Radio Communication

September 1988

KENWOOD

Pocket Packet Power

The availability of hand held tranceivers has meant that it is now possible to carry your amateur radio along with you wherever you go. The TH-25E 2 metre and TH-45E 70 centimetre transceivers are fine examples of Kenwood's ability to take an apparently simple idea and add that touch of magic which makes for ease of operating and user satisfaction.

Both transceivers feature an easy to see LCD frequency readout, 14 memory channels, up to 5W output, and in this age of keypads for everything actually use a tuning knob to leap across the bands in convenient steps. Ever tried "tuning around" with a keypad?

Despite the apparent absence of knobs, every possible facility is provided, including power saving on receive, repeater and reverse repeater shifts – and tone burst of course, and a single key press will load memories from 1 to 10 with every channel upwards starting with the one you put into channel 1.

With all the performance, you can still slip it into your pocket because these rigs are really tiny – and they feel so nice to hold that you won't want to put them down. That's perhaps why they are favourites among the rally thieves? Such is life.

The heading "Pocket Packet Power" is just to remind you that with one of these little rigs sat alongside your packet terminal, you can enjoy an amazing variety of contacts. If I hadn't seen them in operation I wouldn't have believed it. Europe wide QSOs from a hand held.

The Kenwood engineering extends to a whole range of accessories, all of which are described on the brochure which we shall be happy to send you on request. Better still, pop into one of our appointed dealers and ask to see (and hold) the Kenwood world beaters.

TH-25E **£258.00**
TH-45E **£296.00**

LOWE ELECTRONICS LTD.

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

Sole Appointed UK Distributor for KENWOOD Amateur Radio

SEPTEMBER 1988

VOLUME 64 No 9

Radio Communication

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Business hours: 1000 to 1600

Headline News
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Incoming news for GB2RS: Tel 0707 59260

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FRONT COVER
Andrew Keeble, G1XYE
'Young Amateur of the Year' 1988

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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.

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

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

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

The TS-140S. A bargain at £10,000?

What would you say if I announced that the TS-140S would in future cost anything between £10,000 and £75,000? This apparently odd question was prompted by a reader's letter in Radcom (page 483 June 1988) which related the picture of the 1924 station of 2NM on the front cover of the February issue, to the picture of an IC-781 shown inside the same issue, and implied that this relationship illustrates the reason for the decline in the hobby of amateur radio. (Go on, read the letter).

The notion that somehow current amateur equipment is expensive, complex, and out of reach of the amateur is often heard, but on this occasion I decided to do a little research based on the comments of the letter writer to see if there really was some truth in this idea.

I first did a detailed costing of the items visible in the photograph of 2NM, using 1924 component catalogues and magazine advertisements. My final estimate came to something around £100, and did not include any items which may have been in the station, but not visible. I then obtained a figure for the average annual salary of a skilled worker in manufacturing industry in 1924 ("Wages and Salaries in the UK 1920-38", Agatha Chapman, Cambridge U. Press, 1953) and this turned out to be £129. In other words, the station of 2NM cost almost a full year's salary for the average man. Even the IC-781 costs a lot less than today's average salary, and rigs such as the TS-140S seem almost a bargain.

Having a 1924 callbook, I was able to check the address of 2NM and researched newspapers of the period (British Library, Colindale), in order to ascertain the probable cost of his house. This was almost certainly in the order of £250. I then checked the current value of the same house with Caterham estate agents, and their estimate was about £300,000. Even allowing for the ludicrous inflation of property prices in Surrey, it does mean that 2NM's station cost him almost half as much as his house – would you like to pay half the cost of your house today for your station?

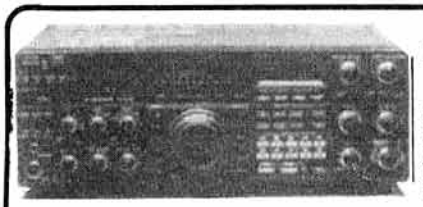
One obvious conclusion of my little quest is that in 1924 amateur radio was definitely a pastime of the better off individual, and was enjoyed by a relatively small number of people – not the 50,000 licensees we have today. As far as the relative cost is concerned, the TS 140S which is the subject of this advertisement is actually not expensive, and if you take into account the sheer technical performance of the transceiver, there can be little doubt that amateur radio equipment offers remarkable value for money compared to that used by 2NM.

On the subject of equipment complexity, I wouldn't mind betting that it took a great deal more skill and effort to operate 2NM than it takes to use a TS-140S, so I don't believe the argument is valid. In any case, the equipment used in a station can be viewed as a tool to further the operator's skill and enjoyment. You don't necessarily have to build a motor car to enjoy driving or be an expert driver.

The final observation I would make is that we all occasionally make statements based more on intuition than fact; I am for example quite convinced that every summer during my childhood consisted of nothing but sunny days, and that ice cream doesn't taste a bit like the ice cream we ate then, but when the facts are determined the truth may well not support one's opinion. I'm simply glad that I don't have to commit a year's salary to buy my amateur radio station, and will come on 80 metres using my TS-140S with a lighter heart . . .

Caveat scriptor (et lector)
John Wilson
G3PCY/5N2AAC

TS-140S **£862**
TS-680S **£985** (inc 6 metres)



TS-940S

Top of the range, the TS-940S has everything the discerning HF operator requires. Amateur bands from 160 to 10 metres, together with a general coverage receiver tuning from 150 kHz to 30 MHz. Operating modes USB, LSB, CW, AM, FM, FSK. Forty memory channels, each effectively a separate VFO. Easy keyboard frequency entry. Leadership in the field. The TS-904S is the transceiver everyone wants to own one day.
TS-940S. . . £1995.00 (carr. £8)

R-5000

Virtually the receive section of a TS-940S, the R-5000 is probably the best HF receiver right now. Notice the family resemblance to the TS-440S which gives it a clean, easy to operate look, and of course Kenwood have applied all their ergonomic skills to make you "at home" the moment you begin to use the R-5000. All mode of course, and has an optional internal VHF converter which extends you to 108-174 MHz.
R-5000. . . £875.00 (carr. £8)

TM-221E

The 45 watt wonder for 2 metres. Common sense facilities, ease of use, and a massive 45 watt output make the TM-221E probably the most wanted FM mobile around. All this and an amazing receiver (see Ham Radio Today July 1987). All you need in a compact package, including all channel spacings (5, 10, 12.5, 15, 20, and 25 kHz). P.S. it also has a 70 cm brother, the TM-421E, and a remote controller available for operating them both together.
TM-221E. . . £317.30 (carr. £8) **TM-421E. . . £352.84**

TS-711E

Called by many "The perfect 2 metre Base Station", the TS-711E is as close to perfection as state of the cart can make it. All mode operation, full band coverage, continuous tuning or step tuning for FM channels. Two separate VFO's, 40 memories storing frequency, mode, repeater shifts, even whether or not you need a tone burst. Optional voice symthesiser, the list of features is almost endless. (And it too has a 70 cm brother, the TS-811E).
TS-711E. . . £898.00 (carr. £8) **TS-811E. . . £998.00**

TR-751E

Versatile 2 metre multi mode mobile or fixed station, the TR-751E again shows that Kenwood magic touch in making a complex transceiver so easy to use. Virtually a miniature version of the TS-711E, the TR-751E set new standards of performance at its introduction, and has continued to win friends ever since, continuing as it did the line started by the TR-9000 and TR-9130. (And, you guessed, it has a 70 cm counterpart, the TR-851E).
TR-751E. . . £599.00 (carr. £8) **TR-851E. . . £699.00**

RZ-1

To be perfectly honest, the RZ-1 came as a surprise to us. We didn't expect Kenwood to come up with a mobile monitor receiver covering 500 kHz to 950 MHz, but here it is. Designed to fit in a standard car radio slot, the RZ-1 seems to have everything. Direct frequency entry, manual tuning, 100 memories, readout of station name on display, scanning, stepping, am/fm modes, unbelievable. . . Of course this level of facilities does not come cheaply, but the RZ-1 really adds a new dimension to the wide range monitor market.
RZ-1. . . £495.00

It's all too expensive.

Although it can be shown that amateur radio equipment is not expensive in purely relative terms, it is nevertheless a fact that some of the top HF transceivers are out of reach for many amateurs. This need not mean that amateur radio itself is out of reach, because there is a wealth of good equipment on the second user market.

With some transceivers now costing upwards of £2000, doesn't it make sense to consider for example a used JRC JST-100 instead. I mention this model simply because I happened to see one on our second user display here at Matlock. With JRC quality and performance in such a tranceiver and a price tag of £850, I think that it's a tempting proposition.

However, there are points to watch, the most important being that you should buy second user equipment only from someone you know you can trust. In this respect, I make no apologies for saying that we at Lowe Electronics are unquestionably the best in the business. Not only have we more experience than anyone else in the country, we try to handle only equipment we would like to own ourselves.

In addition to this we back up all second user sales with a meaningful warranty, and look after every aspect of service and assistance thereafter. We will not sell you cheap junk, and we tell the truth about what we sell; indeed there are some makes of equipment we will NOT sell under any circumstances.

If you want to know more, simply ask for our list od second user equipment or contact any of our branches around the country.

And our branches at:
Glasgow, 4/5 Queen Margaret Rd., (off Queen Margaret Drive). Tel. 041 946 2626.
Darlington, 56 North Road. Tel. 0325 486121.
Cambridge, 162 High St., Chesterton. Tel. 0223 311230.
Cardiff, South Wales Carpets, Clifton St., Tel. 0222 464164.
London, 223 Field End Rd., Eastcote, Middx. Tel. 01 429 3256.
Bournemouth, 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.

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Post Code.....
FREE INFO. Don't forget £1 to cover postage R.C.

LOWE ELECTRONICS LTD.

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

ICOM

DUAL

NEW! IC-32E Dual Band VHF/UHF FM handportable

Features:

- **Full cross band duplex operation.**
- **20 Dual band memories.**
- **Scanning.**
- **5 Watt output with IC-BP7 nicad.**
- **Small size.**
- **Power saver circuit.**
- **Compatible with ICOM accessories.**

When are ICOM going to produce a dual band handportable? This has been the most asked question about new ICOM products for a long time. The IC-32E is the answer.

This exciting new handportable offers full cross-band duplex operation, and with a built-in duplexer allows single antenna operation. 3 Watt output is standard but with the BP7 high power nicad pack or external 13.8v, 5 Watts can be achieved on both bands. The IC-32E comes packed with features, such as the 20 memory channels which can store both a VHF and UHF frequency in one memory and also simplex duplex condition, offset direction and frequency.

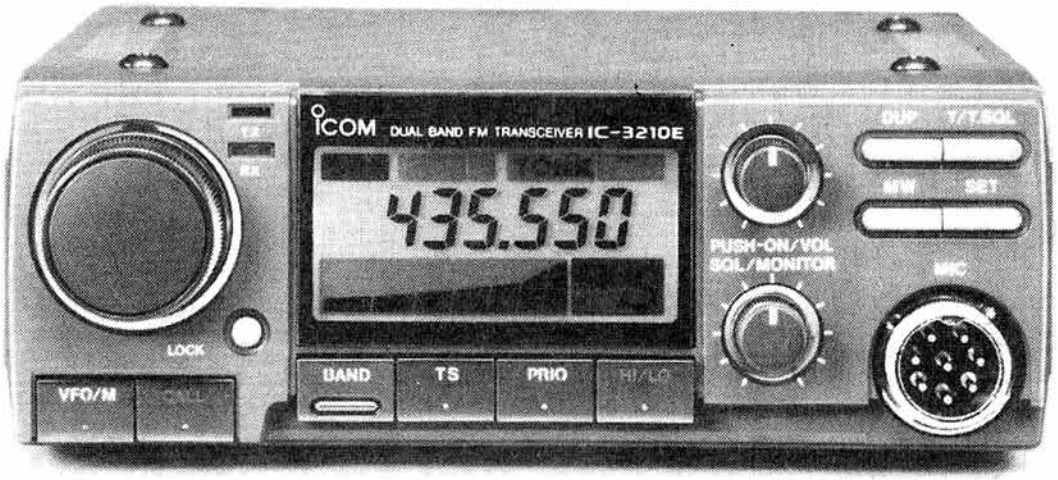
There is a choice of five scanning functions, full programmed memory, memory band and priority. The die-cast frame gives a solid construction featuring rubber gaskets for splashproof operation. The IC-32E is supplied with VHF/UHF a dual band antenna, BP3 battery pack and wall charger.

Icom (UK) Ltd.
Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

Count on us!

BAND.

NEW! IC-3210E Dual Band FM Mobile



If you are newly licensed or just undecided about which band to operate first, then the new ICOM IC-3210 is just the answer. This dual band FM transceiver is ideally suited for the mobile operator. Transmit on one frequency and receive on the other and you're operating full duplex. It's just like talking on the telephone.

The simple and well laid-out front panel ensures quick and easy operation of all its many functions. A great convenience when driving. Optional accessories available are the UT40 tone squelch board. HS15 + SB mobile microphone and switch box SP8 external speaker and PS45 AC power supply.

Features:

- **Full crossband duplex.**
- **20 double-spaced memory channels.**
- **Built-in duplexer.**
- **2 call channels.**
- **4 priority watch functions.**
- **Programmed, memory and selected band memory scan.**
- **Variable LCD backlight intensity.**
- **Tone squelch and pocket beep functions (optional).**
- **25 watts output.**

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.
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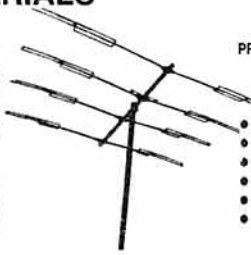
- Computers
- Switching Systems

Fits to any equipment quickly and easily without the use of a screwdriver. Comes in a pack of 3 with complete instructions.
A must for every engineer's toolcase.

Order Code	*Price*
CC701	*£4.50 per pk (3)*

KLM AERIALS



KT-34XA

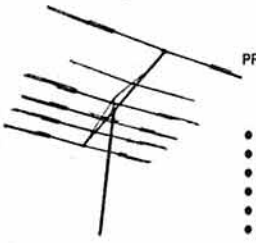
PRICE £579.00

ELECTRICAL

- Bandwidth ..... 14.0-14.350 MHz, 21.0-21.450 MHz, 28-29.1 MHz
- Gain ..... 8.5-9 dB, 9-9.5 dB, 11-11.3 dB
- VSWR 1.5:1
- F/B ..... 20 dB
- F/S ..... 40 dB
- Feed Imp ..... 50 Ohms with balun
- Balun ..... 4.1 5kW PEP

MECHANICAL

- Element Length 24ft
- Boom Length 32ft
- Turn Radius 215ft
- Windload ..... 9 sq ft
- Weight ..... 66 lbs
- Mast ..... 2 in OD



KT-34A

PRICE £403.00

ELECTRICAL

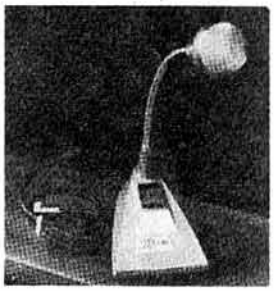
- Bandwidth ..... 14.0-14.350 MHz, 21.0-21.450 MHz, 28-29.7 MHz
- Gain ..... 7 dBd ± 0.3 dB
- VSWR 1.5:1
- F/B ..... 20 dB
- F/S ..... 30 dB
- Feed Imp ..... 50 Ohms with balun
- Balun ..... 4:1, 5kW PEP

MECHANICAL

- Element Length ..... 24 ft
- Boom Length ..... 16 ft
- Turn Radius ..... 16 ft
- Windload ..... 6 sq ft
- Weight ..... 45 lbs
- Mast ..... 2 in OD

TRIBANDERS

HEIL MICROPHONES AND HEADSETS



"Great Improvement Over The Stock TS-440S Microphone"

"The HM-5 Makes A Radio Out Of The New Icom 761"

"The HM-5 Makes The KWM-380 Come Alive"

"Amateur Radio's Dream Microphone"

THE NEW STANDARD IN COMMUNICATIONS AUDIO

The **HM-5** uses the famous Heil HC-5 "Key Element" mounted in a quality goose neck which is set into a steel die cast base - not plastic like most of the industrial paging mics. A large push-to-talk bar with locking switch allows for smooth P.T.T. is possible without the necessity for any external switching.
The **HM-5** is a stunning addition to any station and it will be the answer to getting those signals "on top". The **HM-5** is the preferred microphone for many leading contest and DX stations.

Sensitivity: **-70 DB**

Response: **300 HZ - 4,000 HZ**
With a very defined rise at 2100 HZ.

Price: **£66.81**

The **Heil BM-10** is not just another ho-hum headset. It took nearly two years of development exclusively for the amateur radio operator. To date, 100% of the headsets used were designed years ago for industrial paging, theatrical stage communications or aircraft radio. The amateur radio market was simply a dream of their marketing people to increase the sales of their so-so product.
Unfortunately, those products have been very poor and are, for the most part, inadequate for the special type of communications that sophisticated DX and contest operators require. Through the efforts of the members of the Heil test team (20 of this countries top Contest/DX OPS) The Heil engineers were able to turn the desires, hopes and dreams into reality.
Comes wired with microphone plug.
Price: **£76.38**

MIRAGE 2 METER & 70CM LINEAR AMPLIFIERS

All 2 Meter Linears have built-in receiver pre-amps. All products have a 5 year guarantee (1 year for Power Transformers).

Model	Price
D3010	£279.00
D24	£206.00
D215	£248.00
D3016	£222.00
D1010	£302.00

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GUARANTEE REBATE? What is it? A gimmick or a real consumer benefit? It is another marketing innovation from Amcomm . . . It is simple! . . . It is real! . . . It is a consumer benefit! . . . It is a big effort by Amcomm to help both you and us where it hurts!

This month we introduce, "Guarantee Rebate". It simply means if you don't claim we rebate. Rebate what? Again simple, if you make no claims during the guarantee period we will rebate you the cash component already included in the selling price to cover the guarantee . . . we did say it was simple!

Two things are sure, if you win, we win and Amcomm are going to shell out, but with a smile... there are no losers, either way your guarantee is AMCOMM SOLID, both parts and labour at published or quoted prices.

Check the price first then check the guarantee rebate . . . NOW COUNT THE REAL COST . . . you'll be quick to see it. It's a no lose deal from Amcomm where as everybody says "A great deal more costs a great deal less".

HERE ARE SOME SAMPLE PRICES

FT23	*(with FNB10 N/C 28c) — 2m micro handie* ***£249***
FT747 GX	*— 100W. Compact HF Transceiver* ***£595***
FT290 MkII	*— 2m multimode portable/base* ***£385***
FT736 R	*— 25W. VHF/UHF transceiver* ***£1299***
FT767 GX	*— HF/VHF/UHF All mode TCVR* ***£1395***
FRG 9600	*— 60-950 MHz Scanner Receiver* ***£449***
FRG 8800	*— Precision Gen. Coverage RCVR* ***£575***
IC R71E	*— HF multimode Receiver* ***£739***
IC 735	*— Compact HF multimode TCVR* ***£849***
IC R7000	*— VHF/UHF Communications RCVR* ***£859***
IC μ2E	*— 2m micro handie 2.5w* ***£215***
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IC 751A	*— Top performance 100w TCVR* ***£1319***
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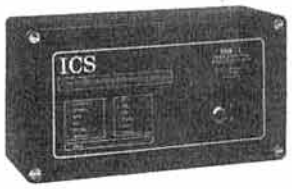
ICOM AUTHORISED YAESU

ICS 10th Anniversary of Amtor

To celebrate the tenth anniversary of the first ever Amtor QSO between G3PLX and G3YYD on 9th September, 1978, ICS (who introduced the first ever fully assembled commercial Amtor product in 1983) are pleased to announce our new third generation top-of-the-line commercial/amateur AMTOR/SITOR terminal unit – the TOR-1.

TOR-1



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★ Both commercial and amateur selcal codes
★ EAROM configuration memory
★ User friendly host mode IBM-PC software support with on screen status
Only £499.95 including VAT plus £5.00 post and packing

PK-232

★ More PK-232s sold world wide than any other multi-mode controller
★ Amtor, Packet, RTTY, CW, ASCII, Facsimile, Navtex and SIAM modes
★ Excellent host mode PC software support **including on-screen send/receive facsimile software for the IBM-PC and Commodore 64**
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★ Superb send/receive high definition on-screen facsimile software for the Commodore AMIGA computer
★ Sixteen levels of grey scale
★ Photographic quality display
★ Mouse driven
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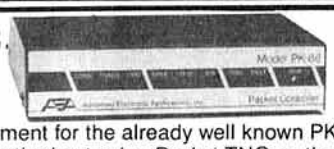
★ No further hardware of software to buy
★ Demo disc available
★ This is quite the best piece of amateur radio image transmission software we have ever seen. Has to be seen to be believed!
Only £99.95 including VAT plus £2.50 post and packing

PK-88



★ Replacement for the already well known PK-87
★ Currently the best value Packet TNC on the UK market
★ Compact size and attractive appearance
★ Host mode ★ Full front panel status display ★ 32K RAM
★ Superb documentation ★ Built in personal mailbox
★ The ideal second unit for existing PK-232 users who want a compatible product which they can instantly understand
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FAX-1

★ Demodulates Weather Facsimile, RTTY and Navtex
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★ Plugs into the extension speaker output of any SSB receiver and drives any Epson FX-80 or NEC P6 compatible printer
★ Built in timer ★ Fully automatic ★ All leads supplied
★ No computer knowledge required
Only £279.95 including VAT plus £4.00 post and packing

PRICE LIST

Prices include 12 months parts and labour warranty
We have recently moved to larger premises, so please note our new telephone number

Product Code	Description	Price (inc VAT)	P&P (UK)
PK-88	Budget Packet Radio TNC	£109.95	£2.50
PK-232	7 mode Intelligent Terminal Unit	£269.95	4.00
HR1	144 Mhz Handheld Antenna	£14.95	1.00
HR3	150 MHz Marine Handheld Antenna	£14.95	1.00
HR4	440 MHz Handheld Antenna	£14.95	1.00
ISOPOLE 144	2 Metre Base Station Vertical Antenna	£39.95	3.00
ISOPOLE 440	70 cms Base Station Vertical Antenna	£59.95	3.00
PC-PAKRATT	IBM-PC Software for the PK-232	£19.95	£2.50
PK-FAX	IBM-PC Facsimile Software for the PK-232	£19.95	£2.50
COMM-PAKRATT	Commodore 64/128 Software for the PK-232	£59.95	£1.50
COMM-FAX	Commodore 64/128 Fax software for PK-232	£59.95	£1.50
COMM-FAX/CT	As above, cartridge only	£39.00	£1.50
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PK-88/CBM	Commodore Software for the PK-87	£59.95	£1.50
PK-88/BBC	BBC Software for the PK-87	£26.95	£1.50
AMIGA-FAX	Grey scale Tx/Rx Fax software for AMIGA	£99.95	£2.50
FAX OPTION	Manual, Cable, ROM for PK-232	£49.95	£2.00
NEW FIRMWARE	Upgrade for PK-232	£15.00	£1.50
FAX-1	Weather Map/RTTY/Navtex Decoder	£279.95	£4.00
ANT-1	Active Antenna. 2 Outputs. 70 KHz 25MHz	£75.00	£3.50
FAX-1/N	As above, but with internal Navtex Receiver	£399.95	£5.00
ANT-1/N	Active Antenna for Navtex Reception	£69.00	£3.50
DCP-1	12v Printer, roll Holder, Bulkhead mtg, Plate	£229.95	£3.50
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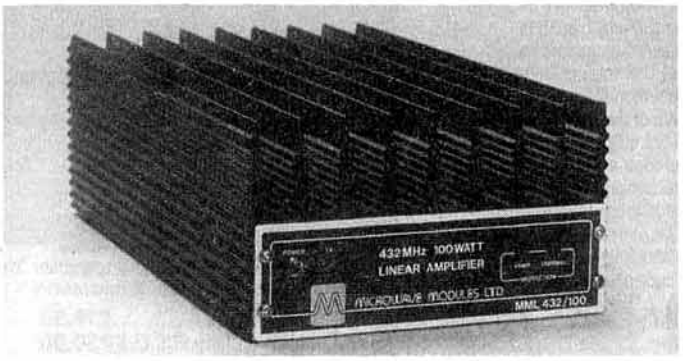

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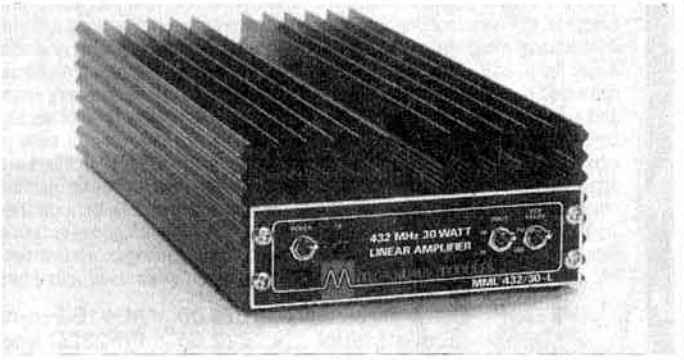

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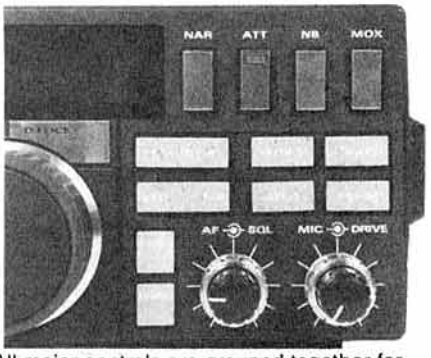

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Naturally, with FM the predominant mode on the VHF and UHF bands, the FT-736R includes all manner of convenient features for both FM simplex and repeater operation, like a discrminator center tuning meter, special narrow FM mode (to cut adjacent channel interference in crowded areas) and Automatic Repeater Shift when tuned to 2-meter repeater subbands.
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FT736R RRP £1450 C/W 2m & 70cms

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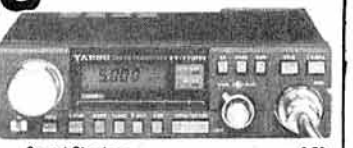

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Founded 1913 Incorporated 1926 Limited by guarantee Member society of the International Amateur Radio Union

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

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Membership application forms available from RSGB HQ

Project YEAR consultation

Youth into electronics via amateur radio, the RSGB's project YEAR, is regarded as one of the most important Projects undertaken by the Society in recent years.

A few members have questioned the need for Project YEAR and a licence which is intended to provide a means of enabling more people to enjoy the benefits of, and the spin-offs from, amateur radio. To those people, Council would point out that a diminished amateur fraternity will eventually result in reduced band allocations. This could occur either at national or international level. However, an increase in the popularity of amateur radio will do much to safeguard the best interests and future well-being of the hobby at a time when the hf spectrum and much of the spectrum below 3GHz is under pressure from a number of other services.

In practice, the demands for spectrum space by other services (eg, Broadcasting, Satellite, Mobile and Fixed) will probably result in a major ITU (International Telecommunications Union) re-allocation conference, in Geneva, in 1992/1993.

The RSGB Council urges all members to make their views known. Many of the RLOs (RSGB Liaison Officers) are touring the clubs in their area to discuss Project YEAR and to explain some of the detailed reasoning for the project which cannot easily be put over in print. If your club has not yet had a visit from your RLO do make contact; a full list was given on page 600 of the August issue of *Radio Communication*. Council urges all members to read the Project YEAR feature, discuss the project at local level with assistance from your RLO, and then complete the consultative questionnaire on page 679 of this issue.

Project YEAR is a new and exciting initiative which aims to benefit amateur radio. Every member can assist in some way and indeed the questionnaire asks just that question. The future of the hobby is in your hands so please act now.

David Evans, G3OUF

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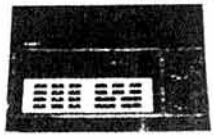

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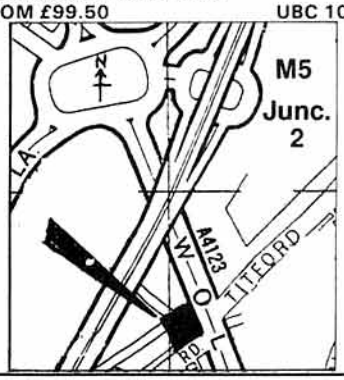

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NEWS

BULLETIN

Andrew Keeble, G1XYE
— "Young Amateur of the Year", 1988

Fifteen-year-old Andrew Keeble, G1XYE, was presented with the DTI-sponsored "Young Amateur of the Year Award" by His Royal Highness, The Duke of Edinburgh at the opening of the RSGB's 75th Anniversary Convention on Friday 15 July.

Andrew lives in Norwich and was nominated for his work within the Scout movement, RAYNET and - particularly - for his interest in the study of propagation and antennas. He was considered by a panel of judges to be the most suitable nominee for this special award. In addition to the prize of £250 and a day at the DTI Monitoring Station at Baldock, given by the Department of Trade & Industry, Andrew received a number of surprise awards: a one-week training course at the College of Marine Electronics, sponsored by the Mobile Radio Users' Association; an engraved presentation model of the RSGB's RC14 Beginners' Receiver, given by the Society; and a week in Vienna as the guest of the Austrian national society OVSV, given by its President, Dr Ron Eisenvagner, OE3REB. Also, the Head of the BBC's Engineering Section offered a meeting with Andrew to talk about the possibility of a career in engineering. All of which is a fine example of the faith which those organisations have in the "Young Amateur of the Year Award" and the Society's "Project Y.E.A.R" and provides an excellent launch pad for the future success of the project; a project which is vital to the growth of amateur radio and the future development of the UK electronics industry by introducing youth into electronics via amateur radio.

NEC REPORT - Part 1:

The Society's 75th anniversary Exhibition and Convention, at Birmingham's National Exhibition Centre, can only be described as a stunning success. Just under 7,500 attended and traders reported brisk business after a slow start - probably due to the public interest in the visit by His Royal Highness Prince Philip, Duke of Edinburgh.

GB2RS "live" broadcast.

In the best tradition of "outside broadcasting", the special GB2RS transmissions only just got on the air at literally the last minute! The plan was to use the transmitters at GB75AC, the special-event station which ran continuously throughout the Convention, for the broadcast; given that the transmitters were located about 600 yards away in the "Terrapin", a considerable amount of work had to take place in order to set up the necessary commentary position together with a feed of Prince Philip's speech from the Lucas Centre. Professional audio mixing gear (and a very professional engineer from Central Television, who knows who he is and is very warmly thanked for his efforts) was used to produce an audio feed which by devious means ended up at the "Terrapin".

(cont. p.662)

BRITANNIA RULES THE (AIR) WAVES:

An amateur radio first took place at 1815 GMT on Thursday 21 July. On that date the Plymouth Radio Club made direct contact with the Royal Yacht Britannia whilst operating the special event station GB400A as part of the Armada celebrations. The Royal Yacht used its international callsign to receive a greetings message sent by the club's Vice-President Paul, G3VCN as it approached Plymouth Hoe. Permission for this historic event was given by the DTI and the message sent was as follows;

> "On the occasion of the Armada Celebrations, the President and members of the Plymouth Radio Club send, with humble duty, loyal greetings to Her Majesty from their special radio station on Plymouth Hoe. They also wish to convey to His Royal Highness Prince Philip, The Duke of Edinburgh, as Patron of the Radio Society of Great Britain, sincere greetings from the assembled radio amateurs in this, the 75th Anniversary of the Society".

Sometime later, the following reply was received at GB400A;

> "The Queen and Duke of Edinburgh have asked me to send you their warmest thanks for your message of greeting and their congratulations on your 75th Anniversary" - signed Private Secretary to H.M. The Queen.

(cont from p.661 col.2)

Persuading amateur transmitters to transmit simultaneously on four separate bands - in this case 3.5, 7, 14 and 144 MHz - is not a trivial undertaking. Headquarters found this out the hard way at the time of the special twice-daily Shuttle news broadcasts some years ago. Rigs which by themselves are quite docile seem to produce all sorts of peculiar phenomena when in the presence of other rigs carrying the same programme material, as it were - the one common factor is that the intended "broadcast" immediately becomes totally unintelligible on one band and completely inaudible on another! The GB2RS broadcast was scheduled to begin at 1145 on the Friday morning, some 15 minutes before the Duke of Edinburgh arrived at the NEC. For various logistical reasons it was not possible to begin setting-up for the broadcast until about 8pm on the Thursday evening - and the broadcast crew immediately ran into a succession of technical problems which defied explanation or analysis. Two rigs could be made to work together with no problem, three at a pinch on low power but not four. By 3am on Friday morning, some eight hours before the broadcast, the position was no different - and to make matters worse the 3.5 MHz transmission, which was expected to be the most widely listened-to, was consistently plagued with massive hum and very chopped-up audio. In addition, the commentator had not yet written his script! It was decided mutually that a little sleep would probably work wonders and the team retired, to re-convene at about 8am.

Time marched on. By 10.15am the position still looked desperate, and it was thought at that stage that only 7 MHz could be transmitted. By 11.15am, with 30 minutes to go, the 3.5 MHz and 14 MHz transmitters had been tamed but 7 MHz seemed likely to be unusable! At 11.30am a squawk over the talkback announced that the 144 MHz FM transmission was now up and running, but there was still no 7 MHz and the 3.5 MHz transmitter was now showing distinct signs of misbehaving. At 11.44am the word was "80, 20 and 2 are OK and we may have 40 in a minute - get going!"

At 11.45 the station was on the air, and at about 11.50 a message saying that the 40 metre transmitter was up and running was passed to the commentator. For some reason never positively established, the transmitter would work on 7050 kHz but not on the advertised 7047.5 kHz! Frequent references to this had to be made during the broadcast, but from reports received it seems that many stations in the north of England and Scotland found the 7 MHz transmissions "romping in", as someone put it.

His Royal Highness, Prince Philip listening carefully before replying to the greetings message sent by the operators of GB75ER, located at Windsor Castle, Berks. Also in the photograph is David Gough, G6EFQ, (holding the mic) who designed the Lucas Centre display of old and new radio equipment.

(Photo ICOM UK)

The special GB2RS transmission came off the air at about 12.25pm as Prince Philip began his tour of the exhibition in the Lucas Centre. Here again, some frantic behind-the-scenes work had been taking place to make it possible for His Royal Highness to exchange a greetings message with the special-event station GB75ER at Windsor Castle. Initially it had again been planned to use one of the GB75AC transmitters for this exercise but in the very wee small hours of Friday morning it was conceded that what had been planned and painstakingly rehearsed was not now logistically possible. A transmitter was therefore set up behind the final exhibit in the Lucas Centre display and various contingencies rehearsed as well as they could be given the rather unpredictable nature of the exercise! Miscellaneous technical problems, the chief of which were how to arrange an audio feed from the appropriate microphone and how to get the royal RF into space, had begun to be tackled on the Friday morning and happily all went well.

Representatives of every national society in the world were invited to attend the event, and although not all were able to make it, many sent messages of congratulations. Next month, we'll be running a selection of some of the messages together with those from other organisations, as well as reporting on other aspects of the event.

RSGB OPEN DAYS - REPORT:

For the first time since the move to Potters Bar, RSGB Headquarters' doors were thrown open for 3-days between the NEC and the Data Symposium. The open days formed part of the 75th Anniversary Celebrations and were well attended by members and overseas visitors alike who were greeted with coffee and biscuits before being shown around the various departments, given a brief talk on how the Society obtained its present premises, a chance to operate the HQ station GB75HQ and a look at some of the gifts presented to the Society by other national societies to commemorate the 75th anniversary. To many it was an eye-opener to see exactly how many few members of staff there are to deal with the 1,000s of queries received every week. There was a good exchange of ideas and each visitor was given a certificate of the visit produced on the recently installed desk-top publishing system. When it came to closing up each day it was difficult to pries visitors away from the massive pile-ups generated by their operation of GB75HQ.

Special thanks to Eileen and Basil O'Brien, and Hilary Clayton-Smith for their help in the smooth running of the whole affair. A splendid time was had by all and we are seriously considering making the open days an annual event - though not so close to a major exhibition next time....please?

RSGB DATA SYMPOSIUM - REPORT:

The first RSGB Data Symposium was held on Friday and Saturday 22/23 July in the magnificent Speech Room of Harrow School. It was attended by some 125 people (and a dog called Dancer) each day.

The programme itself consisted of twenty-one lectures, all of which were listed in July's RadCom and Connect International, plus an impromptu talk from one of the five members of the Belgian Packet Working Group (no relation to the RSGB's PWG) who attended. The subjects ranged from signalling techniques used by British Rail to amateur satellite communication, from composing pictures using RTTY to packet radio networking and from basic digicoms (smoke signals onwards) to AMPRNET and high-speed modems. Each day's session ended with a lively and wide-ranging discussion, the first of which continued in the hotel bar well into the early hours of Saturday morning.

Thirteen countries in all five continents were represented

including Senegal, India, USA, Bermuda and New Zealand, and some of the most interesting talks were those describing packet radio networking in the USA, France, Belgium, Germany and the Republic of Ireland.

There isn't enough space here to describe each lecture in detail - though we do intend to make the papers available in the near future. In the meantime, the following highlights should help to convey the flavour of the event.

Virtually every speaker on packet radio argued that although the availability of Net/Rom made it a useful networking tool initially, it had led us up a blind alley and progress was being hampered by the need to be Net/Rom compatible. Projects described were James Miller's 9600-baud modem which was demonstrated throughout the symposium, 100 kbit/s link equipment (G3VPF), a low-cost bus-orientated network controller - the RMNC (DL8LE), FLEXNET software for levels 2, 3 and 4 on the RMNC (DL8LE), and the ARSENE satellite (F6ABJ).

All speakers on networking insisted that local, national and international coordination was essential and that user access and trunking frequencies must be separate. It was clear that the most obvious mistake to make was to site a user access node on a hilltop; such a site should be reserved for trunking with local nodes being much less well sited. The 430 MHz band was generally considered to be ideal for end-user access.

Among the constructive suggestions made were; to separate personal mail from bulletin traffic; to move towards the provision of services by groups, not individuals; to run duplex or semi-duplex trunk links wherever possible; to negotiate an experimenter's licence; to make more standards/avoid making too many standards; to move towards the delivery of mail overnight to the end-user's personal mailbox; to improve TNC front-panel displays and controls; to make TNCs RF-proof; and not to ignore IARU conferences in other regions since intercontinental cooperation is vital for a global network.

Aside from the high-tech stuff there were some laughs to be had: Ron Broadbent's much-heckled speech at the symposium dinner; John Coll's very nearly successful live demonstration of the data hidden in TV transmissions; Andy Witts describing a desperate solution to a long distance forwarding problem whereby two SysOps exchanged discs at a mutually convenient Motorway service area - the cleft stick has evidently not been totally superseded; W1BEL's wry summary of the history of packet radio..... "In the early days you couldn't have a QSO because we were waiting for enough activity to make a network, now there are so many people on packet that you still can't have a QSO because of congestion"; and the unbelievable description of the totally relaxed way in which packet repeater licensing is done in Ireland.

And have you heard the one about the Irish SysOp who is totally blind? Well, white-stick operator EI3EG runs his mailbox very successfully with the aid of a speech synthesiser on his BBC 'B' and he manages to coordinate EI packet activity as well! The aforementioned "Dancer" was his well-behaved guide-dog.

Thanks must go to 'Smudge' Lundegard, G3GJW and members of BARTG for helping to put together the lecture programme; to Ron Broadbent, G3AAJ, for organising the venue and hotel arrangements; and to David Gough, G6EFQ, for generally assisting in all areas and helping to coordinate the event at RSGB HQ.

All in all, the first RSGB Data Symposium was a lively mix of basics and high - tech, theory and practice, heavy and light. If you weren't there, why not? Ask anyone who went and they will tell you it was a great event in a great venue. The atmosphere was warm and friendly and most conducive to serious discussion. We hope that many more data enthusiasts will take the opportunity to participate in next year's data symposium and to help shape the future of amateur data communication in both the UK and in Region 1.

The second RSGB Data Symposium has been provisionally booked at Harrow School for Saturday and Sunday 8/9 July 1989 - see you there?

3rd AMSAT-UK COLLOQUIUM REPORT:

Almost 200 people attended this year's AMSAT-UK Colloquium at the University of Surrey over the weekend 29-31 July.

The lectures covered a wide range of topics to suit all aspects of satellite activity. Saturday morning dealt mainly with the 'What, How and Why? of satellites' whilst the afternoon concentrated on the more specific details of the UoSAT, OSCAR and Russian series of satellites.

The early part of Saturday evening was taken up by the AMSAT-UK AGM with a 'captive' audience of about 50 members. After dinner the social part of the event got under way with the traditional "Grand Junk Sale/Auction". Ron Broadbent, G3AAJ, was the auctioneer and despite lots of good humoured heckling, the sum of £700 was raised towards the cost of putting on the event.

Sunday dawned bright and clear with a few brave souls doing the rounds of the grounds BEFORE breakfast, which, as usual, was excellent and good value for money. The lectures started at 9.30am and went into the more technical aspects of UoSAT, Phase 3c, Phase 4, Microsats, Bramsats. Low orbiters, and some of the future plans discussed at the Engineering Meeting which was held on the Friday. During the Saturday, the organisers were informed that Leonid Labutin, UA3CR, had at last obtained permission to leave the USSR and lecture at the Colloquium. Hasty arrangements were made to collect him from Heathrow at 11am on Sunday morning. The afternoon was taken up with a full explanation of the recent Skitrek expedition by Canadian and Russian radio amateurs during the early part of this year. UA3CR was the radio operator for the expedition and he gave details of how the UoSAT (OSCAR 11) digital communications experiment was used, through Chris van de Berg the Russian Guide and Interpretor for the visit.

The Colloquium ended at 5pm on Sunday and the general consensus was that it had been the best to date. Certainly a lot of hard work was put in by the team at Surrey and the AMSAT-UK Committee to make it a success.

On 6 August, Ron Broadbent received the following message from Leonid Lebutin;

> "I was very impressed by the good organisation of this international AMSAT conference. Many people I saw in person, those I talked to only by radio before. A lot of new and very useful information I brought back in the USSR. Hope AMSAT-UA will be formed and we will be able to have more close contacts to AMSAT-UK. Again thank you very much for invitation and all you did. Best regards to all. Sincerely yours, Leonid UA3CR."

Next year's AMSAT-UK Colloquium has been booked for 28-30 July - see you there?

RAE MANUAL - AN APOLOGY

Owing to the changes in the C&G RAE syllabus and the amateur licence, production of the new 'RAE Manual' has been delayed. However, we hope to have it available for the Leicester Show.

BBC's "RECORD BREAKERS" CHALLENGE:

Can you send Morse at 35 words a minute or more? If you think you can, BBC Television's "Record Breakers" programme would like to hear from you. The programme is produced in conjunction with the Guinness Book of Records and sets out to break many of the long-standing records contained in the book live on-air, as well as illustrating some of the more off-beat records.

The present record for sending Morse, as given in the Guinness Book of Records, stands at 35 words per minute. It was set up by an American amateur radio operator, Harry Turner, on 9 November 1942 at Camp Crowder, Missouri whilst Demonstrating Morse telegraphy to General Ben Lear, then the US Sixth Army Commander. In offering the challenge to UK amateurs, the Guinness Editorial Office states;

> "There are no restraints regarding the mechanical nature of the key other than the fact that any spring loading or servo mechanism would not be permitted.
>
> "The nature of the text would essentially have to be, a) unfamiliar, b) in the first language of the operator, c) cursive material of an unfamiliar fictional type which would be selected by the invigilator paying regard to the presence or absence of letter groups and/or number groups.
>
> "As regards penalties, this is not a matter which has been settled by precedent in so far as the two existing speed records (sending and receiving) were set without any errors. However, it would seem that the penalty-per-error rate used in typewriting contests of a 10-word (50-letter) penalty per error would be too severe for Morse. We would suggest that a 5-word penalty would be more appropriate.
>
> "Any attempt to beat the highest speed recorded for hand-key transmitting should be sustained for 60 seconds but, of course, preferably longer, in so far as if anyone can maintain a very high transmitting speed for say 3 minutes or 5 minutes that would become a record which any challenger would have to meet."

So there you have it! If you think you can break the record, please contact either the News Bulletin at RSGB HQ or Steve Hocking, Assistant Producer, "Record Breakers", BBC, Television Centre, Wood Lane, London W12 7RJ.

Happy keying....!

RSGB STRAIGHT KEY DAY:

Following the success of last year's Straight Key Day, the RSGB's HF Committee has decided to run the event again this year on Saturday 8 October. For the benefit of newcomers to this event, it is essentially a one day CW activity using a manual straight or "pump handle" key and is certainly NOT a contest in the normal sense of the word. Participants should exchange the normal information (callsigns, reports etc) plus details of the key being used. It is suggested that contacts take place in the 80m band between 3515 and 3555 kHz from 0800-2100 GMT, which should give good propagation around the UK.

As with last year's event, an award will be made to the 'best fist' heard and any comments, photographs, details of keys used and their history, together with any nominations for 'best key', should be sent to G3VTT (QTHR).

PRESTEL/DataBox - THE FUTURE:

There is a rumour currently doing the rounds to the effect that the Society is abandoning its DataBox/PRESTEL facility. This seems to have come about as a result of an announcement put on to both services by the ex-Viewdata Editor after she had been given notice of forthcoming redundancy. The announcement was worded badly and did not reflect the true situation.

To set the record straight, the Society has NO intention of abandoning either the DataBox or PRESTEL viewdata services. Both of these services have been built up to form large databases in the course of the last two years and they provide an extremely important way of outputting information to members. What is true, unfortunately, is that the anticipated growth of usage has not in fact materialised whereas the costs have increased. Something had to give, and for the time being it has been decided to reduce the staff effort deployed in these areas - which is why the editor was made redundant. However, the Society will be maintaining these databases and they will still provide a good service to those members who utilise them.

The Society is well aware that many hundreds of members derive their information either from DataBox or PRESTEL. However, if the numbers who regularly use these services had increased, we would not have found it necessary to reduce the staff commitment. We should add that we suspect that one of the main causes of the lack of growth has been the recent increase in PRESTEL charges, which has resulted in many users cancelling their PRESTEL/Micronet accounts.

The Society needs to take a very close look at its databases and to streamline the editing procedure for some of the standard pages whilst keeping the news pages as up to date as possible. For the time being a skeleton service is being provided, but some items may not be right up to date. In addition, the DataBox has been subject to a number of "crashes" recently, so access may not be possible at all times. When the new editing procedure has been established, the Society will advertise the availability of the services again.

NEWS FROM WATERLOO BRIDGE HOUSE:

What with all the rush and clatter of getting the news together concerning the new licence, we musn't overlook a few other interesting bits of news from the DTI. First of all, we wrote to them earlier this year asking whether amateurs could pay their licence fees at a Post Office. It seemed a reasonable idea to us, but the DTI replied as follows:

> "....The method of payment for all types of licence fee is kept under regular review. When considering the introduction of any new facility we have to pay regard to any additional costs of administration involved because unless there is a volume increase in licences issued such costs under current charging policy can only feed through to the licence fee. In the case of the amateur radio licence we have been able to retain the fee at its present level for five years, no least through tight control of these administrative costs. Payment of licence fees across Post Office counters is a relatively expensive facility. Introduction of it for amateurs would in our view have only a marginal effect on the number of licence renewals (new licences could not be handled in this way). The inevitable result would be an increase in the licence fee of several pounds which I doubt that RSGB members would find acceptable".

Waterloo Bridge House has also, at our request, clarified the matter of how American licence classes compare with ours. The UK/USA reciprocal agreement (sounds like the 1947 Sigint treaty) is that American Conditional, General, Advanced and Extra Classes are equivalent to a UK Class A but there is no UK equivalent to the Technician or Novice classes.

NEWS & VIEWS

Talking Point

The New Amateur Licence — continued

Well, if the comments we've been hearing on the air are anything to go by, you've probably just about digested the story and feature on the new amateur radio licence in last month's Bulletin by now! Practically every other QSO we've heard on 3.5, 7 and 144 MHz in the past few weeks has been about the new licence. As we promised last month, we'll be discussing various topics in this area in subsequent Bulletins, starting this month. Incidentally, from one or two comments heard, it seems as though our point of departure in respect of the new licence isn't quite clear to a few members. Basically, we foresaw the rate at which amateurs were experimenting with new techniques - and for quite some time we've been acutely conscious that the existing licence was lamentably lacking in making provision for state-of-the-art experimentation. This is the main reason why we wanted to make some radical changes to it.

So first of all, here are some amplificatory thoughts on some of the things in the new licence.

Automatic operation of the station

Like a large number of other issues, this was a rather "grey area" in the old licence and a number of different types of operation were affected. Things like the use of memory keyers for normal or meteor-scatter operation, and the increasing number of situations in which a microcomputer is having a fair amount of say in what the station is doing - like packet, AMTOR, RTTY, data, fax and what-have-you - weren't really very well catered for in the old licence. Automatic control of the station is now explicitly included as a provision in the licence. To put it another way, there's now no problem in running a station in which a micro is doing 99% of the work whilst you're drinking your tea....

Unattended operation

We should consider this along with the item above. Leaving the station to get on with doing its thing by itself has been a key feature of many new modes, and of course it's largely bound up with the easy availability of hardware and software to provide flexible control systems of one sort or another. Here again, this wasn't covered by the old licence. We must say, however, that because of the much greater "duty cycle" that can result from unattended operation, it isn't really suited to bands which are already heavily occupied. For this reason we said in our discussions with the DTI that IN GENERAL TERMS (there are a couple of exceptions, but we'll have to cover unattended in much more detail later), unattended operation should be limited to bands above 30 MHz and that the only unattended operation permitted on 144 MHz will be data modes.

Unfortunately, and despite a lot of discussion and argument, the DTI has refused permission for this type of operation on a number of bands on which it would have been very appropriate and useful. We'll obviously be pursuing the matter further, since it is a fast-growing part of the hobby.

Data/packet

Packet radio touched on about seven million issues in the old licence - one of the obvious ones was the relaying of messages received from other amateurs by an unattended station under computer control, which was three for the price of one! Most of the awkward things raised by packet have now been resolved. Retransmission of messages from and to other amateur stations is not regarded as third-party traffic, so this deals with digipeating. Unattended operation is now permitted on 144 MHz, parts of 50 and 430 MHz, and in some microwave allocations. Whilst this represents a step in the right direction, the frequencies available are not all those we would have preferred. In particular, the permitted allocation in the 430 MHz band is somewhat bizarre - it collides head-on with both TV and satellite users. The Society cannot envisage any circumstance in which its use can be recommended since it would 'cut across' every IARU recommendation in the book and would cause considerable aggravation to other band users. We only heard about this as the presses were literally about to roll, and we'll obviously have to have a crack at getting it altered later - or even abolishing it completely since it can serve no possible useful purpose.

THIS MONTH:

We take a look at some of the implications of the new Amateur Licence which comes into effect on 1 January 1989

Mailboxes are treated separately insofar as they have been specifically excluded from the provision for amateur third-party message handling. This is due to the high duty cycle involved in mailbox operation, which - as discussed earlier - means they need co-ordinating. The good news is that the DTI has agreed that the RSGB will act as their agents in the issue of individual Notices of Variation, which permit mailbox operation using callsigns with a distinctive "GB7" prefix. The legal document has yet to be signed, sealed and delivered but it is likely to allow operation in the sub-band 50-51 MHz and the 144 MHz band with forwarding in the sub-band 1298-1300 MHz. This "licensing" procedure should be rapid and straightforward, and the Society already has more than sixty applications waiting in the wings. "Personal Mailboxes" (i.e. those which send and receive mail ONLY for the mailbox operator) do not constitute mailboxes as defined in the licence, so they are permitted.

Beacons

If you think about it, quite a lot of testing and experimental work carried out by amateurs ideally needs temporary low-power signal sources - which will be unattended

for some of the time. Also - especially on the microwave bands - it would be very useful to be able to put on a low-power beacon at short notice with a minimum of formality, to provide a signal for other amateurs in the locality. The existing DTI clearance procedures are (to put it mildly) too cumbersome to be able to respond to this need. This has now changed; the only constraints are that the RIS needs to be notified of occasions on which this type of operation is proposed and some simple procedures for closedown need to be agreed. On rare occasions there may be some restrictions on operation. Again, we will be reviewing the restrictions placed on some of the bands.

Direction finding

The new bits of the licence to do with DF were there because we needed to make provision for DF contests. Whilst this activity can in principle take place on any band, we particularly wanted 3.5 and 144 MHz to enable the UK to take part in IARU ARDF competitions, which have internationally agreed rules. The DTI was happy to allow this on 144 MHz but they could not permit it on 3.5, unfortunately - so we chose 28 MHz as the next best alternative. We do realise that this is far from ideal and we'll be following it up later: our status on 3.5 MHz is shared primary after all.

Remote control

A lot of input from members was concerned with the topic of remote control of station accessories. Certainly many aspects of station operation could benefit from "cordless" short-range remote control links - from mic to transceiver, rotator, preamp and so on. Since the equipment would also be very simple and inexpensive, it would also appeal to beginners to home construction.

We expected this facility to be available on all bands above 144 MHz, and we were somewhat surprised to find that the DTI had imposed restrictions on certain bands. Given the requirement that the signals are not audible outside the curtilage of the premises, why have any restrictions at all? Dunno, Brian. This is another area we'll have to have a second "go" at.

Identification

Some fairly major changes have been made to the requirements for identifying the station - basically all connected with contemporary practice and technology. The old licence was a shade demanding in requiring identifications of virtually every transmission, in a very restrictive range of modes. This caused problems in all sorts of situations - packet, MS, contests, you name it. Generally speaking, identification will only be required a) on initial (CQ) calls, b) at the start and end of each contact, c) when the frequency is changed, or d) every 15 mins during the contact.

It would be impractical to identify every contact in the "standard" modes (i.e. CW or telephony) since this would be a trifle incompatible with things like packet radio. However, the authorities need to be able to identify stations - and equally, other amateurs must be able to identify each other without needing special equipment so that they can share the bands without causing mutual interference. The compromise we've reached is that identification is allowed in any permitted mode for normal working - i.e. at the start and end of a contact or every 15 minutes - but to require identification less frequently - i.e. every 30 mins - in a "standard" mode. The 20 wpm CW speed limit has been abolished, which is good news for contest operators and will also reduce the time spent on idents in data modes. In theory there's no limit to speeds; however, the Society will draw up some guidelines to ensure that idents are still easily decodable.

Class B stations may now identify in CW - however, they must ensure that their CW is readable! One way to ensure this might be to use some form of automatic CW generator. Incidentally, whilst we're on this subject there's a minority of Class B stations who use CW on 144 MHz during auroral openings to work the DX or who use high-speed Morse for meteor-scatter working. General feeling is that this really ISN'T in the spirit of the agreement by which Class B licensees can use Morse for the purpose of on-air practice to help them pass the Morse test - and at least one we've heard doing high-speed MS can't manage to send his own callsign on a manual key without it sounding as though he has St Vitus' Dance. So please don't take part in serious CW DXing activities unless your CW is up to a reasonable standard.

Location

There's always been a certain amount of confusion about alternative premises and when to use /A, /P and when you have to notify the Chairman of British Telecom, the Chief Constable and the Procurator-Fiscal that you're proposing to go on the air from Trotters Bottom instead of Steeple Bumpstead. Basically, we've simplified this by scrapping some of it. The /A suffix will cease to exist (any offers for a special-event callsign to mourn its passing? who'll be the last UK "Stroke A" station on the air?) and it's been merged into /P. In essence, a station can be at five possible locations:

a) the Main Station Address (sign with normal callsign no location details need be given)
b) at a Temporary Location notified to the local RIS Manager (sign with normal callsign no location details need be given)
c) at a Temporary Location not so notified (sign /P and give location details)
d) Mobile (sign /M)
e) Maritime Mobile (sign /MM)

In other words, a lot of that old stuff about Temporary Premises and Alternative Premises has been taken away and shot. Also, there's no time limit on /P operation but remember that you need to give your location to an accuracy of at least 5 km by any of the methods given in Note (v)

Maritime mobile

If we had £1 for every letter we've received over the years on the subject of maritime mobile - usually of the form "why the *&%£&*" do I have to go through this rigmarole" - we'd all be driving round in Ferrari 328GTBs. Happily it's all changed, and almost all the facilities of the normal licence are now available anywhere in UK territorial waters and beyond. You still need to make arrangements with the owner, master etc, but from the licensing point of view an enormous amount of what Charles Dickens would have called Wiglomeration has been given the big E. This is a giant leap forward, which should open up all sorts of new facets for our hobby.

That's it for the licence this time. We have already received loads of letters raising all sorts of interesting points, and we'll make a start on dealing with some of them in next month's Bulletin.

Incidentally, if you were worried by the very last paragraph of the licence text (Note aa) concerning 10m equipment, DON'T PANIC! We have this in hand and all will be revealed as soon as possible.

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 help you. But above all, please let us know what success you had!

ARE YOU SITTING COMFORTABLY?:

Remember a couple of months ago we ran a photograph of the bench at Bosham Church which has an inscription to Gerald Marcuse, G2NM. At the time we asked if anyone knew the origin of the bench. Well, as many of you rushed to point out, the answer lies in the July and August 1962 issues of Radio Communication. Much as we'd love to, we don't have nearly enough time to sit mulling through back editions of RadCom so we'd temporarily forgotten that the answer was staring us in the face, so to speak! However, for the benefit of the newer members of the Society, here's a brief account of the history of the seat, sent in by Irene Marwood (formerly Marcuse).

> "Gerald Marcuse died in 1961 and the memorial seat, paid for by donations from RSGB and RAOTA (Radio Amateur Old Timers' Association) members, was presented to Bosham Parish Council at a ceremony on 21 July 1962 by John Claricoats, G6CL the Founder Secretary of RAOTA. The seat was made by Listers, an engineering firm in Dursley, Gloucestershire, where my son David then worked. The seat was maintained by myself and my present husband, Geoffrey Marwood, until December 1983 when we moved away from Tidewaters, Bosham, where G2NM carried out his later radio work. The responsibility for the seat was taken over, very kindly, by the Chichester & District ARC. It is taken away each winter for re-varnishing and is replaced in the spring. There is also a sundial in Bosham Churchyard in memory of G2NM which was presented by myself and my son David and a commemorative plaque on a house called 'Combe Dingle' in Caterham where G2NM carried out the first Empire Broadcasting and his important pioneering work. In 1983, I presented many early documents regarding G2NM's work, and much of his equipment to the Radio Section of the Amberley Chalk Pits Museum, near Arundel, Sussex. The museum has constructed a mock-up of Gerald's shack with the equipment (which is on permanent loan) and each year, in September, a special event is run in his honour using, with special permission, the callsign G2NM."

So there you have it. Thanks again to Irene and all the others who sent in information and photographs about the seat.

US FCC EXAMINATIONS:

Licensing examinations for US (FCC) licences will be held at the Belfry Hotel on Saturday 24 September at 2pm, prior to the HF Convention. Prospective candidates are requested to register in advance with G3XTT (QTHR).

RAIBC NEEDS LOCAL HELP:

During the past few months, RAIBC Zonal Coordinators have been writing to local clubs and representatives requesting help for members in their areas so that the club can cover any member's emergency situation throughout the UK, such as a fallen antenna etc. So far, very few clubs have responded to these requests and RAIBC would be very pleased if clubs could indicate as soon as possible whether they are able to give such emergency coverage.

RAF No.80 SIGNALS WING:

G3BRU has written asking if any members served in the RAF No.80 Signals Wing during the last war. If so, he would like to hear from you. Please write to:-

2 Corngrave Close
Marske-by-the-Sea
Cleveland TS11 7ER

RESURRECTION OF RAF RADIO CLUBS:

The West Yorkshire RAFARS Group has applied to resurrect the callsigns of the now-defunct radio clubs at RAF Yatesbury and RAF Compton Bassett. If you were a member or, preferably, an official of either club before they closed down in the 1960s, please contact Jack, G3FQH on 0484-862390.

WANT AN RAE LECTURER?:

Following the demise of ILEA, there is an RAE lecturer with many years of successes to his credit who is available and wishes to continue lecturing. Are there any clubs or groups in north London who need a lecturer for their RAE classes? If so, please contact Brian Silverman, G4CSB on 01-802 3378 for further details.

RAE LECTURER WANTED:

The Chesterton Community College, Gilbert Road, Cambridge, CB4 3NY is in urgent need of a tutor for its C&G RAE class which commences 19 September. This is a well known centre that has provided tuition for the RAE for many years. The present pay rate (pending award) is £20 per evening and if you feel you could help out, please contact Ridney Chambers, Senior Community Education Tutor, by writing to the college or telephoning 0223-358689.

RAE CLASSES?:

John Rivers, GOGCQ, wants to know if any readers know of an RAE course being held in the Bexley area. His father was enrolled in a course last year which was abandoned through lack of numbers. He has already passed the Morse test and is anxious to take the RAE as soon as possible. Can you help? If so, please contact John c/o Mountbatten School, BFPO 23.

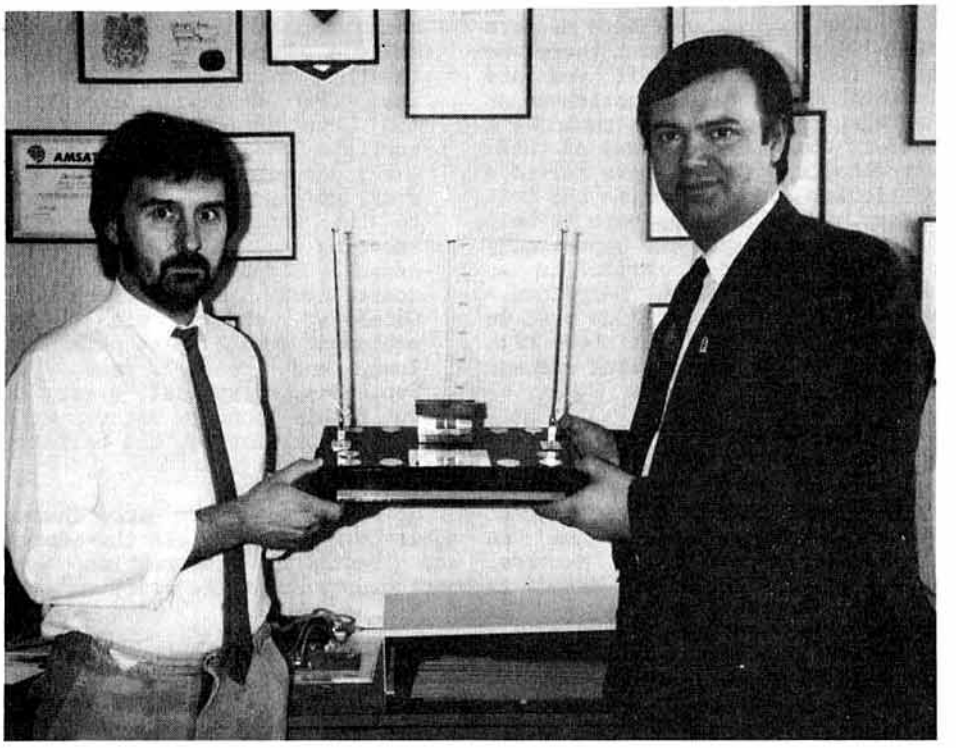
NB: See the list of RAE Classes in the 'Events Diary' pages.

ARTICLE WANTED:

Alan Croft, G8CJM is in urgent need of a copy of "A colour computer SSTV/FAX system for the Tandy TRS80 colour computer" by C Abrams and R Taggart. The article was published in the November and December 1984 issues of 73 magazine. If you can help, you can contact Alan on 0634 47280 or write to him QTHR. All expenses will be refunded.

Around the Groups

The deadline for the NOVEMBER issue is Wednesday 22 SEPTEMBER, but if you can send items in earlier it would be much appreciated.



The "Southgate Trophy" was originally owned by the now defuct 'Enfield Group of the RSGB' and presented as the "Editor's Trophy" annually from 1951 to 1960 to the member of the group deemed to have made (presumably) the best contribution to the group that year. The trophy eventually found its way into the hands of the Southgate ARC who restored it and presented it to the RSGB on the occasion of the Society's 75th Anniversary. It is now to be awarded to the winner of the 3-Watt section of the Low Power Field Day. The photograph shows Steve White, G3ZVW Chairman of Southgate ARC, presenting the trophy to David Evans, the Chief Executive of RSGB.

WAB NEWS:

Traditionally, July and August is a quiet period at the WAB awards "office" since many people take their holidays around that time. Not so this year; Awards Manager G4IAR reported that there was a mountain of claims waiting for him on his return from his own holiday. They included some notable firsts.

ZS6BBY became the first to claim the Overseas Introductory Award which is designed for stations outside Europe. To qualify, the station must work 25 different WAB areas in 10 British counties.

In the VHF scene, GOJHC became the first to obtain the Class II Counties Award for working 55 counties on 50 MHz SSB.

In the HF bands, the new "Acclaim" award (Activating Counties, Large squares, Areas and Islands Mobile), which is the ultimate award for those activating areas whilst mobile as opposed to portable, was claimed, for the first time, by G4WZA/M on 3.5 MHz CW. The starting date for the award was 1 January 1988 and since that time G4WZA/M has activated 40 large squares, 60 counties, 15 islands and 700 areas!

GMOBVG was the first to achieve 180, 190, 200 and 210 islands on 3.5 MHz SSB and GODVT was the first to achieve 50, 60 and 70 islands on 7 MHz SSB.

G5LP/M has also been very busy activating areas and has become the first to achieve 1250 areas activated on 3.5 MHz CW. He also receives Large Squares Class II awards for activating 40 100 km squares on 3.5 MHz CW and SSB.

There were several firsts in the Bookholders awards series - G1EUU for 1000 3rd series books (ie those with numbers above 4000) and G4VID for 100 3rd series books on 7 MHz SSB and for 1200 and 1300 3rd series books on all bands.

So where does all this activity take place? In the HF bands you should take a look around 3760 and 7060 kHz at almost any time of the day. In the VHF bands, try 144.430 MHz SSB on Sundays at 1030 and Fridays at 2030 local time from the south east of England, and 144.440 MHz on Mondays, Wednesdays and Fridays at 2000 local time from the East Midlands and Yorkshire.

Further information about WAB can be obtained from:-

Brian Morris, G4KSQ
22 Burdell Avenue
Sandhills Estate
Headington
Oxford OX3 8ED

GB50RAF:

The above callsign was allocated for RAFARS use during 1988, its 50th anniversary year. This month, the callsign will be active at the Lincoln Hamfest on Sunday 11 September. Although the main operation will take place on 3710 KHz +/- QRM on the Sunday, some operation will also take place in the 80m and 2m bands during set-up on Saturday 10 September. In order to reduce any possible interference to the 2m talk-in station, there will be no operation in the 2m band on the day of the Hamfest itself.

The RAFARS stand will be offering a free basic rig-test to all visitors at the Hamfest. It will also enable potential purchasers of equipment to check it out before parting with any cash. Further details from Ernie, G4NVD whose address is correct in the current callbook.

OLYMPICS SPECIAL STATIONS & AWARD:

There will be three special event stations active from 1 September to 5 October to mark the 24th Olympic Games held in Seoul, Korea this year.

6K24SO will be active from the Olympic Village, 6K88SO will be active from the Olympic Park and 6K88BYC will be active from the Yacht Centre in Busan.

In addition to the special event

activity, the Korean Amateur Radio League is offering the following awards in connection with the games;

Class A:

For working one special event station and at least one station from each of the five Korean call areas, HL1-HL5.

Class B:

For composing the word "SEOUL" from the last letter of the suffixes of five HL stations worked in addition to working one of the special event stations or any HL station with the figures "88" in the callsign.

Class C:

For composing the words "SEOUL OLYMPICS" from the last letter of the suffixes from any five of more DXCC countries including at least one HL callsign.

The awards will be available from 1 October 1988 to 5 October 1989 and can be obtained by sending 10 IRCs to:-

Korean Amateur Radio League
CPO Box 162
Seoul 100
Korea.

(TNX: IRTS Newsletter)

RAIBC NEWS:

The Radio Amateur Invalid & Blind Club is delighted to have been granted the callsigns GB1IBC and GB0IBC for its own use.

The first three nets to be using the callsign GB1IBC will be active on the RAIBC-recommended national net frequency of 145.350 MHz FM. These nets will be in the following locations on the following days and times;

London:	Friday, 2130 local G3OSS/G1FGY
Norfolk:	Thursday, 1930 local G5LW/G0JFT
Shrewsbury:	Tuesday, 1430 local G3VRI/G4XBI

Any RAIBC member or helper who wishes to run a local RAIBC VHF net should contact Angus McKenzie, G3OSS (QTHR). It is hoped that many new RAIBC nets will become active on 145.350 MHz around the country.

It is hoped that GB0IBC will be used frequently and any RAIBC members who wish to use the call for a special event station are asked to write to Angus direct and NOT to apply via RSGB HQ.

AMSAT NEWS:

AMSAT-UK and AMSAT-DL have issued the following statement with regard to OSCAR 13 Mode J uplink, Mode JL transponder abuse;

"As users of this new satellite will be aware, there is a section of the transponder which can be accessed from the 144 MHz portion of the 2m band. This section has not been given too much publicity in the UK since AMSAT-DL (the designers) have especially requested that it be used ONLY by Eastern Bloc countries which do not have the privileges most of us in the Western Bloc enjoy as regards 1296 MHz uplink. The 144 MHz approach enables our friends in the Eastern Bloc to with us in the west without undue hassle, via the space bands. That in itself should be a god reason for not degrading the name of AMSAT to the rest of the amateur radio population by abusing the 144 MHz section of the band which is used (in the UK at least) by mixed mode and other group operation.

"There is, however, a wider issue; that of complete and future cooperation between the USSR and the West in the launch of satellite for AMSAT worldwide. This may not be immediate, but plans are afoot on both sides of the 'curtain' to achieve this goal. Therefore we in AMSAT say, please refrain from the use of the 144 MHz uplink on this satellite.

"Obviously, there will be people who would like to put their point of view and to this end, AMSAT-UK and AMSAT-DL have set a date of 10 September 1988 for a review of the situation. You are therefore invited to WRITE with your input. It would also be of use to receive dates and times that YOU have been inconvenienced whilst using terrestrial operation on this section of the 2m band. Please do not send your input by packet, telephone or radio; letters only please and they must be signed and with your callsign added. Please state if you are an AMSAT member and keep your replies brief (50 words or less). Non-AMSAT radio amateurs' responses are very welcome but please do not reply on hearsay.

"By the above means, we hope to correct a situation to the benefit of the majority, which could have been avoided if IARU and national societies had given a response to AMSAT's request for input some 18 months ago - before the satellite was launched in June this year.

"Finally, to those radio amateurs who have been the subject of QRM by the few satellite users who have used this section of the band to date, we apologise on their behalf. However, on a check of callsigns used in the UK from our own reports, it is certain that 90% of those on this uplink are NOT AMSAT-UK members. To others we say, please respond to the spirit of amateur radio and help us correct a situation which has arisen and which can be corrected.

"Issued jointly by AMSAT-DL and AMSAT-UK, and signed Ronald J C Broadbent, G3AAJ."

ANNUAL QSO REUNION:

The annual QSO Reunion between members of RAOTA and the Dutch OTC will take place on Monday and Tuesday 3/4 October between 0830 GMT and lunchtime each day. Initial calls will take place on 3600 kHz SSB and 3550 kHz CW. If 40m is suitable, calls may also be made around 7070 kHz and 7025 kHz respectively.

Incidentally, membership of RAOTA, the Radio Amateur Old Timers' Association, is open to anyone who has had an interest in the field of amateur radio for 25 years or more. RAOTA publishes a regular magazine "OT News" and applications for membership should be sent to:-

Sylvia Havard, G4USN
1 Merricks Lane
Bewdley
DY12 2PA

...and the current membership fee is £4.00 per annum plus £2.00 initial joining fee.

MONSTER STATION AT LOCH NESS III:

Yet again the special event station GB2LNM (Loch Ness Monster) will be active over the weekend 24/26 September. Operation will be on or around the following frequencies, plus or minus QRM:-

3700 kHz
7065 kHz
14.140 MHz
14.240 MHz

...and in other bands depending on conditions.

The long-awaited "Nessie Appreciation Society" certificate from the Scottish Tourist Board should now be available and details will be given over the air during contacts with GB2LNM. Further information is available from Paddy, GM3MTH.

The Grafton Radio Society, based in north London, operated GB2HCC during 8-10 July from the grounds of Herstmonceux Castle in East Sussex. Many contacts were made in the HF and VHF bands and a lot of success was had from a quarter-wave wire vertical suspended from a kite. Next time they will be attempting a full-wave on top band! The photograph shows members of Grafton RS and some junior-Ops, just before de-rigging the station and one of the Royal Observatory telescopes can be seen clearly in the background.

JOTA COUNTDOWN:

Over the last few months we've been giving details of the things you need to do in preparation for this year's JOTA. The United Kingdom Jamboree On The Air Team has compiled a very useful "Calendar of Preparations for JOTA" designed to help Scout Leaders and radio amateurs plan for the event which will be held over the weekend 15/16 October. Copies of the calendar can be obtained by sending a large stamped addressed envelope to:-

UK JOTA Team
The Scout Association
Programme & Training Dept.
Gilwell Park
London E4 7QW

However, if you've not yet sent off for a copy, here's what to do during September.

Scouts:

a) Prepare an information sheet for each amateur involved giving useful Scouting information (eg size of Troop/Group/District, activities, camps, badges, fund-raising ideas and local information of interest).
b) Prepare large 6" x 10" cards showing the station callsign only as an 'aide memoire' for operators.
c) Obtain maps of your area, the UK, World etc.
d) Obtain or order the official JOTA badges for Scouts involved in Jota together with any stickers required. These can be obtained in person from Gilwell Scout Amateur Radio Group at Gilwell Park on Saturdays only or by post from Northampton Scout ARG, c/o 180 Beech Avenue, Abington, Northampton NN3 2JW.
e) Check and be satisfied with the insurance arrangements; DON'T assume that the radio amateurs will have arranged cover for their equipment and aerials which they will bring to your premises, or that your normal insurance will cover any loss/damage which they may sustain, or any liability which you or they may have towards Scouts and/or visitors (or even passers-by or the owners of the premises).
f) Plan catering arrangements for everyone involved in the event for several hours or more.

Amateurs:

a) Discuss aerial requirements etc, and the electrical power/catering arrangements with the Scout Group.
b) Send a large stamped addressed envelope to the Membership Services Dept at RSGB HQ, requesting a JOTA special event listing so that the Scouts can check off the stations you contact over the weekend.
c) Check and be satisfied with the insurance arrangements for equipment, aerials, liability etc. DON'T assume you're covered or that the Scouts have gone ahead with their own arrangements.

Next month we'll give you the final run-down and we hope that you and your local Scouts will have an enjoyable event this year. Don't forget, you can obtain copies of the pilot edition of the Society's new publication "DIY Radio", which is aimed at beginners to the hobby. Copies are available at £1.50 each, post paid. This charge is made to help cover the initial production costs of this pilot edition. If you would like a bulk supply for JOTA, please write to HQ for more details marking your envelope, "DIY Radio - JOTA".

VERULAM CLUB LECTURE:

The Verulam ARC is holding a special lecture on Tuesday 27 September. The lecture, entitled "How They Do It Over There", will be given by the well known DXer and contester, Paul Bittner, WOAIH, and will give an insight into amateur radio American-style. All this will take place at the RAF Association HQ, New Kent Road, St Albans starting at 7.30pm. Visitors will be made very welcome and further details can be obtained from Hilary, G4JKS on 0727-59318.

WELSH AMATEUR RADIO CONVENTION

Oakdale Community College,
Blackwood, Gwent.

SUNDAY 2 OCTOBER 1988
10am - 5pm

* Trade Exhibits * RSGB Stand *
* Convention station *
* Bring & Buy * Refreshments *

Official opening at 11am
by
Sir Richard Davies, KCVO, G2XM,
President of RSGB

LECTURE PROGRAMME

"HF Antennas and Feeder Systems"
by Louis Varney, G5RV/CX5RV
plus other features

Admission: £1.50 at the door
(includes £300 cash prizes draw)

Talk-in available from 9am on S22
Exit 28 off M4 Motorway

Details: GW3KYA tel: 0495-225825.

NEWS & VIEWS

Events Diary

Club News

In an attempt to reduce the number of pages previously used for Club News, we are using a more abbreviated format listing clubs alphabetically under counties and giving the date and subject of the meeting. As in GB2RS, natter nights and committee meetings are not listed. The full details of when and where clubs meet, the frequency of meetings, the contact person and telephone number will be published twice yearly, in the UK Callbook and Radio Communication. However, any changes to these details or details of any new clubs, will be included in the list below. 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 publicity officer.

Co ANTRIM:
* Ballymena Radio Club - 10, annual rally, Ballee High School.

AVON:
* Bath & DARC - 14, equipment sale; 28, "Radio Communications in Motor Sport".
* Bristol RSGB Group - 26, "Linear Accelarators - part 2" G8LGH.
* North Bristol ARC - 9, bring & buy sale; 16, BT video; 23, 20m activity; 30, 2m activity.
* Severnside TV Group - 18, stand at Bristol Rally.
* South Bristol ARC - 7, AGM; 14, Bristol Rally preparation; 18, Bristol Rally; 21, microwave portable on Dundry Hill; 28, microwave activity.
* Thornbury & DARC - 13, junk sale; 27, exhibition station planning.
* Weston-super-Mare ARS - 12, talk; 26, construction.

BEDFORDSHIRE:
* Bedford RC - 10, GB0SPC.
* Dunstable Downs RC - 2, Shuttleworth planning; 4, National Car-boot sale; 10, barbecue; 16, Wolfsburg video; 30, members' slides.
* Milton Keynes & DARS - 12, "Homebrew & Kit Construction" Ron G3NCC.
* Shefford & DARC - 1, Field Day planning; 8, "Model Engineering" Jim G4BHO; 15, mobile DF hunt; 29, "OSCAR 13" Peter G8AFN.

BORDERS:
* Border ARS - ***ADDRESS CHANGE FOR SECRETARY*** Mrs M Bottomley, GM1IRN, 1 Greenside Cottages, Ladykirk, Berwickshire.

BUCKINGHAMSHIRE:
* Burnham Beeches RC - 5, junk sale; 19, quiz v Maidenhead & DARS; 24/25, autumn DX picnic.

CAMBRIDGESHIRE:
* Cambridge & DARC - 2, contest briefing; 9, contest review & talk/demo; 16, "Equipment Built at Varian TVT Ltd" Ian G3KKD; 23, "Propagation" Ray G3LTP.

CLWYD:
* Conwy Valley ARC - ***NEW SECRETARY*** Norman GW4KGI tel: 0745-823674. Meets 7.30pm at the Edelweiss Hotel, Colwyn Bay. 8, talk by Brian GW3HGL.

CUMBRIA:
* South Lakeland ARS - 13, "WAB" John G0ALQ; 27, AGM.

DEVON:
* Exeter ARS - 12, "Digital Radio" G6FTV.
* Torbay ARS - 24, "Satellite Working" Ernie G3ABU.

DORSET:
* South Dorset RS - 6, "Suitcase Radio" Ted G3ETA.

EAST SUSSEX:
* Southdown ARS - 5, "QRP" G4BUE; 10/11 Radio Club de Normandie visit & GB2SAR.

ESSEX:
* Braintree & DARS - 5, construction; 19, "PMR & VHF Repeaters" Malcolm G3XVV.
* Loughton & DARS - 23, "Applying for Planning Permission for Amateur Antenna Installations" John G1DJI.
* Southend & DRS - 2, "Hospital Communication" Peter Salton; 9, "Clocks" Mr Massow; 16, "Getting Started with Direct Conversion Receivers" Chris G8LVK; 23, "Radio Controlled Model Yachts" Norman Hatfield; 30, night on the air/video.

Co.FERMANAGH:
* Lough Erne ARC - 21, AGM & meal.

GREATER LONDON:
* Acton, Brentford & Chiswick ARC - 20, demonstration of homemrew 2-band transceiver by G4HMC.
* Harrow ARS - ***NEW VENUE*** Harrow Arts Centre, Uxbridge Rd, Hatch End. 2, radio quiz; 9, activities; 16, junk sale; 23, activities; 30 video "Gliding" G1XWF.
* Southgate ARC - 8, demonstration by ICOM UK.
* Wimbledon & DARS - 9, surplus equipment sale; 30, "Facts & Fallacies About Learning Morse" G3ESH.

GREATER MANCHESTER:
* Eccles & DARS - 6, demonstration "Efficient Communication" G6ME1.
* South Manchester RC - 2, discussion; 9, "I See" Dave G0BJK; 16, "Active Filters" Andrew G0HAL; 23, surplus equipment sale; 30 discussion.
* Stockport RS - 14, "Japanese Morse" G3CSG; 28, surplus equipment sale.

HAMPSHIRE:
* Basingstoke ARC - 5, "Computer Design of Aerials" G3PCQ.
* Fareham & DARC - ***NEW SECRETARY*** Bob Reeves, G8VOI.
* Horndean & DARC - 1, Brains Trust.
* Three Counties ARC - 14, "Propagation" Ray G3LTP; 28, "The PC and the TNC" Bob G4ZEJ & Dave G1MAL.
* 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. 27, "Raynet".

HEREFORD & WORCESTER:
* Bromsgrove ARS - ***NEW SECRETARY*** G4OHJ tel: 0789-773286. 13, surplus equipment sale; 27, "St.Kilda, the Island on the Edge of the World" G4WBR.
* Bromsgrove & DARC - ***NEW VENUE*** The Grasshopper public house, Stoke Heath, South Bromsgrove at 8pm. 9, inter-club quiz.
* Kidderminster & DARC - 11, Wyre Forset half-marathon; 13, AGM; 27, video "Round the Shacks" G6YIS.
* Vale of Evesham RAC - 4, family event.
* Wythall RC - 8, RAE Classes commence; 13, construction; 20, lecture; 27, night on the air.

HERTFORDSHIRE:
* Cheshunt & DARC - 7, portable at Baas Hill; 21, "A History of Radio - part 2" Derek G0BTX.
* Stevenage & DARS - 6, HF night on the air.
* Welwyn-Hatfield ARC - 5, "World War 2 Radio".

HUMBERSIDE:
* Goole R&ES - 2, junk sale; 9, rig checking; 16, contest equipment checking; 23, AGM.

ISLE OF MAN:
* Isle of Man ARC - ***NEW*** meets 8pm at Howstrake Hotel, Harbour Road, Onchan, IoM. Details GD4GWO tel: 0624-22295.

ISLE OF WIGHT:
* Binstead ARS - 26, talk/demo "Computers".

KENT:
* East Kent RS - 1, visit to North Foreland Radio; 15, inter-club quiz v Dover & Thanet clubs.
* SE Kent (YMCA) ARC - 14, "Packet Radio"; 28, "The Work of the YMCA" Phil Cross.

LANCASHIRE:
* Bury RS - 13, "Satellite TV" G1IZD.
* Fylde ARS - 6, "Fuel Economy with Central Heating" G4PNI.
* Thornton Cleveleys ARS - 5, surplus equipment sale; 19, "Computer Frauds" Alan G6KOE.
* Wigan & DARC - ***NEW VENUE*** Tuesdays 8pm at Tippings Arms, Poolstock Lane, Wigan, tel: GODTY 0942-47416.
* Wyre ARS - 14, inter-club general knowledge quiz; 28, social.

LEICESTER:
* Leicester RS - 5, test equipment workshop/RF power measurements; 12, HF/VHF activity; 19, "The Last 75 Years of Leicester RS" Frank C4PDZ; 26, "Power Supplies" G4JDI & G3TQF.

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, G0CXT tel: 0744-813589.

NORFOLK:
* Norfolk ARC - ***NEW SECTRETARY*** Craig Joly G0BGD. 7, "Black Holes" Jim G3YLA & Pat G3IOR; 11, GB4ARN; 14, demo "Magnetic Loop Antennas" Malcolm G3PDH; 28, "TV DXing" Tony G4UAM.
* Yarmouth ARC - 1, "Satellites Update" G3IOR; 21/23, JOTA at Gorleston Church.

NORTH YORKSHIRE:
* York RC - 7, visit to BBC Radio York; 14, test your equipment; 21, Emley Moor TX; 28, Gillygate Electrics sale.

NOTTINGHAMSHIRE:
* Worksop ARS - 13, "Photography on the Cheap" Colin G4RUD; 27, "Simple Transceiver for Top Band" Peter G4BVV.

OXFORDSHIRE::
* Banbury ARS - ***NEW VENUE*** 2nd/4th Wednesdays 7.30pm at the Three Pigeons, Castle Street, Banbury. Details G1IIO tel: 0295-51774.
* Vale of White Horse ARS - 6, AGM.

POWYS:
* South Powys ARC - 6, "Conversion of ex-Computer PSUs"

SHROPSHIRE:
* Salop ARS - 1, pre-Telford Rally arrangements; 8, fox-hunt; 22, "Sunk Without Trace! - a Humourous Look at /MM" G6NUL; 29, HF special event station on air.
* Telford & DARS - 7, construction; 14, demo "Meteorsat Satellite TV"; 21, contest planning; 28, "TVI/EMC" G3UKV.

SOMERSET:
* Yeovil ARC - 8, "Netting" G3GC; 15, "Frequency Changing" G3MYM; 22, "Circular Polarisation" G3MYM.

SUFFOLK:
* Felixstowe & DARS - 6, quiz v Leiston RC at Leiston.

SURREY:
* Dorking & DARS - 13, "Power Supplies" G1PXH; 27, "USSR Amateur Radio" G3FXB.
* Kingston & DARS - 21, surplus equipment sale.
* Sutton & Cheam RS - 7, visit to BBC Bush House"; 16, "Antennas for Landed Gentlemen" Malcolm G4XMK.

WARWICKSHIRE:
* Mid-Warwickshire ARS - 14, DF hunt & barbecue; 27, open night & demonstrations.
* Rugby ATS - 6, 2m DF hunt; 13, planning for auction/barbecue; 20, 3rd Annual Aution & Barbecue.

WEST GLAMORGAN:
* Swansea ARS - 1, final preparation for SSB field day; 3, SSB FD at University Playing Fields, Upper Killay.

WEST MIDLANDS:
* Midlands ARS - 20, surplus equipment sale.
* South Birmingham RS - 7, "Operation Raleigh - part 2" John G4AAL.
* Wolverhampton ARS - 13, "My Visit to the USSR" John G4CVU; 20, night on the air; 27, club project.
* Wordsley RC - 1, discussion "Amateur TV"; 10, visit to Broadway Tower Country Park, Evesham; 15, fox-hunt; 29, treasure hunt.

WEST SUSSEX:
* Horsham ARC - 1, "Radio Navigation in World War 2" G0APZ.
* Mid-Sussex ARS - 15, talk.

WEST YORKSHIRE:
* Halifax & DARS - 20, AGM.
* Keighley ARS - 27, games evening.
* North Wakefield RC - 1, junk sale; 8, on air; 15, visit; 29, rally meeting.
* Northern Heights ARS - 7, starting new club project; 21, quiz v Keighley ARS with pie supper.
* Pontefract & DARS - 1, SSB FD finals: 15, on air 22, "QRP" Rev George Dobbs; 24, Raynet exercise "Went Valley Hike"; 29, on air.

Events Diary

* Spen Valley ARS - 8, opening night on the air; 22, "Raynet Operations" G4IOD.
* Todmorden & DARS - 5, "Antennas" G8PG.
* Wakefield & DRS - 6, practical evening; 13, debate on novice licence; 20, on air; 27, visit.

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

DEADLINE - Items for inclusion in the NOVEMBER issue must be sent to HQ marked "Club News - Bulletin", and be received by Wednesday 21 SEPTEMBER latest.

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'.

4 SEPTEMBER
* 21st Preston ARS Rally - University of Lancaster. Opens at 11am (10.30am for disabled visitors). All the usual trade stall, large bring & buy, club and repeater group stands, *RSGB bookstall*, bar, snack bar and restaurant. Lucky programme draw for colour TV. University is on the A6 road, 3 miles north of M6 junc 33. Free car parking. Details Godfrey G3DWQ on 0772-53810.
* Telford Radio Rally & Exhibition - Telford Racquet Centre. Opens at 11am (10.30am for disabled visitors) all the usual traders and attractions. Talk-in on S22 by GB75TRC. Details Martyn G3UKV tel: 0952-55416.
* 5th National Amateur Radio Car Boot Sale - The Shuttleworth Collection, Old Warden Aerodrome, nr Biggleswade, Beds. Plenty of pitches available. Talk-in on S22 by GB2SC. Fly-in is allowed but permission must be obtained first by telephoning Northill 288. Details Wendy, tel: 0582-451057.

10 SEPTEMBER
* Wight Wireless Rally - The Wireless Museum, Arreton Manor, Isle of Wight. Opens at 1pm, bring & buy surplus sale, cafeteria, Wireless Museum open, attractive gardens. Arreton Manor is just off the main A3056 about half way between Newport & Sandown and is well signposted from Arreton village, talk-in on S22 by G3IOW and via GB3IW. GB3WM on the air on 3700 kHz. Details G3KPO, tel: 0983-67665.

11 SEPTEMBER
* Lincoln Hamfest '88 - Lincolnshire Showground, 4 miles N of Lincoln on A15. Opens at 10.30am, all the usual trade stands, large bring & buy, *RSGB stand*, RAFARS stand with equipment check facility, real ale bar, refreshments inside and outside hall, many outdoor/indoor attractions for the whole family, caravans welcome by arrangement. Lucky programme draw, raffle. Talk-in on S22 by West Lincs Raynet. Details John G8VGF, tel: 0522-25760.
* Vange ARS Rally - Nicholas School, Leinster Road, Basildon. Opens 10am, usual traders and attractions. Talk-in by GB4VMR. Details Alan G4OJN, tel: 0277-624386.

17 SEPTEMBER
* Scottish Amateur Radio Convention - Aberdeen Exhibition & Conference Centre, Bridge of Don, Aberdeen. Potentially Scotland's largest amateur radio convention to date. NO CHARGE FOR STAND SPACE, come along and set up you own stall on trestle tables provided as NO CAR BOOT SALE ALLOWED. All the usual traders and attractions, close to shopping and resort facilities. Free parking for 10,000 cars. All catering, bar, and stands under one roof. Dinner available in the evening. Details Graham GM8FFX, tel: 0224-630526.

18 SEPTEMBER
* Bristol Radio Rally - Brunel's Great Train Shed, Temple Meads Station, Bristol. Large trade area, ample free parking. Details Dave G4WUB, tel: 0272-839855.
* Peterborough E&RS Rally - Wirrina Sports Stadium, Bishops Road, Peterborough. Trade stands, bring & buy, bar, cafeteria. Talk-in on S22, ample free parking. Details Fred G4NOG, tel: 0733-77032.

25 SEPTEMBER
* RSGB HF CONVENTION - Belfry Hotel, nr Oxford. Full details on page 705.
* Harlow Mobile Rally - Harlow Sports Centre. Details G4KVR tel: 0279-22365 (daytime)

2 OCTOBER
* Great Lumley AR & ES Rally - Community Centre, Great Lumley, Chester-le-Street, Co.Durham. Opens at 11 with earlier access for disabled. Usual trade stands and attractions, talk-in on S22. Details John Kearney, G1OKA tel: 091-388 6000 (home) or 091-477 4522 (office).
* 4th North Wakefield RC Rally - Outwood Grange School, Potovens Lane, Outwood. Details Steve, G4RCH (QTHR).
* Welsh Amateur Radio Convention - Oakdale Community College, Blackwood, Gwent. Details B.Davies GW3KYA, tel: 0495-225825 or see advertisement in News Bulletin pages.

9 OCTOBER
* Midlands VHF Convention - *CHANGE OF DATE* Details Peter G3UBX.
* Armagh Rally - Drumsill House Hotel, Armagh. Details GI8RNX.

16 OCTOBER
* Elhoex '88 - Floral Hall, Hornsea, Yorks. Opens 11am, usual traders, bring & buy, demonstrations, local club stands, refreshments & bar. Close to sea-front, Potteries and Mere so good for the whole family. Ample parking and talk-in on S22 by G4EKT. Details G3TLI tel: 0964-532588.

28/29 OCTOBER
* Leicester Amateur Radio Show - Granby Halls, Leicester. Usual large trade show and bring & buy stall, *RSGB Stand*, good refreshment and bar facilities. Details Frank tel: 0533-553293 daytime.

30 OCTOBER
* Carmarthen ARS Exhibition & Rally - Leisure Centre, Johnstown, Carmarthen. Opens 10.30am, usual trade stands, bring & buy, cafeteria, bar, swimming pool. Talk-in on S22. Details GW3GUE, tel: 026 783 460.

5 NOVEMBER
* 8th North Devon Radio Rally - Bradworthy Hall, near Holsworthy. Opens 10.30am, bring & buy stall, talk-in on S22. Details G8MXI (QTHR).

5/6 NOVEMBER
* North Wales Radio Rally - Canolfan Abercony Centre, Llandudno. Trade stands and other attractions. Details Tony Wilkinson GW4PVU, 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 GB0WKS. 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 G1IOO, tel: 0204-24104, evenings.

20 NOVEMBER
* Bridgend & DARC Rally - Bridgend Recreation Centre, Angel Street, Bridgend, Mid-Glamorgan. Opens at 11am (early entry at 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 GW6XCG, tel: 0656-724041.

27 NOVEMBER
* Verulam ARC Christmas Rally - St.Albans City Hall. Details G4JKS tel: St.Albans 59318. Trade - Watford 52959.

IN BRIEF - More details later.

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

1989 RALLIES

2 JANUARY
* Oldham Mobile Rally - Queen Elizabeth Hall, Civic Centre, Oldham. Details Kathy G4ZEP tel: 061-624 7354.

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

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

12 MARCH
* Trafford Rally - *NEW VENUE* The G-MEX Centre, Manchester. Details Graham G1IJK tel: 061-748 9804.
* Pontefract & DARS 9th Annual Components Fair - Details Colin G0AAO tel: 0977-43101.

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 G3COO.

28 MAY
* 6th Anglo-Scottish Rally - Tait Hall, Kelso. Details Bruce, GM4UIB.

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

11 JUNE
* Elvaston Castle Mobile Rally - Elvaston Country Park near Derby. Details John G4PZY tel; 0332-767994. Trade Peter G3WFU tel: 0332-700265 evenings.

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

8/9 JULY (PROVISIONAL)
* 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.

OTHER EVENTS

20 SEPTEMBER:
* RUGBY ATS AMATEUR RADIO AUCTION & BARBECUE - The Cricket Pavilion, "B" Building Entrance, BTI Radio Station, A5 trunk road, Hillmorton, Rugby. Starts 7.30pm, admission 20p, 10% (£10 max) commission on all sales, large free car park. Details Kevin, G8TWH.

9 OCTOBER
* COMPUTERCATIONS '88 - 4th annual computer/ham radio exhibition at Hillhead campsite, Dartmouth Road, Brixham, Devon. Opens at 10am, amateur radio and computer trade stands, bring & buy, car boot sale (weather permitting), raffle, cafeteria, bar, ample carparking, overnight camping, special event station GB4CPU. Talk-in on S22 by G4SSD. Details P West tel: 0803-522216.

10 DECEMBER
* RSGB ANNUAL GENERAL MEETING - University of Manchester Institute of Science & Technology.

GB Calls

The list below shows ALL the special event stations licensed for operation during June and early July (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.

PLEASE NOTE: This month we have been forced to abbreviate the GB calls information to date, callsign and location due to a shortage of space.

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* *
* ALL "GB75" PREFIX CALLSIGNS *
* VALID FOR RSGB 75 AWARD *
* *
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THROUGHOUT 1988:
GB75RS - 75 (ANNIVERSARY) RADIO SOCIETY (GB): RSGB HQ, Lambda House, Potters Bar.

1 SEPTEMBER
GB0CDE - Fort Purbrook.
GB0CDG - Grid: SZ 587 989
GB0CDN - Grid: SZ 295 849
GB0TVS - Boatside Farm, Powys.
GB2DDP - Grid: SE 235 077
GB4MRC - Macclesfield
GB4RPS - Rugeley Power Stn.
GB5HC -Horsham, W.Sussex.
GB5ORAF - Hednesford, Staffs.
GB6BC - Belvoir Castle, Grantham.
GB75ATC -ATC HQ, Warley, W.Mids.
GB75ETS - Grid: TQ 325 963
GB75EWR - Kent.
GB75FSK - Cornwall.
GB75JST - Portsdown Hill.
GB75MES - Madley, Herefordshire.
GB75SFG - Grid: TQ 325 963
GB75WD - Yeovil, Somerset.
GB8RRA - Lancs.

NEWS & VIEWS

Events Diary

2 SEPTEMBER
GB5OHC - Horsham, W.Sussex.
GB75QRS - Quainton, Bucks.

3 SEPTEMBER
GB0INF - Sheffield.
GB0WEM - Wem, Shropshire.
GB1CDN - Needles Battery.
GB1WFS - Wellow, Avon.
GB2ALF - Cheshire.
GB2BTF - Grid: SK 599 810
GB2CSC - Essex.
GB2HAF - Cardiff.
GB4RAF - York.
GB4SC - Old Warden, Beds.
GB75DDJ - Derbyshire.
GB75NAR - Grid: SU 938 745
GB75RFT - Margam, W.Glamorgan.
GB8NDS - Northampton.

4 SEPTEMBER
GB0CDX - Grid: SZ 339 879
GB0INF - Grid: SK 371 907
GB2WVR - New Arthill, Strathclyde.
GB75RHS - Rhondda, Glamorgan.

5 SEPTEMBER
GB5OS - Old Swinford, W.Mids.
GB75WFX - Northampton.
GB8NS - Neen Savage.

8 SEPTEMBER
GB0DAN - Grid: TQ 473 749
GB1CG - Grid: SJ 595 692
GB2CAT - Wilmslow, Cheshire.
GB75IVR - Itchen Valley, Hants.

9 SEPTEMBER
GB0CDS - Grid: SU 628 069
GB2SAR - Hailsham, E.Sussex.
GB4BN - Chalfont St.Peter, Bucks.
GB4RR - Cheshire.
GB6RAF - Leicester. Grid: SP69
GB75LSM - Suffolk.

10 SEPTEMBER
GB0DDM - Chichester, W.Sussex.
GB0DPP - Llangunnor, Dyfed.
GB0SPP - Buckingham, Bucks.
GB2CAF - Gloucester.
GB2POU - N.Ireland.
GB2WMF - Winscombe, Avon.
GB4ARN - Norfolk Showground, Norwich.
GB5ORAF - Lincolnshire Showground, Lincoln.
GB75HFV - Stafford.
GB75SIR - Tewkesbury.
GB75WB - W.Burton Power Stn, nr Retford.

11 SEPTEMBER
GB0CDJ - Round Tower, Hants.
GB0CDO - Southsea Castle, Hants.
GB0CDQ - Grid: SZ 631 993
GB2BOB - RAF Finningley, S.Yorks.
GB2CSA - St.Aldwyns, Gloucs.
GB75WHC - Stanborough Lakes, Herts.

12 SEPTEMBER
GB1RUT - Twickenham.

13 SEPTEMBER
GB75USA - Harrogate, N.YORKS.

15 SEPTEMBER
GB2CDU - Grid: SZ 627 588
GB6CDW - Fort Wallington, Hants.

16 SEPTEMBER
GB0VSA - Green Park Centre, Bucks.
GB1RLD - Derby.
GB2RAF - Doncaster, S.Yorks.
GB5OO - Paisley.
GB5ORAF - Doncaster, S.Yorks.
GB75IAK - Roche Valley, Showground, Lancs.
GB75SGC - Grid: SW 725 433
GB8AVS - Aston Clinton, Bucks.

17 SEPTEMBER
GB2NM - Chalk Pits Museum, Arundel, W.Sussex.
GB2RDH - Grid: TF 678 421
GB2SRM - Salisbury, Wilts.
GB4NSY/GB8NSY - New Scotland Yard, London.
GB5XX - Daventry.
GB75BAE - Hatfield, Herts.
GB75BVH - Bodham, Holt, Norfolk.
GB75SAM - Gwent.
GB75YYY - York.

18 SEPTEMBER
GB2BRR - Bristol, Avon.

19 SEPTEMBER
GB0TCP - Neath, W. Glamorgan.

20 SEPTEMBER
GB2LMO - Bradford.
GB2RAF - RAF St.Athan, S.Glamorgan.
GB75RXY - Barrow-in-Furness, Cumbria.
GB75UCS - Sigleton, W.Glamorgan.

22 SEPTEMBER
GB4JSD - HMS Daedalus, Hants.

23 SEPTEMBER
GB0FBM - Wooton Bassett, Swindon, Wilts.
GB2LNM - Drumnadrochit, Loch Ness.
GB75HR - London E4.
GB8CSR - RF Burne's OTH, Shropshire.

24 SEPTEMBER
GB2IVS - Leicester.
GB5CN - Bedford.
GB5ORAF - Abingdon, Oxon.
GB75CVF - Cowbridge, Wales.

25 SEPTEMBER
GB5ORAF - Belfry Hotel, Oxford.

26 SEPTEMBER
GB5ORAF - RAF Carlisle, Cumbria.

27 SEPTEMBER
GB0DRM - Darlington, Co.Durham.
GB2LNM - Aidrie.

28 SEPTEMBER
GB4RRS - Bolton, Lancs.

29 SEPTEMBER
GB0JST - Portsdown Hill, Hants.

30 SEPTEMBER
GB2UVS - Belfast, N.Ireland.
GB75MVS - Bispham Hall, Lancs.
GB75YSC - Youlbury, Oxford.

1 OCTOBER
GB0CDE - Fort Purbrook, Hants.
GB0CDN - Grid: SZ 295 849
GB0DOG - Glencraig, Ayrshire.
GB0EWC - East Wickham.
GB1FCB - Walsall, W.Mids.
GB2BVS - Grid: SO 982 711
GB2MAR - Portchester, Hants.
GB4CPU - Hill Head, Devon.
GB4MS - Macclesfield.
GB4XXX - DXpedition, N.Wales.
GB75CSR - London SW1.
GB75FSW/GB75WFS - Stratford-upon-Avon.
GB75OLD - Oldbury Power Stn, Bristol.
GB8CRJ - Coventry.
GB8MWS - Macclesfield.
GB8RRS - Bolton, Lancs.

2 OCTOBER
GB0CDW - Fort Widley.
GB2BUS - Bradford, W.Yorks.
GB2NVS - Norwich.
GB4EKG - Old Warden, Beds.
GB8MC - Mayfield, Macclesfield.

PLEASE NOTE: If you would like a copy of the JOTA Special Event Stations list for next month's Jamboree On The Air, please send a large A4 stamped addressed envelope to the Membership Services Deptartment at RSGB HQ, marking the envelope "JOTA List".

RAE & CW Courses

BANGOR (CoDOWN)
* Bangor Technical College, Castle Park Road, Bangor. Mondays 7.30pm RAE Theory; Wednesdays 7.30pm RAE Operating Practice + CW Class. Starting September. Details Jon Smyth tel: 0247-271254 ext 217.

BARKING (ESSEX)
* Barking Radio & Electronics Society. Mondays 7.30pm RAE; Tuesdays 7.30pm CW Class. Starting September. Details Paul G4ULK tel: 01-553 1172.
* Barking College of Technology, Dagenham Road, Romford RM7 0XU. Thursdays 6.30pm RAE Theory. Starting 22 September. Enrolment 12/13/14 September 6pm-8pm or on first few evenings of course. Details Dept of Technology tel: Romford 766841.

BRISTOL (AVON)
* Backwell School. RAE commences 6 September; CW classes commence 8 September. Details Nailsea FE Centre tel: Nailsea 853856.
* Brunel Technical College, Ashley Down, Bristol. Mondays RAE Theory; Tuesdays CW Class; Thursdays RAE Practical. Enrolment 6/7 September, other dates to suit. Details Dept of Aerospace & Communications Engineering tel: 0272-41241 ext 2164.
* West Bristol Adult Education Area, Stoke Lodge, Shirehampton Road, Stoke Bishop, Bristol. Mondays 7pm CW Class; Wednesdays 7pm RAE. Starting 26 September. Details tel: 0272-683112.

BRIXTON (Gtr. LONDON)
* Brixton College, Ferndale Road, London SW4. Wednesdays 6.30pm. Starting w/c 12 September. Enrolment from 5 September. Details tel: 01-737 2323. External RAE candidates welcome.

CAMBERLEY (SURREY)
* Surrey Heath Adult Education Institute, Adult Education Centre, France Hill Drive, Camberley. Tuesdays RAE. Starting 27 September. Details tel: Camberley 20145/6.

CHINGFORD (LONDON E4)
* Friday Hill House, Simmons Lane, Chingford. Wednesdays 7.30pm RAE. Starting 21 September. Details tel: 01-529 3380.
* Friday Hill House, Simmons Lane, Chingford. Mondays 7.30pm CW Class. Starting 19 September. Details Tom Langley G4PSY tel: 0992-15168.

CLACTON (ESSEX)
* Clacton Adult Education & Youth Centre, Green Lodge, 180 Old Road, Clacton-on-Sea. RAE enrolment from 12 September, tutor available 14 September for questions. Details tel: Clacton-on-Sea 424151.

COLLINDALE (LONDON NW9)
* Hendon College, Corner Mead, Graham Park, Colindale, London NW9 5RA. Tuesdays 7.30pm RAE. Details tel: 01-200 8300. Also wide range of full & part-time electronics courses.

FAREHAM (HANTS)
* Fareham Adult Education Centre. Mondays 7pm Morse Workshop. Starting 19 September. Thursdays 7pm short revision for December RAE. Starting 15 September. Details G3CCB tel: Fareham 288139 or the Centre tel: Fareham 280709.

GUILDFORD (SURREY)
* Guildford College of Technology, Stoke Park, Guildford, Surrey GU1 1EZ. Mondays 6.30pm RAE. Starts 12 September. Enrolment 5/6 September 2pm-4pm and 6pm-8pm. Details Brian Purse tel: 0483-31251.

HARWELL (OXON)
* Education & Training Centre, Harwell Laboratory. Mondays 7.30pm RAE, starting September. Details Colin Desborough G3NNG tel: 0367-20006.

HARWICH (ESSEX)
* Harwich Centre, Adult & Youth Education, Main Road, Dovercourt, Essex. Enrolment 10/12/13/14 September, tutor available for questions 10 September. Details el: Harwich 2467.

HECKMONDWIKE (YORKS)
* Heckmondwike Grammar School. Mondays 7pm RAE. Starting 12 September. Details G3TEE tel: Leeds 554190.

KIDDERMINSTER (WORCS)
* Kidderminster College, Hoo Road, Kidderminster. Mondays 7pm CW classes, starting 13 September; Wednesdays 7pm RAE, starting 14 September. Enrolment 5/6/7 September 2pm-8pm. Details D Oakley GODAA at college tel: Kidderminster 820811.

LINCOLN (LINCS)
* North Lincoln College, Lincoln Centre, Cathedral Street, Lincoln LN2 5HQ. RAE & CW classes commencing September. Details Mr Richard Merriman, G3SIP, Microwave Development Tutor, tel: 0522-510530 ext 2550.

LIVERPOOL (MERSEYSIDE)
* Liverpool & DARS, Churchill Conservative Club, Church Road, Wavertree, Liverpool 15. Tuesdays 7pm RAE, starting 13 September. Details tutor Gordon G3DVW tel: 051-727 1685.
* Sandown College, Sandown Road, Liverpool L15 4JB. Tuesdays & Thursdays 6.30pm RAE & CW classes. Starting 13 September. Details Mr J C Loughlin, G4DKO tel: 051-733 7211 ext 333.

LOUGHBOROUGH (LEICS)
* Loughborough College, Radmoor, Loughborough, Leics LE11 3BT. Tuesdays 6pm CW classes, 7pm RAE theory Starting 13 September. Details tel: 0509-215831.

MANCHESTER
* Pendlebury High School, Cromwell Road, Swinton. Mondays 7.30pm RAE; Thursdays 7.30pm CW classes. Starting late September. Details Swinton Adult Education Centre tel: 061-794 5798.

ORPINGTON (KENT)
* Ramsden Girls School, Tintagel Road, Orpington, Kent. Thursdays 7.30pm RAE. Starting 22 September minimum of 12 required. Enrolment Bromley Adult Education Service, Aylesbury Road, Bromley or on first night. Details tel: 01-464 5745 or tutor Alan Betts G0HIQ tel: 0689-31123.

PADDINGTON (LONDON W2)
* Paddington College, Paddington Green, London W2 1NB. Tuesdays and Thursdays 6.30pm RAE, starting 13 September. Enrolment w/c 5 September 1pm-4pm and 6pm to 8pm. May be only ILEA-sponsored RAE course, good numbers

Events Diary

required if this course is to survive! Details tel: 01-402 6221 or David Peace G4KKM tel: 01-892 7585.

RUGELEY (STAFFS)

* Rugeley Adult Education Centre, Taylors Lne, Rugeley, Staffs. Thursdays 7pm RAE, starting 15 September. Possibility of CW classes if minimum of 12 can be obtained. Details tutor John Teece, G4DBR tel: 08894-2912.

STOCKPORT (CHESHIRE)

* Avondale Evening Centre, Heathbank Road, Cheadle Heath, Stockport SK3 0UP. Mondays 7.15pm CW classes; Tuesdays 7.15pm RAE. Starting September. Enrolment w/c 19 September, tutor available for queries. Details tel: 061-477 2382 or Rik Whittaker tel: 061-427 4730.
* Reddish Vale Evening Centre, Reddish Vale Road, Stockport SK5 7HD. Mondays 7pm RAE, option to sit/resit in December; Thursdays 7pm CW classes. Starting end September. Enrolment 19/20/22 September 7pm-9pm. Details tutor Dave Wood G4UJD tel: 061-480 9157.

WATFORD (HERTS)

* Watford College, Dept of Engineering & Science, Greatham Road OR Water Lane, Watford. RAE course. Enrolment 12/13 September 2pm-4.30pm and 6pm-8pm at Hempstead Road, Watford. Details tel: 0923-57614 or 57611.

WELWYN GARDEN CITY (HERTS)

* De Havilland College, The Campus, Welwyn Garden City, Herts AL8 6AH. Thursdays 6.30pm RAE, starting 15 September. Enrolment w/c 5 September or on first night. Details [[[[tel: Welwyn Garden City 326318.

WYTHALL (WORCS)

* Wythall Radio Club, Wythall Park Community Centre, Silver Street, Wythall. Tuesdays 8.30pm CW classes; Thursdays 8.30pm RAE, starting 8 September. Details Chris Pettitt G0EYO tel: 021-430 7267.

PLEASE REMEMBER

Radio Amateurs Examination and Morse Classes may be available at your local club or college. Your RLO may have more details.

COUNCIL ELECTION FOR 1989

The Society's Articles of Association require that members who are entitled to vote to be notified of those Council members who retire at the end of each year. The Council members who retire on 31 December 1988 are:-

ORDINARY MEMBERS

Mrs. Joan Heathershaw, G4CHH, who is not eligible for re-election under Article 26.

Mr. John Heys, G3BDQ, who is eligible and willing to accept nomination for re-election.

Mr. Angus McKenzie, G3OSS, who is eligible and willing to accept nomination for re-election.

Mr. Francis Rose, G2DRT, who is eligible and willing to accept nomination for re-election.

Mr. George Benbow, G3HB, who is eligible and willing to accept nomination for re-election.

Mr. Norman O'Brien, G3LP, who is eligible and willing to accept nomination for re-election.

ZONAL MEMBERS

Zone C - Mr. John Greenwell, G3AEZ, who is eligible and willing to accept nomination for re-election.

Zone D - Since Dr. Julian Gannaway, G3YGF, is to become the Society's President in 1989, a vacancy for Zone D is created.

Zone E - Mr. John Case, GW4HWR, who is eligible and willing to accept nomination for re-election.

Zone G - Mr. Frank Hall, GM8BZX, who is eligible and willing to accept nomination for election.

ELECTION OF THE 1989 COUNCIL

1) The role of Council and Council members.

To assist candidates and those making nominations, the following notes are intended to summarise very briefly the main functions of Council and Council members.

The size, complexity and long-term nature of the Society's activities makes it necessary for the day-to-day control of its affairs to be in the hands of a stable administration. At present, the workload is divided between the full-time staff, approximately 30 in number, and the volunteer effort represented by the 16 sub-committees of Council and its honorary officers. Of the HQ effort, roughly half can be regarded as being devoted directly to amateur radio matters, the remainder being concerned with administrative tasks. Responsibility to Council for the working of HQ is primarily with the Finance & Staff Committee, with the Licensing Advisory Committee being heavily involved with licensing aspects. The work of the other committees is mainly concerned with amateur radio matters, although there may be major financial implications.

The main work of Council is that of monitoring the work of HQ and the committees to ensure their effectiveness in handling the commercial aspects of the Society's operation (an income of over £1 million per annum), together with those matters it has identified as being important to amateur radio on both the national and international level.

The main duty of Council members obviously is to play an active part in this operation. This will involve, inter alia, the attendance at, typically, seven Council meetings each year; the critical review of the 200 or so sets of committee minutes and working documents produced during the same period; and the capacity to react constructively to this and other information. Council members are also expected to deal with individual members' problems: their duty is to ensure that these are dealt with by the responsible committee or other body.

2) Candidate's qualifications and details.

a) The candidate must have been a corporate member for at least three years at the time of nomination.

b) The candidate must submit the following:

(i) Written, signed consent to accept office, if elected.

(ii) If appropriate, a statement that she/he is over 70 years of age or will become so during the term of office if elected. The Society's Articles of Association requires that the Council ballot paper shall state the date of birth of any candidate who will have attained the age of 70 before the end of the term of office he/she would normally serve if elected.

(iii) A statement declaring any commercial interest in the field of amateur radio.

These declarations, together with nominations, may conveniently be made by using the "Candidate's Form for the Election of Ordinary or Zonal Members of Council" (Form CF/CE & Form NF/CE) available on request from:-

The Secretary (DAE)
RSGB
Lambda House
Cranborne Road
Potters Bar
Herts EN6 3JE.

3) Nomination procedure.

a) The nominations for each candidate, at least 10 in number, must be fully paid-up corporate members at the time of nomination. In the case of zonal members, the candidates and nominators must reside in the zone concerned.

b) Nominators may nominate only one candidate.

c) The nominations may be made on the "Candidate's Form" referred to above, the associated "Nominator's Form" or on any sheet of paper. Each nomination must be signed by the nominator, who should include the name of his town.

4) Additional information on candidates.

In order to assist the membership in voting, a candidate may enclose a maximum of 200 words as a CV or statement describing pertinent experience which will be circulated within the ballot forms. This must be confined to biographical facts. Clearly, involvement with decision-making in organisations of similar size to the RSGB (or larger) would be relevant, and this should be stated. Prospective candidates will find it useful to have had experience of RSGB procedures, including committee membership, duties as regional or area representatives, writing for Society publications or organising events. This experience should be quoted together with details of participation in amateur radio at the local level. Bona fide statements will receive the minimum of editing consistent with good style and factual accuracy; however, statements exceeding 200 words are likely to be cut to that number.

The candidate may also supply a recent black-and-white head-and-shoulders photograph for publication with the cv, if she/he wishes.

5) Information on nominators.

Nominators are required to give details of their place of residence. It is to be noted that voters may place higher value on nominations if they are seen to have come from many parts of the UK in the case of Ordinary Members, or many parts of the zone in the case of Zonal Members, rather than a restricted area.

Nominators may also supply for publication details of how long they have known the candidate and of relevant positions that they hold or have held; for example, as the chairman of an amateur radio club, a member of Council etc, or who can indicate management experience. The standard nomination form referred to above is designed to facilitate the supply of this information.

The candidate's declaration together with the completed nominations should be sent in a single closed envelope and addressed to:

The Secretary (DAE)
RSGB
Lambda House
Cranborne Road
Potters Bar
Herts EN6 3JE

...to arrive no later than 10 October 1988.

Please mark the envelope "1989 Council Nominations". Nominations for all candidates will be acknowledged by return of post.

PROJECT
YEAR

Youth in Electronics
Via Amateur Radio

INFORMATION AND CONSULTATION DOCUMENT

Project YEAR Acclaimed !

His Royal Highness Prince Philip, Duke of Edinburgh, officially launched our exciting new venture at the RSGB's National Convention in July. The Council has presented far reaching and innovative plans for the rejuvenation of our hobby and for the long term benefit of our nation's electronics industry.

The Society's initiative has received acclaim from industry, broadcasting, the forces and the uniformed organisations. Letters and calls are pouring into headquarters and David Evans reports that the enthusiasm is overwhelming. Now it is the turn of the members to voice their opinions, pledge their support and generally rally to the cause of Project Year.

This document presents your opportunity to participate in the final planning stages before the scheme goes into action. Read the notes and send in your questionnaire.

Project Year is already acknowledged to be the most exciting and outstanding proposal to be put forward by our Society for a generation. Let us unite in ensuring its success in the coming years.

"Project YEAR seeks to offer young people and opportunity to discover science, engineering and electronics... How wonderful it would be if Project YEAR could lead to some form of 'novice' or 'student' licence by which young people could not only create simple radio transmitters and receivers but could then use them to communicate with each other as another way to improve international awareness and understanding... Project YEAR is obviously an exciting concept designed to provide young people with increased opportunities. This is exactly what the Scout Movement is all about so you will understand why we are so happy to support it."

Garth Morrison, Chief Scout

Project YEAR Presentation

At the RSGB's 75th Anniversary Luncheon on 15 July 1988, the Society presented an overview of Project Year and of their proposals for a new beginner's amateur radio licence.

Here is an abridged version of the address given on behalf of the Council by Victor Brand, G3JNB, President of Thames Valley ARTS.

"HRH the Duke of Edinburgh, has now officially inaugurated Project

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INSIDE

- **Student Course Draft Syllabus.**
- **Student Licence.**
- **Your chance to take part.**

"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. That is why I am delighted to inaugurate the Society's Anniversary project, 'Youth into Electronics via Amateur Radio' ... it's a thoroughly good idea and I hope it will be most successful."

His Royal Highness, Prince Philip, Duke of Edinburgh. Patron of the Radio Society of Great Britain.

Prince Philip, Duke of Edinburgh

"My Department fully supports the aims of the Society's Project YEAR. We recognize the importance of amateur radio as a starting point for our radio engineers of the future"

John Butcher MP, Parliamentary Under Secretary of State for Industry and Consumer Affairs.

John Butcher, MP

Just What Forms of Activity Will Project YEAR Encompass ?

We propose to harness the power of the electronics and communications industry, the companies engaged in supplying and supporting the amateur radio movement, the journalists, educationalists and, through the Society, our own powerful nationwide network of over 800 Affiliated Societies.

It is intended to provide a basic training in electronics by way of:

a) A simple study course to a set curriculum. This will provide a sufficient grounding to enable anyone to enter the hobby with an enhanced opportunity for success and personal satisfaction.

b) A formal qualification with certificate will be established that will be immediately significant to the education activities of youth movements and young people seeking employment in the electronics field.

c) A course which will be made available at low cost to individuals, radio societies, uniformed organisations, schools and youth clubs.

It will consist of easy to understand instructions in plain English on electronics and the fundamental practices of amateur radio, guidance on operating a home station, instruction upon the rules and regulations relating to a licensee. It is to be stressed that this is to be a good grounding on how to operate on the air in a SAFE and DISCIPLINED manner!

An early goal will be to present a simpler means of qualification for 'young' people and, indeed, the not so young, to be licensed by the DTI for transmission of signals as 'Student' amateur radio stations - from home, schools, clubs.

Project YEAR should provide a means of "getting your feet wet" without too great an initial commitment - a factor available to the new initiate of almost every other pastime. But amateur radio is different; to really enjoy the hobby you have to know something about it. That is why the RSGB wants to offer the beginner a challenge which at the same time does not represent a barrier. At present the barrier is evidenced by the fact that there are less than 200 people under the age of 18 as members of the RSGB.

The Student Licence

It is proposed that Students will be licensed to operate on designated frequencies and modes that will permit them world-wide communication and the freedom to develop skills in a manner that is prohibited to holders of the Citizens Band Licence.

The Society has initiated consultations with the RSGB Liaison Officers (RLO's)

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Project YEAR Presentation

continued from page 1

YEAR. On behalf of the Council of the RSGB, it is my privilege to present to you an overview of 'Youth Into Electronics via Amateur Radio"..

Before so doing, may I say how delighted the Society is to welcome you all to this 75th Anniversary Luncheon and to host so distinguished a gathering of the most senior representatives of The International Amateur Radio Service, Principals of Government Departments, Broadcasting Authorities, The Armed Forces, The Uniformed Youth Organisation and Industry.

In 1920, Marconi, an honorary member of our Society, said ..."Had it not been for amateurs, wireless telegraphy as a great world-wide feat might not have existed at all."

For seventy five years, private individuals have enjoyed and will continue to enjoy, the singular benefits of a 'brotherhood' of the air that is at once local (through the hundreds of affiliated societies) regional, national and international. Amateur Radio generates friendships, understanding and mutual respect that knows no boundaries of race, creed, colour or, indeed, age.

Project YEAR is an entirely new initiative, an exciting and practical programme with far reaching implications for our hobby, for industry and for education.

Its purpose is to create a new awareness, a new opportunity, for young people (and to 'young' people of all ages). To assist them in developing an interest in science, engineering, electronics and communications by the well proven method of involvement and activity in amateur radio.

Industry is constantly reporting shortage of skilled manpower - a shortage of young people with a burning desire to build careers in the electronics and information technology (IT) related industries.

We are pleased to report that support has already been forthcoming. The DTI have recognised the importance of the project and have shown their support by their presentation of the 'Young Amateur of the YEAR' award to Andrew Keeble, G1XYE.

Mr John Butcher, the Parliamentary Under Secretary of State for Industry and Consumer Affairs, has pledged the full support of his department for the aims of PROJECT YEAR and is excited by the prospect and the concept of a student licence.

Abroad, the national societies of the USA, Germany and Jordan, and others, have already instigated their own programmes for young people. They have been joined by New Zealand, Denmark and many other countries in expressing their support for Project YEAR.

Here in the UK, and thinking ahead, we consider that a major breakthrough for Project YEAR would be the eventual inclusion of basic amateur radio in the school curriculum. A very long shot, you may suppose? Perhaps not! You will be heartened to learn that in the States, the American Radio Relay League has been instrumental in achieving just that! We understand that the State of New York is about to introduce this subject to its own schools, recognising the worth of amateur radio in the attainment of educational qualifications and the subsequent enhancement of career prospects in this world of rapidly advancing high technology.

Back home again and the leaders of our Scouts and Guides have expressed their enthusiasm for Project YEAR. With 650,000 Scouts and 850,000 Guides in the UK and some 16 million members worldwide, they see the project as a breakthrough that will enable them to develop their present training programmes."

continued from page 2

throughout the country on the most desirable parameters of such a licence. We shall now seek the assistance of the entire membership. Radio Communication will carry an appropriate editorial that will invite the widest possible response.

Thereafter, the Society will present a comprehensive proposition to the DTI who have assured us of their fullest co-operation and consideration.

The Licence Conditions

Firstly, the Society believes that this is an opportunity to provide training in the actual operation of an amateur station - something that many would regarded as lacking in the present examination syllabus.

Indeed, we see that such a licence should result in a long term improvement in the operating standards of British stations on amateur bands.

To this end, we shall seek to modify the present regulations to permit accredited students to operate a fully licensed station under the strict supervision of a full licence holder.

Secondly, the Society believes that a Student Licence must be realistic in its conditions and provide an adequate access to the bands whilst safeguarding the rights of our full licensees and, of course, affording the maximum protection to non-amateur interests.

In technical terms we are suggesting that power levels of no more than, say, 4 watts input be permitted. This will undoubtedly bring tears of joy to the G-QRP Club who have long advocated and demonstrated the effectiveness of low power operation.

It is probable that simple wire or single element aerials will be mandatory at hf frequencies and the use of morse at 5wpm shall be the minimum standard.

Frequency Allocations

Careful consideration has been given to band allocations and the proposals to be put to the membership are likely to be as follows:

1.8MHz Top Band - Ideal for home construction and local contacts during the day, with Europe in the evenings. A 50kHz segment, which avoids the dx section of the band, with phone (am or ssb?) and cw.

3.5MHz - 80 metres - Again, ideal for home construction and lots of opportunity to work other low power stations. A 15 or 20kHz segment - cw only.

10MHz - 30 metres - Currently under used and offering a world-wide coverage. A 10kHz segment - cw only.

21MHz - 15 metres - A 50kHz section - cw only.

28MHz - 10 metres - Ideal for local activity and world-wide communication when open. A small allocation allowing contact with, say, the American and Novice operators in other countries.

50MHz - 6 metres - Also ideal for local communication, home construction and experimentation. A small allocation is envisaged away from the popular weak signal and dx sections of the band.

430MHz - 70cms - A small allocation is envisaged to permit fm and data modes.

An all mode allocation at 1.3GHz and 10GHz is also under active consideration.

It is essential to note that the above notes represent a summary of the ideas to date. It does not necessarily mean that all of these band sections will be recommended for the proposed new licence.

The pilot issue of DIY Radio

Clearly there are such factors as minimum age, duration of licence, crystal or VFO control and so on, that must be resolved before the final proposal may be presented to the Government.

However, if all goes well, it is to be hoped that DTI approval will be forthcoming in time to enable Student Licensing to commence sometime during 1989.

There have been some arguments against such a licence based on the possible difficulty of unskilled operators being admitted to the crowded bands.

It is the RSGB's view that we must be responsible for training new entrants. In the fifties and sixties the armed forces did much of this for us but now we must shoulder the responsibility and provide the initiative, the means and the money to ensure that the youth of Britain enjoy opportunities equal to those of other nations. We are resolved to provide a stepping stone to the full amateur licence by providing thoughtful and practical training which ensures that student licensees can operate in a highly disciplined and considerate manner.

Incidentally, there are about 30 countries already operating a successful Novice Licence system with no apparent problems.

DIY Radio — A New Publication For The Beginner

DIY RADIO is intended as a foretaste of things to come, a tool for research and response and to provide a vehicle for criticism/comment/contribution before we go further. If it is found acceptable it is intended to be published monthly.

Basic Amateur Radio for beginners of all ages is the editorial policy and subtitle; DIY Radio will assist us to develop the whole proposal of Project Year and is seen as central to the success of the scheme, the vital means of communication with new students and as an informal and acceptable introduction to the hobby and, incidentally, to prepare readers for the more advanced Radio Communication and the popular amateur radio publications currently available on bookstalls.

It is the intention of the RSGB to set up a beginners section within the Society. DIY Radio will be sent to these beginners instead of Radio Communication, if they so wish. It will be available on subscription to members and societies and, we foresee it circulating widely through the uniformed youth organisations.

Computers in Amateur Radio

Project YEAR will harness the existing expertise and facilities already enjoyed by many students. DIY Radio will introduce the use of the PC at all levels of tuition.

Amateur radio will be presented as an exciting and invaluable aid to communication by computer - the modem sales may suffer a modest set-back but Dad's phone bills should no longer turn him white with horror!

Simple Kits & Projects

The key to success for the entire project, as it has always been in any hobby, will be a low cost of entry and the thrill experienced by a new entrant in making, using and benefiting from a project involving personal skills - no matter how modest.

For Project YEAR, we consider it imperative that low cost, reliable and easy to assembly kits are made available.

They must cater in the first instance for the absolute beginner. Kits required will be simple receivers and, before long, transmitters, aerials, test devices and items that can provide a form of 'consumer' presentation to the hobby rather than, perhaps, reflecting the mysterious and esoteric work of the skilled and established enthusiasts.

The RSGB intends to explore the production of such kits or an advantageous licensing system for the production or supply of kits that are published in DIY Radio or, indeed, in Radio Communication.

Off-air Instruction

The Open University broadcasts are seen by the public to be unique. Few are aware that RSGB, "Slow morse over the air" tuition classes have been running for many decades, providing tuition at a national level to thousands of 'students'.

It has been suggested that we extend this service to simple theoretical tuition over the amateur bands. Your comments and ideas on such an innovation would be welcomed by the Society.

Project YEAR is a Major Undertaking! Enormous support will be required to ensure its success.

1. RSGB will provide management, staff, premises, technical and publishing facilities plus all the accumulated resources of the membership.
2. RSGB has already made an initial injection of funds, of necessity limited, owing to the nature of a society financially geared to providing a membership service and not to maximising a commercial profit.
3. We shall undoubtedly require the support of Government bodies - the DTI, Department of Education, Department of Employment. Those organisations which deal with vocational training - resources, skills and, if appropriate, financial grants.
4. We shall depend upon the backing of British Industry and Commerce allied with the world of communication, including, it is hoped, the BBC and the independent broadcasting organisations. The Society will be looking to the great men and entrepeneural personalities of our times. For them this is a major opportunity for personal and practical involvement.

We are going to need your technical resources, sponsorships, awards and events, and funds to support and develop the project.

We shall require:

1. Staff secondment.
2. Design resources.
3. Sub-contract or sponsored printing.
4. Student manual production.
5. Artwork.
6. Technical drawing.
7. Training videos.
8. Sponsored apprenticeships.
9. Software for amateur radio.
10. Components for projects.

We recognise the PR opportunities that may be available to our sponsors in such involvement and intend to co-operate fully to maximise the benefits to all participants.

To this end, the Society proposes calling an 'Industry YEAR Conference' to examine all such potentials and I am delighted to announce the DTI have kindly offered to host this event at their conference centre.

"Youth into Electronics via Amateur Radio is a theme that I would very much like to see spread to the U.S. Amateur radio offers young people an opportunity to actually participate in the adventure and discovery of using technology to communicate beyond every day horizons."

Anthony England, W0ORE
NASA Astronaut

Anthony England, W0ORE

Educationalists

Give us access to students of all ages - from Primary school level to university. Your assistance with training courses and manual preparation, training/test/examination facilities and accommodation will be vital.

Youth Movements

Grasp this opportunity to bring an exciting and character forming pastime to your country's young people. Work with us in conveying this project to the children, the parents and the public at large.

Publishers

Take a positive editorial stand and a practical approach to making Project YEAR a success. Assist us with the written word in both your own and, we hope, in our publications. You will surely recognise the long term benefits of an ever increasing audience.

The Church

The hobby has a strong following amongst ministers of all faiths - all over the world. Spread the 'gospel' of personal communication by 'radio' by encouraging the project among those church youth club members who need to be challenged and occupied.

Organisations for the Retired/the Disabled

Project YEAR can and will give you a new opportunity to present this hobby to those who are in your care. Work with us to bring the facility to listen to the world outside the UK, to use hands productively, to absorb the mind and, we hope, to enable personal communication by radio day and night at a level quite unattainable through CB, the telephone or personal correspondence.

The Members of the Society

For years our members have shown concern over the lack of new blood in the hobby.

'Project YEAR' will enable every member of the RSGB to play an important role in encouraging, assisting or training those who come after us - the opportunity to put something back into the hobby!

The complexity and difficulties of preparing a young friend for the City and Guilds Amateur Radio Licence examinations will be greatly diminished if the Society's plans for the Student Licence come to fruition.

The Student Course, and all that it entails will take up relatively little time and will allow the member to play that all important role of tutor and mentor in the traditional manner by providing shack experience and assistance with simple construction work.

We appeal to the members to provide the strongest possible personal support as the scheme unfolds in the coming months.

We appeal to all those who think as we do that the time has come for those in authority, those with influence, those with resources, to come forward and join the Radio Society of Great Britain in preparing our youth for the electronic world of tomorrow and to participate in the new spirit that is abroad which is determined to maintain UK limited at the forefront of technical excellence, true innovation and enduring international success!

PROJECT YEAR
Youth in Electronics Via Amateur Radio

Consultative Questionnaire

Your chance to take part

You are invited to participate in the planning of PROJECT YEAR. Please complete and mail to arrive at HQ NO LATER THAN 10 October 1988. Unless stated otherwise, please tick ONE answer that best suits your viewpoint.

1. WHAT SHOULD THE LICENCE BE CALLED ?
Please give us your opinion on a suitable title
A. Student Licence ( )
B. Novice Licence ( )
C. Beginner's Licence ( )
D. Provisional Licence ( )
E. Incentive Licence ( )
F. Basic Amateur Radio Licence ( )
G. Other .....

2. STUDENT COURSE DRAFT SYLLABUS
(See over page)
A. I like it ( ) I do not like it ( )
B. It is too difficult ( ) Too easy ( )
C. Suggest following is included:
.....
.....
.....
.....

3. AGE LIMIT
A. I suggest lower age limit should be 8 years ( )
B. I recommend no lower age limit ( )

4. POWER
A. Power Input.....-.....4 watts ( )
B.....2 watts ( )

5. MORSE SPEED
A. Morse Speed.....-.....5 wpm ( )
B. 7 wpm ( )

6. FREQUENCY ALLOCATIONS
A. As suggested ( )
B. As suggested too few ( )
C. As suggested too many ( )
D. My further frequency suggestions are
.....

7. FREQUENCY CONTROL
A. Transmitter to be - XTAL only ( )
B. VFO only ( )
C. No regulation is necessary ( )
D. My further suggestions are
.....

8. DURATION OF LICENCE
A. 1 year ( )
B. 3 years ( )
C. No limit ( )
D. No limit but renewable ( )
E. My ideas are
.....

9. THE LICENCE
A. I like the concept ( )
B. I do not like it ( )

10. IF APPROPRIATE, I WISH TO PLAY MY PART IN PROJECT YEAR.
I can help with:
(tick the ones that you can help with)
A. Teaching the Theory ( )
B. Helping with practical work ( )
C. Shack experience ( )
D. Design of simple projects ( )
E. Writing training manuals ( )
F. Visiting/demonstrating to youth groups ( )
G. Assisting at shows ( )

11. MY OWN THOUGHTS ON THE PROJECT YEAR ARE:
PLEASE PRINT CLEARLY:
.....
.....
.....
.....

I am a member of the following Affiliated Society:
.....

My Age group is
10 - 20 ( )
21 - 30 ( )
31 - 40 ( )
41 - 50 ( )
51 - 60 ( )
61 - 70 ( )
70 + ( )

My Professional Qualifications are:

Signed.....

Name..... Callsign.....

Telephone (Home)..... (Work).....

PLEASE NOTE - Since the Society anticipates a very large number of responses to this consultation document, completed questionnaires and accompanying correspondence will NOT be individually acknowledged.

STUDENT COURSE DRAFT SYLLABUS

It is envisaged that the Student Licence Course will involve no more than 30 hours of classroom and home study work, plus the time necessary to learn Morse at 5wpm. The following syllabus is a DRAFT only and is intended to convey the TYPE of material envisaged - it is presented for comment and reaction.

This draft syllabus has not attempted to establish the regulations for the Student Licence because at the time of preparation the Schedule had not been finalised.

It is envisaged that the Student Licence examination would be a multiple-choice examination which would depend heavily on visual presentation in the form of block and pictorial diagrams.

LEARNING BY DOING is the keynote of the proposed course; 'show', then let the student 'do'.

1. Components and Units

Students should be able to a) handle and recognise the components listed below, b) know the related circuit symbol and c) be familiar with the units associated with the various components.

Diode, earth, capacitor (Farad), inductor (Henry), transformer, switch, Morse key, relay, fuse, transistor (several different types), battery, antenna, indicators (eg LED/Lamp), integrated circuit, plug, socket, microphone, resistor (Ohm) and crystal (Hertz).

Students should also be familiar with the following units of measurement:- Volt, Ampere, Watts, Decibel, Hertz and Metres. Students should also be able to appreciate that different values of some units mean that the associated components are larger or smaller in physical size.

2. Concepts.

a) Students should appreciate the concept of the following:
   - i) Energy.
   - ii) Power.
   - iii) The relationship between frequency and wavelength.
   - iv) Radio frequency waves.
   - v) Audio frequency waves.
   - vi) The basic relationship between voltage/current and resistance.

b) Students must be able to recognise in block diagram form:
   - i) The main elements of a simple transmitter (eg oscillator, buffer amplifier, multiplier, modulator for both am and fm transmitters.

c) Students must be aware of the main controls associated with simple am, fm and ssb transmitters and must appreciate the function of each control (eg tuning control, microphone gain, mode switch) and know how to use them correctly.

d) Students must know the main controls and their functions on a receiver (eg tuning control, mode switch, rit, squelch, audio gain, agc, noise blanker) and know how to use them correctly. The concept of bandwidth and the filtering of incoming signals should also be taught.

e) Students must be aware of the basic types of emission, eg telephony, telegraphy, data, television, rtty.

f) Students must know the basic elements associated with each type of radio station in terms of a block diagram:
   - i) Morse Station - transmitter, receiver, antenna, feeder, Morse key, power supply unit.
   - ii) Fm/am/ssb Station - transmitter, receiver, antenna, feeder, microphone, power supply unit.
   - iii) Rtty Station - transmitter, receiver, antenna, feeder, keyboard, visual display, power supply unit.
   - iv) Packet Station - transmitter, receiver, antenna, feeder, keyboard, visual display, computer, terminal node controller, power supply unit.

3. Measurements

Training should be arranged so that the student:-
   - i) identifies the switches, controls and terminals of a multi-meter.
   - ii) knows the difference between analog and digital meters.
   - iii) knows how to set up a meter as a voltmeter.
   - iv) Measures voltages in a simple circuit. (LED circuit with resistor and battery)
   - v) is aware of the importance of polarity.
   - vi) knows how to set the meter as an ammeter. (Point out the danger of connecting an ammeter across a supply)
   - vii) knows that great care must be used when connecting an ammeter.
   - viii) measures the current flowing in a simple circuit. (Use the simple LED circuit again)
   - ix) knows that the position of the ammeter in a series circuit does not matter.
   - x) knows how to set the meter as an Ohm-meter.
   - xi) measures various values of resistance. (Give a variety of resistors and encourage the student to read the value from the colour code)

4. EMC and Non-Interference

Students should know:

a) that radio energy from a transmitter can enter other electrical apparatus and cause either interference or breakthrough in some form.

b) how to identify an audio or video emc problem and the first steps to take should it occur. Students should be advised that in most cases first aid consists of ceasing transmissions and calling for experienced assistance.

c) how to handle emc complaints in a responsible manner.

d) about the emc environment, eg power, frequency, distance to affected apparatus.

e) what type of equipment is most likely to be affected by nearby transmitters.

f) about the concepts of filtering.

g) about the concepts of harmonics, sub-harmonics and spurii.

5. Safety.

Students should know:

a) how to construct and erect antennas in a safe manner.

b) about earthing.

c) the dangers associated with high voltages.

d) about lightning protection.

e) the difference between ac and dc power supplies and the dangers associated with the use of mains electricity.

f) the basic tools associated with construction and how to use them safely.

g) how to use a soldering iron safely, must be able to recognise good soldered joints and demonstrate the ability to make them.

A basic safety code should be drawn up in association with the Student examination.

6. Propagation.

a) Students should know the basic concepts of:
   - i) the 11 year sunspot cycle.
   - ii) how the sun influences the ionosphere.
   - iii) the ionosphere.
   - iv) refraction.
   - v) sky wave.
   - vi) skip zone.
   - vii) groundwave.
   - viii) the difference between horizontal and vertical polarisation.

b) Students should also be taught the concepts of terrestrial repeaters and satellites.

7. Antennas/Feed Lines/Test Equipment.

a) Students should have a basic concept of:
   - i) a dipole.
   - iii) a Yagi.
   - vi) a long wire.

Students should also know:

b) the rudimentary radiation patterns and characteristics of the above antennas.

c) the directional properties of an antenna and that some antennas can be rotated to advantage.

d) how to point an antenna in a given direction and appreciate the concept of a great circle map.

e) about: the atu, balun, coaxial feeder and twin feeder.

f) how to use a swr meter and appreciate its limitations together with acceptable readings.

g) that planning permission may be required for some forms of antennas.

h) the safety aspects of antenna supporting devices, simple masts and guying arrangements.

8. Station Operation.

Students should be familiar with:

a) Selecting and checking a frequency.
   - i) listening.
   - ii) identifying and selecting a clear frequency or channel.
   - iii) netting the transmitter (transceiver). Also the concept of zero beating with a low power signal.
   - iv) checking the frequency in use.
   - v) use of callsigns.
   - vi) use of a dummy load.
   - vii) tuning up procedures.

b) CQ Calls.
   - i) CQ call procedure on phone, cw and data.
   - ii) speed of delivery or sending (send no faster than you can receive).
   - iii) calls not too long.
   - iv) appreciation of propagation.
   - v) usage of station location.

c) Answering a CQ or calling in after a contact.
   - i) callsign procedure.
   - ii) speed of delivery.
   - iii) not to be anti-social - be considerate and friendly.
   - iv) use of station location information.
   - v) tail-ending (do not butt in unless there is a good reason).

d) Contact Format.
   - i) establishing how well both stations can hear each other.
   - ii) adopt transmission speed appropriate to conditions.
   - iii) give usual information - name, QTH, signal report.
   - iv) discuss items of common interest.
   - v) signing off.

e) Signal Reporting System.

   Students should have a knowledge of readability, strength, tone, system and should be able to gauge these factors both by ear and by the use of signal strength metres.

f) Phonetic Alphabet.
   - i) knowledge of the NATO voice code.
   - ii) use of spelling technique under poor conditions.
   - iii) use of spelling technique to spell unusual names under good conditions.
   - iv) use of phrases "I spell" and "Figures" on voice.

g) Q Codes.
   - i) Knowledge of the meaning of the following Q codes: QTH QRZ QSB QSL QSY QRM QRN QRP QRO QRL QRT QRQ QRS QSO

h) Abbreviations:

   Students should know:-
   - i) the meaning of the following: CQ DE AR SK BT DN KN K
   - ii) about other commonly used abbreviations.
   - iii) the amateurs code.
   - j) about repeaters; what they are, and the concepts of input and output frequencies and tone calling.
   - k) the rudimentary elements of a packet radio system, a network, a digipeater, a node and a mailbox.
   - l) what to do in an emergency situation.
   - m) the rudimentary elements of relaying a message.
   - n) the parts of a callsign - prefix/number/suffix.
   - o) the different prefixes associated with different countries and international callsigns.
   - p) the usage and effects of differing transmitter powers.
   - q) that some bands are shared with other services and the necessity to conduct their transmissions in safety.

TECHNICAL TOPICS

PAT HAWKER · G3VA

MULLARD BECOMES PHILIPS COMPONENTS

As noted for an address in the item on phasing-type ssb, Mullard Ltd, for many years the UK's largest component firm, has become, since April 27, Philips Components Ltd, although (up to now) their London headquarters offices are still at Mullard House in Bloomsbury. Old-time amateurs may regret the vanishing of this link with the late Stanley R Mullard who died a few years ago at a ripe old age. Captain Mullard's connection with valve development stretched all the way back to the first world war and the first British high-vacuum receiving valve (type R5). Afterwards he set up the Mullard Radio Valve Company and proved a good friend of the early British experimental amateurs of the 1920s: for example he gave Gerry Marcuse, G2NM the very large valves which allowed him to pioneer 'Empire Broadcasting' in 1924 with a transmitter power on 10MHz of about 1·5kW. In 1924 he sold half of his company stock to N.V. Philips Gloeilampenfabrieken of Eindhoven. Three years later in 1927 the Mullard Radio Valve Co Ltd became a wholly-owned subsidiary of Philips – although for very many years (right up to the 1970s) the Philips ownership was never stressed publicly. It was, however, reflected in the early 'PM' (Philips-Mullard) series of valves such as the PM2DX used in many amateur regenerative receivers of the 1930s, and the development of the famous EF50 series. There were few *T&R Bulletins* (original name of *RadCom*) that did not carry a full-page Mullard advertisement, at first claiming "The Filament that cannot be broken except by the very roughest handling" for Mullard 'The Master Valve'. It was the support given by the few such advertisements that carried our journal through the depression of the 1930s. In those financially stringent days, few members could have been in a position to respond to the later advertisements featuring such transmitting valves as the DO/40 "a dull emitter transmitting valve capable of working on anode voltages up to 1000 volts and tested dissipating 40W at the anode . . . suitable for short-wave transmission (down to 40 metres) with total emission 300mA". Its 1931 price of £5.5s must have represented more than a week's wages for many members.

UK PIONEERS OF SSB

The July *TT* item on 'pioneers of ssb' included some notes on the Collins KWM–1 (10 × 100kHz between 14 and 30MHz) mobile rig, the first ssb/cw transceiver to reach the amateur market, although separate transmitters and receivers for ssb operation had been available in the USA in the early 1950s. But as a result of a printing error, the KWM-1 was dated 1965-69 instead of G4KSG's 1956-59 before being superseded by the KWM–2 covering 14 ×200kHz segments between 3·4 and 30MHz.

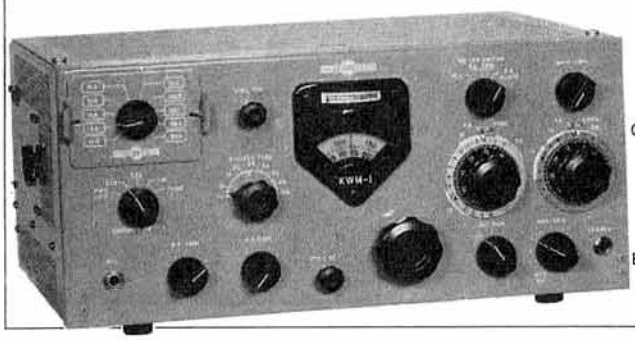
Douglas Kay, G3AAE had good reason to correct the printed dates. He writes: "The KWM–1 was available well before 1965. I used one on Alderney, as GC3AAE, between 16 to 30 May, 1958. GC3AAE was situated at Essex Castle, Alderney and was operated 24-hours-a-day for two weeks by G3AAE (John), G3BQR (Chas), G3IFB (Frank) and G3JUL (Geoff), making over 2000 contacts with 112 countries using a Collins KWM–1 transceiver running 150W on ssb and cw with a G8KW multiband trap dipole. It was the first KWM–1 to leave the USA and resulted from a direct appeal to Art Collins, W0CXX."

I should have spotted the error in proof since I obtained my photograph of the KWM–1 in 1958. Checking some back issues of *QST* etc I find the KWM–1 was being advertised as early as 1957, while the KWM–2 was introduced well before 1963 by which time there were over a dozen ssb transceivers on the American market (Davco, Drake, Eimac, Galaxy, Hallicrafters (2), Heath, National, SBE, Sonar and Swan) with several using hybrid transistor/valve designs. In the late 1950s, Collins were, however, still concentrating on 'separate' receivers and transmitters, including the admirable 75A4 receiver and their new 'S-line' equipment.

SSB began to gain UK adherents in the early 1950s and a bimonthly *CQ Single Sideband* column, initially written by H. F. Knott, G3CU, was published in the *RSGB Bulletin* from October 1951. This set the ssb scene of the day as follows:

"It has often been heard said: 'What is ssb? Where are these stations to be found? What is it all about? . . . The single-sideband system was first introduced to amateurs in October 1947, and so immense are its advantages that a complete change in equipment and operating is certain. Today there are approximately 150 stations using ssb – seventeen in Europe. The first British amateur to adopt the system G2NX (Oswestry) August 1949 was quickly followed by G3CWC (Norwich), G3FHL and G3FDG (Ironbridge), G2CR (Lincoln) and G3CU (all mostly on the 3·5MHz band). After a pause of some months G3AIH (New Malden) and G8RC (Brentwood) made their appearance, and more recently G3BVA (Bromley). At least a dozen other UK amateurs are building equipment". In 1951 all the British ssb transmitters (phasing and filter types) had to be home constructed.

Curiously, although never a frequent user of ssb, I can claim to have written the first article to appear in the *RSGB Bulletin* on the new mode: an unsigned piece 'Amateur single-sideband telephone tests' commenting on the reports in the January 1948 *QST* and describing how to tune in an ssb signal. This must have been in either the February or March 1948 issue.



THE FIRST SSB/CW TRANSCEIVER, THE COLLINS KWM–1 MOBILE TRANSCEIVER, WAS INTRODUCED IN 1957 AND PAVED THE WAY FOR THE CHANGE FROM SEPARATE TRANSMITTERS AND RECEIVERS TO THE MODERN TRANSCEIVER SCENE. IT WAS NOT UNTIL JUST OVER TEN YEARS LATER THAT THE JAPANESE "BLACK BOXES" BEGAN TO APPEAR ON THE UK MARKET.

PHASING-TYPE SSB

Although phasing-type ssb exciters (and a few phasing-type ssb demodulators) were quite widely used in the early days of amateur ssb, it is a long time since any approach other than crystal or ceramic sideband filters has been used in factory-built amateur equipment. Yet it should not be forgotten that quadrature (90°) phasing of rf and af signals (combined with balanced modulators) remains a valid and low-cost approach in its basic form, or as the Weaver 'third method', or as the 'polyphase' system which has the advantage that it can be implemented entirely from preferred value resistor and capacitor networks.

Last year Chris Randall G4RBR drew my attention to an article 'A new approach to low-power ssb circuits' published in *Semiconductor Magazine* (28 August 1987). This article drew on a good deal of material from the Signetics Application Note AN1981, written by Bob Zavrek, W7SX, plus material from ARRL publications. As mentioned in *TT*, November 1986, p784, AN1981 'New low power single sideband circuits' is available in the UK from Technical Publications Department, Philips Components (then Mullard) Ltd, New Road, Mitcham, Surrey CR4 4XY.

In the early days of ssb, phasing methods were used to generate ssb signals directly at the output signal frequency rather than at a fixed 'intermediate' frequency. This called for balanced modulators and rf phasing networks that remained in good quadrature over a wide range of frequencies. This, together with a tendency of the circuits to suffer from significant heat drift and the requirement for unusual precision component values, all tended to turn amateurs ▶

towards crystal sideband filters (or mechanical filters below 500kHz), despite the high cost of good factory-built filters. This trend has been confirmed among home builders since the cost of a home-built crystal ladder filter can be kept low by the use of colour television or other low-cost crystals.

Today, a valid use of phasing-type networks is for their use in direct-conversion ssb receivers. For example this technique is used by Gary Breed, K9AY for "A new breed of receiver" (*QST* January 1988, pp16-23). His design (outlined in Fig 1) makes use of audio phase-shift networks made by cascading op-amp stages with each stage providing a phase shift centered on a particular frequency. Such filters, known as 'all-pass' filters provide a stable phase shift characteristic over a band of frequency, rather like using stagger-tuned rf or i.f filters. Each filter (Fig 2) can be formed from 1% tolerance value components, with K9AY noting that such parts are easy to obtain and inexpensive "quite a change from those early days of ssb!" He had rather greater difficulty in implementing his rf phase shift networks but comes up with several possibilities (eg Fig 3). His receiver achieves an unwanted sideband rejection ranging from about 34dB to 65dB at his 1kHz af balancing frequency on 7150kHz. For the European 7MHz band it might be possible to achieve better than say 40dB over the full band at audio frequencies between 350 and 2900Hz. An explanation of op-amp all-pass filters was given by G4YKT in the August *RadCom*, in this case without stagger tuning.

As the *Semiconductor Magazine* article points out: "The availability of new integrated circuits now makes it possible for the older techniques to be reappraised, with the prospect of low-cost circuits offering more than adequate suppression." Later on it notes that: "High-quality (professional and military) ssb specifications require greater than 70dB of sideband suppression, but the (phasing and third method) circuits so far described offer only 35-40dB. The addition of an inexpensive two-pole crystal or ceramic filter (in a super-de-gainer configuration) will achieve this higher rejection, with the additional benefit of an improvement in the intermodulation performance of the receiver. Fig 4 shows a block diagram of a complete ssb receiver using the phasing-filter technique with the sensitive NE602 allowing a low gain and low-consumption rf amplifier and first mixer. The synthesised local oscillator could be built from either the TDD1742T or the dual-chip HEF4750/4751." Clearly, a tunable vfo could be used rather than a synthesized oscillator.

It is perhaps worth stressing that the op-amp all-pass quadrature phasing networks would appear to take most of the hassle out of a phasing-type ssb generator or demodulator. Whereas it used to be considered quite difficult to obtain an accurate phase shift over say an audio range of 300 to 2700kHz, one now finds all-pass filters being used to obtain 90° phase shifts for broadcast applications involving audio frequencies up to 15kHz.

It is also interesting to note that the 'super-de-gainer' technique, with a superhet mixer in front of a phasing-type direct-conversion receiver (ie no i.f. stages), is currently being regarded favourably as particularly suitable for the application of digital signal processing (dsp).

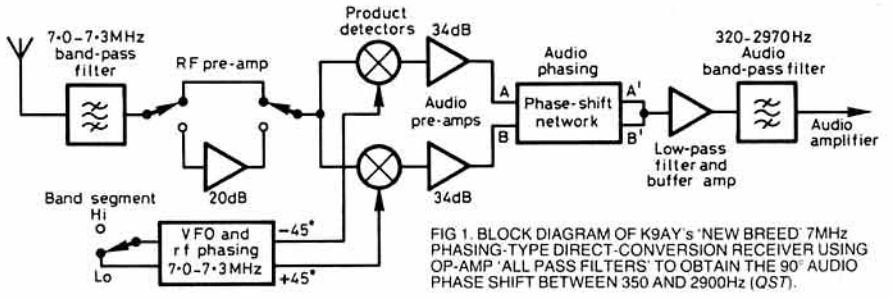


FIG 1. BLOCK DIAGRAM OF K9AY's 'NEW BREED' 7MHz PHASING-TYPE DIRECT-CONVERSION RECEIVER USING OP-AMP 'ALL PASS FILTERS' TO OBTAIN THE 90° AUDIO PHASE SHIFT BETWEEN 350 AND 2900Hz (*QST*).

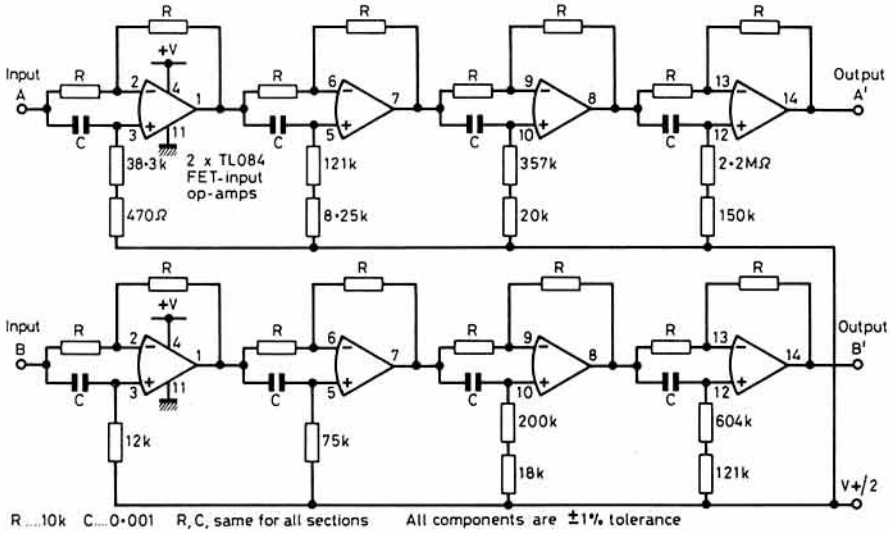


FIG 2. K9AY'S AUDIO PHASE-SHIFT NETWORK. EACH LEG COMPRISING FOUR CASCADED ALL-PASS SECTIONS USING TWO TLO84 FET-INPUT OP-AMP DEVICES.

FIG 3. THE 7·0–7·3MHz VFO AND RF PHASE NETWORK USED IN THE K9AY RECEIVER. C1 IS ABOUT 250pF OBTAINED BY REMOVING PLATES FROM A LARGER-VALUE CAPCITOR TO ACHIEVE DESIRED BAND-SPREAD. L1 IS 35t No 28 ENAM ON ½-IN CERAMIC FORMER. (*QST*).

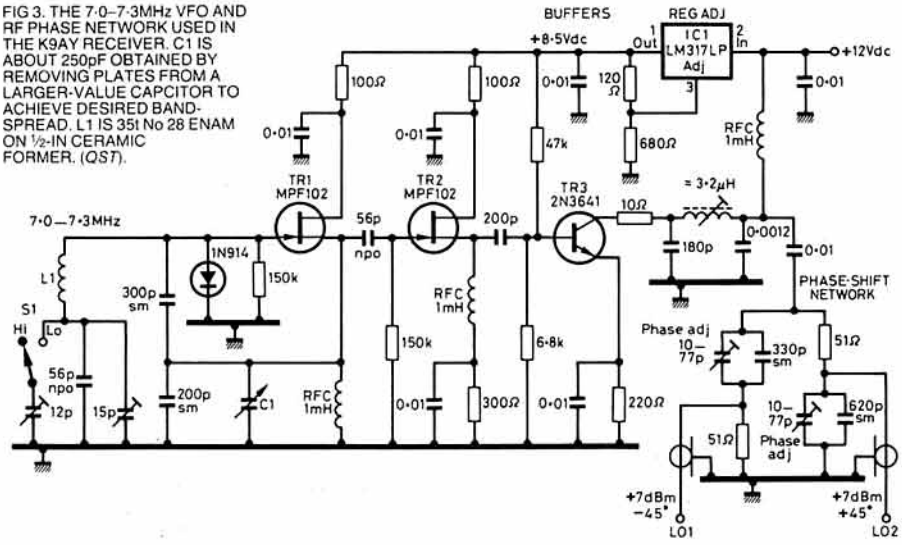


FIG 4. HIGH-PERFORMANCE SUPER-DE-GAINER RECEIVER OUTLINE. SUCH AN ARRANGEMENT SHOULD BE CAPABLE OF ACHIEVING OVER 60dB OF SIDEBAND SUPPRESSION WITH A RELATIVELY SIMPLE CRYSTAL OR CERAMIC FILTER.

PL519 GROUNDED-GRID LINEAR

George Moorfield, GW3DIX has been following with interest *TT* notes on the use of PL519/PL509 valves in high-power linear amplifiers. Ever since these valves were introduced about 1967 for use as line-output (sweep) valves in hybrid colour television sets, he has used them very successfully in a series of home-built linear amplifiers. To cope with a considerable number of on-air requests, GW3DIX last year consolidated and crystallised his experience in the form of a preferred design and has described this in eleven pages of hand-written notes and circuit diagrams. He notes that, with four PL519s (each saturating on peak demand. A transformer rated as say 650V rms at about 800mA used with a conventional full-wave bridge (doubler) circuit, or alternatively one providing 1200-1250V at 400mA, would be suitable. A combination of suitable transformers may be used, with secondaries in series, etc. Note that if windings are connected in series, it is important to use good quality components with well-insulated windings, otherwise there is the risk of a seondary winding short-circuiting to the core or to the primary winding since it is required to withstand much higher voltages than for which it was originally intended. Suitable components are still readily and cheaply obtainable at rallies, junk sales, etc.

In the GW3DIX psu shown in Fig 7, T1 and T2 have their secondaries in parallel, a practice that has to be approached with caution since voltage differentials will result in circulating currents. However GW3DIX comments: "T1 and T2 are available from Marco of Wem, Salop as 175W units at £2.50 each. When tentatively tried with the secondaries in parallel to obtain the necessary current, I could not find any two (I built four amplifiers with this psu and cheap (40 for £1!) 60V dc relays) which produced a circulating current in the secondaries of more than 3mA.

GW3DIX admits that some components are not easy to acquire these days. PL519 (B9A) valveholders are available from Jack Birkett at ▶

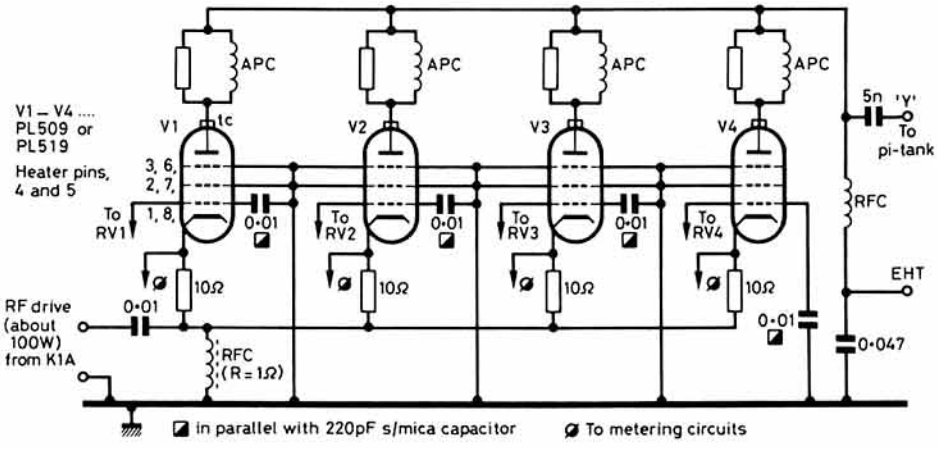


FIG 5. BASIC FOUR-PL519/PL509 GROUNDED-GRID LINEAR AMPLIFIER AS DESCRIBED BY GW3DIX

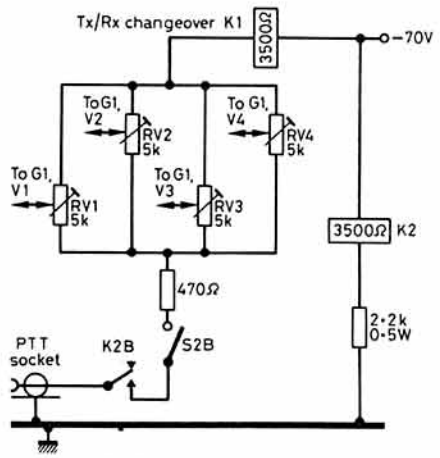


FIG 6. INDIVIDUAL BIASING POTS AS USED IN THE GW3DIX LINEAR.

30W anode dissipation) in parallel, it is possible to run up to 750W pep input, producing about 400W pep output with a 750V supply. However, he prefers to use a higher voltage (1·6 to 1·8kV) resulting in lower distortion with good efficiency. As sweep valves, the PL519 is designed to withstand up to 2·5kV anode voltage if operated correctly. In the ssb linear application, operating conditions (unless a large amount of speech compression is used) are "nowhere near as exacting as those of their regular television service. In class AB2 with 1·6kV and an input of 750W pep, an anode load of 2500 ohms is perfectly practicable. This overcomes the shortcomings of the older designs, and an operating Q of 12 is usable, with the resultant pi-tank components having normal values."

Of all the many enquiries received, GW3DIX reports that "no one who actually constructed the amplifier has failed to get it going satisfactorily." Figs 5, 6 and 7 have been extracted from GW3DIX's notes which include a total of six diagrams.

Although EL519 valves with 6·3V heaters are available in Europe, GW3DIX prefers the PL519 (40V, 0·3A heater) for the reasons already suggested by G4DTC (*TT*, May 1988) and also because, in the UK, the PL519 generally costs less than the EL519 and considerably less than American/Japanese sweep valves. Both the PL519 and EL519 have heavy duty cathodes capable of peak emission to 500mA.

GW3DIX believes that the rock on which such designs may survive or founder is the power supply. It is essential to use a mains transformer of sufficient power rating to prevent it from

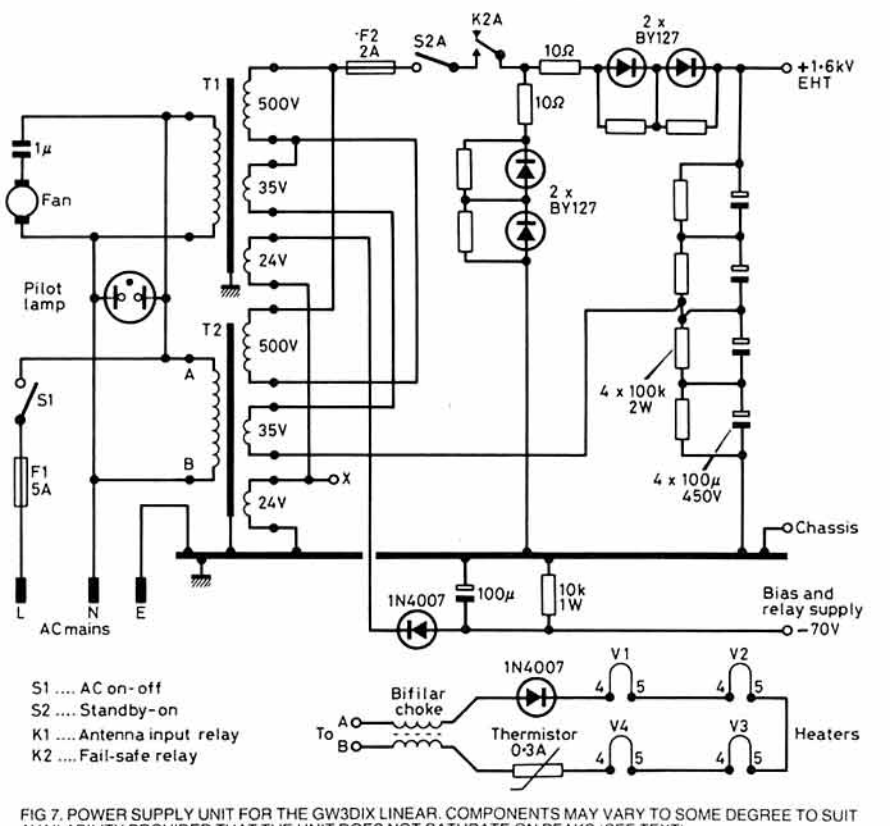


FIG 7. POWER SUPPLY UNIT FOR THE GW3DIX LINEAR. COMPONENTS MAY VARY TO SOME DEGREE TO SUIT AVAILABILITY PROVIDED THAT THE UNIT DOES NOT SATURATE ON PEAKS (SEE TEXT).

about 25p each; he also stocks twin-gang 500pF capacitors (for the pi-tank output loading) and 0·01μF 500V working disc ceramic capacitors. The bias pots are 5KΩ 1·6W wirewound television 'convergence' pots, available from Marco at about 32p each. Other components such as the various relays, 225 + 25μF (350V wkg) capacitors etc can usually be picked up at rallies or from Electronic Component Distribution, Horton, Telford. The "real stinker" tends to be the pi-tank high-voltage tuning capacitor. Available at a price at Telford but can sometimes be found at low-cost if you really hunt for them.

GW3DIX is not at all happy at the idea of anyone using the "darkened-room/glowing-anode" method of setting the standing current for this type of valve (as mentioned by G0DLN in the June *TT*).

Incidentally, if anyone has an unwanted copy of *ART7* GW3DIX would be glad to buy it (George Moorfield, Bryniau, Bull Bay Road, Amlwch, Anglesey, Gwynedd, LL68 9EA, 0407 830710). He "foolishly" lent his copy to someone . . . My own last spare copy of this out-of-print book went a few months ago to a Dutch amateur in exchange for a wartime photograph of the Abbe Museum, Eindhoven, from where it was my privilege to have many contacts, on behalf of the Dutch Intelligence Bureau (BI), with Jack Verhagen and Jan Zandbergen. PA0ZY who were operating under extremely hazardous conditions from Alkmaar (G11) in the still occupied part of Holland. A detailed account of their remarkably successful clandestine operation, from September 1944 to May 1945, has been published in *Electron* (May 1988) by Dick Rollema, PAoSE (kindly translated into English for me by J. D. Lutterot, G5AQZ/PAoLUT). Jack Verhagen, who died in 1968, was a pre-war radio officer on the 'Zwarte Zee' ocean-going tugboat and I can testify that he was able to send perfect five-letter cipher traffic on a straight key at over 27 groups per minute even under the extreme stress of a covert operation which had seen the arrest and execution of almost all the radio operators and associates of the Dutch Internal Radio Service (OD/RvV Resistance organizations). Happily, Jan Zandbergen, PA0ZY is still, at the age of 75 years, an active amateur, though PA0SE makes it clear that he has not forgotten the terrible hunger-winter of 1944-45, and his wartime work over several years for the Dutch Resistance.

To return, albeit reluctantly, to present day radio, R. Hague, G4XOU has drawn attention to the 'Carrig Linear' using three PL519 valves, described by EI8EI over several issues of the journal of the Irish Radio Transmitters Society and representing a high-power linear which can be built for under £50. However it uses a tranformerless voltage-tripling power supply with an output of about 900V dc. Personally, I feel reluctant to advise such an approach, not only because of the difficulty of achieving really good regulation without the use of really massive-value electrolytic capacitors (EI8EI uses six 350μF 350V wkg capacitors) but also because of the inherent danger of a mains-connected transmitter chassis and rf output socket. I recognise that in some circumtstances such an approach is entirely valid (eg the Danish lightweight 10W ac/dc 'Telephone Directory' clandestine transmitter-receiver, see *TT* October 1985) but this hardly applies to normal amateur operation. Remember, for example, that many UK domestic mains sockets have been shown to be incorrectly wired so there is a real risk of connecting the 'phase' (live) lead to 'chassis'. Furthermore, with traditional UK mains wiring practice or with protective multiple earth (PME) wiring, the mains neutral should never be connected directly to a real earth.

IMPEDANCES

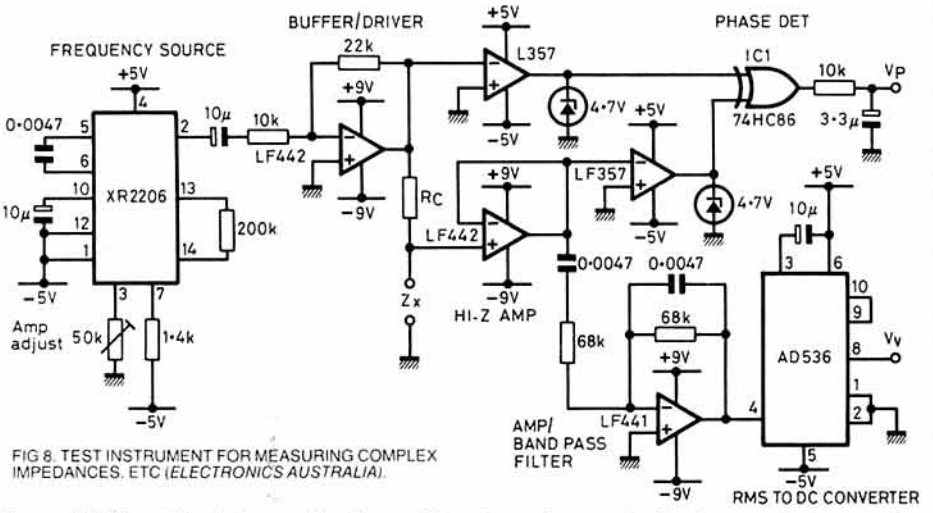


FIG 8. TEST INSTRUMENT FOR MEASURING COMPLEX IMPEDANCES. ETC (*ELECTRONICS AUSTRALIA*).

The availability of ic devices makes it possible for amateurs to build test instruments normally outside their budget range; for example the K2BLA spectrum analyser unit. In *Electronics Australia* (August 1987, p48) Andrew Stewart of Pialba, Queensland, outlines briefly, in the 'Circuit and Design Ideas' feature, an impedance meter capable of determining both the resistance and reactance of circuits comprising, for example, resistors and capacitors connected in series and for measuring the values of the reactance (and hence value) of capacitors and inductors. With an operating frequency of 25kHz the meter is for use primarily at af rather than hf.

Andrew Stewart describes the principle of operation as follows:

"This circuit (Fig 8) calculates the impedance magnitude and argument (phase) of a circuit placed across the terminals Zx. Impedance magnitude is calculated using a voltage divider network formed by the calibration resistor Rc and the unknown circuit element. Rc has not been assigned a value because its value depends on the range of impedance measured. A basic guideline is that Rc should be about 10 (times the measured ?) ohms. Values up to about 1M work well.

"The phase circuit simply compares the phases of the signals before and after they have been passed across the circuit element. A basic rule here is: Phase Angle (degrees) equals 36 × Vp (volts). Calibration of the meter is performed simply using a few impedance elements (eg resistors and capacitors joined in series) to produce calibration graphs of impedance magnitude and impedance argument versus Vm and Vp respectively".

Andrew Stewart points out that impedance meters are extremely useful test instruments but are rarely seen owing to high prices. As a result the desirability of measuring impedance is often waived in favour of more familiar measurements.

STILL MORE ON THE LOW-COST SPECTRUM ANALYSER

A further success story on the building of K2BLA's low-cost spectrum analyser (*TT* April, July, August) came in too late for inclusion in the August *TT*. This was from Steve Hunt, G3TXQ who considers that the use of the MC3356 fsk decoder ic for this application represents a "brain-wave". He writes:

"I made up the analyser as shown in the April *TT* and after one or two minor modifications it worked like a dream – it has completely changed the way I go about my circuit design! The changes I found necessary were: C7 from 5pF to 6·8pF, C13 from 6pF to 6·8pF, C14 from 2·2pF to 3·9pF. I used a ready-wound coil for L4 (Cirkit stock number 35–10864).

"At this stage I had a working analyser, but I have since made further improvements: (a) Add a 50-ohm resistor from ICL pin 20 to ground to terminate the low-pass filter. (b) The original design moves the trace off-screen on fly-back. I fed the vertical output through a 10k resistor and 'clamped' the output to ground on fly-back using an npn transistor (emitter to ground, collector to vertical output, base to blanking line through a 22k resistor). (c) I restricted the tuning range to 0 – 50MHz and added a 'single break-point' linearising network to IC3c. Replace R14 with two 27k resistors in series. Take the mid-point of these resistors through a 19k resistor and a diode to a potential divider (8·2k and 3·3k) between +12 and −12V lines. I now have acceptable linearity. (d) I get about 50dB 'on-screen' dynamic range. I added a switchable 20dB + 20dB + 10dB attenuator at the front end to give a total of 100dB dynamic range (−85dB to +15dBm).

"Like Roger Blackwell, G4PMK, I recommend a look at *QST* (November 1985) with K2BLA's earlier, rather more complex design. Readers may like to know that a company in the USA (A & A Engineering, 2521 W. La Palma, Unit K, Anaheim, CA92801 USA (714) 952-2114)) advertises a complete kit of parts for a

spectrum analyser adaptor based on the *QST* design. It offers 0 – 400MHz, digital readout and two bandwidths for $399.

"I reckon the use of the MC3356 in this application is a 'brain-wave'. I now intend building another even simpler analyser by using just one conversion to 35·4MHz – a frequency for which you can get crystal roofing filters and at which the MC3356 works directly. The next step then has to be a matching tracking generator."

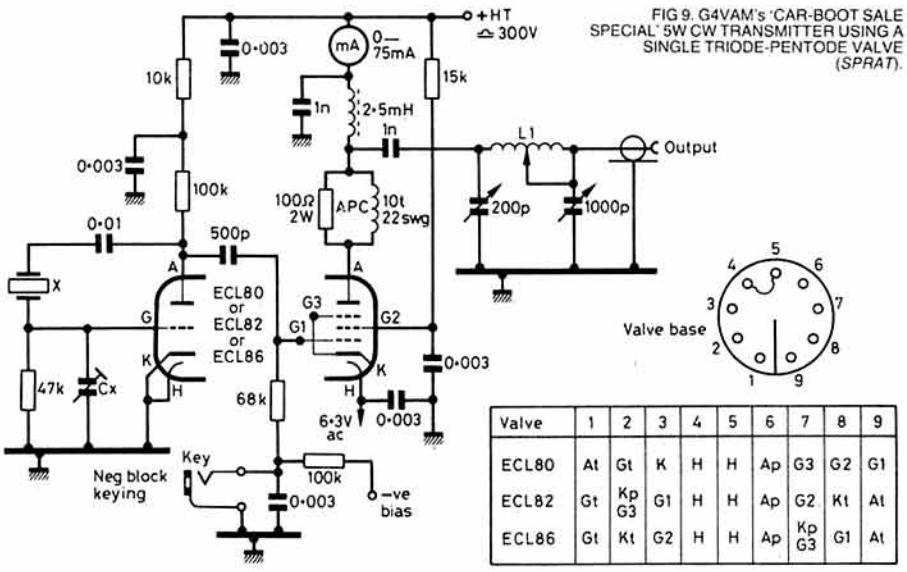
G3TXQ would be happy to help advise any readers who may be having difficulty in building their own unit (0604 858090 or stamped addressed evelope to Steve Hunt, 21 Green Street, Milton Malsor, Northampton NN7 3AT).

"ONE HOUR" TRANSMITTERS

In *TT* (April 1981, p333) I included some extracts from a letter that Al Rechner, VK5EK had written to the Australian *Amateur Radio* (February 1981, p38). In this he commented on designs for 5W cw solidstate QRP transmitters containing almost 100 components as "a stunning example of solid-state technology gone berserk . . . If we are trying to overcome the black box syndrome by inducing people to build their own equipment, then we will maximize our chances of success by presenting simple, cheap projects. Good applied engineering is concerned primarily with securing a good design objective in the simplest and cheapest manner."

With his letter, he presented an alternative design for a 5W crystal-controlled 3·5/7MHz transmitter based on a single triode-pentode valve (eg ECL82, ECL84, ECL85 or ECL86) as co-pa using only about 20 components and which he claimed could be built in about an hour or so yet would do substantially the same job as the 100-component solidstate transmitter.

Seven years later I was interested to note a basically similar valve design (Figs 9, 10), with some useful additions, described by Paul Harrison, G4VAM in *Sprat* (Journal of the QRP Club, Summer 1988, p11) as the "Car-boot-sale special". His title derived from the fact that the valve, the mains transformer and the smoothing capacitor had all been salvaged from an old tape recorder bought at a car-boot sale for 50p. With an ECL86 valve it provides some 6W output on 1·8MHz, about 5W on 3·5 or 7MHz, 4W on 10·1MHz and a modest 1·5W on 14MHz. He uses negative block keying to provide a crisp clean note. With 4 to 6W output, such a rig (even with a modest antenna) is capable of providing plenty of good 100-per-cent contacts at first-hop ranges.



Valve	1	2	3	4	5	6	7	8	9
ECL80	At	Gt	K	H	H	Ap	G3	G2	G1
ECL82	Gt	Kp G3	G1	H	H	Ap	G2	Kt	At
ECL86	Gt	Kt	G2	H	H	Ap	Kp G3	G1	At

FIG 9. G4VAM's 'CAR-BOOT SALE SPECIAL' 5W CW TRANSMITTER USING A SINGLE TRIODE-PENTODE VALVE (*SPRAT*).

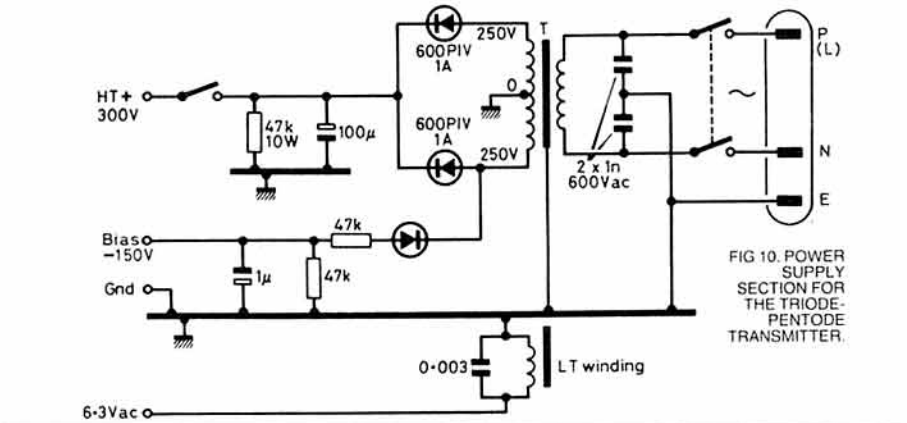


FIG 10. POWER SUPPLY SECTION FOR THE TRIODE-PENTODE TRANSMITTER.

TWO-TERMINAL KALLIROTRON OSCILLATOR

A rewarding result of delving back into early valve circuitry is that one stumbles across ideas that could be readily adapted to mosfet semiconductors – apart from the pleasure to be derived from hunting down the origins of an interesting circuit. *TT* (August) showed, with the help of a number of readers, that the push-pull 'kallitron' oscillator stems from "The Kallirotron, an aperiodic negative-resistance triode combination" by L. B. Turner, published in *The Radio Review* (Vol 1, No 7, April 1920. This journal was later renamed *The Wireless Engineer* and continued to be published by Iliffe's until the 1950s. The merits of the kallirotron circuit, later corrupted (by mistake?) to 'kallitron', as a variable push-pull oscillator, were later stressed, as noted jn the July *TT*, by Herbert J. Reich in *Proc IRE*, November 1937.

I recently tracked down in the Science Museum Library, the original paper by Turner which, incidentally, explains that 'kallirotron' pronounced with the second syllable accented, vowel short, is derived from Καλλιροοτ, the Greek word meaning 'easy flowing'. In his introduction, L. B. Turner notes that: "In a recent triode invention known as the 'Dynatron' (A. W. Hull, *Proc IRE*, February 1918) by virtue of the phenomenon of copious emission of secondary corpuscles from a plate under sufficiently violent bombardment by primary corpuscles, the same negative resistance effect is obtained in quite another way (than by exalting the amplifying action of a triode by introducing magnetic or electric retroaction). The dynatron, being applicable to circuits containing resistance only, as well as to oscillatory circuits, is competent to reduce indefinitely the impedance of a circuit for currents of any frequency, including even steady current.

"The arrangement to be described here consists of a combination of circuits, which may be aperiodic, including two ordinary triodes in which secondary emission plays no part, whereby electrical resistance is annihilated – the result achieved in the dynatron by dependence on secondary emission."

It is also clear that Turner foresaw numerous applications, apart from its use as a limiter-amplifier. A short Section 8, headed 'Kallitorton as oscillator', was as follows:

"Any negative-resistance device can obviously be used to produce sustained oscillation. One simple arrangement is that shown in Fig 11 ▶

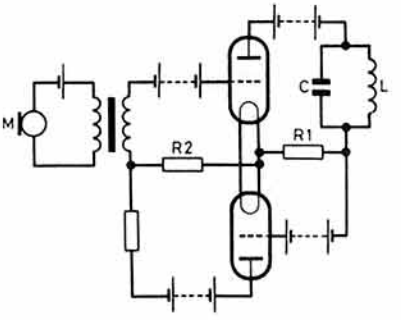


FIG 11. THE ORIGINAL 1920 'KALLIROTRON' (EASY FLOWING) OSCILLATOR/TRANSMITTER AS DESCRIBED BY L. B. TURNER.

where the circuit *LC* begins to oscillate with approximately its own independent frequency as soon as the retroaction (ie positive feedback – G3VA) has been increased sufficiently to reduce the resistance of its action below zero. Where such an oscillator is to be used for wireless telephony, speech control can be effected by a microphone M and transformer, the secondary of the latter being conveniently inserted between either grid and its resistance *r*." But note well that *TT* does not recommend the use today of a 1920 modulated power oscillator producing a mixture of a.m. and fm!

Isaac Lederer, ORS87664 has drawn attention not only to Reich's 1937 *Proc IRE* paper but also to a modified 'Two-terminal push-pull oscillator' described by E. J. Cuddy in *Electronics* (August 1955). This begins: "Of the many types of two-terminal oscillators in use at the present time, the Kallitron has the advantage of push-pull action. This circuit has one drawback, however; the fact that the tank is at dc plate potential and not easily adapted to use with the usual tuning capacitor.

"One possibility is an arrangement such as shown in Fig 12 (a). When the circuit is redrawn as in Fig 12 (b) it is seen to be a bridge-type circuit balanced with respect to the tank until oscillation starts. This conformation has another

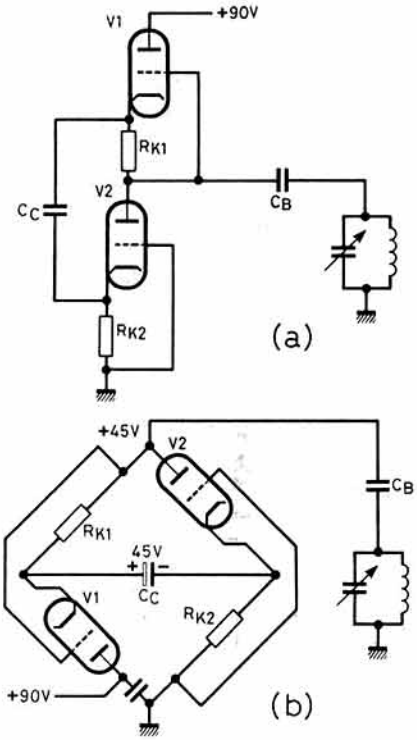


FIG 12. (a) THE TWO-TERMINAL PUSH-PULL OSCILLATOR DERIVED FROM THE 'KALLITRON' OSCILLATOR BY E. J. CUDDY IN 1955. (b) REDRAWN TO SHOW THE BRIDGE CONFIGURATION. THE CIRCUIT COULD BE READILY ADAPTED FOR FET DEVICES.

advantage over the usual push-pull circuit in that the tube grid-to-plate capacitances are in parallel across the tank. This tends to lower the effect of any variation in the output capacitances of the tubes with a change in their grid voltages. Capacitor Cb is used to block dc and is not critical although it should have only a small impedance at the lowest frequency used. Cc should offer a low impedance at the frequency of oscillation. However, it may be replaced by a series-resonant circuit. For fixed frequency operation this may be a crystal used at its series-resonant frequency. Rk1 and Rk2 should be approximately the recommended cathode bias resistors for class A operation . . . The most important factor contributing to good frequency stability and low harmonic content seems to be the class A mode of operation. The simplest method found for adjusting the circuit to these conditions was variation of the plate voltage. This makes it simple to adjust for each range when switching bands, by means of a series resistor simultaneously cut into the plate circuit.

"As in other types of oscillators, a high tank *Q* seems to increase frequency stability but some low-Q tank circuits were made to operate in a satisfactory manner by adjustment of the plate voltage. Loading of the tuned circuit can be prevented by taking the output from the cathode of V2 when amplitude is not important.

"When tried in a superhet receiver this oscillator worked well from 500kHz to 15MHz and over the vhf/fm band using a 7F8 duotriode. It was also possible to use it as a locked oscillator by feeding a signal between the cathode of V2 and ground, as long as the method of coupling did not interfere with normal circuit action. With an antenna attached at the cathode of V2 and a load in the plate circuit between V1 and ht+, a stable regenerative receiver was formed. By inserting the correct RC combination between the grid of V2 and ground it is possible to obtain superregenerative action with this same arrangement . . ." ■

HINTS AND TIPS

Geoff Bagley, G3FHL offers a useful tip on tuning capacitors for stable variable frequency oscillators. He writes: "Most single-ended variable capacitors have some form of wiping contact to short out any resistance, which may fluctuate, in the bearings. Both the contact resistance of the bearings and the wiping contact springs may exhibit unstable contact resistance, be it only a fraction of an ohm. This is often a source of flicker-noise since it carries the main circulating current of the vfo tank circuit. The problem is avoidable by using a small twin-gang variable as a split-stator capacitor. The path of the main circulating current now lies along the solid shaft of the variable capacitor and there is no fluctuating contact resistance in series with the oscillating current."

G3FHL has also been considering the potential use of copper-foil adhesive tape for winding stable inductors: "I obtained some tape from RS Components (512-266) and its width (10mm) should ensure a good Q factor. It can also be silver plated for reduced rf ohmic losses. A further advantage: the windings won't slip."

Electrolube, makers of contact lubricants, point out that even keeping contact surfaces clean and dry does not necessarily remove the problems of noise caused by high contact resistance in switches. Four main factors influence contact resistance: contact surface condition, contamination, frettage and contact bounce. A contact lubricant evens out the peaks and troughs of the contact surface, thus increasing the contact surface area. This in turn reduces contact resistance, minimises the formation of hot spots and reduces surface deformation due to friction wear. Lubrication also reduces the effects of arcing since the lubricant forms a bridge between the partially-open contacts to prevent current concentration of the contact-surface peaks and thus reduces current flow on switching more gradually.

John Greenwell, G3AEZ draws attention to 'Metashrink MSB' a lay-flat pvc with an aluminium outer skin forming a shrinkable tubing intended for such applications as rfi/emc shielding. According to the stockist (Bowman Electronics Plc, Europa Trading Estate, Fraser Road, Erith, Kent DA8 1QL, tel 03224-38182) this can be used as an inexpensive outer shield on cables and as an inner shield for wire termination within connectors; it can apparently also be used to reduce emission from small pcbs – and conversely improve their immunity to rfi. The shrinkable tubing is supplied in six 'lay-flat' widths from 10 to 100mm. Shrink temperature is 98°C with a shrink ratio of 2·5:1. It is not clear if such sheets are available in quantities and prices geared to amateur budgets.

To add to the earlier suggestions on how to feed 12V equipment from 24-28V vehicle batteries (*TT*, March 1988, p182), G B Wolfe in *Electronics Australia* notes that it is possible to obtain a voltage-regulated supply at up to 10A by using two 78H12A three-terminal TO-3 ic regulators (Fig 13) provided that low-value

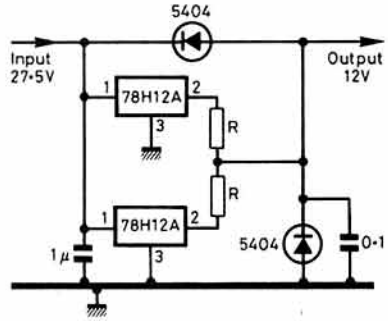


FIG 13. ARRANGEMENT PROVIDING 12V AT UP TO 10A FROM 27·5V VEHICLE BATTERY. NOTE THAT EFFICIENCY OF ALL SUCH ARRANGEMENTS WILL BE LESS THAN 50 PER CENT. (*ELECTONICS AUSTRALIA*).

resistors R are used to ensure equal sharing of the load. His resistors were each made from a piece of toaster-element 0·5-in in length. To the ends of these he crimped lengths of thick copper wire to form pigtails for connecting into circuit. For heavy current loads the regulators need to have good heatsinking.

On the same topic, Christopher Henn-Collins, GU5ZC has often used an arrangement similar to Fig 6 of the March *TT* but adds a further suggestion: "Put a car/truck bulb, with a current rating appreciably greater than that required by the load, in series with the collector of the power transistor (2N3055). In normal use its resistance is low and the bulb does not light. Under fault conditions, it lights and saves the power pack. I have also found the idea useful with car-battery chargers saving short-circuit problems and rectifier burn outs."

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CW – THE EASY WAY

DESIGN FOR A CW TRANSCEIVER FOR 14MHz

BY GEORGE FARE G3OGQ

Born 1929. First licensed as VQ2GF in 1957 in Northern Rhodesia (now Zambia), which meant that the only way to get on the air was to build one's own. Apart from a brief, and unsatisfying, foray into black box operating, has always operated a home constructed station with the main emphasis on dx. He is an active member of Warrington Amateur Radio Club and is the author of a number of articles previously published in *Radio Communication*, winning the Ostermeyer Cup in 1984.

There is no reason why it should be expensive to get on to the hf bands and work dx provided you are content to work cw. The transceiver presented here is capable of working worldwide dx under reasonable conditions and is quite small enough to be used portable.

It was conceived originally as a club project to enable new Class A licensees to get on the air easily and cheaply, giving them experience in construction at the same time. Seven have been built so far, with several more in various stages of construction.

BASIC SPECIFICATION

As it is dedicated to cw, there are no compromises in the design as usually happens with multi mode transceivers.

It includes a single conversion superhet receiver with a home made crystal filter and audio response tailored for cw. Sensitivity is luV for a S/N ratio of 12dB. The transmitter has an output power of 15 to 20W and incorporates semi break in.

Coverage is 14 to 14·10MHz, but this could quite easily be changed to most other hf bands by changing the vfo, the two band pass filters and the output circuit.

Use of a superhet receiver does not necessarily introduce difficulties in construction compared with a direct conversion receiver. In fact, it is much easier to produce good (ie, single signal) selectivity and there is a complete absence of microphonics which are sometimes difficult to suppress in a direct conversion design.

Incorporation of relatively cheap ic.s and standard crystals make this design very cost effective and there is no need for expensive test equipment to align it.

DESIGN IN DETAIL

A block diagram of the transceiver is given in Fig 1 and the circuit diagram in Fig 2.

It is based on the use of NE602 ICs which contain an oscillator, buffer and double balanced mixer in an eight pin DIL package. They are readily obtainable from Quarndon Electronics (all three of them used here cost about the same as one SBL-1 mixer). The chip also contains an input amplifier which typically gives a gain of 20dB at 8V. The third order input intercept point is −12·5dBm (which is approximately +5dBm output intercept) and offers a conversion gain of 14dB minimum.

The IC is designed for optimum low power performance and there is a limitation on its strong signal performance owing to the presence of the rf amplifier. It was always intended during the design of the receiver to incorporate a switched attenuator in the front end but, in practice, this has not been found to be necessary and the idea was dropped.

On receive, the signal is passed through a band pass filter to the combined mixer and vfo. The vfo is tuned by means of a varicap diode and has proved to be exceptionally stable. A variable capacitor could, of course, be substituted if desired. The vfo runs at 4MHz giving the i.f of 10MHz – chosen because 10MHz crystals are usually accurate, readily available and cheap.

The filter following the mixer is a lower sideband ladder filter consisting of two crystals with input and output matching and has a bandwidth of about 300Hz. Three crystals should be purchased at the same time, the third being used in the bfo.

After passing through the filter, the signal is amplified by a SL1612 which is agc controlled. This amplifier is cut off on transmit by a voltage applied to the agc pin.

After amplification, the signal is passed to the second NE602 which acts as a combined i.f amplifier, product detector and bfo. The bfo operates at 10MHz on transmit and is shifted by about 700Hz on receive. In order to be compatible with commercial transceivers, it is necessary for the bfo, on receive, to be above the transmit frequency. As the filter is not symmetrical (the sharpest cut off being on the high frequency side) this is in any case preferable as we can arrange for the transmit frequency to be at the i.f frequency with the receiver bfo above the passband of the filter.

Audio from the NE602 is then amplified and filtered by one half of a dual op amp (RC4558) which is configured to give a gain of 20, a Q of 10 and a centre frequency of 750Hz. The main purpose of this filter is to cut down the noise from the wideband i.f amplifier as the main selectivity is governed by the crystal filter.

A further amplifier follows which increases the audio to loudspeaker level.

AGC is audio derived and is taken from the output of the first half of the dual op amp and amplified by the second half. Time constants of the agc system are tailored to cw and although only one stage of amplification is controlled by the agc, it is nevertheless quite effective.

On transmit, the vfo and bfo signals from the appropriate NE602 are buffered and fed to a third NE602 which acts only as a mixer to produce a 14MHz signal. A band pass filter follows and then four stages of amplification boost the signal to the required output. The final amplifier has a T section filter in the output and harmonic radiation is well within acceptable limits.

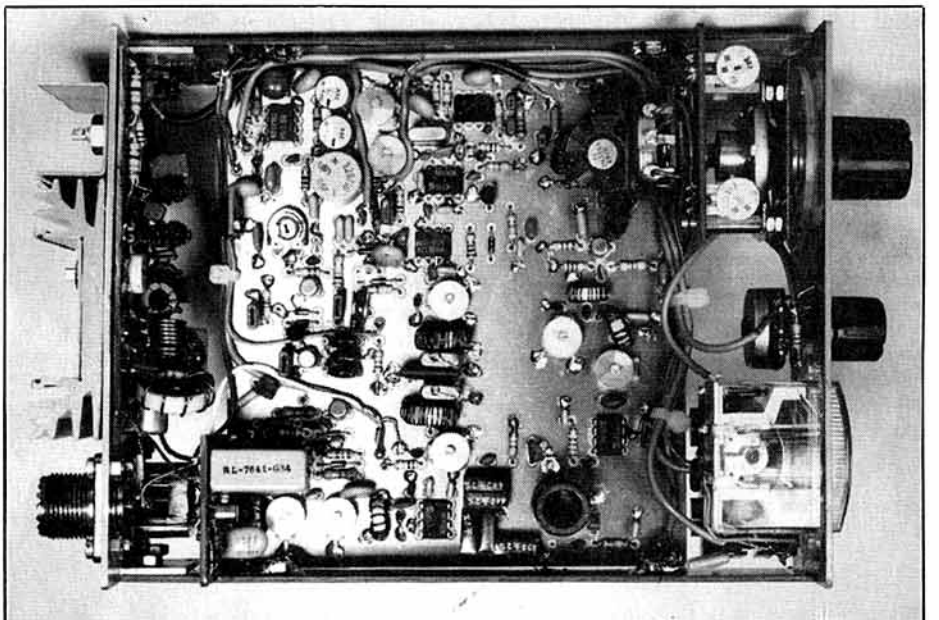
Keying is performed by switching on the vfo and bfo buffers and the transmit mixer, at the same time muting the receiver i.f amplifier. A side tone oscillator is also switched on by the transmit voltage and the output is fed to the audio amplifier. All other stages except the agc remain on, whether in transmit or receive, thus making break in keying feasible. The only speed limitation is the use of a relay for antenna changeover which is seperately keyed with a time constant which prevents the relay changing over between dots.

CONSTRUCTION

Except for the driver and PA stages, and antenna changeover, all the circuitry is contained on one main board measuring 5″ × 4½″. PCB layout is given in Fig 3.

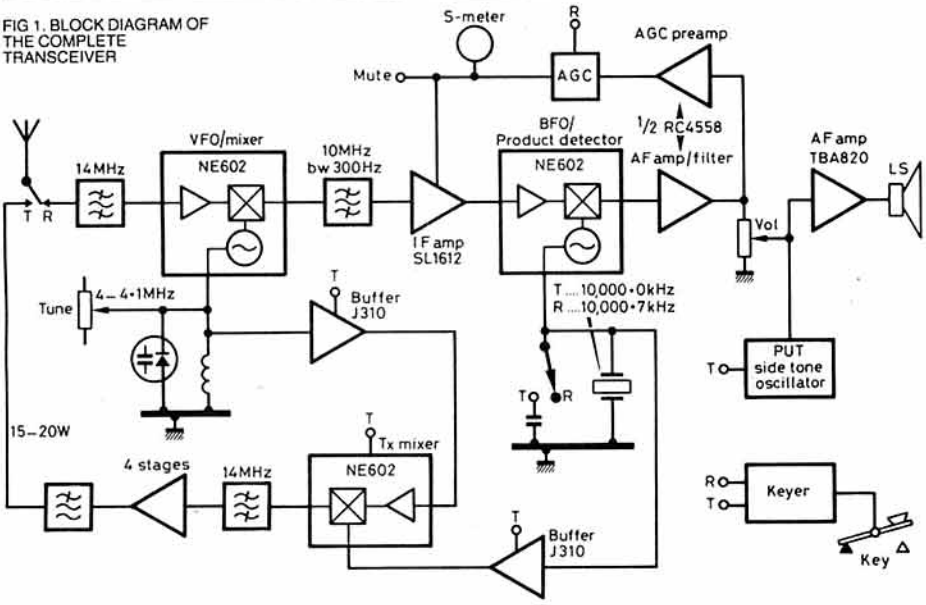
The board is double sided, the top surface being used as a ground plane with all grounded components soldered direct. Mount the components as shown in Fig 4 except for the three crystals. (Note also the three links between the tracks and ground plane.) When winding toroids, space the windings around the core to occupy about 270 degrees, and count the number of outside loops to ascertain how many turns have been applied. Bifilar and trifilar windings are made by twisting two or three wires together, as appropriate, at the rate of six twists per inch before winding.

When all components, except the crystals, are mounted, attention should be turned to the filter. Excessive bandwidth of the filter can be caused by a frequency difference between the two crystals. The use of standard 10MHz crystals in this filter should mean that the frequency difference will be small, but it is well worth checking. First, mark the crystals to identify ▶



INTERIOR VIEW. THE PA BOARD IS MOUNTED VERTICALLY ON THE RIGHT AND THE ANTENNA CHANGEOVER BOARD IS MOUNTED VERTICALLY NEAR THE INPUT BAND PASS FILTER. NOTE THAT THE VFO IS AT THE OPPOSITE END OF THE CABINET AWAY FROM SOURCES OF HEAT. THE PHOTO IS OF AN EARLY VERSION – SINCE THEN THE AGC AND OSCILLATOR STAGES HAVE BEEN REVISED.

FIG 1. BLOCK DIAGRAM OF THE COMPLETE TRANSCEIVER



them and solder them in the position of X3, one at a time. Apply 12V to the board and check the frequency at the gate of TR2 with a frequency counter, if one is available. If not, monitor the signal on the receiver and select two of the three crystals which are closest in frequency by listening to the beat note. When these two are selected, solder them in X1 and X2 positions, grounding the cases to the ground plane with a wire soldered to the top of the crystal case. The third crystal is mounted at X3.

When all components are mounted fit the volume control and loudspeaker and apply 12V.

Check the operation of the audio stages by touching the input pins with a screwdriver when a hum should be heard in the loudspeaker.

If a frequency counter is available, tune C38 to a frequency of 10000·7kHz (this can be checked by applying the probe to the gate of TR2). If a frequency counter is not available, the bfo can eventually be tuned with an incoming signal, but in the meantime tune C38 for the loudest noise in the loudspeaker.

The vfo should now be checked to ensure that it covers the required range. Earth the Vc pin and check the frequency of the vfo. This should be just below 4000kHz and can be measured with a counter at the gate of TR1 or by listening for the signal on a receiver. Disconnect Vc from the ground and apply 8v. The frequency should increase to 4100kHz or just above. A little judicious movement of the last turn or two of L3 should bring the range correct. When you have done this, fix the turns in place with Araldite or similar adhesive. The tuning potentiometer and its trimmers (R1 and R3) may now be wired in.

Attaching an antenna to the receiver input pin (a short length of wire will do) should produce audible signals. Peak C3 and C5 for the loudest signal and then tune the filter. In the absence of measuring equipment, the filter can be tuned, by means of C20 and C24 for the loudest signal consistent with a low level of background noise. Another rather elegant method is to connect an antenna to pin 5 of IC1 and tune the filter for reception of 10MHz standard frequency signals. As already mentioned, one of the characteristics of a ladder crystal filter is that the sharpest cut-off occurs on the high frequency side, forming a lower sideband filter.

The shape of the passband is determined by the size of C22 and correct matching at the input and output, and the object is to make the passband above 10MHz as narrow as possible so as to produce only one signal. The trick, therefore, is to tune C20 and C24 until only one response is heard. This all sounds much more complicated than it really is and a couple of hours' patient work will be well rewarded. Final adjustment is probably best carried out when the whole receiver is complete, using 14MHz signals, to ensure that each signal is only heard once.

The agc action should now be checked. With no signal, there should be about 0·3V on pin 7 of the SL1612. Injecting a strong signal or listening to a strong signal should increase the agc voltage. You can then calibrate the S-meter by adjusting R30 either subjectively by listening to a signal which you judge to be S9, or by setting S9 for a 50μV input at the antenna terminal.

Attention should now be directed to the transmit side.

Fit a 47Ω resistor between the output pin and ground and earth the 'key' pin. The side-tone should be heard from the loudspeaker and the level can be adjusted by R36. Adjust C37 for a frequency of 10000kHz, measured at the gate of TR2.

The rf output can be checked by means of an rf voltmeter or an oscilloscope; failing that, the signal can be monitored on a receiver.

Peak up trimmers C78 and C82 for maximum output which should be about 6V peak to peak or 2·1V rms. The two trimmers interact slightly and the adjustment should be performed two or three times.

The main board is now complete and the driver and PA board should be constructed next. The pcb layout is given in Fig 5 and the components layout in Fig 6. Drill 10mm diameter holes in the transistor positions and link the two sides together by drilling six holes where shown and solder a wire link through.

After making the pcb, it should be mounted on its heat sink using the transistors to sandwich the board. The transistors should then be soldered in place making sure that there is no strain, particularly upwards, on the leads. Heat sink requirements are quite modest as the PA runs at 75 per cent efficiency and a 6·2°C/W heat sink is sufficient.

Following that, all other components are mounted and soldered direct to the surface of the pcb. Keep all leads as short as possible.

TESTING

To test, fit a dummy load and some means of measuring the power output – ie, an rf voltmeter or ammeter, oscilloscope or an swr meter. Connect a coaxial cable to the main board from the input and apply 14V. Switch to transmit and adjust C102 for maximum output which should be 15W or more.

To ensure minimum radiation of harmonics, listen to a receiver tuned to the second harmonic of the transmitted frequency and tune C102 for minimum signal, making sure that the fundamental signal stays at the same strength.

This board is inherently completely stable and there should be no problems. If the power output is too great, reduce the size of R46 and vice versa.

The only remaining work is to fabricate the antenna changeover board which can be built on a piece of Veroboard or to the track layout in Fig 7 if the specified relay is used, with component layout as Fig 8, and connect the key and phone sockets, tune control and trimmers. R3 can be used to set the bottom of the range to 14000kHz on transmit and R1 is used to set the top of the range to 14100kHz.

The cabinet used on the prototype was home made with the front panel fabricated from double sided pcb. The tune potentiometer is fitted with a 6:1 reduction drive which is calibrated by means of a receiver or counter. The tuning is not linear but is quite adequate for this purpose as we are only tuning 100KHz for 270 degrees of the dial.

The back panel was constructed from 16swg aluminium as were the top and bottom covers which are bolted to 1" high runners on each side made from pcb material. The overall size is 5¼" × 6½" × 2". A commercial case can, of course, be used and will save a great deal of time and effort, but it must be metal. Plastic cases are not suitable. For base station use, a larger case could be used incorporating a psu.

POWER REQUIREMENTS

Power requirements are quite modest, 110mA being needed on receive and 2·25A on transmit with key held down. 14V are needed to produce a well regulated 12V from the 7812 regulator although a 13·8V supply has been successfully used. The supply should be well regulated or the cw signal will be degraded.

COMPONENTS

All components are readily available from a number of sources. Amidon toroid cores may be obtained from TMP Electronics and the NE602 from Quarndon Electronics. The driver and PA transistors offer considerable latitude. Almost any NPN transistor capable of 2W output can be used as a driver; BFQ34, 2N5589, 2N5590 have all been successfully used instead of the 2N6080.

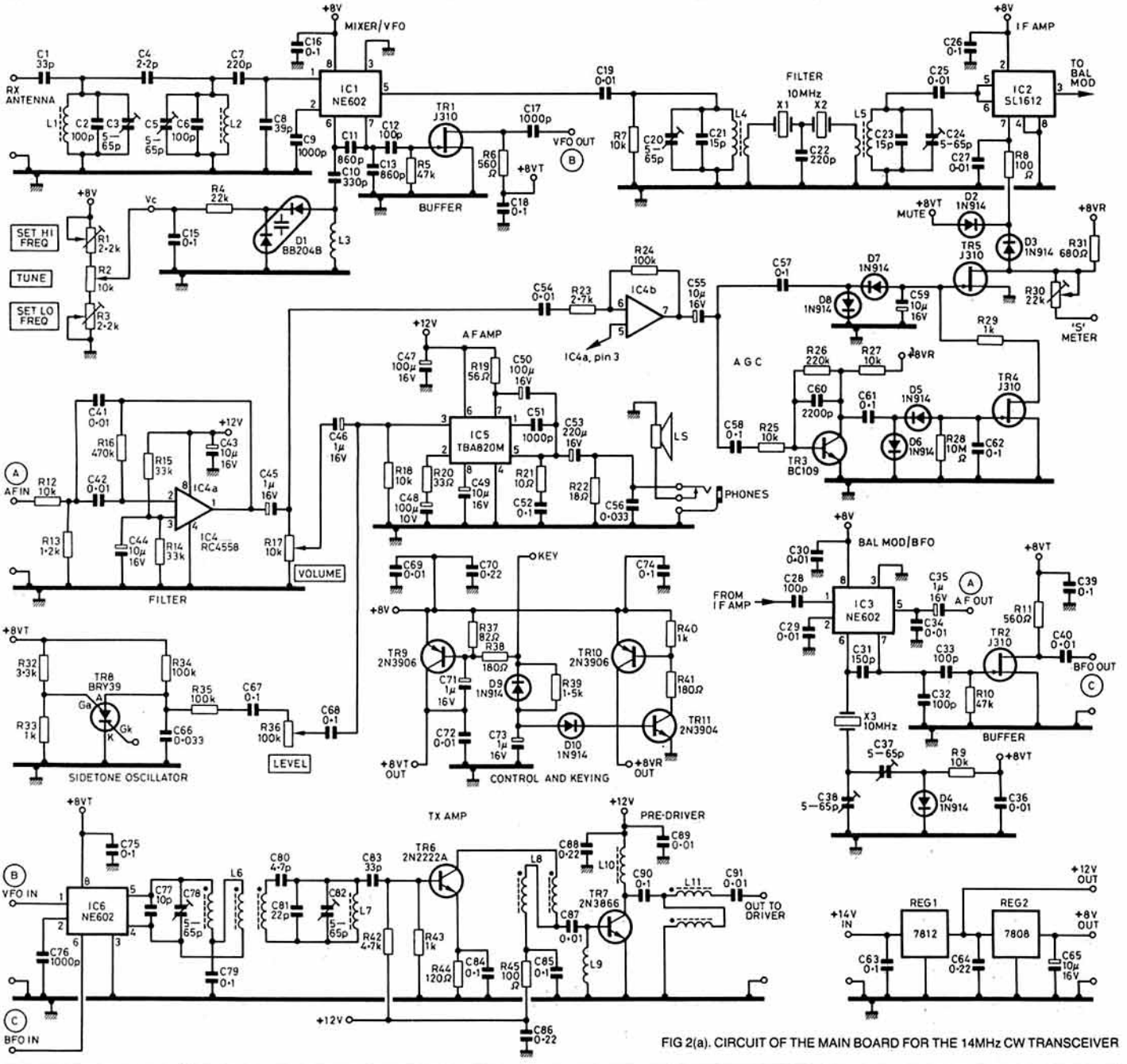


FIG 2(a). CIRCUIT OF THE MAIN BOARD FOR THE 14MHz CW TRANSCEIVER

For the final amplifier, a MRF449A, MRF450A, 2N6084, BLW60, PT9796A, ASO-12 have all been tried and work satisfactorily, the only problem being the method of mounting.

A BFY90 will perform as well as the 2N3866. Where a BC109 is specified, almost any npn transistor will do and MPF102 can be used in place of J310. Any pnp transistor capable of passing 200mA may be used in place of 2N3906.

Polystyrene capacitors may be used in place of silver mica.

PERFORMANCE

The cw waveform is a bit hard, but no clicks can be detected when monitored on a receiver nor have any been reported in QSO. This is due to exaggerated shaping of the rising waveform in the keying circuit which the Class C transmitter stages tend to straighten, the result being an acceptable waveform.

The presence of a 'built-in' rf amplifier as part of IC1, as already mentioned, can lead to some intermodulation distortion. A good antenna will minimise this although if you have very strong local QRM, it might be necessary to introduce an attenuator (just like the TS940S) before the input band pass filter.

It will, however, come as a very pleasant surprise to you to find how much easier it is to work dx with relatively low power using cw than it is with ssb. There is no point in listing countries worked, but as an example, wac was made in one operating session. The sensitivity of the receiver is excellent – well up to the standard of much more expensive receivers – and operating convenience is very good. All that is required to go from receive to transmit, is to press the key!

It should go without saying that, for best performance, an atu or an antenna with an impedance of 50ohms should be used, or the input band pass filter will not perform properly. The transmitter won't be correctly matched either and so the harmonic output will rise. If it is impossible to correctly match the antenna, for example in a mobile or portable situation, then an additional low pass filter is desirable between the output and the antenna.

A set of printed circuit boards can be obtained from the author. Please enclose a sae with any enquiries. ▶

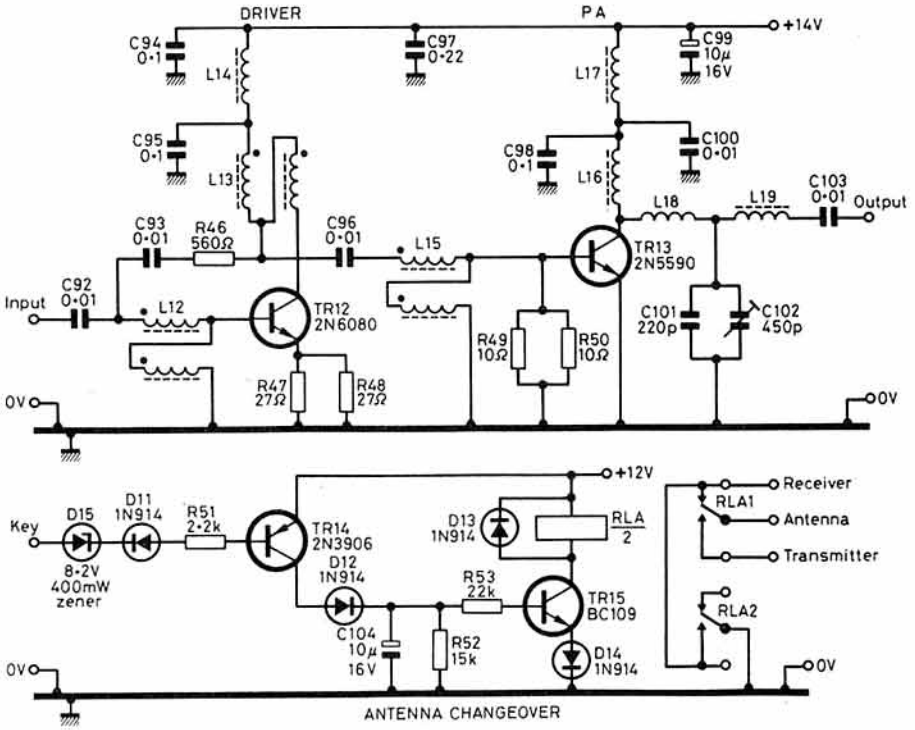


FIG 2(b). CIRCUITS OF THE PA AND ANTENNA CHANGEOVER UNIT

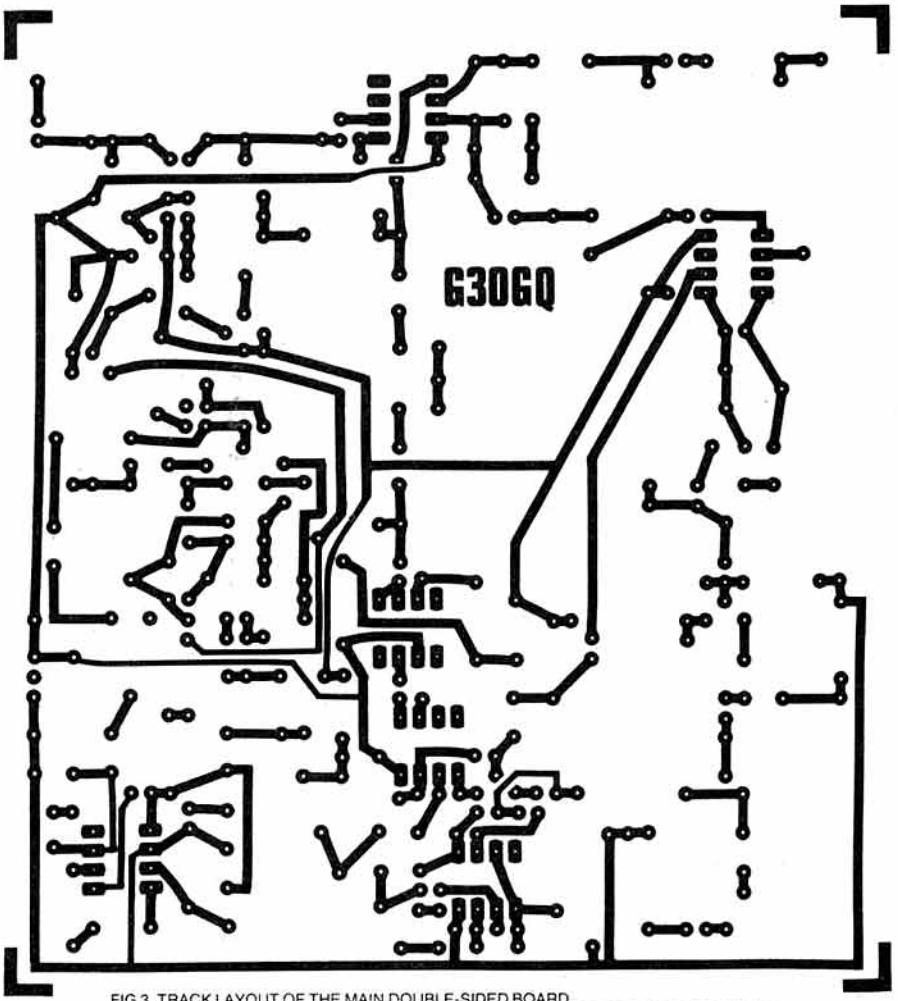


FIG 3. TRACK LAYOUT OF THE MAIN DOUBLE-SIDED BOARD.
HOLES ON THE GROUND-PLANE SIDE ARE ENLARGED AS REQUIRED FOR GROUNDING

COMPONENTS LIST

RESISTORS

¼W

R21,49,50	10R
R22	18R
R47,48	27R
R20	33R
R19	56R
R37	82R
R8,45	100R
R44	120R
R38,41	180R
R6,11,46	560R
R31	680R
R29,33,40,43	1k
R13	1k2
R39	1k5
R51	2k2
R23	2k7
R32	3k3
R42	4k7
R7,9,12,18,25,27	10k
R52	15k
R4,53	22K
R14,15	33k
R5,10	47k
R24,34,35	100k
R26	220k
R16	470k
R28	10M

Potentiometer

R2,17	10k log

Preset variable horizontal mounting

R36	100k

Preset variable, vertical mounting

R1,3	2k2
R30	22k

CAPACITORS

Ceramic plate

C19,25,27,29, 30,34,36,40,41, 42,54,69,72,87, 89,91,92,93, 96,100,103	0·01µF
C56,66	0·033µF
C15,16,18,26, 39,52,57,58, 61,62,63,67, 68,74,75,79, 84,85,90,94, 95,98	0·1µF
C64,70,86,88, 97	0·22µF

Silver mica or polystyrene

C22,101	220pF
C10	330pF
C11,13	390+470pF in parallel

Mullard 682/630 series ceramic

C4	2·2pF
C80	4·7pF
C77	10pf
C21,23	15pF
C81	22pF
C1,83	33pF
C8	39pF
C2,6,12,28,32,33	100pF
C31	150pF
C7	220pF
C60	2200pF
C9,17,51,76	1000pF

Electrolytic radial mount

C47,50	100uF 16V
C53	220uF 16V

Electrolytic, tantalum bead

C35,45,46,71,73, C43,44,49,55,59	1µF 16V
65,99,104	10µF 16V
C48	100µF 10V

TRIMMERS

C3,5,20,24,37 38,78,82	5-65pF
C102	450pF

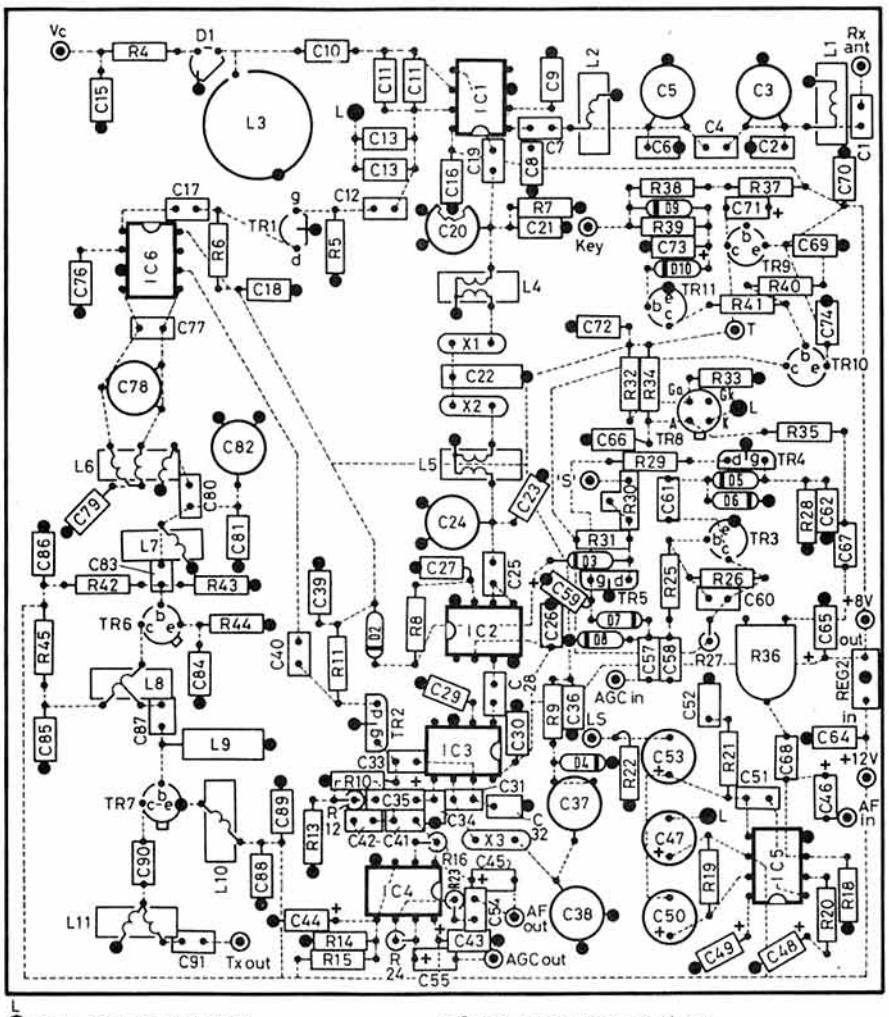


FIG 4. MAIN BOARD COMPONENT LAYOUT. L = TRACK TO GROUND PLANE. O = SOLDER TO GROUND PLANE

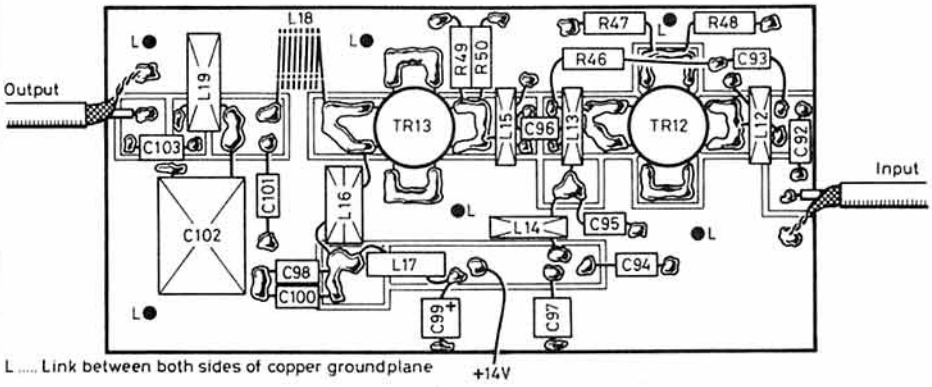


FIG 5. PA BOARD COMPONENT LAYOUT. L = LINK BETWEEN BOTH SIDES

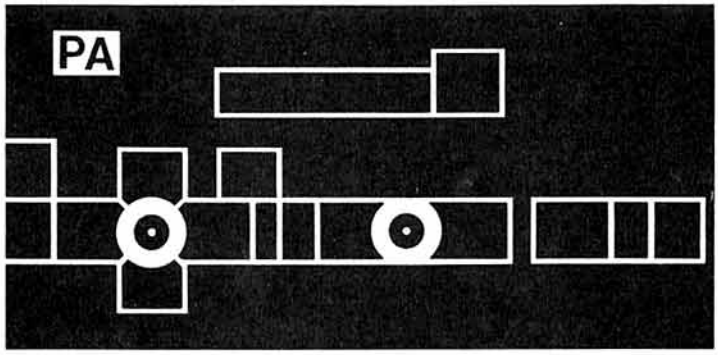


FIG 6. TRACK LAYOUT FOR THE PA BOARD (DOUBLE-SIDED). HOLES FOR TRANSISTORS ARE 10MM DIAMETER

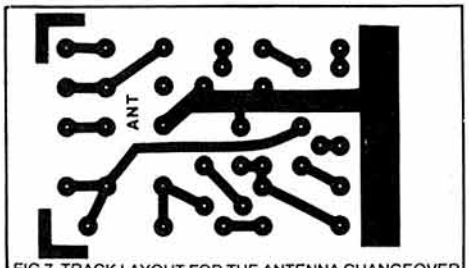


FIG 7. TRACK LAYOUT FOR THE ANTENNA CHANGEOVER (SINGLE-SIDED)

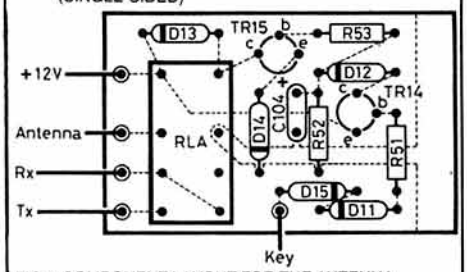


FIG 8. COMPONENT LAYOUT FOR THE ANTENNA CHANGEOVER

COMPONENTS LIST

DIODES

D1	BB204B
D2 to D14	1N914 etc
D15	8V2 400mW Zener

CRYSTALS

X1,2,3	10MHz HC18/U 32pf load cap.

COILS

(all except L3, L9 and L18 wound on Amidon toroid cores)

L1,2	15T 30swg on T37·6
L3	33T 26swg close wound 10mm dia on former
L4	27T primary 3T secondary 30swg on T50·6
L5	6T primary 27T secondary 30swg on T50·6
L6	12T trifilar 30swg on T37·6
L7	23T 30swg on T37·6
L8	10T bifilar 30swg on FT37·61
L9	22µH rfc
L10	20T 30swg on FT37·61
L11,12	7T bifilar 30swg on FT37·61
L13,15	6T bifilar 30swg on FT37·61
L14	9T 30swg on FT37·61
L16	7T 26swg on two FT37·61
L17	7T 26swg on FT37·61
L18	8T 24swg close wound 5/16" dia
L19	9T 24swg on T80·6

MISCELLANEOUS

2 Jack sockets
1 loudspeaker 8Ω
1 6:1 slow motion drive
1 SO239 socket
1 power plug and socket
1 heat sink, Redpoint 2Y
1 meter 100uA
1 Relay 12V (radiospares 346-845) DPCO

TRANSISTORS & FETS

TR1,2,4,5	J310
TR3,15	BC109
TR6	2N2222A
TR7	2N3866
TR8	BRY39
TR9,10,14	2N3906
TR11	2N3904
TR12	2N6080
TR13	2N5590

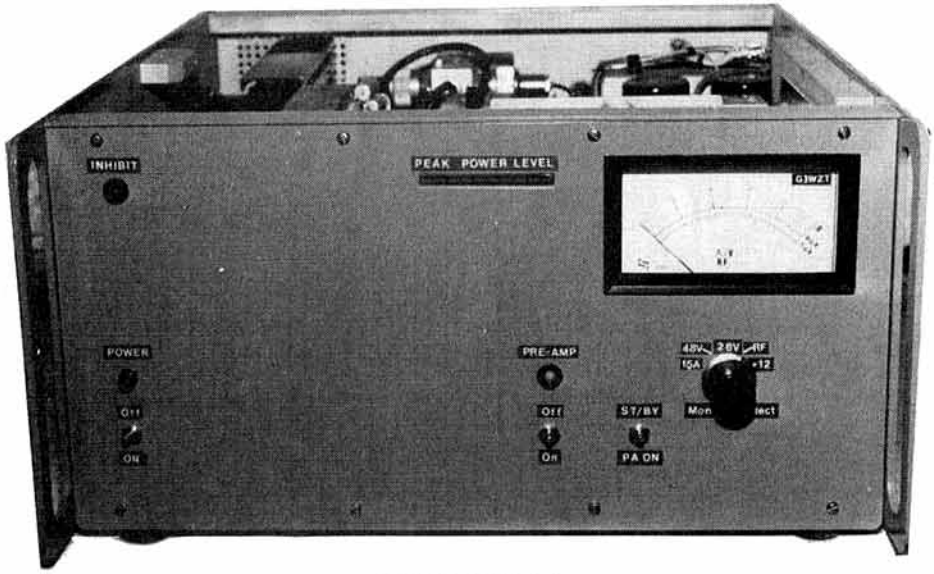
INTEGRATED CIRCUITS

ICl,3,6	NE602
IC2	SL1612
IC4	RC4558
IC5	TBA820M

VOLTAGE REGULATORS

REG 1	7812
REG 2	7808

GUIDELINES



FOR THE DESIGN OF SEMICONDUCTOR VHF POWER AMPLIFIERS

BY JOHN MATTHEWS, G3WZT

My intention in writing this article is to provide an introduction to some of the techniques which anyone can employ in the design of high power solid-state vhf linear amplifiers. I have included a tried and tested means of power dividing and combining for narrow band applications, and simple methods of input/output matching using quarter wave coaxial transmission line transformers.

All of the examples are based upon a working 144MHz 250W pep power amplifier stage and a 75W pep driver with integral power supplies. Description of the driver stage will show a simple means of providing the required push-pull anti-phase signals using quarter wave coaxial matching transformers.

Detailed component and constructional details are not given as the devices used in the pa stages are now classed as obsolete and could prove to be both difficult and expensive to obtain. Using the various methods to be described it will, however, be possible for an experienced constructor to design amplifiers from first principles using transistors which can be found at sensible prices!

One unfortunate aspect of high power solid state amplifiers is their inability to withstand high values of vswr at normal operating power levels. This depends to a large extent on the magnitude of the mismatch, but 'firing up' at full drive power and no load can result in instant destruction and a hefty repair bill!

The design described here includes vswr protection which may be set to a pre-determined level. When this level is exceeded, the amplifier is disabled and the otherwise inevitable catastrophe avoided.

WHY TRANSISTORS?

I am sure that most present owners of 250W amplifiers will have already asked themselves whether it's wise to take the semiconductor route. The devices used in this pa were obtained some time ago and had been taking pride of place in my 'goodies box'. It just seemed a great shame not to use them; I also assumed that I would learn something along the way about the design of high power, vhf solid state amplifiers.

At this power level, the 4CX250 is undoubtedly the most popular and economical provider of rf energy at 144MHz. This design is an alternative approach requiring a regulated supply of only 48V. Without doubt, the solid state approach is more complex and expensive than its valve counterpart but if properly designed and driven, is capable of providing very good performance.

Unfortunately, solid state amplifiers have earned themselves a very poor reputation – a problem which appears to stem from consistent overstatement of performance by most, if not all, commercial manufacturers of solid state linear power amplifiers. In the past few years I have had the opportunity to performance test several makes and models of commercially manufactured linear amplifiers, and found very few capable of producing their quoted output power. Judging by many signals heard on 144MHz, some operators seem to be able physically to achieve the theoretical third order intercept point of a power amplifier! Careful reading of the small print of published data sheets shows quoted output powers of ±0·5dB and others ±1dB. Do not be surprised if your new amplifier rated at 175W only delivers 140W – at ±1dB it's still inside the specification. However hard you drive it makes no difference, the output does not get bigger – only wider! The problem is compounded by a total lack of specification for linearity. If the quoted output power can be met and increasing the drive power further makes no improvement in output, the amplifier is without doubt saturated and not suitable for linear service at this power level.

Drive your pa with sufficient power to give 10-15% below maximum available output – but *never* more than that, not even on speech peaks – and you should keep everyone happy. Bar graph displays are a valuable asset as they do not suffer ballistic problems of moving coil meters when trying to monitor peak output power.

POWER OUTPUT STAGE

The output stage uses two BLX15 bipolar transistors operating from a 48V supply. Although these devices are early generation types, they still provide creditable performance and high rf output at 144MHz. In common with many older vhf high power bipolar devices the gain is modest. At the frequency in question, 5–7dB power gain is all that can be expected. This places quite high demands on the driver stage which must be capable of delivering 60–70W pep with good linearity.

Various configurations for the output stage were considered and the decision made to use two identical stages in parallel with 3dB hybrid directional couplers to divide and combine power from each stage. A simple block diagram of the amplifiers and 3dB hybrids is shown in Fig 1.

INPUT MATCHING

Manufacturers data for the BLX 15 shows the input impedance to be 0·3+j1·80ohms. These are series components and quite typical of high power bipolar devices. At first sight this would seem to be a rather difficult impedance to match into a 50ohm system, but, if these values are converted to their equivalent parallel values, the problem looks far more manageable.

Converting into parallel values (see reference 1) yields 11 ohms resistive and 1·85ohms inductive reactance. This equates to an 11ohm resistor in parallel with a 2nH inductor at 145MHz. In order to make this complex impedance look purely resistive, a component of the opposite sign must be placed in parallel. Capacitive reactance of 1·85ohms at 145MHz is 593pF and is the theoretical value required to make the BLX15 input look purely resistive (Fig 2).

In practice, it was found that a slightly smaller value was required for best match. This is due to small variations in manufacturers' quoted values for input impedance and the practical realisation of calculated values in the T match network. A total of 440pF is used, part of which is made variable to optimise the input match. All that needs to be done to complete the pa input network is to provide a means of matching the 11ohm input resistance to the 50ohms required by the power divider. This is accomplished using a quarter wave coaxial transmission line transformer.

QUARTER WAVE COAXIAL LINE TRANSFORMERS

There are many clever tricks which can be used with coaxial cables to perform impedance transformation and matching, but for the purpose of this article only simple quarter wave types will be used. The short explanation that follows is based upon the needs of the amplifier described but is applicable to other frequencies and transformation ratios.

Source, load, and line impedance, are related in the following way.

$$Zline = \sqrt{Zsource \times Z\,load} \quad \ldots 1$$

Where Zline is the unknown, required coaxial line impedance. Zsource is 50ohms required at the power divider ports and, Zload is 11ohms, represented by the transistor input.

$$\text{Therefore } Zline = \sqrt{50 \times 11} = 23{\cdot}45\Omega \quad \ldots 2$$

So where do we get 23·4ohms coaxial cable? The simple answer is nowhere; but if two lengths of 50ohms coax are paralleled the end result is 25ohms which is quite close enough. Rearranging equation (1) around for Zsource gives:

$$Zsource = (Zline)2 / Zload \quad \ldots 3$$

This means that the impedance seen at the input to the matching section when connected to the transistor will be:

$$Zsource = 25^2 / 11 = 56{\cdot}8\Omega \quad \ldots 4$$

This assumes that the BLX15 input is exactly 11ohms and the coax chosen is exactly 25ohms, and one quarter wavelength long. The resulting errors are negligible and from a practical viewpoint can be ignored.

LINE LENGTH

In order to meet the requirements of equation 1, the transformer line length must be one quarter wavelength. It should be remembered that line length required is *electrical length*, and the free space value must be multiplied by the velocity factor of cable used.

For ptfe dielectric the value is 0·70, and for polyethylene (pe), 0·66. For example, using ptfe dielectric the required 25ohms transformer line length will be:

$$300/FMHz \times 0{\cdot}70/4 = 300/145 \times 0{\cdot}172 = 35{\cdot}6cm \quad \ldots 5$$

A polar plot for this type of transformer is shown in Fig 3. One end of the transformer was terminated with 12·5ohms and the plot shows changing characteristics of the transformer between 50MHz and 450MHz. 145MHz is located close to the centre, indicating a good match into a 50ohm system. The inner circle on the polar plot shows a constant vswr circle of 1·5:1. From this, the upper and lower frequencies corresponding to a 1·5:1 vswr are seen to be 160 and 114MHz respectively. This gives a graphical representation of typical bandwidths which may be expected from this type of transformer.

Reference 2 is recommended if further understanding of transmission line transformers is required.

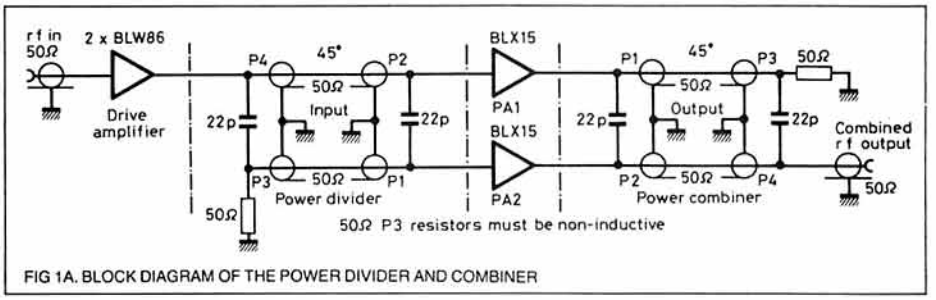


FIG 1A. BLOCK DIAGRAM OF THE POWER DIVIDER AND COMBINER

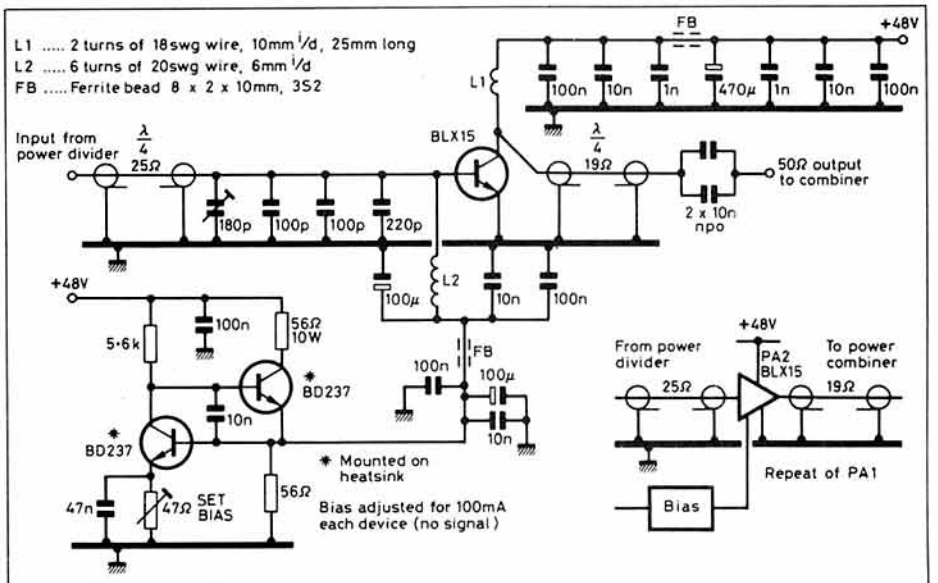


FIG 1B. POWER AMPLIFIER STAGE (PAI)

PA OUTPUT MATCH

Matching each individual output stage to 50ohms required by the power combiner is identical to methods used for input matching. The required impedance transformation is different, but the same principles apply. It is possible to obtain the required output load values from manufacturer's data, but for this type of output configuration it is better to depend on the impedance governed by collector voltage swing and power output requirement.

The output load, for one device, is defined by the following equation.

$$Rload = (Vcc - Vsat)^2/(2 \times Po) \quad \ldots 6$$

Where:
Rload is the required collector load (ohms)
Vcc is the applied collector supply voltage (V)
Vsat is the device saturation voltage (V)
Po is the required peak power output (W)

In order to design for good linearity it is important to ensure that collector voltage excursions do not approach the device saturation voltage. If this situation does arise through overdriving, or incorrect impedance matching at the output, severe distortion will occur. For this design, the value of Vsat will be assumed to be 6volts and calculations for output matching are based on 130W output from each stage. Supply voltage (Vcc) is 48volts, which allows a collector swing of 42volts.

From eq 6:

$Rload = (Vcc - Vsat)^2/(2 \times Po)$.

$\text{Therefore } Rload = (48{-}6)^2/(2 \times 130) = 6{\cdot}78\Omega.$

Now that the required collector load and final load impedance (50ohms) are known, it is possible to calculate the impedance required for a quarter wavelength transmission line transformer.

From eq 1:

$$Zline = \sqrt{50 \times 6{\cdot}78} = 18{\cdot}4\Omega \quad \ldots 7$$

Line length is calculated exactly as shown in eq 5. If ptfe cable is used dielectric constant and line length will remain the same.

The example calculation above does demonstrate one intrinsic poblem when quarter wave lines are chosen as the matching element. When matching two defined impedance using this method, non-standard cable impedances are often required. For the example output matching problem shown above, Belden 83307 ptfe screen cable was used which has an impedance of 19ohms. Unfortunately this particular cable is only available in 100foot lengths and at 50p/ft is prohibitively expensive when only a few feet are required.

All is not lost, however, for the required impedance may be achieved by paralleling lengths of standard miniature coax. For example, two lengths of UR110 50ohms coax gives 25ohms; three lengths gives 16·7ohms; two 50ohm cables and one 75ohm gives 18·75ohms. Either of these last two examples are close enough for the BLX15 design described.

Many solid dielectric screened cables are available, and although not intended for use as rf coaxial cable, do perform well if the insulating ▶

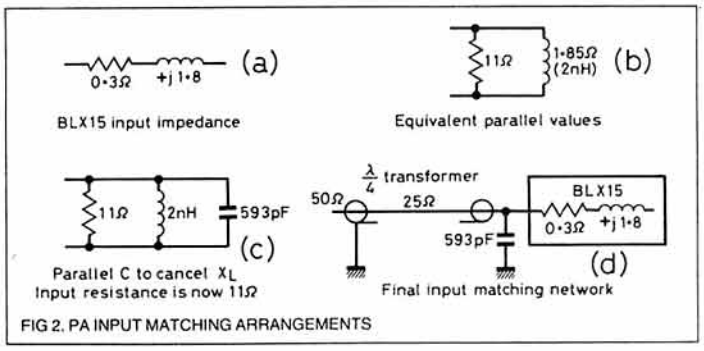
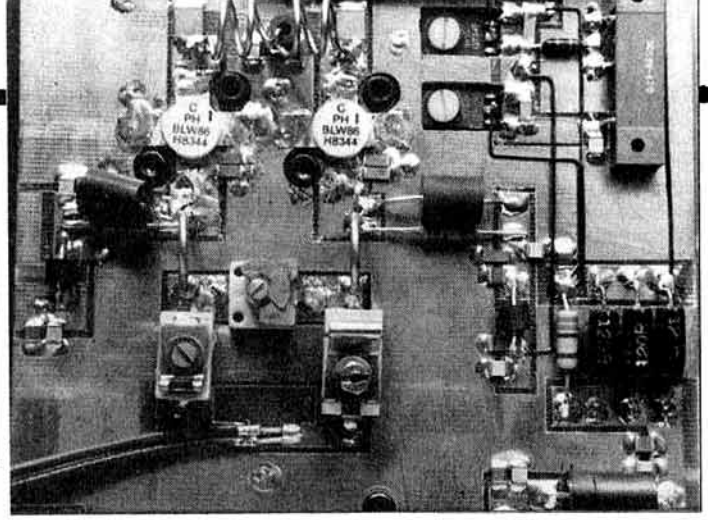


FIG 2. PA INPUT MATCHING ARRANGEMENTS



VIEW OF THE 75WATT DRIVER. BIAS COMPONENTS ARE IN THE TOP RIGHT-HAND CORNER. INPUT MATCHING AND COAXIAL TRANSFORMER ARE AT BOTTOM CENTRE.

dielectric properties are satisfactory. For example, many ptfe screened cables provide various 'odd' impedances combined with good rf performance. After finding unspecified screened cable, how can the approximate impedance be determined? With professional test equipment available the answer is quite simple: just measure it! Unfortunately these facilities are not available to most amateurs and another method must be found to give acceptable results.

The most simple method is to calculate Zo from physical cable dimensions and insulation dielectric constant (Er). All that is required is a micrometer to establish the inner and outer cable dimensions.
Zo may be calculated by using:-

$$Zo = 60/\sqrt{Er} \times 1\log 8\,(D/d) \quad \ldots 8$$

Where D is the inside diameter of the outer screen, and d is the outside diamter of the centre conductor. As an example, a length of ptfe screened cable was measured and found to have a characteristic Zo of 36ohms. Cable dimensions where then measured.
D = 0·043", d = 0·019". Dielectric constant of ptfe is 2·10 (polyethylene 2·28)
Using eq 8.

$$Zo = 60/\sqrt{2{\cdot}10} \times \log\,(0{\cdot}043/0{\cdot}019) = 33{\cdot}8\Omega.$$

This relates closely with the measured value. It provides a satisfactory and simple means of determining the characteristic impedance of unknown solid dielectric cables.

BASE BIAS

A low impedance bias supply is a very important feature which must not be overlooked on high power bi-polar linear amplifiers. Adequate current must be made available at all drive levels. Series feed resistors with diode clamp arrangements are frequently used for this purpose but this method should be used only on low power amplifiers.

The base bias circuitry used in this design is identical to that described in reference 1 (additional information is available in ref 3). It is temperature compensated, and provides adequate base current at all power levels. Inspection of the pa circuit diagram shows that individual, adjustable bias supplies are used on each output stage. There are two good reasons for this. The first is that each stage can be individually set for correct quiescent collector current. As the transistors in the output stage are not a matched pair, individual biasing allows each device to be set for optimum linearity. The other reason is that if a short circuit collector-base catastrophe should occur on one side, the remaining device is saved from a similar fate.

POWER DIVIDING AND COMBINING (HYBRIDS)

There are several established methods which may be employed to combine or divide power at 144MHz. Of these, Wilkinson hybrids, branch line and capacity coupled hybrids are the most frequently used. After considering the pros and cons of each type a decision was made to use a transmission line, capacitively coupled, 3dB hybrid. From a practical viewpoint, this type has several advantages.

(1) Unlike the Wilkinson, capacitively coupled hybrids use coaxial lines which are only 45° long. This makes a relatively compact combiner or divider which can be integrated onto the power amplifier board if rquired, using semi-rigid coax.

(2) With port impedances of 50ohms, coaxial lines used to make the hybrid are also 50ohms. If a Wilkinson type were chosen, 70·7ohm coax would be required with an electrical length of 90°. One disadvantage of capacitively coupled hybrids is the limited bandwidth of around 10%. However, for narrow band amplifier applications this can be advantageous in reducing even harmonics at the ouput.

The above discussion is not intended to denigrate the excellent properties of Wilkinson hybrids but serves to describe why an alternative was chosen for this particular application.

Apart from power dividing and combining functions, all types of hybrid provide isolation between ports. This feature is most important when combining the output (or inputs) of two independent, identical amplifiers.

Fig 4 shows a plot of isolation between the ports used to drive the inputs of the power amplifier stages (see Fig 1). From this it can be seen that isolation between bases of each output transistor will be around 50dB, so any mismatch at one transistor input will not affect the other. The same applies in the output combiner, isolation between collectors being assured.

Any imbalance of phase or amplitude between the two stages is 'dumped' into the 50ohm resistor placed at the isolation port. Should one half of the output stage fail, 50 per cent of the power from the remaining amplifier would be dissipated in the 50ohm isolation port resistor. The remaining 50 per cent is delivered to the combined output port as useful power. Of course, this statement is only valid if the failure of one amplifier has not demolished the power supply on the way out! This should not be the case in a correctly designed and protected psu, of course.

Port isolation shown in Fig 4 is the equivalent of input return loss. As return loss is directly related to vswr, it is possible to calculate the input vswr from the plot.

$$Vswr = 1 + \rho/(1 - \rho) \quad \ldots 9$$

$$\text{Return Loss} = 20\log_{10}\rho \quad \ldots 10$$

$$\text{Therefore } \rho = \text{Antilog}_{10}\,\text{Return Loss}/20 \quad \ldots 11$$

From Fig 4, the return loss at 145MHz is −54dB.
Therefore ρ = Antilog −54/20 =0·0019953
From eq 9. Vswr = 1+0·00199/1–0·00199 = 1·004:1

The plot shows graphically the relatively narrow bandwidth of capacitively coupled hybrids, although at 150MHz the return loss is still a satifactory 22dB. This equates to a vswr of 1·17:1.

All the above calculations assume 50ohm resistive terminations on each port.

Fig 5 shows the insertion loss at each output port of the power divider. This shows quite clearly the departure from 3dB for each port with changing frequency.

Those wishing to acquire more detailed information on various forms of hybrid couplers, well presented and informative literature may be found under References 4, 5, 6 and 7.

DIVIDER/COMBINER CONSTRUCTION

Construction of the input power divider and output combiner hybrids are identical and very simple to make. The coaxial lines are 45 electrical degrees long and made using 50ohms semi-rigid coax type UT141C (M17/130-00001).

Semi-rigid coax is preferred as it can conveniently be soldered directly onto copper laminate. Spacing of the two lines is not critical and is determined by the physical size of coupling capacitors used at each end of the lines. The value of coupling capacitors in divider and combiner is 22pF. For other values of coupling, different line lengths and coupling capacitor values are required (See Ref 7).

If good quality fixed value capacitors are not to hand for the ouput combiner, miniature air-spaced variables may be substituted. 30pF film dielectric trimmers are adequate for the input power divider. In all cases where variables are used, a means of setting the capacity to 22pF should be found before fitting. Alternatively, the hybrid may be optimized at 144MHz by using the following procedure. Refer to Fig 1 for

port designations and Fig 4 to see what should be achieved in terms of port isolation.

Terminate P4 with a 50ohm non-inductive resistor. P3 should already be terminated. Connect P2 to a 144MHz receiver via a 6dB attenuator. Apply a 50ohm signal generator to P1 and adjust the line coupling capacitors for minimum signal in the receiver. If a signal generator is not available, a strong local repeater may be used, but in order to ensure a 50ohm termination don't forget to place a 6dB pad in series with the antenna. Isolation optimization of the hybrid will be achieved using this simple method provided all ports are terminated with 50ohms. If semi-rigid coax is not readily available, ordinary 50ohm coax cable may be substituted. In all cases the electrical length is 45° for a 3dB capacitively coupled hybrid. Using the semi-rigid cable specified each line is 18cm long (velocity factor = 70%).

DRIVE AMPLIFIER

The 75W driver amplifier is of push-pull configuration using two BLW86 bipolar transistors operating from a 28V supply. The use of 28V transistors was dictated by what was available at rallies without spending vast sums of money! This has no disadvantages from an rf performance point of view at this power level, but does require a separate 5amp power supply. Input and output impedances are designed for 50ohms. Gain is approximately 10dB. Excellent linearity is obtained with 3rd order intermodulation products of −36dB wrt either tone at 70W pep output.

BIAS

Bias supply for the driver is similar to that used on the individual pa units, the major differences being that common bias is used for both halves of the push-pull pair. Quiescent current is set for a total of 160mA.

OUTPUT MATCHING

Matching for the output is based on a power output of 75W pep and a 28Vdc supply. It is the maximum power required to fully drive the power output stage. A quarter wave transmission line transformer is used to transform the collector to collector impedance up to 50ohms. This provides a reasonable match for the combining port of the pa power divider. In a push-pull amplifier the output impedance of each device is in series. This effectively multiplies the output impedance by a factor of 4 when compared to a single ended stage providing equivalent power output. Transformer step up ratios are thus smaller and matching made easier. This is particularly so with amplifiers operating from 12 or 24volt supplies.

Output load impedance for a push-pull amplifier is defined as:

$R\ load = (Vcc - Vsat)^2 / 0{\cdot}5 \times Pout$ . . .12

Where: Vcc = supply voltage. Vsat = saturation voltage.

Pout = Total output power.

As a collector voltage swing too close to the supply severely degrades linearity, Vsat should be limited to 6V.

From eq 12:

$Rload = (28-6)^2 / 0{\cdot}5 \times 75$. Therefore Rload = 12·9ohms

Referring to the text describing quarter wave coaxial line transformers and eq 1, it will be seen that a cable impedance of 25·3ohms is required to match 12·9ohms, to 50ohms.

This is obtained by paralleling 2 quarter wave lengths of 50ohm miniature coaxial cable (UR110).

This quarter wave section with one outer end grounded and the other end placed across the balanced collector loads provides the required 180° phase shift for correct push-pull operation. It also performs the function of a 'pseudo-balun', converting the balanced collector loads to 50ohms unbalanced. This simple piece of coaxial cable provides three functions – phase splitter, balun and impedance matching. The only other components required are a dc feed inductor, compensation capacitor (56pF) and dc isolation capacitors (10nF).

DRIVER INPUT MATCHING

Matching the input of the push-pull driver stage to 50ohms is accomplished in two separate stages. The first stage uses a 25ohm quarter wave transmission line transformer to reduce the 50ohm drive source impedance down to 12·5ohms. The principle is identical to that described earlier for output matching and in the same way, provides anti-phase signals to drive each base of the push-pull pair.

Additional components in the form of T networks are used to match the complex input impedance of each BLW 86 into 6·25ohms. The reason for this value being 6·25ohms is because the total impedance seen across the end of the coaxial transformer must be 12·5ohms. As the inputs of the push-pull stage are effectively in series, each half must be matched into 6·25ohms making a total for the pair of 12·5ohms.

The above statement, ie base to base impedance of the pair being twice that of the base emitter impedance of one device, only holds true for amplifiers operating between class A and AB. If the conduction angle is reduced to 180° or less; as in class C amplifiers, the base to ▶

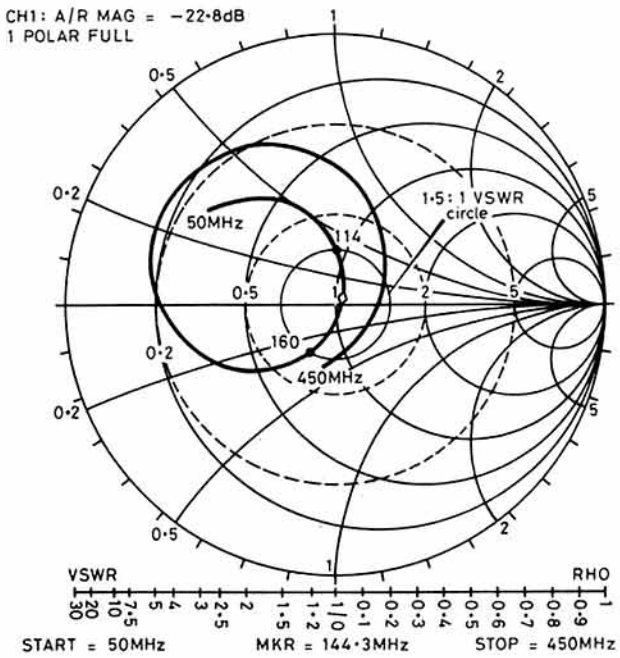


FIG 3. POLAR PLOT OF QUARTER-WAVE LINE TRANSFORMER CUT FOR 144MHZ

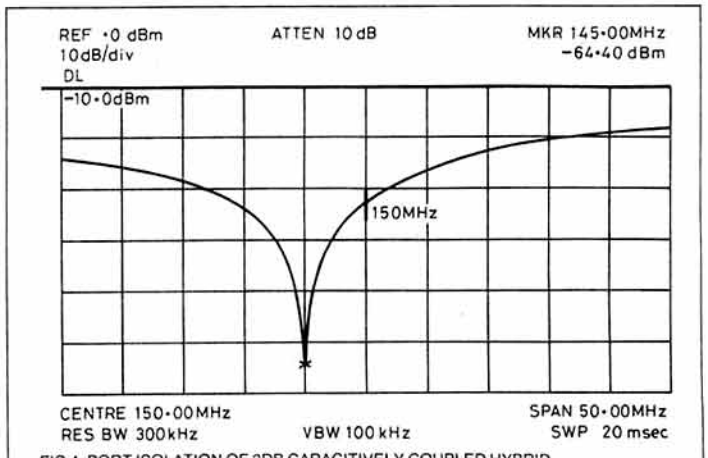


FIG 4. PORT ISOLATION OF 3DB CAPACITIVELY COUPLED HYBRID

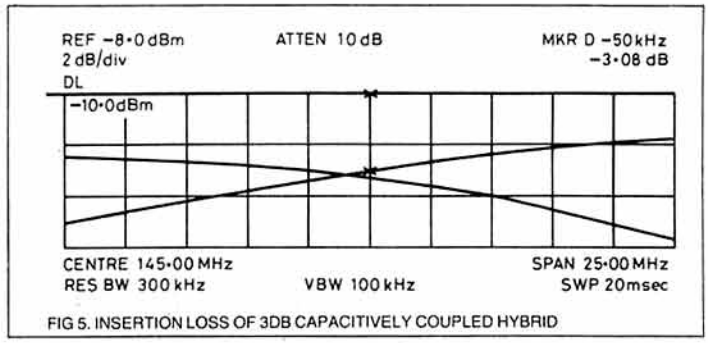


FIG 5. INSERTION LOSS OF 3DB CAPACITIVELY COUPLED HYBRID

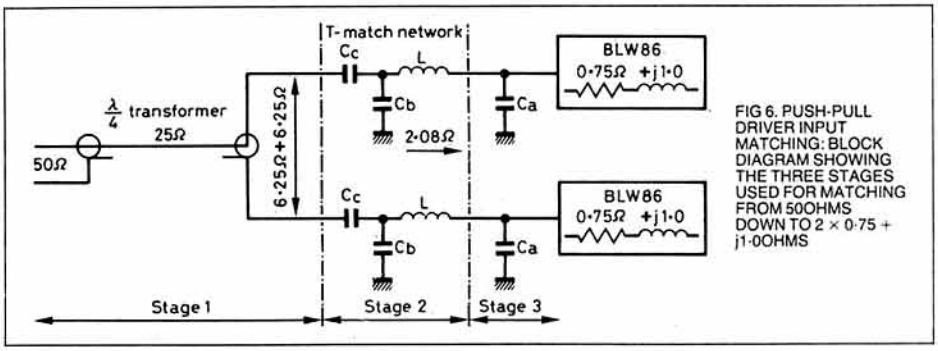


FIG 6. PUSH-PULL DRIVER INPUT MATCHING: BLOCK DIAGRAM SHOWING THE THREE STAGES USED FOR MATCHING FROM 50OHMS DOWN TO 2 × 0·75 + j1·0OHMS

base impedance will be approximately 4 times that of a single device.

In order to ease the remainder of input device matching, only one half at a time will be considered. When this is completed, values may be duplicated for the other half of the push-pull stage. A block diagram of the matching components required is shown in Fig 6.

Inspection of manufacturer's data for the BLW 86 shows a series component input impedance of 0·75 + j1·0ohms at 145MHz. It is a simple matter to cancel the inductive component (+j1·0) using a parallel capacitor at the base (Ca). The first step is to convert the series components of the input impedance into their parallel equivalent values.

The conversion formula and equivalent component values are shown diagramatically in Figs 8a and b. Calculated equivalent parallel values are shown in Fig 8b.

All that remains to complete stage 3 of the input matching is to cancel Xp (1·56ohms) with a capacitor of the same reactance. This capacitor (Ca Fig 7) resonates Xp at 145MHz, leaving a resistive input of 2·08ohms. Ca = 1 / 2 fXc therefore Ca = 703pF.

The final matching section shown in Fig 6 as stage 2, is solved using a simple 'LCC' T match network. This has to match 6·25ohms down to 2·08ohms and is identical for both sides of the push-pull driver amplifier. As the required transformation ratio is small (3:1) only one section is needed. L networks are used in preference to other methods as the Q in this type of network is controlled. The value of Q chosen is not particularly important, but must be low enough to give adequate bandwidth and practically realizable component values. For the example shown here a working Q of 4 was chosen. The method used for obtaining the required component values is fully explained in reference 1 and for brevity will not be repeated here.

Values for solving the final matching T network are:
R1 = 2·08ohms, R2 = 6·25ohms, QL = 4.
From these values: A = 2·158, B = 35·36.
After solving the equations based on these figures the final values for stage 2 (Fig 6) are.
Cc = 13·48ohms (81·4pF) Cb = 19·2ohms (57pF) and L = 8·32ohms (9·13nH).

In practice, capacitors Cb are placed in series and reduced to a single component. By so doing, the value is halved to 30pF. All capacitors in the T match are variable mica compression types based on the calculated values. This allows any variation of transistor input impedance to be adjusted out so presenting a low vswr to the 50ohm drive source. It was also found necessary to reduce the calculated values of Ca by 20% for optimum gain and match at 145MHz.

Although these procedures might seem rather daunting to the uninitiated, they are very straight forward and take far more time to describe than implement!

The driver amplifier described makes a simple, high performance power amplifier in its own right. At 75watts pep the devices are working well within their ratings and linearity is excellent (see Fig 7). Combiners and power splitters are eliminated and only a single regulated power supply capable of 5–6amps at 28V is required.

Like all rf power amplifiers an additional 6dB rf output requires 20dB more input in cost and construction effort!

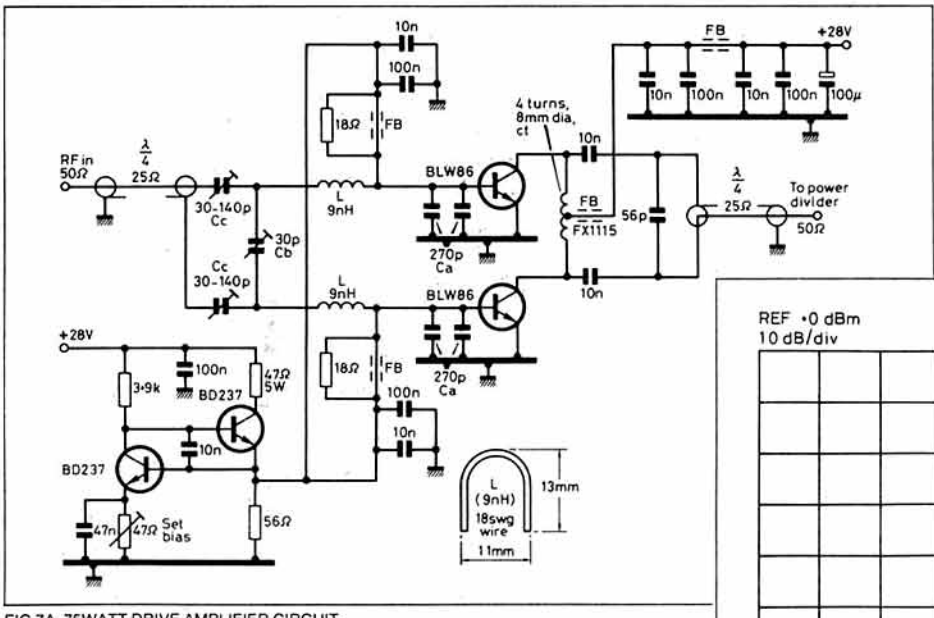


FIG 7A. 75WATT DRIVE AMPLIFIER CIRCUIT

TO BE CONCLUDED NEXT MONTH

FIG 7A NOTES
1) Ca, Cb, MICA COMPRESSION TYPES.
2) UNMARKED FB ARE 3S2 (BLUE).
3) COAXIAL TFMRS ARE 2 PARALLEL 35cm LENGTHS OF UR110.
4) 56pF COMPENSATION CAPACITOR IS GLASS OR ATC PORCELAIN TYPE.
6) ALL OTHER CAPACITORS, CHIP CERAMIC.
7) QUIESCENT COLLECTOR CURRENT SET FOR 160mA TOTAL.

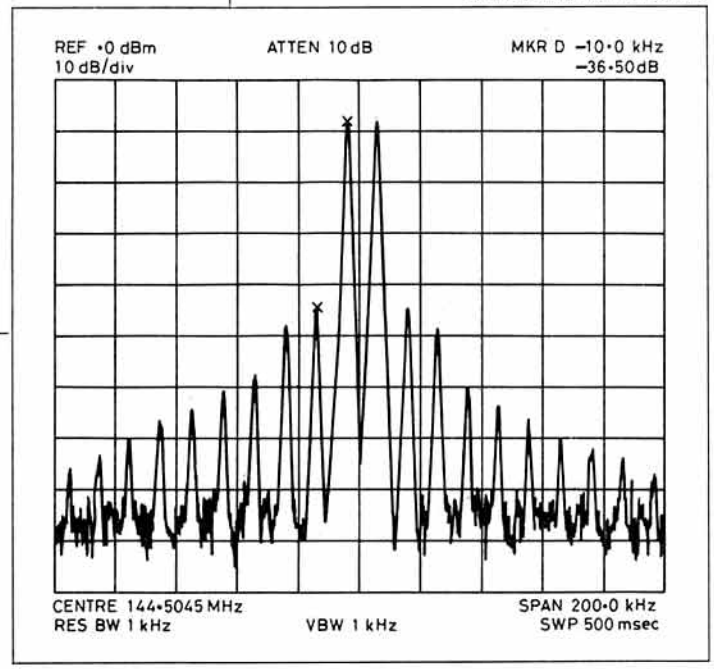


FIG 7B. DRIVER AMPLIFIER IMD

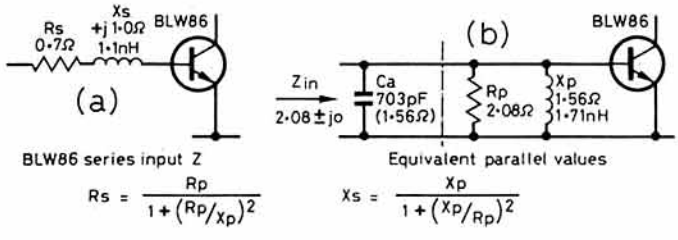


FIG 8. CONVERTING SERIES INPUT Z (a) INTO EQUIVALENT PARALLEL VALUES (b)

SIDEBAND SLIP—UPS

A FEW TIPS ON HOW TO AVOID ANNOYING AND IRRITATING YOUR SIDEBAND NEIGHBOURS

Back in July I discussed several probable causes for poor quality ssb signals. I am now following this up with a few other tips on operating technique which you may find useful if you are keen on keeping your on-air performance clean.

THE "TUNER-UPPERS BRIGADE"

It's happened to all of us. Yes, I mean the persistent tone or whistle caused by some bloke tuning up his rig into his aerial and totally blotting out that rare signal you are trying to hear. Why doesn't he use a dummy load or tune up elsewhere? The reason is probably because he is either unaware of the QRM he causes, or he's just b....y minded! I would like to believe in the former case. But why doesn't he realise he's causing QRM? I have a theory which goes like this.

Let's take the amateur who is listening to your 3·5MHz QSO and would like to join in. He's been operating on a different frequency, so to make sure his transceiver is tuned up on this frequency, he switches his rig into a dummy load and adjusts the controls accordingly. Fine so far, no QRM. But because his aerial is fed via a matching device, he then switches into his aerial system. His rig is still in the'tune' position, so while briefly listening, he no longer hears your QSO, and thinks it's OK for him to tune up. What he may not appreciate is that the 'tune' position on many rigs puts it into the cw mode which shifts the frequency the rig receives without moving the main (vfo) tuning knob. Consequently, when he transmits in the 'tune' condition, his tune-up carrier can produce an interfering carrier superimposing an audible whistle on your QSO.

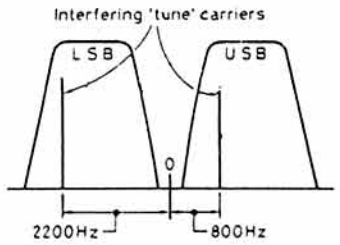


Fig 1. Interfering "tune" carriers produced by a FT101ZD (see text).

Fig 1 shows where the 'tune' carrier whistle from a Yaesu FT101ZD falls in the ssb passband. It is important to realise that the main tuning control of the FT101ZD transceiver is not moved from the correct tuning point to resolve the normal sideband signal. But, as you can see, the frequency changes when the mode switch is moved from usb to lsb or cw, or tune.

I have carried out some tests with the help of local amateurs to find out where the whistle is that's produced when some popular transceivers are switched to the 'tune' position without any change of vfo (tuning) control. The results vary from rig to rig but it is significant that the 'tune' carrier usually appears in the usb passband, except for some of the Yaesu and Icom rigs. The whistle frequency heard (in KHz) is as follows:

Transceiver	USB	LSB	Transceiver mode
Icom IC751A	2·2	0·5	rtty
Icom IC735	0	0	cw
Yaesu FT101ZD	0·8	2·2	tune
Yaesu FT757	0	0	cw
Yaesu FT901	1·0	2·0	tune
Drake TR7	0·8	Not heard	cw
KW 2000B	1·5	0	tune
Trio TS530	0·8	Not heard	tune and cw

Some of the later solid state rigs such as the IC735 and FT757 produce a carrier exactly zero beat with the main tuning point – hence 0kHz in the table. The carrier from some other rigs like the TS530 is at 0·8kHz in the usb and therefore because it's outside the passband it won't be heard when listening on lsb.

If you have a separate frequency counter, you can do this test yourself to find out where your rig's tune-up carrier goes. Tune your transceiver on usb to a convenient frequency – say 28500·0kHz exactly. Switch the rig to 'tune' and read the frequency of the tune carrier on a *separate* frequency counter. Why? Because many transceiver digital readouts don't show the precise carrier frequency. If the counter reads 28501·0kHz, ie within the usb passband, the difference of 1kHz in the readings will be the audible whistle that you could produce when tuning up! It may not be exactly the same as my examples above, but might vary ±200Hz depending on the transceiver line up. Repeat the test on lsb: the whistle may be different as I discovered in my tests.

This theory assumes that the station tuning up into his aerial has his rig tuned to the appropriate sideband for the QSO he wants to join but, of course, that isn't always the case. Tuning up on a 'clear' frequency can still cause interference to others a few kHz away outside the passband of your receiver. The hf bands are pretty congested these days, particularly at weekends, so if there is a way of tuning up your aerial system without radiating any signal at all, everyone will be grateful, and the QRM levels might be lower at times.

Fortunately, 'silent tune-up' can be achieved quite simply, and although you can buy a device ready made, you can also build one. The block diagram is shown in Fig 2 and consists of a noise source and a bridge arrangement. You switch it into circuit while still listening and your receiver is used as the detecting part of the bridge to show the null point when the match is correct, ie minimum noise. Having adjusted your amu for optimum, the device should be switched out of circuit, to avoid blowing up the bridge accidentally. It is advisable to have some automatic disabling of the transmitter until the bridge is out of circuit, and this can be achieved by an extra contact wired in series with the ptt line, for example. Another 'quiet tune' system which is easily added to rigs with crystal calibrators is described in reference 7.

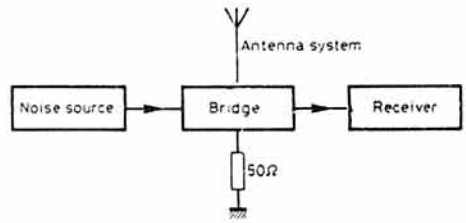


Fig 2. Block diagram of "silent tune up" system using a noise bridge arrangement.

Either of these silent tune-up devices can be added to receivers, and hence benefit swls as much as the transmitting amateur. Try it and see – you may be surprised how simple and yet effective it is. Another simple circuit, described by VK3BYW primarily as a 'tune up protection device' for solid state transceivers, can also be used to tune up without causing QRM, although a very small amount of rf is radiated. The technique has been described in Pat Hawker's Technical Topics for October 1987, February 1988 and March 1988.

What I can't provide is a solution for dealing with 'wallies' who don't listen before they transmit. Anybody got any bright ideas?

LET'S NET TOGETHER

This title is a trifle tautological, because the term 'net' implies everybody's on the same frequency! The use of ssb has resulted in much better netting than in the old am days when it was not unusual to find stations some 5kHz or more apart. However, because some people have a different idea of how the other operator's voice should sound, we invariably hear stations which are on slightly different frequencies. I find it annoying to listen to a group of stations chatting away, all on different frequencies varying between zero and as much as 300Hz or more from the other bloke, causing frequent adjustment of my receiver tuning so that they sound correctly pitched. If a group of stations are not netted properly, there is a danger that they will slowly shift up or down the band following each other, maybe even drifting into the next QSO.

SIDEBAND SLIP

Most transceivers have rit or some form of offset tuning, so if you know that *your* optimum tuning results in a shift of a few tens of hertz from the absolute zero beat position, why not set up the rit on your rig so that you know you are always going to be in the right place when you transmit? The amount of shift will vary from person to person, and some will not need any at all.

If you think you are tuning accurately, try this test of your skill. With your receiver in the lsb or usb mode, tune in a broadcast station between 7100kHz and 7400kHz. Choose one that is playing music. If you get it 'spot on', the music will sound melodious and correctly pitched. I reckon it is necessary to tune within 5Hz to hear music properly. It is also a check of your receiver's stability if it stays tuned 'spot on' for a long period of time without your having to touch the dial.

This technique of listening to am stations as if they were ssb is a good way of reducing selective fading effects which can plague normal am envelope detection methods. Sometimes referred to as exalted carrier reception, the elimination of the carrier and one sideband helps to overcome the phasing effects which cause the horrible distortion as the propagation path changes.

Incidentally, an amateur I know who has a good musical ear still prefers to listen to the other fellow's speech at a slightly lower pitch, so there's no accounting for taste! Clearly, it is a personal choice. However, one thing will be certain if we all try to net together, and that is a reduction in the QRM to adjacent QSOs. It will also make my eavesdropping a little easier!

LINEARS – THE QRO CLUB

Many of the transceivers used on the bands today produce an ssb power output of about 150watts pep, or a cw key down output power of around 100watts. In most circumstances, this power is adequate to give good readable communication, country or world-wide according to band conditions, but there are times when more power is useful to establish communication initially or get through the atmospheric noise. Yes, ORN not ORM.

Most commercial linear amplifiers are capable of giving more than the maximum legal 400watts pep, so we must be careful not to 'bend' the rules! However, under-running a linear does have a benefit, because by running at a lower level than maximum, the intermodulation products and other nasties which produce 'splatter' should be well down, resulting in a nice clean signal which doesn't bother anyone. A clean transmission from a rig just loafing along at 50watts driving a linear to 400watts pep is much better than a 100watt, heavily processed (more of that later!) and distorted signal from a barefoot overdriven rig. So, next time you are tuning over the 3·5MHz band and hear one of the many nets with linears in use, look either side and on the opposite sideband to assess the 'width' and splatter products. You may be pleasantly surprised and, what's more, impressed by the clarity and naturalness of the audio.

I suppose there will always be the bloke who overdrives his linear to the detriment of his own signal and the other band users. He may believe his signal is just that bit stronger, but I wonder if he realises that even an increase in output from 400 to 800watts is only 3dB, which is less than one S point at the receiving end. Is it really worth spoiling your signal quality, and being antisocial by pushing it?

SPEECH PROCESSORS

A few lines back I mentioned processors; yes they do have their uses, but in my opinion they are also much abused, or do I mean maladjusted? Sensibly used, speech processors can be useful, but they can also degrade your readability, not improve it.

Some of the sophisticated modern rigs allow you to listen to the transmitted audio quality after processing, the idea being that you can judge your own signal. I have reservations about this technique, because you cannot hear yourself properly while you are speaking, so a better way would be to record your audio signal on a cassette and listen to it afterwards. All processors distort the speech to a certain amount, so choose a level of processing that only just produces a noticeable change in your 'dulcet' tones. It's no good turning everything up to maximum if the operator the other end cannot make sense of your speech, even if the signal strength is S9+++! You think I'm joking? Listen to some 14MHz signals from East European or Mediterranean shores and you'll see what I mean!

Processors can sometimes prevent overdriving of the amplifier stages of your rig, giving a signal which is suitably narrow on the band and free of splatter. Done carefully, the result is effective but if overprocessed the signal is terrible to listen to. You've all heard it – the bloke who's every breath comes over at peak level and he doesn't stop at just heavy breathing, it's followed by almost unreadable speech with all the meters hard over! If he looked at the alc indication on his rig he would probably find it constantly in the red. Or maybe the transmission that has such a marvellous 'vogad' (Voice Operated Gain and Adjustment Device) that all the kids playing in the road and the dog downstairs modulate fully! Some people may like it that way, but I don't think it improves their readability, do you?

The processor which clips and filters at radio frequencies is generally more effective than other types, and can be applied at audio (like the Datong products), or form part of the intermediate frequency signal path in the transmitter (as in the Yaesu FT902 and Trio TS930/940 transceivers). The purely audio processors usually introduce a high level of audio harmonic distortion which cannot be removed by filtering, so their effectiveness is more limited than the rf processor. For further reading see reference eight.

At the end of the day, it is clear readability that matters, so please be careful with the gain controls! When in doubt, underdrive, and be sure your signal is good. Pushing your rig to give an extra dB of output will not be noticed at the other end. Your signal will be easier to copy when there is less distortion from the transceiver whether it is produced at audio or radio frequencies.

The most cost effective way to deliver and receive a better signal is to improve your aerial system, but that's a subject already well covered by the amateur radio books and magazines. Plenty of reading and food for thought there!

Well, that's about it. I hope you have found my "concerted jottings" interesting and perhaps given you some useful tips. **73, Eavesdropper**

[7] 'Simple quiet tuning and matching of antennas' by M J Underhill G3LHZ *RadCom* 1981 May page 420.

[8] 'Speech processing' by Ian D Poole G3YWX *Practical Wireless* March 1986 page 33.

HF

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USSR/CANADA POLAR BRIDGE EXPEDITION HAILED "A SUCCESS"

I received the following press release from Al d'Bon, of CRRL: "At 1435 on 1 June the thirteen Soviet and Canadian skiers completed their ninety day, 2,000km journey from Cape Arctic in the USSR via the North Pole to Ward Hunt Is in Canada. They were all in good health and walked ashore alongside one another in one line, thus personifying the spirit of cooperation between the two groups which had made it possible to complete this first time crossing of the Arctic from Russia to Canada.

Word of their safe arrival was passed from the expedition by amateur radio to the Canadian base station CI8C at Resolute Bay, which then relayed the good news to Ottawa and Moscow and the other participating stations in the network. This has been very much a team operation, with the amateur radio component providing the safety and housekeeping lifeline for the skiers.

From the amateur radio standpoint, with the exception of the loss, because of an opening in the ice, of all the Canadian ICOM equipment being used by Barry Garratt, 4K0DX, at North Pole 28, the floating Soviet ice station near the North Pole, the communicating system worked extremely well and is a tribute to the dedication of the team of amateurs who worked for over three months in support of the expedition.

Sincere congratulations to Dr Dmitry Shparo, UA3AJH, Chief of the expedition and his four Canadian and nine Soviet companions on their impressive achievement. Amateur radio operators are proud and pleased to have been part of this most exciting enterprise."

PLANS LAID FOR JOINT US/USSR DXPEDITION

From *QST* comes the news that three years ago K7ZR, of the Western Washington DX Club, introduced this idea, initially planned for the Diomede Is to commemorate the 50th anniversary of the first over the pole flight by Chkalov. Last November KD7IK wrote to four clubs in the USSR and met with good responses resulting with the setting up of on-the-air schedules with UB5WE. In May KD7IK received the good news that RSF had approved the operation to take place in May 1989 – to coincide with the CQ-M Contest. Ten operators are already lined up on the US side. As a follow-up to the US team visiting the USSR, the possibility is being explored of having a Russian team in the USA (probably from Wyoming). There may be licensing and financial problems but the whole project seems to be a great idea.

CONTESTS

LZ DX Contest

0000 to 2400 4 September

Cw only, 3·5 to 28MHz following IARU bandplans. Single-operator single and multi-band, multi-operator multi-band and listener sections. Exchange RST plus ITU zone (UK is 27). Multiplier is sum of ITU zones worked on each band. QSOs with LZ count six points, one for others in the same continent, and three for stations in other continents. Listeners earn three points by logging two callsigns and two exchanges, and one for two callsigns and one exchange. Submit separate logs for each band and enclose summary sheet listing zones worked on each band and the usual signed declaration. Post within 30 days of the contest to BFRA, PO Box 830, Sofia, Bulgaria.

In the 1987 contest **G3ESF** scored 32,058 points and **GM4CFS** 28,512 (in the multiband category) and G4ETJ and G3KAY 2,104 and 1,640 respectively. An interesting point is that in all 517 stations submitted logs!

Scandinavian Activity Contest 1988

1500 17 September to 1800 18 September (CW)
1500 24 September to 1800 25 September (SSB)

Licensed amateurs and listeners. Single-operator multi-band, single-operator multi-band QRP (10W input) and multi-operator all band categories. 3·5 to 28MHz – observing IARU bandplans (NB 3,560-3,600, 3,650-3,700, 14,060-14,125, and 14,300-14,350kHz must be kept clear of contest traffic). Exchange RS/T plus serial number (from 001) with stations in Scandinavia and each QSO is worth one point. The multipliers are Scandinavian prefixes LA/LB/LG/LJ/JW/JX/OF/OG/OH/OI/OH0 (Aland)/OH0M (Market Reef)/OX/OY/OZ/SJ/SK/SL/SM/ and TF. Signed original logs (or copies) must be submitted and show date, time, stations worked, both exchanges, band, and if multiplier. Separate logs for each band and duplicate sheets for each band with 200 or more QSOs must be submitted. Entries must be mailed by 30 September 1988. Listeners must submit date, time, Scandinavian station heard and number sent, swl's own report, station being worked, and multipliers and points claimed. Send logs to SSA contest manager SM3CER, Lisataet 18, 86300, Sundsbruck, Sweden.

European DX Contest

1200 10 September to 1200 11 September (SSB)

A reminder – rules for this were given last month.

VK-ZL-Oceania DX Contest

1000 1 October to 1000 2 October (ssb)
1000 8 October to 1000 9 October (cw)

Maximum operating time allowed is 12h. This must be taken in one hour "blocks" based on 'even hour to even hour' (eg 1000 to 1100). Listeners may enter and operate for a total of 24h over the two weekends which in their case count as one contest. One QSO per mode, 1·8 to 28MHz (less WARC bands). Two points per QSO with VK, ZL, or Oceania. Exchange RS/T plus serial number (from 001). The multipliers are the total numbers of VK/ZL/Oceania prefixes worked on each band added together – note that each counts once on each different band. Submit separate logs for each band and show date, time, station worked, numbers sent and received, indicate clearly each new prefix claimed and state QSO points claimed and prefixes worked for each band. Summary sheet must show callsign, name and QTH, points claimed on all bands, total prefixes claimed on all bands, total points claimed and the usual declaration that all rules were observed. Post logs to NZART VK/ZL/O Contest Manager, ZL1AAS, 146 Sandspit Rd, Howick, New Zealand to arrive by 15 February 1989.

Listeners should submit logs of QSOs in which the VK/ZL/Oceania station was heard and the scoring is the same. Participation certificates are available on request (enclose one irc for postage please).

CQ WW DX SSB Contest

0000 29 October to 2400 30 October

All bands 1·8 to 28MHz (but not WARC). Single-operator, single and multi-band, multi-operator multi-band (single or multi-transmitter), and QRP categories (no more than 5W output). Exchange RS and CQ Zone (UK is 14). The multipliers consist of the total number of zones and countries worked on each band. Note that both DXCC and WAE country lists are used (this means that for example GM – Shetland Is is also a multiplier). Own country may be contacted for zone and country credit only and no points are gained. QSOs with own continent count one point, with other continents three. Final score is total QSO points times total multipliers. Use separate sheets for each band and give date, time, station worked, numbers sent and received, and indicate multipliers the first time they are worked. Logs must be checked for duplicates and those making 200 or more QSOs on any band must provide a cross check sheet for that band. QRP stations must indicate same on their summary sheets and state the actual maximum power output used. All entries must be postmarked no later than 1 December 1988 and mailed to *CQ Magazine*, 76 North Broadway, Hicksville, NY 11801, USA. Sample log and summary sheets are avalable from *CQ* in exchange for a large sae and some ircs.

Unfortunately I do not have a supply of any of these items this year.

July *QST* lists results of the **1987 ARRL 10 Metre Contest. GW4BLE** was top UK score in the phone section with 38,544 point followed by G3VZT with 14,732. In the cw section **G3ESF** scored 4,640, and in the mixed **GM4ELV** 2,346. **GW8GT** scored 45,144 points in the multi-operator category. The 1988 event takes place on 10-11 December and this could be very intersting indeed this year.

DX NEWS

DX News Sheet says that CE0GHO, worked on 14MHz ssb, is likely to be on **Easter Is** for some time as Paddy and her husband are medical officers. Laurie, G3YCM/C6A, has asked for it to be made known that he has sent his logs to the person who was nominated as his QSL manager but that so far no cards have been sent out. Home QTH is in 'QTH Corner'.

AL7JG/3D2 who has worked on 21MHz ssb will be in the **Fiji** area until October and may make 'side trips' to other locations (eg Micronesia). ZK1CX is reputed to be a motel owner and willing to receive guest operators.

J28EQ was due to return to France after two years in **Djibouti.** It is also reported that TR8DX is about to leave **Gabon** after making in excess of 20,000 QSOs. *DX News Sheet* quotes G3YAA as saying that resident stations in **Tunisia** have been officially licensed again since November 1987. 3V8LO, in Gabes, should be on the air soon. ZD8MG, on **Ascension Is,** is often on or near 10,106kHz around midnight. There is a new activity from **Malawi** in the form of 7Q7BC who has been worked on 14MHz ssb and claims to be in Zomba.

It is reported in *DXpress* that the Lynx DX Group is negotiating permission to operate from **Mozambique** later in the year.

There is a rumour that one of the monks resident on **Mt. Athos** now has an amateur licence and the callsign SY2A. Oblasts collectors should look for UA9ZZ/U18V from Obl.181, RA3GD/UA0X and UA3GAX/UA0X from Obl.129, and UZ9OWB/UH8W from Obl.45 who are all scheduled to appear about now. Over 50,000 QSLs for contacts with UV1OO on **Franz Josef Land** have already been mailed covering the period Decembver 1985 to February 1987. According to the *Long Island DX Bulletin* anyone still needing a card should send a sae and two ircs to the address in 'QTH Corner.'

It was announced at the LA-DX Group convention that the plateu on Peter 1 Island from which the 3Y activity took place has been named 'Radio Sletta' (Radio Field).

A note from Sue Richardson, J37CD, to say that owing to a five month extension of her husband's contract she will remain on **St. Vincent** until November. She asks everyone to note that mail sent to GW0AWT will be forwarded to her in October and any arriving after 30 September will reach her at the beginning of December. The Japan Amateur Radio League has just started producing a monthly bulletin in English called the *JARL News.* It contains the highlights of amateur radio activity in Japan. This is most interesting and well produced. Issue No 1 mentions that BY7HY began operating from Yueyang in Hunan province on 5 May and that some of the equipment being used was donated by JARL who also sent a five man delegation to attend the opening ceremony. From 9 July to 18 September two special stations will be active during the exposition which marks the opening of the tunnel between Honshu and Hokkaido – these are 8J7XPO (in Aomori) and 8J8XPO (in Hakodate). Both stations are set up in ships which used to be used on the ferry service between the islands but are now redundant.

DXPEDITIONS

P40V will be on the air from **Aruba** for this year running the CQWWDX contest (SSB section) in the multi-multi class. AI6V will lead the group in this year's record attempt. All QSOs will be QSL'd via the bureau without receipt of a QSL card. A certificate will be sent to all who work the group on four bands or more – send QSLs and return postage to AI6V.

Steve, G4UOL, will be on the **Isle of Man** as GD4UOL/A from 20 November to 1 December on cw only – probably 5kHz up from bottom of each band. He will be taking part in the CQWWDX Contest (CW section). Less exostic perhaps but of interest to WAB enthusiasts – G4QK will be in square NM55 (mainland portion) and probably also NM54, 64, and 65. All from 26 September for one week.

SEANET CONVENTION

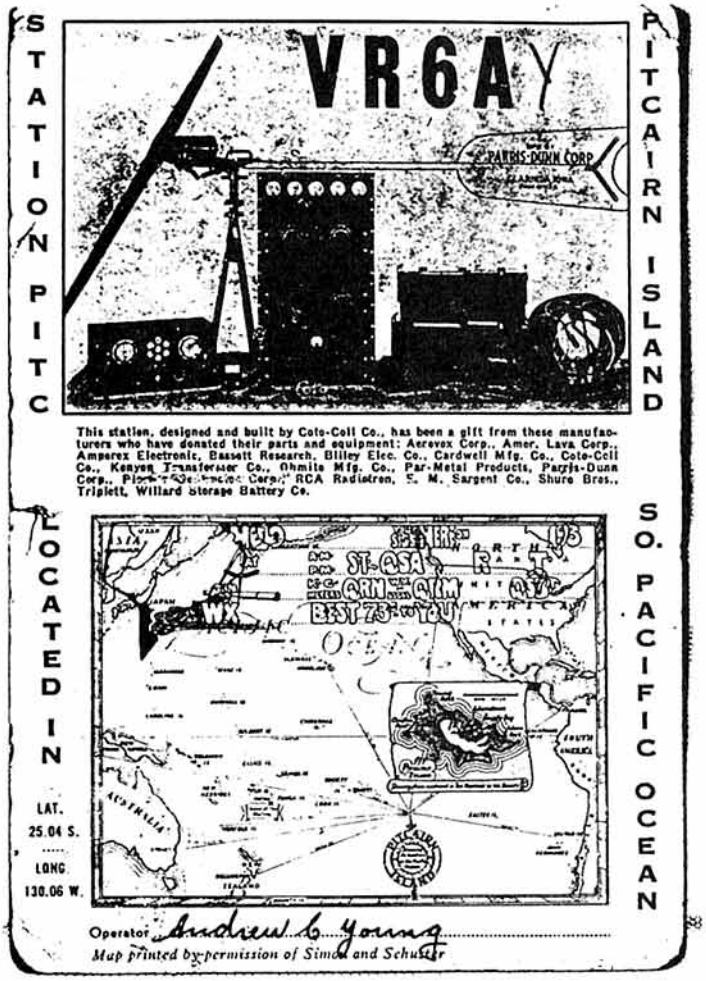
This year this will take place from 11 to 13

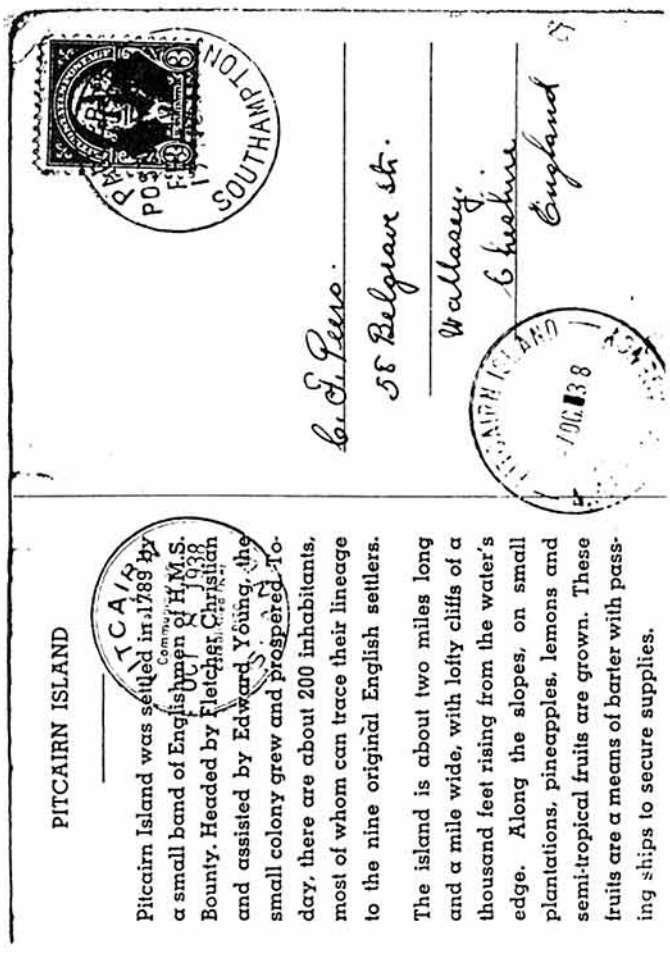
HF F-layer propagation predictions for September 1988

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 000001111122 024680246802	24MHz 000001111122 024680246802	21MHz 000001111122 024680246802	18MHz 000001111122 024680246802	14MHz 000001111122 024680246802	10MHz 000001111122 024680246802	7MHz 000001111122 024680246802	3.5MHz 000001111122 024680246802
** EUROPE								
MOSCOW	.....1111...	....233332..	...25666651.	...57777873.	212777678984	766544445799	874211113588	+42.....25+
MALTA	....111111..	....332232..	...26665662.	...588778851	422877778996	987654456899	997422223689	+++.....3++
GIBRALTAR	.....	....111.11..	....3443341.	....6765674.	21.487777984	775765556899	998642223589	+++3.....2++
ICELAND	.....	.....	.....22122..	....1444452.	...147777872	532565556788	887643223568	+++3.....235
** ASIA								
OSAKA	.....1.....	....231.....	...24531....	...365421...	...253233332	....2...3573	351	.........2.
HONGKONG	....1221....	....134431...	...3566543..	...25555652.	1...33236873	2.......3686	363	.........3.
BANGKOK	...1233321...	...2455542...	...35666751.	...245567841	2...13236885	3.......3688	1.........366	43
SINGAPORE	...1333331...	...3555553...	...45666762.	..1245567841	2...13236885	3.......3688	1.........366	43
NEW DELHI	...233331...	...345552...	...45666521.	..1335567431	312112236775	73......3689	51........368	2.........45
TEHERAN	...2443431..	...4555663..	..165667862.	1.3544568852	535211236897	863.....3689	741.......368	5.........45
COLOMBO	...2443432..	...4555664..	..145667873.	1.1334568863	521..1236897	72......3689	5.........368	2.........45
BAHRAIN	...3444441..	...56666631.	..1655678641	2.3533568864	7452.1236898	963.....3689	84........368	5.........45
CYPRUS	...2544443..	...57666751.	..1788888852	213877788974	757655567899	986322234799	8741....2578	+4.....24+
ADEN	...3555553..	...56667752.	1.1655678853	413433468986	8652..136899	973.....3689	851.......368	52........45
** OCEANIA								
SUVA/S	.....	.....111....	....1333.3..	...13444251.	..155323473.	..1521..351.	...2.....3..	.....
SUVA/L	.....3.	...11.....61	21.4311..173	22175321.473	113752111741	..152...251.	...2.....3..	.....
WELLINGTON/S	.....	....1221....	...13443....	...35544121.	..165323464.	..152...363.	...2.....3..	.....
WELLINGTON/L	.....	21	22.21.....43	231531...164	124752...462	..252...153.	...2.....2..	.....
SYDNEY/S	...12221....	...24443....	...566652...	..167555522.	..1553235662	...22...3662	.........33.	.....
SYDNEY/L	.....	11	11..2.....43	211151....65	11145211.174	...23...1451	.........22.	.....
PERTH	...24431....	...466531...	..15776541..	1.146555641.	311143236753	2...1...3686	364	.........4.
HONOLULU	.....	.....1..	.....1..141.	....12..352.	..134311551.	..3531..22..	..22.....	.....
** AFRICA								
SEYCHELLES	...3445542..	...55667642.	1.1545678753	413323568886	8541..236899	962.....3689	84.......368	+.........45
MAURITIUS	...35556641.	...566777621	2.1555678863	523433558986	9641.1225899	962.....3689	83.......368	+.........45
NAIROBI	...35556651.	...566678731	211655578974	533523358997	9762...25899	984.....3689	872......367	+4........45
HARARE	...26567762.	1..476788842	31.655578975	642633357998	9864..125899	9961....2689	883......367	+5........45
CAPETOWN	...15556763.	...376678852	2..676678985	521754457998	974621125899	9973....2689	8851.....368	5+2.......35
LAGOS	...16567773.	1..276778862	32.575558985	652753337998	99672...4899	8985....1589	7862.....368	4+3.......35
ASCENSION Is	....6544674.	77557861	32..86556994	652174334897	996551..1699	99852....389	7862.....168	453.......35
DAKAR	....5656674.	77667861	22.286556894	552474334897	996751..1699	99852....379	7863.....157	553.......25
LAS PALMAS	....3543352.	....6766674.	1..188888982	321488778995	875876556899	998753323589	887421..1368	+++52.....4+
** S. AMERICA								
Sth SHETLAND	.....266674.	4778861	21..16678884	531135557787	886553225568	89852...2236	6863......13	353.....
FALKLAND Is	.....455674.	6777861	22.127667784	452446555687	896753222368	99852.....36	7863......14	4+3.....
R DE JANEIRO	.....655464.	7766761	11.127655784	442364433587	8866531..279	99852.....48	8763......16	+53.....3
BUENOS AIRES	.....555564.	6766761	11.1.7665684	442326543576	886643211258	99852.....26	8863.......4	5+3.....
LIMA	.....43343.	654651	1...11654563	331133543346	77545321..26	89853.....3	6863.......1	3+4.....
BOGOTA	.....43243.	1644551	3654463	32..14533246	77434321..26	89853.....4	6863.......1	3+4.....
** N. AMERICA								
BARBADOS	.....443343.	6644651	1...17644573	321.36533366	8754532...48	99853.....16	8863.......3	5+4.....
JAMAICA	.....32232.	543541	2654553	21...3543345	763223211..26	898531.....3	6863.......1	3+3.....
BERMUDA	.....132232.	2533541	4654563	21...5543465	763233211147	898531....15	7863.......2	4+3.....
NEW YORK	.....11121.	.....33333.	1554552	21...3553465	652113221136	797421....14	5863.......1	253.....
MEXICO	.....1121.	.....13332.	254442	21....353333	552121221..3	587431.....	2663.....	.43.....
MONTREAL	.....11111.	.....23233.	1454552	1....3554464	642113221246	787421....14	5863.......1	253.....
DENVER	.....	.....1111.	33331	1.....144333	4311..123113	47642.....1	1563.....	.23.....
LOS ANGELES	.....	.....111.	14331	1.....35432	32111..24111	25642....1...	.363.....	..3.....
VANCOUVER	.....	.....	.....112.	13331	32111..25222	24542...2...	.263.....	..3.....
FAIRBANKS	.....	.....	.....11.	11111221	1.1332224432	224521..2211	.132.....	.....

The provisional mean sunspot number for June 1988, issued by the Sunspot Index Data Centre, Brussels, was 101·8. The maximum daily sunspot number was 173 on 9 June and the minimum was 47 on 13 June. The predicted smoothed sunspot numbers for September, October, November and December are respectively: (classical method) 101, 108, 114 and 120; (SIDC adjusted values) 95, 105, 117 and 124.





November at the Ambassador Hotel in Bangkok. It will open with a welcome dinner on the Friday night and will have lectures, discussions and commercial exhibits. There is a formal dinner on Saturday night and RAST will arrange shopping and sightseeing tours for those attending. Registration costs US$75 and a very special rate at the hotel has been arranged – about US$42 single and US$46 double per night for delegates and families. If you can attend you should contact SEANET 88 Contest Manager, Ismail Razak, 9M2FK, 281-C, Jalan Pekeliling, Bukit Clugor, Box 13, Penang, Malasia, as soon as possible. Anyone who has had experience of S.E. Asian hospitality will know that this could be a very good place to be.

QTH CORNER

A71BJ	L.Anstead, G4HOU, 78 Allington Rd, Paddock Wood, Kent, TN12 6AN
G3YCM/C6A	Laurie Ruffle, 7 Leneda Drive, Tunbridge Wells, Kent, TN2 5 RJ
F2DX/FJ	A. Duchauchoy, F6BFH, 21 Rue de la Republique, F-76420 Bihorel, France
JW0B	LA2HFA, Nebbejordet 32, N-1266 Oslo 12, Norway
T31JS	via VK9NS, Box 90, Norfolk Is, 2889
UV1OO	(12/85-2/87) RA9LA, Box 44, 627 400 Ishim-6, USSR
YJ8NJS	Box 431, Port Vila, Vanuatu
1Z9A, 1Z9B	KA6V, Joan Branson, 93787 Dorsey Lane, Junction City, Oregon, 97448, USA
3C1PJF, 3X1SG	ON7GV, Clos Bouchebelle 15, B-7700 Mouscron, Belgium
J87CD	PO Box 975, St Vincent Is, W. Indies
4J0FS	OH2NB, Armas Valste, PO Box 63, 00391 Helsinki, Finland
4S7PVR	P. Perera, 4S7PVR, PO Box 62, Mt Lavinia, Sri Lanka
7Q7BC	PO Box 41, Zomba, Malawi

LEBANON

Remember a listing of Lebanese stations which had been provided for me by RAL, the IARU member society of Lebanon, in the October 1987 column? I recently received a news statement from OD5VT who represents (in his own words) the 'Radio Amateur Group in Lebanon'. He alleges that the information sent in by OD5FH contained many incorrect points and says: "The radio amateurs of the whole world are requested not to get confused by the letter of OD5FH. The newcomer group face too much trouble to keep the radio amateur activities apart from the problems of the civil war, as well as to handle all the radio amateur activities to the national and international rules and regulations."

BAND REPORTS

The usual excellent and interesting report from G8KG goes on as follows: "Cycle 22 will be just two years old in September and this, typically, is the time at which the various measures of solar activity increase most rapidly, the peak in 2800MHz solar flux of 150 sfu reported last month was soon followed by another of 165 on 9 June and one of 193 sfu on 1 July – this one coming at the end of a week of very marked flare activity. The monthly mean solar flux for June was 137 sfu, the highest of the cycle so far, and the provisional monthly sunspot number is likely to be at least 90.

"There have been suggestions that the steep rise in the early stages of the present cycle presage an early maximum, perhaps even as soon as the coming winter. While this cannot be completely discounted there seems to be little reason to expect such a drastic departure from past behaviour patterns. In the fourteen cycles for which the data is regarded as being reliable the high cycles certainly peaked earlier than the lower ones but none took less than 3·25 years to reach its peak. Furthermore, the lead of Cycle 22 over 19 and 20 is beginning to narrow – indeed if one uses the three-month mean susnsot number as the most up-to-date 'somewhat smoothed' index, 22 is currently level-pegging with 19 and may be about to fall behind (see *Radcom*, September 1979, p834).

"As the cycle progresses the two principal official forecasts of the peak are beginning to converge. That from NGDC Boulder reached its highest value of 198 in their March bulletin, falling back to 185 when account was taken of the data for April and May – the figures quoted ▶

IN RESPONSE TO THE MENTION OF VR6AY IN JUNE G3REA SENT THIS PICTURE OF HIS QSL – RECEIVED IN 1938 IN RESPONSE TO HIS LISTENER REPORT

ONE OF THE SPECIAL QSL CARDS ISSUED BY ONE OF THE STATIONS WHICH CELEBRATED THE VISIT OF POPE JOHN PAUL II TO POLAND LAST YEAR

POLAND — ŁÓDŹ

POLSKI ZWIĄZEK KRÓTKOFALOWCÓW
Stacja okolicznościowa pracująca podczas
trzeciej wizyty papieża
JANA–PAWLA II w Polsce, 1987

SN7JP

Special station for the third
visit of pope JOHN–PAUL II
to Poland, 1987

Confirming two way QSO				RST
TO RADIO	MHz	UTC	DATE	mode
			June, 87	

Remarks: GOD BLESS YOU! Op:

zpkśw z 6/88, 50 000

are the 'most probable' values. The May bulletin from SIDC Brussels gave a forecast of 170+ or −25 for the peak on the assumption that a smoothed monthly number of 50 was reached by January of this year. In fact it looks likely that this value was reached a month earlier and this may result in a small increase in the forecast. Boulder still favours late 1989 for the peak while SIDC predict that it will be in September of that year – but this would mean a rise time of only three years.

"With the relatively high levels of the solar indices it was no surprise that the 21MHz band was open to all continents on many days in June; but at this time of year dx on 28MHz is mostly confined to the southerly paths, even at solar peaks. There were, however, extensive and prolonged spells of Sporadic-E propagation, particularly in the first half of the month – no doubt much appreciated during NFD. By the time that this appears in print the monthly sunspot numbers will probably have topped the 100 mark in which case we should expect to see all the higher hf bands open at times to much of the world, with conditions improving as the winter season advances. Increased flare activity will result in rather more geomagnetic disturbances but, on the other hand, these have a less disruptive effect on the ionosphere as levels of ionisation increase with the rising cycle."

Thanks go to the following for sending in logs and other information this month: G2CIL, G2HKU, G5JL, GM3CSM, GJ3EML, G3s GVV, IGW, KSH, SED, YRM, G4EHQ, GM4ELV, GW4KGR, G4s, MUW, NXG/M, SJG, GW4TEJ, G4XAH, and G0DNA, GD0ELY, and G0HGA. Callsigns listed in italics were of stations on A1A:

3·5MHz 0500 *LU4s EZT, FC.* **2000** YC6GR.

7MHz 0100 *FT5ZB.* **0200** *PY1CRP/PY0F, DJ1UR/SV5.* **0400** *FY5AU, OX/12DMK, XE3AAF, YN3CC.* **0500** *FY5FE, PS8AKL, VK3, VP2MM, ZL2AGY, 7X4DA.* **0600** *VP2EMA.* **1900** *FH5EF.* **2000** *VK8AV, 7P8DX.* **2100** *ZS, 9M2FH.* **2200** CE0ICD, J87CD, *PY7DU, VK6, 4K1A.* **2300** *TU4CO, UA0BDU/UA1O, VK6, VP2EMA, ZS.*

10MHz 0500 *VE7ZG, VK2APD, VP2EMA, W4QEJ, ZL2AKW.* **0700** *KB4EYR, VK2BKH.* **2200** *UA3IT/UF2E, W3PA.* **2300** *KP4TIN, TK3VN.*

14MHz 0500 *F2DX/PJ6, XE1X.* **0600** *HC2OG,* V44NXX, W6-W7, ZK1DD. **0700** FO0AQ, V85JB, VR6YL, F9UW/3A//M. **0800** KH3/WY5L, KH6AK, YI1BGD, ZK3RVC, *9Y4LS.* **1000** KL7HX. **1500** A61AB, VK9X/VK4CEI, 3B9FR. **1600** EP2HSA, TU2CJ, XU1SS, YI0SW, 5T5DX. **1700** D68MG, S0RASD, ZD9CA, 5H3RB. **1800** EP2ASZ/M, *VS6UW, YB5ASO,* 8Q7MT. **1900** *4S7VJ.* **2000** JT1T, VP8BOW. **2100** *F2DX/PJ5, TA2D, W7.* **2200** *FY5EW, ZL2TAK.* **2300** VP8ML, VU2TJW.

18MHz 0600 *VK2DUY.*

21MHz 0000 HK0FEU. **0500** BY4SZ. **0700** AP2P, BY4SZ, FO0GW, HL0Y, JA, KH6-DLW, KL7XD, W6-W7, 5W1GR. **0800** BY5NC, FO/FD1MCK, KH6IJ, KH3/WY5L, ZK1XV 9V1WP. **0900** BY5RA, DU3/K4SXT, FO0AQ, *JT1BR, RV0YF,* 9N1RN. **1000** KH0/NY4M P29DD, 4F1FZ. **1100.** JA, VQ9CQ, ZY0TK. **1200** J28DN. **1300** BY7HY, C53FJ, *EI9GC/OD5.* **1400** TL8GM, *UM8MWA/UM8P.* **1500** TN8NW, *UA0YM,* 3C1JPF, 3D6A0B, 9V1RH. **1600** G3ZNT/5N6, 9L1AC, 9V1WW. **1700** BY4RB, VR6TC. **1800** CE0ICD, EP2HSA, ZY0TK, 4J0FS, 9M6HF. **1900** SV30FU, 4S0AA. **2000** SU1ER, T32AB. **2100** S92LB, ZL2APW. **2200** *CE1/N5GZN, KH6IJ,* KL7LF, *P40W,* VI88ACT. **2200** CE0FFD, CO2HR.

24MHz 1400 *LU5DJO, PT7AA, 4X4DX.* **1900** *K4FV.* **2000** *OY1R.*

28MHz 0000 T12CF. **0700** VQ9KR. **0800** 9Q5BG. **0900** OD5MW, VK6ADP, ZB2AZ. **1100** DL3LAP/TF. **1200** AZ1BJ. **1300** TP0CE, *TR8JLD,* W1-W4. **1400** ZD7SE. **1500** A4XZK, D68MG. **1700** A92BE, JY9LC, PJ9LC, YK/OE1RUA. **1800** PY0FC, 5V7WD, 9X5AA. **1900** CE0ICD, ZY0TK. **2000** ZD8MB. **2100** HC6GP, NP2CP, W8GIO,. 9Q5UN. **2200** KG4DM, KP4TL. **2300** W1-W3.

Many thanks to the following for items extracted: *Lynx DX Group Bulletin* (EA2JGO), *DX'press* (PA3CXC), *CQ Magazine* (W1WY), *DXNL* (DL3RK), *Long Island DX Bulletin* (W2IYX), *DX News Sheet* (G4DYO), the *EX-G Radio Club Bulletin* (GI3OEN/W6), and *DX Report* (VK9NS).

Closing date for receipt of material for **November** issue is **9 September.**

1988 28MHz COUNTRIES TABLE

G3VOF – 164
G4XAH – 149 (ssb)
G0DNV – 129
G4MUW – 127 (ssb)
GD0ELY – 120
GD4XTT – 114
G4SJG – 93
G4NXG/M – 84
G4ZYQ 84
G4JBR 50
G4DXW 42
G0FYD 38
GW4TEJ – 36
G4OUT – 34 (cw)
G4OBK – 24
GM4CHX – 23

10MHz COUNTRIES TABLE

	All-time	1988
G3PJT	106	36
G3SED	71	32
G4XRV	25	25
G3JJG	102	18
G4VDX	71	—
G4YWG	64	—
G4OBK	57	—
G4YSN	1	—

TABLE SERIAL NO 25
ALL TIME TABLE WITH DELETIONS NO. 16

Call	1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total
G3KMA	125	*240*	*308*	333	334	318	1658
G3GIQ	71	209	265	337	334	313	1529
G3MCS	64	212	263	323	324	306	1492
G3XTT	*160*	205	248	297	284	254	1448
G4DYO	66	186	233	313	305	287	1390
G4GIR	97	208	245	293	277	260	1380
G3UML	31	220	234	334	298	255	1372
G4BWP	102	217	246	291	264	252	1372
G2DMR	60	187	209	315	313	269	1353
GW3AHN	16	109	118	*365*	*360*	*332*	1300
G3XQU	56	179	198	302	276	248	1259
VK9NS	80	184	226	290	243	192	1215
G3NOF	5	96	96	346	331	283	1157
G4LJF	28	198	205	267	235	198	1131
G4OBK	124	140	171	258	217	176	1086
G3YMC	80	109	180	245	150	191	1055
GW4OFQ	52	225	199	217	190	138	1021
GM3YOR	75	137	183	221	199	181	996 (all cw)
GM3PPE	59	143	158	189	175	141	865
Average	71	179	210	291	274	242	1267

Band top scores listed in italics. Next deadline – Current All-Time – **to reach G3GIQ by 8 October.**

RSGB NATIONAL HF CONVENTION

A ONE-DAY CONVENTION WITH LECTURE PROGRAMME

SUNDAY
25 SEPTEMBER 1988

BELFRY HOTEL MILTON COMMON OXFORD

DOORS OPEN 9.30AM ADMISSION £3.00

RSGB BOOKSTALL	**CAR BOOT SALE**
QSL BUREAU POSTING BOX	**RSGB COMMITTEE STANDS**
PILE-UP COPYING COMPETITION	**CONTRUCTORS' ADVICE BOOTH**
DOCTOR DX COMPUTERISED CONTESTING	**HF DEMONSTRATION BY RAFARS**
WORKED ALL BRITAIN STAND	**PRESENTATION OF TROPHIES**
PANEL PLANNING CLINIC	**1·8MHZ GET-TOGETHER**
G-QRP CLUB STAND	**RNARS QRQ CW TESTS**
BYLARA STAND	**CHILTERN DX CLUB**
BARS	**DX QUIZ**

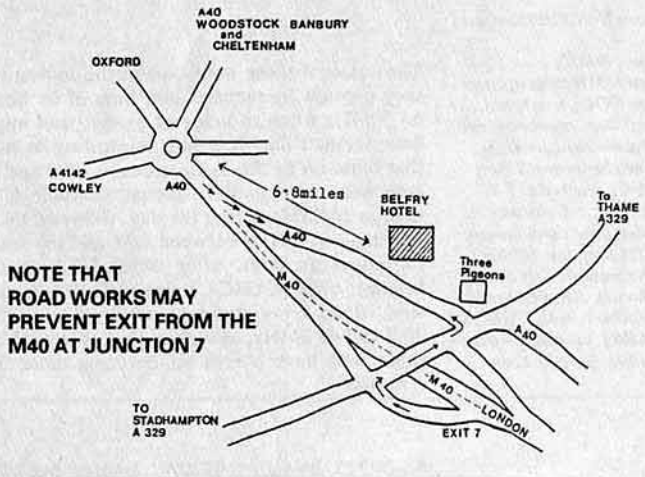
This programme is provisional. RSGB Committee stands include HF, HF Contests, EMC and Propagation Studies. Panel Planning Clinic will be subject to availability of panel member. If you plan to use the QSL Bureau posting box cards must be pre-sorted according to bureau rules

LECTURE PROGRAMME

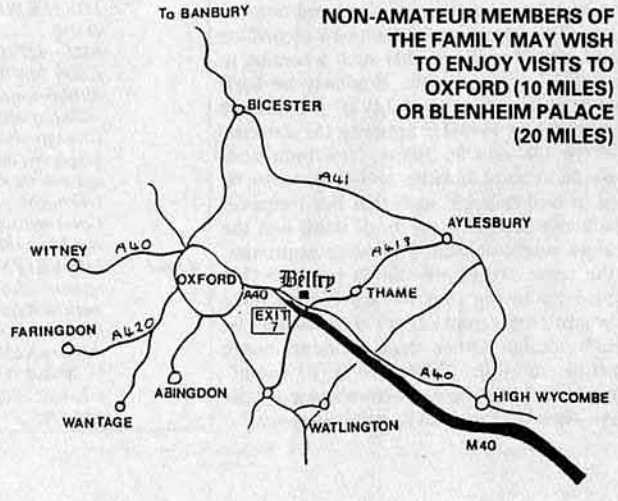
1030-1130	"EMC – The Politics and the European Community Directive" by Dan Bernard G4RLE (EMC Committee Chairman) and Alan Dearlove G1WZZ (EMC Committee Member)
1145-1245	"HF Equipment – New or Second-hand?" by Angus Mckenzie G3OSS.
1330-1415	Trophy Presentation by RSGB President, Sir Richard Davies G2XM.
1430-1530	"QRP Forum" by Peter Linsley G3PDL and members of the G-QRP Club.
1545-1800	DX Slide Presentations: ● "Building a US Contest Super-station" by Paul Bittner W0AIH. ● "The 1988 DXpedition to Kingman Reef, Palmyra and Kiritimati Islands" by Paul Granger F6EXV

Light lunches and snacks will be available at the hotel for a modest charge. Tickets should be purchased from reception on arrival. Dinner, bed and breakfast is available for Saturday night at £35. Bed and breakfast costs £21 per person. A special weekend rate of £60 is also available for two nights. Telephone Great Milton 381 for reservation. Note that these prices do not include £3 admission to the convention.

THERE WILL BE A SHORT PROGRAMME OF DX SLIDES AT THE HOTEL ON SATURDAY EVENING.



NOTE THAT ROAD WORKS MAY PREVENT EXIT FROM THE M40 AT JUNCTION 7



NON-AMATEUR MEMBERS OF THE FAMILY MAY WISH TO ENJOY VISITS TO OXFORD (10 MILES) OR BLENHEIM PALACE (20 MILES)

VHF/UHF

KEN WILLIS G8VR

6 LERYN GARDENS, BROADSTAIRS, KENT CT10 3BH

QSL FOR EXPEDITION TO ALBORAN

TRANSATLANTIC CONTACTS ON 144MHz?

The report on the 1988 VHF Convention in last month's Radio Communication carried a brief mention of a lecture by Ray Flavell, G3LTP, entitles "Trends in Tropo", with the sub-title "The best is yet to come". Ray, who is an acknowledged authority on tropospheric propagation, concentrated on extreme-range paths, typically those in access of 1,000km at 144MHz and more than 750km at 432MHz. We are accustomed to associate good tropo conditions with a stable high pressure system over Europe, and Ray showed that if you look at a weather map, the longest ranges which can be achieved appear as chords across the (curved) isobars of a large anti-cylcone, and that the really long ranges are confined to a relatively small area of the high pressure system. However, studies of a large number of contacts made under good tropo conditions indicated that if the path lengths of a large number of contacts were plotted on a graph, the resulting distribution curve displays no gradual falling off as might be expected, but instead, for each band, a well-defined and repeatable peak at a range depending on the frequency being used. This result, plus the fact that in Europe the longest ranges so far achieved were apparently not associated with regions where the steepest changes in refractive index occurred (normally assumed to be necessary for ducting), suggests that some other mode of propagation is responsible for these very long paths. Much further investigation is required, it seems.

If all of this sounds very technical, just take it that Ray is saying that there is hope for those who live in poor locations. A study of maximum ranges which have been attained at 144 and 432MHz from a variety of locator squares showed that they all tended towards similar values, suggesting that location was not a hindrance to achieving good tropo dx once conditions were right. Ray believed that conditions may already have occurred which would have permitted a contact between the UK and the Cape Verde Islands on 144MHz, but no-one was around to take advantage of the conditions at that time. This would represent a new record for the band, and Ray thinks that such a contact in the future is quite possible. Similarly he feels that there is least the possibility of the atlantic being bridged on 144MHz between the extreme west of the UK and St. Johns, Newfoundland. This would require a large anti-cyclone to be centred in mid-Atlantic such that the transmission path ran across its northern flank and the surface pressures at each end were approximately the same, with no fronts in between. He concluded by saying that we are reaching the point where tropo (and other) records may be broken by design rather than accident, hence this lecture sub-title, "The best is to come". With my luck, I shall be away from home for the few days when the required conditions appear!

50MHz PROPAGATION – SOME INTERESTING LOGS

There seems to be general agreement that the 50MHz openings during June and July this year were better than those of previous summers, leading to much speculation as to the true nature of the propagation which enabled so many long distance contacts to be made, often by stations with extremely low erp.

While double or multiple-hop spradic E is assumed to be the propagation mode, whether this is produced by the same conditions which give rise to sporadic E openings on 144MHz is by no means proven. The evidence points to E-layer reflection, if only (as G3COJ aptly put it) because "during summer there is too much underneath the F layer". Maybe when we get beacons transmitting timing pulses we will be able to assess path lengths and get a better idea of just where the signals go in bridging the Atlantic and Pacific.

Distances covered (up to 6500km) and the duration of some of the events (4-5 hours) both give some food for thought. To get an overall picture of what had happened up to the middle of July as we go to press, one need look no further than the log of Dave Newman, G4GLT (Leics), a long-time 50MHz enthusiast who knows from experience when and where to listen. Here are his notes, supported in parts by observations from other operators. All times are recorded in gmt.

4 June	*2103–2139 Hrd FY7THF beacon* *Intense sporadic E on 144 MHz to I, EA7 etc.*
5 June	*1250 Hrd N0FFO (Wichita, Kansas) EM17 50·110* *1318 Hrd W5AL (Amarillo, W. Texas) DM95* *1421–1427 Hrd Beacon NOLL/B (Kansas) EM09 50,078·3* *Further sporadic E on 144MHz* *W5AL confirmed that 50MHz was open to Chicago when beacon NOLL was heard, suggesting that the first 'hop' of propagation towards the UK was in the right direction. Overnight, path opened between US West Coast and Japan. KOCL worked 23 JAs, and JAs worked as far east as Colorado.*
6 June	*1650 VE1YX Hrd, then band continuously open to USA until 0231 next day. G3 XBY worked KA0JGH (Nebraska). Last station heard was K9RS (Illinois). Beacons heard this day K1NFE/B 50·066·7, N4LTA/BCN 50·70 and W1AW (ARRL cw practice transmission) 50·080. Further sporadic E on 144MHz.*
7 June	*0815 G3IMW Hrd 9JRCR (Zambia) who worked into G and GM 144MHz open for hours to the Mediterranean via Es* *1212 VE1YX, KP4EIT, KP4EOR worked* *2048 F/KA3B worked, W4WHK (Fla) hrd OX3LX worked several G and 90 USA stations in 38 squares.*
9 June	*1325 Speech heard, US accents.* *1355 Hrd "Atlanta Georgia" 50·200.* *1403 Worked W4EQM (Alabama) EM72.* *1450–58 Hrd WB20CK (S. Carolina) 50·120.*
12 June	*1413–17 WB400J hrd, 439 cw, 50·080.* *2045–2106 FY7THF hrd.*
25 June	*2126 Widespread opening to USA from Maine to Florida and west to Ohio. Worked K8WKZ (Michigan), K4CKS (Georgia), WA8R (Ohio).* *USA stations worked into OH.*
27 June	*0430–0600 "5-hop" JA opening to USA W. Coast reported.* *1342–1351 Hrd N5ARS (Arkansas) EM25 50·110 accompanied by strong bursts of solar noise. At this time, stations in Kansas were working into New York, Pennsylvania and New Jersey on 144MHz and 50MHz was open all day there.* *G4GLT says strong correlation between hearing W5/WO on 5 June and W5 on 27 June, both followed by JA openings, suggesting that this type of propagation is global when it occurs.*
3 July	*1615–1631 Hrd 3rd harmonic of Ascension Island BBC relay station, 45·855.*
4 July	*Minor US opening "28 days after the major event on 6 June.*
10 July	*Major sporadic E on 144MHz to YO, YU, HG, UO etc for about two hours in the afternoon. At 1700, 50Mhz was wide open to GM from the south. At 2145 a minor opening to the USA, down to W4, which favoured the western areas of the UK and did not penetrate far to the north.*

The value of these notes lies in the indications they provide frequencies and time of dx heard on 50MHz when to many of us the band might have seemed flat. It is also interesting to note that build-up of the openings on 6 June and 10 July were very similar, intense sporadic E as high as 144MHz during the day, followed by an opening on 50MHz between GM and the south for about an hour, after which USA signals began to appear. G4GLT also lists other Ascension Island relay station harmonics on 30·57, 30·8 and 46·2MHz, as well as that on 45·855 for those who have a receiver covering these frequencies.

ZB21Q – A WELL PLANNED OPERATION

Dave, G4FRE, who was a member of the Square Basher's expedition to Gibraltar mentioned last month, supplied some statistics which illustrate the total success of this well-planned operation. In all, 7290 contacts were made, including many on the hf bands. On vhf, approximately 1400 contacts were made on 50MHz, 220 on 70Mhz and 490 on 144MHz. No less than 103 different stations were worked on 70Mhz, showing that this band is far from dead, as many believe. On 144MHz, 96 different squares were worked from IM 76, many of them during a hectic sporadic E session when Dave worked some 270 stations in a three-hour stint. He commented that "smoke was coming from the log-keeper's pencil!"

Anyone who knows 'the Rock', or has seen pictures of it, will know that it presents a formidable obstacle to radio waves unless you're sited right on top of it with uninterrupted views. Dave said that operation was, in fact, from an ordinary apartment block on the eastern side of the Rock, the aerials being erected on the balcony. This worked out well for the UK and Europe generally, but gave a poor take-off to the west, so when they heard that 50MHz was open to the USA they went portable to a better site where a dipole was erected to great effect. The Square Bashers have shown that if there were more 144MHz activity in Gib, it could be worked much more frequently from the UK, and would be in demand generally as a square and country. The QRB would be good for meteor scatter, too.

SOLAR INFORMATION

Perhaps sensing that I was getting too enthusiastic about the rise in the current solar cycle, Smithy, G8KG, wrote as follows. Cycle 22 will be two years old this September, and this is the time when solar activity can be expected to start to increase most rapidly. The solar flux for June was 137, the highest of the cycle so far, and this is likely to result in a monthly sunspot number calculated to be 90. While a steep rise has been observed in the early stages of the current cycle, resulting in suggestions that the peak will come as early as this winter, there is really little reason to expect such a dramatic departure from the behaviour of past cycles. In the past 14 cycles for which reliable data is available, while 'high' cycles peaked earlier than 'low' ones, none took less than 3·25 years to reach its peak. Indeed, based on 3-month mean sunspot numbers, it appears that Cycle 22 may be beginning to lag somewhat on Cycles 19 and 21 (see *RadCom* September 1979, page 834).

However, the experts at NGDC Boulder, Colorado, still favour late 1989 for the peak of the cycle, with a forecast of sunspot number of 185 (down from their previous estimate of 198). SIDC, Brussels, predict that it will be in September of the same year with a sunspot number of 170 plus/minus 25, though this would represent a rise time of only 3·0 years.

All we can say is that with so many UK stations now equipped for 50MHz, if and when any F2 propagation appears, there will be one big pile-up chasing the really exotic prefixes.

50MHz

On Tuesday 21 June, the day when 25 OH stations received permits to operate on 50Mhz, there was intense sporadic E. About half a dozen of them had a field day working into the UK, and one was reporting his 100th contact long before the propagation faded. Jan, OH1-ZAA, a regular contributor to this column, was unable to start up until 24 June, but he soon made amends and made more than 300 G contacts on his first day. Over the air he told me that the OH 50MHz licence allows operation between 50·0 and 50·5Mhz, ssb and cw only, cw power 50W, ssb 200W pep. There are no limitations on the antenna system, so he was planning to put up a 5-over-5. It was his view that on 50Mhz "anything was possible" and that it was "mainly about antennas, not power". He should know, because on 25 June he worked 25 USA stations right down to Florida, and was regularly copying beacon 5B4CY.

Clive G3POI went off to Shetland during the first week in July signing GM3POI/A, and found that using cw, he could work deep into the south most of the day, sometimes assisted by meteor bursts. This showed very clearly the value of cw for weak signal contacts. On the night of 9/10 July Clive worked the Saba Island expedition PJ0M. G3SED and G4GLT also worked this rare one, all using cw.

Alan GI8YDZ was the first and the last British Isles station to work Harry Schools, FP/K3AB on 7 June. Other 'firsts' for this prefix were G4GLT, GW4EAI, GM8COX, GJ3YHU and EI8EF. Harry worked 143 G, 26 GM, 9 GW, 5 GI, 2 GJ and 2 EI during the opening of 6/7 June, but felt he could have done much better had not some of his equipment been lost in transit, and if he had been able to erect a beam at his hotel instead of the HQ1 Mini-Quad. Harry says that FP5HL has some 50MHz equipment and should be active on the band by next year.

Ted, G4UPS, said that there is hope that OZ and SM amateurs will get some 50MHz facilities if discussions now under way bear fruit. On the air, I0AMU said that the Italians were also hopeful of getting the band. Steve, F/G4JCC worked John, SV1DO (Athens) from his holiday spot near St. Tropez and learned that John was putting up a 5-over-5 which should improve his signal into the UK.

Lasse, SM0KAK reported that during the Nordic VHF/UHF/SHF conference (10-12 June) the first authorised two-way 50MHz contacts in Sweden since 1957 took place. SK3JR, the local club, was granted a permit to operate on the band for two nights from 0100 to 0700 local time. The permit allowed 50w erp, and a five element Yagi was used. On the first night, PA0RDY was heard frequently but no complete contact resulted. High-speed ms procedure was then adopted, and immediately PA0RDY was worked. An ssb sked with GM produced many long 59-plus bursts, but the Scottish station experienced such heavy QRN that he was unable to send even a report. Later LA6QBA and three PAs were worked, all using high-speed cw, and LA1K was contacted using normal speed cw. Lasse confirmed that discussions are taking place in connection with SM licences for 50MHz, and while nothing has been promised, he says that two years ago the authorities refused to talk about the subject so this marks distinct progress.

F8MP (Beziers) JN13, worked a lot of G stations on his first day on 50Mhz using only 100mW to a dipole, proving that you can have fun on the band with simple equipment. There were home-brew kits for transceivers for the band on show at NEC this year.

Thanks to G3CCH, G3IMW, GJ4ICD, G1DYN, G1UOR and G7A0T for 50MHz reports which will go to the PS Committee for analysis.

70MHz

G5UM feels that 70MHz operators suffered in the Jubilee contest because there were minor differences in the rules compared with those for other bands. He also deplores the low level of cw activity at the low end of the band, commenting that some portable groups even failed to include a morse key in their equipment. Frequency modulation was also seldom used, though Jack says that there is much fm activity among fixed stations on 70·26MHz. Others have commented that RSGB does not do enough to encourage the use of cw and fm in contests.

The first issue of QSB, the new 70MHz newsletter edited by G4WND was a great success, and issue two is already out. One of the items it contains is a useful list of European stations equipped to work crossband, and information about the fm nets mentioned by G5UM. Write to G4WND·QTHR for further details.

AWARDS

In response to some queries from claimants, Jack Hum, G5UM, VHF Awards Manager says that cards confirming 50MHz contacts with G4UPS when he operated /P last year from Andorra are 'legit'. Also acceptable are cards from EA1MO, the Spanish 'Lone Ranger' on this band. Jack has supplies of claim forms for the three categories of 50MHz award, but the design of the actual certificates had not been finalised when he wrote at the end of June.

Jack also sent a copy of a letter from David, G4YTL (Oxon) who proposes a change in the awards rule which stipulates that if you move QTH further than 10km, you must start again from scratch collecting squres, counties and countries. David suggests that for the FMD countries/counties awards, a move within the same county should be acceptable, while for squares awards, a move within the same square or to an adjacent one should satisfy the rules. If you have any views on the subject, I suggest you write to G3ZNU, chairman of the VHF Committee.

BEACON NOTES

The **Icelandic** beacon on 50MHz was taken out of service for repairs during July, and it was planned that on its return, two 50MHz rigs would be delivered to Iceland for the use by local amateurs. One of the recipients was said to be TF3JP, so 50MHz activity from TF should be assured in future.

Alan, GI8YDZ, reported during a 50MHz contact that he was making good progress with the construction of the proposed **Northern Ireland** 50MHz beacon. It was delivering 18W output, but some sproggies needed to be cleaned up before it would be serviceable.

OH1ZAA reported over the air that he was making good progress with the 50MHz beacon ▶

for the **Cayman Islands**. Following receipt of some transistors from G3JVL, he has achieved an output of 65-70W, but running at this power level would require a larger heat sink than Jan wishes to use, so the output will need to be reduced somewhat for continuous operation.

G4UPS confirmed that the **Ascension Island** beacons on 50 and 28MHz were QRV following reports that they had been closed down in July while Mike, ZD8MB, the beacon-keeper, was on vacation. Ted said that another operator, ZD8MG, was equipped to come on 50MHz using ssb if alerted to the fact that the ZD8 beacons were being received in the UK. Ted, who is quite happy to telephone around the world if it results in some exciting activity on 50MHz, has ZD8MG's number, and can be relied upon to stir things up if he thinks conditions are right.

FY7THF, on 50.039MHz, was being copied quite regularly in June by G4UPS and others, and should be a valuable indicator of conditions as we approach the autumn and winter with (fingers crossed), the possibility of some F2 propagation. Reception of 5B4CY (50.499) was also reported by several operators during the last two weeks in June and the early part of July.

REPEATER NEWS

The Summer issue of *FM News*, published by the Central Scotland FM Group contains its usual wealth of articles covering a variety of topics ranging from packet radio to hints on treating a person suffering from a heart attack (contest operators please note). There's also a lot about repeaters in the publication, too. One major item is the proposed move of **GB3AY (R2)** from its present IBA site at Lethanhill, Ayrshire to one at Galston where an old relay station mast and building are available, needing only minor refurbishment. Tests have indicated that the site should provide much better coverage than the current one, so that the black spots around Kilmarnock should disappear when the repeater is moved there.

The new location will be IO75TO (NGR NS 499 357). The site is 110m asl and the mast height 80m. The equipment will comprise a Storno CQF 612 running 10W into a single collinear antenna.

A full application to move GB3AY was submitted to DTI in April this year. The group was hopeful that approval would be granted within three months of the application date.

Colin Dalziel, GM8LBC, the editor of *FM News*, is also the RMG co-ordinator for the region, and wearing this hat he inserted a newsletter into this issue giving interesting statistics related to the UK repeater scene, including a map of VHF repeater coverage in the British Isles. According to these figures, England has a total of 230 repeaters (VHF and UHF), Scotland 29, Wales 16, Northern Ireland 6, Channel Islands 4 and IOM 1.

Finally in this issue, Robin, GM6LJE provided a useful round-up of repeaters in the region which will be worthy of reproducing in full next month if space permits.

We are indebted to GM8LBC for a rather nice piece of what we called 'Pig Latin' at school many years ago. It is "Sic Biscuitus Disintegrat", meaning "That's the way the cookie crumbles". A useful adjunct to "Nil Carborundum Ilegitimus" – no need to translate of course!

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FROM HERE . . . .

Anyone who has been chasing the dx on the VHF bands for any length of time will have heard of Szigy, YO2IS, the amiable Rumanian operator who has given so many UK VHF operators their first 144MHz contact with his country and square. More recently, Szigy built a 50MHz receiver and used it to good effect in giving many their first 50/28MHz crossband contact with Rumania.

Although he always sends a QSL, he says that his efforts to qualify for an award have been frustrated because so many UK stations fail to send him a card in return. He listed auroral, sporadic E, tropo, satellite, meteor scatter and crossband contacts going back as far as 1976 which are still unconfirmed. As they say in the army "no names, no pack-drill," but some very well-known and respected calls are on Szigy's 'No QSL' list. He added a ps at the end of his letter which read, "If anybody has a problem with a QSL for a vhf contact with a YO station, let me know the call and date and I will help with pleasure." Anyone with an attitude like that surely deserves some help in return, so if you owe Szigy a card, send one via the bureau, or send it to me and I will see that he gets it.

Michael, G2SP (Notts) sent a copy of a QSL received from SP5IYV for a 144MHz spradic E contact on 16 May 1986. Before you ask "So what?" the contact was made when Michael was operating as G2SP/Mobile, driving south on the M1. At the time the rig as delivering 15W to a 5/8 whip antenna, and another interesting fact is that the mode was fm, not sideband. Michael wonders if this sort of 'first' or even a distance record for a 144MHz mobile (computer gives the QRB as 1,583km). I seem to recall hearing about a mobile contact with Poland a few years ago, and maybe this was the very QSO, but if there are any other claimants, please write giving details.

If you worked EH9IA via spradic E in June, you indeed caught a rare one. Manuel Camberos Marfil, EA7ZM, wrote to say that this expedition station was located on the island of Alboran, locator IM85LW, which shows it to be off the North African coast. The station was manned by members of the Grupo Expedicionario Malagueno, (GEMA), all of whom hold EA7 calls. On June 5th this year they worked nearly 100 stations in G, GW, GM and PA via sporadic E during a 1 hour 45 minute opening. Their card is shown here, and to get one, write to "Group GEMA", PO Box 5.156, Malaga 29080, Spain, or to EA7ZM at P.Victoria Eugenia, Bloque Venus, 11 b-29011, Malaga, Spain. The group also operated from Alboran in 1985, so if you still want a card for a contact then, the above addresses may help.

. . . . AND THERE

MICRO-WAVES

MIKE DIXON G3PFR

WHITHER ON 10GHZ PART ONE: SYSTEMS APPROACH

There are two opposing schools of thought concerning the continuing use and development of the 10GHz band and, come to that, the 24GHz band too. On the one hand there is the lo-tech 'simple is beautiful' view, usually coupled with line-of-sight wideband working. On the other is the hi-tech 'narrowband and real DX are the only modes worth pursuing' view. Both approaches have their gains and losses (merits and demerits) and will, no doubt, continue to be the subject of much hot debate! There could well be a case for 'midi-tech' to bridge the gap between the two extremes.

As mentioned last month, there has been a lot of comment recently on the advanced state of 10GHz technology on the Continent, in particular in Germany where, it is said, "hundreds of ssb Products transverters are in use for working DX". OK, fine! Is that really all there is to exploiting the band? Is that the ultimate use to which many aspire? Or is there almost as much merit in trying to improve and make more and varied use of simple wideband gear before going hi-tech (and hi-cost!) to state-of-the-art narrowband? To judge by the number of entries into the John Rouse Memorial Trophy design and constructional contest (one!), it would seem that some of the factors outlined later may be responsible for the apparent lack of real interest in original design and construction, some preferring to spend a lot of money on ready-built equipment for these bands. Where is the pioneering spirit?

The principal merits of the simple lo-tech approach are that it is easy for the absolute beginner to understand, virtually sure-fire, inexpensive and undemanding in terms of components and construction techniques. Similar techniques can be used at 24GHz, as was also mentioned last month. The 'rules' are the same: it is just that waveguide bits are half the size!

Of all the microwave bands, 10GHz is probably the best 'tutor' available to the beginner, especially to those interested in real QRP experimentation. Having built such gear and used it portable a few times, perhaps the novelty and interest starts to wane – hence "What do I do next?". One answer, often given, is to build narrowband equipment and use it to work dx by tropo – or rain-scatter.

This is not as easy as the green-fingered cognoscenti would have you believe! First of all, whether a waveguide (G3JVL) or a pcb design (Dubus) is undertaken, that design is going to be a lot more complex and orders of magnitude more expensive in terms of materials, time and

"WOODSTOCK", GAZE BANK, NORLEY, WARRINGTON, CHESHIRE WA6 8LL

skills. Alignment and optimisation is difficult for the tyro, as is maintaining stability or performance in the field. Can the wide gap between simple wideband and complex narrowband be more readily bridged? I believe it can, by following a number of commonsense evolutionary steps, rather than trying to make the leap all at one go.

Maybe before reaching this decision stage, the partially-experienced novice should concentrate first on how the performance of existing basic gear can be improved and, second, how it can be put to better and more varied uses! Immediately after this, perhaps the several midi-tech approaches now available should be considered.

Aside from the complexity and difficulty of narrowband, two other factors appear to be significant in the UK amateurs' apparent reluctance to pursue the hi-tech approach. First is the indisputable fact that semiconductor supplies are easier and less expensive in Europe than in the UK. Second, there may be an 'excellence' factor. Why is there an apparent preoccupation for sideband operation? It is comparatively inexpensive and easy to generate up to about 100mW of nbfm or cw, but difficult and costly to produce the same level of ssb. Also, where manufacturers' literature says that 14dB gain is available at xGHz from a particular device, the amateur may try to design for this gain and not achieve it. Would it not be better to rethink, accept lower but practical gain and add another stage? These kinds of approach would enable typical amateur compromise and ingenuity to come into play to produce a practical product without sophisticated resources. For example, two 7dB gain stages using six-pound GaAsfets would be much more realistic than a single 14dB stage using a thirty-pound device. Moves in this direction are being made by the Components Service.

Having said all this, there is still a lot of room for improvements to most existing simple wideband equipment which is seldom systematically optimised. And there are many more ways of using it than line-of-sight portable working! I and others before me have said many times that there are ways of improving wideband gear which are not time consuming, elaborate or costly. Perhaps it is worth reviewing these points yet again – they have all been discussed over the years here, in the VHF Manual and in the Microwave Newsletter, so there's nothing new or revolutionary about them, even though the same old questions seem to come around again and again!

Over the next couple of months or so I'll be considering what can be done with existing gear to improve performance and what the midi-tech alternatives might be. Some simple test gear is indispensible and should be borrowed or constructed to aid the process. Two items of equipment which will be needed to improve existing gear and to aid the move to better techniques are calibration sources – an absorption wavemeter and a signal source. The former is desirable and can either be built to one of the designs in the VHF/UHF Manual or obtained surplus. It casn be calibrated against professional equipment at a Microwave Round Table. A calibrated variable attenuator (again surplus) is a useful adjunct to the wavemeter, as is a simple detector (VHF/UHF Manual).

The signal source can be either a 'microwatt' beacon (such as the crystal and waveguide multiplier described in the VHF/UHF Manual) or a Gunn oscillator set to a known frequency, again at a Round Table. You migh even consider a mini-beacon along the lines I suggested recently. The Gunn mini beacon on show at NEC aroused a great deal of interst. Any of these signal sources can be used to maximise performance by being placed at increasing distances away from the receiver as alignment at performance improves. House walls can make good attenuators for this purpose.

Another interesting piece of gear, in some ways an alternative to a signal source, is a noise generator such as that described in a recent issue of the Newsletter: such a source, used in conjunction with a G4COM automatic noise measuring rig (VHF/UHF Manual, makes alignment for best performance a relatively easy matter. Maybe you will even, after helping yourself by acquiring or building such useful bits of gear, be able to help others who may be struggling to get going and are entering the phase of learning you have just passed through!

Hopefully, at the end of this short series of brief reviews, beginners might be encouraged to go ahead and venture from the simplest non-optimised wideband gear at least part way along the evolutionary trail to narrower band, even if not all the way. ■

DATA COMMS

IAN WADE G3NRW

7 DAUBENEY CLOSE, HARLINGTON, DUNSTABLE, BEDFORDSHIRE LU5 6NF

Following my comments in June's *Data Comms* column about packet on the hf bands, I have been almost overwhelmed by responses from readers! Or, to put it another way, one reader actually put pen to paper – Geoff Roberts, G3ENY, reminds us of the ARRL rtty news station W1AW, which transmits bulletins on 14,095kHz on Mondays, Wednesdays and Fridays. W1AW is copied by many stations, and so Geoff asks packet users to steer clear of this frequency.

On a wider front, the RSGB HF Committee has recently prepared a paper containing proposals for hf packet radio bandplanning, for submission to the IARU Region 1 HF Working Group meeting in September. According to Don Field, G3XTT, the basic philosophy adopted in the proposals is to split the existing rtty allocations, in order to provide an exclusive packet allocation in each of the hf bands without increasing the total amount of spectrum used by data modes. Don says that there seems to be little else we can do at this stage, until it is clear what longer term view the ARRL will be taking.

The issue of packet frequencies above 14,100kHz has raised the most controversy. The ARRL Computer Networking Conference supported the use of a limited number of frequencies above 14,100 for mail forwarding only. ARRL currently takes the view that other packet activity should take place below 14,100, although in practice this does not seem to happen. European ssb operators, for the most part, are unhappy with packet above 14,100, given that the US phone allocation has moved progressively down the band to 14,150kHz, leaving relatively little of the band free from the dominance of US stations.

There have also been problems with interference to the international beacon network on 14,100kHz from packet transmissions. The IARU meeting will be a first formal opportunity to see what line other Region 1 member societies are likely to take. While the RSGB has no wish to take a 'head in the sand' position, as a member of IARU it is committed to working with other member societies to find an agreeable solution to bandplanning issues. While packet operators who are not RSGB members may find this unacceptable (and some have already said so), the alternative would be anarchy on our bands. On the whole, bandplanning has worked well for amateur radio and can continue to do so.

The RSGB paper contains three specific proposals:

(1) That packet radio has a bandplan allocation separate from the parts of bands used by rtty.

(2) That the packet radio allocation is 10kHz on 14MHz and 21MHz; 5kHz on 10MHz; 10kHz on 3·5MHz; and 30kHz on 28MHz, plus one 29MHz fm channel.

(3) That the packet radio and rtty allocations are revised to those shown below. The proposed bandplans reflect present usage of the bands and do not represent a significant increase in the data allocations. Note that where interlinking is required, the frequencies must be the same in all countries and, if possible, in all regions of IARU.

Band	Present RTTY Allocation	Proposed RTTY Allocation	Proposed Packet Allocation
3·5MHz	3580-3620	3580-3590 3600-3620	3590-3600
7MHz	7035-7045	7035-7045	no allocation
10MHz	10140-10150	10140-10145	10145-10150
14Mhz	14070-14099	14070-14089	14089-14099
21Mhz	21080-21120	21080-21100	21100-21120
28MHz	28050-28150	28050-28120	28120-28150 + an nbfm allocation on 29250

▶

Finally, Don says that the HF Committee is interested in receiving any comments on these proposals, to be sent either to him or to the committee's chairman, Martin Atherton, G3ZAY.

PACKET AT THE NEC

Packet radio was well represented at the RSGB Convention at the NEC in July. Live demonstrations took place on many of the stands, and two special pbbs stations were set up by the RSGB, using the callsigns GB75AX in the main exhibition hall and GB75AC in the adjoining Lucas Building. Both stations were accessible from the UK packet network, and were kept very busy. Perhaps the most surprising contact took place on the first day of the show, when a station in the Channel Islands was able to connect to GB75AX via a combination of digipeaters and NET/ROM nodes; a noteworthy feat, bearing in mind the traffic chaos on the bands and the number of intermediate linking stations that must have been involved.

One particularly interesting demonstration was set up by Andy Witts G1DIL and James Miller G3RUH. Andy had a dual port mailbox system running under Desqview on a pc. One port served GB75AX, and the other port was connected to James's pc, via a pair of the new G3RUH 9600bps modems connected back to back. The difference in speed, compared against the usual 1200bps used by most of us, was remarkable to behold!

James says that the beta tests for the modem (described in July's *Data Comms* column) were completely successful, and that the modem is now generally available. The bare pcb costs £18 post paid for UK and European addresses, and £19 for airmail elsewhere. A couple of programmed eproms are required, and when ordered at the same time as the pcb will cost £6 for the pair (all payments to be made in sterling). James does not supply the remaining parts for the modem, but he says that is should cost about a further £20-£25 to populate the board, using standard components which are freely available.

Because it can be used with any ordinary fm radio, and with any tnc having a modem disconnect socket, the G3RUH 9600bps modem represents as significant advance in low cost high speed packet radio. I am sure that we will see a real improvement in network traffic handling capabilities once the modem comes into general use.

More information and the hardware from James Miller, G3RUH, 3 Benny's Way, Coton, Cambridge CB3 7PS.

GB7 LICENCES ISSUED

The first batch of GB7 packet repeater licences were issued by the DTI in July. These are:

GB7CK-2 Charing, Kent
GB7GI-2 Enniskillen, NI
GB7DV-2 Daventry
GB7MM-2 Birmingham (South)
GB7SP-2 Paisley
GB7EA-2 Bury St Edmunds
GB7HZ-2 Penarth, South Glamorgan
GB7GH-2 Gloucester
GB7NU-2 North Uist

All of these stations (which are repeaters, not mailboxs), will operate on 144·650MHz. The legal agreement with the DTI which will allow the RSGB to issue mailbox permits is still pending at this date, owing to work on the major overhaul of the Amateur Licence, but the Packet Working Group hopes that negotiations will be resumed very soon.

PROGRAMS

TNC DRIVER PROGRAMS FOR THE ATARI ST

A couple of driver programs for the Atari ST have recently come to light. The first is from Steve Collins, G0FCW, and is called QTERM. It includes buffering for read and write, and supports the dumping of buffers to screen, disk or printer. It also allows listing of the disk directory and of files to the screen from disk. A write buffer is provided to prepare CQ calls, and there is an auto mode which allows up to 26 personalised connect messages. QSOs can be written to disk, with callsign stamping of the dumped files. Steve says that to get a copy of the program, just send him a disk plus return packing and postage. His address is 1 Congreve Approach, Bardsey, near Leeds LS17 9BN.

The second program for the ST is called YAPP (Yet Another Packet Program), and is available from Steve Henson, G6IXS, at 4 Monaco Place, Westlands, Newcastle, Staffs ST5 2QT. Again, a blank disk and return packing and postage should be enclosed.

NEW VERSION OF BBC AMTOR

Paul Harris, G3WHO, recently announced the issue of the MkII version of his very popular Amtor/rtty/cw program for the BBC. This is an expanded 16K version of the original program, and includes many new facilities. The main differences are:

3 modes (Amtor/rtty/cw transceive)
user-definable screen colours
improved memory usage
user-definable mailbox message
word mode
echoed text suppression
80/40 column screen modes
improved memory editor
users own memories in eprom
type-ahead buffer editing
selectable unshift on space
improved ARQ selcall entry

The software is on eprom to plug into one of the spare sockets inside the computer. Hardware requirements are identical to the original system; ie, a terminal unit capable of operating at 100bps (such as the G3LIV or ST5 design), and 1kHz clock unit to provide accurate timing (again from G3LIV). The eprom and full operating instructions are available from G3WHO for £27 including p&p, but if you already have the earlier Amtor version you can get this latest offering for £17 instead.

RON BROADBENT

THIN RESPONSES TO FIRST CONVENTION

The NEC Convention, and the Data Symposium from which we have just returned home, certainly lived up to their expectations of being the places to discover whether readers appreciate the new format and style of this column. Most commented that they liked the content of the last two issues, but so far haven't been specific about their own areas of interest. I will, therefore, continue in my own sweet way of providing the latest news and views around the world on matters satellite. Long lists of computer tracking programmes will not be my priority, nor will lists of who worked who and when. To be fair, though, any major DX via satellite will be reported if topical.

As we go to press I am about to attend the RSGB's First Satellite Convention in Godalming, Surrey. Invitations were sent out by the RSGB to ALL National Radio Societies across the world for a delegate to attend this meeting to discuss the Amateur Space Bands and Space Programmes now being put together by many groups across the globe. It is sad to report only about ten or twelve countries saw fit to respond. It may well be that every one of them will turn up on the day, but I doubt it. It's a disappointment as AMSAT groups are trying to do some serious forward planning within the IARU framework. I will report on the outcome of discussions in the next issue.

OSCAR 13 IS ALIVE AND WELL: DETAILS

Those who are keen satelliteers will be aware that the new Oscar 13 is now open for business, with a very loud Beacon on 145·810MHz and an even louder engineering beacon on 145·985MHz (Mode B). The satellite opened for general operations on 22 July 1988 at 1500 UTC, but is in Mode B only at the time of writing. It is suspected that Mode L will be in operation every weekend for the next several weeks. The Marburg team have reported that the satellite will be placed in its final parking orbit on or about 26 July. Fingers crossed, by the time you read this most of the bugs should have been ironed out. Reports will, of course, be very welcome at the AMSAT offices around the world.

The following are UP/DOWN LINK frequencies of Oscar 13. Please note that you should not transmit on the Beacon frequencies as ranging tests are on most days being carried out at one of the five command stations around the world. Also note that on the 435 to 145MHz downlink the 'offset' is 9kHz higher than that published by AMSAT-DL *before* Oscar 13 was launched. For a 435·500 signal into the transponder you will receive your signal back at 145.899MHz and*not* 145·890MHz as published. These are actual readings during operationon Sunday 24 July and were verified when the satellite was at zero Doppler.

SATELLITES

G3AAJ

94, HERONGATE ROAD, WANSTEAD PARK, LONDON, E12 5EQ. 01989 6741

OSCAR 13 FREQUENCIES

Mode B: Uplink
435·422 MHz – 435·567MHz
Mode B: Downlink
145·968MHz – 145·823MHz
Mode L: Uplink
1269·330MHz – 1269·620MHz
Mode L: Downlink
436·005MHz – 435·645MHz

Rudak Engineering Beacon is on 435·677 MHz.

General Beacon is on 435·651MHz.

A full frequency chart is available from AMSAT-UK for a small-donation fee; --More-- this will also include the band-edge divisions and the recommended ssb, mixed, and cw portions of the bands on all the various Modes B, L, JL and RUDAK experiment.

On this subject, RUDAK, there has been a long discussion over to whether the system devised by AMSAT-DL will work on this new satellite. Although this digital system has been working for over two years on a water tower inside DL-land, there are some folk who decry the experimental nature of this deviceand have suggested that it will be very expensive for the average amateur (whoever he is) and too complicated to set up. I suggest that it will be a challenge to a lot of people, and if so will inspire more experimentation, which is where we all came in (or should have done). I would be pleased to hear of anyone who gets signals through this device. I have not seen the final-'copy' for the *Handbook* on the RUDAK and Oscar 13 systems yet, but know that it runs to 250 pages. This *Handbook* is being published jointly by AMSAT-DL and AMSAT-UK over the next several weeks. More on this subject in a later issue of *Radcom*.

On a final note about the Oscar 13 satellite at this time, there have been criticisms about lack of details, frequencies, modes of operation and engineering parameters from designers and builders. Let me make an attempt to alleviate this situation a little. Many people jump on the band-wagon of being first with the news, and then find they have to eat their words because of changes to a set of figures owing to design problems. Unfortunately, once these errors get into print total confusion ensues, because it is virtually impossible to counter incorrect information once in print. The policy of AMSAT-DL on Oscar 13 has been to wait until they have the satellite into its final orbit before issuing precise details and frequencies. This has been a wise move, as you will know if you have been reading the IHU telemetry coming back from the satellite itself over the last few days. Some of us can grab this information as it happens by using the G3RUH PSK decoder for 400baud which tells the ground station all about the satellite's 'heart beats' as they happen. Some parameters are nothing like those expected prior to launch. Even the Mode B frequencies being 9kHz high was not expected, as evidenced by band plans published in some magazines!

WHERE TO START

For the benefit of newcomers to the satellite scene I will offer a few tips on where and what to listen for on the space bands in order to help you get your feet wet. I stress that this is not for the advanced satellite users but the newcomer and, perhaps, that young person who you – the old man – are going to take under your wing this Y.E.A.R.

The following does not need any equipment other than that which you have in your shack at present – assuming you have ssb and fm receiving equipment on145MHz.

First we have the UOSATs Oscar 9 and 13 amateur satellites. These two satellites transmit on 145·825 fm. They orbit the earth every 95 minutes or so, and can be heard on any fm receiver covering that frequency. Signals to be heard include a digitalker, voice bulletins, morse code signals, data-streamand command signals. You will learn a lot about the behaviour of low orbit satellites by just tracking these birds. We then have the RS 10 and 11 Transponders inside a Cosmos Russian satellite. These are ssb (upper) and cw devices which you will again hear approximately every 120 minutes (about 12 orbits per day) if you listen on 145·8 to 145·9MHz. Radio amateurs transpond from 21MHz (Mode T) into 144MHz. No fm is used. As we have reported above,Oscar 13 is now up and running and you can catch ssb, cw, and rtty bulletins for very long periods of time in a 700-minute elliptical orbit of earth. For the beginner the 70cm down to 145·900 frequency plus or minus 20kHz would be the best place to listen. No exact times can be given as we go to press; that will be worked out at the AMSAT-UK Colloquium on 30 July 1988. More next issue.

We also have Oscar 10 in orbit still, giving some folk a run for their money on nearly the same frequencies as Oscar 13. Try around 145·9MHz for voice ssb,and the steady beacon on 145·810MHz.

That should wet your appetite, and once heard you will be hooked *if* you still have a sense of adventure, and do not wish to remain an appliance operator all your days. There are certainly some exciting ideas on this one.

MORE RS TRANSPONDERS

On the other satellite front we have the news that RS 5 and RS 7 have now been abandoned by the Russian control station RS3A, but could be self activating at any time. Also news that a series of RS transponders will be launched in 1989 possibly as a package inside other weather sats, as is the case with RS10/11. It is further reported that these will be LEOs and on the 145/28MHz Space sections of our bands.

JAS-1 ACTIVITY UP

There appears to be a steady trickle of dedicated amateurs who use the JAS-1--More--satellite, both in analogue and digital mode, as evidenced by the sale of the G3RUH JAS-1 Modem. AMSAT-UK had another batch of these made recently and although there is no panic-mad rush to buy them, most folk have been very pleased to use the modem to uplink messages into the mailbox on JAS-1 to friends across the world. In this connection I heard a funny story yesterday. Lack of use of JAS-1 by our USA friends appears to be because of misunderstanding about the system. If this is so, it bears out my thoughts about lack of technical information on the subject in the USA. I will remind overseas readers that there is in the RSGB Booklist a Handbook called *The Fuji-FO12 Technical Handbook* which will provide you with all of the information you require to operate via both modes into this satellite. This book is also available from AMSAT-UK – the publishers.

THIRD COLLOQUIUM PAPERS

By the time you read this we will have attended the AMSAT-UK Third Colloquium on 29 – 31 July. Although I will prepare a short report on this event in the next issue, for those who are not able to attend and want full details, AMSAT-UK are publishing the Papers of the Colloquium at a nominal price. An s. a. s. e. to RSGB or AMSAT-UK will bring you full details. Subjects so far received are The Chinese Satellite Scene by G. Perry of the Kettering Group; Satellite Tracking at Royal Greenwich Observatory by Max White; The Oscar 13 and Phase 4 series of satellites by the technical staffs of AMSAT-D and AMSAT-NA; UOSAT and future small satellites by the staff of University of Surrey satellite team; Russian Sport Satellites by UA3CR (if he arrives) and many more.

OSCAR 13: KEPLER ELEMENTS

These are the latest Kepler Elements for Oscar 13 and should be stable for a few months: Epoch: 88193.9. Inclin: 57.654. RAAN: 247.538. Ecc: 0.6538919. Arg: 187.2210.MA: 357.217. MM: 2.09697960. Decay: Zero. Updates will be on RSGB Databox from time to time.

One final word to all readers: as some of you will be aware AMSAT-UK serve the satellite operators in the UK. Should you wish to ask questions about satellites most members of AMSAT-UK will be very willing to assist as will myself, the Hon. Sec. Please, however, do not telephone at midnight to tell us that you've heard your first signals, and ask long questions on the subject when we may be going to bed! A letter to the address of this column will be answered for the courtesy of an s.a.s.e. Better still, come up on the AMSAT-UK Nets during the week and Sundays.

That's about all for now. I hope to see many of you at the various rallies we attend, and of course any questions will gladly be answered as space permits. Action Required: QQ

SWL

BOB TREACHER BRS32525

QSLING TECHNIQUES

With new listener members joining the Society all the time, it might be helpful to provide a few hints on how to qsl dx stations. First you should have a reasonably up-to-date set of callbooks, or at least access to them. It's useful to read radio magazine dx columns, have a subscription to *DX News-sheet*, and obtain as much qsl information from whatever source as you can. If you cannot find a qsl route using the above, obtain a copy of the qsl manager lists which I offer from time to time, or ask an active dxer.

When qsling a dx station direct always include return postage and an SAE. Return postage can be in the form of International Reply Coupons, an airmail stamp of that country affixed to your return envelope, or a dollar bill.

CONTESTS

The Derby and District ARS sent the results sheet from their 144MHz contest; regrettably there were no swl entries. Although the event was a rather low key affair and band conditions were poor, it is disappointing that no listener was interested in giving a couple of hours to support the event. We can only hope that this Society continues to offer an swl section in 1989.

USSR CALLSIGNS

Listeners may have noticed the strange callsigns used by the Russians in May. It seems that every May the 'E' prefix is aired to commemorate the end of the World War II. Calls beginning with EU are in the capitals of the 15 Russian Republics. Those with EV identify stations in the capitals of the 20 autonomous Republics.

Hero cities have EW, and stations in cities with former guerilla activity use the EM prefix. EO prefixes are from cities awarded medals for their contribution to victory.

It is easy to determine the Russian Republic by the letter after the number. These are: A, N, V, W, or X = UA B, T, V, or Y = UB

Other letters identify the republic as usual. The DXCC country is the same as the Russian Republic, except for Russia itself: you must then refer to the number in the callsign – 2 is Kalingrad; 1, 3, 4, or 6 is European Russia; and 9 and 0 is Asiatic Ruissia.

QSL all stations via PO Box 88, Moscow.

VHF ACTIVITY

Since writing such glowing things about the 144MHz Sporadic E openings in early June, the remainder of the month was a blank for our regular contributors. Unfortunately, we have to work during the day. It was most frustrating to hear amateurs talking about openings during normal working hours to YO, 9H1 which, although short in duration, had been missed!

50MHz had been almost as poor with the only good Es activity after 7 June on 12, 25, 27 and 29 June. A good tropo opening to PA0 occured on 10 June, while 19 June saw enhanced conditions around G, with GJ4ICD 59 at 0854 and G4KUX (IO94) good copy at 1900.

The Finns got access to the band on 21 June, and on the 25th, OH1ZAA (KP01) was 59+ at 1320. On the same day CT1WW, GM0EWX and LA1BEA/P were all heard at about the same time, and it was not a surprise to find another Stateside opening in the evening from about 2135 to around 2300. This, however, was not the widespread event of 6 June. I only heard stations in W1 and 2.

It appears that Luxembourg is the next country to gain access to 50MHz. I understand that permits should have been issued by the time you read this.

VHF NFD was very much a non-event this year with the lowest Summer Low Pressure area over Britain since 1956. As a result, conditions were abysmal. 70MHz conditions were the best, as that band is not so dependent on tropo conditions as the other UHF/VHF bands. Even well sited groups complained of poor conditions and spent as much time ensuring that the rain stayed off the gear! In such conditions, what chance has the swl with his modest antennas on top of the chimney?

DX NEWS

With only one HF Table update to hand at the time of writing, I have held that over this month.

Susan Powell BRS90808 provided an interesting list of what she had been hearing during June. 29MHz fm produced good Es loggings from DL8FQ and LX2PA.

Colin Watson BRS46598 sent his now regular list of dx heard. The pick of his month's activity was A92BE, numerous W6s, and 3B8DB on 21MHz. 14MHz accounted for CE4RAA, CP5A1, XE1RAE and many VKs.

SATELLITE SWL

G6MEN's reference to there being no swl's monitoring satellites has prompted a letter from Ken Clarke BRS88772.

Between listening on vhf, country chasing on 28MHz and hunting Islands for the IOTA Awards, he listens to the RS satellites on 29·450MHz. Over 20 listener reports had been sent to stations heard via satellites. His best dx at the time of his letter was KH0AC on the Marianas. He has no orbital information so has to 'guess' when the best time might be. This hit and miss approach had been quite rewarding to date. Let us hope for a further update from Ken in the future on an aspect we hear little about.

ACTIVITY FROM BY

Many reports from listeners mention the ever increasing number of stations active from the Peoples Republic of China. Many do not know the direct QSL information, so I have compiled this list of QSL addresses from various publications which might help those who need a card from BY.

BY1PK	PO Box 6106 Beijing
BY1QH	PO Box 2654 Beijing
BY1SK	PO Box 2916 Beijing
BY1CJK	PO Box 6206 Beijing
BY4AA	PO Box 205 Shanghai
BY4AG	PO Box 5304 Shanghai
BY4AOM	PO Box 227 Shanghai
BY4RB	PO Box 413 Zhen Jiang
BY4RN	PO Box 2405 Nanjing
BY4SZ	PO Box 51 Suzhou
BY4WNG	PO Box 1827 Nanjing
BY5RA	PO Box 730 Fuzhou
BY5RF	PO Box 209 Fuzhou
BY5QA	PO Box 507 Fuzhou
BY5HZ	PO Box 804 Hangchow
BY5RT	PO Box 707 Fuzhou
BY7KT	PO Box 1285 Guangzhou
BY7HL	PO Box 105 Changsha
BY8AA	PO Box 607 Chengdu
BY8AC	PO Box 607 Chengdu
BY8GA	PO Box 12 Kanzhou
BY0AA	PO Box 202 Wulumuchi

When sending your card direct, please do not forget to include three irc's to cover return postage.

FINALE

The rules for my annual hf Challenge will appear next month. The dates for your diary are 29/30 October for ssb and 26/27 November for cw.

Please note that any news, comments, unusual swl items of interest, and table scores for the November issue should reach me no later than 13 September.

REPLYING TO SWL REPORTS

G0GDU had never received a listener report until earlier this year. They caused him something of a problem because he realised that he had no idea about how to reply! Other newly-licensed members might be in the same predicament. Simply follow these few rules:

1. Check details correspond with your log.

2. If so, fill out a QSL card as shown below. (If not, either return the swl card via the bureau and note on the reverse what details were incorrect, or acknowledge it, and point out where the report was deficient). Both are more helpful than committing the card to the bin!

3. Although not necessary, make some comment to show the listener that his report was useful.

4. If asked to provide the card for a new square, county, or for an award, remember to include the salient details in your comments if they are not already printed on your card. (For example, a card from a foreign listener reporting an Es QSO on 144MHz will obviously require a QTH locator to be given). If any reader has any further comments on QSLing an swl report, please drop me a line.

STATION	DATE	GMT	MHz	MODE	RST
BRS 32525	28.3.88	2315	7	1 × ssb or 1 × cw	Tnx

CONTEST NEWS

1ST 28MHz CUMULATIVE CONTEST 1988 – RESULTS

Posn	Callsign	County	2/5	10/5	18/5	26/5	Claimed Score	Checked Score
1	G4WQN*	NOT	335	411	CK	628	1375	1374
2	G4RCG*	YSW	–	349	362	524	1057	1235
3	G3TLMA*	ICN	444	–	266	335	888	1045
4	G4VMM/P†	LEC	230	341	CK	169	715	740
5	G4ODV	CNL	182	–	158	258	533	598
6	G4AGQ/M	SXW	152	CK	170	229	461	551
7	G3GLL	ESX	217	168	128	–	467	513
8	G3UHU	ESX	CK	130	123	103	327	356
9	G3MCX	LDN	142	68	132	CK	343	342
10	G4OBK	LNH	–	207	112	–	451	319
11	G0HDD	SFD	–	132	91	81	265	304
12	G0E7L†	LDN	97	90	CK	114	314	301

Checklogs received with thanks from G2HLU, G3CXM, G4PTE and G4SBD and entrants 4th evening marked CK.

* Certificate winners. † Phone only.

Congratulations to G4WQN, a clear winner with an excellent log. Log keeping was generally very good and few points were lost due to minor errors. As last autumn one entrant lost many points by failing to observe rule 3a and 'deliberately' working a duplicate, a call may only appear once whether fixed, /A,/P or /M. G4VMM/P came fourth with a phone only entry, and well done G0HDD, first ever contest, who lost only one point and correctly presented the entry.

The rules were a little vague about scoring this time, bonus points should have been claimed in both phone and cw on the same evening for each county worked. No mention was made of points for overseas contacts, a bonus for the first with each new country was also allowed for phone and cw. These bonus points have been added to the claimed scores and in two cases the check logs have been switched for scoring purposes as would have been intended had the entrant been aware of the bonuses for countries.

The common factor in equipment used by all the leading stations was a rotary beam at least 40ft up. It is a pity only 12 logs and four checklogs were sent in considering 188 British callsigns from 43 different counties appeared in the logs; overseas calls were 161 from 30 different countries mostly European including 44 from Italy and 36 from West Germany; several contacts were also made with Africa and both North and South America. On the last session G4ODV made 36 contacts which only included one G and one GM.

Two people made it quite clear before the contest that as they did not like cw they would not enter; however, most of those who did enter thoroughly enjoyed themselves. Thanks for the extensive comments – a brief summary follows:

"Liked the new format but prefer cw, ssb fanatics might enjoy it if they tried. If the CQ's are too fast just send QRS de own call, the other op will slow right down."

"Prefer five sessions, better chance of being active on three out of five than three out of four."

"Two hours on each mode is too long without a good antenna."

"Scoring needs explaining more carefully."

"Everyone should call CQ occasionally. If it is always the other person's frequency other stations cannot call you."

"Prefer separate phone and cw events – some would-be entrants will not do mixed mode, maybe room for both formats."

"Superb sporadic E conditions on last session, strong EU blotted out weak G's."

"Use 28·3 – 28·4 for ssb and 28·1 to 28·15 for cw to allow inter G working when the band is open."

"Misread the rules and worked 10 cw stations during the ssb period, only worked six cw during the cw period."

"Would like separate mode one hour only."

"Activity in the South East was very sparse with very few local stations active."

To try to satisfy both phone and cw entrants the format may change again next time. It is hoped that next Spring this event will be held earlier, thereby avoiding the Bank Holiday weekends and NFD. One final point – encouraging local club members to take part is not considered pre-arranging contacts and does not infringe any rules as long as skeds are not pre-arranged.

Many thanks to all those who sent logs in – and please do keep the comments coming. *G3MCX*

COVENTRY DF QUALIFYING EVENT – REPORT

A warm June day with over 90% relative humidity followed an unseasonal 42mm of overnight rainfall giving the prospect of an exhausting afternoon for the 22 teams which assembled at Pringles Sports Centre in Nuneaton where good signals were heard from both stations by all the competitors.

Station A, G4CFG/P, operated by Phil Arnold, was located 29km east of the start in a small wood near the village of South Kilworth. Most competitors considered it unlikely that the transmitter would be hidden close to the bright yellow wire which was clearly visible amongst the trees on the edge of the wood, preferring to investigate a black wire which meandered across the wood through head-high nettles, brambles and various thorny bushes. The numerous cries of pain and anguish confirmed the difficulty of this task. They later realised the error of their logic and the deviousness of the organisers by finding the transmitter directly under the yellow wire.

Station B, G4KZU/P, operated by Norman Rathbone, was hidden 19km south of the start and 26km from station A, in Wappenbury Wood where a thousand yards of aerial wire awaited the arrival of the searchers. This had been passed through or over anything large enough to hide a transmitter, operator and flask. During the afternoon the distinctive sound of splintering timber, followed by a loud splash and groans were heard as one competitor inspected a nearby stream at close quarters. Only one team attempted to reach the transmitter by the shortest route from the bridle path but was repelled by an impenetrable entanglement of blackthorn, bramble and dog rose.

Tea was served by a team of club members XYLs and relatives at Baden Powell House in Coventry where 65 hungry DFers congregated for the obligatory post mortem on the afternoon's entertainment.

COVENTRY DF – RESULTS

Pos	Name	Club	Time of arrival Stn A	Stn B
1	P Lisle	Mid-Thames	1442	1550
2	M Hawkins	Chelmsford	1451	1551
3	C Plummer	Mid-Thames	1602	1448
4	T Gage	Mid-Thames	1505	1606
5	G Foster	Stratford	1508	1607
6	A Malbon	Mid-Thames	1505	1609
7	B Bristow	Mid-Thames	1507	1610
8	A Judd	Mid-Thames	1506	1610
9	W Pechey	Mid-Thames	1509	1614
10	G Whenham	Coventry	1511	1615
11	R Goodearl	Mid-Thames	1507	1617
12	C Metcalfe	Mid-Thames	1508	1620
13	A Collett	RSGB	1626	1455
14	D Newman	Northampton	1507	1628
15	D Holland	S Manchester	–	1455
16	R Boby	Oxford	1604	–
17	G Nichols	Banbury	–	1611
18	M Mallinson	Banbury	–	1612
19	C Merry	Dartford Heath	–	1612
20	M Bennett	Coventry	1619	–

Two competitors failed to find either transmitter.

P Lisle and C Plummer qualify for the National Final.

SALISBURY DF QUALIFYING EVENT – REPORT

Twenty teams assembled on a warm sunny day near Sixpenny Handley, for the start of Salisbury's RSGB DF Qualifying event.

Several teams set off first for s tation "B" (G3YWT/P) which was located 14km N/E of the start in a thickly wooded area near the Mizmaze on Breamore Down. Unfortunately few more subsequent transmissions were heard – and this seriously affected results. (Only two teams found this station.) Like Stonehenge there are legends about this area – and some might say we were "got at"!

Station "A" (G4RLF/P) seemed a safer bet, it was located about 14km N/W of the start in thick undergrowth on the steep slopes of Castle Ditches. Seventeen team found this station having varying degrees of difficulty in doing so. Three teams failed to find any of the transmitters. The usual excellent tea was served at the Activity Centre after which results were announced and prizes presented.

SALISBURY DF – RESULTS

Pos	Name	Club	Time of arrival Stn A	Stn B
1	T Gage	Mid-Thames	1441	1619
2	G Whenham	Coventry	1438	1627
3	B Bristow	Mid-Thames	1433	–
4	C Plummer	Mid-Thames	1435	–
5	C Metcalfe	Mid-Thames	1439	–
6	A Simmonds	Mid-Thames	1441	–
7	M Standen	Mid-Thames	1442	–
8	S Holly	Salisbury	1442	–
9	K Chan	S. Manchester	1457	–
10	P Clark	Chelmsford	1501	–
11	A Judd	Mid-Thames	1502	–
12	R Goodearl	Mid-Thames	1528	–
13	J Drakeley	Slade	1546	–
14	G Nichols	Banbury	1548	–
15	P Larbalestier	Devizes	1556	–
16	C Wells	S Manchester	1603	–
17	A Collett	Dartford Heath	1629	–

T Gage and G Whenham qualify for the National Final in September.

NORTHAMPTON DF QUALIFYING EVENT – REPORT

The start of the Northampton event was near Castle Ashby, 21 teams signed in and set about preparing their equipment.

An excellent signal was heard from station "B", but although it was established that station "A" was on the air, none of the competitors were satisfied that they could identify the signal. Therefore an approximate bearing was given, with the additional information that the Tx. was over 10km away.

The "A" transmitter was hidden near Bugbrooke in an area between the Grand Union Canal and the railway. Two tunnels under the canal provided access to this area; a stream flowed through one of the tunnels, and a number of competitors chose to wade through, apparently unaware that the other tunnel was a footpath and quite dry.

The "B" transmitter was hidden in a wood south of Horton, it was approachable along a disused railway track about a kilometre from the road, however some competitors found another way in which was well over two kilometres.

After the contest an excellent tea was served in the village hall at Yardley Gobion, where the results were announced and the prizes presented.

NORTHAMPTON DF – RESULTS

Pos	Name	Club	Time of arrival Stn A	Stn B
1	M Hawkins	Chelmsford	1449	1541
2	G Whenham	Coventry	1547	1451
3	A Judd	Mid-Thames	1551	1444
4	B Bristow	Mid-Thames	1451	1618
5	P Lisle	Mid-Thames	1452	1618
6	D Newman	Northampton	1450	1619
7	C Plummer	Mid-Thames	1450	1619

NORTHAMPTON DF – RESULTS

8	C Wells	S Manchester	1449	1619
9	W Pechey	Mid-Thames	1454	1619
10	G Foster	Stratford	1508	1621
11	T Gage	Mid-Thames	1509	1623
12	C Metcalfe	Mid-Thames	1456	1624
13	A Collett	Dartford Heath	1626	1541
14	R Witney	Chelmsford	1630	1547
15	P Larbalestier	Devizes	1442	–
16	D Holland	S Manchester	1447	–
17	A Simmons	Mid-Thames	1459	–
18	J Drakeley	Slade	1502	–
19	A Malbon	Mid-Thames	–	1619
20	G Nichols	Banbury	–	1620
21	K Chan	S Manchester	1630	–

A Judd and B Bristow qualify for the National Final in September.

7MHz CONTEST RESULTS FOR 1987

CW The total number of Logs received this year for this section was only slightly down on 1987 due entirely to the large increase from Europe and Listeners. The UK entry was 18% down, the Rest of the World over 66% lower. It appears that Antennas are beginning to be a major factor in establishing a winning entry. This year the following Antennas were used by the leaders. Four 2el Yagis, One 6el Yagi, Two 4el Yagis, One VEE Beam, and One phased array.

SSB In this section there was an overall drop in Logs of 18%. Surprisingly the UK entry remained the same but with a big drop in European entries which were 42% down. The Rest of the World at 60% down was a similar drop to the cw section. Antenna hardware in this section was really impressive. One 3/3el Yagi, One 5el Yagi, Three 2el Quads, Four 2el Yagis, Two 4el Yagis, One 6el Yagi, One 4el Phased Array, One VEE Beam, One 2el Phased entry.

Generally the standard of Log keeping was excellent but there is still room for improvement in Dupe sheets which in some cases were extremely difficult to read. *G3HCT.*

7MHz CONTEST CW EUROPE

Position	Callsign	Score
1	Y26QO	6,630
2	Y27QO	5,850
3	Y26LG	4,920
4	Y37ZE	4,840
5	Y21XH/A	3,850
6	Y23U1	3,575
7	Y26SO	2,720
8	Y21UD	2,700
9	Y23HJ	2,560
9	Y24JJ	2,560
11	Y21YA	2,320
12	Y23GD	2,295
13	Y48YN	2,250
14	Y21CL	1,800
15	Y22KO	1,760
16	Y23GB	1,720
17	Y65ZF	1,645
18	Y22YB	1,560
19	Y62YN	1,530
20	Y54CO	1,365
21	Y58ZA	1,295
22	Y25TO	1,280
23	Y56SF	1,075
24	Y35ZJ	968
25	Y24YH	900
26	Y51YJ	840
27	Y22YJ	735
28	Y21DH	675
28	Y23TL	600
29	Y31HB	600
31	Y62QH	405
32	Y21GO	300
1	LZ2AX	10,725
2	LZ1TD	5,520
3	LZ1AX	5,400
4	LZ2WO	5,115
5	LZ1KBC	2,430
6	LZ1XL	2,280
7	LZ1FJ	1,360
1	YU7SF	6,760
2	YT2IX	5,005
3	YU2CTG	4,320
4	YU7NOL	1,800
5	YU7FT	1,160
6	YU7KM	875
1	SP1PEA	6,840

7MHz CONTEST CW EUROPE

Position	Callsign	Score
2	SP3MEY	185
1	YO8CDQ	1,960
2	YO4BBH	975
3	YO8CMB	90
1	HA8ZO	7,280
2	HA1RW	3,060
3	HA1SL	2,240
4	HA1TI	2,030
5	HA6QM	2,000
6	HA0HG	1,020
1	PA3AMA	4,050
2	PA0DIN	3,550
3	PA3DUS	2,920
4	PA3DCS	1,345
5	PA3AFF	800
6	PA3BFH	390
1	OK1AWH	4,565
2	OK3CEL	4,536
3	OK1DXW	2,970
4	OK1OFM	2,400
5	OK1FTX	2,135
6	OK1FIM	1,980
7	OK3CVF	1,820
8	OK1KZ	1,600
9	OK1JDJ	750
10	OK1DRE	600
11	OK2KPS	448
1	RB5HM	10,650
2	UB5QMA	6,215
3	UB5EF	3,450
4	UB5AEO	1,225
5	UB5ZEL	960
6	UY5TE	450
1	UL7MU	9,630
2	UL7BN	2,310
3	UL7BY	1,230
1	UO5ON	5,280
1	UC1AWK	1,950
1	UQ2GP	3,150
1	UP2OU	4,455
1	UR1RYO	100
1	UA6LFQ	1,170
2	UA1AUA	930
1	LA8CE	1,470
2	LA5VFA	1,050
3	LA8AK	810
3	LA4YGA	810
1	OH6RC	2,360
2	OH9UW	2,240
3	OH6AC	1,530
1	DJ0MBN	5,390
2	DK9XT	4,730
3	DL1OO	4,180
4	DL9OT	4,100
5	DL1ZQ	3,780
6	DL1SN	600
1	HB9RE	1,575
2	HB9DX	1,110
1	ON6AB	3,780
2	ON6TJ	2,440
1	OZ3QN	5,460
2	OZ1IGT	4,450
3	OZ1CMC	2,340
1	SM0BVQ	1,600
1	EI5DI	5,995
2	EI7CC	2,240
1	G6ZY/EA6	12,750
1	I7ALE/8	3,950
1	EA2CR	360

7MHz CONTEST CW BRITISH ISLES

Position	Callsign	Score
1	GW3YDX	402,840
2	G3LET	282,240
3	G4CNY	179,950
4	G3IGW	122,550
5	GM3RAU	122,145
6	G3TBK	104,615
7	G3VYI	79,860
8	G4CWH	76,230
9	G3LIK	68,880
10	G5MY	68,200
11	G3NKS	67,410
12	GW3HGJ	66,360
13	G2QT	64,240
14	G3SWH	60,270
15	G4KGK	58,425
16	G4WYG	56,330
17	G4IUF	54,325
18	G3APN	51,660
19	G4IFB	51,110
20	G4ODV	50,000
21	G3MPB	48,380
22	G4IQM	47,385
23	G3ESF	46,410
24	G0EHO	42,550
25	GM3CFS	37,625
26	G3SJX	36,050
27	G3DOT	31,790
28	G3JJZ	25,575
29	G4OOT	23,970
30	G4ECI	23,660
31	G3TXF	17,680
32	G3AWR	16,560
33	G4EBK	14,950
34	G4GLC	14,210
35	G4HON	5,270
36	GW4HBK	5,200
37	G4AUR	2,070
38	G3GMM	360
39	G4PVB	15

7MHz CONTEST CW UK & OVERSEAS RECEIVING

Position	Callsign	Score
1	BRS1066	55,460
2	BRS52868	34,030
1	OK2 31097	1,800
2	OK3 27707	570
1	UD6 001 220	8,685
2	UI8/UA4 13321	4,960
1	Y55 10 A	875
2	Y56 15 F	100
1	UB5 075 145	4,200
2	OQ2 037 403	4,050
3	UA 142 992	3,960
4	UA3 170 565	930

7MHz CONTEST CW REST OF THE WORLD

Position	Callsign	Score
1	UD6DKW	13,420
1	UJ8JA	10,550
2	UJ8AQ	1,620
1	UA9FF	13,585
2	UA9FAL	12,050
3	UA9SGN	9,650
4	RA9SUV	9,225
5	UW9CP	2,660
1	NM2Y	11,450

7MHz CONTEST CW CHECK LOGS

Position	Callsign	Score
–	VS6UO	–
–	G5ZG	–
–	G3MCX	–
–	LZ1KSR	–
–	YU4AAJ (Multi-OP)	–
–	Y43QF	–
–	Y22EF	–
–	SP1CU	–

7MHz CONTEST CW CHECK LOGS

Position	Callsign	Score
–	OK1US	–
–	UA6YW	–
–	UA6BJQ	–
–	UT4UB	–
–	UY5GG	–
–	UA9SAW	–
–	YO2CGU	–
–	ZL1HV	–
–	G3AEZ	–
–	G4UOL	–

7MHz CONTEST SSB EUROPE

Position	Callsign	Score
1	ON6JG	13,860
2	ON6AB	12,960
1	HB9DX	1,080
1	LZ1KVZ	15,840
2	LZ2WO	2,255
3	LZ2KHM	1,520
4	LZ1KZM	900
5	LZ2QV	250
1	EA6SX	16,240
1	EA3EGB	600
2	EA5LPH	280
3	EA2CR	160
1	YU5DX	700
2	YU3PG	420
3	YU7SF	400
4	YT5G	375
5	YU7KM	45
1	HA8XX	20,700
2	HA5BBC	17,850
3	HA3GO	6,160
4	HA8ZO	4,740
1	DL1EDB	5,360
2	DL2ZP	4,725
3	DJ0MW	3,685
1	PA3EFC	4,550
2	PA0KDM	3,400
3	PA3EUS	1,800
4	PA2BJM	750
5	PA0IA	690
6	PA3COA	630
7	PA3CLD	600
1	IK1BHL	1,155
2	I4CSP	735
1	SM5IMO	8,480
2	SM4SET	8,175
3	SM7HSP	600
1	FE6DRP	1,620
1	EI7CC	7,420
2	EI5DI	4,355
1	UW1BI	735
2	UA3ZU	350
3	UA4NC	140
1	UQ1GWY	240
1	UP2BOS	200
2	UP2BBD	100
1	UR1RYO	120
1	UR2RPZ	120
1	RO5OO	10,125
2	UB5QMA	8,890
3	UB5MNO	4,620
4	UB5AFI	120
1	UC2IDC	2,655
1	UO5OQ	690
1	OZ1DYI	2,100
2	OZ4NA	540
1	OH4RH	6,565
2	OH3HE	1,050

7MHz CONTEST CW EUROPE

Position	Callsign	Score
1	OK1DKS	2,000
2	OK1AGA	840
3	OK1KZ	700
4	OK5MVT	630
5	OK3YK	450
6	OK1KCF	250
7	OK1DVK	180
–	–	–
1	SP5PSL	9,230
2	SP7ZGE	2,450
3	SP6DVP	375
4	SP1HJK	240
1	YO2DDM	540
2	YO4CVT	450
3	YO5QBL	325
4	YO3DCO	260
5	YO9FEH	140
1	Y37CB	2,700
2	Y21SD	1,250
3	Y26KO	1,215
4	Y41ZF	990
5	Y46PH	910
6	Y24FB/A	840
7	Y51XO	735
8	Y24EE	541
9	Y54CO	540
10	Y26UH	520
11	Y24MB	420
12	Y68RF	400
13	Y67UL	325
14	Y25MO	275
15	Y56UA	225
16	Y21WI	200
16	Y23HJ	200
16	Y24JJ	200
19	Y22TF	195
19	Y24ZM	195
21	Y23TL	130
22	Y24HB	105
23	Y25YA/A	90
24	Y27AO	70
25	Y66YF	–
3	OH7NW	425
1	LA1XDA	1,530
2	LA9CQ	1,360
3	LA9PW	1,085
4	LA1KQ	450

7MHz CONTEST SSB BRITISH ISLES

Position	Callsign	Score
1	G3NLY	374,470
2	GW4UZL	261,800
3	G4CNY	170,715
4	G3LET	114,210
5	G4VMM	90,300
6	GD4PTV	79,950
7	G3TBK	73,150
8	G4MET	66,785
9	G2QT	57,760
10	G4IUF	51,090
11	G3FNM	49,700
12	G3VLX	40,765
13	GW4HBK	29,700
14	G0HGW	25,050
15	G3UHU	19,430
16	G4JVG	18,850
17	G0HXO	17,400
18	G0CDO	14,250
19	G4NXG/M	10,440
20	G4IQM	6,325
21	G0EOI	2,550

7MHz CONTEST SSB REST OF THE WORLD

Position	Callsign	Score
1	RM8MA	2,520
2	UM8DX	1,980
1	UW9CY	1,575
1	UA9AAS	1,575
3	UA9WFV	1,350
4	RA9CFB	1,170

7MHz CONTEST SSB CHECK LOGS

Position	Callsign	Score
–	UP2BH	–
–	UP1BYL	–
–	RA6LPY	–
–	UW3RR	–
–	UZ3YXF	–
–	RA3DR	–
–	LZ2WM	–
–	SP5GKI	–
–	UB5VAA	–
–	UZ1NWO	–
–	SP9PEY	–
–	Y51YJ	–
–	RA9XB	–
–	IK5HMQ	–
–	Y23LD	–
–	Y43QF	–

7MHz CONTEST SSB RECEIVING UK & OVERSEAS

Position	Callsign	Score
1	BRS32525	63,140
2	BRS28198	26,600
3	BRS52543	24,480
4	BRS90400	22,040
5	BRS90808	7,590
6	R87949	5,490
1	SPO189 6D	6,650
1	NL4483	9,955
1	OK2 31714	1,520
1	Y39 14 K	4,485
2	Y56 10 M	1,780
3	Y59 16 N	1,320
1	LZ1 H 200	5,320
2	LZ1 M 333	875
1	ONL 4003	1,225
2	ONL 6945	275
1	UA9 154 2105	3,360
2	UA9 167 780	1,785
3	UA9 154 2149	1,540
4	UL7 023 406	1,275
1	UA3 137 988	4,200
2	UB5 062 500	3,770
3	RM1 036 01	3,380
4	UP2 038 2519	3,000
5	UA4 156 986	2,700
6	UA3 170 386	2,250
7	UA2 125 1059	2,200
8	UB5 069 564	2,050
9	UA3 121 3118	2,000
10	UA3 170 372	770

RSGB CLUB CALLS CONTEST 'CCC' (WAS VERULAM CLUBS CONTEST)

Aims of contest:
To encourage contacts between Affiliated Societies.
To put Club callsigns on the air.
To encourage 'B' class licencees to operate under supervision of their club members.

Rules:

1 Eligibility. The contest is open to all licenced amateurs and short wave listeners. Portable, mobile and fixed stations may take part.

2 Period. 20:00 – 00:00 gmt Saturday 12 November 1988.

3 Frequency. 1900 – 1990kHz. Mode – any.

4 Exchange. RS(T), serial number (commencing 001), name of your club (or 'no club'), or name of club + 'club station' if you are operating a club station.

5 Scoring. Three points per contact (in points column). A bonus of 5 points for first member worked from each new club (in bonus column). A bonus of 25 points for working an affiliated club station (in bonus column). Totalling logs. A full page of contacts = 40×3=120 + total of bonus points = page total.

6 Logs. Standard RSGB hf logsheets should be used. Logs must include gmt, callsign of station worked, RS(T)/serial number sent, RS(T)/serial number received, club name received (or 'non').

7 Definitions. Members of more than one club may claim membership of whichever they prefer, but must use the same one throughout. Club names should be kept brief. All club calls must belong to bona-fide affiliated societies as listed in *Amateur Radio Callbook*.

8 Entries. Entries should include an RSGB HF cover sheet, giving the following information: callsign and station address, equipment used, entrant's address (if different), full name of club with abbreviation, if sent, and a signed declaration that the rules and spirit of the contest and terms of the entrants' licence were observed. Entries should be postmarked no later than 15 days after the event and sent to Mrs M. H. Claytonsmith, G4JKS, 115 Marshalswick Lane, St. Albans, Herts, AL1 4UU.

9 Swl entries. Scoring will be the same as the transmitting section with the following differences: (a) Only stations taking part in the transmitting section of the contest will count for points. (b) Logs must include gmt, callsign of station heard, callsign of station being worked, serial number and club name sent and points claimed. A particular station may appear only once in the 'station heard' column.

10 Certificates Awarded to: the leading radio club/society call; leading individual club member; leading swl individual non club member giving away most points.

SECOND 28MHz CUMULATIVES 1988 RULES

After reviewing the operator's comments made on the May Cumulatives the HF contests committee have made a few minor changes to the format of this new series. These are primarily training sessions to encourage new blood but all are welcome.

1 General Rules: Except where modified by the specific contest rules below, the general rules published in *"Contest News" RadCom* January 1988 will apply.

2 Eligible entrants: All entrants must be fully paid up members of the RSGB.

3 Dates and times:

Please note change of date

1 Session, Monday 10 October, cw 1900-2000. ssb 2030-2130.

2 Session, Tuesday 18 October, ssb 1900-2000. cw 2030-2130.

3 Session, Wednesday 26 October, cw 2000-2100. ssb 2130-2230.

4 Session, Thursday 3 November, ssb 2000-2100. cw 2130-2230.

5 Session, Friday 11 November, cw 2000-2100. ssb 2130-2230.

All times are gmt assuming BST ends on 23 October. Frequencies; 28·0 to 28·1 cw and 28·5 to 28·6 ssb.

4 Sections: Single operator transmitting only. If desired entrants may use a portable location but this must be the same for all sessions.

5 Contest exchange: RS(T), serial number starting with 001 on each evening and running continuously through both modes and RSGB county code. All reports, serial numbers and county codes sent and received are to be logged. Incomplete logs will be treated as check-logs and not scored. Entrants may work stations worldwide. The same station may be contacted on both modes during the same evening. Each day is treated as a separate event apart from scoring, see 6 below.

6 Scoring: Three points per completed contact plus a bonus of ten points for each county, including entrant's own, and each new country outside the British Isles. Bonus points should be claimed for the same counties and countries in both cw and ssb on the same evening.

Entries should be submitted, selected by the entrant as follows:

a Total of best 3 sessions from 5 cw.

b Total of best 3 sessions from 5 ssb.

c total of best 3 evenings from 5 cw and ssb (not necessarily a+b).

An entry can be made for any one, any two or all the three parts. A check-log for non-scoring sessions will be welcome.

7 Logs: Standard RSGB format in accordance with the general rules. A 'dupe' sheet is not required but a list of counties and countries worked on each mode in each of the sessions would be useful. One standard declaration (HFC2) is sufficient to cover all five sessions.

8 Entries must be post-marked not later than Monday 28 November 1988 and sent to the HF Contests Committee, c/o J Kennedy, G3MCX, 22 Croham Park Avenue, South Croydon, CR2 7HH.

9 Awards: Certificates of merit will be awarded to the entrants with the highest checked score in 6a and 6b and also to the highest three in 6c above.

10. **Note:** If the cw CQ is too fast send QRS de own call or QRS IMI, the other op will slow down to any speed, you may be worth 13 points!

CONTESTS CALENDAR

RSGB HF CONTESTS

Sep-Oct	28MHz Cumulative cw
3, 4 Sep	SSB FD (Rules in May issue)
4 Sep	DF Qualifying Event Grimsby
20 Sep	DF National Final Colchester/Chelmsford
Oct-Nov	28MHz Phone Cumulative Contest (Rules in January issue)
9 Oct	1/28MHz SSB (Rules in May issue)
16 Oct	21MHz cw (Rules in May issue)
22 Oct	DF Treble Night Event Mid-Thames
12, 13 Nov	Second 1·8MHz
Nov	Second 1·8MHz Contest (Rules in September issue)
Nov-Dec	28MHz Cumulative Phone

RSGB VHF CONTESTS

3,4 Sept	144MHz Trophy/IARU VHF and SWL (Rules in July issue)
11 Sept	10GHz Cumulative (Rules in January issue)
18 Sept	70MHz Trophy and SWL (Rules in January issue)
1, 2 Oct	432MHz-24GHz/IARU UHF/SHF (Rules in January issue)
6 Oct	432MHz Cumulative (Rules in January issue)
14 Oct	1·3/2·3GHz Cumulative (Rules in January issue)
22 Oct	432MHz Cumulative (Rules in August issue)
23 Oct	50MHz Trophy (Rules in January issue)
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 Calls 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

4 Sep	LZ DX Contest (Rules in September issue)
10, 11 Sep	European DX Contest (ssb) (Details in August issue)
1, 2 Oct	VK-ZL-Oceania DX Contest (ssb) (Rules in September issue)
8, 9 Oct	VK-ZL-Oceania DX Contest (cw) (Rules in September issue)
15, 16 Oct	Y2 DX Contest
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, 20 Nov	OVSV All Austria Contest
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

SECOND 1·8MHz CONTEST 1988 RULES

Please note

i The date of this contest has been changed to coincide with the Austrian 160m DX Contest. Austrian stations will send RST plus a three digit number identifying their District Locator. See *Month On The Air* for full rules.

ii In view of the increased activity during the 1st and 2nd 1·8MHz Contests, your adjudicator feels that a return to the original time span of five hours might be useful. Your comments would be welcome.

iii In order to encourage the lesser experienced operators, the high speed entrants are urged to QRS if requested.

1 The general rules for RSGB HF Contests, as published in the "Operating Guide" supplement. *RadCom* January 1988, will apply.

2 Date and time. 2100gmt Saturday 19 November to 0100gmt Sunday 20 November 1988.

3 Sections. Single-operator entries only. British Isles entrants must be members of RSGB. (a) British Isles (b) Overseas (including EI).

4 Band and mode 1820kHz – 1870kHz, cw only.

5 Exchange. RST plus serial number starting 001. British Isles stations must also give their county code as shown in the "Operating Guide".

6 Scoring.

(a) British Isles section: three points for each completed contact, with a bonus of five points for the first contact with a bonus of five points for the first contact with each British Isles county and for the first contact with each country outside the British Isles.

(b) Overseas Section: three points for a contact with a station in the British Isles (not EI), with a bonus of five points for the first contact with each British Isles county.

7 Documentation Logs to be headed: date/gmt; callsign; RST/number sent; RST/number received; code received; bonus' points. Duplicates must be clearly marked without claim for points. Unmarked duplicates will be penalised at the rate of 10 times number of points claimed, and logs containing more than five unmarked duplicates, for which points have been claimed, would normally result in disqualification. Each entry must be accompanied by a cover sheet and the following signed declaration: I declare that this station was operated strictly in accordance with the rules and spirit of the contest and agree that the decision of the Council of the RSGB shall be final in all cases of dispute.

8 Name and address for entries. Address logs to "HF Contests Committee" as follows: British Isles entrants to J C Burbanks, G3SJJ, "Southlands", 16 Colgrave Road, Plumtree, Nottingham NG12 5NX. Overseas entrants to PO Box 73, Lichfield, Staffs WS13 6UJ, England.

9 Date for entries. Logs must be postmarked not later than 15 days after the end of the contest.

10 Awards

(a) The Victor Desmond Trophy will be awarded to the winning station in the British Isles section, and certificates of merit to second and third placed entrants.

(b) The Maitland Trophy will be awarded to the Scottish entrant with the highest aggregate number of points in this contest combined with the First 1·8MHz Contest 1989.

(c) Certificates of merit will be awarded to the first three stations in the overseas section.

11 Receiving section

(1) Transmitting section rules 1, 2, 3, 4, 6, 7, 8, 9 will apply.

(2) A station may appear only once in the column headed "Station heard". The callsigns of the stations being worked may only repeat once in every three contacts logged. Logs to be headed: date/time gmt; callsign of station heard; RST/serial number/county code sent by that station; callsign of station being worked.

(3) Certificates of merit will be awarded to the leading three entrants.

(4) Holders of UK Class B licenses may enter the receiving section.

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 . . . .

YAESU FRG8800 hf receiver, in original packing with instruction book ex condx, £375ovno. Tel: 0479 2034.

DELIGHTFUL 2 METRE tranceiver Trio 7930, mobile or base, three whips, gutter mount, beam, 7 amp p/s, hd battery. Heatherlite mobile mic, all mint condx £275. G3AO, QTHR, near Buxton. Tel: 0663-50639.

SCANNING RECEIVER, VHF/UHF covers 68MHz to 512MHz. Desktop model by Realistic, very sensitive, mint condx, c/w instruction manual, packing, box, mains lead. £115ono. Matt, G4YGF, QTHR. Tel: Washington (091) 4173483 (after 8pm).

TRIO KENWOOD TS811E 70cm multimode, scan-mike, manual. Orign pckg, used twice and exactly as new, £725 securicor despatched. Would consider exchange Amstrad 1640-EGA (cash adjustment) or PC clone. G4UKL. Tel: 0326-40595 (Cornwall).

ICOM IC251E with muTek £425. Yaesu FT727R 2m/70cm handheld with extra nicad packs, +charger, £275. 2m/70cm mm tsvtr £90. 21-ele Tonna N-type £30. WANTED; 9-ele + 19-ele Tonnas N-type. G6UAJ, Paul, QTHR. Tel: 0344-411485.

IC MICRO 2E vhf mini handportable, new, unused, £160. G3BPE, QTHR. Tel: 0373-826939.

FRG7 NO MODS EX CONDX, manual, £110. 5-amp psu £10. Can be seen working. Buyer collects. G0JMP, QTHR. Tel: 0675-81266 (Warwicks).

HF5 VERTICAL ANTENNA £30. Radial kit £10. 2m 16-el J-beam £20. AZ-EL rotators £10. Advance LF sig/gen type 81A £25. ICL line printer £55. WANTED: circuit diagram for FT101Z fm board. G8DYK. Tel: Tadcaster 835989.

ALTRON 3-SECTION 10m telescopic tiltover lattice tower c/w KR600C Azimuth motor and controller, £275. AEA PK80 plus HF PM-1 packet radio modem, £75. MX-80 matrix printer £50. Tandy 102 portable computer plus disk drive £250. Mike G0AXM, QTHR. Tel: 06286-62328.

AR88D COMMUNICATIONS RECEIVER 540KHz-32.0MHz with S-meter manual and matching speaker. Ex condx £95. Buyer collects. Also Microwave Modules MMS-1 morse talker 2-20 or 12-48wpm £85. G3IWE, QTHR. Tel: 0925-601485.

21MHz 2-ELE QUAD operational but will dismantle in one hour longest member 8'6". All in ex condx £25 G3AO, QTHR, near Stockport. Details: 0663-50639.

IC240 fitted 12 simplex and most popular channels for 2m. Exceptionally clean, little used. Magmount antenna and coaxial feeder. Only £160 the lot. Collect Leicester if possible. G5UM, QTHR.

FOUR METERS. Three Nolton Sabre tcvrs xtalled on 70.300AM. Makers manual, magnetic mount, 1/4wave aerial. The lot £110. G8SIC, QTHR. Tel:0606-554178

NEW'BRAIN COMPUTER £50. Expansion interface module £70, disc interface £50, twin 40TSSDD disc drives with psu £50. Seikosha printer £40. £200 the lot ono. WANTED: mint VFO230, SP230 for Trio 830S. Brian, G1YIG, not QTHR. Tel: Standish 422547 (anytime).

KANTRONICS KAM PACKET radio modem, unused £220. Buyer collects/pays postage. Tel: 061-225-2706 (Manchester) G6BKP.

TEN-TEC CORSAIR 2 tcvr 1.8KHz-500Hz filters HD psu, mic, new Feb cost £1400, Offers. Yaesu FT77 tcvr all options, mint. Mic, £450. 25/35A SMC psu new £140. New'AT230 atu £160. FP757GX switching psu. Unused. Offers. GW4RLP, not QTHR. 0286-5264.

MARCONI HF AMPLIFIER pair 4/125 £110. Philips D6350 cassette recorder suitable for MS SEE Dubus 3/87 £25. Various atu bits, roller coasters. Large wide spaced capacitors. Ring G3ILO, 0453-83-3411.

SHUGART SA800/1 floppy drives. Quantity five all vgc. c/w manual, dual psu and misc spares. £70 the lot. Also ADM3A vdu ex condx £50. All items buyer collects. G4GII, not QTHR. Tel: Leighton Buzzard 378690.

FT767GX fully modified. All options. 70cm, 6m, 2m mint condx. Sale due to overspending £1500 or near offers. WANTED: SP980 speaker must be mint. Howard, G0HZH, 0394-460-474.

YAESU FT101E G3LLL fm mod.and spare valves. £300. Paul Johnson, G4UCX, QTHR.

B2. TX. RX. psu. MCR1. 19-set, 18-set, 46-set. 38-set. BC342. Command'receivers. BC221. 1155. 1154. Morse key type'365. AR88. 52-set. Horn speaker. RF units. Valves QQV0640A etc. SAE with offers. Many items for sale. G4CNK, 7'Burns Ter., Shotton Colliery, Co Durham.

FULL HF+VHF STATION. FT757GX - FP757 hd power/sup Matching FTV700 v/u tsvtr. Datong speech processor. Shure desk mic and handheld mic. All boxes. All as new. £775. G0HCX. Tel: (Deal, Kent) 0304-368162 (after 7.30pm)

G2DAF TX/RX Mk3. Offers, Andy, G4HUE, QTHR. Tel: 01-989-0867.

SONY 7600D, with psu freq guide, vgc, £100. Radiomobile CB202 10m fm tcvr with Nevada TC35DX amplifier, £65. J-beam 4-ele 2m quad loft use only £20. High res EMI monitor metal case 56cm screen, £30. Tel: (Hampshire) 04893-6687 (evenings).

FT102 AM FM £550ono. Doug, G4YIO, QTHR. Tel: 0962-714463.

YAESU FT726R c/w 70cm/2m boards and sat board, £875ono 1 year old. Also base mic MD1B8 £55ono. BNOS 25A p/supply £95ono. John, G0CHQ, Hillingdon. Tel: 01-561-6980 (not QTHR).

YAESU FT2700RH dual band 2m/70cm. Speech module fitted. Duplexer. Antenna. Mobile mount. boxed, mint condx, £400. Consider p/x plus cash for current model hf tcvr. G6XRL. Tel:0625876192.

COLOUR GENIE COMPUTER. rtty/cw, split screen. Type ahead. Tunicator. b/w portable hardly used. Handbooks, £120. Noel, G3ZLN, Ipswich. Exchange for switched mode 20a psu. Tel: 0473-49139.

40ft LATTICE MAST z-winches, rotator housing, £125 or p/x swap? for 2m or hf gear?? Sony u-matic vcr +30 tapes £120. WANTED: low-band am RXs for part time firemen, 81.25MHz. Please help! R Hill, G0IMV, Marclecote, Ledbury Road, Ross-on-Wye, Herefordshire, HR9 7BE.

FT690 MK11 c/w FL6020 linear, nicads. As new, hardly used, boxed, mint condx. G0IIE, £315. Tel; 0604-881-971 (Northampton).

HANDHELD ICOM IC2E with charger and case, £95. FTV107R tsvtr converts from 10m to 2m. Used currently with FT102 and allows ssb/cw/fm modes. Owner going mobile! £115. Tel: Cardiff 794190 (Could deliver to Birmingham area if required). GW4URC.

YAESU FT790R 70cm multimode portable, mint condx, includes nicads only £300 or will consider p/ex for 2m base station in good condx with cash adjust ment, Icom IC251 or similar rig. Philip, St Albans Tel: 0727-72528 (evenings/weekends).

COLLINS/YAESU/TRIO. Collins separates 75S3B, 32S3, psu and speaker. Very clean. Manuals. £500. Yaesu FTONE, Fist mic, manual, £950. FTV107R (2+70) with FTONE lead, £250. TW4000A dual bander. Diplexer and MA4000 antenna, £350. G4WZK, QTHR. Tel: Nottingham 394128.

TRIO KENWOOD TR9130 2m multimode tcvr, £325. Welz SP45M swr/pwr meter 140-470MHz £45. CTE mains linear amp 26-30MHz o/p 70w am 140w ssb PEP.Min/max drive 2w-20w. £45. All orig condx and pkg. G1NEO, Dennis. Tel: Nottingham 622651.

BBC MASTER 128 with 512k DOS board fitted, microntech med res RGB monitor & bridge, disc drive unit (2xDSDD40/80) with psu. Plus various Eproms & S/W. All boxed and in first class condx. G4XUR. Tel: 0823-270907 (after 7pm).

TWO METRE MULTIMODE. Icom 260E in mint condx, £250. 100w linear to use with it £75. Ring Ken, GW3TMH on Rhyl 2859.

HEWLETT PACKARD frequency counter Model 5246L with 500MHz converter 5253B 10-digit £50. German Bosch 2m tx/rx 10w fm crystals for R5/R3 with tone burst mic/LS £50. Mullard QY4-400 £15. Exchange any Eddystone rx except EC10. Harrison, G3TMQ. Tel:-0604-700979.

FT290II BRAND NEW still boxed, unused, surplus to requirements. Comes with new unused nicads, £385. Save over £50. J-beam CB 70cm colinear, new, unused, £50. Tel: 01-540-3959.

CT1600; 2m HANDHELD, IC2E copy with charger. £105. inc carriage. Jon, G4LJW, not QTHR. Tel: Bristol 293864.

KENWOOD TS940S with automatic atu serviced by Lowe Electronics in June. £1500, present price £2240. Any trial. New AT200 tuner £100. vfo 120 £100. Alinco ELH730G 70cm amplifier £50. Tel: Roy, 0793-822055.

MICROWAVE MODULES 70cm 100w linear. 10w i/p. Model MML432/100. £180. 70cm 18-ele beam £20. 6m 3-ele beam £20. 2m 7-ele beam £15. Howard, G0HZH. Tel: 0394-460-474.

YAESU FT221R with muTek board £325. Buyer please inspect and collect. G8ATA, QTHR. Tel: 04484-4671.

DATONG MORSE TUTOR £25. G3ULX Minehead. Tel: 0643-3754.

TRIO COMMUNICATION receiver R600 about three years' old as new, also atu. Tel: (Norwich) 0603-47125 (evenings/weekends).

TS130s, WARC bands, mic, pwr leads, PS30 25a psu, plus manuals. £650. Trevor, G4WKJ, QTHR. Tel: Hatfield 71020.

HQ1 ANTENNA WITH handbook £70. DC7011 Diawa controller with 60' of 6-way control cable, mast rotator and handbook £70. German Junkers key new, £30. HF5R radial kit with handbook, new and boxed, £40. G2FXD, QTHR. Tel: 0268-281475.

TR7930 2m FM TCVR 5/25w 21-mem, priority channel, hardly used. c/w up/down mike, p/supply, J-beam LR2/2m antenna. Buyer to collect and dismantle antenna. C/w orig/pkg and box. G4JIZ, QTHR. £200 ono (inc mobile bracket). Tel: 062-981-2398.

YAESU FT23R plus nicad charger and FNB10 battery £185. Hewlett Packard HP28C maths and graphics calculator as new, £125. HP16C logic and computer functions calculator £45. All boxed. GM1OIN, QTHR. Tel: 0383-414283 (after 6pm). Donald.

STATION SALE: Altron AT42 wall mount tiltover telescopic tower with auto brake winches. As new, £400. KR400 rotator with APPX 15m cable, £115. Yaesu FRDx401 tcvr, completely realigned, with manual and spare set valves, ex £250. MuTek TVVF-50a tsvtr £200. MuTek TVVF144A tsvtr £200. Microwave Modules 432/28 tsvtr £50. Datong DL70 morse tutor £30. Welz SP420 swr meter, £30. Various other items. Please phone for details. All items ono. G8FXG. Tel: 0409-24-548 (daytime).

2M TRANSISTOR PA Vibratrol USA make 150w+ o/p fm/ssb £120, inc massive homebrew psu. Wayne Kerr Universal bridge B221 c/w leads and handbook,

offers? Possible delivery. G3VAG, not QTHR. Tel: 01-670-5113.

TWO HOMEBREW transmatch atus with swr and wide spaced caps 160m-10m £50ea ono. Marconi Instruments digital multimeter with self-contained batt/pack and charger, £30. G3BDK, QTHR. Tel: Towcester 52309.

G4MH MINIBEAM. 10-15-20 plus 2m. vgc, £45. Turner +3B desk amplified mic, £10. TT100 valve make 200w linear. Full details £18. Yaesu FT227R, manual, mint £130. WANTED: "Atlas" console and other accessories. 9MHz fm filter. G3XKA, QTHR. Woking 73620.

ABSOLUTELY MINT CONDX PRO2004 scanning receiver. 25MHz-1300MHz in orig box. £250. Buyer must collect. Tel: (Droitwich) 0905-772501.

60' TRAILER MOUNTED TOWER ideal contest group, etc. £600 or will split. Tel: (Leicester) 0533-674112 (after 6pm).

TR751E VSI fitted £460. Tel: Barnsley 289578 (after 4pm). G6TWV, QTHR.

AOR2002 1.3GHz-26MHz. Immaculate, offers. Trio TS430S 30MHz-150KHz tcvr, offers. Tel: 0639-882708

FDK MULTI 700E 2m fm tcvr, variable power output, 1-25w, mobile mount, mobile mic, vgc, £125. G4RPA, QTHR. Tel: Bognor Regis 862629.

YAESU FRG8800 receiver with vhf module with free Dressler ARA30, £500 cash sales only please. Buyer collects. Tel: (Ferndale) 0443-755876.

RACAL RA17 hf general coverage rx with manual, £125, buyer collect. KR500 elevation rotator, never used with 18m rotator cable, £110. Microwave Modules MMT432/28.5 tsvtr, £80. Contact Pat, G4YWJ, QTHR. Tel; (Barnsley) 0226-203737.

FT102 SPARES FOR SALE; AF-board £65, counter-board £30. Crotech 20MHz dual-trace oscilloscope. Dual components. Tester only 13 months' old, £200, cost £380. Audio sig/gen £15, homebrew. Tel: Guisborough 76887. G0EWT, QTHR.

ALTRON 30FT telescopic tiltover mast with five foot ext. head unit c/w base and fitting instructions plus anti resonance guys supplied if required. Reason for sale, planning permission refused. £160. Carriage included. GM3CFS, QTHR.

FT901DE WITH ALL FILTERS, keyer, DC/DC £400. MM432/28s tsvtr, MM432/50 amp with 2x48EL beams £200. FT290R, nicads, charger, case, 30w-amp £250. Datong morse tutor £30. All prices negotiable. G4XKR, QTHR. Tel: 0253-701316.

ICOM 271E 2M BASE STATION fitted muTek front end. As new, £600. G8WGD, QTHR. Tel: 0594-34830.

EDDYSTONE 960 RX, solid state, 500KHz-30MHz, immaculate £80ono. NEMS Clarke special purpose rx 1302A, 55MHz-260MHz VFO tuning, am/fm, bfo, ex condx £80ono. Another 1302A working but tatty £30ono. Consider exchange with cash adjustment for hf rig. WHY? Oxford 341428.

PYE PF1'S on RB2 with nightcall audio amp and charger £35. Two uhf starphones, one receive only needs trx xtal RB6, £15, other trx/rec RB3 £30. 12 way charger for above, £15. Spares also. G4LKU, QTHR. Tel; 0536-742935.

AVO's 7 & 8 , various transformers, high fidelity amplifier, extending arm wall light (new), asstd valves, pen recorder, xpelair 3kw heat fans, variable speed motor 1-100rpm 1/4hp, 240v check meters, numerous electric switches and power plugs. Ken, G0HJA. Tel: 0403-52023.

MUTEK TVHF230C transverter. A cheap easy way to transvert your 2m rig into an hf band tcvr. £200 ono. John, GW4TJO, QTHR. Tel: 0222-614383.

ICOM IC251E 2m multimode 1w/10w fm/lsb/usb/cw muTek front end. Also matching IC-SM5 desk mic. Excellent base station in very good condx, £500ono Roy, GU8TGP, QTHR. Tel: (Guernsey) 0481-47918.

SONY ICR4800. 6-band, mw and 5 shortwave bandspread. Pocketable. LED tuning indicator. Case. £25. Hitachi WM20 shortwave transverter. 13-90m 9-band. All pushbuttons. For car radio or base use. £20. G4IOF, QTHR. Tel: 01-722-7040.

FT480R £275. M/M, rtty to TV converter £95. Converted CB 10m am/ssb £80. Discone ant, as new, £25. Or exchange above items for hf linear FL1000, FL2000, FL2500 etc. WHY? WANTED: FV401, ext vfo. G0JNT (Crimsby) not QTHR. Tel: 0472-752794.

ICOM ICR71E rx, with fm board fitted, boxed as new, £600. Trio 7500 fm tx/rx mobile bracket, £80. Coutant power supply, 12v, 5a, £10. G3VEZ, not QTHR. Tel: (Bournemouth) 0202-530436.

SILENT KEY. Yaesu FT757GS, FC757AT, FP757GX, MH1DB hand scanning mic. FDK multi 750XX mobile 2m FDK hand scanning mic. RD300 dummy load. G4MH minibeam ant. AR40 rotor. HF5 vertical ant. 2m ant. SP10z ex speaker. World clock, poles, cables, bits & pieces. Callbooks, etc. £1050ono. Collect help dismantle. G4IKM, QTHR. Tel: 0602-287025.

ALTRON AQ6-20 3-ele 4-band minibeam. £50. GM4HHY, QTHR. Tel;0968-73783.

RELUCTANT SALE. Immaculate condx. FT901D Yaesu tcvr 1.5-30MHz 9-bands, all hf modes £450. Yaesu FC700 atu £95. Asahi power meter £15. Shure 444 mic £26. ONO. G3JNY, QTHR, Leeds 863058.

COMMODORE 8096 with 4022 printer and 8050 dual drive. Fair condition. Buyer inspects and collects G8APX, QTHR.

ZETAGI 150w broadband 3.5-30MHz linear with preamp. 3 months' old. £95. G0HAD, QTHR. Tel: (Wilts) 0225-708240 (after 7pm).

TWO MULLARD TY4-400 triodes, never used, £35ea.or £65 for both. G3UGL, QTHR. Tel: 0234-750050.

MOTOROLA UHF T/T base ideal for repeater use. VHF highband unit also. Quantity of spare plug in modules for above. Tel: G4AJE, 0354-740441 (Cambs)

ICOM IC2E, £120. IC4E, £150. Both boxed with chargers and all supplied accessories. Little used and like new. IC-SM6 amplified Icom base mic. £20. Kenwood MC60 base mic with built-in preamp, £30. G0BII, QTHR. Tel; (Oxford) 0865-880229 (after 7pm)

BUTTERNUT HF2V 80/40m vertical antenna together with STR11 stub-tuned radial kit. Both mint, unused, boxed, £110ovno. G0DKN, not QTHR. Tel: (Downton) 0725-22406 (weekends only).

SHACK CLEARANCE: Standard C828 2m, 10/1w mobile tx/rx £100; FDK "Multi-2000" 2m tx/rx, 240/13.5v fm/ssb/cw £120; Icom IC02E handheld, as new £230; Swiss pocket altimeter/barometer (digital electronic) as new, £90; "Novec" computer monitor, amber-screen, £45. G3URE. Tel: 01-940-2349.

TET 21MHz 2-ele beam Model HB15F2T unused, in sealed box, £60. G3UGL, QTHR. Tel: 0234-750050.

KENWOOD PRODUCTS. VF0120. TS830S. TS520SE station clock. Hanson I/L wattmeter, Tono 7000 rtty computer 13v psu all working. Station redundant. Tel; 0455-272624.

MUSEUM PIECE all valve 70w am/cw tx in working condx, professionally built 1960 battleship style. Anyone interested please contact G4MU, QTHR. Tel:0604-582951.

YAESU FTV50 6m module for FTV901R unused as new £110ono. Alex, GM0HNX, not QTHR. Tel: 089083-294.

TS430S FM BOARD and all filters fitted AT250 atu, PS430 power supply, MC60A mic, all pristine, orig pkg, manual, complete set up £1050. Microwave Modules MML144/50S with preamp, hardly used £70. G0BZR, QTHR. Tel: 0925-726485.

AR33 ROTATOR UNIT, complete with control unit and 30m cable. Needs attention. £10. Kenpro KT200EE vhf handheld with charger, thumbwheel frequency tuning, £70. PF70 3-channel uhf handheld with leather case, base charger and spare batteries. £45. GW8KSF. Tel: 0978-759732.

ALINCO 203E 2M fm tcvr, mint condx. Still in the box complete with carrycase, £170. G8YNI. Tel: 021-360-2448 (evenings).

FT102 MINT BOXED and manuals, fm and cw filters, £575ono. Trio TS700G 2m base station 12v or 240v. Plus matching speaker £265. FT230 2m fm mobile 3w or 25w £145. All good condx. G0CPM, QTHR. Tel: 0625-871084.

ICOM 720A gen/cov tcvr, ex condx. £495. HF linear amplifier, all band 1.2kw no tune, model LA1000NT, very compact similar size to tcvr, £450. Tel: 0534-54186 (after 6pm).

FT757GX Yaesu tcvr, ex condx, £550. FP757 power supply £65. New NR Electronics 6m 25w tsvtr, £135. Tel: 0534-54186 (after 6pm).

SOMMERKAMP FT767DX same as Yaesu FT707, FP707 psu, FC700 atu, FV707DM. Prefer no splits, £600. PX Kenwood TS130S. WANTED; Kenwood MC50 desk mic, Heathkit HM102 swr/power meter or WHY? 4/5 way ant switch. Tel: 0782-395017/0782-317042.

SONY VIEWDATA SYSTEM (KTX1410UB Trinitron monitor/terminal, K1-100 keyboard, UP101UB printer) £140. Logabax dot matrix printer, £35. TI911 vdu (green) £10. 48k ZX Spectrum, datacorder, masses of software (games, morse tutor, etc) many magazines/books, £85. QUME S9 d/wheel printer (needs attn) offers? Burroughs TP422 dual 5.25" disc drives, cased, integral power supply. Offers? Buyer collects or pays carriage. G1IFL, QTHR. Tel: 0438-721404.

HF LINEAR FL2100Z ex condx, little used, £550. Yaesu Y0901 monitor-scope little used, £275. SMC HF5V vertical antenna, good condx, £35. Trio 9000 2m 10w multimode with B09A system base, never used mobile, ex condx £325. Trio 7800 2m 5/25w fm tcvr good condx, £190.Icom IC4E 70cm handheld as new, £169. Microwave Modules MM144/100S little used, £115. J-beam 10XY Yagi brand new, £30. All above equipment have instruction manuals & have orig pkg and boxes. Homebrew 2x4CX250B hf linear complete but not tested, £75. Decca KW108 monitor scope, working, £50. Daiwa CS401 coaxial switch as new, £29. 50m URM67 coaxial cable, RS388-142, £29. Farnell 13.8VDC 7.5a power supply, £30. G4TMG. Tel: 0903-721225 (work), 0903-772052 (evenings/weekends).

LINEAR BUILDERS, new can electrolytics 60UF, 450v six for £5.80 postage paid UK. Pye super Lynx CCTV camera and monitor £40. WANTED: 12v power unit for Pye SSB130 hf tcvr part no AT04431/01. G4ULR, QTHR. Tel: (Norwich) 0603-51656.

TRIO 2200G 12-chan fm portable. Fully xtalled some spare xtals, leather case/strap, mic, nicads, 5/8 helical antennas, full documentation, £65ono. VDUs "Elbit" DS1920X 15" b/w monitor, detachable ASCII keyboard, RS232C and printer o/ps, adjustable 110-9600 baud, full/half duplex. Fb for packet terminals. 6 available at £20ea inc user manual. Buyers collect, or "at cost" delivery Essex/Herts area. Graham, G8URI, QTHR. Tel: 0277-657235 (evenings/weekends).

TRIO TR9500 70cms multimode ssb/fm/cw/ trans mic etc., vgc £325ono. Tel: 0305-813202.

MULTIBAND RECEIVER "Steepletone" domestic, with instr manual mw SW1-2 lw/fm HR-MB mains, battery bought Jan 1988, £25 bargain. Canon 310XL 8mm movie camera f/1.0 3X zoom lens, instruction book as new, bargain £35. Tel: 01-397-2785 (RS90661).

AERIAL COUPLER. Johnson Match box balanced output large coil, large condsrs, really solid. Large girl this one - a beaut. Please collect, £90. G3JJU. Bob, 31 Avondale Road, Fleet, Hants. Tel: Fleet 615831.

YAESU FT270RH 50/5w mobile 145MHz fm tcvr. Mint, boxed, £250. Micro 7 3-chan 70cm handheld. Good condx. Boxed, £70ono. G4KUR, QTHR. Tel; 021-743-6701.

R2000 WITH INTEGRAL VC10 vhf converter. Boxed, in good clean condx £450. Tel: (Chester) 0244-533051.

FDK MULTI-750XX mobile and base station 2m, all mode, tcvr, box, manual, high power 20w low 1w, £250. G6ZTL, 24 Marmion Road, Coningsby, Lincoln, LN4 4RG. Tel: Bernard Rogers, 0526-42899.

MUTEK 2M HEAD amp GMFA 144E £120. 6m valve linear QQV06/40A £75. SM220 station monitor with pan adaptor, £270. G3NOH, QTHR. Tel: 01-997-4756.

YAESU FRT7700 antenna tuner, £30. WANTED: Trio 9R59DS gen/cov receiver, about £40/£50 in good wkg order. Tel: Mr Wood, Clochan 378.

TONNO 5000E plus Crofton monitor as new, £700. Icom 751 all band multimode tx as new £900. New Welz SP225 swr and power meter £80. SP180 speaker £50. IC04E 70cm tcvr £180. Near offer please. Tel: 0308-22700.

AMSTRAD CPC6128 COLOUR computer. Features built-in disc drive, 128k of RAM and CPM+. Also DMP2000 printer, 512k memory expansion, RAM drive and RS-232 interface (with built-in viewdata/ASCII terminal emulator). Extensive software inc word processors, database, C-compilers, spreadsheet and general utilities. Lots of games. All necessary leads and manuals inc. Just plug in and go! Acquisition of IBM-pc forces sale. £495 (or near) the lot. 0279-29531 ext 2547 (day).

ICOM 251E 2m base station with IC-SP3 speaker, vgc £360+carriage. MM 30w linear amp 1-3w input, £45. Tel: 0709-541277.

COMPLETE HF STATION comprising Kenwood TS430S all-mode, fm board, ssb/cw filters, PS430, SP430, SEM Transmatch, low pass filter, j-beam triband dipole and KR400 rotator - all boxed and perfect wkg order. First £850 cash. G0DPX, QTHR (Yorks). Tel: 0274-878888.

TRIO TH41E 70cm handheld fm trans mint, boxed, £150. Tokyo hy-power HT106 6m ssb/cw trans, unwanted gift, mint, £250ovno. Trio TS120V 10w hf trans VF0120, PS20, vgc, boxed, £375ovno. Will split. Tel: 0305-813202.

KW VICEROY MK3 transmitter and KW77 rx c/w handbook and circuits any demonstration £120 the pair. G3LEI, QTHR. Tel: 0474-534374.

FT290R case, std 2m multimode, rotator and control HY30V linear fm/ssb 30w BNOS 6a psu 20m each, L/L coax control cable. Also MET 2m beam. Mint condx

and all boxed, £365ovno complete. G1TOL, QTHR. Tel: (Swindon) 0793-873063. Manuals/instr books.

DRAKE TR7A c/w 3 filters and FA7, PS7 c/w FA7, RV7, MS7, MN75 c/w balun, Shure 201, trap dipole, boxes, manuals, spares, £1300. Also Dressler D200S £500. Datong MK £80. All immac can deliver. G4JBH, QTHR. Tel: 0935-824225.

EPSON PX8 COMPUTER. Ex portable/mobile packet terminal. CP/M2.2, basic, wordstar, calc, diary, scheduler, terminal, utility programs (all on rom) integral micro-cassette. Superb condx with manuals. £150. Peter, GOFRQ, not QTHR. Tel: (West Yorkshire) 0535-56557.

MUTEK/MICROWAVE MODULES. BBBA500u wideband preamp. 20-500MHz. The scanner Deafaid £25. MMC432/28'S' dual band converter, £20, never used, orig pkg. GOIIE. Tel: (Northampton) 0604-881971.

ICOM PS30 system power supply, 25a metered, never used, still in orig box. £250ono. GOIIE, John. Tel: 0604-881-971 (Northampton),

DRAKE TR4 remote vfo L4B linear, £1200. Will split. Heath SB101 £135. Trio 120S £310. 480R £240 all in good order and boxed. G4JYQ, QTHR. Tel: (Southport) 0704-77411 (evenings/weekends).

FT77 MINT CONDX 100w 80-10m WRAC fm board, mark, mic, manual, boxed little used, £470. Inspection welcomed. G3NJP. Tel: (Truro) 0872-501487.

HYGAIN 153BA 15M 3-ele beam. Brand new in unopened carton, £99. BN86 balun £25. GOIIE. Tel: (Northamton) 0604-881971.

FT290R 2m MULTIMODE, + mobile mount. Boxed, good condx, £275ono. GM4YDC, QTHR. Tel: 0764-3583.

KENWOOD RZ-1 mobile scanner. Brand new, boxed, unwanted present, £360. GOEJO, QTHR. Tel: 0202-782186 (office), 0202-533309 (evenings).

KENWOOD TS430S £610. PS430 £110. SP430 £18. TR2500 £125. Yaesu 290R nicads MM £210. FL2010 10w linear, £60. 790R nicads MM £250. MML144/25 £45; AR40 rotator c/w 50ft cable £70. G6BQE, not QTHR. Tel: (Waterlooville) 0705-240728.

KENWOOD TR9130 used only as base station. PS30 psu, Kenwood SW200 swr/pwr meter. All mint, realistic offers, G4HKL, QTHR.

VALVE CRT SALE. QQV02-6, 2C39A, DET22, DET24, A2521, Y644, JT15, 6883, 9524S/A, 3BP1A, DG7-32, DG7-5, DG7-31, DB4-1, 5BTP7. DET29 (gold plate cavity). All tested, some cavities, bases, screens £5ea item (+post). G3MDQ. Tel:021-354-9972.

DRAKE MN7 ATU with balun unit £235. WANTED: Drake MN2700 2kw atu, also 70cm power amp 1w drive 30w minimum output. G4DIC, QTHR Hinckley. Tel: 0455-636315.

FT102 SUPERB CONDX in orig box with instructions +fm +MH1 mike mainly used for listening £575. G1ALK, QTHR. Tel: 0634-271319.

KENWOOD/TRIO TS770E TCVR. Dual band 25w (2m-70cm) multimode. Ex condx. Also 100w linear amp for above. Whips, mike etc., £525ono the lot. Buyer collects. G8UUX, QTHR. Tel: (Medway) 0634-716690.

TRIO TR9130 MULTIMODE £340, R600 rcvr £220, HS5 h/phones £25, swr/meter SW100A £25. Yaesu FT209 £200. Global 1000 atu £25. Daiwa 8a/psu £50. Datong active ant £20, hf preamp +psu £12. TAR G5RV ant new, £10. G3JKS, QTHR. Tel: 0727-59318.

PYE LABGEAR 7026 teletext unit needs attention but no manual. Based on orig Texas teletext chip with uhf tuner and modulator, £35. G6ALK, QTHR.

RACAL RA17L 10MMS rcvr 1/30MHz. Good condx in carrier £100. Tel: 0224-780545 (daytime) or write: John Carver, GM0IZC, 284 Rosemount Place, Aberdeen, AB2 4YA.

FERGUSON MM02 12" green screen monitor. gwo. £32. Ian, G0HAV, not QTHR. Tel: Fakenham 51654.

SOMMERKAMP FT726R WITH 2M and 70cm plus satellite boards, £600. Trio TW400A dualband with voice synthesizer, £300. Thirty foot tower (wind up) £250. Tel: 01-500-2084.

MM4000 RTTY terminal unit with keyboard £80ono. G3RPV, QTHR. Tel: 0480-53019. STOLEN FROM CAR in Stevenage, FT727R in case. Serial No.7C170924. Any information to G3RPV please.

TRIO TM2550E 2m fm 45w tcvr, fitted voice board, provision for DCL/DCS. New March this year, sell £250 or swap. TS120S or other. Pioneer hifi new last Xmas, cost £500, swap hf gear or WHY? G4OLC, Northumberland. Tel: 0670-855953.

FRG7 RECEIVER digital readout 2m converter fitted. Exc condx, handbook, £130. G3LTZ, QTHR. Tel: 0793-762559.

MICROWAVE MODULES 1296MHz tsvtr 144MHz IF mint condx £160, or swap for 144-432 tsvtr. Motorola CD100 vhf and uhf boot mount mobile units £30ea. G4AJE, Cambs. Tel: 0354-740441.

TS830 WITH MATCHING SP230 speaker and AT230 atu. £750. Kenpro KR500 elevator with "H" frame for mounting two beams side by side. £75ono. 14-ele MET 2m beam £10. G4VSW, QTHR. Tel;061-456-7384 (after 6.30pm).

ICOM 701 hf tcvr, mint condx with ac psu £450. Tel: 0745-2859. Ask for Ken GW3TMH.

FT767GX, 70cm 2m 6m board, desk mic, 12 months' old £1500. Contact G1SPZ, Tel: 0707-372575, or page me 01-884-3344. Give BGNT 301, then state FT767GX and give your name and phone number. I will reply ASAP.

KENWOOD 430S WITH instruction/service manuals, all filters and fm board fitted, £625ono. Kenwood AT230 antenna tuner, £145ono. All in perfect working order. G0CDD. Tel: 01-958-1164.

FL2100Z LINEAR. Ex condx, £500. 40/80m vertical £30. TA33 Jnr £100. Tel: 0302-782616.

FT290R MUTEK, nicads, charger, case with Tokyo hy-power HL35v 2m linear. Morse delay unit, HB9CV £275. Les, G7ADT. Tel: 0226-764545.

BELCOM LS102 28-30MHz tcvr, vgc, cw/fm/ssb/am no offers, £140. G4WOE, Tel: 01-518-2752 (between 6.30-8.30pm only). Not QTHR.

FT102, FV102, FC102, SP102, FA1-4R ant select, am/fm board, am and cw filters, MH-1B8 mic, all very little used, as new in perfect working order. Boxed, wikth all manuals. £850. Any trial. Only reason for sale is lack of space for computer. Free delivery within 50 miles radius of Chelmsford G3JOX, QTHR (after 6pm or weekends).

FT1 ALL MODES inc fm/cw/narrow filter, am filter dealer fan modification, ram memory unit, Curtis keyer, scanning fist mic, all manuals and boxes. vgc, reason for sale going QRT. £850ono. G0ANC, not QTHR. Tel: 01-729-5429 (evenings).

ICS/AEA CP1, rtty terminal unit t/indicator, variable shift (mint) £55. Kenwood HC10 digital world clock (mint) £50. Datong SRB2 "woodpecker" blanker unit £55. VHF comms 2m antenna switch polarisation unit £20. Tel: Paul, G4XHF, QTHR. 0293-515201.

HF TRANSCEIVERS ssb, Yaesu FT401, 560w PEP FT101 260w PEP, £285ea. 70cm FDK fm palm IV tcvr and beam £80ono. FDK 2m fm 700E £130ono and beam, 20-ele. Tel: 0582-606173. David, GOFDV.(Dunstable Beds).

YAESU FRG9600 uhf/vhf 60-905MHz scanner rcvr. £385. Tel: 05645-70259 (West Midlands).

KENWOOD TM221ES plus RC10 remote control. Boxed and guarantee. Best written offer secures. May split items. Service manual also supplied. John G8BXO, QTHR.

ICOM-IC202S 144.000-144.400, 144.800-145.000, mic leads, case, vgc, £130. Realistic general coverage rcvr, DX100L variable BFO 150KHz-30MHz vgc, £55. Swan 350, 3.5MHz-30MHz, 500w PEP, good condx, mic speaker, psu, manual, £199. G4JXK, Hampshire. Tel: Fareham 230737.

IDEAL STARTERS RIG. Trio TS510 5-band hf tcvr. 100w out c/w PS 510 psu/speaker £200ono. WANTED: tsvtrs for 70MHz and 144MHz with 28MHz IF. Tel: Andy on (Dartmouth) 08043-5320.

150Ow LINEAR amp. Yaesu FL2500. 1.8-30MHz, £300. G3LNP, QTHR. Tel: Tring 4402.

THE QTH OF GM3ZBE, probably the best vhf site in Scotland. Traditional stone cottage, 2 bedrooms, kitchen/dining room, hall, bathroom, large lounge, central heating. Half acre ground, no TVI! Allan, Westhill of Crimond, Keithhall, Inverurie, Grampian, AB5 0LQ. SAE/details.

TRIO TL922 linear amp, £1000. Daiwa CNW518 atu £200. Telereader CWR685E built in screen, cw/rtty/ascii/baydot. Novex 12" screen monitor. Brother printer M1009, £650. All in mint condx. Telescope 6" reflector by AE of Luton. 4,9 & 20mm +2X Barlow eye pieces. .25wave optics. Very heavy duty tripod stand. Nearest £300. G4OYU, QTHR, Nr Gloucester. Tel: 0452-812216.

YAESU FT902DM, dc-dc converter, new valves fitted all leads, manual, boxed, vgc. £595. Tim, Tel: 0377-89257 (Yorkshire),

YAESU FT790 70cm multimode, £285. Matching Yaesu 7010 linear, £60. Icom 290E 2m multimode, £285. Realistic PRO-2001 scanner, 68-88, 144-174, 430-512MHz. Sixteen memories +band scanning. £90. G1BWW. Tel; 0462-711722.

YAESU FT902DM HF tcvr c/w dc lead, mic, digital read out, fm, fsk. Good condx. £600ono. No time wasters please. Prefer inspect/collect. Reason for sale AGE. G6NK, QTHR. Tel: 0932-844058.

FT101ZD 12-band, fan, mic, nice condx, £425. Cash. Prefer buyer inspects/collects or plus £7.50 towards Securicor. Have orig pkg. GW0IWK, QTHR (North Wales). Tel: 0745-4995 (phone after 10.9.88 anytime).

TONO 5000E terminal unit amtor/rtty/ascii/morse with vdu and keyboard £495. Ayr teletext unit with remote control £45. G3RUD, Avon. Tel: 0934-812348.

SALE/EXCHANGE Heathkit 3400 microprocessor trainer, course, cassettes, experimental components. Exchange for amateur rcvr, tcvr or good hf beam, rotator, WHY? Sell £200. Also require circuit or manual, p/e W3OAM. Tel: 034-282-2843 (after 8pm).

2M SALE: Icom 251 all mode base station tcvr w/mic £370. Icom 240 mobile tcvr w/mic £85. J-beam C5 colinear ant, £65. Mobile whip magmount £20. All vgc, seldom used. Tel: 0723-365043.

COMPLETE STATION COLLINS S-line 30L-1, 32S-3, 515F-2, 75S-33, 312B-4. All mint, offer over £4000 All with manuals. G3KVH, QTHR. Tel: 021557-8417 (offfice hours).

APRICOT f1 PC msdos 756k ram 3.5 disc. Lots of software inc wordstar, turbo, pascal, d/base etc. Would make good packet setup. £400 or swap for AOR2002 scanner or willing to px for 2m rig. Tel: 0983-811747 for deal.

VERSATOWER P40 fitted 12' pole containing CD45 rotator. Hygain TH3JNR, 5-ele, 6m Tonna, 3-ele 4m MET. All good condx. Buyer to remove. Plus control cable +coax. £375. Will consider splitting G3GHB, QTHR. Tel: 0386-792582 (anytime).

TS830S WITH SERVICE manual, swr bridge, 80/10m trap dipole, £625, firm price. Pair 5200IA valves unused £17.50 pair. Heathkit 4-way coaxial switch £10. 2m 6-ele quad £10. All items vgc. Carriage extra. Prefer collection. tcvr. G3GHB, QTHR. Tel: 0386-792582.

MY LOFT IS IN danger of collapsing into the cellar bound volumes PW 1964-76. QQV03-20's brand new MIL types. Offers. Record decks tape decks, psus, old valves, Mullard modules HB scope with probes. SAE lists. G4IDF. QTHR. Tel: 0905-351568.

YAESU FT757 boxed with manual, £550. c/w key, HI mound MK704. Still in box, unused. £12. Tel: 061-320-6941.

RUTLAND WIND generator. Rated 50w at 12v. c/w sectional mast and guys. New would cost over £300. Condition as new. Ideal for remote station. Gift at £185. G6GUL, Nottingham. Tel: 0602-894547.

TRIO 751E 2m multimode. Still under warranty. Save £99, As new £500. Going QRT on two. G0HES, QTHR. Tel: Runcorn 711887.

KW204 TRANSMITTER ssb 180w PEP 75w am 1.8-30MHz, manual, vgc., £150. RA17 rcvr manual, vgc. £150. Excellent low price station. Will separate. Buyer collects. G8XET. QTHR. Isle Brewers 394 (Taunton area).

YAESU FT102 HF trans ssb 1.8-3.1KHz cw 300-800Hz, cw 270-600Hz filters +fm +MH1 mic. Mint condx. Reason for sale wish to go hf mobile. £550ono. G4OAB, QTHR. Tel: Runcorn 65804.

YAESU 101Z. 9-bands. Fitted fm. Only moderate use. Orig PAs spare matched GE 6146Bs and NEC 12BY7A driver. YD148 desk mic. Manual. Orig pkg. £350. G4LSB, QTHR. Tel: Dean 43329.

ICOM IC740 inc int psu & fm marker, £600. Icom IC02E vgc, c/w case, charger +2spare battery packs £180. Standard C78 70cm 1w portable fm only synthesized £100. Sota 2m 100w base station amp £120. Microwave Modules MML432/30-L 1-3w i/p, 30w o/p £90. KW107 atu, offers. Buyer collects on all items or p&p extra. Brian Smith, G4ETN, Bridgwater, Somerset. Tel: 0278-452743.

MICROWAVE MODULES 100w linear 3w input, £115. Exchange for printer for BBC. Also FT902, gdo 757 mobile mount transistor tester. Offers. 48k Spectrum computer and cassette recorder £75. Akai colour camera for ATV £125. G0DVZ, QTHR. Tel: 051-625-2271.

YAESU FT101ZD MK3 fm fan, cw filter, 2 spare sets valves, matching 902 atu, Yaesu desk mic, all boxed as new. Prefer buyer sees and tries this complete 9-band hf station. Bonafide reason for sale, £595. Tel: Brixham 7144.

TS711E 2M MULTIMODE v good condx, boxed, also 6-ele yagi quad with about 30' of coax, £700ono. G4VOT, QTHR. Tel: 0376-515017.

NEW LICENCE – AMENDMENT

Since the printing of the new licence text in last month,s *Rad Com* two errors, both in the 'Unattended Operation' sections, have come to our notice.

Opposite we have reproduced an amended version of the relevant part of the text and if desired this may be pasted over the uncorrected copy previously released.

Unattended Operation

(4) Subject to sub-clause 2(5), the Licensee may conduct Unattended Operations ("Unattended Operation" means the operation of the Station when unattended by the Licensee) only:

(a) of a beacon:

(i) in the frequency bands including and above 70 MHz specified in the first column of the schedule (except the bands 144 MHz to 146 MHz, 430 MHz to 435 MHz, 438 MHz to 440 MHz, 1240 MHz to 1325 MHz and 24050 MHz to 24250 MHz and the sub-bands 435.0 MHz 436.60 MHz, 436.8 MHz to 438.0 MHz, 10250 MHz to 10270 MHz and 10300 MHz to 10400 MHz), with a maximum power of 14 dBW erp carrier or pep,

(ii) for the purpose of direction finding competitions, in the frequency bands 28.0 MHz to 29.7 MHz (when the Licensee is operating under an Amateur Radio Licence (A)) or 144 MHz to 146 MHz, with a maximum power of 14 dBW erp carrier or pep

which is capable of transmitting the call sign of the Licensee periodically (in accordance with clause 7) and capable of being switched off within two hours of a demand to close down given by a person authorised by the Secretary of State;

(b) of a low power device to control apparatus at the Main Station Address or a Temporary Location by remote control, in the frequency bands including and above 70 MHz (except the bands 144 MHz to 146 MHz, 430 MHz to 435 MHz, 438 MHz to 440 MHz, 1240 MHz to 1325 MHz and 24050 MHz to 24250 MHz and the sub-bands 435.0 MHz to 436.6 MHz, 436.8 MHz to 438.0 MHz, 10250 MHz to 10270 MHz and 10300 MHz to 10400 MHz) specified in the first column of the Schedule, with a maximum power of −20 dBW erp carrier or pep: in such a way that no electromagnetic energy capable of reception by any station or apparatus outside the curtilage of the premises in which the Station is situated is emitted from the Station; or

(c) by digital communications at the Main Station Address or at a Temporary Location notified in accordance with sub-clause 7(3)(b),

(i) in the frequency band 50 MHz to 51 MHz, with a maximum power of 10 dBW erp carrier or pep, or

(ii) in the frequency bands including and above 144 MHz specified in the first column of the Schedule (except the bands 430 MHz to 435 MHz, 438 MHz to 440 MHz, 1240 MHz to 1325 MHz and 24050 MHz to 24250 MHz and the sub-bands 435.0 MHz to 436.6 MHz, 436.8 MHz to 438.0 MHz, 10250 MHz to 10270 MHz and 10300 MHz to 10400 MHz) with a maximum power of 14 dBW erp carrier or pep.

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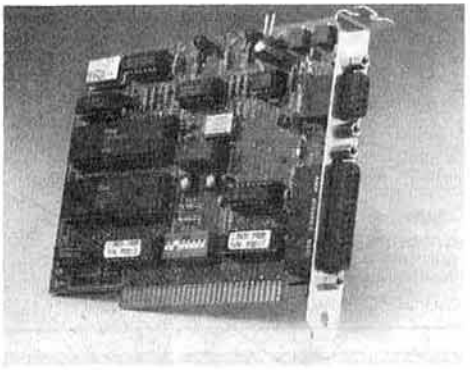

PC*PACKET ADAPTER

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PC*PACKET ADAPTOR only £129.00 + £2.50pp
HF*MODEM only £79.00 + £2.50pp

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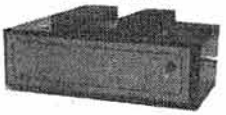

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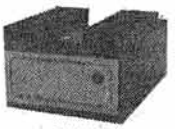

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75th Anniversary Tie	–	£5.95

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MEMBERS. Use right-hand price columns. It is essential that you quote your call sign or BRS number so that you can be recognised as a member.

PRICES. These include postage, packing and VAT where applicable, and are subject to change without notice. For airmail despatch, please ask for price before ordering. Goods are obtainable, less p & p, at RSGB headquarters between 10am and 4pm, Monday to Friday.

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Amateur Radio Computer Networking Conference Papers Vols 1-4 (ARRL)	£18.10	£15.39
Amateur Radio Computer Networking Conference Papers Vol 5 (ARRL)	£12.33	£10.48
Amateur Radio Satellites—The First 25 years (Amsat UK)	£2.06	£1.75
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The last...

VEHICLE REGISTRATION NUMBERS (AGAIN)

Sir – The DVLC has already indicated elsewhere that it will not issue low car registration numbers to satisfy individual or minority needs.

My own experience is that Ministries can be persuaded to break new ground if there is sound justification.

In addition to the normal DVLC transfer fee I would be willing to pay up to an additional £350 (to the society) for the privilege of having my callsign matched to my car registration number in August 1989. CWL is a Bucks County Council allocation – my home county.

I hear the anti-elitists cry 'foul'. However, here are potential revenues of £140,000 using my £350 figure.

I believe the following options could have broad appeal:

Option A: The Society could establish a fund and use the interest/capital to make an award to the DTI-supported Amateur of the Year to enable him or her to pursue research, undergo training, lead or assist in leading an expedition.

Option B: The Society could donate all monies to the Gt.Ormand St. Children's Hospital Wishing Well Appeal which is already receiving country-wide support from individuals, industry and other organisations.

An individual approach to the DVLC or MOT is unlikely to carry weight. I believe the Society has a role to play and could also gain wide favourable publicity by co-ordinating either option.

It's a unique opportunity. Let's go for it in our jubilee year!

B Fletcher, G4CWL

We did have quite extensive correspondence with DVLC some time ago about this and the outcome was reported in the News Bulletin at the beginning of this year – they wouldn't play, unfortunately. However, we will try again and see whether we can persuade them to change their minds.

AMATEUR QRP RADAR

Sir – First I wish to thank the RSGB for the information and sample magazine sent in reply to my request to apply for membership.

I have written to the most helpful RDD/DTI and one of my queries regarded amateur radar experimentation at very low (QRP) power levels. I was advised that "the possibility of amateurs using radar is under consideration and therefore it is currently not permissible'.

Why QRP?

Reasons for QRP rf o/p are that frequencies about vhf may be hazardous with even a modest rf o/p and also to facilitate necessity. Yes, we have to have output restrictions in order to provide us with a greater need to build more sensitive receivers. All fine and well turning up the power to account for inefficiencies, but therein lies the problem – we don't need high outputs if we have greater inefficiencies.

Why radar?

Our country was the wise old uncle in this field once. Radar is essential for air and sea navigation as well as weather observation. If amateurs are once again given the allocation for radar experimentation at low power levels, then here will be an opportunity for the improvement in its efficiency world-wide, thanks to a few enthusiasts. In the process it would re-establish the radio amateur's worth in science and technology.

In conclusion – much of today's radio-based equipment can do many clever things reasonably well. Anything which can do the basic job very well is worth a lot more.

Michael Drake, GM1RHV

VOTE OF THANKS

Sir – May I have the opportunity, through your letters' column, to thank all of those who made a contribution to the successful operation of GB75AC at the 75th Anniversary Convention of the RSGB, NEC, Birmingham?

Ever since the annual exhibition moved to the NEC, Solihull Amateur Radio Society has accepted the task of providing the hf demo station, but always with the assistance of others. It was not without some trepidation that this year's committee supported this ongoing situation; it was obvious that something special, and something big, was required for such an auspicious occasion. I can reveal that we had great ambitions for the reason that if we were only 50% successful then that would still be more than enough. The actual result was probably nearer 90%, which I think is a great achievement.

None of this could have been done without help from all quarters. Much was through direct sponsorship from business organisations – time, money and materials – for which we are extremely grateful. However, a significant amount of 'amateur' effort was spent before, during and after the event and that was the lynch-pin of the whole activity.

I would like to thank all those (not all amateurs) who made a contribution, no matter how small, to GB75AC. I dare not give a list of names for fear of missing one out. They made an amateur event into a professional occasion. Thank you.

The IARU and the RSGB are democratically based on amateur radio and radio amateurs. The amateur radio demonstration station was ably demonstrated by radio amateurs. If that becomes impossible then the hierarchy will have failed and thereby cease to exist!

R P Ralph, G4KSG,
Chairman,
Solihull Amateur Radio Society

GB75AC proved to be one of the most popular special-event stations ever, if what we heard was anything to go by. They had pile-ups ten deep on all their frequencies every time we came across them!

BE FRIENDLY OFF THE AIR TOO

Sir – As a teacher of boys with specific learning difficulties, several of whom are keen members of the Radio Club and hope one day to get their amateur licences, I am very much in favour of a Student Licence. From what I have read so far of the intentions, this would be a most realistic first step for my boys, but the large amount of text confronting them at the moment can be very off-putting. I appreciate that this might not be a prime area of concern in creating the new category, but must surely carry some weight.

Also being a minister of the gospel, I would wish to add that all of the good ideas being collected in order to attract new recruits to the hobby will mainly be a waste of time and energy unless we also become 'evangelistic'. As I remarked on the air recently, we amateurs are a strange breed. On the air we are the most friendly and sociable of mortals, but go along to a Special Event club station, in the hope of meeting some fellow enthusiasts (who one assumes are there as ambassadors of the hobby), unless there is someone there already known to you, it is almost like being invisible! At least that has been my experience at two such events in just over 12 months. Not all budding radio amateurs are extroverts who can easily break through the apparent lack of interest shown in them, and while hopefully my experience is not typical, it is sadly not totally exceptional. A church's growth is related to the commitment of its members to spread the message through interpersonal relationships, and not simply gathering useful ideas, etc. While there are real differences, this particular truth should surely be embraced by the amateur radio fraternity.

The question which arises surely is this: do we really want the hobby to flourish and grow, or is it actually a case of being happy with our own experiences together with a "we're alright as we are, thank you.'?

Hopefully, when time allows me to get involved in a radio club locally, if ever I'm operating a Special Event Station, I shall act in accordance with my own views!

Peter N Morgan, G7ATR

IS CW REALLY WISE FOR THE STUDENT LICENCE?

Sir – With regard to the student licence, surely people should be looking to the future and not back in time. There has been a lot of talk about low power transmitters and cw, which was alright for the 1920's. But we are in the 1980's. People must realise that modern youth have computers, etc. How many people struggle with cw to obtain their a class licence, and never use a key afterwards?

So why expect young people to use that mode?

If the Society is after young blood and wants to make the prospect attractive, it must think like a young person.

There is a lot of PMR equipment about which is readily available and at prices they can afford; this could be used to give them limited frequencies on the vhf or uhf bands.

As for study, a lot of technical colleges will not take 14-year old students. Staffordshire, for instance, starts at 16 years old.

I am a scout leader and have run three JOTA vents. The lads have enjoyed brief greeting messages passed to other scouts – I certainly would not like to think that the bands allocated would end up like the cb bands at the present time. Phone is much more attractive to the younger, future, amateur. Not cw.

B G Scholte, G1SIG

HOW NOT TO USE 144MHZ

Sir – With reference to *RadCom*, June 1988, page 484, when the band is busy a calling frequency has outlived its function. The QRG you QSY to is likely to have become occupied since you checked it before you start calling CQ, which means you re-QSY, get into QRM and probably lose your prospective QSO partner. There is no rule which forbids us to call CQ on any QRG away from calling frequencies, within the self-imposed restrictions of the band plan. While the CQer from .050 ushers others across the spectrum, you can complete at least one QSO elsewhere.

Let's use a calling frequency only to contact a specific station which we know is standby there, or when the band is absolutely dead (though I can't recall a case of that for the last 15 years, as far as 144MHz is concerned).

It is bad enough to have call books with 'particulars

....word....▸

APOLOGY TO A.R.E. COMMUNICATIONS

A.R.E. Communications suffered embarrassing criticism last month in our "Last Word" correspondence column, owing to RadCom's failure to offer the right of reply in the same issue. When any reader writes to the editor commenting upon, complaining about or criticising another party – in particular a manufacturer or his products – the person or company is always provided with copies of the correspondence in advance of any intention to publish. The system broke down last month, and G0BLW's letter complaining about corrosion inside an EMR-400 rotator was committed to print without A.R.E.'s knowledge. Quite justifiably, A.R.E. are extremely upset, and have indicated that there is little doubt that the problem is attributable to freak circumstances. A.R.E. have sold hundreds of rotators, and are wholly confident that they have an equivalent number of satisfied customers with properly-functioning units. A.R.E. are particularly aggrieved at inferences of poor co-operation over the complaint, and in evidence of their willingness to assist we have been shown letters which indicate a most reasonable attitude towards this complaint. We are confident that A.R.E. have always had a good reputation amongst their customers both for goodwill and service and the RSGB, being dedicated to fair play, apologise most sincerely to A.R.E. for the failure to implement it in this case.

the last ... word

with-held' entries. If Mr Clandestine puts his views to paper, would he please tell us who he is, so one can get at him?

On the topic of phonetic alphabets, a good one should have at least three syllables per letter, and all should have the same number of syllables, while avoiding ambiguity. Countless are the times my call has been copied as delta kilo three uniform kilo. Fortunately I use cw mostly, where the aforementioned problems don't exist.

Edmund Ramm, DK3UZ

Eddie must live on a fantastic site if 144MHz has never been absolutely dead in the last 15 years! Seriously, his point is valid. The problem is that less well-sited stations with modest antennas may experience the band as being 'dead' for quite a large proportion of the time and therefore decide to call CQ. A better-sited station with good antennas, however, will quite often hear two or three stations calling CQ simultaneously, all of whom are oblivious of one another. In urban areas of the UK it's probably a reasonable assumption that calling frequencies aren't necessary nowadays and probably do more harm than good. We'd like to hear what DX-chasers in northern parts of Scotland feel about this topic, though. Equally, what about higher bands? Are calling frequencies needed – or does the 'centre of activity' concept work better? Let's have some views.

Oddly enough, two other German readers wrote in to defend the ICAO phonetic alphabet, saying that they thought it was just fine as it stood. We also had a vitriolic letter from a UK member who said that he thought it was disgusting that people don't stick to the ICAO phonetics! Funny that a lot of people on 144MHz still copy the Bulletin editor's callsign suffix as ORX instead of FRX....and only the other day we heard an air traffic control radar unit confusing "Foxtrot Four Five" with "Oscar Four Five". We've also heard various professionals mixing up Kilo and Zulu – and only last week we happened to hear some marine traffic on 3.5MHz in which "Oscar" was confused with "Sierra". It ain't just the Editor needing his ears syringed – there do seem to be times when non-standard phonetics are necessary.

SENIOR CITIZENS' LICENCE?

Sir – While I applaud the efforts of the RSGB to attract younger members and the possible introduction of some form of Novice Licence (that I hope will not include any age restrictions) the Society may be missing a large source of potential members.

Like all products in today's market the RSGB needs to offer the item to the widest volume of possible consumers. With the ever-increasing number of people taking early retirement and the possibility of much longer lives in reasonable health Amateur Radio offers an ideal hobby for the Senior Citizen. Many of these people have good engineering and other skills that could be put to good effect, but still may have memories of Amateur Radio as portrayed by the media in the '50's. In addition to selecting members to publicise Amateur Radio to the younger generation, perhaps others could work at the other end of the scale. After, say, a year or two of controlled effort it would be revealing to see the average age of new adherents to the hobby.

J D Harris, G3LWM

DATA SYMPOSIUM WAS EXCELLENT

Sir – It was with some trepidation that I, a beginner at modern data modes, checked into the recent RSGB Data symposium. What sort of people would I meet? Would I get any glimmerings of enlightenment from the presentations? What sort of accommodation was provided? Certainly it was cheap enough! Would there be lots of yuppie technocrats whose conversational jargon went over my head?

Technocrats there were, and very nice people they turned out to be, as were all my fellow attenders. I was made to feel very much at home and was given much advice and encouragement.

The presentations, mostly of half-hour duration, were crisply given, with much use of audio-visual aids. The rate of information flow was at times hectic, but we were assured that recordings were being made and would appear in print in due course. Topics covered varied from early history to the future vision and from teleprinter art to the difficulties arising from international legislation; not to mention descriptions of some commercial systems and outlines of foreign packet networks.

All this in the inspiring surroundings of Harrow School made one feel that the torch of life of Amateur Radio was indeed being carried forward.

Nor were creature comforts neglected. Accommodation was excellent for the price, both at Monksdene Hotel and the lunches in the school refectory. Yet so interesting was the programme that the good food (not to mention Harrow's own wine) had no soporific effect in the afternoon!

A very hearty "thank you" to the team which planned this event so well, and ran it so smoothly, and to the presenters for sharing their expertise so clearly.

Can I book my place for the next one now, please?!

E Arnold Matthews, G3FZW

PRESSURE ON SPACE

Sir – One frequently sees references to the pressure on space in RadCom, and yet I open the July issue and what do I see but yet another article by GW4FRX expounding the excessively complicated approach to building high-powered vhf amplifiers.

While not wishing to challenge the technical merits of his design, given the shortage of editorial space, the small proportion of people interested in building their own linear amplifiers, and the even smaller number who one would imagine to be interested in reproducing this design, how can you justify devoting so much space to what is clearly of specialist interest? Why not publish this material in the vhf newsletter, where it will reach a receptive audience? Where are the QRP transceiver designs, the speech processors, notch filters, rtty decoders and simple test equipment which would be of interest to all radio amateurs, particularly the young who the society purports to have an interest in recruiting to the hobby?

From reading RadCom these days one would be forgiven for thinking that amateur radio is primarily about working 144MHz ssb. For several months in the Bulletin section we have been subjected to diatribes on how we are supposed to operate on 144MHz.

Presumably this is intended to guide the newcomer to the hobby, but cannot the RSGB use these valuable editorial pages to encourage the practice of ragchewing, homebrew, rtty and other of the ultimately more satisfying facets of amateur radio? Have you ever tried describing a rubber stamp QSO to a non-amateur? It sounds completely ludicrous!

If all amateur radio is about collecting numbers, no wonder young people don't want to take up the hobby. Most of them have better things to do!

Julian V Moss, G4ILO

Patience, please! RadCom is heading for complete revision in content and presentation. Your new editor has been working 'in the wings' on recent issues, and when fully installed in RSGB HQ will begin the magazine's 'restoration'. Members will shortly be consulted, in a questionnaire, for their views on desired content, and the results will directly influence the new shape of RadCom. Don't let this stop you canvassing us now, however; succinct notes addressed to the Ed will be very welcome. The file's open already – Ed (almost!)

Filmset by First Page Ltd, Park House, 37-51 Greenhill Crescent, Watford Business Park, Watford, Herts. WD1 8QU.
Printed by Passmore International (Ambassador Press, St. Albans)

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