170 bargain £50. Cabinet-wrap round perf steel. 16x5.5x10.5/£12.50. Sharp cass'recorder £15. 0-field transformer 6.3v, 5.7a x2 plus 6.3v/2a £10. Mallory 41,000mfd/50VDC £5. Eddy dial 180degree/6x 4.25ins £5. Decimal pocket stop-watch £5. Wrap round cabinet plain, 8x5x5.5/£7.50. Barbour jacket large £30. Lab balance scales+weights £25. G3RHM, QTHR. Tel: 01-423 2329.

DRAKE C-LINE STATION T4XC R4C, MN4, MS4-spkr, 7075-mic in everyday use. Complete Drake equipment with manuals, moving QTH no room for this superb station. £750. Will not separate. GWOFFY, QTHR. Tel: 06333 64446. Buyer to examine and collect.

PYE PMR VHF AM for sale, base and mobile. G4KBD, QTHR. Offers please.

FP757HD YAESU HEAVY DUTY psu with dc cables for both Yaesu and Trio rigs. £150 plus £5 postage. G3DPR, not QTHR. Tel: (New Milton) 0425-615676.

GOBLIN TYPE CR DOMESTIC radio set made by British Vacuum Cleaner & Eng Co. Five valves, built in electric clock and alarm - all working. Beautiful walnut case. Collector's item. Sensible offers. G14ZH, QTHR. Tel: 0265-848815.

FT790R, 30W LIN, 19-ELE TONNA 4x23-ele, stacking frame, power divider, 21-ele ATV tonna, HWB QRP HF CW, all above open to offer. Brian, G14KIS, QTHR. Tel: Antrim 67948.

YAESU FRG8800 receiver with frequency converter also Datong broadband amplifier, £575ono. Tel: (Preston) 0772 717598. Roy, 403 Brook Street, Preston, Lancs. PR2 3AH.

PYE RADIOS FM WESTMINSTERS. One pair on 69MHz Simplex (suitable 4metres) £100. 2 on 70.375MHz £50ea. 2 on 70.425MHz £50ea. Buyers must collect. MTV435 20w/psp ATV transmitter, £125. 2xL18 PF2's on 70.425MHz, £100pr. G1EZJ, QTHR. Tel: 0782-46570.

SHACK CLEARANCE OF OLD FAITHFULS; Atlas 210X mains cabinet psu £350. Yaesu FT101MK1, 160m and G3LLL RF clipper fitted (improves reception too!); spare valves £325. Both excellent performers. Prefer buyers inspect/collect. G4DCY, QTHR. Tel: 0703-266048.

KENWOOD LOWPASS FILTER. 1kw LF30A Toyo T100 100w dummy load hf-vhf. Both mint condx. Offers. Panasonic EA80671 3-way 100w car speakers £55. Sansui 2/4-chan car stereo amp, up to 150w, £125. Prices include interlink delivery. G4WRLP. Tel: 0286-5264

REG-HB PSU LARGE AND HEAVY professionally built, good protection 5-20v 27amps cont digital voltage readout multi-turn pot for volts adjust. Capable

35amps, £65. Buyer collects intel 8271 & ROM for BBC disc interface, £20. G3BDK, QTHR. Towcester 52309.

ATUS HONEBREW TWO BOTH transmatch with wide spaced caps 1.8-30MHz swr and power indicators, £55ea ono 2m XY 5-ele ant £20ono. 70cm 13-ele slot ant £20 ono. G3BDK, QTHR. Tel: Towcester 52309.

YAESU FT101Z 300Hz CW filter, fan, mike, manual, mint condx, little used, £360. Nevada TM1000 atu £90. Kenpro KP-60 rf speech processor, £10. G3RCE, Tel: 0705-752618. 221 Hayling Avenue, Copnor, Portsmouth, Hants, PO3 6DZ.

MMC144/28 £10. BC221+PSU £10. BC221VHF £10. ATV/Tonna £25. Spectrum+computer £50. BATC-TX £3. Bound volumes Wireless World, £2ea. RadCom £10ea. Complete set semiconductor circuit design £5. 50 semiconductor data books £5. G8KNJ. Tel: (Great Milton) 08446-8933.

TRIO R2000 COMPLETE with fitted cw filter. Orig pkg £450. Hallicrafters SX24 Skydrill defiant vintage rx. Good condx, £75. G4MHZ, QTHR. Tel: 0962-822401 (day), 0703-268705 (evening).

FT708R WITH SPEAKER mic. Listen input mod variable power output £140. Standard C7800 mobile 70cm £155 Belcom 2m handheld £75. Hygain heavy duty rotator £120. Tel: 0782-322907 (Stoke).

TRIO R1000 £220. SMC VHF/UHF scanner £125. 10m multimode (conversion) £125. 10m/fm £35. 10m valve linear 70w (multimode) £85. 10m fm amp £15. ALTA1 rotator £35. Oslerblok twin meter £35. 10m vertical £15. ATU/swl £15. G4VEN, QTHR. Tel: 0705-473764 (evenings).

TRIO 7200G FM MOBILE 10/1watt 10-ch. 7-repeater channels. £100ono or will swap for 70cm transverter. Tel: Dave, G1WXC, 0903 755898 (West Sussex).

STC PRESTEL TERMINAL, green screen complete with keypad and keyboard, ready to go, £60. Microwave Modules 2m-70cm tsvt with repeater shift, 10w o/p complete with 9-ele 70cm Tiger antenna (ANT Products) £100. 15 over 15-ele 23cm antenna, £25. All prices ono and prefer buyer collects. Tel: David Gough on 01-207-0709 (evenings only please).

FT101ZD FM27MHz £450. Weltz AC200 atu £100. HFSV and radial kit £60. Weltz CT150 dummy load £15. YH77 £10. MK703 £20. Star masterkey £65. Safetune £10. Lots bits/pieces. G4UXG, QTHR. Tel: 0734 734263 (evenings) or 01-759-4718 (daytime).

813s BOXED NEW AT LESS THAN half price, £30ea. T125-125 new with base £28. Q-V08-100 SH £7.50. Heater transformer for 813 £7.50. Capacitors Mylor 40mF 2.5kv £10. Megger £28. High voltage probe new, £20. Tel: 0442-211220.

FT209RH 2M FM HIGH power handheld. Highly recommended by G3OSS. With case, nicads, mains charger, car charger, rubber duck and 7/8 wave antennas. Mint, boxed with manual, £210. David, G4JLU, QTHR. Tel: 01-954-9180.

YAESU FT902DM TCVR all options. WANTED: good quality atu/transmatch. For sale: ERA Micro-ready ritty/cw - including morse tutor. Programs required: BBC computer on disc 40/80 or Rom, ie Smith chart - dictionary, thesaurus and/or any interesting programs. Tel: 0704-880345.

PYE T30/R6AM BASE STATION. Local microphone. Remote controller. Number serviceable mobiles. All last used PHR high band. Suitable vhf amateur conversion or use as a set. Ex wkg condx. Full manuals, buyer collects. G0JLX, not QTHR. Tel: 0489-6577.

FAX-1 PACKAGE, ONE MONTH OLD, HARDLY USED, £350. FRG7 receiver, pristine condx, £120. Global AT1000 aerial tuner, as new, £25. Tel: (Dover) 0304-240612 or 0836-720920 (after hours) Greg, RS91561.

14AVQ VERTICAL 10-15-20-40 metres in orig pkg, unused. Also 36 yds UR67 coax unused, £85 or exchange for SEM Transmatch atu. Ron, G4LHK. Tel: 0538-757225. Transport by mutual arrangement. QTHR.

YAESU FT290R MK1 with case, mic, nicads and charger unit. Little use, as new. £260ono. Circuit 2m linear 25w for above. Built but case needs finishing. Offers. G8YOF, QTHR, Birmingham. Tel: 021-360-3972.

DRESSLER 2MTR AMPLIFIER model D200, 500w(max) o/p excellent condx, £450. G3LKZ. Tel: 0206-396352 (7-10pm).

FT101E TCVR 160m thru' 10m. Immaculate condx. Little used, £350. Drake T4XB, £48, M54 £150. Shure 444 desktop mic, £20. Tel: 0892-40051.

TRIO R2000 RECEIVER 100kHz-30MHz inc vhf converter 118MHz-174MHz. Ex condx, £450ono. Prefer buyer collects or pays transit. G3KJP, QTHR. Tel: 0404-3006 (after 6pm).

YAESU FRG9600M scanning receiver 0.1-950MHz. No gaps all modes fitted revised front end extended hf/vhf/uhf ranges. PA4C psu £450. Yaesu FR50/FL50 hf tx/rf offers. Rttv setup Creed 7E ST5TU monitor scope +spares. £50. G4ISN, QTHR. 0509-234046 (evenings).

MICROVITEC RGB MONITOR, high-res. £169 (new £370) Phillips and Grundig video 2000 recorders, £39, £60. Some tapes/films. Prestel unit, £20. Speech processor, RF type £55. Billiard table, 6'x3' £35. WANTED: digital sw radio (portable) any make. G6ASA, Oxford 0865-863333.

JIL SCANNER SX400, 26-520MHz, £350. Marconi TF1066 B am/fm sig/gen 22-550MHz, £150. J-beam 12XY/70cm £25. MuTek GL-NA432E 70cm preamp with controller, £60. Pioneer open-reel tape deck, £100. Tel: 0452-812216. NJ Philpot, Far Field, Mill Lane, Cranham, Glos. GL4 8EZ.

JAPAN RADIO CO JST125D TCVR, NBD500G psu, NFC97 antenna tuner unit, CHC43 desk mic. All tested only, brand new, boxed. Best offer over £1000 secures. DL1000 1kw dummy load in h/duty cast heat sink, £75. Tel: 0602-609345 (anytime).

STRUMECH VERSAPOD, heavy-duty triangular lattice tripod, specially designed for flat roof mounting, 5' base footprint, 10'6" height, inc H2R rotator head unit, KS065. Thrust bearing. Fully galvanized free standing for hf/vhf or dish antennas. New condx £420ono. New Delta M750SFA multitrotator rotator, heavy duty with preset positioning controller, 60' cable tested, unused, boxed as new £210ono. Tel: 0602-609345.

HF LINEAR RAYTHEON SBE linear model SB2-LA frequency 3.8-28MHz. With 12v power inverter model SB3-DCP. Can be used as base station or with inverter for high power mobile. Inputs to 1kw. £400. G3BXI, QTHR. Tel: 0373-830804 (Trowbridge, Wilts).

R210 RX, 2-16MHz psu, VLF converter, £40. Sig/gens HP608E 10-480MHz £30. Airtec 201 30kHz-30MHz £30. All c/w manuals. 2-section 28' mast, guys etc. £20 G4VUX, keyer c/w paddles, £15. Thousands of unused components. G4VUX, QTHR. Tel: (Watford) 0923-248331.

SHACK CLEARANCE - GOING HF. Standard 258-2m all mode tcvr with carry case, m/mount, 20w linear, new nicads, book, box, £250. BNOS LPM-144-10-100w linear/preamp, ssb/fm, book, box, £110. Yaesu FT708R uhf/fm tcvr, with carrycase, charger, book, box, £125. Yaesu FT480R uhf multimode tcvr, with m/mount, book, box, £290. MMT432/144 tsvt with 15db attenuator, book, £95. Hygain V-FM L/usb am for conversion, £30. Single RCB protected 13amp socket fits double box, £5. Daiwa DR7500A rotator with DC7055 controller £35. All items sensible ono Tel: GMIARC, (Langholm) 0541-80327 (after 5.30pm)

TRIO KENWOOD 2M-FM mobile/portable TR2300, c/w nicads charger, case, £110. Zetagi B-40 vhf linear 5w in 35w out £25, or £130 both. G0BDF, QTHR Lutterworth. Tel: 04555-57263 (Pete).

FT101Z, WARC, FM, FAN, mic, manual, boxed, £435. Atlas 180, £190. Pair new boxed Jap GJ56/C, £17p. Ditto Toshiba, offers? GEC 1324V CRT, offers? Osler swr-200 £10. WANTED: IC730, G32VC, etc board. G2HCV, QTHR. Tel: 01-866-4871.

HIMOUND HK8 STRAIGHT key £10. Himound BK100 semi-automatic key, £18 new condx. Also practice oscillator £8. Set morse learning tapes, 1-25wpm £8. Yaesu YD148 dynamic desk mic, £15. Alan, G0BZG, QTHR. Tel: (Mansfield) 0623-25536.

ICOM PS20 POWER SUPPLY with built in speaker, mint condx, £175ono. Icom RC10 freq/controller, mint condx, £25ono. FT23R with speaker mic MH182B, hardly used, £250. Boxed, orig. Tel: Johnny, 0427-5266.

THE BEST - LITTLE USED and in immac condx. Icom IC275E £725; Icom IC475E, £775. Dressler D200S 2m 700w fm/ssb linear £590. Dressler D70 70cm/400w fm/ssb linear, £650. Can be seen working. Tel: Chris, 0532-456370 (work).

444 CREED TELEPRINTER complete, inc text holder £25ono. 120 column dot-matrix printer £50. Maplin model 300 baud, built and boxed, £35. Martyn, G4PKS. Tel: (Leeds) 0532-826487 (after 6pm).

ATV EQUIPMENT Wood & Douglas ATV-1 tx, £65. B&W video camera, £60. Konica miniature colour video camera, brand new/unused, £170. 2m 11-ele Cushcraft yagi £12. Yuasa 12V/2.6Ah battery, cost £18.70 new and unused, £10. Tel: 09277-63773 (evenings).

2M FM LINEAR, 10W IN/40W out. Heathkit HA202 with manual. S0239's fitted (originally phono sockets). Recently serviced and aligned. £35. G4PLW, QTHR. N Hertfordshire. Tel: 043-887-350.

PYE POCKETPHONE 70 PF2AMB low band with LSM working order. £10. Pye pocketphone 70 10-way standard

order. £10. Pye pocketphone 70 10-way standard battery charger. BC11 £10. Pocketphone 70 8-way automatic battery charger BC11A £10. PF70 nicad batteries £1ea. Contact Mick, RS26882. Tel: (Valley) 0407-741193.

YAESU FT480R 2M 10W multimode tcvr, c/w mobile bracket and handbook, ex condx, £285. Also Psion XP 32k handheld computer, new, boxed, with morse program £129. G6LKB, QTHR. Tel: 0229-873288 (work) or 0229-54982 (home). Lake District. Ask for Dave.

CUSHCRAFT A147-20T 2M antenna gamma matched, horizontal cut 144/ssb, vertical cut 145/fm. Made in USA, ideal DXer cost £85, sell £40. Trio TR3500 70cm handheld, spare nicad, soft case, charger, handbook, £195. Azden 2m tcvr ideal mobile, seven facilities on mic, 8-mem 5/25w, band, memory-scan, 12.5/25KHz, £195. Three Regonda (USSR) 6' b/w TVs offers? Philips FM321 Australian 70cm fm with service manual £185. Azden AS-006 ext speaker £17.50. Major M588 am/fm/ssb 80-chan ideal 10fm conversion, offers? Yaesu FT707 hf tcvr £395. May part/ex for good condx Trio TR9130 or Icom IC1271. WANTED: Icom AC35 70cm external preamp, Icom IC8AT 100/150/500 atu. Please ring evenings/weekends. 0328-710641 (North Norfolk).

DX-QTH. JAPAN ON 100W and 1.4WAVE vertical. Two acres. Detached bungalow, three beds, 1971 D/C. Solid c/h outbuildings. OPP for 4-bed bungalow, FFP ten caravan site, residential. Stair/a/c. Croft, Stromness. Details 0856-2216. M0HPV. Contents? make an offer!

COMPLETE RECORD COLLECTION MUST GO! Fantastic variety, something for everyone, popular, classic al, synthesiser, etc. All LPs in mmarked orig condx. You want find secondhand L's ANYWHERE in as good condx. Large SASE for a complete listing. G3M3A, QTHR.

TONNA 2M 9-ELE fixed antenna, '0.09N. Orig box £10, plus postage. G3PLL, QTHR. Tel: 0572-812134.

YAESU FT101E NICE CONDX £285. No offers. Includes matching base mic. Buyer inspects/collects. Cash preferred. Steve, G0EVJ, QTHR. Tel: 0543-251915 (after 7.30pm).

TS711E SHURE MIC PM2001 WATTMETER. Tokyo hy-power HL160V. All as new, £760. Tel: 0326-73943.

DETACHED 4-BEDROOM HOUSE with garage within walking distance of Maidstone town centre and railway station. Two minutes M20. Beautiful views of North Downs. South facing rear garden. Planning permission for mast obtained. £152,000. Tel: 024369-6838.

D100 DX-TV CONVERTER £60. Yoko 5.5" mono TV for dx-tv £65. Yaesu SP102 speaker £45. Yaesu FR7700 hf receive atu £40. Datong DC144/2E converter, £25. Alinco EMR400 rotator £60. Daiwa 4-way BNC coax switch, £15. J-beam 432MHz 24-ele parabean, £30. Complete set of "Technical Software" radio progs for C64 computer inc TX-3, RX-4, interface, locator, logbook, morse tutor, and vhf/uhf contest log. All progs are latest versions and originally cost £116 total (tape versions). Your's for £60 and recommended. All items in orig pkgs with manuals. G6IAT, QTHR. Tel: (Luton) 0582-23750.

TRIO TS930S EX CONDX £1000. Kenwood AT230 atu ex condx £125. Both boxed with handbook. Sylvia, G0HBY, QTHR. Tel: 0289-302129 (after 5pm). Berwick Upon Tweed.

FRG7700 PLUS FRT AND FRV model B. Excellent, prefer buyer collects, £270. Cash only. G0IZV, QTHR. Tel: 0734-692293.

TS530S WITH MC35 MIKE £400. WANTED: SEM QRM eliminator. Also wanted service repair info on Eddystone 840C and Magnum 2 tcvr. G4WJX. Tel: 0782-330613.

BARGAIN COMPONENTS; Meters, switches, capacitors, transistors, tools, etc. Majority new, includes trays/bins. £25. Carefree, maintenance free, rechargeable lead acid 12V6A battery. RS constant voltage charger. Together £39. Alphascom-32 printer £25. WPD speech processor, £14. G4GIG, QTHR. Postage extra. 021-777-6086.

PREPARE FOR THOSE WINTER MONTHS. Compete station comprising TR9000 2m multimode 18w o/p £300. Microwave Modules TVT435 +receiver, £150. MM144/30LS £55. Daiwa rotator £100. SMC 10a psu £30. J-beam 48-ele/70cms £10. 8-ele/2m £10. Marconi/dualtrace 100MHz £100. Chris, G6NMR. Tel: 01-908-4274.

YAESU FT727R 2M AND 70CM handheld 5w, case, £295. matching NC15 base stand quick charger £55. As new boxed. 3 Labgear Televista vhf to uhf. Built in power pack £10ea. G4IOF, QTHR. Tel: 01-722-7040.

TRIO TS430S WITH fm board, crystal filters for am/ssb(narrow) and cw(narrow) and matching PS430 power supply. All in ex condx £775. SP940 speaker (3-filters) £65. Tel: 01-393-9691. G4YBU.

SPEAKER/MIC KENWOOD, SMC30 (use with TR2600/TR3600 TH21/TH41 series). £15. As new. 00V06-40A with base £15 SP940. Kenwood speaker £65. Black/Decker de Walt radial arm saw foldaway model powershop 320. Hardly used, £275. Tel: 01-393-9691. G4YBU.

TS430S BRAND NEW, boxed, still under guarantee, all manuals, receipts, documents included. Mint condx £685ono. Tel: COHFF, 0209-714342.

BENCHER IAMBIC PADDLE KEY, £30. MFJ electronic keyer £30. Both perfect. "Tanoy" straight key £2.50. Admiralty handbook, or-Wireless Telegraphy vols one, two, £10 pr. All plus postage. G43DVX, QTHR. Tel: 0333-50768.

KENT BRASS MORSE KEY as new, £25. C4A1H, QTHR. Tel: 061-962-1904.

FT101 RECENT CHECK UP new pa valves, reasonable condx, £200ono. Buyer collects. G4ZDE, QTHR. Tel: 0283-215906 (after 7pm).

FREQUENCY METER (LCD) Thandar model TF200, 10Hz-200MHz. Oscilloscope probe, holdall, instructions, and service/manuals. Mint condx £60. Antenna rotator, Channel master separate top, steady bearing and short antenna support tube. £25. All plus carriage. G1UUG, QTHR. Tyneside (091) 252-7141.

SILENT KEY SALE. FDK750E multimode, good condx testing available, £225ono. Buyer collects. Tel: 0327-50663 (evenings). G6ZGA, QTHR.

KENWOOD VHF FM TCVR. TH215E, charger, and sprk/mic £200. Kenwood TS520E. New PA valves, £350. MFJ deluxe versa tuner II. £100. G4GHC, QTHR. Tel: 0803-37050.

ICOM IC740 INC FM UNIT orig packing, vgc, £600. Yaesu FC902 atu, £100. G4PZK, Tel: (Reading) 0734-68712.

YAESU FT101ZD MK3. Plus immaculate with Trio MC50 desk mic, £550. fm FTV901R 2m & 6m £250. All with boxes and books. G6KLD, QTHR. Tel: 06053-3957

YAESU FT726R 2M/70CM and satellite module, very little used £800. Hansen FS603M peak reading 70cm meter, £40. J-beam PB18/70 £30. Vertical colinear £30. All absolutely mint, antennas never used outside. AR40 rotator and cable £80. G6EYD. Tel: (Chesterfield) 0246-239487.

COMPLETE STATION. YAESU 767CX tcvr. MD1 mic. Kenpro KR600RC controller for HQ1 hybrid quad. Capco SP3000 atu. All cables, etc. £1500. Cost £2200 last year. Mint condx. G3RFD, QTHR. Tel: 0934-24675.

ICOM ICR71E RECEIVER, with fm board fitted. Boxed, mint condx, £500. Buyer must collect please. Ken, G1XTT, near Watford, Herts. Tel: 0923-670475.

DRAGON 32 APPROX one hour's use only. Manual, standard software, boxed. Dragon single discdrive unit never used. Manual boxed, complete. 7 Dragon books. 44 Dragon user magazines. Cassette player available. Best sensible offer secures. Tel: Bob, 0372-57837 (9pm-10pm only).

ICOM IC211E HANDHELD £110. Star LC10 printer (new) £140. Commodore/1541 discdrive £120. Commodore TX3 cw/rty tx/rx i/f complete £25. Howes/speech processor £15. Rigel Comms 6m preamplifier, £16. Realistic PRO2004 scanner, latest model, 25-130MHz, bargain £240. Leader Logic probe LD076 £20. Boxer fans (new) £3. AR40 rotator £30. 8" Shughart/floppy drives, £10ea. Icom SM3 desk mic £10. Answerphone (needs repair) £10. Webber full track studio alignment tape £15. Large quantity of DEC equipment VT52, memories, controllers etc, etc to clear-need space!! £100. Large quantity of Commodore 64 equipment hardware and software-new PC forces sale. Phone for details. Revox tape heads (unused) £10. Large quantity of magazines RADCOM, PW, WW, etc. Buyer must collect!! £10. G8MAC, QTHR. Tel: (Towcester) 0327-53087.

ICOM IC251E 2M MULTIMODE with muTek board £380. Heatherlite 2m explorer linear amplifier (4CX250B) £420. Marconi hf amplifier, £110. TNC220 packet modem, £100. Icom 275E 2m 25w multimode, £875. G3ILO. Tel: 0453-83-3411.

FT290R MUTEK FRONT END, nicads and charger £200ono Six-element quad 2m CC. GDO, Diawa swr/power meter. Offers. G4VOV, QTHR. Tel: 0706-526834.

FT102 MANUAL, technical supplement, am/fm board plus am/narrow/ssb/cw filters fitted. £560. RA17L ex condx, new case, manual, spare valves, £195. Can deliver Midlands or North. C4BOH, QTHR. Tel: (Cheshire) 04775-296.

TR10 TS530SP mint condx. Complete with hand mic, instruction book and orig packing, £550ono. Tel: (North Avon) 0454-412624.

TR10/KENWOOD TS940S, AT940 auto atu, 500Hz c/w filters, Lowe mods, SP940 ext speaker, service manual. All in mint condx £1600. Sony IFC6800W

0-30MHz, 30-band receiver £100. Tel: (Edinburgh) 01-665-4415.

ICOM 2900 2M MULTIMODE, 25w, good condx £350. G0JTO. Tel: Swanage 424908 (evenings).

KENWOOD TS430S ALL MODES hf tcvr with fm etc fitted, complete with matching PS430 power/supply and SP430 speaker and Yaesu FC902 antenna tuner and all manuals. All in vgc, £700ono. G11VY, QTHR. Tel: (Rugeley, Staffs) 08894-3136.

FT290R (MUTEK) immaculate £260. MM 144MHz 50w linear £65. FT690R-2 immaculate, £300. BNOS 3-50w 50MHz linear £90. MM ATV tx/rx £115. Immaculate. Tokyo 3-30w 70cm linear, £65. All genuine, QRT V/UHF. All ono. Job lot, £825. G4RNI. Tel: 091-469-9989.

ICR70 HF GEN/COV RECEIVER. With fm board & dc kit. Exc, £410. HRO MX receiver c/w psu and 4 coils, vgc £90. Number of radios pre and post war in gwo. £30-£50. Tel: 061-962-7577.

YAESU FT707, FC707, FP707, FV707. All for £575. Little use. G1LDJ. Tel: Bristol 667179 (evening/weekends).

TS930S WITH AUTO ATU twin narrow cw filters, SP930, £1175. FT726R 2m/6m/70cm satellite module cw filter £900. TS430S narrow, cw and fm module, £750. All good condx with orig boxes. Prices all ono. G4BWP, QTHR. Tel: 0638-751830.

COMMUNICATIONS RECEIVER DX300 digital, mains/battery/12volt. £120. G10KP, QTHR. Tel: Dean, 0594-510470.

FT221 MUTEK F/E £60. MMT1296 £140. DX1296 £80. HF400 £70. LWM/1296TT10 £90. L/wave power/meter £40. 4x23-ele'-tonna £70. LWM 13cm tsvttr and relay £90. LWM2320 £45. 2x46-loops £100. Amplifier 13cm/2C39 £50 and 4x2C39 £10ea. Buyer collects. 2C39AMS/23cm £90. G8WPL, QTHR.

SWAN 102BX, 160-10M 2 vfo's speech processor, etc, vgc. Recently serviced £375ono. G4HPF. Tel: 0463-241211.

COLLINS KWM380 HF TCVR, speech processor, noise blanker, two cw filters, gen/cov rx. Mint condx boxed, £2550. YO-101 monitorscope. Also mint condx and boxed, £130. G4JFH, QTHR. Tel: 0977-556488.

IC260E 2M MULTIMODE, IC-HM10 MIC, vgc £280ono. CT82 noise generator, £20. 2m sludge pump £20. Nombrex sig/gen £10. Two tone oscilloscope £10. Leak stereo 30 £15. Garrard AP75 turntable £10. G4D10, QTHR. Tel: (Wolverhampton) 0902-733185.

YAESU FT980, FC757AT auto atu, MD1 desk mike, keyer fitted. General coverage tx kit. £950ono. G0DKM not QTHR. Tel: 0934-815239 (after 6pm please).

SCARAB TERMINAL UNIT, SCARAB interface and software. Rty for Spectrum computer. Complete and working, £50ono. G4YMT, QTHR. Tel: 021-475-6307.

YAESU FT290R, nicads, charger, case, boxed, only used twice, £275. FT208R handheld tcvr, nicad, case, antenna, as new, £150. BBC-DFS with twin 40/80T discdrive, novex colour RGB monitor with sound, good condx £575. Mark, G1LOH, QTHR. Tel: (Surrey) 0428-737263.

10M FM TRANSCEIVER, converted CB, DNT, £30. 10m USB transceiver, converted CB. Adams £50. MM 70cm transverter, 2m input, Set for FT290R £100. Trio 70cm handheld TH41E £125. Yaesu 2m handheld FT203R £120. Further details ring 0222-623974.

TEKTRONIX OSCILLOSCOPE 545B 33MHz bandwidth. Checked to makers specification £60. Choice of plug in's single to four trace, £25-£55. Photocopy manuals at cost. Purchaser to collect. Richard, G8MSM, QTHR. Tel: (Brighton) 0273-34908.

SOMMERKAMP (YAESU) FT277B (FT101B). All mode (inc fm) 90w output, car forces sale! £275. Daiwa CNW419 ant tuner, cross-needle, 200w, ant switch, mint, £150. KR400 rotator, hardly used £80. Hard up student, so no offers!! COGHS, QTHR. Tel: (Chelmsford) 0245-352522.

JRC JST-100 HF TCVR with matching psu and speaker. Extra cw filters fitted. Superior quality equipment, £750. Prefer buyer inspects. G4MYR. Tel: 031-346-0591 (evenings).

TR10-KENWOOD TS811E 70CM. All mode base station used twice and as new. The best available boxed, manual, scanning mike, unopened accessory pack, 230VAC or 12vDC £715. G4UKL, QTHR. Tel: (Cornwall) 0326-40595.

UNIDEN BEARCAT 50XL handheld scanner. See ads for spec £69. Sony ICG600DS new May, 1988. £95. Both items excellent condition. Buyer to collect & pay postage. Tony Cox. Tel: (Camberley) 0276-79308.

YAESU FT902DM. ALL HF MODES, ssb/am/fm/fsk. Also Yaesu FT757GX with matching psu. Rty, and cw microreader by ERA including cw tutor facility, ritty and cw scroll across screen. WANTED! Quality atu TRI/68N (FC102). Tel: 0704-880345.

HILOMAST 50FT PNEUMATIC 5-section mast c/w compressor wall brackets. Overhauled spare seals, £450. Tel: (Eastbourne) 0323-22571. G6VYH. (Evenings).

LINEAR BUILDERS, PYE TF100'S 00V06-40 o/p +cooling No19 set Canadian and rotary converter. Apple 11+, discdrives, PIAX2, Diagonal drives, stepper motors literature, monitor. G44TPX, QTHR. Tel: Prestwick 78886.

IC251E MUTEK FRONT END FITTED, MML100's 100w amp BNOS 12a psu. AR40 rotator 8-ele jaybeam quad and extras, £725 the lot. No offers, no splits for this excellent vhf station in very good condx. G6VAS, QTHR. Tel: 0964-613928.

ADMIRALTY HANDBOOKS Wireless Telegraphy vols I/II £16pr. Electronic insulation tester (Megger). New and unused £55, cost £75 new. Computer T switch radiospare 470-572 unused, as new, £40. G4DVH, QTHR. Tel: 0229-54466.

YAESU FT301D TCVR, FP301D psu, FV301 remote vfo, FC301 ATU, YO301 monitorscope. £695. FT221 with muTek board, £295. Microwave Modules 2m 50w linear, £70. Tristar 747 converted 6m £95. Nevada 6m linear, unused, £22.50. G4ILO, QTHR. Tel: (Colchester) 0206-210878.

HEATHKIT SB220 2KW LINEAR c/w matching power meter £495. Icom 751A mint, boxed, c/w remote control £945 or £1300 the pair. G4RZC. Tel: 0462-813235 or 0462-811930.

CURTIS CHIP KEYS, INTEGRAL regulated psu, side-tone, weighting, c/w electronic iambic paddle, will key any tx £40, post extra. Dx40 tx and VFU1 vfo £20. (Buyer collect). G3RB, QTHR. Tel: (Tyneside) 091-2530504.

SHACK CLEARANCE; Icom 720A with SM5 base mic £550. Yaesu FT480R 2m, all mode, 10w £265. MML144/100S linear with preamp £85. Yaesu FT780R 70cms, all mode, 10w £295. BNOS LPM432-10-50 70cm linear and preamp £100. Spectrum 10m-6m tsvttr 10mw in 2w out, £50. Icom IC4E 70cm handheld with nicad pack, chgr case dc/cov £140. All in ex wkg order with boxes, manuals, etc. Updating equipment. Tel: 091-3853552 John, G4WJV, QTHR.

FT690 MKII MINT orig pkg, £295. G6JHR. Tel: 0843-601845.

HF LINEAR AMP Dextron GLA1000 4x6L06 1kw. In good order, £300. Yaesu FT-DX400 tcvr for spares, £50. Barry, G4BHE. Tel: (Basingstoke) 0256-781468.

MORSE TUTOR, DRAE, AS new, £30. Pye pocketfone 70, 3-channel, working on R80, R82, S88, £55. G6YNF, QTHR. Tel: 0296-28109.

YAESU FT901DM, VGC, complete with fox tango ssb and cw filters, fm, keyer, dc/dc, manuals and spare valves, £475. Aitron A06-20 3-ele minibeam, as new, £75. Tandon T01000 Prestel terminal (hobs etc) £50. G3ROC, QTHR. Tel: Winchester S3450.

YAESU FT101D RECEIVER £160. FRT-7700 tuner, £40. YH-55 'phones, £15. SP-901 speaker, £30. All boxed ex condx. Contact RS85809. Tel: (Bournemouth) 0202-872085 (evenings please).

ICOM IC4E & B&J slim jim for 70cms. £150, boxed with charger in orig pkg. Very little use and in almost new condx. G010Y, QTHR. Tel: (Southampton) 0703-769483 (after 7pm).

FT767GX FULLY MODIFIED. All options, 70cm/2m/6m. Mint 1yr-old. Hardly used, £1700 or part/ex £1761. Howard, G0HZH. Tel: (Suffolk) 0394-460-474.

FT757GX £650. FC757AT £185. Mint hardly used. Offers near? MML432/100W Linear £200. Antennas 6m/3-ele £20. 2m/7-ele £15. Heathkit monitorscope £130. All mint condx. Howard, G0HZH. Tel: (Suffolk) 0394-460-474.

YAESU FT757GX, FP757HD psu, MH1 mic +mobile brkt. Never used, £675. Trio Kenwood TS711E c/w mobile bracket, £675. WANTED: 70cm multimode base, 6m multimode base. Prefer Icom. G4AJE. Tel: (Cambs) 0354-740441.

24V SUPPLY IN STEEL CABINET, 58x25x11" with 12 YAP chloride cells trickle and 6a charging. 60AH at 10hr rate. TM3 level microvoltmeter. 12V6a psu. 24v4a transformer. G4MH ant, 10/15/20 and 2x20' poles, rotator, control cable. 100m 5-core screened cable. 50m coax, 75ohm. 9-valve wireless sets. Vintage BBC high RST phones, AVO sig/gen 1935 and Sullivan telegraphy key, circa 1900. Used KT66s, 807s, 6V6s and others. SAE for radio books 0827-712348, G3PH. Cecil RH Broadhurst, 65 Church Walk, Atherstone, Marks.

YAESU FT290 MK11 boxed as new. High capacity nic-ads, mobile mount, soft case, 5/8th mag/mount. 5-ele jaybeam. All for £300. GILTC, QTHR. Tel: (Plymouth) 0752-336022.

ALINCO ALX2E, 2M FM TCVR, smallest 2m pocket rig in the world. 3w/500mw, all-channel, memory, battery save, charger, hardly used. As new, boxed 6 months' guarantee. Cost £199, Accept £149. Tel: 0332-831300. Colin, G4SOV, QTHR, (Derby).

KDK240 2M FM MOBILE TCVR, 25w/5w good condx £150. Pete, G0BAG, Tel: (Portsmouth) 0705-596087.

TANDY 100/102/DISK/VIDEO interface 5-1/4" floppy discdrive. 40/80 characters display tv monitor £100. G4UVJ, QTHR. Tel: 0268-697978.

YAESU FT77 VCC fitted with narrow cw filter, manual, orig box, £400. Prefer buyer inspects/collects. G0CZB, not QTHR. Tel: (Hitchin) 0462-34552.

KAM (TNC) KANTRONICS all mode (vhf/hf) used only vhf packet, £185. Also amber screen monitor (composite video) £35. Also Commodore 64 computer (slightly faulty). RS232 interface included £50. 144MHz valve linear project including QOV06-40A (new) £30. G0ECX, Tiptree 815978.

TONO 5000E PLUS NINE inch external video monitor spanning condx, £300. G3DKO, QTHR. Tel: 0760-23897.

TS930S MINT/BOXED. With instructions, accessories, indistinguishable from new. Very lightly used. With MCSO and SP230 in same condition. All purchased new from Lowes. Total list £1807. Sale £1350. No offers please. G2FZU, QTHR. Tel: (Southwell, Notts) 0636-813847.

KENT TW'N PADDLE BRASS £28. Targa electronic iambic keyer, c/w paddle £35. SEM auto hf preamp £25. Rangemaster ultrasonic tapeless measure, £15. G4UNM, QTHR. Tel: 0983-402273.

"TRIGANO" AND "RACLET" frame tents complete with inner sleeping compartments. "Trigano" £120; "Raclet" £200. Excellent for domestic, rallying or NFD use. SAE please for details. Buyer inspects and collects. (South Hampshire). Tel: (Titchfield) 0329-42482.

PSUs SEVERAL 12V 40a £59. 13.8v 40a £75. T/V sound monitor (Motion Electronics) 6 presets am fm/uhf/vhf bands 1-5 240v in peak box, £29. All above inc post. G4XOX. Tel: 0245-324555.

YAESU FT480R MINT CONDX 2m multimode 25w plus mobile mount, boom mike and remote switch for mobile use, £325. Also 12-ele/2m yagi, £12. G4MVA, QTHR. Tel: 0723-85563.

FDK MULTI 8000 2m 25w fm mobile PLL tcvr. With U/D mic. Band scanning. Memory. Also remote frequency display. As new, £210. G3ION, QTHR. Tel: 0703-769706.

THE RECENTLY PURCHASED ROBOT 1200 is now for sale. Unit comes with Wrasse compatibility, Eprom, 4 extra high res memories. G3NOX program + interface for BBC B micro and Philips high res RGB monitor. £1300. G4ZEK. Tel: 0206-851343.

TRIO TM201A HARDLY USED. Box, VGC, 2m 25w fm tcvr, £200ono. G6JUC, QTHR. Tel: 0742-346532 (after 6pm).

KAM AS NEW, £200. 1com IC240 vgc, £100. Homebrew 5-ch scanner for 1com 240, £10. G43TR1, QTHR. Tel: 0738-26941.

AOR2001 SCANNER, £225. AEA MBA/R0 morse/rtty reader £45. Brother EP Electronic keyboard/printer (serial) £40. Sony ICF2001 gen/cov rcvr £95. Technical software TX3 +RX4 software with TIF1 and interface for Spectrum £30. G1MIL, QTHR. Tel: (Crewe) 0270-585092.

IC02E TWO METRE HANDHELD tcvr, soft case, chgr, Heatherlite headset, £175. G4DPZ, QTHR. Tel: 0245-73331 (extn 3269).

TWO 11.4M TELESCOPIC MASTS (military style) c/w insulated base plate, guy ropes, stakes, pulley, pins, hammer and box. £120ea. or would consider p/ex for hf linear (homebrew?). Dave, G0HHT. Tel: (Darlington) 0325-58745.

STANDARD 2M MULTIMODE CS800. Ex condx, £230. Panasonic gen/cov rx, digital readout £85. Trio gen/cov rx, £50. Heathkit cw rx and vfo £35. Bryn, G0HXA. Tel: 0274-60530.

MARCONI DA30 OFFERED FOR MA20A PP5/400. Cash adjustment if required. Will pay high price for Tungsram 015/400 and Mullard TD25. G4IMT, Bernard Litherland, QTHR. Tel: 0225-891254.

DATONG D70 MORSE TUTOR as new. Internal speaker and earphone. Sends choice of 5-letter groups, 5-figure groups or 5-mixed characters. Speeds up to 37wpm. with variable delay for beginners. QTHR. G3TJT. £30. Tel: 0302-65472.

FT290R, 144MHz MULTIMODE. Complete with case, nic-ads, and charger, £250ono. G6MXL, QTHR. Poole, Dorset.

SILENT KEY SALE; Yaesu FT767GX +2m mod 4-ele mint condx, towners manual £1000ono. G4VDZ, QTHR. Tel: 0942-865302 (anytime).

ICOM IC4E 70CMS HANDHELD with case, spkr/mic, spare battery pack, and DC adaptor, £165ono. Memotech MTX512 computer, 32k ram, 32k rom, shielded case (!) With five games, £40ono. Tel: Simon, G0FRD on Leighton Buzzard 375959.

TRIO 2600E 2M HANDHELD, £150. Marconi rcvr No.52 £15. Spectrum 16k £20. BC221 frequency meter, £10. BC312M hf rcvr £15. All offers considered. Dave, G1YMN, QTHR. Tel: 0789-740108 (Warwicks).

PROPERTY OF LATE G4PRM. TS830S MINT, boxed, £725ov no. KW707 (Supermatch) atu £100ono. Also FV102DM remote vfo £100ono. G4BZV, QTHR. Tel: (Mansfield) 0623-863785.

COMPLETE 70CMS BASE/MOBILE STATION; Kenwood TR9500 all mode tcvr, mutek GLNA433E masthead preamp, MET 17-ele yagi, colinear, 3x 5/8ths mobile whip, cavity wavemeter. All cables, boxes, instructions, All ex condx, £500. Tel: Martin, (G0HRZ), 01-590-5490.

MC85 DESK MIC. Preamp, voice compensator, both adjustable metered, up/down. Suitable all rigs at present plugged for TS940S. Unmarked like new, in box, etc., £80. Max, G3WMB, QTHR. Tel: (Ware) 0920-3564.

FT290R MUTEK MOBILE MOUNT, cased, 50w TONO linear, 15-ele beam, 7a psu, 5/8 wave mobile, Drae wave meter, £325ono. 10 fm JWR, c/w 30w linear, £40. Tel: 0227-74283/366232.

TET TWO ELEMENT TRIBANDER BEAM antenna, £75. Tel: 0253-886389. G4TMA, QTHR.

WANTED....

YAESU FV102DM, SP102. G0JFU. Tel: 0452-862773 (Glos).

AVO VALVE VOLTMETER. type CT38. The meter is bust, any help as to replacement, repair or anything to get this delightful equipment back into use. G8RHO, QTHR. Tel: (Malvern) 06845 62721.

MAINS POWER UNIT for AVO transistor analyser (mark 2). G4KLP, QTHR. Tel: 04024-47246 (after 7pm).

ANY INFO, CIRCUITS ETC. for a Clavioline concert valve musical organ made by Selmer. I have the keyboard but not the psu/amp. All expenses refunded. Mike, G4JRB, QTHR. (Sorry no phone).

HEATHKIT RC1 ANY CONDX. Electroniques coilpacks solid state. HRO cabinet and coilpacks 50MHz converter. BC348. G43UMD, QTHR. Tel: 0222 761813.

VALVE TYPE COMMUNICATIONS RX. BC348 preferred. Will pay very good price for unit in mint condx. Also consider AR880 or Eddystone 750 but emphasise only mint condx acceptable. G3DPR. Tel: (New Milton) 0425-615676.

F9FT 9-ele YAGIS TYPE 20809N 16, yes sixteen required, must be cheap. 4-way power divider, four needed, Brian, G1K15, QTHR. Tel: Antrim 67948.

FRG7 RECEIVER WANTED. G0ISG. Tel: (Kidderminster) 0562-741440.

BEG, BORROW OR BUY, circuit and/or information for Redifon HF125 PA, driver, and switch mode regulator boards. Expenses refunded. G3POL, QTHR. Tel: 0652-55736.

VFO240 REQUIRED BY OLD timer. Saved up for the rig and again for the vfo. Now discontinued. Can anyone help? Your price paid if in reasonable condx. G4M3CSM, QTHR.

TET HB33M 3-ELE Minibeam for 10, 15 and 20 metres. In any condx. Not QTHR. G4PTJ, Tel: 04446-45826 (daytime only 8am/5pm) or 04446-3522 (evenings).

DIGITAL UNIT FOR FT101Z; matching FC901, FV901, FTV901R etc. Consider damaged FT101Z for spares. Small atu such as AT130. M. Twigg, 30 Valley Drive Cleveland, TS15 9UJ.

DRAKE MN2000 ATU/C4 station console. Yaesu FT221 R/D all items to be in good working condx please. Tel: 0670-855953 (Northumberland) or write G4OLC, QTHR. All letters answered.

HF LINEAR, 10w input/100w output. Trio TL120 or Yaesu FL110 or similar. Homebrew valve linear also considered, mains or 12v operation. In fact any linear suitable for use with TS120V. Cash waiting. G0AYZ, QTHR. Tel: (Gosport) 0705-589560.

CUSHCRAFT R3 HALF WAVE vertical antenna for 10-15-20m wanted. Will inspect/collect. Tel: (Northampton) 0604-44341. G4IRO, not QTHR.

HANDBOOK SERVICE INFORMATION for Barlow Wadley XCR30 hf receiver, about 1977. Ted, G4TLY, QTHR.

6 METRE MODULE FOR Yaesu FT726R. Please phone or write with price. FOR SALE; Pye fm 1/band Westminster on 4m £50ea. FT209R £145. FT709R £145. TR2300 £95. Buyer collect please. Handhelds with some accessories. Charger/etc. Tel: G1EZJ, QTHR. 0782-46570.

REQUIRED TWO PHILIPS VCR N1700/2 video heads in new condx, only. G3CAT, QTHR. Tel: 0278-780780.

CODAR RX T28 MAINS PSU Type 250/S. PR30 RF Presel. Also units 12m/s psu and unit switch type 12R/C. G13YMT, QTHR.

INFO ON WPO COMMUNICATIONS Alpha ssb (160m) transceiver; Construction details, reviews, etc; to photostat? All costs refunded. John, G4LTH, QTHR. Tel: 0375-674301.

HF LINEAR AMPLIFIER. Heath SB200, Yaesu FL2100 or FL2500, KW1000 or WHY? Would consider good compact homebrew job. Steve Ireland, G3ZZD, QTHR. Tel: 01-348-9780 (home) or 01-927-9544 (work).

WANTED IN GOOD CONDX - HF5 vertical antenna with radial kit. G4YIX, QTHR. Tel: 0452-617145 (evenings).

TRIO TS520 TCVR, good condx, cw filter, £280. Matching homebrew 2m tvtr, 3w out, £50. Ian, G4UWK, QTHR. Tel: 062-982-3072 (evenings).

G4UWK, QTHR. Tel: 062-982-3072 (evenings).

POCKETPHONE PF2's any condx for local ATC group. G44TPX, QTHR. Tel: Prestwick 78886

ALTRON 3-SECTION 10M telescopic tiltover lattice tower wanted. Price to include delivery, Dorset area. G3NQU, QTHR. Tel: 0935-815616.

PLEASE HELP! WANTED. Trio JR60 gen/cov rcvr in wkg condx. Fair price paid. Dave, G1DJR, QTHR. Tel: (Kettering) or mobile on 0836-601920.

FT225 RO WITH MUTEK front end. G4PYB, QTHR. Tel: 0553-86306 (after 6pm). Daytime, 0553-761995 Also Wanted: Drake TR4 remote vfo.

WANTED TO COMPLETE PROJECT R1155 rx preferably "N" also Codar AT5 tx, all replies answered. G3VXI, QTHR. Tel: 052-16-382.

KW107 SUPERMATCH. Must be in good condition. G0KFN. Tel: 0458-31857.

YAESU AMPLIFIER required model No. FL2010. 2m 10w linear amp in good condx. Tel: Cullingworth. 0535-273891 (Yorks area) anytime.

HELP. WANTED URGENTLY, copy or sight of service manual for Tequipment Serviscope Model S43. Failing this, circuit diagram of time base and horizontal amplifier (wired version not PCB). All expenses refunded. G3YYZ, QTHR. Tel: 0255-880893.

TRIO VFO230, DIGITAL including split frequency operation with five memories, plus external speaker SP230 with built-in audio filters, both items must be in good working order. Dennis, tel: 0407-830182 (after 8pm) Anglesey, Gwynedd.

All Members Ads received up to the 3 October have been included above.



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Sony Air 7 Airband Handheld Receiver.....	£249.00

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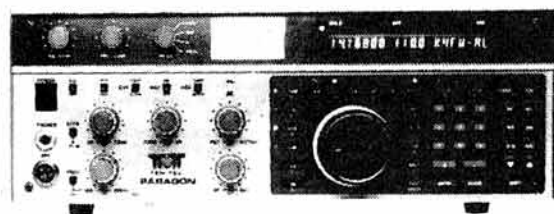
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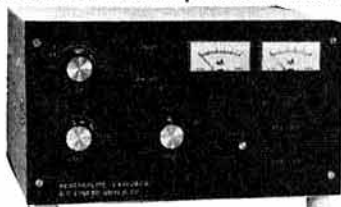
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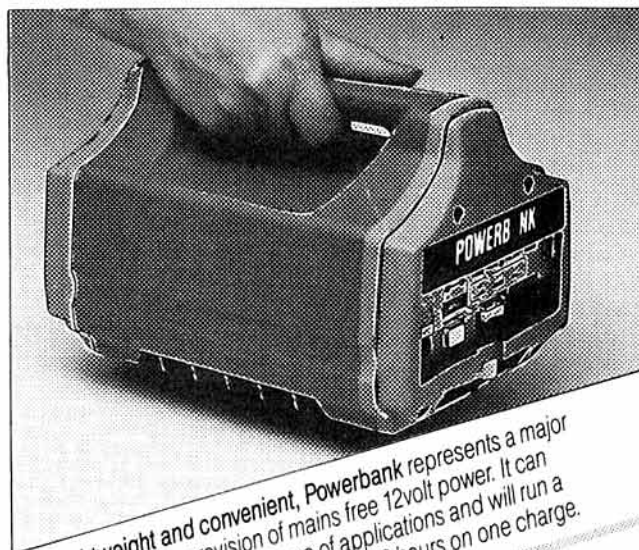
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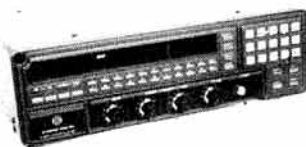
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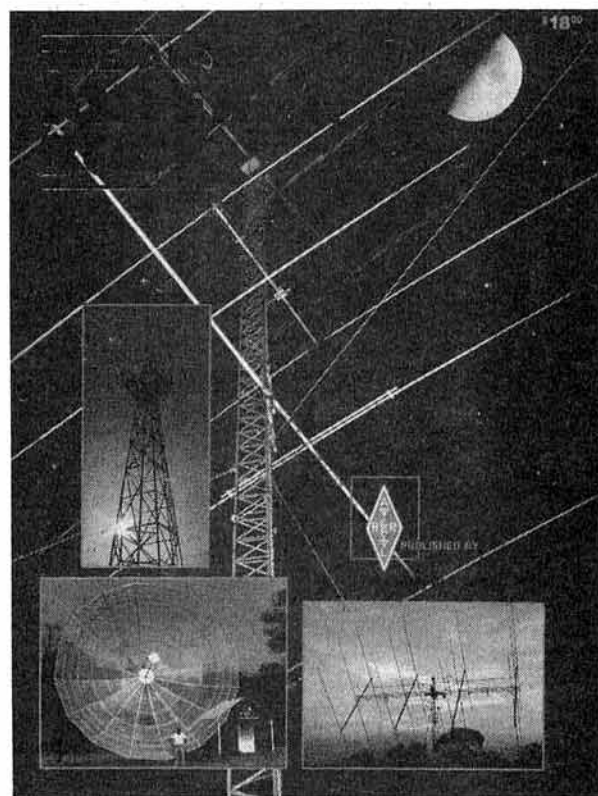
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A QUESTION OF PRIORITIES

I cannot agree with Mr Moss's (G4ILQ) criticism of the technical contents of RadCom in the September issue. For my money I would prefer to see many more articles of the calibre of those by GW4FRX and G4JZQ. The editorial page of each issue states "Membership (of the Society) is open to all those with an active interest in radio experimentation and communication as a hobby." I suggest that the GW4FRX/G4JZQ articles are in that very best tradition.

Did Mr Moss actually read the article, I wonder? The authors lucidly stated their design philosophy and it really is not all that complicated. I cannot recall having seen previously in any amateur radio publication a design for a voltage regulator using power fets. The advantage their design offers of such a low input/output voltage differential should be obvious and I would suggest that the days of the conventional low voltage high current regulator are numbered.

My guesstimate of the cost of parts for their design is about £20, or considerably less for those with a well-stocked component box. For this outlay you have the satisfaction of building it and of extending the life of your valves by a factor of two or three. Using 4CX250B valves, I would have thought it made a great deal of sense to incorporate it into a high power hf or vhf amplifier.

I suggest that it is vital for RadCom to publish state-of-the-art articles of this calibre so that they are available to the membership at large, and not relegated to a specialist newsletter where one would be preaching to the converted. Therefore I am somewhat apprehensive at the 'almost editor's' comments about RadCom's impending restoration. To what? (Wait and see – but don't worry, technical integrity isn't being discarded. Ed)

Mr Moss asks, "Where are the QRP transceiver designs, the speech processors..." I suggest this material is to be found in Pat Hawker's monthly TT feature and in the numerous books available from the Society. Otherwise maybe he should consider submitting articles on the 'missing' subjects.

Norman Fitch G3FPK

STICKING UP FOR R.F. BYRNE

May I say how much I enjoyed seeing the R.F. Byrne cartoon in the August issue of Radio Communication. It is nice to see the talents of members appearing in the Society magazine. So many people have commented that the past issues have been bland and somewhat uninteresting. Also, a little humour helps to remind us all that we are following a hobby and that it should be enjoyable!

D.J. Ackrill

G0DJA

SPEECH SUPPORTERS CLUB

The Morse enthusiasts have had frequent access to your columns to laud the great merits of that mode of communication and, by implication or more directly, to applaud the virtue of those who enjoy it and condemn the rest who joyously hurl forth their keys when the weary business of passing the test is over (in my case it took 44 years from my first encounter with the code!), or worse, to say that the test should no longer be obligatory. To redress an imbalance I

beg to requote from today's The Times an excerpt from the year 1931.

"Wireless telephony was now available to the ends of the earth, and this was of paramount importance, as the best and most natural means of intercourse between human beings was by the spoken word." The author of this heresy was the Marchese Marconi! Alex D.Dick GM0IRZ

GOOD START FOR PROJECT YEAR

I am a fourteen year-old school boy and have been a radio ham for about eight months now.

When I first took my radio to school all of the other pupils thought it was CB – even the teachers. I have tried to explain to them what Amateur Radio is, but most of them are totally ignorant. A few of them listened, however, and so far one is on the RAE course at the local college, while three more are interested. I don't think there is enough publicity in schools about Amateur Radio. If there was better awareness there could well be more young radio hams on the air.

I got to know about amateur radio through my father, G8FWH, who has been licensed for 16 years. If he hadn't gone into Amateur Radio I don't think I would have found out about it. I hope that now this Project YEAR has started something will be done about this.

Martin Hill G0JAC

OSCAR 13J – TO BAN OR NOT TO BAN?

If it works well, is cheap and generally trouble-free, then ban it!

Mode J is the only low power coverage satellite mode accessible to those of modest means. Other satellite modes need £1000's-worth of special equipment to start. Mode J is accessible on low power with less than £180's-worth of special equipment, also it is affordable by those most valuable of radio amateurs – the newcomers – and those burdened by the 4M's of Middle age, Marriage, Mortgages and Multiple offspring.

So why all this Packet Radio and 80m lobbying to ban Mode J? The suggestion that it causes gross interference over most of the country is complete nonsense. The uplink band is empty over most of the UK outside the biggest cities, and even there much room exists for mutual cohabitation, particularly as Mode J works well on low power and high elevation angles with almost no potential for serious interference.

Please, therefore, take a large pinch of salt when you hear or read statements on this subject. Several radio amateurs entering this debate have associations with supply of equipment for other modes, and while I must make it absolutely clear that I impute no commercial motivation whatsoever for the clamour to ban Mode J, I do note that they are failing to tell you that in addition to their high equipment costs, their alternative modes suffer serious antenna pattern asymmetries and high levels of non-amateur interference.

If Mode J is banned in the UK, the message will be clear. Sensible local co-operation is out and the No Men are in; No Newcomers allowed on satellites, No new ideas permitted, No compromise on band plans, in fact No sense, and very shortly No more Radio Amateurs.

John Branegan GM4IHH

PARTY MESSAGES – PLEASE

The Caribbean hurricane disaster highlights once again the frustration of many UK radio amateurs who are denied the facility, under the terms of their licence, to handle third party messages. Albeit some UK stations were participating regardless of possible repercussions, the new UK licence proposals still rule out the handling of third party messages except when a GB special event call sign is used.

The Jamaican Club station 6Y5MV, located at Mandeville, was outstanding in the way they organised emergency traffic not only for the amateur service but for the civil services and airlines.

The emergency frequencies, 14.130MHz for Europe and others for USA were monitored by amateur radio operators of all nationalities, and many offers were made to pass messages, regardless of cost, to relatives in many countries.

Perhaps the DTI could again consider allowing UK amateur radio operators the facility of handling third party messages in emergencies, when in the case of the Jamaican disaster there was no other way of getting messages out of the stricken country.

Finally, is it not about time that the media realised that there is an amateur radio service and dropped the habit of using the descriptions 'Radio Hams' and 'Radio Enthusiast' in some of the reports obtained from amateur radio service operators? Frank Bernard G4FB See this month's News Bulletin – there's a story on the achievements of UK amateurs during the hurricane disaster. Note also that Section 1 (3) of the new UK licence refers to the use of amateur radio during disasters.

LICENCE PAYMENTS 'OVER THE COUNTER'

I read with interest the article in the News Bulletin section of Radio Communication that the DTI have not agreed to the payment of licence renewals at Post Offices. This is quite a surprise because I've been doing that for at least three years! The system is simple. Use a TransCash form available at Post Offices, enter the Post Office account number quoted on the reverse of the licence renewal document, quote your call sign in the message section of the TransCash form and hand it, with your money, over the counter. It works every time. The only snag is that a fee is payable for the service but it's cheaper than a postal order and not too expensive given that no postal charges are involved.

Andrew Steele G1HEA

TECHNICAL TOPICS – PRAISE STILL POURS IN!

You asked for some views on Technical Topics back in March. May I say that for many years it's the first thing I turn to in "The Bull"? Readers' letters come next. I find Pat's article first class. It's thought provoking in many ways, and he is not afraid to discuss the oldies like the HRO and B2, etc. Neither is he backward in modern day telecomms either.

Keep up the good work, Pat. I only ask the RSGB one favour: could we please have ALL the TT articles available in book form with a cross-reference please? I find my company is reluctant to support my furtive photocopying of TT each month.

D.A. Shepherd G3LCS

PRAISE WHERE PRAISE IS DUE

A song of praise for KW Communications Ltd. My Ten Tec had failed to shine, and a letter winged its way to Vanguard works. "Let there be light. A bulb please. And by return a nice new bulb with compliments. "No charge". And all this only four days, door to door, in spite of the postal strike. J.A. Jackson G0FVS

DIPLOMACY IS THE NAME OF THE GAME

I would like to pick up on a couple of items which have appeared recently in the letters column. The first concerns the case of G4MVR being hounded off the air by problems caused by EMC.

I am not able to judge the specifics of his story as I do not know him or his neighbours and the reactions to the sensitivities involved. However, having been a newcomer into a community six times in my life, I have been subject to the practical and psychological problems of setting up a station and dealing with the consequent neighbour attitudes.

Some rules of thumb I have adopted are:

Tell the neighbours you are setting up a station and that your licence obliges you to keep a log which can be used to check whether any interference coincides with times on the air. XYLs are also useful communicators in this respect.

When putting up an antenna system, think of the neighbours' point of view. In my case my XYL has been an acid judge of the limits of desecration I can inflict on her house and garden! A modest affair at first creates a better climate for acceptance of something more ambitious later. I always bear in mind the axiom of a colleague that TVI is directly proportional to the size and height of your aerial array (in the minds of the neighbours).

When interference occurs, establish what limits of it are (bands, power, antenna) and try to work your activities round them while trying to cure the problem.

The use of the Interference Investigation team is now costly but can set your mind at rest over where the problem lies and gives the neighbour an official view of the situation. However, do not expect the neighbour to pay for the investigation or the cure; he may do, but remember that you came along and caused interference that was not there before, irrespective of the ins and outs of equipment performance. I believe that this is a fair if uncomfortable point of view. It is different if your were there first and the neighbour acquires equipment subsequently which picks up your signals.

In practice I have found that 99% of the neighbours are tolerant and co-operative – but only up to the point that their interests are not infringed upon to any significant degree! They will normally get involved in simple solutions like filters, etc, but don't expect them to pay! Again this applies specifically when you are the newcomer.

If the interference has proved hard or expensive to fix I have decided to give up the activity which caused it and concentrate on an aspect of the hobby we could all live with. However, EMC problems are demoralising and create social pressures if they drag on. I still jump when the phone rings when I go on air – dreading a call to announce some breakthrough next door.

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For directions, Mail Order, Access/Visa orders, information etc. Ask for Heather. If you are unable to visit us during normal hours we will arrange special open days on Sundays for groups of 20 people or more (G4ROB) for details. Why not pay us a visit next time you are near Nottingham? You'll find out why everybody is asking "Have you discovered Anchor yet?" **ANCHOR SUPPLIES LTD**, Cattle Market Road, Nottingham. Tel: 0602 864902. Fax 0602 864667.

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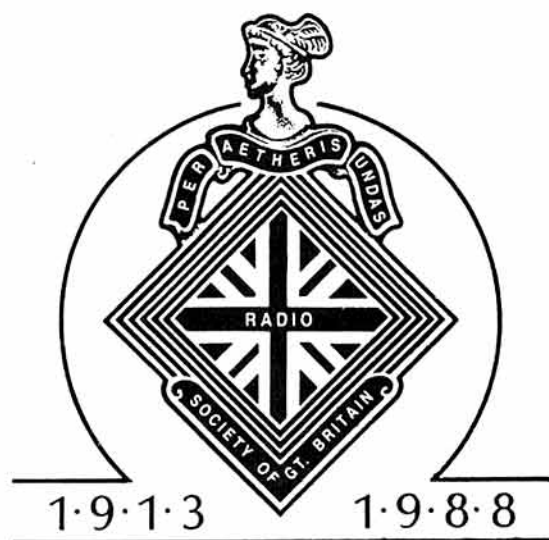
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RADIO SOCIETY OF GREAT BRITAIN



**REPORT AND ACCOUNTS
and
THE YEAR IN REVIEW**

for the year 1 July 1987 to 30 June 1988

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)

LAMBDA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTS EN6 3JE

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

COUNCIL (1 July 1987 to 30 June 1988)

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* Retired 31 December 1987

§ Co-opted to Council in January 1988

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G. R. Smith, BSc, MISTC, MBIM, G4AJJ ¶

¶ Elected 1 January 1988

§ Co-opted to Council in March 1988

Bankers - Barclays Bank PLC

Solicitors - Douglas-Mann & Co.

Financial report of Council to members of the Radio Society of Great Britain for the year ended 30 June 1988

Efforts to contain expenditure during the recently completed financial year resulted in a saving of some £68,000 compared with the previous year. This has been achieved despite inflationary trends. This would have enabled the Society to achieve the small surplus predicted by the 1987/88 budget. Unfortunately the Society was (and is) less able to exercise control over its income; advertising was down by approximately £24,000 and book sales by £32,000. As a result it has not been possible to move "into the black" as was hoped. The deficit for 1987/88 is £5,599 before tax of £3,060. Although this is considerably better than last years performance much still needs to be done; more about that later.

When noting the increase in subscription income compared with the previous year, despite static membership numbers, members should note that 1987/88 was the first FULL year of the higher rate arising from the July 1986 increase. Similarly 1989/90 will be the first Full year to benefit from the increase which took place on July 1st this year. Furthermore the item Subscription Income now includes subscriptions arising from the specialist newsletters which have been gaining in popularity in recent years. For relative information members should refer to note (1f) on the accounts.

It will be seen that the income from exhibition space and the cost of rallies, exhibitions etc. are significantly reduced. This is because there was no event at the N.E.C. during the year under review. It was moved to July in order to coincide with the Society's 75th Anniversary. The Rates bill is lower following reassessment of the land around the HQ building. The item "Telephone, postage, printing and stationery" is down because the postage and other costs associated with the newsletters is included elsewhere in the accounts.

"Legal and Professional fees" are less because it was not necessary to seek advice as much as in the previous year when some members were beset with emc problems. One other item calls for comment; "credit card charges". In recent years members have asked to be able to use their credit cards to facilitate the ordering of books etc. by telephone and post. Considerable use is now made of this. It is not possible to be sure whether sales have been affected as a result.

The Society's resources, although considerable, are reflected in the

valuable fixed asset of the HQ building at Potters Bar. After "depreciation" at the standard rate of 2% per annum since purchase this now stands in the books at £379,466. Members will realise that property values in recent years have moved in the opposite way to "depreciation"! The Society's resources, as shown in the Balance sheet do not, of course, take into account any enhanced valuation of Lambda House. However liquidity has suffered following recent deficits.

It has been said in the past and it may well continue to be true that the Society tries to do too much for the money! A significant part of the effort is directed at benefitting the lot of ALL United Kingdom radio amateurs - and, through the IARU, the hobby worldwide. It is a sad reflection that so many licensed amateurs are not members of the Society. Workers, both staff and those who work for no monetary reward, are reasonably entitled to ask for a contribution from them.

Further economies were discussed during the preparation of the budget for the year now under way and it was decided to reduce the HQ staff by one. The financial outcome of the year 1988/89 is more difficult to assess than that for earlier years. The cost of celebrating the Society's 75th Anniversary had to be taken into account as also did the somewhat unpredictable result of the lottery. At the time of writing this report it seems probable that the income from the lottery will achieve its first priority i.e. to cover the launch of Project Y.E.A.R. at the Society's 75th Anniversary National Convention. The National Convention and associated events must be adjudged a significant success. Many of us were fortunate enough to hear HRH the Duke of Edinburgh's opening address and later, comments about RSGB from our overseas guests and others. We felt proud to be members - and also that it was all very much worthwhile!

Remedies to contain expenditure and increase income will continue to be sought. It is not difficult to suggest what they might be; not so easy to implement them! Increasing membership by any means considered likely to be effective, production of a new generation of saleable books, increasing advertising income are all avenues that are being explored. The alternative is a reduction in services; a remedy which would not be popular with those whose hearts are in their efforts to administer a successful Society.

RADIO SOCIETY OF GREAT BRITAIN

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 30 JUNE 1988

	Notes	£	1988	£	1987	£
INCOME						
Subscriptions (inc Newsletters)	(1) ...			631,187		595,271
Advertising	(1) ...			198,574		222,388
Exhibition space				11,800		33,867
Book Sales				270,145		302,329
Other Income	(5) ...			33,137		37,586
TOTAL INCOME			£ 1,144,843			£ 1,191,441
EXPENDITURE						
Cost of Sales						
Cost of printing & distribution (Books etc)		148,986			150,874	
Cost of editing & despatch staff		49,057			68,145	
Cost of printing & distribution (Newsletters)		23,682			16,144	
Morse Tests		12,266		233,991	15,603	250,766
Headquarters						
Rates, lighting, heating & cleaning		25,693			29,129	
Repairs & maintenance		3,454		29,147	6,142	35,271
Administration						
Cost of administration staff		287,057			255,816	
Telephone, postage, printing & stationery		64,462			86,414	
Insurance		4,949			4,341	
Hire & maintenance of equipment	(7) ...	44,273			46,263	
Depreciation of fixed assets	(1) ...	19,986			18,921	
Audit fees		9,500			9,500	
Legal and professional fees		8,311			17,818	
General expenses		2,680		441,218	3,029	442,102
Finance						
Bank charges		7,796			8,347	
Credit card charges		3,599			-	
Bad debt provision		(799)			(620)	
Exchange differences		(2,101)		8,495	(2,608)	5,119
Membership services						
Radio Communication	(8) ...	342,437			336,133	
Certificates, awards, trophies, etc		1,228			2,793	
QSL Bureau		8,262			7,701	
Beacons, repeaters, satellites & Intruder Watch		12,827			13,079	
IARU Region 1 contribution & levy		14,027			15,137	
Rallies, exhibitions and publicity	(9) ...	16,711			56,264	
Cost of committee, regional & Council meetings		42,099			47,074	
Cost of international meetings & conferences		-		437,591	7,306	485,487
TOTAL EXPENDITURE			£ 1,150,442			£ 1,218,745
DEFICIT ON ORDINARY ACTIVITIES BEFORE TAXATION						
(£5,201 [1987:£27,304] of which arises in the Society)				(5,599)		(27,304)
Less provision for taxation thereon at 26.5% (1987 28.5%)	(10) ...	(4,000)		(3,060)	(6,500)	(6,482)
Over provision for corporation tax in previous year		940			18	
DEFICIT FOR YEAR			£ (8,659)			£ (33,786)

RADIO SOCIETY OF GREAT BRITAIN

BALANCE SHEET AS AT 30 JUNE 1988

	Notes	The Society £	1988 The Society and subsidiaries £	The Society £	1987 The Society and subsidiaries £
FIXED ASSETS					
Tangible assets	(1)(2)...	434,419	434,419	423,333	423,333
Investments	(3) ...	200	—	200	—
		<u>434,619</u>	<u>434,419</u>	<u>423,533</u>	<u>423,333</u>
CURRENT ASSETS					
Stocks, at lower of cost and net realizable value		103,741	103,741	145,670	145,670
Trade debtors		86,260	86,260	78,424	78,424
Prepayments and accrued income		82,832	82,832	43,340	43,340
Cash at bank and in hand		110,465	112,464	98,434	100,433
		<u>383,298</u>	<u>385,297</u>	<u>365,868</u>	<u>367,867</u>
CREDITORS:AMOUNTS FALLING DUE WITHIN ONE YEAR					
Trade creditors		(104,188)	(104,188)	(53,443)	(53,443)
Amounts due to subsidiary companies		(215,117)	—	(215,567)	—
Corporation tax		(5,559)	(5,559)	(5,982)	(5,982)
Other taxation and social security		(10,136)	(10,136)	(15,186)	(15,186)
Other creditors		(15,032)	(16,149)	(21,866)	(23,035)
Accruals and deferred income		(53,924)	(53,924)	(42,755)	(42,755)
		<u>(403,956)</u>	<u>(189,956)</u>	<u>(354,799)</u>	<u>(140,401)</u>
Subscriptions in advance		(286,683)	(286,683)	(296,613)	(296,613)
		<u>(690,639)</u>	<u>(476,639)</u>	<u>(651,412)</u>	<u>(437,014)</u>
NET CURRENT LIABILITIES		<u>(307,341)</u>	<u>(91,342)</u>	<u>(285,544)</u>	<u>(69,147)</u>
Total assets less current liabilities		<u>127,278</u>	<u>343,077</u>	<u>137,989</u>	<u>354,186</u>
CREDITORS:AMOUNTS FALLING DUE AFTER MORE THAN ONE YEAR					
Corporation tax payable 1 October 1989	(10) ...	(4,000)	(4,000)	(6,500)	(6,500)
		<u>123,278</u>	<u>339,077</u>	<u>131,489</u>	<u>347,686</u>
PROVISIONS FOR LIABILITIES AND CHARGES					
Deferred taxation	(1)(10)...	(2,000)	(2,000)	(2,000)	(2,000)
		<u>£ 121,278</u>	<u>£ 337,077</u>	<u>£ 129,489</u>	<u>£ 345,686</u>
ACCUMULATED FUNDS					
Income and expenditure account					
Balance at 1 July 1987		129,213	345,410	162,999	379,196
Deficit for year		(8,261)	(8,659)	(33,786)	(33,786)
		<u>120,952</u>	<u>336,751</u>	<u>129,213</u>	<u>345,410</u>
Legacy Fund	(4) ...	326	326	276	276
		<u>£ 121,278</u>	<u>£ 337,077</u>	<u>£ 129,489</u>	<u>£ 345,686</u>

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

Approved by Council on 29 September 1988
and signed on its behalf by:

Sir Richard Davies, KCVO, CBE, C.Eng, FIEE, G2XM President
Basil O'Brien, ACIB, G2AMV Hon. Treasurer

NOTES ON THE ACCOUNTS

1. Accounting policies:

- 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.
- Advertising income is the net amount receivable, after deduction of VAT, for advertisements in *Radio Communication*.
- Depreciation - tangible fixed assets, except freehold land, are written off using the straight-line method over the 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
- Deferred taxation has been provided using the liability method in respect of timing differences which are not expected to continue for the foreseeable future.
- Since a consolidated income and expenditure account is submitted, no such account for the Society alone has been presented
- The Income & Expenditure shown is the gross figure in each case and income from Newsletters, Morse Tests Exhibition Space have not been 'netted' as in previous years. The figures for 1987 have therefore been revised to give to give a true comparison.

2. Tangible fixed assets

	Freehold Land and Buildings	Furniture, Equipment and Computer programmes	Total
Cost	£	£	£
At 1 July 1987	417,572	74,353	491,925
Additions	—	31,072	31,072
Disposals	—	(6,534)	(6,534)
At 30 June 1988	<u>£ 417,572</u>	<u>£ 98,891</u>	<u>£ 516,463</u>
Depreciation			
At 1 July 1987	31,755	36,837	68,592
Charge for the year	6,351	13,635	19,986
Disposals...	—	(6,534)	(6,534)
At 30 June 1988	<u>£ 38,106</u>	<u>£ 43,938</u>	<u>£ 82,044</u>
Net book value			
At 30 June 1988	<u>£ 379,466</u>	<u>£ 54,953</u>	<u>£ 434,419</u>
At 1 July 1987...	<u>£ 385,817</u>	<u>£ 37,516</u>	<u>£ 423,333</u>

Freehold land included above amounts to £100,000 (1987: £100,000)

3. Fixed asset investments

	1988	1987
Shares in group companies at cost	<u>£ 200</u>	<u>£ 200</u>

The subsidiaries are Lambda Investment Company Limited (an investment company) and RSGB (Raynet) Limited, (which has been dormant since incorporation), both Registered in England. The share capital of both companies comprises ordinary shares which are wholly owned by the Society.

4. Legacy fund

	1988	1987
	£	£
Balance at 1 July 1987	276	2,143
Donations received	50	529
Transfer to Profit & Loss account	—	(2,396)
Balance at 30 June 1988	<u>£ 326</u>	<u>£ 276</u>

5. Other income includes bank interest of £9,933 (1987: £10,125)

6. Total staff costs

	1988	1987
	£	£
Wages and salaries	338,948	320,915
Social security costs	33,607	26,256
Pension costs	4,000	8,830
	<u>£ 376,555</u>	<u>£ 356,001</u>

The average number of persons employed by the Society was 33 (1987:32) divided into the following categories:

	1988	1987
Headquarters	27	25
Radio Communication	4	4
QSL Bureau	2	2
Advertising	—	1
	<u>33</u>	<u>32</u>

7. Lease rentals for equipment amounted to £19,107 (1987:£23,143) Annual commitments for lease rentals amount to £16,509 (expiring in 2 - 5 years £15,716, over 5 years £793)
8. Radio Communication expenses comprise the whole of the costs of printing, distribution and the cost of editorial and advertising staff.
9. Rallies, exhibitions and publicity expenses comprise:

	1988 £	1987 £
Society publicity and advertising	4,814	17,089
Cost of the Society's own events and participation in other rallies and exhibitions.	11,897	39,175
	<u>£ 16,711</u>	<u>£ 56,264</u>

Book sales totalling £16,921 gross (1987:£44,336) made at rallies and exhibitions have been accounted for under income from book sales. Sale of exhibition space has been shown as income and the figures for 1987 have been adjusted accordingly. The income from exhibition space is £11,800 (1987:£33,867).

10. The Society is liable to pay corporation tax on its investments 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 £75,000.
11. The Society administers certain prize and memorial funds, totalling £647 (1987:£660) which are not included in these accounts.

CONSOLIDATED STATEMENT OF SOURCE AND APPLICATION OF FUNDS FOR THE YEAR ENDED 30 JUNE 1988

	1988 £	1987 £
SOURCE OF FUNDS		
Deficit for the year before taxation	(5,599)	(27,304)
Donations received (less payments made) from legacy fund	50	(1,868)
Adjustment for items not involving the movement of funds:		
Depreciation (including losses on disposals)	19,986	18,921
Total generated by (absorbed by) operations	14,437	(10,251)
APPLICATION OF FUNDS		
Purchase of fixed assets, less proceeds of sale	(31,072)	(28,541)
Corporation tax paid	(5,983)	(7,200)
	<u>£ (22,618)</u>	<u>£ (45,992)</u>
DECREASE IN WORKING CAPITAL		
Stocks	(41,929)	(16,387)
Debtors, prepayments and accrued income	47,328	19,102
Creditors, accruals, deferred income and subscriptions in advance	(40,048)	(53,375)
	<u>(34,649)</u>	<u>(50,660)</u>
MOVEMENT IN NET LIQUID FUNDS		
Cash balances less bank overdraft	12,031	4,668
	<u>£ (22,618)</u>	<u>£ (45,992)</u>

REPORT OF THE AUDITORS TO THE MEMBERS OF THE RADIO SOCIETY OF GREAT BRITAIN

We have audited the accounts set out on pages iii to vi 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 1988 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 Act 1985.

Clifford's Inn
Fetter Lane
London EC4A 1AS
29 September 1988

MOORES & ROWLAND
Chartered Accountants

The Year in review - Secretary's report

A look at some of the activities of the Society - 1 July 1987 to 30 June, 1988

Overview

Planning for the future well-being of amateur radio has been the basis of the Society's work during the 1987/88 year. HQ staff and volunteers have applied a great deal of energy to this task and this has manifested itself in a number of ways.

1. Project YEAR addresses the basic need to recruit more radio amateurs into the hobby. Protecting amateur radio in terms of frequency allocations is directly related to the number of radio amateurs who use the amateur bands. There is now ever increasing pressure on frequencies, much of it of commercial origin. The use of the radio spectrum by radio amateurs needs to be justified not only by the positive spin-offs from amateur radio which benefit society in general, but also in terms of numbers of users. Project YEAR is unique because of its potential to increase the amateur population and it enables the nation to train and develop its future electronic engineers and scientists. Both are vitally important to UK Ltd.
2. During the year the major forward-looking review of the UK amateur licence was concluded. The work involved considerable resources of personnel from the DTI and the RSGB. The new licence looks to the future inasmuch as it takes into account some of the new technology within amateur radio and the changing aspirations of UK amateurs. With this theme in mind the Society also worked with the DTI to produce progressive new licensing conditions for packet radio. To our knowledge the UK is the first country in the world to develop comprehensive licensing conditions to incorporate this new technology.
3. A major locally-based liaison scheme was introduced by the RSGB. The RLO (RSGB Liaison Officer) Scheme is a serious attempt to help members with their problems at local level so that they might get the best out of amateur radio.
4. A new internal management accounting system was introduced at RSGB HQ. Although this system might not be regarded by members as of direct benefit to them, in practice the new accounting software has provided information for management which in turn has helped to reduce expenditure.
5. The Society has reviewed its book production mechanisms and as a result introduced desktop publishing equipment at HQ. This equipment will enable the Society to have more control over the format and frequency of its publications in future years.

Project YEAR

Project YEAR (Youth into Electronics via Amateur Radio) was instigated by the Society's Council because clearly it is consistent with the Society's fundamental objective to preserve and enhance the future of amateur radio. All of the good works by clubs and individuals during the past few years have not produced a sufficient number of beginners countrywide to keep the hobby buoyant into the next century. Without new recruits the hobby will die. A new initiative was required; a major effort in planning was undertaken, much discussion ensued and Project YEAR was born.

Much of the work involved in getting Project YEAR off the ground was handled directly by Council (specifically Joan Heathershaw, Julian Gannaway and John Case) and the Secretary's office. It also embraced the newly formed Training and Education Advisory Group and the Licensing Advisory, HF, VHF, Microwave and Membership Liaison Committees. The latter is primarily concerned with presentation of the project to members through the affiliated clubs and the locally based volunteer RSGB Liaison Officers. The inception of Project YEAR also involved co-ordination of other tasks such as publicity. Here the Society's News and Information Department co-ordinated much of the effort. Staff member David Gough, G6EFQ is to be thanked for his efforts, as are many other staff in every department for just making things happen. Such wide involvement of staff and volunteers on a single project tested the Society's internal communications to the limit; some valuable lessons were learnt and ideas to improve matters noted for the future.

Very early in the formulation of the anniversary celebrations a major decision was taken to make the 75th Convention the launching platform for Project YEAR. When the Society's Patron, His Royal Highness, The Duke of Edinburgh, agreed to attend the Convention, the opportunity to give Project YEAR its official launch could not be resisted.

Although the 75th Anniversary National Convention was strictly outside the 'year' under review by a fortnight, virtually all of the planning was conducted within the 1987/88 financial year. While the launch of Project YEAR remains fresh, it is therefore appropriate to mention the highlights of the event.

The Opening Ceremony of the 75th Anniversary National Convention at the National Exhibition Centre on 15 July was conducted by the Society's President, Sir Richard Davies G2XM. It was the highlight of the event. The text of His Royal Highness' speech and that of Mike Coolican from the Department of Trade and Industry is featured in the November News Bulletin. As a moment of his visit the President presented His Royal Highness with a home-built RC14 receiver

commenting that "this might inspire some interest from one of the Royal children" (!).

After His Royal Highness had made a tour of the exhibition, he proceeded to the 75th Anniversary Luncheon at which he was Guest of Honour. The Society was also pleased to welcome, at His Royal Highness' table, the President of IARU, Richard Baldwin, W1RU and the Presidents of the largest National Societies in each of the ITU/IARU Regions. Namely Karl Tadddey, DJ1PE (DARC), Larry Price, W4RA (ARRL) and Shozo Hara, JA1AN (JARL).

Presidents, other senior officers from Societies and organisations in other countries, and IARU representatives in attendance also included:

A4XBB, A4XJT, A92BW, CT1BH, DJ1BM, DJ6TJ, EI3BUB, I1BYH, I1RYS, K1ZZ, LA5QK, OE3REB, OH2BA, ON4VY, ON4WF, PA0JMM, PA0JNH, PA0LOU, SM3AVQ, SP5FM, TF3KB, VK3ADW, VK3KI, VP9IM, VU2MY, ZL3QL, 4X4AT, 9V1UV.

The Anniversary Luncheon was followed by a Project YEAR presentation given, on behalf of the Society, by Victor Brand, G3JNB, who was closely involved with the Project YEAR group. The Anniversary Luncheon concluded with speeches and gifts from National Societies throughout the World. The President of the IARU closed the proceedings with a special 'thank you' to the Society for its leadership and its hospitality. Project YEAR was launched, the media were there, so too were guests from industry, the two largest youth movements in the country - the Guides and the Scouts - and from Government. The Society wishes to thank all of the staff and volunteers who contributed to the National Convention and the launch of Project YEAR. A special mention must go to Ron Broadbent, G3AAJ and Warwick Hall, G4WMH, for their tireless efforts.

It is fitting to add by way of a concluding remark that the Project YEAR ideas were presented in the September 1988 issue of Radio Communication. As a result much good feedback has been received. Project YEAR will continue to be the Society's major programme well into the foreseeable future.

The New UK Licence

A major effort in manpower was devoted to discussions with the DTI on the content and construction of the new UK Licence. This followed two major periods of consultation with appeals for input, by way of views, comments, desires, suggestions in 1986 and 1987. Needless to say a large number of letters was received. The DTI received an accurate reflection of what had been asked for. In some instances, where a good, well supported case had been made for a particular licensing feature, this formed part of the Society's submission to the DTI even though the licensing experts within the Society were not fully convinced of its value. As a representative body the Society sees this type of representation as an essential role, although in so doing the Society has laid itself open to remarks such as, "why are they so out of touch?" The truth is that the Society is very much in touch because of the wide-ranging input received. It is simply that there are always going to be minority groups who believe that their way is best; licensing conditions are no exception.

In the event, the major redesign of the Licence which the Society had strongly advocated never materialised. The prime reason, in the Society's view, was due to the very tight deadlines which the DTI had set itself. Not everything that the Society had asked for was achieved. Thus rather than the fundamental changes to the Licence which the Society expected in one round of negotiations, the result has been excellent progress, but with many loose ends left to be followed up. It is interesting to note that during our discussions with the DTI their staff often found it difficult to believe that not all radio amateurs first applied common-sense when interpreting the Licence; the plea from the Society at the start of the negotiation for clearer regulations was taken into account by the DTI. There are, however, some areas which the Society believes could still be improved.

Despite all this, the series of meetings held with the DTI during the last six months of the review process were particularly fruitful. The DTI, as the compilers of the UK Licence, had consulted well. Considerable progress was made and the licensing conditions which become effective on 1 January 1989 were welcomed as an important step in the right direction.

The RSGB Liaison Officers Scheme

During the past five years there has been a tendency for more newcomers to ask more basic questions about amateur radio than ever before. At National level the Society addressed this progressive change by employing more staff in its Membership Services Section, setting up a comprehensive dial-up database and enhancing the range of information published in the Call Book. These measures enabled the increasing number of members to gain access to a vast amount of standard information. Not only was the volume of questions increasing, but the nature of the questions was changing as well. Some new mechanism was needed to put the questioner in touch with the volunteer expert who had the answer.

It was during the latter half of 1987 that ideas crystallised into a new programme to provide more self-help to members at local level. A Presidential Working Group co-operated with the (then) Membership & Representation

Committee to re-think how to get more Society help to members in the field. After a lengthy series of meetings the new RSCB Liaison Officer Scheme was conceived, published in order to solicit comment and then set up.

The concept was to provide one volunteer officer in each County, Scottish Region and main island to advise members on how to get their questions answered. Obviously some questions could be answered by HQ staff, but more often a volunteer expert could supply a solution. A main task for the RLO would be to advise members on how to get the best out of the organisation.

The RLO Scheme commenced in January 1988. By any criterion the Scheme is new, but already it is achieving positive results. The zonal members of Council have a special role to play in the new Scheme since each zonal member effectively manages the RLOs in their Zone. The Membership Liaison Committee replaced the M&R Committee on 1 January 1988 as a means of directing the operation of the RLO's in order to maximise the effectiveness of the Scheme.

Internal Accounting

During the mid 70's the Society began to computerise its operations. The use of sophisticated software to manage the high volume/low value financial transaction within the Society has been a great success. Each suite of programs provided information for the nominal ledger which until the current year operated on a manual basis. In July 1987, after parallel testing, a computerised nominal and general ledger was introduced. This has enabled monthly management accounts to be provided far more quickly than in the past. In turn this has helped to control expenditure and monitor performance against budgets and past operations.

Book Production

Considerable progress was made during the first six months of 1988 revitalising the Society's book publications programme. It was essential that the limited staff resources were used in the most productive way. In January 1988 the Publications Management Group, formed by Council, met for the first time. Its task was to consider all aspects of book production with a view to setting priorities and speeding up production.

The first task of the group was to review all existing book projects to devise new procedures for producing books from the germ of an idea to the final product; also to set practical and commercial priorities. As a result of what became a wide-ranging review of procedures several bottle-necks were identified. Since these could only be resolved by additional staff effort, a new production plan was devised to allow freelance editorial input if necessary for certain phases of production. Another outcome of the PMG review was the introduction of desktop publishing hardware and software at RSCB HQ. This dtp equipment was installed during April 1988 and has now been used successfully for learning and also the production of two new publications; the RSCB Awards Book and the new syllabus RAE Manual (both available late 1988).

The work of the PMG has put the publications section into a very healthy position to enable it to cope with further new publications in the future.

Around HQ

The new HQ departmental structure described in some detail in last year's report has essentially been maintained during the year although, of course, there have been a number of staffing changes. Significant points as well as the name of the senior staff member are noted below, department by department.

Membership Services Department (Brett Rider, G4FLQ).

The staff in this department continues to handle the bulk of enquiries from members and non-members. It is estimated that during the year there has been a 25% increase in telephone calls to HQ. One of the principal reasons was the introduction of a credit-card telephone ordering scheme for books. It is therefore not surprising that the department now has an extra member of staff. This department handled 2,188 Morse test applications and 2,014 special event call sign requests were processed.

In addition to the heavy day-to-day workloads, the department also produces much of the information for the Call Book and assists Raynet in a number of ways. The QSL Bureau, though located away from HQ, comes within the Membership Services area. During the year the Bureau processed over 2.4 million cards. There is still concern at the 30/40% of cards not collected from the Bureau. This expenditure of effort and money could represent savings in the future, but this will require further rationalisation in Bureau procedures.

Data Processing (Hugh Payne)

This department provides an internal service to HQ staff to enable them to operate effectively. A new Manager was appointed to the department in January 1988.

Circulation Department (Tim Charles, G4EZA)

This department, in addition to normal stock control and associated functions, looks after the HQ Despatch Department. Overall the Society despatched into the postal system in excess of 752,000 items of mail during the year. Newsletter despatches were up 17%, although sales despatches were down by 21%. A total of 41 new items were made available for sale during the year. In addition new machinery was installed in the Despatch Department: (a) for the production and mailing of newsletters and leaflets and (b) to save effort on labelling and continuous stationery bursting.

Accounts (Reg Seaman)

As recounted earlier, the Accounts Section has implemented new reporting systems during the year. Unfortunately the department has suffered more than its fair share of staff illness. Advertising in Society publications now comes under the Accounts Section from an administrative point of view because of a change of staff. Mike Hawkins, the Society's Advertisements Officer, left the Society's employment to set up his own advertising agency. The Society decided to retain Mike Hawkins' expertise on a freelance basis.

Publications Group (Alf Hutchinson)

Alf Hutchinson retired as Editor-in-Chief in April 1988 after 19 years of work with the Society. His replacement, Trevor Preece, G3TRP, was appointed but unable to take up his position until October 1988.

Before he retired Mr Hutchinson had to cope with the serious problem of the Society's typesetters closing at very short notice; this unhappily delayed the production of the December 1987 issue of RadCom and in turn has had a knock-on effect with RadCom schedules throughout 1988.

Book production progress has been described elsewhere in this report.

News and Information (David Gough, G6EFQ)

For much of the year, as stated earlier, the department was associated with the visual presentation of work associated with the 75th Anniversary celebrations. Such work included the design of the 75th Anniversary logo and work associated with the National Convention, the '75 Years of Radio' exhibition, the RSCBHQ Open Days and the Society's Data Symposium, as well as the 75th Anniversary souvenirs.

During the year production methods for the GB2RS script were streamlined. Unfortunately, however, a reduction in staffing levels occurred because the Prestel and DataBox services had not been used as much as had been expected. Consequently there is now reduced input to these services. This department also co-ordinates RSCB attendance at non-RSCB rallies. HQ staff attended 20 rallies during the year.

Membership

For the second year running there has been a small net drop in the membership total by 252 from 37,061 to 36,809. This small decrease of 0.68% is in fact only half the net drop in membership during 1986/87. Nevertheless both the recruitment of new members and the retention of existing members remain important factors. Some 2,745 members were recruited during the year compared with 3,299 in the previous year. These trends are similarly reflected in the overall numbers of radio amateurs in the UK where the rate of increase in licensed amateurs is slowing down. If this downturn continues it is inevitable that precious frequency bands will, sooner or later, be lost to other services. This is why Project YEAR aims to increase the number of new recruits into amateur radio.

Council and Volunteers

At the end of 1987 the Society's Immediate Past President, W.J. McClintock, G3VPE, Zone B member H.S. Pinchin, G3VPE and Zone G member, F.D. Hall, GM8BZX, stood down from Council because of Article 26.

Council members Dr E.J. Allaway, G3FKM, Dr J.N. Gannaway, G3YGF and J.J. Barnes, G3USS stood for the 1988 Council and were all re-elected. The Zone A Council member, D.S. Smith, G4DAX, did not stand for re-election and his place on Council was subsequently taken by G.R. Smith, G4AJJ. The other new Council member in 1988 was J. Allen, G3DOT (Zone B).

During September 1987 the Society's Honorary Treasurer, P.F.D. Cornish, G3COR, retired for health reasons. David Cornish became Treasurer in 1978 and had, over a decade, helped the Society to grow into the organisation that it is today. No record of the current year would be complete without recording the most grateful thanks of the Society to G3COR for his exceptional contribution. In January 1988 the new Council appointed Basil O'Brien, G2AMV, to the post of Honorary Treasurer. This created a vacancy amongst the ordinary members of Council which was subsequently filled by the co-option of G.L. Benbow, G3HB, in March 1988. Also at the January 1988 meeting of Council, since there were no nominations for the Scottish Zone, F.D. Hall, GM8BZX, was co-opted for Zone G until the end of 1988.

All the hundreds of hard working volunteers on the RSCB Committees and the Society's officers, as always, deserve a very special mention. Without this voluntary effort many of the Society's services would simply not be available. The following pages pay tribute to those who give up so much of their free time to help others enjoy their hobby to the full.

In Conclusion

The Society has recorded another very successful year in respect of future planning. As mentioned in the financial report, although income from advertising and publications has been disappointing, in-roads have been made in terms of savings. This is due primarily to better internal control and budget monitoring made possible for the first time this year. There are two key factors which will determine the financial future of the Society. First, there is the need to convince more non-member licensed amateurs that they should support the work of the Society and second, there is the very future of amateur radio itself. If new recruits join the ranks of licensed amateurs the future of the hobby will be on a much firmer footing.

COMMITTEE AND OFFICER REPORTS

EMC

Committee: G4RLE, G1WZZ, G3OSS, G3UFB, G4JKS, G5HD, G8SOZ, GU3YIZ*, G3BLE*, G3GVM*, G3GVV, G3VWK*, G3XZB*, G4DXA*, G4FWM*, G4IWS*, G4JXO*, G8KLH*.

Expenses: £1089

First I would like to thank my colleagues on the committee for their hard work, dedication and enthusiasm over the past year. I would also thank those Society members who have provided information on the results of their own EMC investigations. You are helping others by your continued support. Please keep it coming.

Secondly, my message to you all is - increase your awareness and knowledge of the EMC phenomena. Read, learn and inwardly digest, to coin a phrase, the publications available. It is for your benefit and required by your licence.

Though much work has been put in, progress remains steady.

1. The EMC County Advisers Scheme proposal is now with Council for their consideration.
2. Liaison with manufacturers has increased and many are being extremely co-operative in providing assistance and information.
3. The implications of the EEC EMC Directive are being closely studied and progress followed with interest. We are also commenting where appropriate.
4. The Joint DTI/RIS/RSGB EMC Code of Practice is near completion though Council's decision on the EMC County Advisers Scheme will decide its final content before negotiations with the DTI/RIS commence.
5. Advice, representation and information has been provided to approximately 400 amateurs and complainants, many with successful results.
6. The EMC Database is presently being compiled on paper. Discussions to provide a micro to ease this work still ensue, the problem essentially being financial.
7. We have been asked for, and provided, to the UK Government our views on the ideal level of immunity for domestic and other equipment. We would like to see a significant increase over the present levels currently being used by the RIS.

One last point; contrary to popular belief, none of the committee members or myself are employed by the RSGB. We are all volunteers who give up a considerable amount of time to help you. Those of us who are not retired have full-time jobs and families. So before you telephone to describe your EMC problem please first ask yourself if you have done everything within your power to find your own solution to your problem. Telephone calls at 3am are not received with relish.

D Bernard G4RLE, Chairman

EXHIBITION & RALLY

Committee: G3MVB, G3SZJ, G3TDR, G3VPK, G4HHP, G5HD, G3GVV*.

Expenses: £834

During the period under review the committee met for eleven formal meetings with additional informal meetings throughout the year.

The main objectives of the year's work were to organise the Trade Exhibitions at the VHF Convention, National Convention at Birmingham, National Rally at Woburn Abbey plus support for a few non-Society events.

In co-operation with HQ staff and the 75th Anniversary committee, planning for 1988 celebrations to be held during the National Convention at Birmingham have been discussed at great length and recommendations put forward.

Attendance figures by visitors and exhibitors increased by a small percentage each year with the exception of the National Convention where attendance has remained static. Trade participation at the VHF Convention and Woburn has reached maximum capacity.

The committee is currently looking at alternative venues for events but it appears to be difficult to improve on the present locations.

May I say 'Thank You' to all the committee members and HQ staff involved with Exhibition and Rallies for all their hard work.

Norman Miller G3MVB, Chairman

FINANCE & STAFF

Committee: G3VPK, G2AMV, G3FKM, G3LP, G3VPE, G3YGF, G4CHH, G6JP, GW8HEZ*, President (ex-officio), Secretary (staff).

Expenses: £1886

The full committee met six times during the year with meetings lasting between four and seven hours. In addition, working groups met on three occasions to consider budgets and staff organisation.

The main preoccupation of the committee was the close monitoring, through the newly established monthly management accounts, of income

and expenditure in order to improve the efficiency of the Society's operations, thereby reducing last year's deficit. Although significant savings have been achieved a simultaneous reduction in Society income has reduced the impact of these economies; as a result the Society's operation will not return to surplus until the financial year 1988/89.

As part of the overall policy of tight financial control the full costs including staff time of each activity throughout the Society are being ascertained. To that end a pilot scheme involving cost centres has been introduced. In contrast, the Society's 75th anniversary celebration, which was an exceptional item of expenditure (and income) for 1988, has been closely monitored to ensure adherence to strict guidelines. The adoption of a lottery to help fund project YEAR and its associated activities has been well supported by the membership. Some activities are more long term. For example, the RLO scheme and Project YEAR are not expected to bring a short term result but should have considerable impact in the years to come.

Alf Hutchinson retired as Editor of Radio Communication in May 1988 after 19 years' service. It was decided to synchronise with this event the way the Society handles all its publications. The Secretary was tasked with updating the Society's book production facilities and as a result desk top publishing techniques have now been adopted for the production of Society books. The committee approved the capital expenditure and staff re-structuring necessary to allow the Society to benefit from the significant advances now available in this area.

Another significant landmark was reached when G2AMV was appointed honorary treasurer in January. At the same time G3YGF joined the committee following his election as Executive Vice-President.

All committee members, especially G3VPE - the minutes secretary - are thanked for their support.

W J McClintock G3VPK, Chairman

HF

Committee: G3ZAY, G3FKM, G3HCT, G3KMA, G3PJT, 3RZP, G3VTT, G3XTT, G4BUO, G4FAM, GW4BK*, G3DME*, G3GIQ*, G3GVV*, G3PSM*, G4DYO*, G4JVG*, G6RX*, G8GOJ*.

Expenses: £434

The committee spent considerable time discussing the development of HF packet radio and has produced an initial discussion paper which is available from G3XTT (QTHR). Its recommendations are that packet QSOs should occupy the upper portions of the existing RTTY allocations (with the exception of 40 metres where packet operation should be discouraged) and follow normal operating practices of listening to monitor occupancy.

Other activities included the appointment of G4JVG as manager of the HF Expedition Fund, liaison with the T&EAG regarding the Student Licence, and preparation of papers for the Region 1 IARU HF Committee.

In the next year we propose to work with the new RadCom editor to develop the HF content of *RadCom*; to develop the links with academic researchers in HF communications with a view both to WARC preparation and to better policy making/band planning; to identify regular sources of income for the HF Expedition Fund; and to produce a policy statement on packet radio band planning following further consultation with Society members, the IARU and ARRL.

M J Atherton G3ZAY, Chairman

HF CONTESTS

Committee: G6LX, G3FKM, G3HCT, G3KDB, G3MCX, G3OZF, G3SJJ, G3UFY, G4BUO, G4DJX, G4IFB, G4JKS, G4RWW, RS20249, G3AEZ*, G3GVV*, G3KKQ*, G3RJV*, G3XDY*, G3ZAY*, RS325258,

Expenses: £1012

The committee is responsible to Council for all aspects of the Society's HF contests. During the year, the committee met ten times in formal session and there were several additional checking meetings. These were in addition to meetings held at members' homes to adjudicate the AFS and NFD contests, both of which are very time consuming.

The committee had a stand at the NEC exhibition and were in attendance at the HF Convention. Various members of the committee visited a number of clubs and societies to talk on contest matters and to answer members' questions. The committee Chairman represents the Society on the Region 1 Sub-Working Group on HF Contests, which co-ordinates all contest matters throughout the region. A further link with IARU is maintained through G3FKM who is the Secretary of Region 1 and through cross-membership of the RSGB IARU Committee. There are other links with RSGB committees via cross-membership of the HF and VHF Committees. The Society was active during the IARU HF Championship contest with committee members providing a HQ station on each of the HF amateur bands.

The revised arrangements for NFD, which is now incorporated under

the wider umbrella of the IARU Region 1 CW Field Day, is working well. The AFS clubs contest continues to be popular and the committee will be organising a new club phone event which will take place later this year. Other events also attract wide individual support from members. A special effort has been made to encourage newly licensed amateurs to take up contest activity by altering the format and the frequency of the 28MHz Cumulative Training Contests. The other Cumulative events on the lower frequency bands will also be reviewed after the January 1989 events, with a view to possible changes to make them more attractive to the newcomer to amateur radio. The rules for other events are being examined to ensure that they meet the wishes of the membership.

There have been several changes in the committee membership during the year and we were saddened to hear of the death of G6AGE, our hard-working Corresponding Member who was responsible for DF events. We were glad to welcome new members G3MCX and G4IFB and the return of G3UFY to the committee after an absence of some years. The Chairman thanks all the members for giving up so much of their leisure time to adjudicate contests and for their attendance at the formal meetings. Thanks are also due to the corresponding members and in particular BR532525 for his help in regard to SWL HF contest matters. A further word of thanks is also due to the various persons who assist the committee by inspecting NFD stations.

Ron Glaisher G6LX, Chairman

IARU COMMITTEE

Committee: G3GVV, G3FKM, G3PSM, G3WDG, G3WSN, G3ZAY, G3ZNU, G4IQQ, G4KGC, G6LX, G3DME*, G3PFR*, G5XB*, G8PB*
Expenses: £258

During the year mid-way between major international conferences, the workload diminishes; consequently the IARU Committee met formally on three occasions only, at considerable saving to the Society. However, there was frequent contact between members, both by telephone and by correspondence.

Acting in its co-ordinating and liaising capacity, it enabled recommendations of the 1987 Region 1 Conference to be implemented. A long-standing commitment is to provide assistance and guidance to developing countries, where amateur radio is to be encouraged as a valuable social and technological asset; RAE manuals have been despatched to a number of Societies in Africa and in Asia. The dissemination and inter-change of administrative and technical information between member Societies in all Regions continues. Two conferences in the coming year have necessitated the preparation of documents; first the Region 1 HF Managers' conference, to be held in the Aaland Islands in September 1988; second, the Region 3 conference to be held in Seoul in October 1988. For the latter, five papers have been presented; furthermore the RSGB will have an opportunity of discussing with the Societies of Asia and Australasia the position to be adopted at a forthcoming WARC, probably in 1992. Although 1992 may seem remote, all the radio societies of the world must now prepare a unified and logical approach so that the retention or extension of existing frequency allocations can be justified against rival claims by other users of the spectrum.

R.J. Hughes, G3GVV, Chairman

LICENSING ADVISORY COMMITTEE

Committee: G3YGF, G3ZNU, G4AFJ, G3FKM, G3OUF (staff), G3STG, G3WDG, G3WSN, G4FJN.
Expenses: £529

The main work of this committee involves liaising with the DTI to maintain and improve the facilities available in the amateur licences.

It has been an exceedingly busy year. The highlight was the publication of the terms of the revised licence, which will take effect from January 1989. The details can be found in August 1988 *RadCom*. It has certainly brought a great deal of the old licence up to date, and introduced several major new facilities, including the CEPT Licence and Maritime mobile. However, there are still a number of areas where it is inappropriate to modern day conditions. The hobby continues to develop at a rapid rate, and these, together with other issues which were deferred until after the revision, will be addressed in the near future.

Some of the licence changes relating to packet radio will be enacted before the new year, and this will enable RSGB to distribute Letters of Variation for mailbox operation.

As part of the YEAR project, a draft schedule was generated for the Student Licence. This involved striking a delicate balance between granting a sufficient range of facilities to arouse interest, but not so many that it would be seen as devaluing the achievement of existing licensees. The DTI have already given the principle of this licence their enthusiastic support, and we look forward to feedback from the membership following the September *RadCom*.

Several other important issues illustrate the increasing impact that legislation is having on the hobby:

- Probably the most adverse development was the introduction of restrictions on the construction and import of single-band 28MHz transmitters. This is a most regrettable development which we will continue to oppose.
- As part of the move towards a single European market in 1992, legislation will be introduced to require all equipment put on the market to meet certain EMC immunity and emission standards. While we welcome the improvements in standards, it may have a very negative effect on the amateur service because of the bureaucratic requirements which may apply to amateur equipment could discourage experimentation. The details of this legislation are still under discussion.
- It would seem that deregulation of the spectrum (as outlined in the CSPI report) is proceeding in a piecemeal manner in some parts of the spectrum. The outcome is not yet clear, but indications are that its effects on the amateur bands are likely to be slight.
- The Civil and Defence reviews of the Spectrum have concluded.

All this brings home the extreme commercial pressure on frequencies in many parts of the spectrum, and emphasises the need to be seen to be making good use of our allocations. This is particularly important in the preparations leading up to the WARC in 1992.

It is good to note that other countries are continuing to follow our lead and have granted allocations at 50MHz.

Julian Gannaway G3YGF, Chairman

MEMBERSHIP LIAISON

Committee: G4DAX, G3USS, G8BZX, GW4HWR, G3AEZ, G3DOT, G3YGF, G4AJJ, G4CHH, G3GVV*
Expenses: £1652

Despite being able to hold only four meetings owing to financial constraints, the committee has completed many of the tasks it identified early in the year. The main objective was to set up and begin to operate the new RSGB Liaison Officer Scheme on 1 January 1988. Despite the short time available this was achieved, without too many face-to-face meetings of the committee, by the use of computer/telephone/word processor techniques. In these days of limited budgets, and with a committee which is composed mainly of zonal members, I feel that more and more business will have to be conducted in this manner. Some vacancies still exist for RLOs in various parts of the country; however, the scheme seems to have got off to a good start, with Project YEAR being the first major task with which the new RLOs have become involved.

Other projects have included the RLO Handbook (which became a folder). Changes to the Club News in Radio Communication, reviewing the terms of reference and appointment of a Slow Morse Service Co-ordinator, a review of the problems of representation of members resident on British Sovereign Bases abroad, and the possible increased use of the RSGB HQ station.

Routine work of the committee, such as maintaining an overview of GB2RS, club news and membership services, continued to take a large percentage of committee time, increasing in fact as the services increase. It is envisaged that as packet radio moves from the experimental to the routine, this committee may well become more involved with this mode in its role as the regulator of the Society's news services. In this field, and not forgetting our roots, a CW GB2RS broadcast experiment has begun in the North West of England. It is hoped that this low-key (sic) venture may well develop, if the demand is there, into a wider service.

Members of the committee have visited many clubs throughout the country, bringing members' opinions and wishes back to committee for discussion, and most of us have attended rallies and conventions throughout the year, representing both the Society and the committee.

Finally, I would like to thank all the staff members who have assisted the committee in its work, particularly David Gough (GB2RS, *RadCom* News Bulletin, and Rallies), Brett Rider, (Membership Services) and Heather Norman, the committee secretary, who prevented me from putting my foot in it too often!

D Smith G4DAX, Chairman

MICROWAVE

Committee: G3PFR, G3JVL, G3PHO, G3WDG, G3YGF, G4DDK, G4FRE, G4KGC, G8AGN, G3GVV*, G3JHM*, G3RPE*, G3RWL*, G3XDV*, G3ZNU*, G4FSG*, G4KNZ*, G4MQS*.
Expenses: £1300

The committee met on six occasions for general business and once for special business (joint meeting with PWG). In addition to the usual 'routine' committee work, there has been a strong bias to frequency planning this year resulting from increasing primary user occupancy of many of the bands, more amateur user groups coming to the fore with allocation needs and the early effects of the Government's Spectrum Review. This aspect of

committee work is expected to increase in importance in view of the Society's consideration of a Student Licence and the possibility of an early WARC.

The special projects for 1988 have met with varying degrees of success. Activity on the 24GHz band is now increasing, largely as a result of easier access to the band and readier availability of various modules.

Promotion of home design and construction, via the John Rouse Memorial Trophy and Premium has again resulted in poor response, despite work done by members to promote the project by publicity (in *RadCom* and the *Microwave Newsletter*) and provision of many crucial components and materials through the Components Service. The one entry to the Memorial Trophy, by G3BNL, was judged to be of sufficient merit to win the award for 1988. Appropriately, it was a 24GHz narrowband design which should help to further activity! The committee also recognises that the possibility of commercial uses of frequencies near to 24GHz may provide an excellent opportunity to acquire new devices and ideas for the lowest of our millimetre bands, just as the availability of 10 to 12GHz devices has recently encouraged many users onto the 10GHz band.

Three committee members' designs, the G4FRE beacon keyer and the local oscillator and companion 1W linear amplifier for 1150 to 1300MHz (both due to G4DDK) have proved extremely popular and are in use for many applications on this and other bands. It is to be hoped that such designs might provide the spur to other home designers and constructors for the 1989 award! Further reliable designs will, it is hoped, be published in the coming year.

Progress towards publication of the long awaited *Microwave Handbook* has been made, although other Society publications have necessarily taken editorial priority. The size of the draft has grown to the point where it has proved necessary to divide the publication into three companion volumes. The first of these should be published during the year 1988/89 with the two other volumes to follow.

Work on a possible video presentation of amateur microwave activity has, as a consequence, not progressed. However, it may have taken on new significance, in that there will be a need for instructional material to support the proposed Student Licence. A significant amount of committee business, quite rightly, has centred on this proposal and will require the committee to provide technical support for Project YEAR.

The coming year's special objectives will be:

1. To complete publication of the Handbook.
2. To continue with careful frequency planning as and when required.
3. To continue preparative work for the next WARC.
4. To continue technical work to support the work of the T&EA Group on the Student Licence.
5. To encourage design and building of equipment for the new satellite packages just launched or about to be launched.
6. To continue to sponsor home design and construction via the John Rouse Memorial Trophy.

I would again like to take the opportunity to thank all those who have contributed to the Committee's work during the year, some of them members of the committee and others, outside the committee, who have also made significant input to the work reported here.

Mike Dixon G3PFR, Chairman

PLANNING ADVISORY

Committee: G8GG, GW4ZXC, G3OSS, G3PVH, G3TZZ, G4GJB, G4OIG, G4OVX, G4SHF, G5HD, GM4YRS*, G0IID*, G4LYX*, G6MNF*, G2XM*, G8NXU*, RS39901*, G3GVV*, G4FLQ (staff)

Expenses: £386

The Committee has maintained a steady flow of case work assistance to members as well as answering a wide variety of more general queries. Pressure of their own professional work has, however, made several members currently undertaking this type of casework to ask to be excused further work for some time. One new member from Scotland has permitted better service to members north of the Border but new members, corresponding or otherwise, are needed if the overall level of service is to be maintained. Although the NEC display drew attention to this need, no approaches were made at the time, but it is hoped that some response may result from Society members experienced in the Planning field.

A proposal by a member to use a large telescopic mast on a trailer led to his local council determining that this required planning permission and the Minister, when endorsing this on appeal, introduced a concept not previously used which could have an impact on static proposals also. An appeal has been made to the High Court but it is likely to be some considerable time before the matter is concluded.

Comments have been forwarded to the Department of the Environment in respect of proposals for a wide ranging revision of the General Development Order and to two District Councils in respect of policy documents regarding masts and antennas.

The updating of the brochure *Planning Permission - advice to members* has been completed and copies were available for members at NEC, together with a single sheet advice note which was taken by many visitors. The more

attractive display at the 75th Anniversary Convention drew favourable comment while several members who had previously used the services of the advisory panel took the opportunity of expressing their appreciation to the representatives on duty.

The Committee intends to continue to seek additional membership to help with casework and also to explore further the concept of 'local planning representatives'.

H.Fenton G8GG, Chairman

PROPAGATION STUDIES

Committee: G3LTP, G2FKZ, G3BYW, G3DME, G3HTF, G3JVL, G3NAQ, G4AQI, RS87676, DJ5DT*, F8SH*, G2AHU*, G3USF*, G4CEB*, G4MXU*, G3GVV*.

Expenses: £849

The work of the Propagation Studies Committee divides quite conveniently into three sections. First there are the direct services to members, in which we may include the monthly HF prediction tables in *RadCom*, the solar/geophysical and ionospheric data summaries on GB2RS (with an expanded version on the Databox/Prestel services), the manning of stands at the National, VHF and HF Conventions, as well as frequent talks on propagation topics given to local groups and clubs. Then there are indirect services to members, by which we try to co-ordinate their own efforts, liaise with the national societies in other countries and with IARU in the establishment of the world-wide network of HF beacons, and maintain mutually beneficial relations with CCIR and a wide range of professional research organisations. Finally, we carry out a number of research projects of our own, and to that end each of the members of the Committee is a specialist in at least one of our fields of interest.

The Committee met six times in the period covered by this report. I am pleased to be able to record that all of our activities continue to flourish and that we enter the new financial year with no shortage of useful work for the future.

R.G.Flavell G3LTP, Chairman

RAYNET

Committee: G3STG, GM4SRL, G3FKM, G3KWU, G3TJP, G3VPE, G3WDG, G3WSN, G3YAC, G8CAC, G8RWH, G3GVV*, G4FLQ (staff).

Zonal Representatives (corresponding): G14VC, GM3RFA, GW4PUX, G4EAN, G4EJP, G4ETN, G4FSS, G4MWO, G4PFO, G4UJQ, G4YMU, G6BBW.

Expenses: £1577

Perhaps the most spectacular events of the year under review for RAYNET members took place during the weekend of the big blow. During this period, RAYNET members in the South East, and in South Wales, devoted many hours of service to the community providing communications for their local communities, while public facilities were either out of action or overloaded. Tributes were paid to their efforts in many places, including a comment from a CEPO on Radio 4 that he did not know how he would have coped without the assistance of the radio amateur.

However, the network's strength is that some 5000 members have given up many hours to provide communications for the community, both in direct rehearsal of capability for disaster situations, and in practising their skills at a variety of events and activities such as major sporting and athletic events throughout all parts of the United Kingdom. Such public service activity in real pressured situations provides an invaluable training ground which cannot be matched by paper exercises.

Conscious of the need to support local group efforts by the rehearsal of longer distance networks, the committee encouraged members throughout the UK to take part in two exercises designed to severely test their capabilities. These certainly demonstrated the difficulties of passing accurate traffic under heavy traffic conditions without a great deal of pre-planning.

The major achievements in the committee's work programme have included very substantial improvements in the relationships with our user services at national level. Important co-operative work has been done with St John Ambulance and Red Cross in laying plans for dealing with major local or national disasters. In addition, a beginning has been made in frequency planning work in conjunction with the Home Office, and significant relaxations in the licence requirements as applied to RAYNET's operations have successfully pursued.

The year has seen a number of changes in the committee's membership, with more expected during the coming twelve months, some as a consequence of changes in zonal representation which forms an important part of the management and co-ordination of the network.

The weekly 3.5MHz net continues to provide an important means of communications within the organisation, and attracts regular support from all areas of the UK.

The committee's thanks go to the HQ staff, and to all zonal representatives and controllers for their hard work during the year.

G.Griffiths G3STG, Chairman

REPEATER MANAGEMENT GROUP

Committee: G4AFJ, GM8LBC, G3URE, G3VZV, G3XDV, G4CCC, G4DAX, G4EFO, G4NJU, G6LMR, G8IMB, G8SSL, G3PFR*, G3WSN*, G3ZNU*, G8GOJ*

Repeater Regional Representatives (corresponding): GM3UKG, G14FUM, GM0HXX, G3LEQ, G1GNS, G0COA, G8FWY, G8HVY, G4HSY, G3TJM, G4PJZ, G0FKE, G3UQH, G0BEQ, G3GHS, G8UVY, G3YXZ, G8JNZ, G6AWT

Expenses: £1333

Difficulties arose during the first quarter of the year owing to illness of the Chairman and consequent work overload for the Vice-Chairman. Our difficulties were compounded with the absence overseas for 6 months of the Proposals Co-ordinator. Recruitment of a new Minutes Secretary enabled a new post of Assistant Chairman to be created. In addition, new Proposals and Special Projects Co-ordinators were appointed. These changes, as well as a move towards more delegation of work, resulted in a great reduction in the backlog of work that had built up. This has had the effect of requiring more input from the Regional Repeater Co-ordinator and Representative system which, on the whole, seems to be working quite effectively. There is, however, a need to stress to repeater groups in general that RSGB HQ and/or the Chairman do not necessarily know all the answers!

Towards the end of the year G3XDV was recruited to HQ staff and G4AFJ took over as Chairman. Fortunately G3XDV's expertise was not lost as he will continue as a staff member of committee.

As a result of the personnel problems referred to previously many of our special objectives and projects were not completed and these will carry on into the new year. In particular the franchise document was not implemented and the extension of the GB2RS experiment via repeaters was not processed. It is anticipated that progress will be made very quickly on these projects. Repeater linking proposals were overshadowed by the need for packet network linking. Negotiations with DTI on packet matters were slower than anticipated but it is expected that there will be positive progress very soon.

Routine business formed the main part of the work of the committee and included vetting new proposals for the DTI, responding to licensing queries from the DTI, encouraging repeater groups to provide a good service, monitoring technical standards and compliance with licensing conditions, giving technical advice to repeater groups, resolving interference problems, ensuring the accuracy of HQ records, providing a stand and organising meetings at the VHF and National Conventions, producing Repeater Report, briefing the VHF Manager for the IARU VHF Working Group meeting, checking with groups the accuracy of emergency closedown information, drafting technical specifications, collating service area maps, and revising the *Ins and Outs of Repeaters*.

I would like to express my thanks to all members of the committee for their support and the repeater groups for their forbearance in what has been a difficult year for RMG. "Could do better" certainly sums up the first half of the year and we did do considerably better in the second half!

I would like to place on record an official thanks to Mike, G3XDV, for the considerable amount of time and energy that he has put into repeater matters over the past 15 years or so. Coupled with this I would also like to thank the staff at HQ, in particular Heather Norman.

Finally thanks goes to all those individuals in repeater groups whose work keeps the repeater network up and running.

Geoff Dover G4AFJ, Chairman

PACKET WORKING GROUP

Committee: G3XDV, G1DIL, G8ONH, G0K/K8KA, G3VPF, G4SHJ, G4ZRT, G8IMB, G8LWY, G6DLJ, G8KHV, G4VYA, G3MRX*, G3NRW*, G3PLX*, G4MTP*, G3PFR*, G3WDG*, G3WSN*, G3YGF*, G3ZNU*, G3RWL*, G3RUH*, G3XTT*, G6KVK*

Expenses: £663

There was much steady progress during the year towards obtaining the licence changes necessary to put packet radio on a firm basis for the future. In addition several new packet repeater licences were obtained from the DTI.

To ensure compatibility with other band users, discussions were held with each spectrum committee re national and international bandplaning. Papers were drafted for the IARU Region 1 HF and VHF Working Group meetings to be held in September 1988.

A detailed report was produced on the 1987 packet radio experiment, and this was published in *Connect International*. Another report will be published after the end of 1988.

A number of lectures were given by PWG members at the very successful first RSGB Data Symposium.

The packet radio networks developed at an unprecedented rate during the period under review. Close contact was kept between the PWG and

network node providers in order to ensure orderly and structured growth. It is expected that 1988/89 will see another quantum leap in packet networking.

M Dennison G3XDV, Chairman.

TECHNICAL & PUBLICATIONS

Committee: G3SIX, G3SEK, G3VA, G3YGF, G8ONH, G3GVV*, G4BWE*, G1NQW*, G3MRX*, G3RPE*, G3RZP*, G4FAW*, G4FZH*, G6XM*, G8EZE*, Radio Communication Editor (staff).

Expenses: £537

The principal tasks of the committee include refereeing articles for *RadCom* and book manuscripts and to provide technical recommendations where required. The committee met on 10 occasions during the year.

Several members left the committee during the year including the Chairman and Minutes Secretary, and this resulted in a serious shortage of members. In addition, the retirement of the editor, Mr Hutchinson, and subsequent delay before the new editor could take up the post resulted in additional difficulties. By nature, the work of the committee requires close contact with the headquarters editorial department.

Seventy articles were submitted for publication in *RadCom* and about half were accepted. Under the new editor, *RadCom* is undergoing a facelift. New working practices are being introduced; in particular, a greater use of electronic publishing methods to improve efficiency and deadlines. Plans are in hand to adopt commissioning as a means of obtaining key articles.

On the book front, the committee refereed six book manuscripts. The Publications Management Group was formed during the year involving HQ staff and T&P to improve the management of the book publishing activity. The installation of desk top publishing at HQ should improve the speed and efficiency of processing manuscripts. The new awards book is the first to be produced using the new equipment. There are several new titles on the way.

Peter Hart G3SIX, Chairman

TRAINING & EDUCATION ADVISORY WORKING GROUP

Committee: GW4HWR, G3FVC, GU3MBS*, G3PHK*, G3FKM*, G3PFR*, G3YGF*, G3ZAY*, G4AJJ*, G4ASR*

Expenses: £2170

This new group was set up during 1987 at a Council Working Party Meeting on 24 April 1987, attended by Messrs F Hall, GM8BZX, W McClintock, G3VPK, A McKenzie, G3OSS, D Smith, G4DAX, D Evans, G3OUF and led by J Case, GW4HWR. Guidelines were laid down and a rather long list of objectives suggested.

The proposals were put to Council and instructions to set up the new group were issued. In the period June 1987 to June 1988, eight meetings were held. The initial ones were taken up with obtaining the necessary recruits and deciding the priorities for the various projects.

Very early on it was thought that maximum priority be given to attracting young people into electronics using amateur radio as a medium. The need for some new form of licence quickly became apparent and the group was enlarged to enable a draft licence proposal to be generated. Feedback from the three spectrum committees was sought and each represented on the group. Later a representative from the QRP Group was co-opted.

One meeting was held at Gilwell Park, the Scout Headquarters and a very useful working relationship established.

The results of the work of this group has already had considerable coverage in the pages of *RadCom*, and more information will be available shortly. When the feedback from members has been analysed a document for presentation to the necessary authorities will be prepared.

Members of the Group during the period were as above, with the addition of G4CHH and G3MCK.

J. Case GW4HWR, Chairman

VHF

Committee: G3ZNU, G2AHU, G3COJ, G3FZL, G3OSS, G3UBX, G3WSN, G3ZVW, G4ASR, G4CCC, GM4ANB*, G3GVV*, G3PFR*, G3RKL*, G3SEK*, G3UUT*, G3VKM*, G3XDV*, G3XDY*, G4OUT*, G5UM*, G8VR*, G3RWL*, G3STC*, G3VZV*, G8GOJ*

Expenses: £546

During the year the 50MHz Reporting Group Co-ordinator, G2AHU, was made a full member of the committee, reflecting the importance of continued active support in this area. The VHF Awards Manager, G5UM, announced his intention to retire from the post, and from a number of applicants, the committee has selected G4OUT to succeed him. We all wish Jack a happy 'second retirement'.

The committee met on five occasions during the year, a figure adequate to handle the workload although sometimes resulting in slow response times.

Preparations were under way for the planned Region 1 VHF Managers' meeting which was to have been held in September 1988. For the RSGB, packet radio was the only policy item of major importance, and with the PWG a paper was produced on future plans. In the event, however, the meeting has been postponed to next spring since so few societies had any matters to discuss.

The committee processed an unusual application for a beacon on 50.000MHz, to be locked in frequency to an off-air standard and carrying time pulses to allow path length measurements to be made during propagation openings. The beacon, GB3BUX, will be co-located with the 70MHz beacon and the GB3HH and GB3SF repeaters. A suitable technical case had to be made to the DTI, and as a result they have now agreed to license the beacon.

The committee's study into the feasibility of adopting 12.5kHz channel spacing for FM on 144MHz has produced a comprehensive interim report for publication in *Radio Communication* (November 1988). There are many arguments for and against the narrower channel spacing, and it will be interesting to hear amateurs' views, and attempt to draw appropriate conclusions.

At the VHF Convention the committee launched an unusual construction contest aimed at encouraging experimentation and activity on 50MHz and 70MHz, and aims to present a constructor's trophy in 1989.

The VHF Convention continues to attract an increasing attendance, but this success brought the problem of excessive delays for visitors entering the convention. Owing to the overcrowding in the exhibition hall, the committee is reviewing, together with the Exhibition and Rally Committee, the possibilities for expansion to an additional exhibition floor. The committee also attended the National Convention at the NEC, again using the opportunity to meet many of the VHF fraternity. Attendance at the Midlands VHF Convention was less than expected, but this is still considered a worthwhile event.

As usual, a big thank you to all who are involved with the work of the committee in both large and small ways.

Malcolm Appleby G3ZNU, Chairman

VHF CONTEST

Committee: G3XDY, GM8MJV, G3FZL, G3LCH, G4FRE, G4JLG, G4NBS, G4WAD, G8HHI, G8TFI, G2HIF*, G3GVV*, G3ZNU*, G6LX*, RS32525*.
Expenses: £802

During the year G3LCH left the committee after several years' valuable work. The resulting vacancy was advertised in the April 1988 News

** Corresponding committee members*

Bulletin, and an appointment will be announced shortly. 24 Contests have been organised for 1988. This is slightly fewer than last year, and is a move towards gradual rationalisation of the contest calendar to produce a better balance throughout the year. The 70MHz CW event was reinstated in view of the increased support for this event in 1987.

Following the successful introduction of a 50MHz contest last year, two events are included in 1988. The first of these produced a surprisingly high level of activity and entries, which was very encouraging. Some changes to the scoring system have been implemented to avoid distortion of the results by a few high scoring Sporadic E or F-layer contacts. No interference to continental TV has been reported as a result of contest operation. A unique new trophy (the Telford Trophy) will be awarded to the leader of the October contest which is open to both fixed and portable stations this year. Consideration is also being given to running a 50MHz Cumulative Contest in 1989.

There has been a continuing decline in the number of entries for some VHF contests which is causing concern. The AFS events are continuing to generate a lot of activity and entries, but UHF events are not well supported. Views have been expressed that the resources needed to assemble and operate a winning station are beyond those available to the average amateur or group of amateurs. Measures to reduce the complexity of equipment needed in some events are being studied.

After further discussion of VHF NFD it was decided to leave the event to run as last year for 1988. For 1989 proposals have been made to include an all mode 50MHz session in place of the 70MHz CW session, and to make the 70MHz Phone session all mode. This will not require any more operators than before and it appears that in general 50MHz equipment is fairly widely available, so that most groups should be able to put on a station on this band. Feedback to the Chairman on this topic would be very welcome.

Computerisation of input for *RadCom* is being progressed, and should result in shorter lead times for results publication in future.

Members of the committee are available to talk to clubs about contest operation and the behind the scenes adjudication work. Please contact the Chairman for further details. This will supplement the opportunities for feedback at the VHF Convention and NEC Convention, and allow the committee to get a clearer picture of entrants' views and concerns.

Finally, I would like to thank all the members who submit entries for VHF Contests for their support, and to appeal to everyone to take part and send in a log to show that we do use our bands effectively.

John Quarumby G3XDY, Chairman

REPORTS FROM THE ...

... Amateur Radio Observation Service Co-ordinator

Problems have been of the usual variety - many dealt with successfully, others less effectively. Lack of a satisfactory conclusion to investigations into many serious offences has been due to the difficulty of correctly identifying sources of deliberate interference and illegal, unlicensed and pirate transmissions.

Neither the Observation Service, nor the majority of amateurs who may be suffering, have sophisticated locating systems. The Radio Investigation Service of the DTI will assist when sufficient local resources are available, and they have indeed done so at times. However, since the amateur service is 'unprotected', there has never been any guarantee of help.

Thought has been given to the possibility of designing a low-cost, but up-to-date, DF system which could cover all or at least most of the HF bands, and from a fixed antenna. Such could be used by Observers and others to help towards immediate location of a transmission.

The knowledge that such stations could be speedily found, even if only to general area accuracy, could well prevent much of the unpleasant behaviour that has now to be endured.

There is still too much abuse of the agreed bandplans, and a large number of cases have been the subject of friendly letters of advice to both deliberate and innocent offenders. Chaos and bad tempers are inevitable unless the proper procedures are adhered to.

Other problems which have caused concern include interference from modified CB sets with output particularly in the 10 metre band, and often from taxi and other commercial users; the use of 'cordless' telephones with frequencies in amateur bands; operation on unauthorised frequencies, outside the proper bands by amateurs and others; working SSB on 24MHz; excessive power and other licence infringements applicable to certain bands; foul language and personal abuse, and some poor operational practice from both early and recent call signs.

Technical faults arising from badly set up or designed equipment, or

from overloading and other kinds of poor operation have been very few, although adjacent interference due to high-power working by bad neighbours and contest operators is not uncommon.

Direct contact with the DTI Investigation Service, both formal and personal, to DTI HQ and to districts, has been of benefit. However, very few cases are referred to the authorities, and those have to be of a serious nature, with sufficient evidence to support any request for action.

R.J. Osborne G4FJN

... Audio/Visual Library Co-ordinator

The Library continues to function satisfactorily with the emphasis on VHS cassettes being borrowed. Some new titles have been added including Packet Radio which leads the Librarian to say that he is always pleased to acquire new donations from amateur or commercial sources. In the past year 216 titles were despatched on hire and in the last six years over 400 different clubs and societies have availed themselves of the Audio/Visual Library - many of them as 'regular customers'.

Owing to recent postal increases, the hiring charge has been raised to £2 per title per evening, which includes postage. There are no other changes in the arrangements.

- Q. My club wishes to hire some items from the Audio-Visual Library. Where do I get information about what is available, hiring conditions and prices?
- A. Write to R.G. Auckland, G2PA, Library Curator, 60 High Street, Sandridge, via St. Albans, AL4 9BZ (QTHR), enclosing a stamp for reply. Do not write to RSGB HQ.
- Q. I am a member of the RSGB. Can I borrow cassettes and tapes?
- A. No. The Audio/Visual Library is only for affiliated clubs and societies of the RSGB. The service does not extend to individual members.
- Q. I represent a body (eg. St. John Ambulance, RAE Course teacher, Scout

- Group) and want to borrow from the Audio/Visual Library.
- A. Items will be loaned for educational and promotional purposes, but the decision is discretionary. Write to the Library Curator.
- Q. Does the Audio/Visual Library sell audio or video cassettes?
- A. No.
- Q. Does the Audio/Visual Library loan to societies abroad?
- A. No.

R.G.Auckland G2PA, Chairman

T Total: 91 squares awards (95)

... HF Manager

In accordance with my Terms of Reference as HF Manager I have continued to try to keep Council informed on the development of amateur interests at frequencies below 30MHz, and also to advise on international matters. There has been no Regional conference or meeting of HF Managers since last year's report was written.

So far I have received no complaints of interference problems arising to the IBP beacons on 28MHz from US Novice and Technician Class licensees. However, as the current sunspot cycle progresses it remains to be seen whether problems in copying the beacons will arise. To date there have been relatively few openings into the USA from western Europe but this state of affairs will soon change.

A problem is now arising from severe interference to the beacon network on 14.1MHz caused by packet radio signals. Again we are suffering as a consequence of what seems to be an apparent lack of understanding at the international level. This is probably due to the rapid expansion in the use of packet radio on the HF bands, and to unwillingness by a small minority of operators who are determined to take no notice of bandplaning. Unfortunately the development of packet radio has outstripped the pace of inter-society and international liaison.

Although there has been no meeting of HF Managers during the period covered by this report one will take place in September and I have helped in the preparation of papers on the future usage of the 10MHz band, 'dx windows' on the 3.5MHz band (status and suggested code of practice), and packet radio on HF.

Finally, other overseas contacts resulting from my monthly column and IARU duties have enabled me to keep in contact with other HF representatives from many fellow societies.

John Allaway, G3FKM

... HF Awards Manager

During the last year a total of 724 HF certificates were issued, the details of which are shown in the table. This figure is similar to that for 1986, but does represent a significant increase on last year.

	G	Europe	Nth Ameri-	Stth Ameri-	Asia	Africa	Oceania	Total
WBC	6	152	-	-	52	-	11	221
CDXC	1	7	1	-	2	-	-	11
IARU	33	105	3	2	22	-	18	183
DXLCA	1	76	-	-	16	-	2	95
BCRTA	3	45	1	-	16	-	1	66
BCRRA	1	28	-	-	4	-	1	34
WAC	102	-	-	-	-	-	-	102
28MHz								
Countries	1	1	-	-	-	-	-	2
CCC	2	1	-	-	-	-	-	3
SBCCC	4	-	-	-	-	-	-	4
WITUZ	-	1	-	-	-	-	-	1
SBWITUZ	-	2	-	-	-	-	-	2
	154	418	5	2	112	-	33	724

It should be noted that the WBC, CDXC, BCRTA and BCRRA are part of the Society's previous Awards Programme, but it is proposed to continue to issue these certificates as long as stocks last.

Following the change of Awards Manager last year, it was necessary to notify IARU member societies world-wide of this change, and the opportunity was also taken of publicising the Society's new Awards structure. Whilst this will inevitably take some time to reach the amateur population at large, it is hoped that this will bring about an increase in the number of awards issued in the future.

Pending the reissue of the Society's Awards Handbook, the current awards were detailed in Radio Communication earlier this year and it was

pleasing to note an increase in interest from G stations, in particular in the Worked All Continents Award.

During the year under review numerous queries have been dealt with relating to both RSGB and overseas Awards. It should be noted that in most cases the HF Awards Manager is able to verify applications for foreign awards, thereby saving the need to send QSL cards.

Contact has also been maintained with the editors of a number of overseas Awards Manuals to ensure publicity of the Society's programme.

Congratulations go to members in receipt of Awards as follows:
Commonwealth Century Club No3 WA Ricalton G4ADD, No4 DL McLean G3NOF, No5 E Rogers 9H4G and No6 FH Bliss G3IFB.

5 Band Commonwealth Century Club Class 4NP Haskins G8JR, Classes 2 & 1 L Margolis G3UML, Supreme H Lewis G3GIQ.

Finally, a plea to applicants for awards. Would they please submit these in log book format as it makes checking very much easier and also enables a permanent record to be kept.

S Emlyn-Jones GW4BK

... Trophies Manager

1988 has seen the acquisition of a number of new trophies. The Telford and District ARS presented the Society with a most original replica of Telford's Iron Bridge in recognition of receiving the 50MHz band. The trophy is awarded to the winner of the 50MHz Trophy contest. This year it was presented at the VHF Convention along with the G6ZR Memorial Trophy which was also being received for the first time.

I was delighted to accept on behalf of the Society, the Harold Rose Trophy, presented by the UK 6 metre group, to be awarded to the person who makes the most outstanding contribution towards 50MHz during the year. It will be presented for the first time at next year's VHF Convention.

The Enfield Trophy has recently been brought back into circulation by the Southgate ARC. This was awarded to the winner of Section (b) in the Low Power Field Day at the HF Convention. Also presented for the first time at that event, was the Verulam Silver Jubilee Trophy which is awarded to the entrant having the highest scoring most accurate log in Ropoco 1.

As always, my thanks to John Cattermole, G8NPK, who has engraved the trophies throughout the year.

Hilary Claytons-Smith G4JKS

... VHF Awards Manager

The big event on the metrewave awards front during 1988 has been the introduction of three classes of certificate for the 50MHz. Although this report should give awards details up to 30 June, one feels it worth listing the 50MHz certificates so far despatched up to 30 September of this year.

Category 50MHz Squares Awards	10
50MHz Countries Awards	12
50MHz DX Awards	2

Seven of the 50MHz awards have gone to Class B licensees, which is an indication of the enthusiasm directed to the band since it became available to Class B operators in June 1987.

Perhaps of equal importance to the above has been the introduction of three classes of certificate for the 24GHz band as follows:

Microwave Awards 24GHz	
Advanced Class for first QSO beyond 150km	2
Microwave Awards 24GHz	
Intermediate Class for first - beyond - 75km	6
Microwave Awards 24GHz	
Beginners' Class for first - beyond - 25km	Nil

Other awards details to 30 June are as follows:

Four Metres and Down Certificates

(Last year's issues in parentheses)

70MHz Standard Transmitting	9	(1)
70MHz Senior Transmitting	4	(3)
144MHz Standard Transmitting	9	(16)
144MHz Senior Transmitting	8	(13)
144MHz Receiving	0	(1)
432MHz Standard Transmitting	8	(6)
432MHz Senior Transmitting	7	(5)
432MHz Receiving	0	(1)
1.3GHz Standard Transmitting	3	(4)
1.3GHz Senior Transmitting	0	(3)
2.3GHz Standard Transmitting	0	(1)

Supreme Award (qualification:
three Seniors or two Seniors plus one 1.3GHz) 6 | (3) |

FMD Microwave Distance Award

(For initial contact beyond specified QRB)

1.3GHz 600km	2	(13)
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2.3GHz 500km	2	(2)
3.4GHz 400km	1	(0)
5.6GHz 300km	1	(1)
10GHz 150km	9	(4)
Total FMD certificates issued during the year (inc 24GHz)	73	(75)

QTH Squares Awards

(Last year's issues in parentheses)	year's	oss
70MHz 20 squares and 4 countries	6	(0)
70MHz 25 squares and 6 countries	1	(0)
70MHz 30 squares and 8 countries	2	(3)
70MHz 35 squares and 10 countries	1	(9)
70MHz 40 squares and 10 countries	0	(0)
70MHz 50 squares and 10 countries	0	(0)
144MHz 40 squares and 10 countries	21	(14)
144MHz 60 squares and 15 countries	13	(9)
144MHz 80 squares and 18 countries	6	(7)
144MHz 100 squares and 20 countries	11	(11)
144MHz 125 squares and 20 countries	3	(5)
144MHz 150 squares and 20 countries	1	(3)
144MHz 175 squares and 20 countries	1	(4)
144MHz 200 squares and 30 countries	0	(4)
144MHz 250 squares and 35 countries	2	(0)
144MHz Receiving 125 squares 20 countries	1	(0)
432MHz 30 squares and 6 countries	5	(5)
432MHz 40/10	9	(7)
432MHz 50/13	4	(6)
432MHz 60/15	3	(2)
432MHz 70/15	2	(3)
432MHz 80/15	0	(4)
432MHz 90/15	4	(1)
432MHz 100/15	4	(2)
432MHz 110/15	1	(0)
Total 91 squares awards (95)		

Microwave Squares Awards

1.3GHz 5 squares	5	(8)
1.3GHz 10 squares	5	(7)
1.3GHz 15 squares	3	(6)
1.3GHz 20 squares	2	(4)
1.3GHz 25 squares	0	(4)
1.3GHz 30 squares	1	(4)
1.3GHz 35 squares	2	(2)
1.3GHz 40 squares	2	(2)
1.3GHz 45 squares	1	(1)
1.3GHz 50 squares	0	(1)
1.3GHz 55 squares	1	(2)
1.3GHz 60 squares	2	(1)
1.3GHz 65 squares	2	(0)
1.3GHz 70 squares	1	(0)
2.3GHz 5 squares	2	(1)
2.3GHz 10 squares	0	(3)
2.3GHz 15 squares	1	(1)
2.3GHz 20 squares	1	(1)
2.3GHz 25 squares	0	(1)
2.3GHz 30 squares	1	(0)
2.3GHz 40 squares	0	(1)
2.3GHz 45 squares	1	(0)
3.4GHz 5 squares	1	(1)
3.4GHz 10 squares	0	(0)
3.4GHz 15 squares	0	(0)
3.4GHz 20 squares	1	(0)
5.6GHz 5 squares	1	(0)
10GHz 5 squares	3	(0)
Total microwave squares awards	39	(50)

The downward trend in competitive amateur radio observed here a year ago appears to have continued during 1987-88 judging from the above awards results.

In addition to the FMD and squares awards dispatched during the year a large number of contest winners' certificates were issued on receipt of instructions from the VHF Contests Committee.

Valedictory: This will be the last "VHF Awards Manager's Report" to be contributed by G5UM to The Year in Review. Next year it will be prepared by G4OUT, Ian Cornes of Stoke-on-Trent (half G5UM's age!), who will be gently eased into the office of VHF Awards Manager at the turn of the year.

Jack Hum, G5UM

... Microwave Manager

The main work of the Microwave Manager during the past year has been

concerned with international matters and liaison between the RSGB Licensing Advisory Committee and Microwave Committee.

On the international scene work has continued on frequency planning, particularly in view of the likelihood of a WARC in the next few years. One important forum for discussion this year was cancelled (the VHF/Microwave Managers meeting in Finland), but these matters will certainly be raised at the Region 3 conference and our delegates have been briefed.

A number of licensing matters involving microwaves have been addressed. The major work undertaken was the preparation of a submission to the DTI for their Non-Defence Spectrum Review, involving the 1.3GHz and 2.3GHz bands. During the preparation of this document it was clear that we are now being asked to justify our microwave allocations more strongly than ever before, in the face of competition from other users and potential users. As amateurs, there are three things we can do to justify our microwave bands:

- use them;
- be prepared to write up details of activities including contest entries/activity tables, equipment development and propagation studies;
- emphasize the importance of our allocations for 'self-training'. The value of the experimental nature of amateur radio on the microwave bands is something we must capitalise on in terms of the often unique experience it can give to potential or existing RF/microwave engineers in industry. This point is in fact well taken by the professional and administrative bodies with whom we have to deal.

In this light, new applications and activities for amateur radio on the microwave bands are being sought. The recent liaison between the PWG and Microwave Committee concerning the use of the microwave bands for packet repeater links is very welcome.

During 1988/1989 we hope to find more such areas where microwaves can be used, and to increase activity by positive encouragement. One area in which we plan to contribute is the student licence, by providing equipment designs, as well as background information and suggested applications.

C W Suckling G3WDC

... VHF MANAGER

Since my last Annual Report, much work has been done within the Society to continue the well-being of our Allocations and to plan all the various activities which you, as users of those Allocations, wish to undertake. As you will have seen, the Licence review has improved a number of areas which have required amendment for many years. Such reviews are by nature rather infrequent but the Society will continue to consider any changes or improvements that we feel can help the Amateur Service.

Last year saw the Region 1 IARU Conference, and several committees are already thinking of topics for the next conference to be held in 1990. New areas of activity continue to be discovered and this often requires careful planning. Packet radio is a typical example, its popularity continues and its nature demands considerations which were not even thought about previously. There seems little doubt that Packet radio in its present form, or something like it, will be high on the agenda at the next conference.

We have managed to resolve a number of national problems during the past twelve months, although there are still decisions to be made regarding our requirements for band planning and policies.

In addition to the next Region 1 Conference, we are likely to see another WARC in the near future. This will demand considerable attention as all our allocations will be under scrutiny and we must ensure that our requirements and activities will be able to be met for the future.

There will be many new licensees reading RadCom, and you in particular will have found many activities to undertake. One most important factor is adherence to the band plans. The careful co-ordination of band plans on an international basis is one very sound way of ensuring efficient use of our allocations. It is most rewarding to find that the vast majority of licensees do stick to the band plans, and I thank you all for this.

The 50MHz band continues to attract considerable interest from other societies, and indeed several have been fortunate in obtaining an allocation themselves. Work on the most interesting allocation continues, and we hope more will be granted use on this band in the future.

As always, members of the VHF, VHF Contests, RMC, PMG, and other committees of the Society, Council, and all the HQ staff continue to undertake considerable work on behalf of us all, and I thank them all for their dedication, not only on matters relating to VHF, but for the Amateur Service as a whole.

K A M Fisher G3WSN.

... MORSE TEST STEERING GROUP

Committee: G3GDO, G0KFE, G3OUF, G3AEZ, G4FLQ (Staff Member)

The year has been one of consolidation and fine tuning of our organisation. Examiners now number 282 and test centres are now operational in Jersey, West Germany, Cyprus and Ascension, the latter to cater for applicants

overseas. The number of candidates, 2311, was as expected slightly down on the previous year and the pass rate of 67.6% was a slight improvement. Some 5383 places were provided and the take-up was approximately 50%.

Taking into account, the many and very severe handicaps suffered, the standard reached by the 80 disabled persons tested was very high indeed, and with a very acceptable pass rate. Congratulations to them for their efforts. Testing such folk continues to be a very humbling but rewarding experience for us all.

Of the 80 complaints received and fully investigated, only two cases were considered justified and subsequent compensating action necessary.

Bouquets received numbered 25, four of them from candidates, who despite having failed, noted the helpful manner of the examiners.

This year has been a successful one, thanks solely to the unstinted efforts of all examiners and RSGB HQ Support Staff, and the ready co-operation of the DTI Officers, and I feel once again they can all be proud of their efforts.

Special thanks are due to the Deputy Chief Examiner, Phil Bell (now G0FKE) and Brett Rider, G4FLQ, who have once again rendered Yeoman Service. Thank you all.

A N Ianson G3GDO, Chairman

RSGB ANNUAL MEETING AGENDA AND PROXY FORM

RADIO SOCIETY OF GREAT BRITAIN

(Company Limited by Guarantee)

Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

THE ANNUAL MEETING OF THE SOCIETY

Part 1 - THE ANNUAL GENERAL MEETING

Notice is hereby given that the Sixty-Second Annual General Meeting of the Society will take place at the University of Manchester Institute of Science and Technology, Renold Building, C Floor, Sackville Street, Manchester M60 1QD, in Main Theatre (C16), at 2pm on Saturday 10 December, for the following purposes:-

1. To receive and consider the Minutes of the Sixty First Annual General Meeting circulated with the May 1988 issue of Radio Communication.
2. To receive and consider the Accounts for the year ended 30 June 1988 and the Reports of the Council and Auditors thereon.
3. To announce the names of members to serve on the Council for the year 1989 and to call for volunteer scrutineers for the 1990 Council election.
4. To re-appoint the Auditors, Messrs Moores and Rowland, and to authorise Council to fix their remuneration.

Notes to Members

1. Members attending the meeting should bring their current membership cards as proof of identity.
2. Members are asked to arrive for the AGM no later than 1.45 pm; doors will be opened at 12 noon.
3. As an experiment, the Society will make available for sale an official audio tape recording of the proceedings. The use of video equipment at the meeting(s) will not be permitted.
4. A member entitled to attend and vote at the AGM may appoint a proxy to attend and, on a poll, vote instead of him/her. The proxy need not be a member. Reference should be made to the proxy form attached for your use.
5. Proxy holders who are not members of the RSGB may not speak at the AGM unless they wish to join in the demanding of a poll.

By Order of the Council, David Evans

Secretary

31 October 1988.

(Tea Break)

Part 2 - SOCIETY OPEN MEETING - AGENDA

1. Presentation of the following Council awards: The Calcutta Key, Founders Trophy.
2. Presentation of the following Committee awards: Ostermeyer Trophy, Norman Keith Adams Prize, Courtney Price Trophy, Wortley-Talbot, Raynet Trophy.
3. President's Address.
4. Open Forum.

During the Open Forum, Council members and Committee Chairmen, senior staff and officers of the Society will be available to respond to questions raised. It would assist the Chairman to order the business of the Open Meeting if questions could be submitted in writing in advance to the Secretary, or on forms provided on the day. A limited number of written questions from members not present at the Meeting may be accepted as time permits.

PROXY FORM

At this year's Annual Meeting there will be a vote under Annual General Meeting Agenda item 4 regarding the reappointment of the Society's Auditors (See left hand column). Members who wish to appoint a proxy to vote on this motion on their behalf should note that the form of the proxy was changed last year in general meeting. The new form of the proxy is given below for information together with instructions for its use.

Radio Society of Great Britain

Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

I, Call/RS

of

a member of the above named Society, hereby appoint

..... Call/RS

of

or failing him:

..... Call/RS

of

To vote for me and on behalf of me at the Annual General Meeting of the Society to be held on the 10th day of December 1988, and at every adjournment thereof.

Voting instructions to proxy.

This form is to be used IN FAVOUR OF/AGAINST (see note 1 below) the resolution numbered 4 on the AGM Agenda. Unless otherwise instructed the proxy will vote as he thinks fit.

As witness my hand this day of 1988.

Signed

IMPORTANT NOTES

1. Strike out whichever is not required.
2. Members may appoint any member or non-member as their proxy holder. The following are willing to act as proxies: The President, Sir Richard Davies, G2XM, Haven House, Thorpeness, Leiston, Suffolk IP16 4NR; The Immediate Past President, Mrs J Heathershaw, G4CHH, The Old School, Main Street, Mappleton, Hornsea, North Humberside HU18 1XX; The Executive Vice President, G3YGF, Dean Hill Barn, East Dean, Salisbury, Wiltshire SP5 1HJ.
3. The proxy form must be signed either by the fully paid up corporate member or by his/her attorney duly authorised in writing.
4. RSGB Articles 37 to 49 inclusive refer to proxy votes and the calling of a poll.
5. To be valid this proxy form MUST reach the Secretary of the Society at the Society's registered office (address above) no later than 2 pm on Thursday 8 December 1988. You may send your proxy in the envelope provided for your 1989 Council election vote.



ICOM

Count on us!

IC-R7000, 25-2000 MHz

Commercial quality scanning receiver



With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz.

The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or

by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto-M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-colour fluorescent display. Other features include dial-lock, noise blanker, attenuator, display dimmer and S-meter and optional RC-12 infra-red remote controller, voice synthesizer and HP 1 headphones.

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Helpline: Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.

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Finally, an HT that's built to take the realities of life.

Let's face it. It's easy to bump, drop, or get rain on a portable. But if *your* portable is Yaesu's mini 2-meter FT-23R or 70 cms FT-73R, such mishaps are a lot less worrisome. They're built to last, with rugged aluminium-alloy cases that prove themselves reliable in a one-meter drop test onto solid concrete. Plus, their moisture-resistant seals really help keep the rain out.

Built for the realities of operating. Despite their miniature size, both radios have all the operating capabilities of larger microprocessor-controlled portables. Yet operating them couldn't be easier. Consider: You get a 7.2-volt, 2-watt battery pack. (Optionally, a 12-volt, 5-watt pack, or 7.2-volt miniature 2-watt pack.) 10 memories that store frequency, and offset. (7 memories can store odd splits.) Memory scan at 2 frequencies per second. Band scan at 10 frequencies per second. Tx offset storage. Priority channel scan. Tuning via tuning knob, or up/down buttons. LCD power output and "S"-meter display. Battery saver

circuit. Push-button squelch override. Eight-key control pad. Keypad lock. High/low power switch ($\frac{1}{2}$ watt on low power.) Options available: Dry cell battery case for 6 AAA-size cells. Dry cell battery case for 6 AAA-size cells. DC car adapter/charger. Mobile hanger bracket. External speaker/microphone. And much more. So get the intelligent mini that's built for life's realities. Yaesu's 2-meter FT-23R, or 70 cms FT-73R.



Radios above shown actual size.



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