September 1986

RADio COMmunication

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Journal of the Radio Society of Great Britain

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Top Band — 70cms*, Multimode — all in one! Our latest arrival . . . the FT 767 GX!

State-of-the-art advances in transceiver design and latest computer aided technology have produced the newest addition to the YAESU family, the Incredible new FT 767 GX. The unit has plug-in VHF & UHF 10 watt modules for 2M, 6M and 70cms (*which come as optional extras) — so you can have all band coverage with one rig.

- **Front panel keypad frequency entry**
- **Automatic SWR & Watt meter (digital)**
- **10 multi-function memories**
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- **Twin VFO's**
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- **General Coverage Receiver**
- **Built-in Power Supply**
- **Built-in auto HF antenna tuner**
- **Four internal CPU's**
- **Plug-in modules for 2m, 6m and 70cms**
- **Improved built-in keyer**

THIS MONTH'S NEW PRODUCTS FROM YAESU

STOP PRESS!!

The 'MKII' FT 290
— destined for even greater success! 'New look' front panel, optional 25w p.a. for mobile use and lots, lots more! Super new additions to an ever popular YAESU rig.

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YAESU have done it again!
● CMOS microprocessor controlled ● 0.5/5w output ● 20 keys/40 channels ● Mini CAT ● Liquid crystal meter

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CONTENTS

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

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

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

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remember the TR9000 two metre multimode, that revolutionized mobile operation, the TR9130, that improved the unimprovable,

now, better than ever, the NEW TRIO two metre multimode, the **TR751E**.

There has been a TRIO two metre multi-mode mobile transceiver for the last six years. Beginning with the successful TR9000 and continuing with the TR9130, amateurs have always found the series to be reliable and above all easy to operate, especially whilst mobile. Advances in technology have enabled TRIO to further improve on the TR9130. Additional operating features have resulted in an even easier to use and smaller transceiver. However TRIO have not discarded the valuable experience gained over the last six years. The result is the TR751E, a new generation of multi-mode mobile transceiver.

The TR751E is the first multi-mode mobile transceiver that can be set to select the correct mode whilst scanning the band. By setting the rig to VFO and selecting AUTO mode before pressing SCAN button, the TR751E will move up or down the band changing both mode and step rate according to the band plan (5kHz/SSB, 12.5kHz/FM or 1kHz/SSB, 5kHz/FM depending on the selected frequency step).

The transceiver has two VFO's and 10 memory channels. Memory information is easily transferred to either VFO. Each memory holds information on frequency, mode and also the step rate to be set when transferring the memory information to VFO. Memory channel one is also the ALERT frequency, memories 7 and 8 relate to DCL and memory 9 programs the user defined limits of frequency scan.

The TR751E can be set to scan between user programmed limits or around them depending on the frequency set when the scan is started. When AUTO mode is set the transceiver will select the correct mode as it scans. In addition to scanning each memory, the TR751E can be set to scan those memories programmed with the same mode. Pause on an occupied channel is time operated but can be changed to carrier hold by an internal modification.

Operating on 13.8 volts DC, power output from the transceiver is 25 watts (high) and approximately 5 watts (low). The low power setting applies to all modes. When compared with the TR9130, the TR751E is smaller and lighter, TR751E (TR9130) 180mm (175mm) wide, 60mm (68mm) high, 213mm (253mm) deep, 2.1Kgs (2.4 Kgs).

The TR751E is perfect for base station use. When operating on SSB, signals can easily be found using the frequency step set to 5kHz, fine tuning quickly achieved by switching to the 50Hz rate. Operation is also ideal on FM, the rig stepping in either 12.5 or 5 kHz steps. Full repeater facilities are also available including reverse repeater. Receiver performance is excellent, our first sample amazed us, FM, 0.14μV for 12dB SINAD and SSB, 0.09μV for 10dB S+N/N.

As an option, the TR751E can be fitted with DCL. Compatible with the DCS system, DCL (Digital Channel Link) enables your rig to automatically QSY to an open channel. The DCL system searches for an open channel (checks the next eleven 25kHz spaced frequencies above the one stored in memory 7), remembers it, returns to the original frequency and transmits control information to the other DCL equipped station that switches BOTH rigs to the clear channel.

For the blind operator the TRIO TR751E is perfect. As each mode is selected a tone gives the appropriate morse letter (F for FM, U for USB, etc) and when fitted with the optional VSI board, a digitally encoded girl's voice will announce on request the operating frequency.

In addition, the TR751E has an illuminated analogue S/RF meter, all mode squelch, MHz select keys, a noise blanker, semi break-in CW with side tone, RIT, memory channel up/down keys and a frequency lock. TRIO's attention to detail can be seen in the design of the included mobile mount, a clamp system with rubber pads protecting the rig as it is slid in and out and for security, the clamp can be easily locked in the closed position.

Better than the TR9130, there is so much more to say about the TR751E, so why not ring us and let's talk about it.

TR751E ..... £525.00 inc VAT carr £7.00

MU1 DCL unit .... £26.78 inc VAT carr £1.00

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE
Telephone 0629 2817, 2430, 4057, 4995.

send £1 for complete mail order catalogue.

station accessories

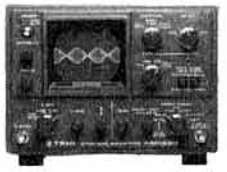
TL922 HF amateur band linear amplifier

The TL922 is a class AB2 grounded grid linear amplifier using two high performance EIMAC 3-500Z tubes. It covers 160 to 10 metres for SSB, CW and RTTY modes of operation. Engineering perfection, those who have seen a TL922 will know what I mean. It is one of the few items of amateur radio equipment which is truly hand built by a specialist engineer.

TL922 inc tubes . . . **£1250.00** inc VAT, carriage £7.00.

SM220 station monitor

Based on a wide frequency range oscilloscope, the SM220 station monitor features in combination with a built-in two-tone generator, a wide variety of waveform observing capabilities. The SM220 aids efficient station operation as it monitors transmitted waveforms and it also serves as a sensitive wide frequency range oscilloscope for various adjustments and experiments. When fitted with the optional BS8 panoramic display and connected to one of the following transceivers (TS940, TS830, TS180, TS820 series) signal conditions in the vicinity of the receive frequency can be seen over a 40 or 200KHz range.



SM220 . . . **£262.75** inc VAT, carriage £7.00
BS8 . . . **£66.11** inc VAT, carriage £1.50

amateur band transceivers

TS830S HF amateur bands transceiver

Needing no desciption, the TRIO TS830S, which uses a pair of 6146B valves in the PA, is well known on the amateur bands (160 to 10 metres) for its superb signal quality. Modes of operation are USB, LSB and CW. Having variable bandwidth tuning, If notch, IF shift and provision for various filters, its receive performance is excellent too.

TS830S . . . £898.00 inc vat, carriage £7.00

TS530SP HF amateur bands transceiver

An HF amateur bands (160 to 10 metres) valve transceiver without frills but providing today's amateur with all the necessary facilities for reliable worldwide communication. Modes of operation are USB, LSB and CW.

TS530SP . . . £779.79 inc vat, carriage £7.00

send for the **TRIO** general catalogue

All advertised prices subject to exchange rate variation

amateur band plus general coverage transceivers

TS940S HF transceiver with general coverage receiver.

Top of the range, the TS940S has every operating feature that the discerning HF operator needs. Amateur bands from 160 to 10 metres plus a general coverage receiver tuning from 150 kHz to 30 MHz. Modes of operation are USB, LSB, CS, AM, FSK and FM. Forty memory channels, each effectively a separate VFO and easy keyboard frequency entry make operation and ownership of the TRIO TS940S a pleasure.

TS940S . . . £1795.00 inc vat, carriage £7.00.

TS930S HF transceiver with general coverage receiver

Much has been said and written about the ST930S and it now has a place high in the affection of radio amateurs. Modes of aperation are USB, LSB, CW, AM and FSK. Providing full coverage of the amateur bands from 160 to 10 metres and including a general coverage receiver tuning from 150 kHz to 30 MHz, the TRIO TS930S is the ideal rig for today's crowded bands.

TS930S . . . £1395.00 inc vat, carriage £7.00

TS440S HF transceiver with general coverage receiver

A step forward in compact HF equipment, the TS440S covers the amateur bands from 160 to 10 metres and is also a general coverage receiver tuning from 100 kHz to 30 MHz. It has keyboard frequency entry, full and semi break-in on CW, one hundred memories and provision for fitting an internal ATU. Modes of operation are USB, LSB, AM, FM and AFSK.

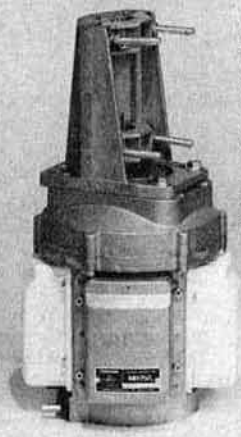
TS440S . . . £950.00 inc vat, carriage £7.00

TS430S HF transceiver with general coverage receiver

A compact HF transceiver suitable for mobile or portable operation, yet having all the facilities necessary for effective radio communication. The TS430S covers the amateur bands from 160 to 10 metres and is a general coverage receiver tuning from 100 kHz to 30 MHz. Modes of operation are USB, LSB, CW, AM with FM optional.

TS430S . . . £750.00 inc vat, carriage £7.00

DAIWA
rotators . . . . .



The new range of rotators from DAIWA, the MR series, are designed so that additional motors can be added around a central core, each motor increasing the rotators turn and braking capacity. The MR series will accept up to four motors being initially supplied with one. As the number and size of aerials increases, additional motors can be added, and both turning capacity and braking effort increased.

MR750E	Multitorque rotator (round controller).....	**£214.13** inc VAT,
MR750PE	as above but with preset controller.....	**£241.44** inc VAT,
MR300E	Higher speed version with round controller..	**£214.13** inc VAT,
LMC	lower mast clamp.....	**£15.55** inc VAT,
MR750U	additional motor for MR750E/PE.....	**£71.74** inc VAT,
MR300U	additional motor for MR300E.....	**£71.74** inc VAT,

Carriage on rotators £7.00, components £3.00

CN410M. . .3.5 to 150 MHz, forward 15/150 W, reflected 5/50 W, SO239 connectors. . . **£53.28 inc vat.** carriage £1.50.

CN460M. . .140 to 450 MHz, forward 15/150 W, reflected 5/50 W, SO239 connectors. . . **£57.73 inc vat.** carriage £1.50.

NS448 with remote head. . .900 to 1300 MHz, forward 5/60 W, reflected 1.6/6.6 W, N type connections. . . **£75.00 inc vat.** carriage £2.50.

NS660P with switchable meter reading (average, normal PEP and hold PEP) and provision for optional remote head (U66V), 1.8 to 150 MHz, forward 15/150/1500 W, SO239 connectors. . . **£99.50 inc vat.** carriage £2.50.

U66V remote head. 140/525 MHz, max 300 W, N type connectors. . . **£48.00 inc vat.** carriage £1.50.

SC20 extension cable for U66V, approx 20 metres long . . . **£25.85 inc VAT,** carriage £1.50.

CN410M

NS660P

NS448

CN460M

HOKUSHIN aerials.

FOR BASE STATION USE

HF5	**80 to 10 metre vertical,** no radials required when ground mounted . . . **£75.01 inc vat,** carriage £7.00.
HF5R	**Radial kit** for use with HF5 when mounted on chimney or gable end . . . **£47.43 inc vat,** carriage £7.00.
GPV5	**Two metre base station colinear,** 6.5 dB gain, 3.1 metres high . . . **£47.36 inc vat,** carriage £7.00.
GPV23	as above but 3 section colinear, 7.8 dB gain, 4.45 metres high . . . **£46.80 inc vat,** carriage £7.00.
GPV7	**Seventy centimetre triple 5/8 base station colinear,** 6.8 dB gain . . . **£39.13 inc vat,** carriage £7.00.
GPV720	**Dual band (144/430 MHz) base station aerial . . .** **£39.23 inc vat,** carriage £7.00.

FOR MOBILE USE

2E	**Two metres 5/8 whip,** 3.4 dB gain, foldover base . . . **£12.50 inc vat,** carriage £2.00.
2NE	**Two metres 7/8 whip,** 4.5 dB gain, foldover base . . . **£18.92 inc vat,** carriage £2.00.
OSCAR430	**Seventy centimetre triple 5/8 whip,** 6.3 dB gain . . . **£23.81 inc vat,** carriage £2.00.
OSCAR720	**Dual band (144/430 MHz) whip** . . . **£20.93 inc vat,** carriage £2.00.
HS770	**144/430 MHz diplexer** for use with OSCAR720 . . . **£19.77 inc vat,** carriage £1.50.
GSS	**Gutter mount** (requires RG4M cable assembly) . . . **£5.55 inc vat,** carriage £1.25.
RG4M	**Cable assembly** for GSS base, complete with SO239 and PL259 plug . . . **£5.55 inc vat,** carriage £1.00.
12B	**Car wing mount** with SO239 top and bottom . . . **£5.11 inc vat,** carriage £1.00.
HSTMB	**Car boot mount** including cable and PL259 . . . **£13.35 inc vat,** carriage £1.50.
MA200S	**High quality mag mount** with cable and strong protective cover to prevent paintwork damage . . . **£22.90 inc vat,** carriage £2.00.

data communications equipment.

CD600. . .RTTY, CW, ASCII, TOR, AMTOR decoder, output for UHF television, monitor and printer, can also be used as morse tutor. . . **£188.19 inc vat,** carriage £7.00.

CD670. . .A higher specification RTTY, CW, ASCII, TOR, AMTOR decoder complete with liquid crystal dot matrix display, variable RTTY shift, normal/reverse mode switch, outputs for TV, monitor and printer and can also be used as morse tutor. . . **£286.73 inc vat,** carriage £7.00.

CD660. . .Similar to the CD670 but without the built-in display. . . **£231.79 inc vat,** carriage £7.00.

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send £1 for complete mail order catalogue.

NEW from TRIO, a 45 watt fm mobile.....

The TRIO TM2550E is a high power 2 metre FM mobile transceiver.

Power output from the TM2550E is 45 watts. Current drain is approximately 9.5 amps in the high power position (45 watts) and approximately 3 amps in the low power position (5 watts). Low power can be adjusted up to 40 watts. Power requirement of the transceiver is 13.8 volts DC.

Frequency selection is easy using the back-lit front panel keypad. The selected frequency is displayed on a backlit LCD together with additional operating information, eg priority channel, reverse repeater, simplex or repeater shift etc.

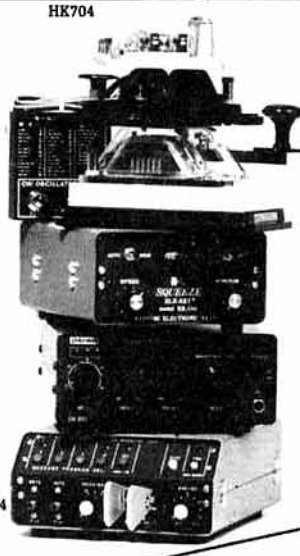
The TM2550E has 23 memory channels into which frequencies are easily written. The TM2550E automatically selects simplex or repeater mode in accordance with the band plan. This function is easily overridden by using the "OS" key.

Scanning operations are divided into keyboard, memory and priority scan. Frequency hold on an occupied channel can be either "time" or "carrier" operated.

As an option, the **TM2550E** can be fitted with the DCS system, DCL (Digital Channel Link) enables your rig to automatically QSY to an open channel. The DCL system searches for an open channel (checks the next eleven 25kHz spaced frequencies above a user designated one), remembers it, returns to the original frequency and transmits control information to the other DCL equipped station that switches BOTH rigs to the clear channel.

TM2550..... £399.00 inc vat, carriage £7.00.
MU1 DCL unit.....£26.78 inc vat, carriage £1.00.

HK704
HK708
HK702
TX3
EK150
DK210
MK1024



KEYS & keyers.

TX3. Morse practice oscillator. **£11.65** inc VAT, carr. £1.50
HK708. Straight key. **£18.09** inc VAT, carr. £2.50
HK702. Deluxe version on marble base. **£34.44** inc VAT, carr. £3.00
HK704. Squeeze paddle. **£17.10** inc VAT, carr. £1.50
EK150. Electronic keyer with built-in sidetone. Solid state or relay keying. **£114.85** inc VAT, carr. £3.00
MK1024. Electronic keyer with 1024 bit memory. **£198.00** inc VAT, carr. £3.00
DK210. DAIWA electronic keyer. Requires paddle. **£59.93** inc VAT, carr. £2.50

BST 1

BY2

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BY1 Black base, **£67.42. BY2** Chrome base, **£76.97**
BY3 Gold plated base, **£141.75.** VAT inc.
BENCHER Single Paddle.
BST1 BLack base, **£67.42. BST2** Chrome base, **£76.97.** VAT inc.
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telephone 0222 464154.

In London,
the shop manager is Andy, G4DHQ,
the address, 223/225 Field End Road, Eastcote, Middlesex,
telephone 01-429 3256.

In Bournemouth,
the shop manager is Colin, G3XAS,
the address, 27 Gillam Road, Northbourne, Bournemouth,
telephone 0202 577760.

Although not a shop, there is on the South Coast a source of good advice and equipment, John, G3JYG. His address is Abbotsley, 14 Grovelands Road, Hailsham, East Sussex. An evening or weekend call will put you in touch with him. His telephone number is 0323 848077.

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ICOM

IC-28E 2m. FM mini-mobile.

Rx Range 138-174 MHz.

This new 2 metre band transceiver is just 140mm (W) x 50mm (H) x 133mm (D) and will fit nearly anywhere in your vehicle or shack. Power output is 25 watts or 5 watts low power and is supplied complete with an internal loudspeaker.

The large front panel LCD readout is designed for wide angle viewing with an automatic dimmer circuit to control the back lighting of the display for day or night operation.

The front layout is very simple, all the controls are easy to select making mobile operation safe. The IC-28E contains 21 memory channels with duplex and memory skip functions. All memories and frequencies can be scanned by using the HM-15 microphone provided. Also available is the IC-28H with the same features but with a 45 watt output power.

Options include IC-PS45 13.8v 8A power supply, SP8 and SP10 external speakers, HS15 flexible mobile microphone and PTT switchbox.

IC-271 & 471 Multimode Base stations

ICOM can introduce you to a whole new world via the world-communication satellite OSCAR. Did you know that you can Tx to OSCAR on the 430-440 MHz IC-471 and Rx on the 2m IC-271.
By making simple modifications, you can track the VFO's of the Rx and Tx either normally or reverse. This is unique to these ICOM rigs and therefore very useful for OSCAR 10 communications. Digital A.F.C. can also be provided for UOSAT etc. This will give automatic tracking of the receiver with digital readout of the doppler shift. The easy modifications needed to give you this unique communications opportunity are published in the December '84 issue of OSCAR NEWS. Back issues of OSCAR NEWS can be obtained from AMSAT (UK), LONDON E12 5EQ.
This range includes the IC-271E-10W, IC-271E-25W, 271H-100W and the 70cm versions IC-471E-25W and 471H-75W r.f. output. The 271E has an optional switchable front-end pre-amp. The 271H can use the pre-amp AG-25, with the 471E and 471H using the AG35 mast-head pre-amp. Other options include internal switch-mode PSU's: the 271E and 471E use the PS25 and the 271H and 471H use the PS35.

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ICOM

The ICOM Control System

If you have a BBC Micro (Model B) or Commodore 64 or 128, the ICOM control system can control up to four (or more) ICOM radios in the range IC-751, 735, R71, R7000, 271, 471 and 1271 (and 745 with modification). The help menu shows the available functions.

	H = HELP	↔	Frequency Steps
F0	Frequency	↑ V	Up/Down (arrows)
F1	Select Mode	M	Memory Channel
F2	Freq/Memory Scan	, .	Memory Up/Down
F3	Mode Scan	/	VFO/Memory
F4	VFO → Memory	B	Bargraph Select
F5	Memory Write	@	Occupancy On/Off
F6	Memory Clear	:	Scan Stop Off/On
F7	Set 'SIG' Level	S	Change Set
F8	Memory File Read	DEL	Speech (If fitted)
F9	Memory File Write	Q	Quit

IC-735, The Compact HF Radio

The new ICOM IC-735 is ideal for mobile portable or base station operation. It has a general coverage receiver from 0.1MHz to 30MHz and transmits on all amateur bands from 160m to 10m. SSB, CW, AM and FM modes are included as standard. RTTY and Amtor are also possible. The IC-735 has a built-in receiver attenuator, pre-amp, noise blanker and RIT to enhance receiver performance. A 105dB dynamic range with pass band tuning and a sharp I.F. notch filter for superior reception. The twin VFO's and 12 memories can store mode and frequency. The HM12 scanning mic.is supplied. Scanning functions include programme scan, memory scan and frequency scan.
The IC-735 is one of the first H.F. transceivers to use a liquid crystal display which is easily visible under difficult conditions. Controls that require rare adjustment are placed behind the front panel hatch cover but are immediately accessible. Computer remote control is possible via the RS-232 jack. Output power can be adjusted from 10 to 100 watts with 100% duty cycle. A new line of accessories are available, including the AT150 electronic automatic antenna tuner and the PS55 AC power supply. The IC-735 is also compatible with most of ICOM's existing line of HF accessories. See the IC-735 at your authorised ICOM dealer or contact Thanet Electronics Limited.

ICOM

VHF/UHF FM Handportables

If you want a handheld with exceptional features, quality built to last and a wide variety of interchangeable accessories, take a look at the ICOM range of FM tranceivers. All ICOM handhelds come with an IC-BP3 nicad battery pack, flexible antenna, AC wall charger, belt clip, wrist strap and personal earpiece as standard.

IC-2E/4E, 2 metre and 70cm thumbwheel handportable. These popular handhelds from ICOM are still available. For those Amateurs who require a simple but effective FM transceiver the IC-2E and 4E take some beating. Frequency selection is by means of thumbwheel switches (with 5kHz up-switch) and duplex or simplex facility. Power output is 1.5 watts or 150 milliwatts (2.5 watts is possible with IC-BP5A battery pack).

IC-02E/04E 2 metre and 70cm keypad handportable. These direct-entry CPU controlled handhelds utilize a 16-button keypad allowing easy access to frequencies, memories and scanning. Ten memories store frequency and offset. Three scanning systems, priority, memory and programmable band scan, (the IC-02E now with an improved CPU retains duplex offset). These handhelds have an LCD readout indicating frequency, memory channel, signal strength, transmitter output and scanning functions. Power output is 3 watts or 0.5 watt in low power position for the IC-02E and 2.5 watts or 0.5 watt for the IC-04E. (5 watts is possible with the IC-BP7 battery pack or external 13.8V.DC.)

STOP PRESS. New handheld available. Just released is the **IC-12E** 23cm keypad handportable, this new transceiver has direct keypad entry for frequency, memories and scanning systems. Ten memories store operating frequency simplex or duplex. An internal power module provides 1 watt or 100 milliwatts of RF power. Five tuning speeds including 12.5kHz and 25kHz.

Also available for ICOM handhelds are a large range of optional extras including a variety of rechargeable nicad power packs, dry-cell battery pack, desk charger, headset and boom mic, speaker mic, leatherette cases and mobile mounting brackets.

For more information on these handportables and other ICOM Amateur equipment contact your local authorised ICOM dealer or Thanet Electronics Ltd.

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IC-3200E Dual-band

If you are a newly licensed or just undecided about which band to first operate, then the ICOM IC-3200E is just the answer. This is a dual-band (144-146/430-440MHz) F.M. transceiver ideally suited for the mobile operator. The IC-3200E has a built in duplexer and can operate on one antenna for both VHF and UHF, and with 25 watts of output power on both bands (the low power can be adjusted from 1 to 10 watts) you can never be far from a contact whether simplex or 2m/70cm repeater.
The IC-3200E employs a function key for low priority operations to simplify the front panel and a new LCD display which is easy to read in bright sunlight, 10 memory channels will show operating frequencies simplex or duplex, and four scanning systems memory, band, program and priority scan. Try this exciting set from ICOM the IC-3200E, when only the best will do.
Options include IC-PS45 AC power supply, HS15 mobile boom mic, SP10 external speaker, UT23 speech synthesizer and AH32 dual-band mobile antenna.

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This is strictly a helpline for obtaining information about or ordering ICOM equipment. We regret this service cannot be used by dealers or for repair enquiries and parts orders. Thank you.

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

Listed here are just some of the authorised dealers who can demonstrate ICOM equipment all year round. This list covers most areas of the U.K. but if you have difficulty finding a dealer near you, contact Thanet Electronics and we will be able to help you.

Alyntronics, Newcastle, 091-761002.
Amateur Radio Exchange, London (Ealing), 01-992 5765.
Amcomm, London (S. Harrow), 01-422 9585.
A.R.E. Comms, Earlestown, Merseyside, 09252-29881.
Arrow Electronics Ltd., Chelmsford, Essex, 0245-381673/26.
Beamrite, Cardiff, 0222-486884.
Booth Holdings (Bath) Ltd., Bristol, 02217-2402.
Bredhurst Electronics Ltd., W. Sussex, 0444-400786.
D.P. Hobbs, Norwich, 0603-615786.
Dressler (UK) Ltd., London (Leyton), 01-558 0854.
D.W. Electronics, Widnes, Cheshire, 051-420 2559.
Eastern Communications, Norwich, 0603 667189.
Hobbytronics, Knutsford, Cheshire, 0565-4040. Until 10pm daily.
Poole Logic, Poole, Dorset, 0202 683093.
Photo Acoustics Ltd., Buckinghamshire, 0908-610625.
Radcomm Electronics, Co. Cork, Ireland, 01035321-632725.
Radio Shack Ltd., London NW6, 01-624 7174.
R.A.S. Nottingham, 0602-280267.
Ray Withers Comms, Warley, West Midlands, 021-421 8201.
Scotcomms, Edinburgh, 031-657 2430.
South Midlands Comms. & branches, 0703 867333.
Tyrone Amateur Electronics, Co. Tyrone, N. Ireland, 0662-42043.
Reg Ward & Co. Ltd., S.W. England, 0297-34918.
Waters & Stanton Electronics, Hockley, Essex, 0702-206835.

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ICOM IC 490E all mode 70cms 10w/1w	529.00
ICOM 3200E 2m/70cm 25w each band	479.00
ICOM IC 47E 25w FM very small 9 memories	445.00

NEW

HF EQUIPMENT

YAESU FT 767 1.8Mhz-430Mhz. All mode gen cov rcvr	POA
YAESU FT ONE gen cov tcvr	1999.00
YAESU FT 980 gen cov tcvr inc AM/FM	1750.00
YAESU FT 757GX gen cov tcvr inc AM/FM/Keyer	839.00
ICOM IC 751A gen cov tcvr inc AM/FM/Keyer	1299.00
ICOM IC 745 gen cov tcvr	925.00
ICOM 735 gen cov tcvr inc AM/FM	829.00

All accessories for above held in stock. leaflets available.

HF LINEAR AMPLIFIERS

YAESU FL 2100Z 160m to 10m	862.00
YAESU FL 7000 solid state integral PSU and ATU	POA
TOKYO HL 1K 1kw amplifier	829.00
TOKYO HL 1KGX new 1K linear	POA
TOKYO HL 2K new 2K linear	POA
TOKYO HL3K 3Kw new linear	1625.00
ICOM IC 2KL/LPS	POA

HANDHELD TRANSCEIVERS

FT 727 VHF UHF Hand held	185.00
YAESU FT 203R with FBA 5 battery case	215.00
YAESU FT 203R with FNB 3 nicad 2.7w	219.00
YAESU FT 203R with FNB 4 nicad 3.7w out	229.00
YAESU FT 203R with FNB 4 nicad 3.7w 1.8w	255.00
YAESU FT 209R with FBA 5 battery case	260.00
YAESU FT 209R with FNB 3 nicad 2.7w	235.00
YAESU FT 209R with FNB 4 nicad 3.7w	265.00
YAESU FT 209RH with FBA 5 battery case	269.00
YAESU FT 209RH with FNB 3 nicad 3.7w	189.00
YAESU FT 209TH with FNB 4 nicad 5w	289.00
YAESU FT 209RH with FNB 4 nicad 1.5w 2m	275.00
ICOM IC 2E synthesised 1.5w 2m	289.00
ICOM IC 02E keypad entry lcd display	
ICOM IC 4E synthesised 1.5w 70cm	
ICOM IC 04E keypad entry lcd display 70cms	

FT 703R and FT 709R available same output spec as FT 203/209.

RECEIVERS

YAESU FRG 8800 gen cov 150Khz-30Mhz large display, keyboard entry/free tuning	540.00
ICOM IC R71 100 Hz to 30Mhz passband tuning/notch filter, variable tuning rate	729.00
YAESU FRV 8800 converter module 118-179 for FRG 8800 range extension	90.00
AOR 2002 UHF/VHF 25Mhz-550Mhz and 800Mhz-1300Mhz	425.00
YAESU FRG 9600 UHF/VHF Scanning receiver all mode 100 mem. Now up to 950MHz	429.00
ICOM R7000 Scanning rcvr 25-2000Mhz 99 memories all mode	849.00
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FDK RX 40 141-180Mhz handheld rcvr	159.00
JIL SX 400 UHF/VHF recvr inc PSU	598.00

RTTY/CW

TONO 5000E CW RTTY ASCII and AMTOR c/w 5" high res monitor	POA

Range of 50Mhz equipment both YAESU and ICOM in stock.

VHF MOBILE TRANSCEIVERS

YAESU FT 290R mob/port 2m all mode c/w nicads, chgr, case	369.00
YAESU FT 290R as above with Mutek	399.00
YAESU FT 270R 25w FM	315.00
YAESU FT 270RH 45w FM with fan	359.00
YAESU FT 2700RH 2m/70cms 25w each band full duplex	449.00
ICOM IC 290D 25w all mode	469.00
ICOM IC 27E 25w FM 9 mem	359.00
ICOM IC 27H 45w FM 9 mem	399.00
FDK M750XX 2m all mode 20w	449.00
FDK M725X 2m FM 25w	279.00

VHF BASE STATIONS

YAESU FT 726R/2M all 726 options available	899.00
ICOM 271E multi mode 25w 32 mem	779.00
ICOM IC 271E/H multi mode 100w	979.00

UHF BASE STATIONS

YAESU FT 726 70cms multimode — all 726 options	899.00
ICOM 471 E 25w multimode 70cms	889.00
ICOM 471 H high power multimode (75w) — 70cms	1099.00
ICOM 1271 E multimode 1240-1300Mhz	1099.00

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HL 30U 70cms Gaasfet preamp 2w in 30w out	120.00
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HL120U 70cms Gaasfet preamp 12w in 100w out	399.00
HRA 2 2m mast preamp, Gaasfet	—
HRA 7 70cms mast preamp, Gaasfet	—

TOKYO

BNOS

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LPM 144-3-100 2m c/w preamp 3w for 100w out	197.50
LPM 144-25-160 2m c/w preamp 25w for 160w out	250.00
LPM 144-3-180 2m c/w preamp 3w for 180w out	290.00
LPM 144-10-180 2m c/w preamp 10w for 180w out	290.00
LP 144-3-50 2m c/w preamp 3w for 50w out	125.00
LP 144-10-50 2m c/w preamp 10w for 50w out	125.00
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MICROWAVE MODULES range also available, call for details or literature on above.

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AMCOMM 9000 coax, random wire, tuned feeders 100w	89.00
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ICOM AT 500 500w auto antenna coupler	475.00
YAESU FC 757GX auto antenna coupler	318.00
YAESU FRT 7700 receiver antenna tuner	49.85

HEIL ACCESSORIES

HEIL HC3 Mic element Yaesu/Trio	22.85
HEIL HC5 Mic element Icom SM5/6	25.40
HEIL HM5 Desk Mic (300Hx-3Khz) cardiod	59.00
HEIL MM5 handheld Mic with HC3	29.00
HEIL SS2 Speaker special comms spkr	59.00
HEIL EQ300 Mic Equaliser	65.00
HEIL BM10 lightweight headset/boom mic	65.00

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YAESU FP 757HD 20A	199.00
YAESU FP 757 GX 20A	169.00
YAESU FP 700 20A	175.00
BNOS 12/6amp	69.00
BNOS 12/12amp	115.00
BNOS 12/25amp	169.00
BNOS 12/40amp	340.00
BNOS professional range also available on request	POA
ICOM IC PS 35 switch mode	182.00
ICOM PS 15 20amp external	149.00
ICOM IC PS 55 20amp	185.00
ICOM IC2 KLPS to match IC2KL linear	349.00
ICOM IC PS 25 switch mode	106.00
SMC RS 12 4amp 5 amp peak	14.95
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HK 706 manual	19.35
HK 707 manual	18.25
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HK 803 manual solid brass	84.00
MK 701 single lever paddle	28.50
MK 702 single lever paddle	29.95
MK 703 twin paddle squeeze heavy base	32.50
MK 705 twin paddle squeeze marble base	28.50
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SP425
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Twin meters
£109.95

NEW SP825 1·8-1300MHz

£163.00

The new SP825 covers all amateur bands from 1·8 to 1300MHz. Made by the famous Welz company its the complete station VSWR/POWER meter. It measures power between 1 and 150 watts. A few in stock now.

WELZ-DIAMOND D130 DISCONE 25-1300MHz

The new D130 from Diamond offers complete coverage from 25-1300MHz. No other antenna can offer this value from money! And an added bonus is that it can be used for transmit on all amateur bands between 50 and 1300MHz. (You cannot use 50MHz vertical polarization in the UK). Constructed of stainless steel and alloy, it comes complete with mast clamps and 50ft of coaxial cable

NEW

FABULOUS SONY AIR-7

108-136MHz; 144-174MHz; 76-108MHz; +LW/MW/SW

The new Sony Air-7 is a superb new monitor with a performance and presentation that outperforms the competition. The PLL circuitry, LCD readout and 40 memories (10 on each band) make a most versatile package. Such features as priority channel, channel lockout, and delay are all included and the sensitivity puts most of the competition to shame! It also includes the broadcast bands both VHF and LW/MW and covers such things as NDB beacons as well as part of the marine band to 2194MHz. We are impressed and so will you be when you try it!

SONY 2001D

150kHz-30MHz
76-108MHz
108-136MHz
32 memories
AM/SSB/FM BROADCAST

New from Sony is the 2001D general coverage portable receiver. It gives superb performance on the short wave bands using PLL circuitry and has separate filters for SSB and AM. A novel system of synchronous exalted-carrier provides a dramatic reduction in interference when receiving AM broadcast stations. Features include LCD readout, clock, scanning, timer, RF gain control, comprehensive memories and a host of features that make it an incredible performer. It equals or betters many base station receivers we sell and the SSB performance with switchable upper and lower sideband is a joy to use.

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NEW

THE COMPLETE GUIDE TO VHF/UHF FREQUENCIES 25 TO 2000 MHz

Replacing our previous scanners guide, this new book sets out to cover the complete spectrum between 25 and 2000MHz. It thus keeps pace with the extended coverage of some of the latest receivers. And whats more there are no gaps! If you have any interest at all in this part of the radio spectrum then you cannot affort to be without a copy of this new publication. Beautifully set out in large easy to read pages it starts off with a few hints and tips on receivers and then it goes straight into the heart of the matter; what services operate where! Full details of duplex frequencies are given and there are very comprehensive details of military and civil air bands plus a very comprehensive section giving you all the details you will ever need for marine band monitoring including full listings of all the shore stations. Other entries include sections on police allocations, ambulances, fire etc, and such fascinating entries as NASA and Russian Space frequencies, weather satellites, navigation beacons and much more. So don't waste money on those expensive American publications listing frequencies not applicable to the UK. Send today for this brand new book which will answer all the questions you have ever wanted to know about the mysteries of the VHF/UHF spectrum.

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WORLD RADIO TELETYPE HF FREQUENCY LIST £3.95 + 40p p&p

A new publication produced by popular request. If you are interested in RTTY or thinking of taking it up, this book will be a very handy frequency guide. It lists full details of the World's RTTY services including meteorological, press and marine. They are all entered in country order plus a separate listing under transmission times (GMT). Simplex and duplex frequencies are listed with details of languages and also a handy reference section on band plans and prefixes etc. Altogether a handy guide to have around the shack or just for interesting reading.

WELZ	
SP825 HF; 6m; 2m; 70cm; 23cm	£163.00
SP10X Budget HF/VHF	£36.50
SP220 PEP HF/VHF	£59.95
SP225 Dual meter	£109.95
SP420 PEP VHF/UHF	£71.00
SP425 Dual meter	£109.95
AC38 ATU 10-80m	£99.00
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RS655 6 amp PSU	£87.95
RS1150 11 amp PSU	£136.00
RS3050 25 amp PSU	£195.00

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CP5 5 band vert.	£169.00
EL40 40m whip	£49.50
EL80 80m whip	£56.00
M285 5/8th 2m	£12.50
M287 7/8th 2m	£22.95
GLS Gutter mount	£13.25
D130 Discone 25-1300MHz	£69.95
RH200B 3db 2m BNC	£28.50
EL770 Dual band	£26.50

FDK	
M750XX 2m all-mode	£449.00
M725X 2m FM mobile	£279.00
ATC720 Airband rx	£189.00
RX40 140-180MHz	£159.00

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AM503 Base mic.	£59.00
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FX-1 Goose neck mobile	£49.00

MISC.	
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BL40X 1:1 HF Balun	£16.75
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Revcone Discone (RX)	£29.00
CDE AR40 Rotator	£115.00
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KC038 Mast clamps	£13.80
KS065 Bearing	£26.45
KR500 Elevator	£139.95
AR250 Rotator VHF	£69.00

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TS940 HF tcvr.	£1795.00
AT940 Int ATU	£218.00
TS HF 430S tcvr.	£750.00
PS403 PSU for above	£139.00
AT250 Auto ATU	£314.00
AT230 HF ATU	£170.65
TS830S HF 240v tcvr.	£898.00
TS530S HF 240v tcvr.	£779.00
TL922 linear	£1265.00
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TS780 2m/70cm tcvr.	£1061.00
TR9130 2m all-mode	£544.00
TH21E 2m h'held	£189.30
TH41E 70cm h'held	£220.95
TR2600 2m h'held	£299.00
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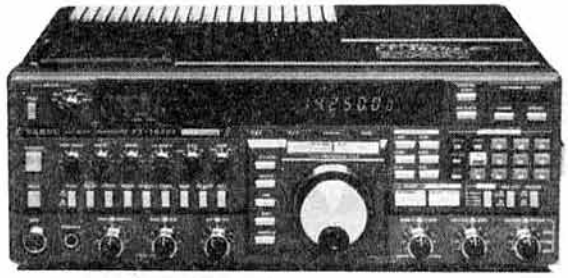
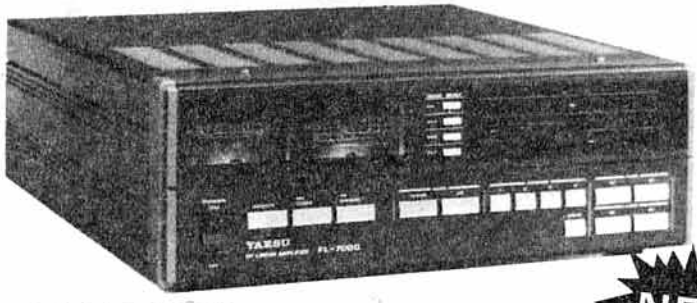


NEW **FT767GX**

Contact Head Office for further details



FL7000

All Mode, All Band Solid State 500W PEP QSK Linear Amplifier featuring:- Fully Automatic ATU (with manual override), Twin Large Meters monitoring amplifier parameters, full Overload Protection using seven separate monitoring circuits.

NEW **FL7000**

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Chesterfield (0246) 453340
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Buckley (0244) 549563
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10-4 Sat

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Talke Pits, Stoke.
Kidsgrove (07816) 72644
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Grimsby (0472) 59388
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- 100 Memory Channels

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- 200 Memory Channels
- VHF/UHF Converter (opt.)

NRD 525

- General Coverage HF Receiver
- Twelve Memory Channels
- 118-174 MHz with opt. VHF conv.

FRG8800 £575 FRV8800 £90

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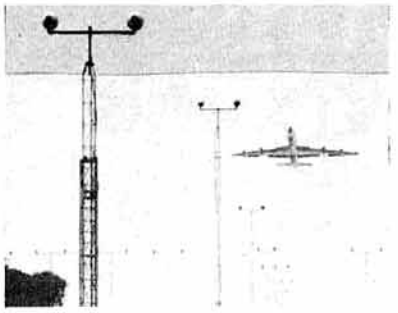

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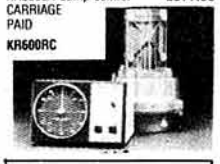

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FS500V	50-150MHz	20/200W	Pep	£89.50
FS300V	50-150MHz	20/200W		£53.50
FS601M	1.8-30MHz	20/200W	Pep	£62.15
FS603M	430-440MHz	5/20W	Pep	£62.15
FS210	1.8-150MHz	20/200W	Auto/SWR	£65.50
FS301M	2-30MHz	20/200W		£42.25
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FS711H	2-30MHz	20/200W	Head/Display	£43.65
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FS711U	430-440MHz	5/20W	Head/Display	£43.65
FS5E	3.5-150MHz	20/200/1000W	HF	£42.75
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FS20DL	3-150MHz	1/10W		£43.65
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T3-170L

FS500

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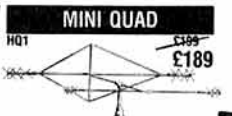

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THE NATIONAL SOCIETY REPRESENTING ALL UK RADIO AMATEURS

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

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

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Secretary and general manager: D A Evans, G3OUF

EDITORIAL

MORE THAN MEETS THE EYE . . .

Hands up all those RSGB members who believe that all their Society provides is a monthly magazine and a QSL bureau . . . yes, we thought as much. To judge from some of the mail we receive here at headquarters, there are a lot of people out there who believe exactly that.

Perhaps we could be permitted to correct this common myth! In addition to *Radio Communication* and the QSL Bureau, the Society provides no less than 31 other main services to its members. The most fundamental one, of course, is the formidable amount of effort which goes into improving and extending the facilities available to the UK radio amateur by means of extensions to the licence. For example, during the past 12 months the Society has successfully negotiated for the following:

Third-party greetings message facilities between the UK and the USA, Canada, the Falkland Islands and Australia, which was a major breakthrough for users of special event call signs (October 1985);

A new amateur band at 50MHz, made possible by a decade of close co-operation with the UK licensing authority on this issue (February 1986);

More special-event callsign prefixes (February 1986);

Permanent on-air morse practice facilities for Class B licensees, granted after a special one-year experiment (May 1986);

A pass in the morse test to be valid for life (June 1986);

and there were some others as well.

Liaison with the DTI takes place on a daily basis, and some of it involves the resolution of the problems of individual members. Other elements of it look to the future; packet radio —where a major advance is expected soon—and the long-overdue revision of the UK licence are two major items on the list. Other matters we are currently discussing include emc/rfi matters, the future of Syledis, the re-issue of callsigns and callsign series, emergency communications, repeater and beacon licensing, and CEPT and its functions relating to reciprocal licences.

It must be evident—or if it isn't we're not doing our job properly—that an enormous amount of both staff and volunteer effort goes into the relationship between the RSGB and the DTI. It has to; it is the UK licensing authority as far as radio is concerned and the RSGB is the representative national society. There must be a continual dialogue between the two bodies, on many levels and in respect of many topics, and we are proud of our track record.

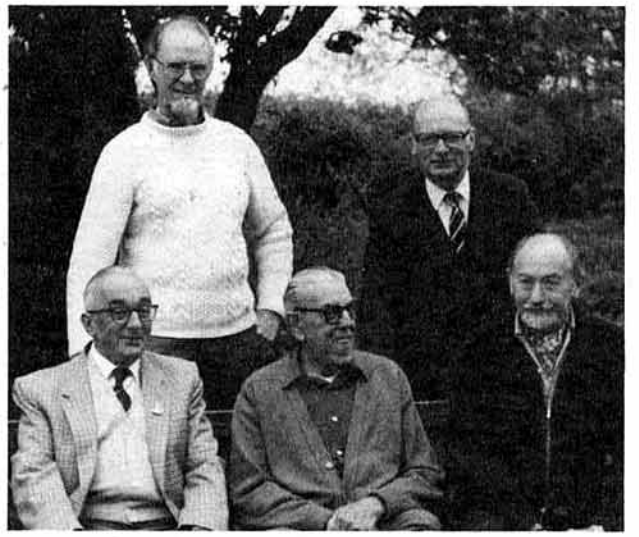
If you think about it, that's almost the main reason why **every** licensed radio amateur in the UK should be an RSGB member. It might be worth pointing that out to your friend at the radio club who can't see any reason why he should join the Society.

David Evans, G3OUF

Amateur Radio News

"OPERATION EAST STOUR"

G6CJ's 60 years



At G6CJ's diamond jubilee: 240 years of amateur radio—(l to r) G3LP, ZL3GQ, G6CJ, G3BEY and G5RV. Photo: G3BEX/YL.

On 31 May 1986, some 50 amateur radio friends gathered at the village hall of East Stour, Dorset, to celebrate the 60th anniversary of "Dud" Charman obtaining his famous callsign G6CJ. A splendid repast, organized by his sister "Sim" Attwater, and her colleagues of the local Women's Institute, rounded off an afternoon which will long be cherished by those who were privileged to attend.

G6CJ's association with the late Kenneth Alford, G2DX; Gerry Marcuse, G2NM; and many other radio pioneers was illustrated by a well-arranged exhibition of documents, apparatus, photographs and cards. In particular there was a most interesting collection of memorabilia connected with AC4YN, the first amateur station to operate in Tibet. What could have been more apposite than the fact that one of the honoured guests was none other than Sir Evan Nepean, G5YN, the original operator of that rare dx station which everyone wanted to work.

Among the old-timers present was Frank Hicks-Arnold, G6MB, the original GB2RS news reader, now well into his sprightly 'eighties; G6GR, G6NZ, G6JP and G2MI—all past-Presidents of the RSGB; G3LP, present Council member; G2QY, G6NA, G3VW, ZL3GQ and many others.

The vintage equipment on show included components used by G2DX and G2NM, and the first dull emitter transmitting valve to work Australia. The famous "Aerial Circus" was well in evidence, and it was appropriate that also present was that other antenna wizard, G5RV, with his wife. Dud gave his visitors a very interesting short talk about his early days as a professional radio engineer.

Readers will be familiar with the recent devoted work put in by G6CJ in the revival of RAOTA and it was very pleasing to see so many old-timers present. During the tea interval, a short meeting of the RAOTA Committee was held.

A vhf station, G6CJ/A, was provided by the Blackmore Vale ARC to talk-in the visitors. It was certainly rather odd to hear the callsign of such a sturdy upholder of the cw tradition actually on phone!

A great deal of care and thought was put into the presentation of the exhibits and to the entertainment of their visitors. Both "Dud" and his sister are to be congratulated in having staged a very pleasant and memorable event.

G2MI

WELSH AMATEUR RADIO CONVENTION

Oakdale Community College, Blackwood, Gwent

10am–5pm, 5 October 1986

*** Trade exhibits * Convention station * RSGB stand * Bring-and-buy stand**
Prize draw—£300 in cash prizes
Refreshments

Official opening at 11am by Mr W McClintock, G3VPK, President of the RSGB

LECTURE PROGRAMME
HF and vhf features
Video presentation on shuttle mission 51F (W0ORE/Challenger)

Admission: £1.50, at the door

Talk-in from 9am on S22 **Take exit 27 off M4**

Full information from B Davies, GW3KYA, 16 Vancouver Drive, Penmain, Blackwood, Gwent NP2 0UQ, tel 0495 225825.

Region 10 representative

No nominations having been received from Region 10 members to fill the vacancy for a representative of that region, Council appointed Mr D A Phillips, GW4KQ, as Region 10 representative at its meeting on 26 June.

South Dorset RS silver jubilee

A celebration dinner will be held at the Streamside Hotel, 29 Preston Road, Weymouth, on 10 October 1986 to mark the South Dorset Radio Society's twenty-fifth anniversary. Tickets approximately £8.50. Details G1ANK, tel 0305 67596.

CQ6ER QSLs and awards

C Pollard, G3PDX/N6UH, has received a batch of QSL cards and awards from Esteban, CQ6ER, for distribution. If the following addressees wish to receive them, would they please send a large (9 by 11in) sase for awards or normal sase for QSL cards. QSL cards for G3LQC, G4SCD, G3CPN, G3AZY, G3JHF, G3LNS, G4OUJ, G3MXJ and G3ZGN. Awards for: G3NKS, G3BPX, G6TC, G3JHF, G3AZY, G3CPN, G4SCD and G3LQC.

If not claimed within one month they will be destroyed.

Eighth Army Reunion

The Eighth Army El Alamein Reunion will take place at the Empress Ballroom, Winter Gardens, Blackpool, on 24–26 October. G2DHV (GB8ARS) and G3JFE, who met in Naples in 1945, will be attending and will be equipped with handhelds for contacts with other RSARS members. Details G2DHV.

ARMA (UK)

Lee Adams, G4RKV, is still interested in hearing from any amateur radio operator or short wave listener who is currently involved in any aspect in the martial arts. Please contact Lee, G4RKV, or Graham, G3NOH, both QTHR and mark the envelope ARMA (UK).

College quest for 100-year-old former student

The London Electronics College, which celebrates its 80th anniversary this year, intends to mark the event by setting out on an international quest to find its oldest former student. The College, formerly known as the British School of Telegraphy, was founded in 1906, trained early marine radio officers using the original Marconi wireless telegraph, some 300 of its students being at sea in 1912. Harold Bride, wireless operator on the *SS Titanic* at the time of the tragic iceberg disaster; and Thomas Cottam on the *SS Carpathia*, the first ship to acknowledge radio distress messages which saved so many lives, were both trained at the college.

Nowadays, the college specializes in professional electronics technician education, having ceased radio officer training in 1980. The nautical connection was maintained to the end, as the college was among the sponsors of the Trans-globe Polar Expedition led by Sir Ranulph T-W Fiennes under the patronage of HRH The Prince of Wales, during 1979–82. Lady Virginia Fiennes, the expedition's radio operator, trained

at the college during one of the last marine courses.

Since its foundation the college reckons it must have trained some 5,000 students, many of whom will still be scattered over remote parts of the world, both on land and at sea. In honour of the college's 80th birthday, a general signal "QSO" is being sent out to all former students asking them to get in touch again. It's just possible that some of those original 1906 MARCONI wireless telegraph operators will respond to the call. Present-day staff and students would be delighted to welcome such visitors on a tour of inspection—just to see how much electronics has changed in the era of microcomputers and new technology.

Contact Mr M D Spalding, Senior Lecturer, London Electronics College, 20 Penywern Road, London SW5 9SU, tel 01-373 8721.

New morse journal

Since 1983, two Dutch radio amateurs, Rinus Hellemons, PA0BFN, and Dick Kraayveld, PA3ALM, have published a quarterly journal, *Morsum Magnificat*, for morse enthusiasts. Contributions have been written by amateur and professional morse telegraphers, young and old, from around the world, but as the journal appears in Dutch, its circulation has been very limited.

In 1985, an experimental, one-off, English version was published to "test the ground" for a wider audience. Now, Tony Smith, G4FAI, has joined the editorial team as English Language editor, and a new English version of *Morsum Magnificat* will shortly be available by post, worldwide. Its aim is to publish material about morse, past and present, not normally found to any extent in popular magazines today, and will include history, illustrations, anecdotes and adventures in both wire and wireless telegraphy.

At last, cw addicts can have their fill of morse matters, can make their own contributions, or have their say, sure of the attention of a specialized and receptive readership.

UK subscription for 1 year (four issues) is £6, postpaid, from G4FAI, 1 Tash Place, London N11 1PA, cheques payable to "Morsum Magnificat". For further information, including overseas rates, send an sae, or tel 01-368 4588.

SCOTAM '86

SCOTTISH AMATEUR RADIO CONVENTION

(Organized by the Glenrothes & District ARC)

Lomond Centre, Glenrothes, Fife

11am-5pm, Saturday 13 September 1986

(Early entry for disabled visitors)

LECTURES WILL INCLUDE

"50MHz Achievements and Expectations", by Ray Cracknell, G2AHU
"ATUs" by Peter Chadwick, G3RZP
"HF Contesting/DXing", organized by GM3YOR

Morse testing centre

All Usual facilities: bar, snacks, restaurant

Talk-in on S22 144MHz

Maps and full details from GM3YBQ, tel 0592 265789

RAE Courses 1986-7

(See also *Rad Com* July 1986, p55)

Barnet. Hendon College of Further Education, The Burroughs, Hendon NW4 4DE. Enrolment 2-8pm, 10 September at the college. Tel 01-202 3811 for details.

Boreham Wood. De Haviland College, Elstree Way, Borehamwood, Herts. Tuesdays 7-9pm, commencing 16 September. Enrolment 2-8pm, 8 & 9 September. Details from the college.

Brighton. Brighton College of Technology, Pelham Street, Brighton BN1 4FA, tel 0273 685971. Enrolment 4-8pm, 8 & 9 September. Details R A Bravery, G3SKI, senior lecturer at the college.

Brixton. Brixton College, Ferndale Road, London SW4, tel 01-737 2323. Wednesdays 6.30-9pm, commencing 24 September. Enrolment 15-18 September. Details from the college.

Crawley. Ifield Community College, Lady Margaret Road, Ifield, Crawley, W. Sussex. Mondays 7-9pm, commencing 15 September. Enrolment 7-9pm, 8 & 10 September. Details from course tutor, G3LNM, tel Crawley 24007.

Carnforth. Carnforth Comprehensive School, Lidgett Lane, Canforth, Leeds. Commences 8 September, enrol on same night. Details G3TEE, tel Leeds 554190.

Eastbourne. Hailsham Leisure Centre, Vicarage Lane, Hailsham, E Sussex. Commences 7.30pm 16 September. Run by Southdown ARS; details from G4XNL, tel 0323 638653.

Gosforth. Gosforth Adult Education Centre, Regent Centre, Gosforth, Northumberland. Tuesdays, commencing in September. Details from the centre or G8BGU.

Halifax. Holmfield High School, Holdsworth Road, Holmfield, Halifax. Thursdays, 7pm, commencing 25 September. Details G3FDC, tel Halifax 244642.

Heckmondwike. Heckmondwike Grammar School, Hecknomdwike. See local press for details or contact G3TEE, tel Leeds 554190.

Islington. Islington Institute, Rising Hill Street, London WC2. Mondays, 6.30-9.30pm, commencing 22 September. Enrolment from 6pm 15 September. For details tel 01-485 7065.

Kingston-upon-Thames. Kingston College of FE, Kingston Hall Road, Kingston Upon Thames. Mondays, 7-9pm, commencing September. Enrolment 8 & 9 September. Details Paul Farmer, tel 01-546 2151.

Melton Mowbray. Melton Mowbray College of FE, Asfordby Road, Melton Mowbray, tel 67431. Enrolment 1 & 2 September. Details from college or Ken Melton, tel 090581 3849.

Orpington. Ramsden Girls School, Tintagel Road, Orpington, Kent. Thursdays, 7.30-9.30pm, commencing 18 September. Enrolment by post to Bromley Adult Education Service, Aylesbury Road, Bromley. Details G8TKV, tel 0689 31123.

Romford. Barking College of Technology, Dagenham Road, Romford, Essex. Thursdays 6.30-9pm, commencing 18 September. Enrolment 6-8pm, 8, 10 & 11 September. Details Science & Mathematics Dept, tel 0708 66841.

Stockport. Avondale Evening Centre, Edgeley, Stockport. Tuesdays. Enrolment week commencing 15 September. Details from Avondale EC, or G4WAU, tel 061-427 4730 or c/o Amateur Radio Market, 8 Market St, New Mills, Stockport, tel 0663 47260 Saturdays only.

Watford. Cassis College, Watford, Herts. Wednesdays, commencing 24 September. Details G0AQT, tel 0923 38613 evngs.

Welwyn Garden City. De Haviland College, Applecroft Centre, Applecroft Road, Welwyn Garden City, Herts, tel 26318/31344. Thursdays 7-9pm, commencing 18 September. Enrolment 2-8pm, 8 & 9 September at the college. Details from the college.

Wetherby. Further Education Centre, Wetherby High School, Wetherby. Thursdays, commencing 11 September, enrol same night. Details G3TEE, tel Leeds 554190.

Morse courses

Kingston upon Thames. Kingston College of FE, Kingston Hall Road, Kingston upon Thames. Tuesdays, commencing in September. Enrolment 8 & 9 September. Details Paul Farmer, tel 01-546 2151.

Milton Keynes. Organized by the Milton Keynes & D ARS, "The Meeting Place", Hodge Lea Lane, North Milton Keynes. Two courses, novice and advanced, each running for 20 weeks. Cost £12. Mondays 7.30pm. Details G0AXF, tel MK 78804; G1GOF, tel Bedford 767904, or in person at "The Meeting Place."

islington. Organized by the Grafton RS, Islington Institute, Rising Hill Street, London WC2. Details tel 01-485 7065.

Romford. Barking College of Technology, Romford, Essex. Details Science & Mathematics Dept, tel 0708 66841.

Mobile Rallies Calendar

7 September
Lincoln Hamfest, Lincolnshire Showground. Further details to be published at a later date.

7 September
Vange ARS Rally, Nicholas School, Basildon. Open 10am-5pm. Talk-in on 144MHz. Details Mrs D Thompson, 10 Feering Row, Basildon, Essex SS14 1TE, or G4OJN.

13 September
Wight Wireless Rally, Wireless Museum, Arreton Manor (A3056) near Newport, IoW. Open 2-6pm. Talk-in on 144 and 432MHz fm, and GB3WN will be on hf bands. Details G3KPO, tel Ryde 67665.

13 September
Ballymena ARC 12th Annual Rally, Ballee High School. Opening address given by RSGB President, G3VPK. Talk-in S22. Details GI4HCN, tel 0266 3044.

16 September
Rugby ATS amateur radio auction and barbecue, Cricket Pavilion, "E" Building entrance, BTI Radio Station, A5 trunk road, Hillmorton, Rugby. Opens 7.30pm. Details G8TWH, tel 0788 77986.

21 September
Harlow Mobile Rally, Harlow Sports Centre, Hammarskjold Road, Harlow, Essex. Open 10am. Talk-in on S22. Details G4KVR, tel 0279 22365, day, or G3UEG, tel 0279 27788 evenings.

21 September
National Amateur Radio Car Boot Sale, The Shuttleworth Collection, Old Warden Aerodrome, nr Biggleswade. Open 10am-5pm. Talk-in on S22, GB4SC. Aircraft and motor museum. Free car park. Admission 50p. Details and advance bookings G6EES, tel 0582 607623 evenings.

21 September
Peterborough R&ES Mobile Rally, Wirrina Sports Stadium, Bishops Road, Peterborough. Open 10.30am to 5pm. Free car parking. Food in the adjacent Tropicana Restaurant. Bar until 3pm. Details G4PNW.

5 October
Great Lumley AR Rally, Community Centre, Great Lumley, Chester-Le-Street. Open 11am (10.30am for disabled). Talk-in S22 and RB0 (GB3NT). Details G4MSF, tel 091 4693955.

5 October
Wakefield Mobile Rally, Outwood Grange School, Potovens Lane, Wakefield. Open 11am (10.30am for disabled). Free admission, easy parking. Talk-in on S22, GB3WU. Dealer enquiries and further details G4RCH, tel Leeds 536633 or G3SPX, tel Wakefield 828520.

12 October
Carmarthen ARS Rally, St Peter's Civic Hall, Nott Square, Carmarthen. Open 10.30am–5pm. Talk-in on S22. Free parking. Details GW3GUE, tel 026–783 460.
19 October
ELOHEX 86. The Hornsea ARC's amateur radio, computer and electronics exhibition, Floral Hall, Hornsea. 10am–5pm. Talk-in on S22 G4EKT. Details G4YTV, tel 0401-62498.
19 October
South Bristol ARC present the Second Bristol Radio Rally at Hartcliffe Youth Centre, Hareclive Avenue, Hartcliffe, Bristol. Open 10am–5pm. Talk-in and special event station, GB2BRR. Details G1LDJ, tel 0272 667179.
26 October
Aycliffe & Shildon ARC "Ham-day", Elm Road, Working Mens Club, Shildon, Co Durham. Talk-in S22. Open 11am–5pm. Details G4OHZ, tel 0325 314638.
1 November
North Devon Radio Rally, Bradworthy Memorial Hall (near Holsworthy). 10.30am-5pm. Talk-in on 144MHz ssb. Details G8MXI.
9 November
Bridgend & DARS Rally, Bridgend Recreation & Leisure Centre, Angel St, Bridgend, Mid-Glam. Open 10am for disabled, 10.30am for public. Talk-in on S22. Details GW1OUP, tel 0656 723508.
23 November
West Manchester RC Mobile Rally, Pembroke Halls, Walkden, Worsley, Gtr Manchester. Details G1IOO, tel 0204 24104 evenings.
7 December
Verulam Christmas Rally, The City Hall, St Albans. Open 11am–5pm. Talk-in on S22 and SU8. Details G4JKS, tel St Albans 59318.
14 December
Leeds & DARS Annual Christmas Rally, Pudsey Civic Centre, Dawsons Corner, Pudsey. Open 11am (10.30am for disabled). Talk-in on S22. Trade enquiries G4WYD, tel 0274 685039, details G1EBS, tel 0274 665355.
8 February, 1987
Bury RS Hamfeast 1987, Mosses Youth and Community Centre (only minutes from the M66), Cecil St, Bury, Lancs. Details available from G1PKO, tel 061–764 5018.
5 April 1987
Pontefract & DARS Components Fair, Carleton Community Centre, Pontefract, midway between Pontefract and Darrington just off the A1. Open 11am–4pm. Details G0AAO , tel 0977 43101.

Special Event Stations

1 May–26 October, GB4NGF, GB8NGF, GB2NGF
North Staffs ARS are operating three special events stations, for the National Garden Festival, Stoke-on-Trent. GB4 and GB8 will be on the Festival site, GB2 is located at the QTH of G4XEE. Open 11am–8pm. Transmission on all bands using cw, rtty and tv. Special QSL cards. Details G6MLI, tel 0782 332657.
1 April–31 December, GB2RIP
Celebrates 1,100 anniversary of the granting of the Charter by King Alfred the Great to the city of Ripon. Station on air most evenings on hf cw/ssb, 144MHz fm. Other modes/bands as equipment becomes available. QSL via RSGB. WAB-SE37, Maidenhead 1094FD. Details G0CLY.
September, GB9DB
To celebrate the 900th anniversary of the Domesday Book, which was conceived in Gloucester Cathedral, the Gloucester ARS will operate this station from Gloscat, Oxstalls Campus, Oxstalls Lane, Gloucester, on various days during the month. Transmission, on hf and vhf, will commence at 1200gmt on 6 September to coincide with the Gloucester Local History Festival at the same site. Details G6AWT, tel 0452 504515.
1 September, GB2STC
Celebrates the centenary of the official opening of the Severn Tunnel, at Pilning Railway Station. Operational 10am–6pm on hf, 144 and 432MHz. Details G1DJW, tel 0934 514429.
13 September, GB2RAF/GB2AB
Royal Air Force Abingdon Battle of Britain At Home Day. GB2RAF on 3·5 ssb and 14MHz cw. GB2AB on 144MHz ssb and fm. Station operated by Oxfordshire RAFARS. Members wishing to participate contact G6ZH before 31 August.
13 September, GB2WMF
Celebrates Annual Winscombe Michaelmas Fair, Winscombe, Somerset. Operated by Weston-super-Mare RS on hf, 432 and 144MHz. Open 10am–6pm. Details G1DJW, tel Weston 514429
13, 14 September, GB0OLD
Operational during the open days of Oldbury-on-Severn nuclear power station, on hf, 144 and 432MHz. Special QSL cards. Details G8AZT.
14 September, GB0NBC
Operated by the Tyneside ARS from the new BBC broadcasting centre at Fenham Barracks, Newcastle-upon-Tyne. Will demonstrate amateur radio to the public, using hf and 144MHz, from 11am to 5pm during the centre's open day. Special QSL cards. Details G4KOT, tel 091 234 1148.
14 September, GB2WHC
Operational on hf and 144MHz by Welwyn Hatfield ARC at the Welwyn Hatfield Water Carnival, Stanborough Lakes, Welwyn Garden City. Details G0AII, tel 0707 326138.
15–22 September, GB2GAF
Commemorates Battle of Britain Week. The station will be operated by the Gloucester ARS from the RAF Association Club, Gloucester. Activity on hf and vhf. Special QSL cards. Details G3MA, 40 Calton Rd, Gloucester GL1 5DY.
20, 21 September, GB2TV
From 1200gmt on the 20th until 2000gmt on 21 September, the Boreham & Elstree ARS will operate this station to celebrate the 50th anniversary of high-definition television transmission in the world. Bands 3·5–28MHz and 144MHz, ssb, cw and possibly rtty. Details G4XEW.
18–22 September, GB4XXX
Operational on all hf bands and 70MHz, plus QRP on 3·5MHz, during the third "X-net" dxpedition to North Wales. Details G4AUX, G4CAX and G4LPX.
20–28 September, GB8OO
The Maxwelltown ARK will put this station on the air from St Michael's Church Hall, Dumfries, to celebrate the octocentenary of Dumfries becoming a royal burgh. Operation on 3·5–28MHz, 144 and possibly 432MHz. Special QSL card. Details GM4NNC.
2-4 October
21, 22 November, GB2IY, GB8SIR
Smith Industries RS will operate this station from Bishops Cleeve, Cheltenham. From 10am to 4pm on 2, 3 October, and from 1 to 6pm on 4 October. The Saturday is the company's open day for Industry Year. Transmissions mainly on 3·5, 14 and 144MHz. Details G4YIX.
3, 4 October, GB2EHZ
On a "communications day" being held by East Herts College, this station will be operational on hf and vhf for 24h commencing noon 3 October. Details G0BTX, tel 01-804 6992, or the college tel Hoddesdon 466451 ext 55.
11–18 October, GB8AAW
G Ridgeway, G8UYD, will operate this station and intends to gain sponsorships per contact prior to going on the air. Operation on 144MHz ssb, fm and rtty, also 432MHz ssb. All day and evenings 11, 12 and 18th, evenings only 11–17th.
17–19 October, GB4OYC
Station QRV 1800gmt 16 October to 2400gmt 19 October to start the Yeovil ARC's 41st year. Operation from the club HQ on 3·5 to 432MHz, cw and ssb. Details G4JBH, tel 0935 23873.
18, 19 October, GB2XSG
South Dorset RS together with Crossways Scout Group will operate this station from the Crossways Village Hall, Crossways, Dorchester, Dorset. Transmissions on hf and vhf using sstv and phone. Special QSL cards. Details G4VBY, tel 0305 853408.
25, 26 October, GB2EMR
On the occasion of the International Endurocross Motor Cycle Races, from Beach Lawns, Weston-super-Mare. Operated 10am–5pm each day by members of the Weston-super-Mare RS. Transmissions on hf, 144 and 432MHz. Details G1DJW, tel 0934 514429.
3–9 November, GB4PW
In remembrance of Poppy Week. Station operational from The Royal British Legion HQ, 49 Pall Mall, London SW1. Open 10am–8pm on 3·5, 14, 144MHz, cw, ssb and fm. Operators required from Services & Royal British Legion Members, class A or B. Contact G4PSH, tel 01-446 0266, giving name, callsign and day/s you wish to attend. SWLs welcome to assist in keeping log and QSL cards up to date.

Other Events

13 September
SCOTAM '86, Lomond Centre, Glenrothes. Details GM3YBQ.
21 September
Third National Amateur Radio Car Boot Sale, organized by the Dunstable Downs RC, Old Warden Aerodrome, Nr Biggleswade, Beds. Talk-in by GB4SC. Admission 50p. Open 10am to 5pm. Details G6EES, tel 607623.
28 September
RSGB HF Convention, Belfry Hotel and Conference Centre, just outside Oxford on the M40.
5 October
Welsh Amateur Radio Convention, Oakdale Community College, Blackwood, Gwent. Details GW3KYA, tel 0495 225825
11 October
RSGB Midlands VHF Convention, Madeley Court Centre, Telford, Shropshire. Details G3UBX.
24, 25 October
Leicester Amateur Radio Exhibition; Granby Halls, Leicester. Details G4PDZ, tel (day) Leicester 553293, (evng) Leicester 871086.
6 December
RSGB AGM, Institution of Electrical Engineers, Savoy Place, London WC2R 0BL.
15 March 1987
NARSA 25th Amateur Radio & Electronics Exhibition, Belle Vue, Manchester. Enquiries to G6CGF, tel 051-830 5790.

OBITUARIES

Consequent on the move from Chelmsford to Potters Bar and the loss of editorial staff, it has not been possible to include obituaries in this issue.

COUNCIL PROCEEDINGS

A brief report on the Council meeting held on 6 March 1986

Present: Messrs W J McClintock (President, in the chair), J T Barnes, P F D Cornish, Dr J N Gannaway, Messrs F D Hall, J Greenwell, Mrs J Heathershaw, Messrs J D Heys, A A McKenzie, B O'Brien, N F O'Brien, F S G Rose, D S Smith, K E V Willis, (members of council), D A Evans (secretary/general manager), A W Hutchinson (editor), Mrs R Evans (minutes secretary).

Apologies for absence were received from Dr Allaway and Dr Evans, who were attending an IARU meeting in Vienna; Mr Case, who was in hospital; and Mr Pinchin, who was absent for business reasons.

Hon treasurer's report
Mr Cornish reported that the Society had made a small surplus for the six months to 31 December 1985 and he briefly reviewed the various components of the accounts.

Book sales were the subject of some discussion, and Mr Cornish stated that this was obviously a most important item in the accounts.

Mr O'Brien asked the hon treasurer what was happening in relation to beacons and repeaters. Mr Cornish replied that the amount paid had increased this year due mainly to a double bill from the DTI for both this year and the previous year.

Mr Cornish then discussed *Radio Communication* costs, which during the period had worked out at slightly below budget.

The President wound-up the discussion by saying that he was pleased to note the half-year surplus and echoed the views of all those present by saying that publication sales would clearly be important during the second six months of the year.

In the context of the hon treasurer's report, a resolution from the Finance & Staff Committee concerning subscription increases was raised for discussion. Mr Cornish introduced the resolution by looking at the effects of the proposed increase for a full year.

A full discussion on the proposed increase in subscriptions and the joining fee then took place, and at its conclusion the recommendation to increase the annual corporate membership sub-

scription to £18.50 from 1 July 1986, and to institute a once-off joining fee was proposed, seconded and carried unanimously.

Recommendations from committees
Finance & Staff Committee
"That the Society should not endorse the correspondence course proposed by the NEC on the grounds that it could belittle courses provided by other colleges or affiliated societies."

After some discussion, the recommendation was proposed, seconded and carried unanimously.

VHF Contests Committee
"That the Hansen Trophy be awarded to Martin Parry, RS52543, as winner of the 1985 VHF/UHF Listener's Championship."

This was proposed, seconded and carried unanimously.

Secretary's report
Mr Evans drew Council's attention to the *Council Letters* which had been circulated recently concerning the problems with the Radio Interference Service/Radio Investigation Service, and spoke at great length on all the implications and the actions which were being taken by the Society.

The secretary then dealt with the question of immunity standards for domestic entertainment equipment. In the UK, the BSI have produced a standard known as BS905, which was essentially brought into being to solve the cb problem since its frequency limits are from 26 to 30MHz.

There is also an international organization known as Cenelec, which is also establishing an immunity standard for domestic electronic equipment. Research has indicated that if Cenelec agree a standard based on 1·8V/m through the frequency range 150KHz to 150MHz, then it is highly probable that the EEC will adopt this standard. It will initially apply to mains powered televisions and radios, but it is given to understand that it may well later apply to other types of domestic equipment. If this standard is adopted by the EEC then every member country must operate to this standard.

Apart from all the technical and legal aspects of emc, it appeared to the secretary that much hinged on the attitude of the Government to radio amateurs.

Mr Evans said that the legal aspects should also be considered, and the Society had already involved its solicitors and had consulted a barrister on these matters.

The secretary then spoke about packet radio, which was attracting much interest at present, and he felt that the role of the Society must be to take a lead in this new area.

Mr Evans said that he had discussed the 1986 *Call Book* with the chairman of the Technical & Publications Committee and with the Finance & Staff Committee, and it had been concluded that the time was now right to include 30 to 40 pages of additional information in the next edition and to produce it every six months.

Mr Heys asked about the "particulars withheld" problem. The secretary said that although there was no obvious way of finding a solution to this problem, he was hopeful that in-roads could be made to it in the future.

In the absence of the chairman of the Technical & Publications Committee, the general manager noted the heavy workloads in the publications section and said that while there was always far more work than could be handled by existing staff, work was always handled on the basis of priority.

Some discussion took place on the technical content of *Radio Communication*, and the general manager thought that perhaps more was being asked of the volunteer members of the Technical & Publications Committee than was reasonable to expect. He wished to see the committee concentrate its efforts on being the body which was responsible for all technical standards within the Society, both for books and *Radio Communication*. He considered *Radio Communication* to be one of the Society's great strengths, but wished to see it more in tune with today's membership. Mr Willis thought that it was now more technical than it was 20 years ago. Mr Evans went on to say that there were more than 10 possible books which could be commenced later this year, but that at present it was essential to consider only books which were commercial as opposed to esoteric. He discussed the *Equipment Review* book, the *Microwave* and *EMC* manuals and others in this context. In the case of the *EMC Manual*, clearly this might not be a best seller, but a book which the Society was obliged to publish for the good of its members.

IARU matters
Mr Hughes, G3GVV, chairman of the IARU Committee, joined the meeting to give a report and brought Council's attention to several issues. These covered frequency planning, the monitoring system, repeaters on 29MHz and aid to developing countries. A full discussion on all the topics took place, and various proposals regarding Society policy were made.

Membership and representation
Council noted:
(i) That reduced subscriptions had been granted to a further 25 members, Mr B O'Brien commented that he thought the number of reduced subscriptions were decreasing slowly.
(ii) That subscriptions had been waived in respects of a further 10 members.
(iii) That affiliation had been granted to:
Hatfield Polytechnic RS;
Ibstock ARS;
Meopham Parish RC;
Mirfield ARC, Birmingham;
Northern Radio Club (Amateur), Bolton;
NSRA, Sweden;
Queen Mary's CCF Signals Section, Basingstoke;
Southeast Wales Repeater Group, Cardiff;
Widnes & Runcorn ARC;
Yell Amateur RC, Shetland.
(iv) That Mr B W Wood, G4RDS, had been appointed area representative for Southend and district.

Council approved an application for life membership from Mr G Morgan, GW4KYN.

Morse testing
The general manager noted that the agreement with the DTI called for Council to be responsible for appointing volunteer morse examiners.

It was agreed that a steering committee consisting of the chief morse examiner, the general manager, and Council members J Heys, N O'Brien and K E V Willis would be set up as agreed with the DTI, and that it would be responsible to Council for the RSGB Morse Test Service.

Of over 400 people who had volunteered to assist the Society with morse testing, two applicants were practising senior BT morse examiners. The general manager proposed that one of these, N Le Gresley, G4SEV, be asked to become the Society's chief examiner, and said that he had submitted copies of G4SEV's qualifications to the DTI and they had agreed to support this appointment.

This proposal was approved unanimously by Council.

A brief report on the Council meeting held on 26 April 1986

Present: Mr W J McClintock (President, in the chair), Dr E J Allaway, Messrs J T Barnes, E J Case, Dr D S Evans, Dr J N Gannaway, Messrs J Greenwell, F D Hall, Mrs J Heathershaw, Messrs J D Heys, A McKenzie, B O'Brien, N F O'Brien, H S Pinchin, F S G Rose, D S Smith, K E V Willis (members of Council), D A Evans (secretary/general manager), A W Hutchinson (editor), H M Norman (minutes secretary).

Apologies for absence were received from Mr Cornish, who Council was sorry to hear was ill.

Secretary's report
The secretary reviewed progress on the emc front, specifically in relation to the DTI. Both the RSGB and the DTI had agreed that neither side should act in any way that surprised the other, as had been the case in a number of recent events.

It was intended to invite three members of the DTI to headquarters to give them an overview of amateur radio. If this was successful, the possibility of a two-day seminar for other DTI staff would be considered.

On morse testing, Mr Evans reported that to date approximately 500 applications for morse tests had been received, with some 350 test places available at nine forthcoming rallies.

A firm called CSP International had been asked by the DTI to study the ways in which all UK users of the radio spectrum could be surveyed in terms of the cost-effectiveness of the usage of their allocations and the charges that could be made for them. It would therefore be necessary to produce a critical review of the amateur radio aspects, emphasizing the wide range of spin-offs.

The timescale was probably a few months. Mr Evans voiced his deep concern over this matter and felt that it would prove necessary to seek high level assistance in preparing the amateur radio case.

29MHz fm repeaters
Mr Smith raised the matter of conflicting views over the IARU decision relating to 29MHz fm repeaters, which did not seem to have been resolved.

Much discussion ensued. Dr Allaway pointed out that when Mr Hughes gave his report to the last meeting of Council, an IARU Region 1 managers' meeting was taking place in Vienna at which the RSGB had requested clarification on this matter. A vote had been taken on a proposal to conduct a one-year experiment; the result had been nine for the proposal, six against and three abstentions. As a two-thirds majority had not been achieved, the chairman of the meeting had ruled that each national society was free to carry out its own experiment if it so wished. This was, in effect, temporary approval until the 1987 Region 1 conference.

Council would await recommendations from the HF Committee. It was understood that the Repeater Management Group was also considering proposals for a one-year experiment, which would be submitted to the Licensing Advisory Committee.

Hon treasurer's report
in the absence of the hon treasurer, Mr B O'Brien reported that the accounts for the nine-month period to the end of March were not yet available.

Some discussion took place on the financial aspects of the major conventions. It was emphasized that care should be taken in the choice of dates for next year's NEC and VHF conventions, in order to adequately separate the two events.

Committee recommendations
EMC Committee
"That Mr Neil Brinkworth, G3UFB, be the RSGB representative on the BSI Committee dealing with rf radiation from computers and associated equipment (Committee GEL 111 considering BS 6527)".

This was approved unanimously.

Membership and representation
Council noted that:
(i) Reduced subscriptions had been granted to a further 34 members.
(ii) Waived subscriptions had been granted to a further four members.
(iii) Affiliation had been granted to:
Barr Beacon ARC, West Midlands;
Berwickshire Hinds AR Contest Group;
Dartmoor Radio Club, Plymouth;
Grafton Radio Society, North London;
Marconi Radio Society, Middlesex;
North Norfolk Radio Repeater Group;
Sleaford & DARC;
Vale of Evesham Radio Amateurs' Club;
West Middlesex Radio Club, Brentford;
Wrekin ARS, Salop.
(iv) That Mr G R Watts, G8BCH, had been appointed area representative for Weymouth.

Morse tests
The secretary explained that since the appointment of Mr Le Gresley, G4SEV, as chief examiner, BTI had advised their employees not to participate in the RSGB Morse Test Service as it would contravene their contracts of employment. As this affected Mr Le Gresley, it had been necessary to seek a replacement for this position. At a meeting between Mr Le Gresley and Mr Evans, the name of Mr Ianson, GW3GDO, had been suggested. He had subsequently been approached and agreed to accept the role of chief examiner until 30 June 1987. Mr Ianson had been the senior BT morse examiner for Wales prior to his retirement.

Unanimous approval was given to this appointment.

There was some concern that the Society had not yet received a formal contract in respect of the morse testing programme from the DTI.

Members' Mailbag

The views expressed in published correspondence are not necessarily those of the RSGB, and readers are urged to verify independently any factual statements on which they may wish to rely as it cannot be guaranteed that such statements are correct.

WITHHOLDING PARTICULARS

Sir—I too find much to be desired in the phrase "particulars withheld". In fact, I find very little more annoying than to discover, after a long patient wait, when testing out a rig, for various reasons, to hear a callsign and then to find "particulars withheld".

The remedy is to refuse to list callsigns unless the address is given.

I shall thank the RSGB on the day this is done.

J W Dainty, G4PDN

Sir—Ref B Russell's contribution to "MM" on withholding particulars.

He has hit the nail on the head, but has not hit it hard enough.

Certainly my house is "recognisable"; that is one thing. It's letting every Tom, Dick and Harry know I'm away from it that worries me!

Consequently I have requested my particulars be withheld when the listing is made available to the general public next year.

"A Non Ymouse"

Sir—I read with interest the letter from B Russell headed "Withholding Particulars" and, at the request of a member of the Exmouth ARC, I raised the subject at our last meeting. After some discussion it was the wish of the club that I should write to you to say that a vote on the suggestion of a minimum entry of callsign, town and county resulted in 27 in favour, 4 against and 3 abstentions. The main theme of the argument being that although a licensed amateur could contact such a station when heard to find the QTH, an swl would never know if that station did not collect cards from the bureau.

It was mentioned by one member that if a station wanted particulars withheld there was no real point in his callsign being entered into any call book, and it also left that particular callsign open to piracy.

R F Maynard, G4YRM
chairman, EARC

Sir—As an amateur who for the last few years has had his address removed from the *RSGB Call Book*, I think I should explain to B Russell the reasons why.

When my address was in the call book I was getting an average five unwelcome visitors a week on my doorstep. Typical comments being: "We are down on holiday, so I looked through the call book and found that you lived in Cromer; hope you don't mind me calling." Sometimes I had to get quite rude to rid myself of these unwanted visitors. Since my address has been deleted, no unwelcome visitors have called!

My antenna system is quite large, and I cannot recall any visitor saying he had called because he had seen my arrays on the horizon.

It is assumed these days that all amateurs wish to exchange QSL cards. I, among many others, don't have the time or interest to spend hours writing out cards. I know that my signal is audible in Mogadishu, Nairobi or Shanklin by the stations who answer my calls from these locations. I tell them that I do not send QSL cards, so they do not need my address.

David Blake, G3MWV

Sir—I see that someone has finally raised the subject of the "no publicity" box on the licence application form, suggesting that the *Call Book* should at least mention a regional QTH for "particulars withheld" stations. I realize that there are those with good reason for keeping their pursuit to themselves, but there must be operators who now wish their details to appear in the book.

Would it not be possible to provide a mechanism by which a partial or full address could be published with the co-operation of the station? As B Russell suggests, a simple—compulsory, perhaps—"Station located in Dorset" would be a start, but why not go the whole hog and actually ASK the amateurs concerned whether they would like their details published?

At the very least, a notice in *Radio Communication* stating that anybody who now wishes their details to appear should write to the RSGB might do some good. Perhaps some stations with no address might like to comment?

Giles Read, G1MFG

These letters represent a cross-section of recent opinion on this subject. The Society tends to feel that a name plus the town in which the station is located would be a reasonable minimum as far as the Call Book *is concerned. We would also like to know whether those who are currently "particulars withheld" would consider modifying their request, for the sole purpose of enhancing the utility of the* Call Book.

HARMONIC RADIATION OF 14MHz SIGNALS

Sir—May I make a plea to amateur radio operators worldwide through this page, to please conform to their licence conditions and check on the level of harmonic content of their transmitters and antenna systems.

In this particular case I refer to those users of the 14MHz band, especially during contest work and where fairly high power and high gain antenna systems are in use.

After a lengthy period of vhf operation only, I decided to try my hand again at hf. Due to domestic limitations I was obliged to stick to 28MHz and a simple groundplane antenna. As many will confirm, 28MHz cw operation can be great fun, especially when the band really "opens up". However, in my case, and perhaps for many others, I was immediately beset with an annoying frustration.

It is amazing just how many stations one can hear on the 28MHz band during just moderate "openings" that eventually turn out to be the second harmonic of a station calling on the 14MHz band.

I have lost count of the number of stations that I have replied to after their "CQ", received no reply and with some suspicion re-tuned to 14MHz only to find them on that band still calling in earnest! My rig is an old KW2000 which has been "re-vamped" and is now fairly sensitive on 28MHz; together with an atu and the single-band groundplane, there is a fair amount of selectivity before the front-end, so I can discount "mixing" problems.

Some years ago it was suggested to me, and I believe I have seen it in print, that it is not necessary to add to your "CQ" call the band you are calling on; ie "CQ two metres" etc. I am now having second thoughts on the matter, as it will certainly help me in many ways! Perhaps in this day and age of broadband pa systems and multi-band antennas we should revert to that system.

The problem stated above has meant, in my case, that I am obliged to have a second receiver tuned to 14MHz while I am responding to a CQ call heard on 28MHz.

Has any reader experienced the same situation, and if so could they perhaps suggest an answer?

R T Morrison, G3VZP

REDUCING RF BREAKTHROUGH

Sir—Reference the article "Reducing RF Breakthrough using Ferrite Rings' in the *RSGB News Bulletin* section of your April issue.

If most amateur radio operators and experimenters in Great Britain are as financially poor as hams in the USA, I am sure they will be interested in the following tip: deflection yokes from old tv sets are great substitutes for ferrite rings. Most tv service shops throw away one or more of these old yokes every week.

Ask for yokes from 21 or 23in sets. Just remove all the wire—which can be used for many purposes, including "invisible antennas"—and follow the same winding directions given in the article.

Harold J Estok, W6JIP

We don't know whether the same is true in the UK, but Mr Estok's comment is worth noting—scrap yokes are a good source of small-diameter wire. Don't forget that ferrite rings are still available from RSGB headquarters.

RFI—BT REPLIES

Sir—As chairman of British Telecom's EMC Working Party, I was dismayed to read Mr Blanchard's letter (*Rad Com*, June) alleging unwanted radiation by British Telecom transmitters and exchanges. I have consulted the chief engineer of British Telecom Radiopaging and the designers of our electronic switching systems, and would like to reassure all radio amateurs that British Telecom takes a responsible attitude towards its use of the radio spectrum.

If anyone suspects malfunction of our transmitters, could I ask that they contact BT locally as soon as possible. This will enable us to check out the situation much faster—we can only deal with complaints that we are aware of.

Regarding radiation from telephone exchanges, of course we do consider this at the design or procurement stage. In the absence of a Statutory Instrument on spurious emissions at the present time, we are working to make all our equipment comply with BS6527*. This aims to reduce such emissions to an acceptable level.

I know the suggestion that British Telecom has no amateurs on the staff was made only in jest, but I am pleased to say we have thriving radio clubs at headquarters, at our research labs and across the country. We even have a keen amateur in our press office, as RSGB HQ knows!

We look forward to the continuing co-operation of radio amateurs and swls.

Brian Jones
chairman, EMC Working Party

*Specification for Limits and Measurements of spurious signals generated by data processing and electronic office equipment.

THANK YOU, RSGB

Sir—It is with great pleasure that I write to tell you that, with RSGB's help, I have been successful in gaining planning permission for a 40ft telescopic mast at my home. The booklet giving guidelines was very helpful indeed, and I feel that the letter of support played a significant part in the favourable decision.

I look forward to many years of amateur radio operating and continued membership of the RSGB.

Wishing the Society success in its endeavours on our behalf.

B J Coles, G0EHW

HELP WITH A HELLSCHREIBER

Sir—I am interested in the Hellschreiber system and would like to be able to operate using this mode, as much for the fun of it as anything else. I have heard that a program or programs exist that will allow Hellschreiber to run on a BBC B micro, but to date have not been able to track them or their owners down.

If anybody has such a program, or any information on the Hellschreiber system, I would be very pleased to hear from them.

Barry Harvey, G8RIW,
56 Oakwood Drive,
Wybers Wood,
Grimsby,
Lincs DN37 9RN

RSGB NATIONAL HF CONVENTION

Belfry Hotel, Milton Common, Oxford

SUNDAY 28 SEPTEMBER 1986

Doors open 10am Admission £2

ONE DAY CONVENTION WITH LECTURE PROGRAMME

★ **QSL checking for awards (not DXCC or IOTA)**
★ **QSL Bureau posting box (cards must be pre-sorted)**
★ **1·8MHz get-together**
★ **Car boot sale (£5 per pitch)**
★ **Worked All Britain stand**
★ **Official 12wpm cw tests**
★ **RNARS QRQ cw tests**
★ **QSL "arrivals" board**
★ **CW pile-up competition (individual, and team competition for teams of three from an RSGB affiliated club)**
★ **RSGB bookstall**
★ **Presentation of trophies**
★ **HF demonstration station (GB2HF and GB2CAR) by Chiltern ARC**
★ **Talk-in on S22 and 29,550kHz fm by Mid-Thames Raynet (GB2MTR)**
★ **RSGB committee displays (EMC, Propagation Studies, HF and HF Contests)**
★ **DX quiz** ★ **G-QRP Club** ★ **Testing booth** ★ **BYLARA** ★ **ISWL stand** ★ **Bars**

★ ***Also*, supervised constructional area; build a simple direct-conversion receiver. Why not bring the "harmonics" to make a start on their first rigs?**

PROVISIONAL LECTURE PROGRAMME

1030-1130	"HF Antennas for Small Gardens", Don Field, G3XTT
1145-1245	"Question & Answer Forum" with RSGB officials
1330-1415	Presentation of trophies
1430-1530	"HF Receivers", Peter Chadwick, G3RZP
1545-1645	"DX Forum", with slides etc of dxpedition activity including G3OKQ/VR6JR, Pitcairn Island

1730 DX Buffet, hosted by Chiltern DX Club

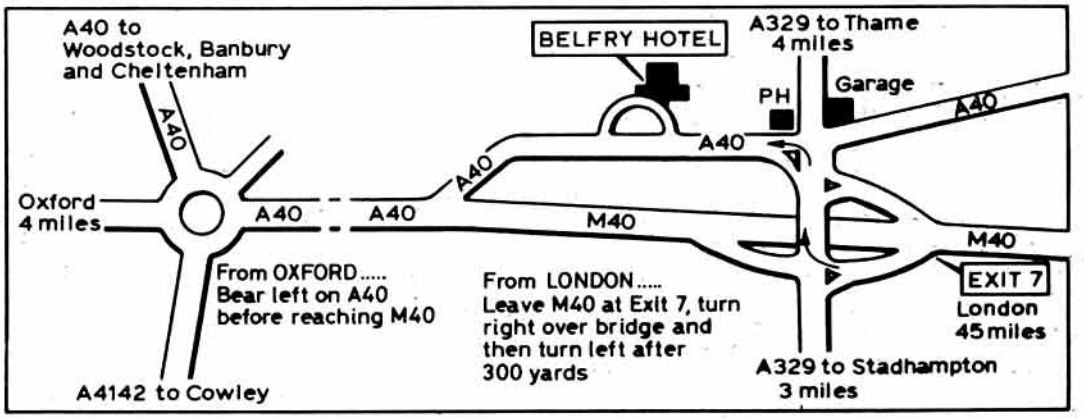
Those wishing to stay for the buffet should contact Roger Brown, G3LQP, beforehand. The cost will be £5.50 per head.

If there is sufficient demand, FCC qualifying tests (for USA licences) will be held on Saturday 27 September at the Belfry Hotel. Those interested should contact Greg Lambert, G0/KK1J, 27 Redcliffe Rd, London SW10 9NP, Tel 01-352 2746.

Non-amateur members of the family may wish to visit Oxford (10 miles) or Blenheim Palace (20 miles).

Light lunches and snacks will be available at the hotel for a modest charge. Dinner, bed and breakfast is available for Saturday night at £27.50. Bed and breakfast £17.50 per person.

HOW TO GET THERE



A HOME-BUILT FREQUENCY SYNTHESIZER FOR 45 TO 75MHz

John Crawley, GM3LBX*

(PART 2)

Section F. Loop 1 mixer and bandpass filter (Fig 12)

The buffered input to pin 3 of IC601 is from the selected vco in loop 1 (section A Fig 6) and will be between 45–75MHz. The amplitude at pin 3 should be approximately 50mV peak-to-peak. The input to pin 7 is from the 42MHz filter via the buffer TR602 and TR603. The amplitude need only be about equal to that on pin 3.

The bandpass filter L601–604 is designed to pass 2·5MHz up to 33MHz, and to reject frequencies above and below this band—particularly the 45–75MHz band, and the 42MHz component from loop 2.

The inductances L602 and 603 are Toko 10K formers wound with eight turns 32swg copper wire and mounted in screening cans. They have adjustable cores and a pot-core. L601 and 604 are Toko 3335R.

The filter should be adjusted by injecting a variable frequency into the empty socket of pin 5 of IC601 and monitoring the output. Adjust cores for a sharp cut-off above 35MHz.

Section G. Second loop vco etc (Fig 13)

The circuit for IC702 is similar to that in section E, except that it needs no crystal and that the reference frequency is divided down to 400Hz by using the highest available divisor, 8,192; this is programmed by leaving pins 5, 6 and 7 high.

The section is sited on the right centre of the pcb. L701 is a Toko Style MC120 No 100075. It has a screened inductance of 0·17μH. This vco (T603) should be tested after assembly to see that it runs in the region of 95MHz.

When checking the MC145151 here, and in the other place where it is used, there are two useful guides to what is going on inside it. Pin 10 is connected internally to the output of the main divider so that when all is well, this should be showing the reference frequency (400Hz in this case) if a counter is placed on the pin. Pin 28 is a lock detector output. It is high when the loop is locked and pulses low when out of lock. Some constructors may wish to use this pin to drive a l.e.d indicator to show when the loop is locked.

Section H. Loop two mixer and 6·4 filter (Fig 14)

TR801 buffers the input to pin 3 of the SL1640. The frequency at "n" and pin 3 should be between 95·3876 and 95·6432MHz when the loop is locked. TR802 is a tuned buffer to double the 44·545MHz from section C. The tuned circuit is L803 (12 turns of 28swg wire on a 1MΩ resistor 0·25W and a 2·8–12pF ceramic trimmer). The bandpass filter has two inductances of 15 turns, 32swg insulated copper wire on Toko 10K formers. Ready-wound devices such as 10K SW1 KANK3333 would do the job. The filter should be tuned to 6·4MHz sited in the middle of the right-hand edge of the pcb. Layout as in Fig 7.

*Cove, Campbeltown Road, Tarbert, Argyll PA29 6SX.

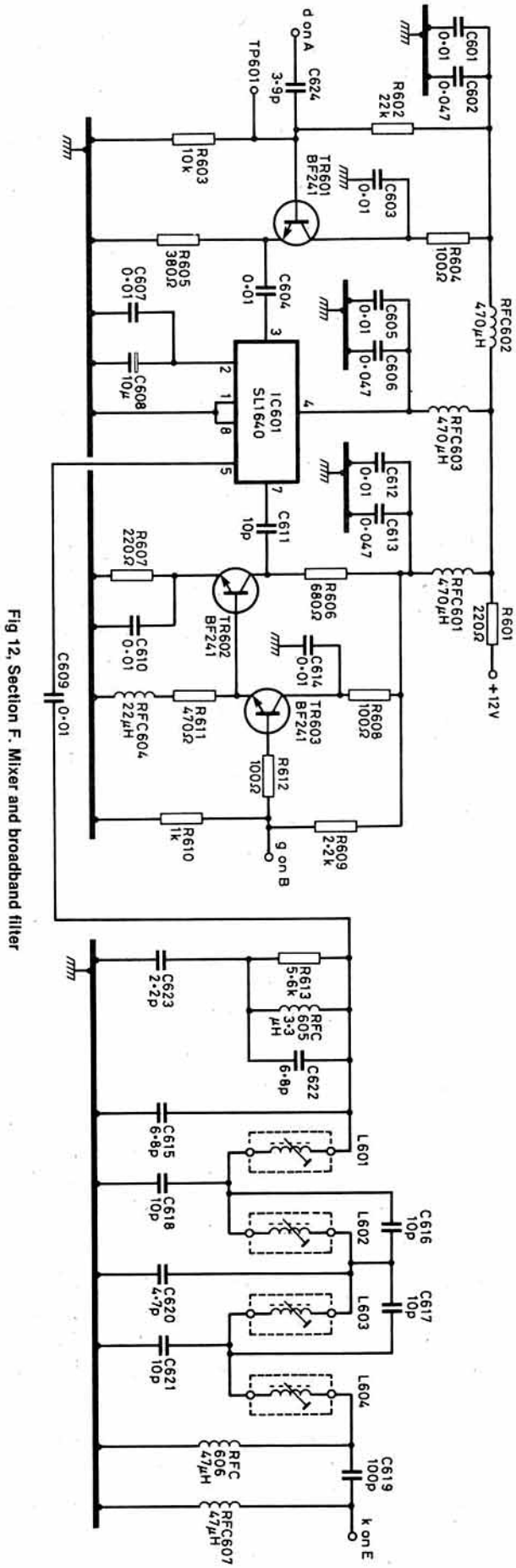


Fig 12, Section F. Mixer and broadband filter

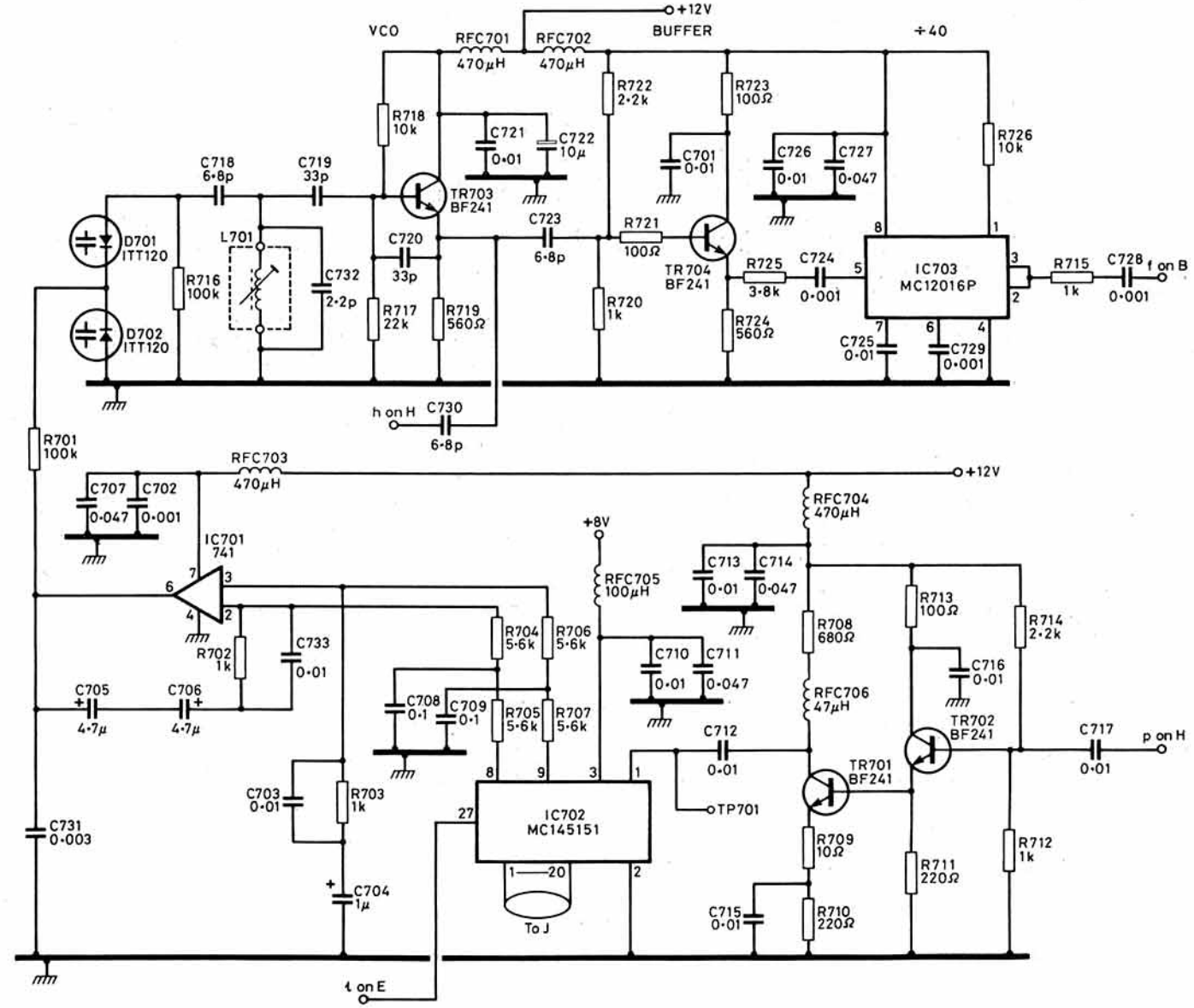


Fig 13. Section G. Second loop phase discriminator and lpf

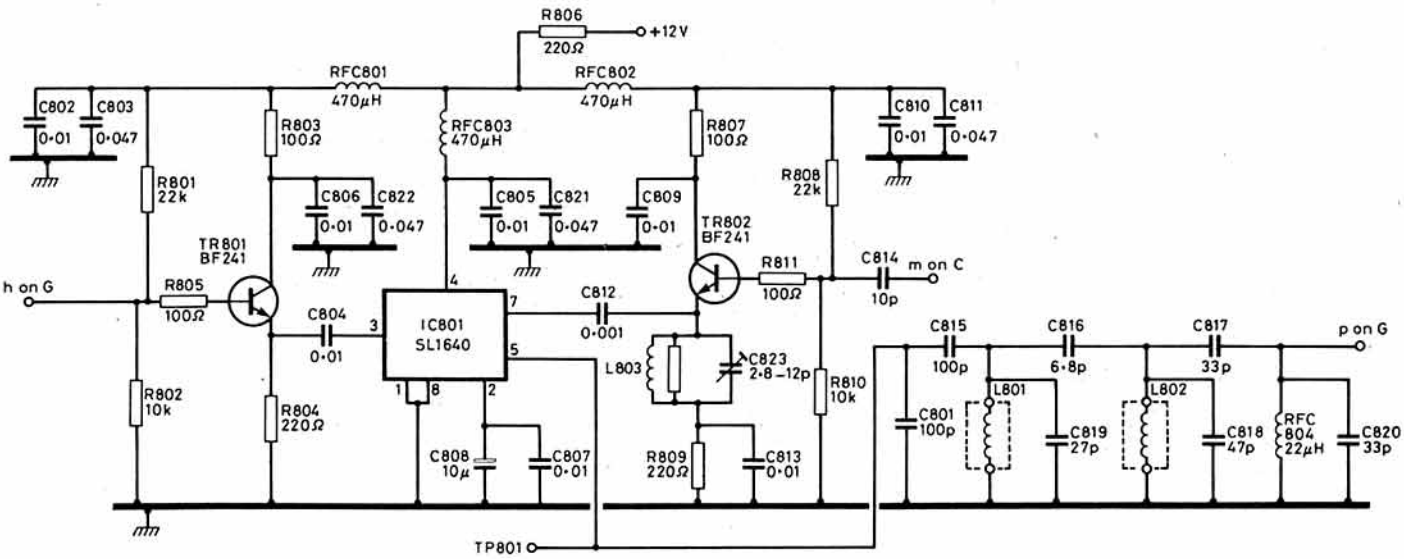


Fig 14. Section H. The mixer and 6·4MHz filter in Loop 2

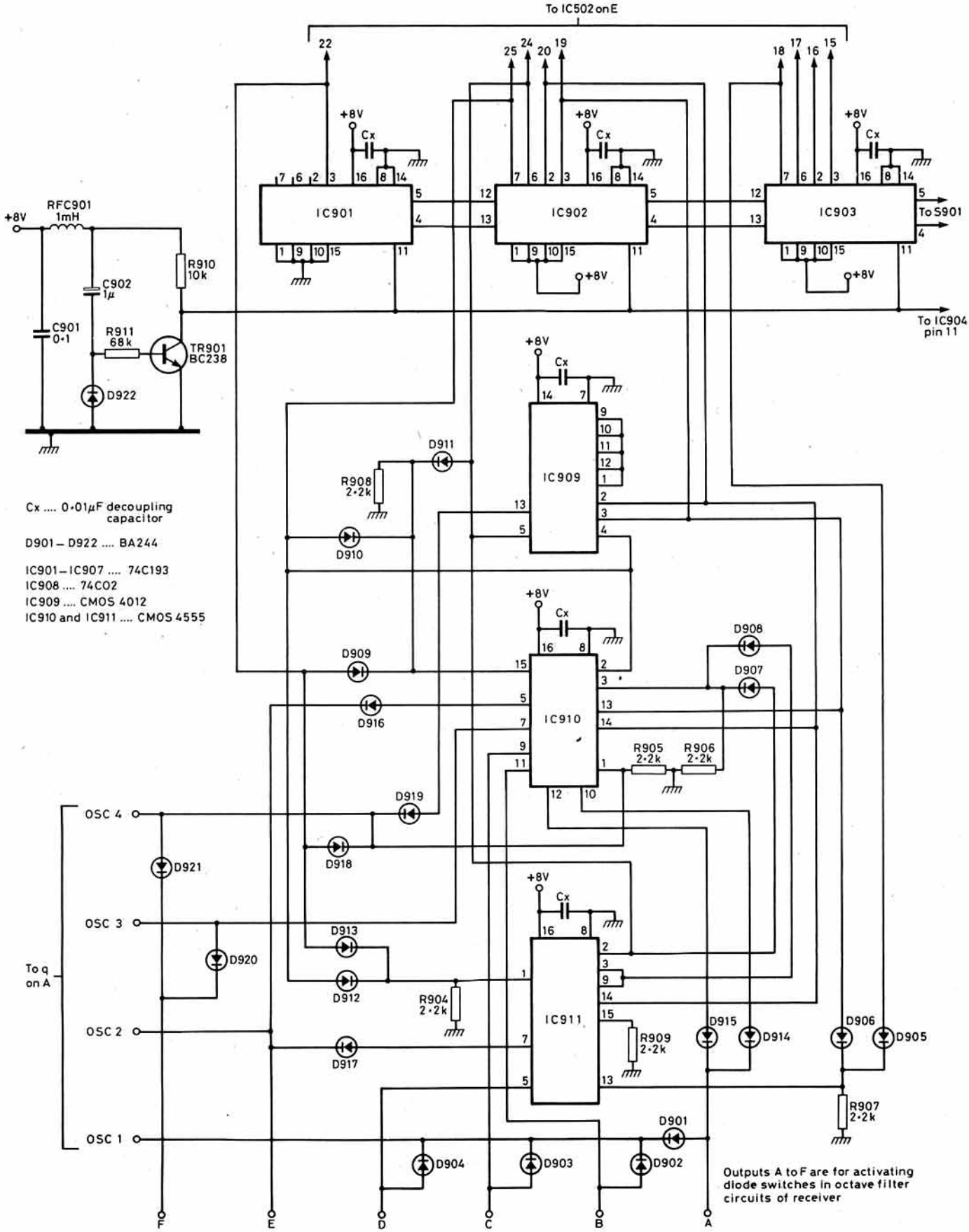
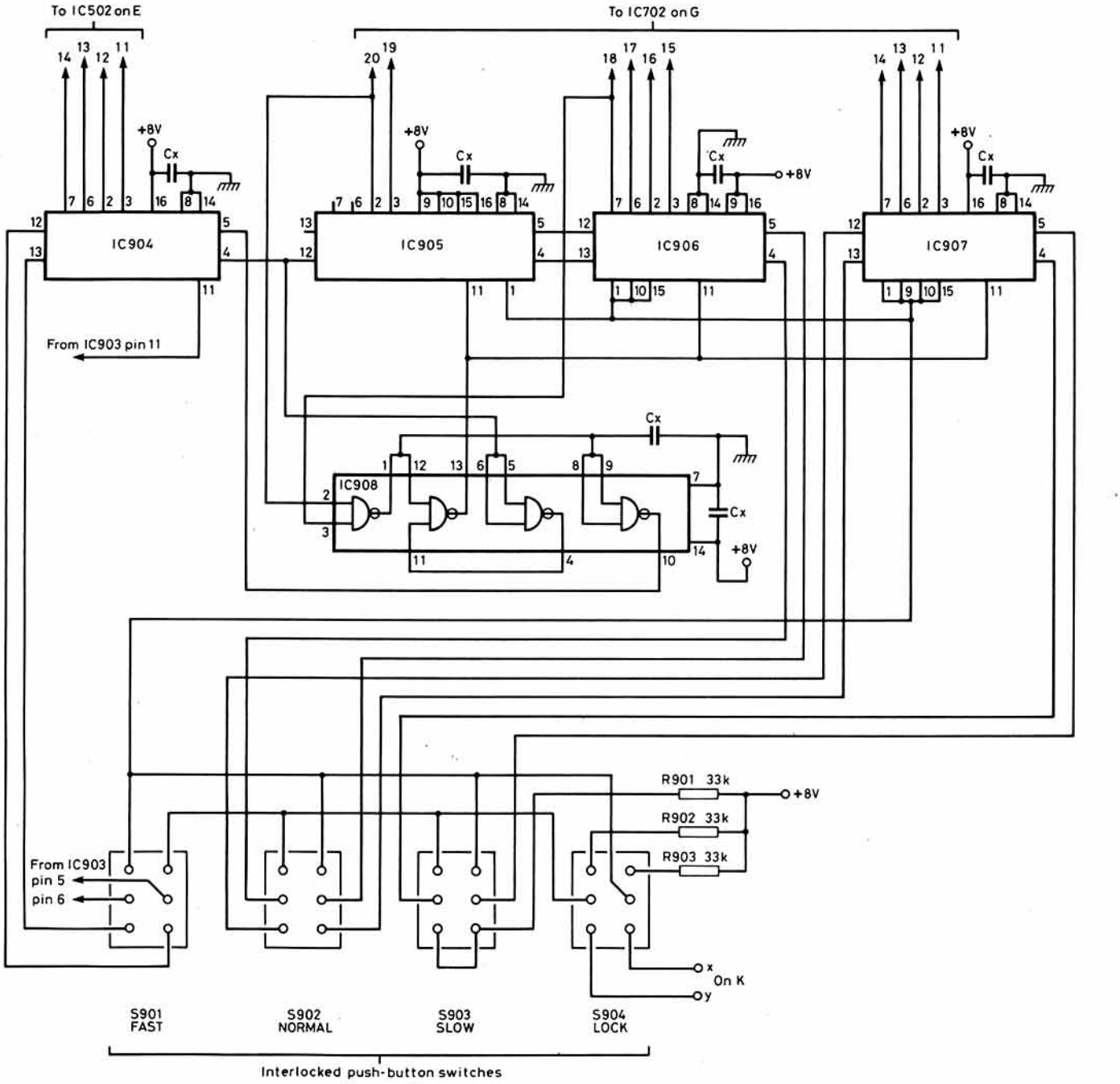


Fig 15. Section J. Frequency control, part 1. Part 2 on facing page



Section J. The up/down counter (Fig 15)

The main function of this section is to control the state of the programming inputs to the MC145151 in the two loops. IC901-7 are all 74C193. These are cmos up/down binary counters which have their parallel outputs on pins 3, 2, 6 and 7. The count on these is implemented with each falling edge on pin 5 (the up-count pulses) and decremented with each pulse falling edge on pin 4 (the down-count pulses). Pins 12 and 13 are the "carry" and "borrow". Parallel data inputs are at pins 15, 1, 10 and 9.

The main tuning is done by the introduction of up or down pulses to pins 4 or 5 on IC907. The tuning pulses are derived from a "shaft encoder". (I used an Alps device from Cirkit—an LA226 (stock No 48-00226) and a decoder circuit, which routes the up and down pulses separately to the correct pins). These pulses are then routed to the selected part of the counter-chain by the press switches SW1-4. R901, 902 and 903 keep the inputs of unused parts of the counter high when they are switched out. If this is not done, they will oscillate. IC908 (74CO2) limits the count for loop 2 to the range between 15744 and 16383, and passes on a carry or borrow pulse as appropriate to the rest of the counter chain which controls the count in loop 1. On IC901 and 902, the parallel data inputs are wired to preset the counter to a point near the low-end of the frequency spectrum of the synthesizer. Other builders may wish to set the count at other parts of the band. The BC238 (TR901) generates a negative-going pulse at switch-on which performs the preset operation.

A further part of this section (IC909, 910, 911) deals with the selection of the appropriate vco in loop 1 and also the selection of the correct front-end filter in the receiver. There are seven board pins for connecting the control lines to the front-end filters. From the front of the pcb they are: **(a)** up to 1MHz; **(b)** 1 up to 2MHz; **(c)** 2-4MHz; **(d)** 4-8MHz; **(e)** 8-16MHz; **(f)** combines the outputs of the sixth and seventh pins via diodes for 16-30MHz.

Since there are a large number of wire links and diode links in this section, reference should be made to the detailed overlay: Fig 7.

IC909 is a CMOS4012, a double four-input NAND gate. IC910 and 911 are CMOS4555 decoders. Table 1 gives the truth table for these.

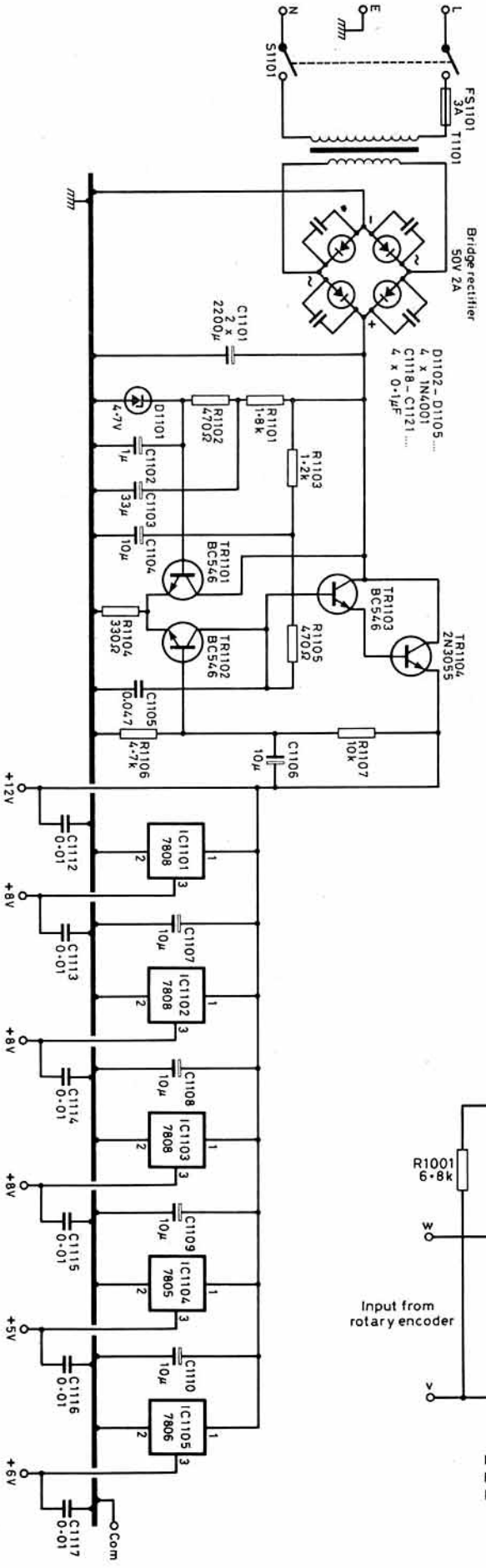


Fig 17. Section L. Power supply and regulators (with spare power for receive etc). These provide spare power at 12V and 6V for the receiver board

Section K. Pulse decoder (Fig 16)

This section is on a small separate pcb (Fig 20) which can be mounted directly over the rotary encoder. The circuit and layout are self-explanatory. IC1002 and 1003 shape the pulses and the flip-flop IC1001 routes them to the up or the down line x and y. I added the resistor R1007 to protect the 4013, which appeared to be suffering from surges of spiky voltage. Anyway, the last one has lived on, so all seems well.

The rotary encoder gives 50 pulses per revolution of the shaft. It has three terminals, the outer ones go to w and v and the centre one to ground. Choose the direction of rotation for up and down as best suits your ideas on such things. Fig 21 shows the component placing.

Section L. Power supply (Fig 17)

Three regulated 8V supplies, one at 5V regulated, and a 12V regulated supply are required for the synthesizer. In addition, a 6V regulated supply is provided for the receiver board; and the 12V line is hefty enough to run a two or three watt audio output stage on the receiver. The mains transformer used is a Drake P1215, a 12VA job. It runs warm when the receiver is working and some builders may prefer a larger unit. If the synthesizer is to have sole use of this power, then the P1215 is certainly ideal. Heat sinking for the regulators and for the 2N3055 is provided by the enclosure side. Figs 22 and 23 show the pcb layout and component placing. The board can be soldered directly onto the transformer secondary lugs. The other end is supported on a 0·75in pillar.

Enclosure

I mounted the synthesizer in the top-half of a steel box, 350mm by 230mm. The lower-half houses the rest of the receiver. The synthesizer compartment, which is 60mm deep, also houses the power supply and the rotary encoder and decoder. Fig 5 shows the scheme. The pcbs are on 0·75in pillars, the larger board needs five. Coaxial lead-throughs are required for the connections to the receiver of the injection frequencies.

Inter-board wiring

These are: (a) mains power to transformer via fuse and switch (not shown); (b) 8V lines to section J, E and G; (c) 12V to the pin in the top right-hand corner of the board, just above section C. The latter must run right round the board wherever 12V is required, and various wire links are needed as shown on the overlay. The two leads carrying the up and down pulses from the decoder board are most easily soldered to the front pair of pins on the "lock" switch.

Each board needs an earth-line to ground the board to the enclosure. The 5V line goes to the left-hand side of the board to feed the display, and another 5V line goes to the decoder board. In the first instance it is best to make all these leads long enough to enable the builder to lift the whole of the large pcb out of the enclosure for the exciting job of de-bugging.

Alignment

This needs to be tackled slowly and calmly! Get section J and the tuning pulse system working perfectly first. Check with a logic tester if you have one, but a voltmeter will do. Check output of pulses at the decoder, "up" pulses only on one line, and "down" pulses only on the other. Next check

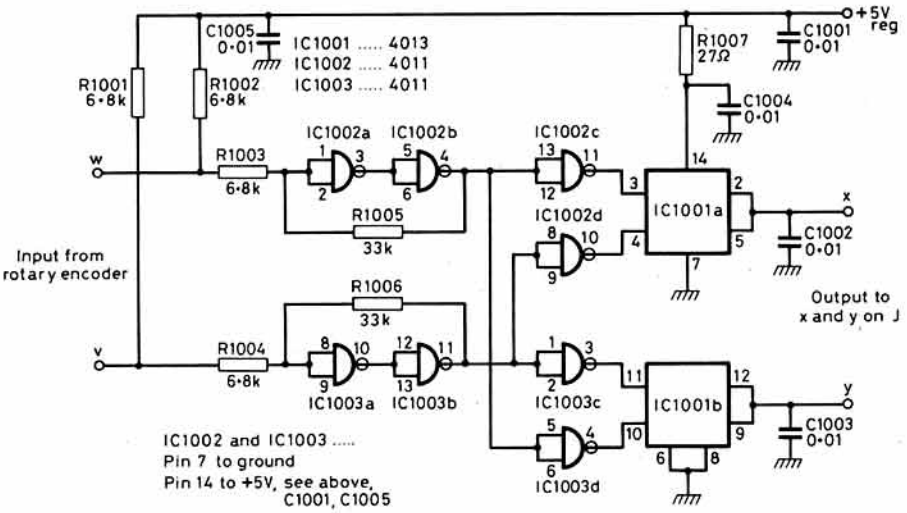


Fig 16. Section K. Pulse decoder

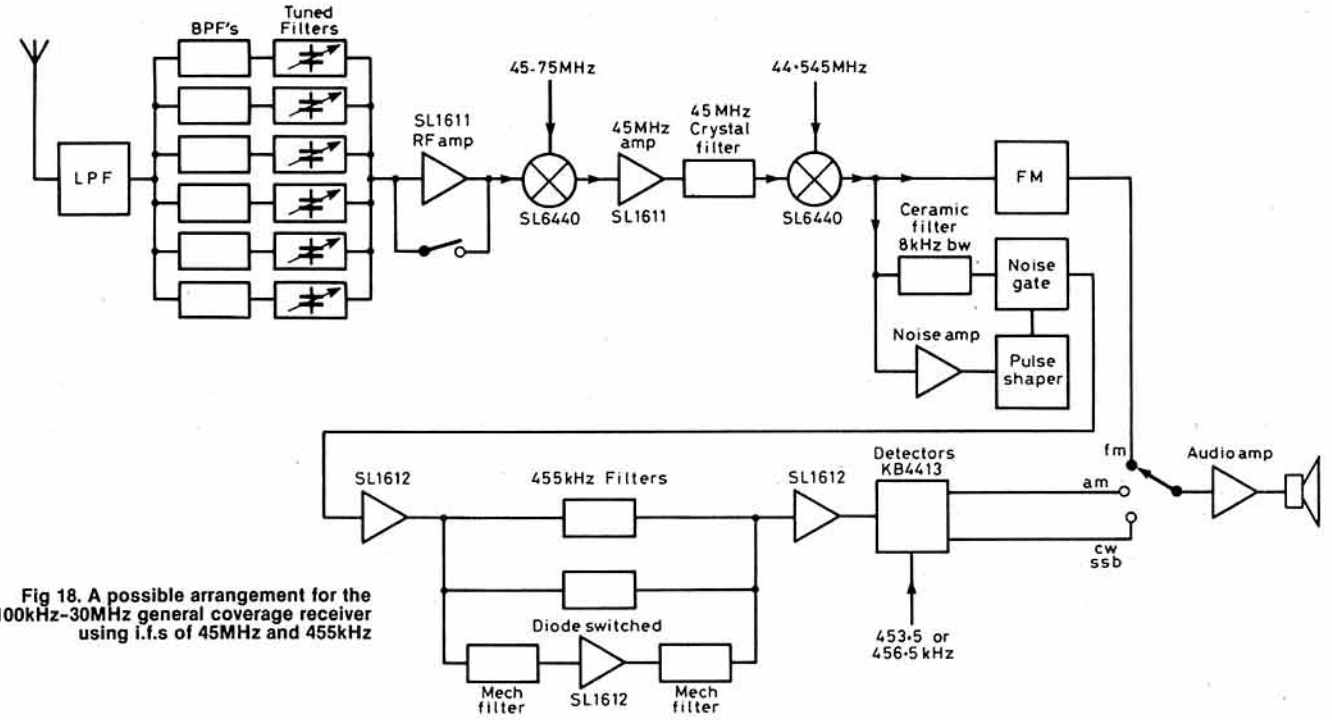


Fig 18. A possible arrangement for the 100kHz–30MHz general coverage receiver using i.f.s of 45MHz and 455kHz

the count on the whole string of 74C193s, checking the output pins 3, 2, 6, 7 in that order, and check the continuity of the lines to the equivalent pins on the MC145151. Remember that a common fault is bridged tracks on the pcb where the copper tracks are very close. The whole board should be examined in a good light with a magnifying glass.

Make sure that the count control is working (IC908). Start with the output pins on IC905, 906, and 907 in J, all high (except pins 6 and 7 on IC905 which should never show up high) and tune the count slowly down, by turning the knob in the right direction. When pin 7 on IC906 drops for the second time, the count has reached its limit and IC905, 906, and 907 should set back to high again. Check the up-count from the bottom limit; when all pins of IC905 have reached "high" (except pins 6 and 7 of IC905) the next "up" pulse should re-set to 15744 again, ie to 11110110000000. The first four 1s of this number are there all the time on the MC145151 (pins 22, 23, 24 and 25 have no connection to them) so the highs on IC905, 906, and 907, should be on pin 3 of IC905 and pin 7 of IC906.

The next check is to see that the digital switching, IC909, 910, 911, is working correctly—only one vco should be "on" at a time! Check the inputs and outputs of IC910 and 911. If all is not well, the truth table for the 4555 (Fig 19) will help.

Perhaps the most critical part of the setting-up is the tuning of the filters in sections B and F. The most convenient way to do this is to take out the SL1640 mixer immediately before the filter, and, using a suitable signal generator, inject 200mV or so into the empty mixer socket at pin 5. Watch the output of the filter after amplification by the following amplifier, and swing the signal generator slowly across the part of the spectrum we are concerned with. Take the 42MHz filter in section B first. The main concern here is to let through as much energy at 42·16MHz while keeping out the 44·545MHz component. This is quite a tall order and persons of wealth may prefer to order a special crystal filter! However, with care and attention the filter shown will work very well.

If you have trouble getting a narrow enough passband, try reducing the coupling by making C212, 213, and 214 even smaller. Tune the filter so that the upper frequency of the pasband is at 42MHz, and the fall-off of response towards 45MHz as steep as possible.

Table 1. Truth table for the 4555 decoders

Pinout		Truth Table						
1 Enable	16 +8V	E	A	B	Q1	Q2	Q3	Q4
2 A	15 Enable	H	x	x	L	L	L	L
3 B	14 A	L	L	L	H	L	L	L
4 Q1	13 B	L	H	L	L	H	L	L
5 Q2	12 Q1	L	L	H	L	L	H	L
6 Q3	11 Q2	L	H	H	L	L	L	H
7 Q4	10 Q3							
8 Ground	9 Q4							

Each 4555 has two decoders, each with two inputs and four outputs plus an "enable".

The filter in section F is broadband. The coils are hand-wound, and you may want to alter the number of turns and experiment with different values of capacitance. The aim is to get a steep fall in response above 35MHz and a fall also below 2·5MHz, though this latter does not seem to be nearly so critical, and, in fact, needs no adjusting.

The lowpass filter before the display, situated on the left-hand end of the board, may give trouble. If the display is not steady, and all other indications are that the rest of the synthesizer is working properly, try the arrangement shown in the appendix.

Now turn to loop 2, sections G and H, and check for volts and oscillation. See that there is 44·545MHz from section C. Tune the doubler in section H, then, with a voltmeter on pin 6, IC701 section G, watch the voltage while you move the core in L701 (G). When the loop is locked, the voltage will rise and fall with equivalent movements of the core: move the core until the voltage is about 6V. If no lock is achieved, check the circuit and the tuning of L801 and L802 in section H. These can be peaked at 6·4MHz. When the loop is working properly, the voltage at R701 in section G should rise slowly as you tune, and then drop suddenly as the first part of the counter resets.

You should also look at the R701 point to see that the lowpass filter is working properly. To do this, substitute a scope at its most sensitive setting for the voltmeter; there should be no trace of the 400Hz reference frequency.

Next, turn to loop 1 and repeat the same procedure. Set the cores of each of the four vcos starting from the low-end. In each case, set the core so that the tuning voltage is centred at about 6V.

Checking for sideband suppression

Since I do not possess a spectrum analyser or a receiver which will cover 45 to 75MHz, the final adjusting of the synthesizer was done using a receiver at 10MHz, and a double-balanced mixer with an injection from a Marconi signal-generator running at a frequency 10MHz higher than the frequency of the synthesizer. See Fig 19.

Using the lowpass filter in section E as shown, the 6·4kHz sidebands should be over 40dB below the output at the required frequency.

The bandpass filter in section B can be adjusted for the best "note".

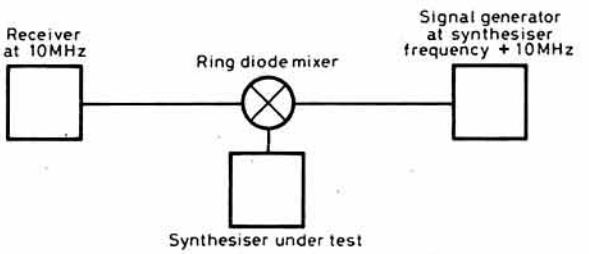


Fig 19. Using a receiver to check synthesizer output

Components list

SECTION A

R101	33k
R102, 104 106	100k
R103	10k
R105	100Ω
R107	6·8k
R108	22k
R109	470Ω
R110	2·2k

4 of each

R111, 116	1k
R112	22k
R113, 114	100Ω
R115	10kΩ
R117	220Ω
C101, 102, 115	3·9pF
C103	2·2pF
C104, 106, 113	0·01μF
C105, 114	0·047μF
C107	6·8pF
C109	39pF
C110	10pF
C111	100pF

4 of each

C112	See text
C116, 117	0·01μF
C118	10μF electrolytic

4 of each

L101	See text
D101, 102	BB109
D103	BA244

4 of each

TR101	BC238
TR102	BC308
TR103, 104, 105	BF241

4 of each

RFC101, 103, 104	470μH
RFC102	10μH
RFC105	1·2μH

All RFCs are Toko 7BS series

SECTION B

R201	380Ω
R202	100k
R203	680Ω
R204	100Ω
R205	220Ω
C201	6·8pF
C202	2·2pF
C203, 204, 205, 207, 209	0·01μF
C206, 210	0·047μF
C208	10μF electrolytic
C211	10pF
C212, 213, 214	See text
C215	22pF
C216	3·9pF
C217, 218	4·7pF
L201, 202, 203, 204	Toko K3344
TR201	BF241
IC201	SL1640
RFC201, 202	470μH, Toko 7BS

SECTION C

R301, 305	22k
R302, 304	5·6k
R303	1k
R306	4·7k
R307	220Ω
R308	10k
C301, 304, 307, 308	0·01μF
C302, 306	22pF
C303, 310	10pF
C305, 309	0·047μF
X301	Crystal 44·545MHz with 20pF in series
L301, 302	K3335 (1·2μH)
RFC301, 302	100μH, Toko 7BS
TR301, 302	BF241

SECTION D

R401, 407, 408	100k
R402, 405, 409, 413	100Ω
R403, 406, 410, 411, 416	220Ω
R404	380Ω
R412	68k
R414	680Ω
R415	150Ω
C401, 418	2·7pF
C402, 403, 404, 405, 406, 408, 409, 410, 412, 420, 423, 430, 431, 433, 434, 436	0·01μF
C407	10μF
C411, 421, 427, 428, 429, 432, 435, 437, 438, 439	0·047μF
C413, 414	3·9pF
C415	4·7pF
C416, 426	2·2pF
C417, 419, 422	0·001μF
C424	10μF electrolytic
C425	12pF
RFC401, 402, 403, 404, 406, 408	470μH
RFC405	1mH
RFC407	10μH
L401, 402, 403, 404, 405	3·3μH Toko 7BS
TR401, 402, 403, 404, 405	BF241
IC401	SL1640
IC402	HD10551
LCD	FC177 Cirkit 39-17700

SECTION E

R501, 519	100Ω
R502, 506, 514	1k
R503	560Ω
R504, 511, 512, 518	3·3k
R505, 507	33k
R513	2·2k
R515, 516, 517	220Ω
R510	10Ω
C501, 510, 511, 516, 517, 518, 519, 520	0·01μF
C502, 512, 521, 522, 523	0·047μF
C503, 508, 509	0·1μF
C504, 505	1μF
C506, 507, 513, 514	0·001μF
C515	6·8pF
X501	Crystal 3·2768MHz. HC18U Cirkit 45-03000
TR501, 502, 503	BF241
IC501	741 op-amp
IC502	MC145151
RFC501, 503, 505, 506	470μH
RFC502	100μH
RFC504	3·3μH

SECTION F

R601, 607	220Ω
R602	22k
R603	10k
R604, 608, 612	100Ω
R609	2·2k
R610	1k
R611	470Ω
R613	5·6k
C601, 603, 604, 605, 607, 609, 610, 612, 614	0·01μF
C602, 606, 613	0·047μF
C608	10μF electrolytic
C611, 616, 617, 618, 621	10pF
C615, 622	6·8pF
C619	100pF
C620	4·7pF
C623	2·2pF
C624	3·9pF
L601, 602, 603, 604	See text
RFC601, 602, 603	470μH
RFC606, 607	47μH
RFC605	3·3μH
TR601, 602, 603	BF241
IC601	SL1640

SECTION G

R701, 716	100k
R702, 703, 712, 716, 720	1k
R704, 705, 706, 707	5·6k
R708	680Ω
R709	10Ω
R710, 711	220Ω
R713, 721, 723	100Ω
R714, 712, 722	2·2k
R717	22k
R718, 726	10k
R719, 724	560Ω
R725	3·8k
C701, 702, 703, 710, 712, 713, 715, 716, 717, 721, 725, 726, 733	0·01μF
C704	1μF tantalum
C705, 706	4·7μF tantalum
C707, 711, 714, 727	0·047μF
C708, 709	0·1μF
C718, 723, 730	6·8pF
C719, 720	33pF
C722	10μF electrolytic
C724, 728, 729	0·001μF electrolytic
C731	0·003μF
C732	2·2pF
L701	0·17μH Toko MC120 100075
TR701, 702, 703, 704	BF241
IC701	741 op-amp
IC702	MC145151
IC703	MC12016p
D701, 702	ITT120
RFC701, 702, 703, 704	470μF
RFC705	100μH
RFC706	47μH

SECTION H

R801, 808	22k
R802, 810	10k
R803, 805, 807, 811	100Ω
R804, 806, 809	220Ω
C801, 815	100pF
C802, 804, 805, 806, 807, 809, 810, 813	0·01μF
C808	10μF electrolytic
C811, 821, 822	0·047μF
C812	0·001μF
C814	10pF
C816	6·8pF
C817, 820	33pF
C818	47pF
C819	27pF
C823	2·8–12pF min ceramic
RFC801, 802, 803	470μH
RFC804	22μH
TR801, 802	BF241
IC801	SL1640
L801, L802	15 turns of 32swg wire on 10k former with pot-core
L803	12 turns 28swg enam copper on 0·25W 1MΩ resistor

SECTION J

R901, 902, 903	33k
R904, 905, 906, 907, 908, 909	2·2k
R910	10k
R911	68k
C901	0·1μF
C902	1μF electrolytic
C903–12	0·01μF for decoupling the ics and for pin 12 on IC8
IC901, 902, 903, 904, 905, 906, 907	74C193
IC908	74CO2
IC909	CMOS4012
IC910, 911	CMOS4555
D1–22	BA244
RFC901	1mH Toko 7BS
TR901	BC238

SECTION K

R1001, 1002, 1003, 1004	6·8k
R1005, 1006	33k
R1007	27Ω
C1001, 1002, 1003, 1004, 1005	0·01μF
IC1001	CMOS4013
IC1002, 1003	CMOS4011

SECTION L

R1101	1·8k
R1102, 1105	470Ω
R1103	1·2k
R1104	330Ω
R1106	4·7k
R1107	10k
C1101	2 × 2,200μF electrolytic
C1102	1μF
C1103	33μF
C1104, 1106, 1107, 1108, 1109, 1110	10μF electrolytic
C1105	0·047μF
C1112, 1113, 1114, 1115, 1116, 1117	0·01μF
C1108, 1119, 1120, 1121	0·1μF
T1101	Transformer Drake 12VA P1215
D1101	Zener diode, 4·7V Cirkit 12-00478
D1102, 1103, 1104, 1105	4 rectifier diodes, 1N4001 or similar
TR1101, 1102, 1103	BC546
TR1104	2N3055
S1101	Mains switch
FS1101	3A fuse
IC1101, 1102, 1103	Regulators 7808
IC1104	Regulator 7805
IC1105	Regulator 7806

Holders for all ics
Board pins for connections
Incremental encoder Alps LA226 Cirkit 48-00226
Connecting wire and miniature coaxial
All RFCs are standard value Toko 7BS or 7BA series

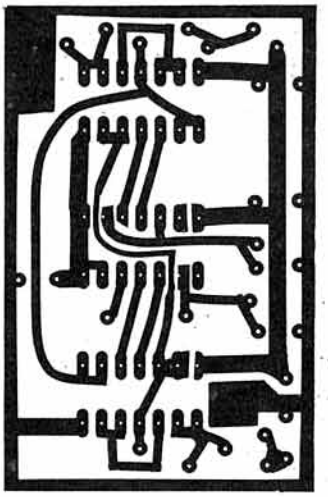


Fig 20. Pulse decoder pcb layout

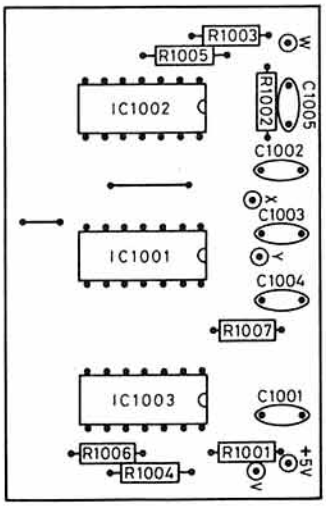


Fig 21. Pulse decoder component layout

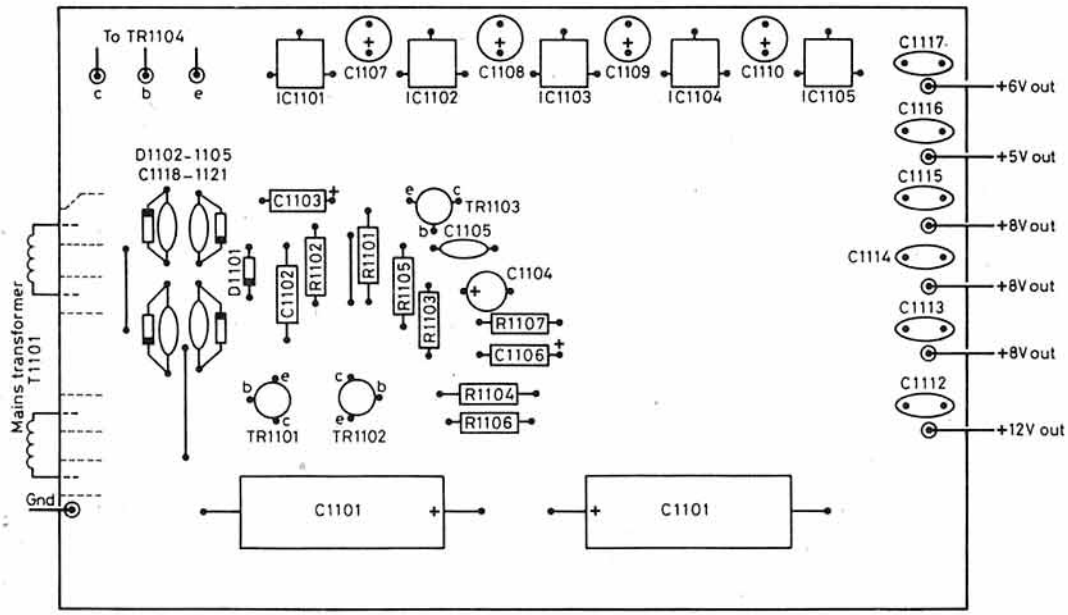


Fig 22. Power supply component layout

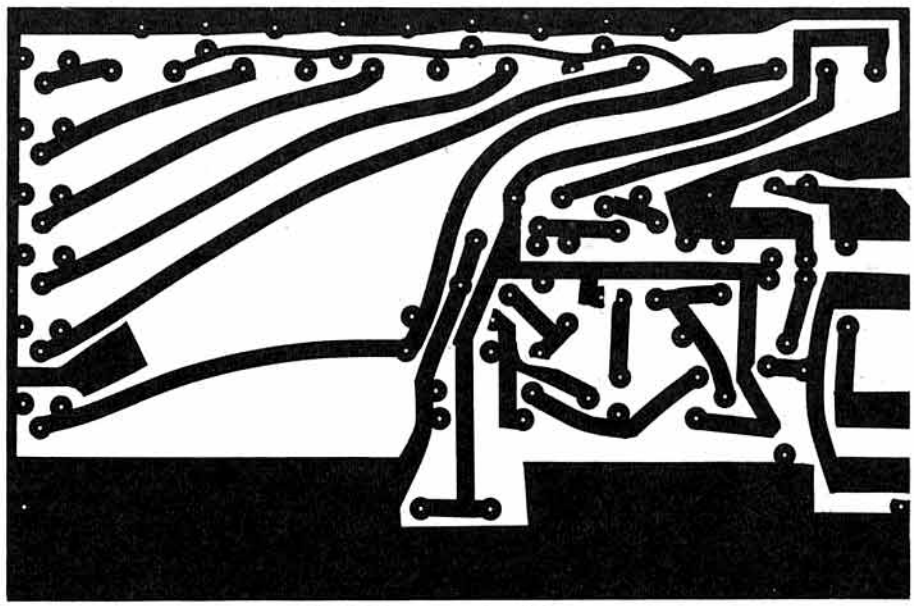


Fig 23. Power supply pcb layout

Putting the synthesizer to use

Each builder will have his own ideas about the ideal receiver circuit. I used chiefly the Plessey SL series ICs. Fig 18 shows the block diagram of the complete receiver. The 45MHz filter is a cheap two-pole crystal device, 45M15A, supplied by Cirkit. The two balanced mixers are SL6440. The synthesizer could very well drive a compact QRP all-band transceiver.

EDITOR'S NOTE

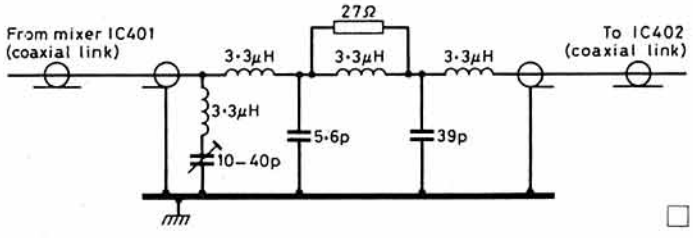
Because of its large dimensions, it has not been possible to reproduce the main pcb layout, the component layout for which (Fig 7) was published in Part 1. Photocopies of the master negative can be obtained on request from the editor at RSGB HQ.

Errata. In Part 1, page 562, under the heading "The circuit described by sections", Section A, lines 5, 7 and 10 for C122 read C112; line 8 for C102 read C112.

Components

All the components are readily available. Resistors are all carbon film 0·25W per cent. Capacitors: 0·1 are Mylar; 0·001, 0·01, 0·047 are low-voltage disc ceramic, smaller values are mostly ceramic chip. Electrolytics are 16V working radial leads, except those indicated on the components list. Builders interested in purchasing a set of pcbs for the project, should contact me.

APPENDIX



Technical Topics

by Pat Hawker, G3VA

AMATEUR RADIO in the UK is almost totally dependent upon the continued goodwill of the Radio Regulatory Division of the Department of Trade & Industry. In 1983, the RRD (previously called the Radio Regulatory Department) was transferred from the Home Office to the DTI after having moved in the late 'sixties from the Post Office to the short-lived Ministry of Posts & Telecommunications and thence to the Home Office.

It is often argued that the more things change the more they stay the same —but it could be dangerous to assume that this truism applies to RRD, since their attachment to DTI appears to have sparked off a series of far-reaching changes and investigations aimed at treating the radio spectrum less as a public service responsibility and much more as a marketable commodity. The idea of using "market forces" and "deregulation" as a means of producing more efficient exploitation of the spectrum could have very important repercussions on our activities.

Marketing the spectrum?

The extent to which such concepts will or could be applied to amateur radio regulation is by no means clear—though we are already seeing some quite daunting situations arising from the imposition last year of the £21 charge for the investigation by the RIS of viewers' and listeners' interference complaints—including the prospect of having "variations" imposed on our power limits, bands etc. Possibly even more fundamental to our activities is the determination of the DTI, spurred on by the present government, to "exploit" more fully the commercial possibilities of providing access to the radio spectrum.

At an IERE Conference on Land Mobile Radio last December, A J Nieduszynski, a senior official in tbe RRD, gave a keynote speech that included the following:

"Like coal, or gas, or oil, the radio spectrum is a limited resource. Unlike them, however, it cannot be used up or depleted in the same way because it can be re-used, day after day and year after year. Any moment that it stands unused because of regulatory constraints when somebody could be using it is an opportunity wasted—an opportunity *cost* or *loss* that makes the community that much poorer.

"Increasingly, therefore, we have come to appreciate that we regulators have a duty to ensure that that cost is minimized and that we put as few obstacles as we can in the way of the spectrum being used at any given moment to the fullest extent that can be justified economically . . . a piece of spectrum carries a potential price tag."

This is a crystal-clear expression of the British Government's wish to exploit more fully the radio spectrum by means of the market economy, using such techniques as "selling" or "renting" bits of the spectrum virtually to the highest bidder. Inevitably this is not an operation in which amateurs can afford to participate in competition with professional services. It means that the RRD is likely to become ever more anxious to seek out *under-used* frequencies and to transfer them to services willing to pay handsomely for using them. The RRD is already on record as suggesting that "The amateur radio licence fee is one of the least expensive, even within the category of licence taken out by hobbyist users of radio. In terms of the spectrum to which access is provided, the amateur fee is very good value for money." Could it be that they are already thinking in terms of a substantial rise in licence fees and/or reducing the amount of spectrum devoted to this non-profit-making activity? Remember that international regulations can be overruled nationally provided that this does not result in interference to authorized users in other countries.

This is yet another reason why it is surely essential to ensure that we make *full* and *responsible* use of *all* the frequencies to which we presently have access. It really is a case of *use or lose*—and using them for the internationally-defined purposes of "A radiocommunication service for the purpose of self-training, intercommunication and technical investigations". These are clearly "public service", "educational" and "scientific" rather than commercial arguments—but they remain the primary justification for our continued existence!

It is by no means reassuring—as happened to me recently—to be reminded by an American visitor (who had brought his handheld transceiver with him) of the continuing disgrace of the Crystal Palace 144MHz London repeater.

Valve and "kiss" aficionados

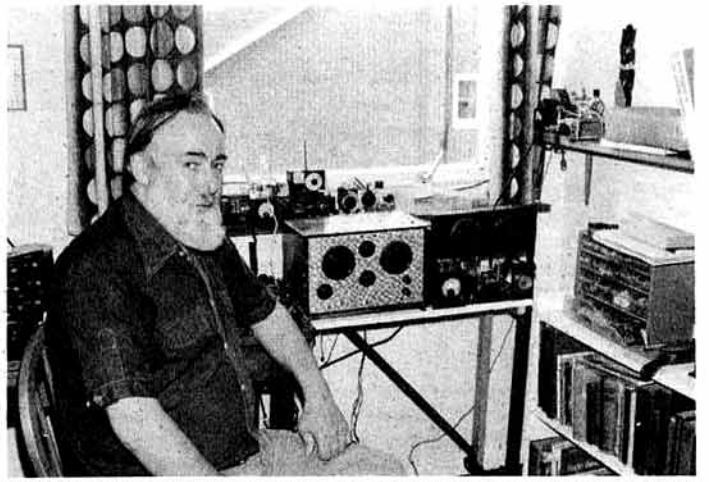
My mailbag continues to tell me that I am far from being the only operator still using thermionic devices and/or recalling the advantages of simplicity and easy repairability they bestow on home-built equipment. The other week my old HQ129X receiver produced thumps instead of cheeps; it took no diagnostic feat to decide immediately that the bfo was not oscillating, to guess that the emission of a near-40-year-old valve must at last have faded, to plug-in a replacement 6SJ7 and be back in business in a matter of minutes. I wish I could say the same for a non-functioning transistor broadcast radio that has been defeating my desultory attempts to trace and rectify the fault!

Alan Errock, G3HCO, built a 7MHz 6L6 crystal oscillator which gave 7W output, then a 6V6-6L6 crystal oscillator power amplifier that gave a more useful 20W output. But after studying some pre-war *QST*s he reverted to a single 6L6 as a cathode-coupled co that pushes out 15 to 20W and with which he has no difficulty working round Europe. His sense of achievement at getting 20W from a co was somewhat dimmed by finding in those old *QST*s an RCA advertisement that showed a circuit diagram for a single-valve oscillator providing no less than 150W output! The valve, needless to say, was not a 6L6 but an 813 with its 50W heater.

John Clarke, TK5FF/G8KA, living in Corsica, had some difficulty in locating a source of older-style crystals suitable for use in power oscillators, but draws attention to an advert that appears on the back pages of *QST* wherein CW Crystals, 570 No Buffalo St, Marshfield, MO 65706, USA, offers FT243 crystals ground to frequency of choice at what G8KA considers "a not unreasonable price". But to obtain further information it may be advisable to enclose $1 to ensure a reply.

For sheer nostalgia, however, the prize must go to Richard ("Badger") Farley, GW3SSJ, who has recreated early hf equipment in the form of an LS5A transmitter originally described by Frank Haynes, G2DY/G2DZ, in *Wireless World* in 1927, and has rebuilt, using components of the right period, a very decrepid *Wireless World* Empire Two (O-v-1) designed for "colonials" by H F Smith, including modifications suggested in 1928 for extending coverage from 80 to 190m.

GW3SSJ finds—as do several other readers—that regenerative 0-v-1 and 1-v-1 straight receivers can still be used to work consistently through the evening QRM on 3·5MHz, though such receivers tend to be difficult to "net" accurately. The modern form of the 0-v-1 is the direct-conversion receiver, but one misses the old sense of satisfaction you got from adjusting a really smooth "reaction" control for maximum sensitivity!



Richard Farley, GW3SSJ, with his re-constructed "1920s" equipment. The "Empire Two" receiver on the right uses 2V battery valves, lt, gb and ht batteries etc, with engine-tuned front metal panel. The single-valve transmitter was built about 25 years ago using an LS5A as specified in 1927 but now usually uses a 415PT valve dating from 1928 (4V directly-heated pentode) that runs at about 7W input. As a self-excited oscillator on 7MHz GW3SSJ got T7C reports but as a usable co gets good T9 reports from around Europe. The LS5A (but not the 415PT) gives enough light to operate by!

IERE "Radio Receiver" Conference

At the beginning of July, the IERE, in association with a number of professional institutions and the RSGB, held its fourth international conference on "Radio Receivers and Associated Systems" at the University College of North Wales at Bangor—a college that harbours and has bred many radio amateurs. Of the 130-plus delegates, an unusually large proportion were or had been licensed amateurs. Although most were wearing their "professional" hats, Ray Flavell, G3LTP ("Space and time continuity as an aid to North Sea transmission path studies") and L Sharrock, G3BNL ("Phase locking of Gunn diodes at 24GHz") presented papers solidly based on their amateur radio experiences, while my own paper "Dynamic range—fact or fiction?" brought together a number of topics aired in recent months in *TT*, coupled with the warning that current military radio systems, in attempting to design the human operator out of the system, faced the danger of introducing a software crisis into area networks and an ever-lengthening time between the formulation of an initial "requirement" and the production of operational systems. In other words stressing the need to retain a rapid "kiss" response to previously unforeseen requirements. I took, as an example, the way in which SCU, SOE and the Anglo-Polish teams were suddenly faced in 1940 with the need not only to distribute "Ultra" information to overseas commands on a secure (SLU) network but also to provide "suitcase" and pocket equipment for covert operations. Within a matter of months, a whole new concept of portable hf radio stations capable of providing, even with poor antennas, (reasonably) reliable communication over distances of hundreds of miles was developed, bringing "miniaturization" into radio systems, yet based on standard consumer and amateur-radio components and designs.

But what of current professional work on receivers, antennas etc? How much of what was disclosed in the 40 or so papers could have a direct bearing on amateur radio practice?

In an overcrowded spectrum there remains a keen interest in what can be done to minimize the effects of interference. A BBC paper described tests on a random sample of vhf fm broadcast receivers (often used with a uhf/shf converter for amateur portable operation). This underlined (as did some German tests a few years ago) that many receivers have adjacent channel selectivity well below the international planning requirements, particularly those for stereo-reproduction free of birdies and whistles. It is also clear that in this respect poor selectivity is found both in low-cost and high-cost models, with medium-price models tending often to be the best. Unfortunately the BBC tests did not extend to investigating why some receivers are so poor, though they do indicate that there can be a problem with dual 470kHz/10·7MHz i.f amplifiers, due to a peak in the response curve corresponding to the lower i.f. Since vhf/fm broadcast receivers are often used by radio amateurs as tunable i.f systems, this matter is of considerable interest.

Radio engineers have traditionally sought frequencies offering *good* propagation characteristics. However, for both military and civilian applications there is growing interest in the high-absorption gigahertz bands such as 60GHz. The military are interested because attenuation is so high that signals cannot (at least in normal conditions) be intercepted from any distance. Civilian applications such as short-range personal or mobile communiciations would allow very frequent re-use of the same frequencies.

Back-window vhf transmitting antennas

From an amateur radio viewpoint, one of the most practical papers was that by Dr J D Last, GW3MZY, and B Easter of UCNW and the associated "Industrial Development Bangor Ltd" on "Broadcast reception and mobile radio communication using vehicle rear-window heater aerials". Their system is currently being used by several vehicle manufacturers as broadcast (lf/mf/vhf) receiving antennas (see *Electronics & Wireless World* February 1985, pp64–67): Figs 1 and 2. Recent work has shown, however, that the technique can also be used for two-way vhf mobile radio, and it has been tested by the Essex Police. It has also been used successfully on 145MHz. Although window-heater antennas are not intended to outperform quarter-wave roof-mounted whips, they overcome the expense of fitting, the need for holes in the bodywork, the vulnerability to car-washes and vandals, aerodynamic drag etc. They can provide entirely satisfactory broadcast receiving antennas, provided they are not too close to the "rubber" (carbon-loaded plastic) flexible glass-retaining mouldings used on many vehicles.

It has been found that the characteristics of a typical window demister heater used as a transmitting antenna can be affected by the choice of the terminal configuration by which the heater supply and rf power are connected. Compared to broadcast reception, better impedance matching is needed at the operating frequency. It is also usually necessary to achieve nominally vertical polarization. For the police radio experiments (82 to 83MHz transmit, 97 to 100MHz receive) the natural choice is to connect the

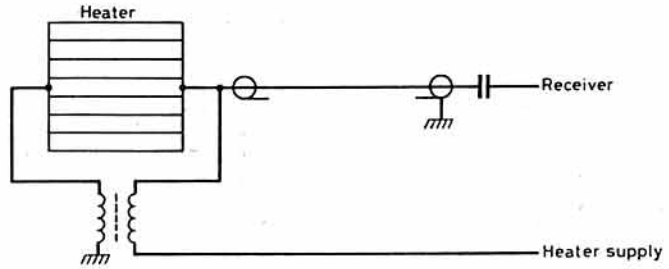


Fig 1. Basic back-window heater antenna isolated from the vehicle chassis by an isolating choke which is bifilar-wound to eliminate dc magnetization of the core. Problems arose on some vehicles due to the capacitance coupling to the "rubber" (often carbon-loaded plastic) flexible glass-retaining mouldings, but this is being overcome by increasing the physical separation

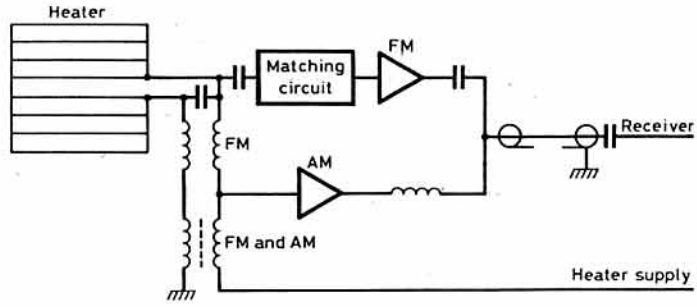


Fig 2. Arrangement for a combined lf/mf and vhf/fm antenna

two heater terminals in parallel (at rf) and to couple an unbalanced feed between this joint and the nearby metalwork. The structure is series resonant within the required frequency range, with a Q-factor of about 30. In this case, because of the separation between transmit and receive frequencies, a single matching network is not possible and relay switching of two matching networks was needed (this would not be the case for 145MHz). A vswr of better than 1·2:1 was achieved on transmission, but it was first necessary to remove the standard tailgate wiper arm which proved to have an unfortunate resonance, replacing a part of the arm assembly with a non-conductive component. The local field from an 18W transmitter at 83MHz did not present a safety hazard to passengers in the rear seat.

The authors conclude that the performance of a heater antenna, for pure vertical polarization, is (as might be expected) inferior to that of a centrally-mounted whip antenna. However, its superior performance for horizontal polarization strongly suggests that in many situations, especially where propagation is strongly perturbed and the polarization is altered, the overall performance will often be comparable, particularly in urban areas. Performance at 145MHz is substantially similar to that achieved on the police frequencies.

Digital signal processing

Many of the papers were concerned with single-chip paging receivers and digital signal processing (dsp) both at i.f and with zero-i.f direct conversion.

As someone who helped to re-introduce the "homodyne" concept to UK amateurs in the 'sixties and 'seventies, I found it interesting to note the large number of presentations concerned with this alternative to the basic superhet. There are two main reasons for this: *(1)* the dc receiver facilitates and makes practicable the virtually complete integration of a "receiver on a chip" and is thus very attractive for radio-paging and cordless telephone applications; and *(2)* the dc approach brings signals down to baseband frequencies for subsequent digital signal processing within the present limitations of general purpose ic devices and analogue-to-digital converters. However, as a number of speakers emphasized, the Costas-loop direct-conversion receiver presents practical problems in achieving precise balance and 90° (quadrature) signals, and the future of dsp seems likely to depend on a/d converters that can cope with an i.f of, say, 1·6MHz and yet provide a resolution with sufficient dynamic range. It is also interesting to find that the snags as well as the advantages of direct-conversion are being re-discovered the hard way.

I was left with the impression that, as amateurs, we need to approach digital processing warily, particularly low-cost compromise designs. Of the professional designs now being developed, most seem to be aimed at a performance "as good as" the classical analogue designs based on crystal filters.

However, a paper "Design considerations for an hf digital radio receiver" by T H Pearce and S D Rogers of the Marconi Research Centre, outlined work on a receiver that should achieve a 120dB instantaneous dynamic range and provide a performance that would represent a real step forward. It was clear that this will require an extremely-low-noise frequency synthesizer and a front-end mixer of exceptional performance. Few of the professional designers seem to believe such performance can be achieved in practice with existing components. The mixer requirement could conceivably be met by Ed Oxner's Si8901 mixer with resonate-gate drive (*TT* March 1986) but you would be hard-put to develop a low-cost synthesizer with the required low noise and jitter to provide a practical drive for a mixer that could use a 120dB dynamic range.

A number of other developments of interest were also reported at Bangor but must await another month. A novelty was a receiver technique that is intended to recover a wanted signal from under a stronger interference signal by providing up to about 55dB of suppression on the unwanted signal. It sounds too good to be true but I'll include an outline of what is proposed next month.

Receivers and transceivers

A paper by D Holman, of Plessey Electronics Systems Research, on "Design techniques for low-cost transceivers" described some cost-cutting techniques used in the Plessey Model PTR5300, a 10/1W multimode battery-operated military "automatic hf transceiver" based on the premise that a soldier regards a manpack set as "a piece of unwanted junk that prevents me from doing my job (fighting) as well as I might" and that the true cost of equipment includes purchase, training, operation and maintenance. Personally I cannot help feeling that it might be better to spend a little more on training (or at least interesting) soldiers in the techniques of radio communication and a little less on making everything automatic and hence more complex. But it would, I suppose, be highly unfashionable not to incorporate microcomputer control!

However, there are some interesting concepts in the PTR5300, including the use of bilateral amplifiers, elimination of the usual output filter bank by re-configurating the atu into a variable lowpass filter when the 50Ω socket is in use (in the whip mode, the atu has sufficiently high Q to provide reasonable out-of-band rejection): Fig 4. An lcd alpha-numerical display tells the operator that he has set his unit to the correct channel/mode etc or reprimands him for his mistakes. Fig 5 shows the configuration of the bi-directional amplifiers used in this model, a control voltage switching from "forward" to "reverse" direction.

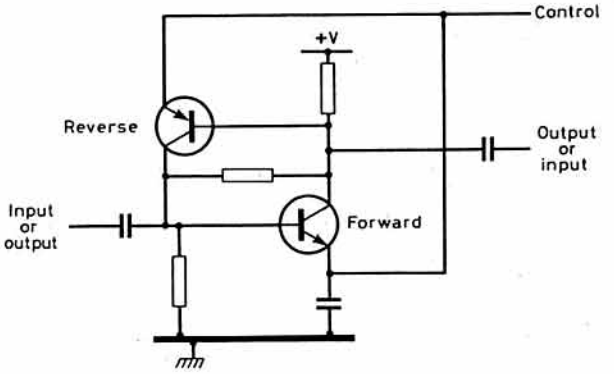


Fig 5. By applying a suitable switching "control" line, a bi-directional amplifier can provide gain in either the forward or reverse direction

The "msj" antenna

Most of the antenna technology used by radio amateurs is derived from professional research and development, some of it stretching back to the early days of hf radio. It is unusual to find a design presented as suitable for professional local broadcasting or communications that stems directly from a design originally developed for use on the amateur bands.

However, in *IEEE Transactions on Broadcasting* (Vol BC-32, No 1, March 1986) E Demacopoulos and P Zimourtopoulos, of the University of Thrace, and J N Sahalos, of the University of Thessaloniki, Greece, present a detailed description and analysis of a vertically-polarized "msj" antenna as developed for use at a local 101·8MHz experimental vhf/fm broadcast station. The "msj" turns out to stand for "modified slim jim" and the design is based with only minor modifications on the 144MHz "slim jim" (*j*-type *i*ntegrated *m*atching stub) antenna first described by F C Judd, G2BCX in *Practical Wireless* April 1978, pp899–901. It is pointed out that this antenna well meets the needs of broadcasters in offering omni-directional radiation concentrated in the horizontal plane, wide usable bandwidth and impedance stability.

The dimensions and geometry of the original Slim Jim (Fig 6) were first analysed theoretically using the so-called "method of moments". This showed that the antenna has an impedance of 50Ω at 155MHz and not in

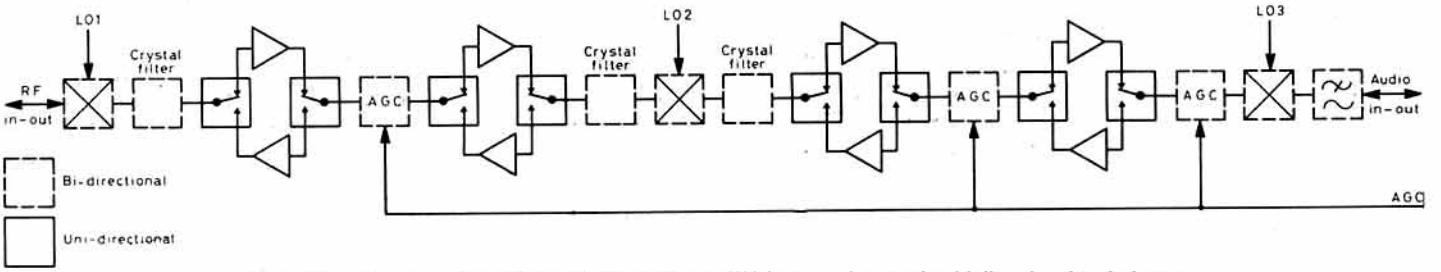


Fig 3. Block diagram of the Plessey PTR5300 10 or 1W hf manpack set using bi-directional techniques

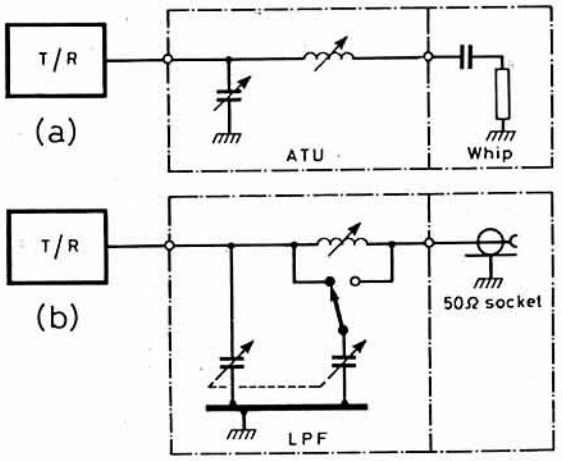


Fig 4. The use of an atu that can be re-configured to provide a tunable lowpass filter to eliminate the need for a bank of lowpass filters

the 144MHz band, but this is not considered a serious problem since it is possible to slightly redesign the antenna by scaling the dimensions. The main problem that emerged was that maximum radiation is at 22° above the horizontal, whereas it is usually desirable for a broadcast antenna to radiate most energy at 0° or even at a slight downward tilt. They retained the basic shape of the antenna but varied the place of the feedpoint, the leg distance and the place and the length of the gap.

The paper presents theoretical and experimental results of a number of variations of these dimensions, aiming at achieving maximum horizontal radiation while keeping the input impedance close to 50Ω.

Their final choice was based on that suitable for an antenna sited near a hill in the city. The actual dimensions for 101·8MHz are as follows: height 2·21m; leg distance 0·06m, height of gap (beginning) 1·10m; height of gap (ending) 1·25m; height of the feedpoints 0·37m; radius of wire 0·004m.

From an amateur viewpoint, the slight upward tilt would not be a disadvantage for some applications, but, for example, for a repeater station on a hill, the modified radiation pattern of the "msj" would be an advantage. The authors conclude: "We believe that with larger leg distance the radiation pattern will become directional in the horizontal plane." This will give some new ideas about the use of the msj as an element in directive arrays.

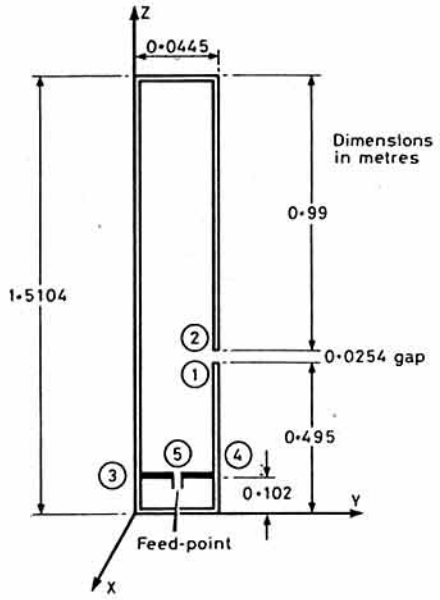


Fig 6. Dimensions of the original "Slim Jim" 145MHz antenna described by Fred Judd, G2BCX, in *Practical Wireless* in 1978 and now proposed in a slightly modified form as a Band 2 broadcast antenna

More on the T2FD

The Revd John Marshall, G3RKH, draws attention to an article "More on the T2FD" which appeared in *CQ* (February 1953) reprinted in *CQ Antenna Roundup 1963*. This included a 600Ω, open-wire version of the T2FD (*TT* July 1986) and some useful general design principles:

(1) Length of each leg should be $(50{,}000/f \times 3{\cdot}28)$ft where f is the lowest frequency of operation in kilohertz.

(2) Spacing is $(3000/f \times 3{\cdot}28)$ft.

(3) Angle of slope is about 30°.

(4) Terminating resistor should be non-inductive and rated at 35 per cent of dc input power (Note that this would have been for a.m operation, and a lower value would suffice for other modes—*G3VA*).

(5) The resistor value is quite critical: 390Ω for 300Ω feeder; 500Ω for 450Ω feeder; 650Ω for 600Ω feeder.

(6) If other than a non-inductive resistor is used, an atu will be necessary.

I must admit to a continued mistrust of an antenna system in which up to about 50 per cent of the rf power fed to it ends up (on some bands) in that non-inductive resistor. With open-wire feeder and a good atu, I strongly suspect that you could radiate equally effectively without there being any resistor in place, though this could result in what would amount to a voltage-fed arrangement on some bands. It must also be admitted that radiating half of your power effectively on a convenient multiband system that can be implemented at low cost is quite likely to result in a well-satisfied operator!

Roach pole plus sailboard mast vertical

A D Macfadyen, G3ZHZ, has been making good use of a multiband Windom (perhaps more correctly a variation of the VS1AA). This uses 300Ω ribbon feeder at roughly one-third the distance from one end (in practice a 140ft top, fed 44ft 5in from the end): Fig 7. This antenna, fed at the shack end through a 1:4 step-up balun, provides an swr of roughly 2:1 on most bands, with G3ZHZ using a transmatch to reduce the swr to near unity swr at the transmitter output. This works well on all pre-WARC bands from 1·8 to 28MHz.

Later, after reading the various notes in *TT* on the use of roach poles, he obtained one of these plus, from the local sailboard stockist, a *free* broken sailboard mast, 4·5m long. He found this could be easily repaired, at least for his purpose, with resin and glass-fibre tape. Among the masts from which he could choose were some made of carbon fibre. Again, recalling earlier *TT* notes, these were rejected. All the masts had carbon fibre

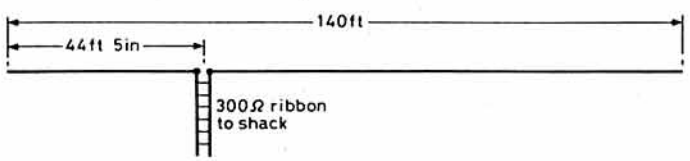


Fig 7. G3ZHZ's horizontal multi-band Windom with 300Ω transmission line

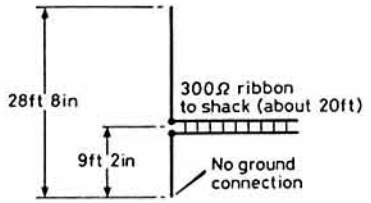


Fig 8. Vertical quarter-sized version of the 300Ω wire Windom used as a vertical dipole antenna by using a roach pole mounted atop of a repaired sailboard mast to provide an effective 33ft-high support. Resonate to 14·1MHz using gdo at shack end of feeder

reinforcement in the form of four thin strips running longitudinally along the mast. However, no problems have arisen in practice from these thin strips. The top of the sailboard mast fits neatly into the butt end of the roach pole, giving a strong self-supporting "whip" some 33ft long. G3ZHZ mounted this on tabernacles to facilitate easy raising and lowering.

After some experimentation he developed a quarter-sized version of his multiband Windom. Final dimensions, following work with a gdo and swr meter, were as shown in Fig 8. The antenna element comprises switchgear cable to BS6231, type BU, 1/1·78mm (2·5mm²). This is approximately 15swg copper wire pvc sheathed and is available from electrical wholesalers. Fed via the 4:1 balun, the swr is about 1·1:1 over most of 14MHz and about 2·5:1 on 28MHz.

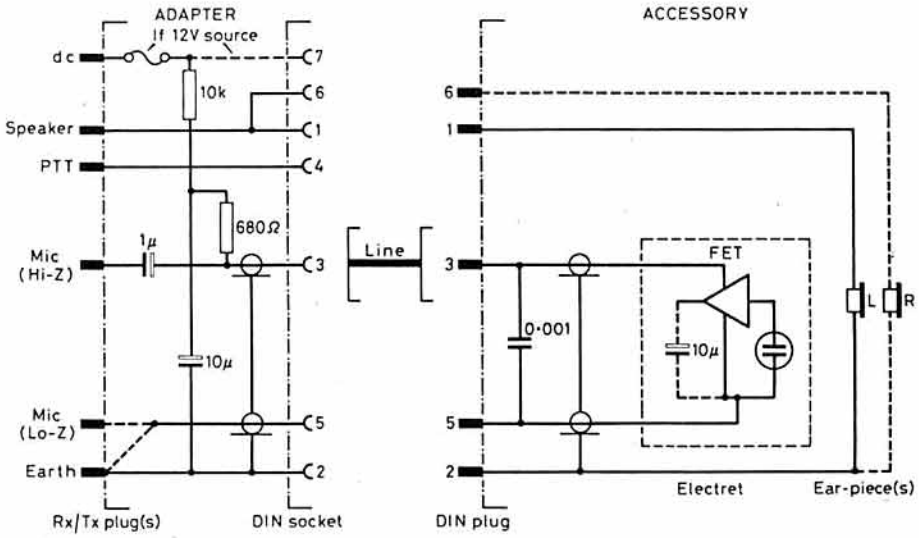
G3ZHZ reports that this antenna works excellently on 14 and 28MHz. With careful adjustment of the atu, good results can be achieved on 7MHz. 21MHz is not currently in use at G3ZHZ, but there is no reason to believe that performance on that band would not be more than adequate. Unlike most verticals, no radials or elaborate ground connection are used even on 7MHz. During May/June 1986 a series of 14MHz cw skeds with ZF1JC (Cayman Islands) showed an advantage on receive of some 3 to 4 S-points over the horizontal windom. On 7MHz, once tuned up, signals are much the same on the vertical and horizontal antennas, suggesting that for those with tiny gardens or small flat roofs there is still hope of harvesting dx while growing vegetables rather than radials!

Electrets on the SACWRG connector

TT February 1984 included details of the DIN-connector arrangement proposed by Dr P J Best, G8CQH, and adopted as a "standard" by the Solihull & Chelmsley Wood Raynet Group (SACWRG). This comprised three elements: (*a*) a "rig adapter"; (*b*) a "line"; and (*c*) a selection of accessories or peripherals fitted with DIN connectors. The object of the exercise is to permit the use of microphones and speakers etc with different equipment and so help to overcome the operational and administrative problems that arise when groups of people depend on equipment owned by individual amateurs.

Dr Best now points out that to accommodate modern, miniature, lightweight accessories (eg headsets) which have electret microphones, whether of home construction or commercial manufacture, just two simple additions are needed. The first requires an alternative "rig-adaptor" to be constructed to add a voltage to the mic-high conductor via a 680Ω resistor which becomes the drain-load for the fet in the electret device. The second requires the electret accessory to be equipped with a DIN plug to replace the original connector if that caused the mic-lo and speaker-return conductors to be presented as a common connection. The required polarising voltage may be sourced at the transceiver's microphone socket from any pin which has between (about) +3V and +9V present. The voltage is not critical, and the current drawn is sufficiently small that pins allocated to scanning functions can be considered as suitable sources. If the source is above about 5V, further decoupled resistance should be considered, as shown (at about 2kΩ/excess volt). The added voltage must be blocked from the preamplifier stages (1μF or greater) to prevent conflict with the transceiver's internal arrangements for biasing and for superimposing tone-burst signals. This externally-added voltage has no effect upon passive microphone accessories when they are used instead, but gives the electret microphone a suitable impedance to match the specific transceiver; normally about 600Ω, due to the drain load which is shunted by the high-impedance fet amplifier in the electret device. The few extra components needed for this adapter may be housed in an in-line module (eg RS Components 456-201) with a seven-pin DIN socket set into one end-plate, and the body of the appropriate microphone plug soldered into the other. The finished item will have strong mechanical integrity and will protrude neatly from the transceiver like certain oscilloscope probe adapters. If preferred, an in-line version can be prepared.

Readers will deduce that this adapter is sufficiently general to surplant any specific adapters which manufacturers might otherwise claim to be an



essential item to use their electret-based accessories. Further, transceivers which have series mic-ptt circuits only need a minimum form of adapter simply to translate their signals onto the SACWRG DIN-socket format. The necessary polarizing voltage is already present as a consequence of the ptt action. Any which require extra shunt resistance can have such a resistor strapped behind the DIN socket of their adapter.

Clearly, any of these adapters is highly specific to the transceiver for which it has been prepared and should not be swopped to other transceivers in any attempt to effect hurried repairs. □

Fig 9. Modified form of the DIN-connector arrangement including provision for electret microphones as now proposed by the Solihull & Chelmsley Wood Raynet Group

MODIFICATIONS TO THE FT707 CONVERSION

M J GRIERSON, G3TSO*

SINCE WRITING the article "Conversion of the FT707 for top band" (*Rad Com* June 1986) the following additional modifications have been made.

RF stage 'on/off' modification

It became apparent that the overall gain of the transceiver was excessive. By adding two diodes and a biasing network it is possible to switch off the rf stage by simply removing the 13·5V receive supply and connecting it to the new diode "by-pass" circuit. A suitable switch already situated on the front panel is the FIX switch, which serves no useful purpose.

The diodes D1 and D2 should ideally be similar to those used in the FT707 for front-end switching. D1 should be a low capacitance Schottky diode 1SS97 or equivalent. D2 is a germanium gold-bonded type 1S1007 or OA47. Both these diodes are of low capacitance and have a low forward voltage characteristic. While almost any diode may work, front-end performance may suffer and, more important, feedback could be introduced on either receive or transmit if the correct types are not used. Diodes D1 and D2 together with the bias components can be wired directly to the underside of the rf board.

Existing component values are shown for PB2201, on PB2903 (early models) TP3 and TP4 do not exist, neither do C47, C58. D19 is a 1S1007 labelled D22, while D22 is labelled D25, otherwise circuits are similar.

To remove the 13·5V receive supply from the rf stage, move the brown wire from rf stage to JO1 pin 4. Another part of the circuit is also fed from the 13·5V receive rail and is connected directly to the rf stage; this is another brown wire which should be re-routed directly to JO1 pin 4.

The operation of the ON/OFF circuit can be checked by connecting the 13·5V receive line to either the rf stage or the by-pass circuit. On transmit neither circuit is activated.

To use the FIX switch, the front panel must be removed and the rf/af gain control lifted out of the panel. Pins 11 to 15 can be identified on PB2102 by the colour of the wire. Remove the red/white wire from pin 11, the white/yellow wire from pin 12, the blue wire from pin 13 and the grey wire from pin 14. Connect them all together. Trace the grey wire to the vfo l.e.d and insert a 560Ω resistor in series.

Disconnect R4902 from pin 11 and join to pin 5 adjacent to R4901 (560Ω). Connect pin 11 to new diode by-pass circuit. Connect pin 12 to JO1 pin 4 rf board. Connect pin 13 to the rf stage rf board. A three-pin flying plug and socket is useful for these three connections.

When the FIX switch is depressed, the rf stage is switched off and the FIX l.e.d illuminates to advise you.

While the S-meter will indicate lower readings, the ability to copy a station on the lower frequency bands is not improved by the use of the rf stage; it simply adds more noise and on 7MHz overloads the mixer. As a rule, better performance can be obtained on 1·8, 3·5 and 7MHz with the rf stage off.

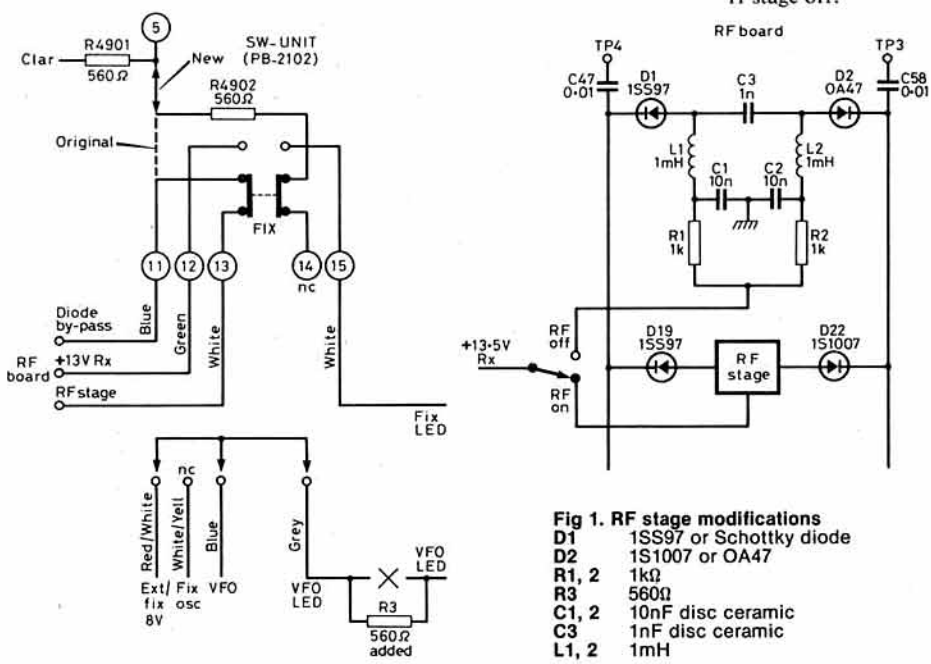


Fig 1. RF stage modifications

D1	1SS97 or Schottky diode
D2	1S1007 or OA47
R1, 2	1kΩ
R3	560Ω
C1, 2	10nF disc ceramic
C3	1nF disc ceramic
L1, 2	1mH

Power output control

The conversion of the FT707 results in a transceiver capable of producing at least 100W rf output. This may concern some amateurs as the maximum legal power is in the order of 30W p.e.p.

The power output on 1·8MHz can easily be controlled by using the existing alc circuitry in the FT707. Provision is made for power reduction on the 28MHz band to comply with lower power limits in certain countries. In the UK this facility is not used and so can be used for 1·8MHz instead.

Pin 6 of J1003 on the rf board is wired directly to the 10A-D positions on S3a, the bandswitch. Remove this wire and reconnect to the new 1·8MHz position. Select 1·8MHz, connect a dummy load and power meter to the FT707, and set power output at maximum while in the cw position. The power output can now be set by adjusting RV2006 on the i.f. board to the maximum legal power for 1·8MHz. There is now no fear of exceeding the power limit on ssb as the alc will automatically restrict the power. □

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HOW ABOUT TRYING 50MHz?

*Ray Cracknell, G2AHU**

MUCH PUBLICITY has been given to the release of 50—50·5MHz to all Class A licence holders, and many are asking if it is worthwhile getting on the band and what it can offer that is not provided by either the 144 or 432MHz bands. Meanwhile many Class B licence holders wish to know if the effort to work cross-band is justified.

The excitement stems from two factors: firstly, the way permission to use the band was granted in the past, then taken away and is now being tentatively returned; and secondly, the nature of the band at the upper limits of ionospheric propagation where it seems the unexpected may always happen and in fact sometimes does and where with simple apparatus and without the aid of expensive modern technology it is still possible to explore the unknown.

The 56MHz band in the 'thirties offered all the thrills of pioneering. Transmitting from the top of Mount Snowdon and tests from aeroplanes made headline news stories and when, in the second half of the decade, G6DH and several others started working dx into Europe, it seemed an incredible feat. In those days equipment was expensive, valves were inefficient, and 56MHz was "uhf" both in name and to everyone's way of thinking. Further, as if the present is an echo of the past, special permission had to be obtained from the licensing authority to use 56MHz (and even 28MHz) and a good reason (generally to conduct propagation experiments at "uhf") had to be stated. The power allowed in those days was just 10W, with only a highly-favoured few being granted 25W licences.

The war brought many changes, and with a return to peacetime conditions in 1945/6, the amateur service was allocated the 50MHz band and more liberal regulations were applied. In 1947, sunspot numbers rose to unprecedented heights and after the first transatlantic contact between W1HDQ and G6DH, all parts of North America were worked by many European countries. PA0UN and others worked Cape Town; contacts were made between North America, South America and the Pacific Islands; and MD5KW (now G5KW), operating from the Suez Canal Zone, pre-empted transequatorial propagation working by VQ2PL near the Victoria Falls.

Understandably, the excellent conditions which prevailed were all thought to be linked to the sunspot maximum, and after it interest rapidly waned. The 'fifties brought a great surge in the demand for vhf tv channels and resulted, in Europe, in the loss of the 50MHz band. Nevertheless interest never died completely. The Americas, Japan, the Pacific Islands, Australia and Southern Africa kept the 50MHz allocation; while in Britain a few enthusiasts maintained their interest, some being given 52·4MHz permits during the International Geophysical Year, while others worked crossband through it and the two succeeding sunspot maxima.

By the advent of the 'eighties, a general migration of tv from the lower vhf channels to uhf was soon under way, and after the Merriman Report which recommended closing down the old 405-line transmissions in Bands 1 and 3, the efforts of the RSGB to regain a foothold on 50MHz were rewarded. Since some European services still continued to use channels covering the 50MHz band, the licensing authority proceeded very cautiously and, at first, only a very carefully chosen few in non-sensitive areas were given permits. In terms of their permits they were allowed to conduct experiments in propagation between 11.30pm and 8.30am, and were obliged to feed back reports to the RSGB. The restrictions were observed most conscientiously, the reports came in, were analysed and a summary was forwarded by the RSGB to the licensing authority.

On 1 February 1983, the first permit holders commenced operating on 50–52MHz, and an analysis of the power and equipment they used is given in Table 1. After 18 months a further 60 permits were issued, activity and enthusiasm mounted, Norway licensed a chosen few, several stations dotted about Europe appeared working crossband and the Sporadic-E season continued to bring a crop of mid-Summer American contacts. After final closure of the Band 1 tv transmissions in Britain, all the existing permits were cancelled. The band was reduced to 500kHz, power output was reduced and for the first time defined as effective radiated power (erp), but operation was permitted without time restrictions and the band was made available to all Class A licence holders on 1 February 1986.

Table 1. Equipment used by permit holders as at December 1984

Effective radiated power		**Receiver front-end**	
24dBw or more	16%	Commercial nf below 3dB	44%
18–23dBw	34%	40673 or equivalent	19%
12–17dBw	25%	3SK88	9%
6–11dBw	19%	3SK95	9%
Less than 6dBw	6%	BF981	6%
		Others	17%
Antennas employed		**Height of antenna**	
5-over-5 Yagi	3%	50ft or over	20%
5-element Yagi	38%	40–49ft	10%
4-element Yagi	13%	30–39ft	33%
3-element Yagi	13%	20–29ft	27%
2-element Yagi	3%		
Mini beams	6%		
Dipole	25%		

RESULTS ACHIEVED DURING THE EXPERIMENTAL PERIOD

It can be seen from Table 1 that about two-thirds of the old permit holders have had to reduce their erp to conform to the new regulations. Nevertheless, at least a third used less power than allowed, and several experiments with low power gave a good indication of what the effects of reducing erp would be. Table 2 shows the time which permit holders devoted to various aspects of 50MHz work, and Table 3 gives the ranges over which extended groundwave QSOs took place during a six-month period.

Table 2. Time occupied on 50MHz work

Activity	Average	Limits
Operating	62 hours	6–208 hours
Monitoring	56 hours	0–660 hours
Experimenting	20 hours	0–150 hours
Developing equipment	31 hours	0–150 hours

Table 3. Extended groundwave range

Distance	No of contacts	
Less than 100km	1,064	
101–150km	652	
151–200km	433	
More than 201km	479	(one GM reported 175)

Extended groundwave

True groundwave propagation at 50MHz is, of course, very restricted, although we know that in practice—apart from where there is complete screening—a signal can be heard continuously over far greater distances. At first the groundwave is extended by scattering from the ground and other obstacles such as power lines and even over hills by a process known as

G2AHU is a corresponding member of the VHF and Propagation Studies committees, with responsibility for writing the Reports on the results achieved during the experimental period of limited operating on 50MHz. He has been the author of several articles in *RSGB Bulletin*, *QST* and *Radio Communication* on propagation studies, and vhf transequatorial propagation is his special interest. The VHF Committee is keen that the work undertaken during the experimental period should not end with the general release of the 50MHz band but should continue on a voluntary basis.

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"obstacle gain", but scattering from the lower levels of the troposphere gradually takes over as the dominant means of maintaining the signal. This tropo scatter is determined by the refractive index (dN) and turbulence, the dN being determined by the change in the temperature, pressure and moisture content per 100ft. When these are normal, the dN has a value of 4, and the maximum range workable between average stations listed in Table 1 was approximately 300km (nearly 200 miles). Under poor conditions this distance could be reduced to about 200km, and under good conditions extended considerably so that under the best conditions we refer to it as tropospheric propagation. The factors affecting the range under normal conditions are: antenna height and antenna gain at both transmitting and receiving stations, the transmitter power and the intermediate terrain—the effect of reducing the erp is more pronounced on extended groundwave than on any other form of propagation.

Tropospheric propagation

Under the best of conditions, signal strengths are enhanced and low-power stations are no longer at such a pronounced disadvantage. The effects are illustrated in Fig 1, in which the contacts made by G5KW/A operating from Penzance, Cornwall, are drawn on a map showing the locations of the original 40 permit holders. Apart from the exotic dx to Iceland, Greenland, North America, Portugal and Gibraltar, all the contacts with British stations are by extended groundwave and tropospheric propagation. Quite obviously, contacts with Scotland and Northern Ireland are by tropospheric propagation, but of the many contacts in the 350–450km range only the operator at the time could classify the signals. The difference between the two modes is very obvious on 144MHz where, when dN rises to around 19, there is complete refraction of the signal; the association of these conditions with high pressure systems and temperature inversions is well known. It

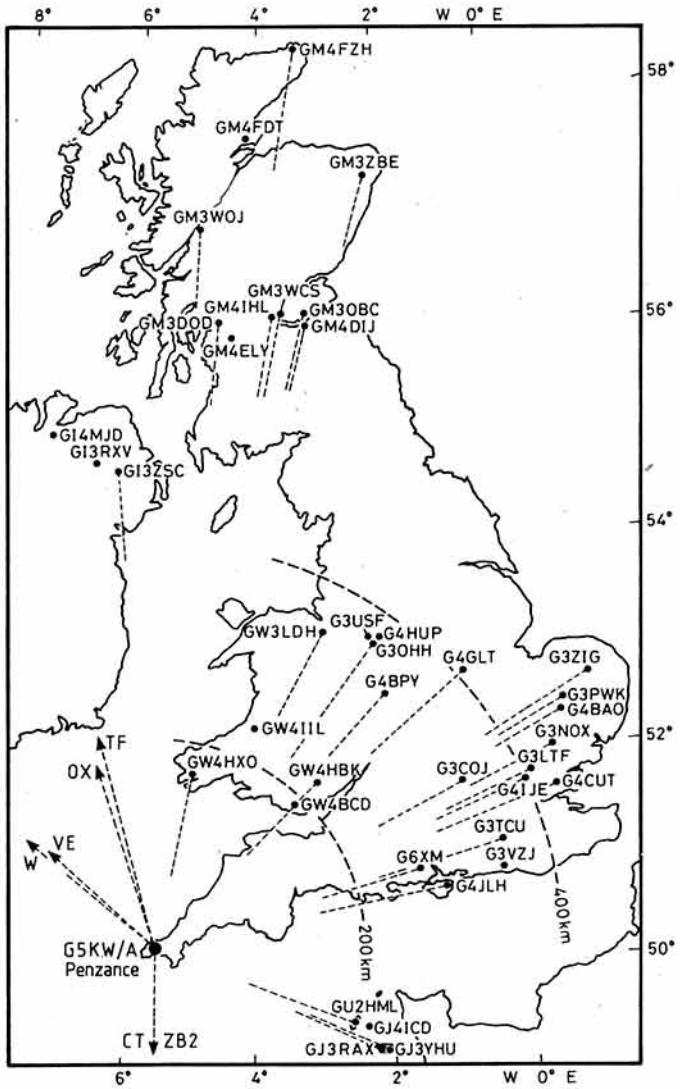

Fig 1. The original 40 permit-holders and the two-way 50MHz contacts worked by G5KW/A from Penzance

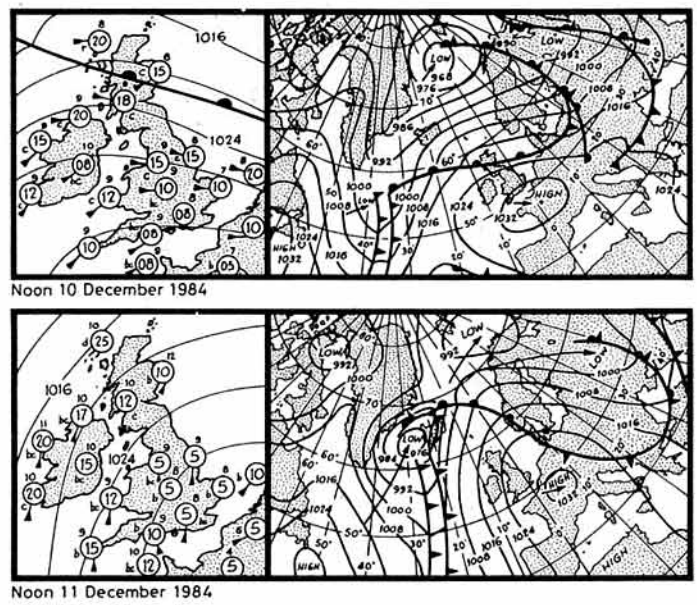

Fig 2. Weather conditions on 10 and 11 December 1984

seems doubtful if the dN would ever rise high enough to give full specular refraction at 50MHz, nevertheless conditions may improve markedly as the contacts between Scotland and Penzance shown in Fig 1 clearly illustrate —that with GM4FZH was as near John O'Groats to to Land's End as makes no difference and spans 600 miles (960km).

This type of tropo is not fully understood and, like so many other modes at 50MHz, offers much scope for further investigation. G3IMW has made several studies of similar tropo events, and during the weather conditions on 10 and 11 December 1984 shown in Fig 2, he noted that from north London, the Buxton 70MHz beacon was 20–30dB above its normal signal strength, and on 50MHz G4GLT in Leicester and G3FDW in Nottinghamshire were 30dB up. GJ3YHU reported that the RSGB HQ 50MHz beacon GB3NHQ was six S-points up in Jersey during the same period. With enhancement of this sort it is obvious that reductions in transmitter power of a few decibels will not make much difference. Hence it would appear that the new power restrictions will not so much affect the maximum range or even the number of other UK stations that can be worked, as it will how frequently the more difficult contacts will be possible.

Sporadic-E

Sporadic-E propagation (*Es*) is sometimes described as the "work-horse" of 50MHz, and the exotic dx shown in Fig 1 would almost certainly be by this mode. After the additional 60 permit holders, the Norwegians and several other European stations working 28/50MHz crossband became active, there was a much welcomed upturn in *Es* activity during the summer months of 1985. A record of the number of days in each calendar month from May 1985 to February 1986 that sporadic-E propagation was observed at G2AHU on 50 and 28MHz is shown in Fig 3. The histogram shows the actual count; the two-monthly running average graphs smooth out the effect of disturbances and illustrate the underlying trends with their mid-summer maxima and small subsidiary increase in mid-winter. For 28/50 crossband work it is convenient that not only are there more openings on 28 than 50MHz but they last longer, appear first and are always present on 28MHz when 50MHz is open.

Every year since the last solar activity maximum in 1979–82, mid-summer openings have occurred to North America. These are so regular that GJ3YHU reports working the same W1 at almost the same time on the same date three years in succession in 1983–5. American signal strengths were described by him as being "chassis-bending", and a recording made by WA1JGK in Vermont sounds as if it were recorded by a tape recorder on GJ3YHU's operating table. In 1985, openings occurred on the nights of 2/3 and 30/31 July into areas that seemed to be clearly defined and about the size of half of England. Several Americans and Canadians, some using powers as low as 10W, were worked from Britain, and G3RMB raised KP4 and W2 using 5W ssb to a dipole. Very many contacts were made and several stations were using contest procedures for up to two hours to clear the pile-ups which occurred. Much more evidence is required, not only from those who worked American QSOs (which are obviously of importance) but also from those who were on and did not hear signals, as this defines the

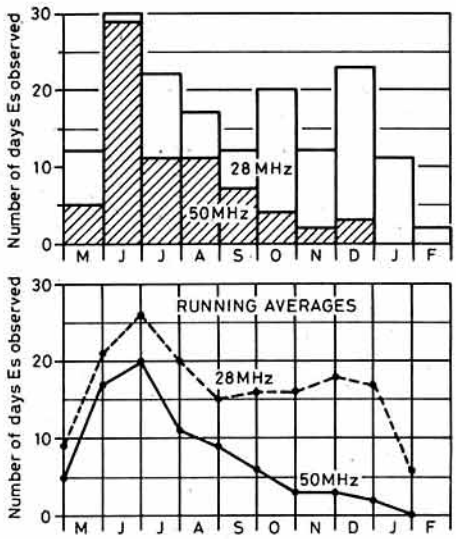

Fig 3. Observations of sporadic-E on 28 and 50MHz, May 1985–February 1986

area into which the opening occurred and gives important clues to the supporting mechanism. The evidence now seems almost conclusive that the first encounter is with sporadic-E ionizations at both ends of the circuit, but what happens between these first areas of refraction is by no means certain. The strength of the signals and their regular occurrence is something to be carefully observed, but at present these factors seem to indicate that conventional 3- or 4-hop propagation is improbable. The question will be hotly debated, but the solution to the problem offers a wonderful challenge for amateur ingenuity.

As well as two-way contacts with Norway, of which there were very many in 1985, crossband contacts were made with Portugal, Spain, Gibraltar, Sweden, Denmark, Norway, France, Yugoslavia and Greenland. The most interesting result of all this activity is that the long-held fallacy that sporadic-E was dependent on high sunspot activity was finally laid to rest. The opposite is in fact true, since temperate zone *Es* is disrupted by magnetic disturbances which are fewer in years when the sun is quiet.

Sporadic-E ionization occurs in patches typically 100km or more across and about 1km thick. Academic opinion now favours the wind shear theory, which suggests that they are due to strong contra-flowing winds at an altitude of 95–110km. The long persistence of *Es*, which in mid-summer appeared to last almost around the clock and often provided good early morning 50MHz contacts with Norway, Sweden, Spain and Portugal, was originally the drawback to the wind shear theory, but the persistence of *Es* is now explained by the transference of charges from the lighter and more mobile oxygen and nitrogen atoms, which would lose their charge rapidly through recombination, to much heavier and less mobile iron atoms deposited in the same levels by meteoric dust.

Meteor scatter

Meteor scatter (ms) propagation works very well at 50MHz. Bursts are considerably longer and stronger than on 144MHz, and QSOs are workable by the backscatter as well as the forward scatter mode during showers and via sporadic meteors. Openings as long as 2min often occur during major showers but sporadic meteors are shorter. When the LAs were first allowed on the band, activity on their 50·300MHz ms channel was intense and many QSOs with British stations were worked with ease. Signals between Scotland and southern England are excellent and duplex crossband ms QSOs with European stations can be great fun as well as being informative, as can comparisons with ms at 70 and 144MHz. G3NOX, working from Saffron Walden in Essex, has successfully transmitted colour sstv pictures by ms to GM3WOJ and to LA6QBA. There remains great scope for further development of similar techniques, and for other experiments such as high-speed data transmission. During the experimental period only cw and ssb could be employed, but under the new regulations fm could also be used for ms work.

Perhaps the most important feature of ms is its dependability. It is not disrupted by ionospheric storms or any other unpredictable events. Sporadic meteors are more numerous in the early mornings, when our rotational velocity tends to scoop up more of the many millions of the tiny shooting stars that daily bombard our upper atmosphere. Unlike showers they are randomly distributed. Showers travel in fixed orbits, like comets from which many originated, and appear to come from a point source in the heavens which must be above our horizon before we can see them visually or by radio. The possibilities of ms were well summed up by GM3WOJ, who wrote in his report: " . . . it is easy to work three QSOs in 15min. In tests with G3IJE I never have to wait more than a few minutes before copying . . . sporadic meteor signals from GB3NHQ peak S6 even during periods of low meteor activity."

Auroral propagation

Auroral propagation (*Ae*) is operative at the very time ionospheric propagation is disrupted. Nevertheless, although we are in a period of very low sunspot numbers, many openings were observed and contacts between Scotland, Norway and the more northerly stations in England and Northern Ireland took place; on 8 and 9 February 1986, just one week after something like 150 new Class A licensees had appeared on the band, one of the best aurora for very many years was visible throughout Britain and the Channel Islands and hundreds of fine QSOs were worked. In the build-up of F-Layer propagation immediately prior to the onset of the magnetic storm, 28MHz opened up for dx, and on 50MHz there were reports of GB3SIX being heard in the USA. Reflections back from the aurora were strong, and good quality signals were received. Many enthusiasts were looking for contacts with Canada via auroral *Es*, but as far as is known at present these did not occur.

The 50MHz band is perhaps the best on which to observe *Ae* propagation. Most openings favour the more northerly situations but, as shown on 8 and 9 February, openings are not confined to them. Signals are often strong, as an excellent tape recording (by G3NNO in Harrogate) of reflections back from GB3SIX which beams at America from Anglesey, lasting until 0242gmt on 21 April 1985, demonstrates very clearly. Several permit-holders became very interested in *Ae*, and it is hoped that some of the newcomers will share their enthusiasm.

FUTURE PROSPECTS

F-layer propagation

The 50MHz band is in that very interesting section of the frequency spectrum which, in years of high solar activity, offers the possibility of worldwide communications by means of F-layer propagation, while still maintaining those modes which have already been discussed. We are, of course, at present in a trough and do not expect to hear F-layer propagation —except under most extraordinary conditions such as occurred on 8 February 1986 and already discussed—until sunspot numbers rise again, when we can expect such events to become more numerous. Unless we return unexpectedly to conditions similar to those in the 17th century when (according to the records) there were no peaks of sunspot activity, the conditions we may expect from, perhaps, 1990 to 1992 are best predicted from results obtained during the last solar maximum (cycle 21). We are again indebted to Major Ken Ellis, G5KW, for the records he kept of three expeditions to the Isles of Scilly from October to January 1979–81. These

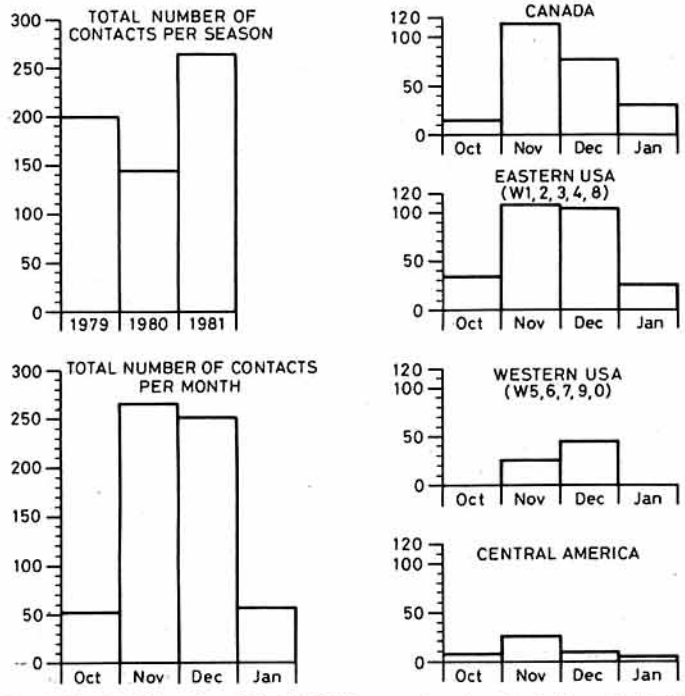

Fig 4. The G5KW study of his 50/28MHz crossband contacts from the Scilly Isles to America during the winters of the sunspot maximum of solar cycle 21

results have been analysed and appear as a set of histograms in Fig 4. The first shows the total number of contacts made on each visit (including January of the following year) and, below it, the totals per month summated over the three visits. In the other four histograms, these totals are then subdivided into geographical zones, namely Canada, eastern USA, western USA and central America.

Newcomers are often puzzled by the seeming paradox of the highest usable frequencies appearing in winter. Earlier explanations were that in the northern hemisphere, the earth was nearer to the sun in winter. This is true, but it is the structure of the ionosphere under the intense ultra-violet and X-ray radiation during the long summer days that causes the F region to subdivide into the F1 and F2 layers during daylight hours and the E and D regions to become heavily ionized and blanket the upper regions. For practical reasons the survey does not cover February and March, when a further rise might be expected and make a mid-winter dip apparent. A second paradox is that results were lower in 1980 when one might have expected to see the maximum. The reasons for this are that sunspot maximum, as well as producing the highest usable frequencies, also produces the peak in ionospheric disturbances, and that the last cycle showed maxima in 1979 and 1981, with reduced smoothed sunspot numbers in 1980.

Good conditions on north-south paths across the Equator occur nearer the equinoxes, and are at their best in October and April when openings to Africa, South America and Western Australia can be expected. Asia and the Pacific Islands can be more difficult, as might be expected from the differences between east and west USA shown in Fig 4, although Cyprus and the eastern Mediterranean may help as far as Asia is concerned. G5KW, G3COJ and G4BPY managed crossband WAC on 50MHz during the last sunspot maximum.

Although these prospects sound very exciting, it is only fair to warn that all is not as easy as it may sound. Openings have to be looked for, skeds have to be made and equipment kept in a high state of preparedness. Many openings will not reveal any manned 50MHz station, apart from North America, but beacons help to reveal possibilities. Actual QSOs are often only the result of getting to know the dx operators via contacts on 28MHz (28,885kHz being the usual contact frequency) and organizing tests at the most promising times.

Licensing restrictions

If you decide to give 50MHz a try, with a Class B licence you must limit your activities to receiving or to operating crossband QSOs. With a Class A licence there are several choices, but transmitter power and antenna gain have to be considered together in order not to exceed an erp of 14dBW carrier or 20dBW p.e.p ssb. This erp can be obtained with 25W cw/fm or 100W p.e.p ssb into a dipole, but if a beam is used, the power fed into the antenna must be reduced by an amount equal to the antenna gain. For example, if you use a three element Yagi or a cubical quad with a gain of 5·5dB over a dipole, and it is fed with coaxial cable with a loss of 1·5dB, transmitter power output must be reduced to 10W cw/fm or 40W p.e.p ssb.

The maximum permitted height of the antenna above ground is 20m (66ft) and it must be horizontally polarized. The height of the antenna is the principal factor determining the extended groundwave range, but more factors need to be considered than at, for example, 144MHz. At a height of three wavelengths (60ft) a dipole or beam over a perfect earth is likely to exhibit a deep null at a vertical angle of about 10°, an angle at which ms, *Es* and F-layer propagation might possibly occur. However, unless one is transmitting over the sea or a salt marsh, a perfect earth is very unlikely and the null will not be so deep or sharply defined. Further, determination of the effective earth is very difficult, and plotting the vertical polar diagram is by no means an easy matter. Operating over the rooftops in a built-up city area, nobody can do more than guess at the effective earth, and the best advice that can be offered is to erect the antenna as high as possible above the surrounding buildings and noise sources. Otherwise, from a reasonably clear site, provided it is above nearby roofs, a height of 1·5 wavelengths (9m or 30ft) avoids any probable nulls in the vertical angle and gives enough high-angle, radiation to work shorter haul ms, and to cover the possibility that long-range dx by F-layer or *Es* may come in at higher angles than the geometry of the circuit might suggest. The reason for this possibility is that much long-range propagation at 50MHz is dependent upon irregularities, tilts and gradients which project the signal into the ionosphere at a flatter angle than that at which it arrives.

At first it may seem that in defining erp the regulations discourage the use of beams. It is cheaper to build a transmitter of 40W and erect a dipole than it is to build one of 10W and erect a tower or pole with a rotator and beam. However, any communication circuit must take into account receiver antenna gain as being equally important as transmitter antenna gain. Further, where noise and interference are significant factors, the receiver antenna gain is of greater importance. The new regulations have reduced erp by an effective 6dB, and if a further 6dB is discarded at the receiver end, results comparable with those achieved in the experimental period will not be possible. A further consideration is the all-important one of avoiding interference with continental tv. A beam enables tv sidebands to be eliminated by directing it away from the source, but it is even more imperative to appreciate that when tv signals appear across the band it is utter folly to transmit into the teeth of the QRM.

Other considerations

It is interesting to learn that when the newcomers appeared on the 50MHz band on 1 February 1986, many were using 10W solidstate cw transmitters. This is a commendable way to start, and such a building project, combined with that of a dual-gate mosfet converter, is a very rewarding and economical way of trying out the band. No doubt, in time, operating convenience may mean a change to a transverter used in conjunction with a 144 or 28MHz transceiver. It is as well to remember that for a long time to come, crossband facilities will also be desirable and, if the station transceiver is tied up, a separate converter and receiver will be required. It is perhaps important to appreciate that in the design of a successful 50MHz station, flexibility is an important consideration, and such tasks as connecting and disconnecting converters or transverters will frequently lead to neglecting the band after giving it an initial try-out. Even if all the equipment is new commercial gear, designing the station for maximum operating convenience remains of paramount importance.

The case for erecting a beam has already been made. This advice is also applicable to listeners and to Class B crossband operators. I can only emphasise after very many years of dx working on 50MHz—and I am sure others will endorse my opinion—that the advantages of a beam at vhf are never totally accounted for in terms of decibel gain. If a signal is 30dB or more above the noise threshold, of course, the gain of a beam is immaterial, but at vhf it is frequently the signal right down in the noise that we are interested in, and then the gain of the beam and the reduction in noise makes all the difference between a readable signal and one that is not even heard.

It makes good sense, therefore, to design for a 10W carrier power transmitter (or 40W p.e.p) and to erect a simple beam. Among permit-holders, a commercial five-element beam was the most popular antenna, but home-built more widely-spaced three- and four-element Yagis showed no significant differences in results. I was surprised to find an absence of cubical quads, which work equally well and can be cheap to construct, and if one lives in northern England in a service area of the old 48–53MHz Band 1 transmitters, there should be no shortage of Yagis that can be stripped, thoroughly cleaned and matched for 50MHz work.

Another aspect of 50MHz is that it is most convenient for home-construction. Whether solidstate or tubes are used for a pa, large coils and capacitors are not required and all reasonably modern gear works efficiently. In beam construction, booms and elements are of easily-managed lengths, so that beam erection is not a major engineering feat and building a mosfet converter calls for little specialist knowledge or skill. Local tvi and bci are not likely to be a problem unless one is grossly careless or the local field strength from the BBC/IBA is very low. There are, of course, obvious precautions—such as a lowpass filter in the feedline, operating the pa in a linear mode and reasonable screening for the transmitter—that should always be taken.

Future of the RSGB 50MHz research project

It is very clear that during the experimental period, not only was the discipline displayed on the band exemplary, but the experimental side was tackled conscientiously as well. Really useful information came out in the reports which I was asked to produce from the information submitted. Although with the new regulations there is no longer an obligation either to conduct experiments on propagation or to submit reports, it must be evident that being able to prove that we are using the band responsibly and endeavouring to pursue aims of increasing our communication skills at vhf, will remain significant factors in retaining use of the band and extending our facilities. We have, therefore, been asked by the RSGB VHF Committee to continue the project on a voluntary basis. A core of permit-holders has already agreed to continue to participate, and we should like a number of newcomers—listeners as well as transmitting members—also to join in. Participation will involve supplying details of your station, operating or listening times, general information on what you hear and work on the band, as well as enlarging upon aspects that are of particular interest to you, and in representative opinions and suggestions. Reports would be requested six-monthly, and in return you should receive a copy of the summary. Those wishing to participate should advise the VHF Committee or me personally. □

NEWS & VIEWS

VHF/UHF

*Ken Willis, G8VR**

Sporadic-E

This summer has seen a dramatic change in the role of sporadic-E due to the fact that, for the first time, 50MHz operation has been possible right around the clock instead of after tv hours, and this has indicated just how often sporadic-E is present up to and above these frequencies. Another factor has been the surprising number of European stations who have gone to the trouble of building receiving converters for 50MHz (and 70MHz), so by working crossband to 28,885kHz, which is normally open to Es if 50MHz is also, there has never been a dearth of dx to be worked. Typical among the "far-enders" are F/G4JCC (St Tropez), who has always seemed to be on 28MHz when things were looking good on 50MHz; and Peter, DL7YS, in West Berlin, who has made over 100 crossband 50/28 contacts with the UK. There are, of course, many others too numerous to mention.

There is much to report, so even if I am as cryptic as possible, much must still be left unpublished. After a poor start, when the expected 144MHz openings in June failed to materialise, much has happened to make 1986 already a bumper year for Es as this is being written in mid-July. Let's first take the 144MHz band.

The pattern up to July had been mainly one of short openings, limited in their coverage, but providing some good dx for those lucky enough to catch them. Then on 2 July around 1500gmt, things started to happen in the north, where Nick, G4KUX, with his 4 × 16 element antennas started to hear the PA and DL stations working the dx, calling USSR stations. At 1604gmt, Nick worked UA6LJV (KN97IE) with reports of 59 both ways over a distance of 2,950km. Nick went on to work RB5VD, RB5CCO (KN59), UB4VWV (KN68), and heard UB5BN (KO50). Other local stations who participated in this opening were G4SXU and G1GUY. Nick says that GM8BDX also worked UA6LJV, and this may well have been over a distance of more than 3,000km, and probably a new Es record for GM. G4KUX made a note of the squares being called or worked by PA and DL operators, and concluded that the event was "a monster".

During the same opening, Paul, G4SXU, reports being called by UA9OF (ZX29d), the Russian being confused and excited by the "strange G callsign" on 144MHz. Paul has since located the station as being in Shadrinsk in the "top corner of Zone 17". The distances involved suggest some rather special propagation, and add further proof to the fact that we need to know a lot more about what happens "up there". There is no indication that the contacts were made other than with beams pointing towards the stations being worked, and they sounded to all intents like normal sporadic-E.

From around 1800gmt on 8 July there was a major Es event which was widespread, but better to the north of the British Isles. Again G4KUX provides some indication of its intensity when he says that he stayed on the same frequency for 60 contacts embracing HG, YO, YU, OE, SP, UB5 etc. At the end of his event the propagation swung to Scandinavia. In the south, OH and SM were worked from AL square, while the northern stations were working into the USSR and East Europe, a sort of crossover effect if one looks at the possible location of the reflecting media. During this event Steve, G0EAK (Harrogate), worked a station in 3V8 (Tunis) in square FW33a, and there are suggestions too remarkable to do more than speculate upon, suggesting reception of signals from OD5, 5A and SU! That this was a major event is beyond doubt. GM4WHD had 26 contacts with YU, OE, OK, HB and D, and heard comments similar to those made by G4KUX that it was one of the biggest-ever openings. From County Antrim GI1JUS reported working one new country and five new squares in 44 contacts with HG (12), SP (13), OK (17), DL and Y24. One of the stations he worked was SO6AUU (JO81IL). This was operated by none other than Kris Partridge, G8AUU, who was on one of his regular summer visits to Wroclaw. Kris sent in a log showing contacts with 11 British Isles stations (G, GW, GM) while he heard six more, plus EI. His first experience of Es from a European location was of great interest, as one can imagine. He thinks the occurrence of Es is far greater in Europe-proper than here in the UK. From the Channel Islands, GJ1TJP (St Martin) caught the 8 July event and worked RA3LE (KO64AR) over 2,385km, and later it swung to SM when SM4GVF and SM5EVZ were worked. There was another minor event at breakfast-time on 12 July when EA1MO (IN71PP) and EA7PZ (IM67) were worked by several stations in the southeast.

On 50MHz the band has been open on many days to EA, OH, SM, OZ, DL, CT etc, with many good contacts being made by stations using only a few watts and simple antennas. The crossband frequency, 28,885kHz, is surely an essential monitoring spot for 50MHz enthusiasts, quite apart from it being an indicator of Es generally by its sheer activity levels. Space permits only a brief mention of some of the more important achievements on this band. Where specific UK stations are mentioned, others will no doubt have made similar contacts, but the intention is to show what paths were open. On 25 June, G3UHH worked EA1MO two-way on 50MHz. Next day he had a similar two-way with W6JKV/CU2 and crossband with EA, F, CT, YO, LA, SM and OZ. OH1ZAA has worked over 100 G stations crossband 50/28. G4WAD had two-way contacts with CT4KQ, LA6QBA/P(JP61), LA6HL/TF (IP24) and LA8AK (JO38).

However, everyone on 50MHz was waiting for the hoped-for opening to the USA and Canada. There was a small one on 9 July, but a bigger one on 12 July. During the day FY7THF was copied at 1227gmt, and ZB2VHF was S9+ earlier, but at 2020gmt W2CAP/1 made contacts with G4BAO, followed later by G4GLT, and K1JRW is reported to have been worked. As we go to print, information is still somewhat sketchy, but the message is clear, this is a very interesting band and much can yet happen now that activity levels are ensuring that it is being monitored most of the time.

Martyn, G3UKV, cites working 29 squares in nine countries two-way, plus seven other squares crossband on 50MHz up to 26 May, and compares this with an all-time total of 38 squares and nine countries on 70MHz in 13 years operating!

Tropo

At last, summer weather arrived and brought with it some excellent tropo conditions during June. On 20/22 June, Shetland Islands stations were enormous signals in the southern part of the country, and LA, OZ and SM were there for the picking, even for low-power poor-location stations. Conditions were good again on 28 June, though this time they did not last so long.

Many operators wrote in to say that they had made their best-ever contacts during these openings, proving yet again that power is not always required for good dx working. Joy Stirling, GM1NTQ (Glenrothes), runs only 25W to a five-element antenna, which she stuck out of the window on a broomstick to great effect since she worked 34 Dutch, 10 German and one Belgian stations during the 20/22 opening, and heard OX. Some of her contacts were made on fm, and she made the point that she worked numerous PD0 stations (who are Netherlands Class D stations) who begged her to remind other Gs to listen for them. They are permitted to use 25W fm input, horizontally polarized, crystal-controlled on S10, 11, 13, 14, 15 and 16, phone only.

It is understood that several stations worked OX9JD during one or both of these events, while others worked into OK and SP. It will be interesting when space permits to debate how many countries one can normally expect to work on 144MHz these days, since high activity plus modern equipment have broadened horizons incredibly compared with only 10 years ago; while compared with 25 years ago, present-day performance reeks of science fiction, and many remarkable contacts are taken for granted today.

Unfortunately we still get little or no input for contacts on 432MHz during these openings, though it is known that very fine dx is regularly worked on this band. Similarly we get almost no news of fm dx contacts such as those made by Joy, GM1NTQ. If the conditions are favourable for ssb, they'll also support other modes, so let's hear from fm-only stations who have interesting contacts to report.

Beacons

Al Lotz, W6RQ, sent a copy of a letter he had received from CE3BCF (Santiago, Chile) which referred to "a computerized beacon on 50,000,700Hz", that is, just inside the bottom end of the 50MHz band. No other details are available at the present time, and Al says he has not previously seen this one on any of the beacon lists.

Although not notified at first-hand, it is understood that the 50MHz beacon GB3RMK suffered some sort of burn-up and is being repaired by

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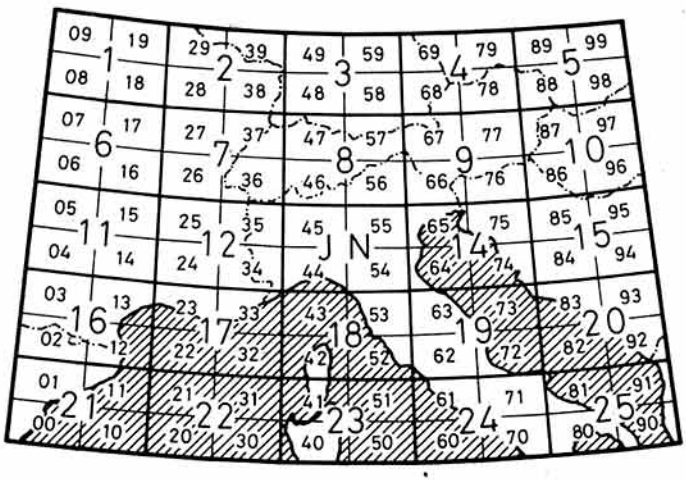
GM3WOJ. Previous to this it was reported as being a weak signal; the reason for the fault is apparently not known with any certainty.

Graham Kimbell, G3TCT (Leatherhead), has listed the occasions when beacon FY7THF in French Guiana was copied in the UK by G4GLT, G3WBQ or himself, between 30 May and 7 June this year. Some 18 separate reports are listed, plus one from SM6PU, the signal being up to S7 on two occasions and seldom lower than S3. Graham says that he cannot yet suggest the form of propagation except that it hardly qualifies for the term "sporadic", and he looks forward to a complete analysis of the situation when all the data is available. He thought that the signal differed from the USA openings last year. They are characterized by a fairly constant peak amplitude with fades typically of about a 4–10s period, whereas the USA signals were accompanied by rapid and irregular fading.

On 28MHz, Steve, F/G4JCC, from his portable QTH near St Tropez, was heard to say that GW3LDH had taken the UK-built 50MHz beacon to Malta, and so by the time this appears in print it may be operational and have been copied in the UK.

OZ7IS says that the two Greenland beacons on 50·045 and 144·902MHz, both signing OX3VHF, are in good health from a new location GP6OQQ, and reports are requested to Bo G Christensen, Telestationen, Box 187, DK-3920, Julianehaab. OZ7IS says that the 144MHz beacon frequency is "OK in IARU Region 1, but it is located in Region 2!"



DJ9HO proposal for a European beacon plan based on 25 channels per locator square plus two "spare" channels

Arend Janssen, DG1BP, has sent details of a proposal from DJ9HO, the newly-appointed West-German vhf/uhf manager, for a new beacon-band concept for Europe. The plan is for 125kHz spacing with 27 channels (5kHz steps). Each QRA locator square would be assigned 25 beacon frequencies as shown in the illustration. Each square would have the same channel assignment, leaving channels 0 and 26 available for special purposes. Arend goes on to say that DG9HO wishes to change the beacon band to 144·450–144·580MHz, and gives some very questionable reasons why this would not cause any problems to ssb operators (including meteor scatter). Arend suspects that the true reason for wanting the change, which is hardly likely to receive IARU support, is to provide more fm channels for West-German operators. DARC set a deadline date for comments and papers for discussion at the April 1987 IARU meeting as 30 June 1986, and Arend says that if they published the new beacon-band proposal in the June issue of their journal, this would give no time for any objections to be raised, "the same procedure as the world-wide locator and the last beacon proposal", says Arend.

The Midlands VHF Convention 1986

This convention, which has now become one of the major vhf events of the year, is scheduled to take place on 11 October, commencing at 11am. As last year, it will be held at Madeley Court Centre, Telford, Shropshire, and in addition to a small trade show, bring and buy stall and bookstall, there will be an afternoon programme of lectures covering cellular radio, 10GHz amateur tv, and meteor scatter techniques, plus an opening address by vhf manager G3WSN, and a vhf forum which will answer questions from the floor. An evening buffet with bar until 10pm requires booking in advance (£5), the entrance to the convention being £1.20. It is hoped to provide equipment-measuring facilities up to 18GHz—write to G3UBX, QTHR, the convention secretary, if you have any special measurement requirements which you would like to bring to the meeting, or in connection with any other enquiries. Make an effort to attend so that this event can continue to flourish, providing as it does a venue somewhat further north of Watford than most!

Repeater news

The fact that little news has come in on the repeater front suggests that most systems are working well, or that the arrival at last of some summer weather has resulted in "repeater people" being engaged in other pursuits. However, two newsletters arrived recently. Leicestershire RG *Lens No 2 1986* contains much of a social nature since the group's tenth birthday party is featured, with several excellent photographs including some of the group members performing the famous Wilson, Keppel and Betty dance, suitably costumed, which earned an encore from a delighted audience. Maybe we could get them to enliven the Society's agm by providing a cabaret during the tea-break. The publication also includes a write-up of the group's agm (by Jack Hum, G5UM) at which a new chairperson, Maureen Winters, G4RZH, was elected, together with a new committee.

Aylesbury Vale RG in its *Newsletter* for July 1986 reports on GB3VA, GB3AV, GB3BV and GB3VB (the last two being still in the "paperwork" stage) and on its own agm, held on a night when a blizzard reduced the attendance to 40, which some groups would regard as a very full house. It is good to note that the chairman of this group is a very well-known vhf operator whose accomplishments I envied years ago, none other than G6NB. The group's full membership stood at 120-plus at the date of the agm. The newsletter contains some interesting "howlers" heard over the system which, when space permits, will be reproduced here since they are of general interest.

Some readers have said that they do not know who represents their repeater interests with the licensing authority and the RSGB, so here is a list of Repeater Management Group members and their specialist roles.

Mike Dennison, G3XDV, chairman.
Mick Senior, G4EFO, vice-chairman, technical officer and proposals co-ordinator.
Colin Dalziel, GM8LBC, co-ordinator for Scotland, Northern Ireland and Borders.
Ken Fisher, G6LMR, co-ordinator for Northern England.
Chris Reed, G8MFP, co-ordinator for Midlands, and BARTG liaison officer.
Graham Shirville, G3VZV, co-ordinator for South East, BATC liaison officer and atv technical adviser.
Geoff. Dover, G4AFJ, minutes secretary, hf repeater co-ordinator.
Chris Young, G4CCC, co-ordinator for southwest, VHFC liaison officer, editor *Repeater Report* and publicity officer.
Martin Stubbs, G8IMB, Data repeater co-ordinator.
Dave Smith, G4DAX, Council liaison.
Ex-officio members are G3ZNU, chairman, VHF Committee; G3WSN, VHF manager; G3FPR, chairman, Microwave Committee.
Elected or co-opted corresponding members (repeater regional reps) are GM3UKG, G3LEQ, G1GNS, G0COA, G8FWY, G3TZM, G2SP, G8GTZ, G3UQH, G0BEQ, G3GHS, G6AWT, G8UCY, G8HVV, G4HSY and G8JNZ.

More on multiband antennas

Ian White, G3SEK, has some interesting comments on his own solution to an antenna problem. Now that he is active on and greatly enjoying 50MHz, he needed an antenna which would allow him also to operate on 28MHz for crossband purposes. He also likes to use some other hf bands (especially the 14MHz vhf/eme net) so his need was for an antenna system which would cover these bands. As an aside, he remarks that "we should not kid ourselves that we can explore the real potential of 50MHz with simple dipoles. With one hand tied by the erp limit, let's not hamper ourselves further . . . a simple beam is vastly better than a dipole."

Ian had an HQ1 two-element beam covering 14–21–28–50MHz, which lost its diamond reflector in a gale. He took the multiband driven element, which now acts as a rotary dipole for 14–21–28MHz, and incorporated it into a four-element 50MHz beam based on a design by DL6WU. The result is a beam of clean pattern with feed impedance close to 50Ω, the entire array being reasonably well-matched on all four bands "without any fancy impedance transformers".

He says that the multiband driven element is not too difficult to reproduce as a homebrew development project, especially if one were to confine it to 28/50MHz. The dimensions of the rest of his 50MHz beam are:

Reflector length: 2,940mm, spaced 1,120mm behind driven element.
First director: 2,710mm, spaced 475mm ahead of driven element.
Second director: 2,665mm, spaced 1,550mm ahead of driven element.

All parasitic elements are $\frac{1}{8}$in heavy-wall tubing mounted above the boom on insulators. For through-boom mounting, he advises extending each element by 0·6 × boom diameter. Results compare very favourably with computer-predicted figures, a forward gain of 7dBd and a f/b ratio of 15dB.

There have been other reports of successful operation using unmodified

HQ1 arrays, though of course what G3SEK has done is to improve his 50MHz performance greatly at the expense of hf-band gain and radiation-angle. If you propose taking a hacksaw to your own HQ1 I suggest you drop Ian a line first to make sure you have everything under control!

From the postbag

Paul Godolphin, G4XTA, would like to know if anyone has received a QSL card from CT1BZT. He worked him while mobile on the A6 from near Shap in Cumbria (1,017 miles) which he thinks may be an all-time mobile dx record. He has tried all the conventional methods of extracting a card from Vladimiro without result, so he is keen to know if anyone else has had success.

Georg Landbo has sent details of the OZ Locator Award, issued by EDR, and available to all licensed amateurs. Contacts with OZ stations since 1 January 1985 count towards the award, the minimum being 10 locator squares in Denmark worked, either on phone or cw, with categories for phone, cw, eme, ms, satellite and crossband. There are 13 locator squares covering Denmark. Send sae plus 10p stamps for photocopy to G8VR for further information.

An interesting letter from Harold Wilson, EI2W, who was a regular contributor to this feature (and its predecessors) in years gone by, said that he had an urge to get back into active amateur radio because of the upsurge of interest in 50MHz. He sent a list of EI "firsts" on 50, 70, 144 and 432MHz, 27 of which he holds himself. On 50MHz during sunspot maximum periods he worked 3,020 QSOs with 45 states of the USA, and Canadian call areas VE1, 2, 3, 4. His home QTH is IO63ND.

David Dodds, GM4WLL, said there was some response from his request in this column for "Tuesday night is 4 metre night". He plans to activate XP square on 70MHz this summer and is considering trying a "ZL special" antenna on this band, stretched across the street from his flat.

Paul, G4SXU (Harrogate), has had his callsign pirated on 144MHz from a station signing GD4SXU. Paul says he has never operated from GD and has no plans to do so, hence anyone using this call will be a phoney. What made it worse was that Paul was QRV on one part of the band when his "look-alike" was knocking them off on another, causing a certain amount of confusion among the locals.

David, GM4WLL, unearthed a paragraph from *Rad Com* December 1970, in which the writer complained that operators were "reactionary" about QRA locators, also that "searching the band" brought good results, especially from the Continent, this instead of calling CQ on the appropriate channel without checking to see who might be around. As Dave says, "Some things never change". On the same topic GI1JUS wrote to say thanks from the GIs for suggesting that operators turn their antennas that way more often, "Much appreciated by GI vhf/uhf operators".

Some interesting propagation information relating to 50MHz submitted by Graham, G3TCT, must be held over until next month. Meanwhile do not miss his scholarly article in *Rad Com* July 1986.

News from Malta

VHF/UHF March 1986 contained information from Walter Gatt, 9H1DU, that the Maltese Amateur Radio League (MARL) was the organization on the island recognized by IARU, and that 9H1DU is the awards manager for the country.

The situation in Malta as regards the representative group or society has always been somewhat obscure, but Henry Souchet, 9H1CD, has now written with some words of explanation. There are, apparently, some 200 licensed amateurs in the islands which comprise Malta, and Henry sent me a list of all currently-licensed amateurs there, so if you need any 9H1 addresses for QSL purposes, send me a sae and I will gladly let you have the QTH you require. Henry says there are no less than four amateur radio organizations in Malta, each having its own awards manager. These are the MARL, the 9H VHF-UHF-SHF Group, the Gozo ARS, and the Amateur Radio, Electronics & Computer Club (AREC). I have told Henry in a letter that UK amateurs are most interested in making 9H1 contacts on vhf, and in claiming any awards which the country offers, but by and large we are not concerned with local issues provided we have a clear understanding of who should be approached in these matters. I must confess to being still somewhat confused since Henry says that all four groups have actively supported the annual 9H1 Falcon contest, one which some UK amateurs have entered in the past, so presumably entries could be sent to any of the four groups concerned. Whatever the local problems may be, we in the UK will always thrill when the 144MHz band gets that certain "feel" and the 9H1s start to come through via sporadic-E. There have been all too few occasions this year, so far. It would be great if 9H1 were ever to be authorized for 50MHz operation, since we could expect many more openings each year on this band than we normally get on 144MHz.

Micro-users' corner

Malcolm Fry, G6VHI, has up-dated his micro program for fax, mentioned in *VHF/UHF* April 1986, to make it "more user-friendly for disc-system users". He still hopes to publish a full article on the subject eventually, but meanwhile anyone wanting the details of the up-date should send an sae plus 20p in stamps for photocopying either to me or to Malcolm, QTHR.

In July *VHF/UHF*, G4JHM requested information on a meteor-scatter micro program, preferably for a Spectrum. I have said before that this column is like a human computer, pose a problem and someone out there comes up with the answer. In this case the response came from Don Ayris, G4GZA, who has such a program which he uses himself (as does veteran ms operator Johnny Stace, G3CCH), so anyone else wanting one please contact Don, QTHR. Don is also an amateur astronomer of some ability with a 10in reflector plus associated electronics in his home observatory. He sent me a photograph of Comet Halley which he took using this equipment and which testifies to his ability in this field. Don would be pleased to hear from others interested in astronomy—he is a member of the British Astronomical Association, and is presently engaged in the deep sky section, "about to engage in the Nova Patrol—real dx!"

Note from G8VR: Is there anyone out there who will write me some programs for an Acorn Electron? I seem to be the only guy in the UK who bought one of these way back when they were first introduced!

Motor-cycle mobile

On 22 June I worked G3ROZ/Mobile who was on the M1 en route to the Denby Dale mobile rally in S Yorks. Nothing unusual in that, you may think, except that the QRB was 100 miles plus, and Steve was on a motor cycle using ssb with horizontal polarization on 144MHz!

G3ROZ/Motor-cycle mobile 80W of ssb on 144MHz.

The photo shows the set-up in an appropriately-named location. The rig is a TR7010 and MRF247, capable of 80W to a halo or HB9CV mounted on the Honda CX500A (that's *not* a beam tetrode by the way). Steve says wind noise can be a problem. He asks the organizers of mobile rallies which are held "in the sticks" to call on 144·300MHz occasionally, say every 15min. He once circled Droitwich rally several times because jokers had arranged the signs so that you followed a circular route if you obeyed them! Sanity was restored by finding numerous antenna-infested cars outside a pub and enquiring within "Is anyone here a radio amateur?", to have the entire bar respond "Yes, I am!"

Late news

In the tropo opening of 21 June, G0EAK (Harrogate), worked LA6HL/TF in RX square in rainy conditions, possibly the first G-TF contact by this mode.

On 50MHz on 21 July, Bill, G3BW, worked W2CAP/1 at 54 both ways while "three other W stations screamed their heads off for G contacts". In this event, Graham, G3TCT, heard WA1OUB and W2CAP/1 weakly but made no contact. However, on 21 July, after hearing W1AW on 28MHz earlier, he heard locals on 50MHz working WA1OUB and made contact himself, followed by a QSO with K1JRW. Others heard were K1RSA, K1GPJ, W1QXX and K2QWD, the last sending QRZ. His conclusions were that the openings followed much the same pattern as last year's, being very selective geographically, with the south not so well favoured, and the log of Ted, G4UPS (Devon), supports this view. □

HF

*John Allaway, G3FKM**

THE LIST of "pirate" Chinese callsigns received from CRSA and published in the July column has prompted G4UZN to point out that on cw only a dot separates a "B" from a "6"—and that surely, therefore, BY5HN and BY5SN could have been 6Y5HN and 6Y5FS! It would be interesting to know at what time the QSOs took place.

G4FFV has been receiving requests for QSLs from amateurs and listeners, mostly on the European continent, for VP8VK. She does not know anything about such a station and is certainly not his QSL manager.

G4UZQ would like information on the QSL routes for contacts he had with ZS3BI (March 1986) and 6W1KY (December 1984, operator "Otto"). Please telephone him at 0494 444280.

NQ4I will return to Guyana for the CQWW SSB Contest, and will operate as 8R1Z for up to five days before the contest when he will concentrate on 1·8 and 3·5MHz. Last year's operation brought 8R1Z to third position in the single-operator multi-band section. This year Rick will have better antennas—a pair of 1·8/3·5MHz slopers and Moseley Classic 33 on the roof of the hotel 165ft high. He will have a TS-930S and amplifier for all bands. On 1·8MHz he will look for Europe on 1,849kHz and will transmit on 1,827kHz. This will happen for the first 10min of each hour from 0200 to 0700.

Overseas news

Barry Woodcock, Z21GT/G4XPZ, writes from Gweru, Zimbabwe, to say that he has been on the air since 14 December 1985. However, he has had problems with his equipment and wishes to praise the efforts of ZS1SL who organized its repair. Barry reports that Gerry Wall, Z22KV, recently became a silent key and that he has bought his FT200. Conditions have been poor but KH6, VQ9 and VK6 have been worked. His usual operating time begins at 1500—when he is submerged by callers from Japan and usually limits himself to 12 QSOs. Useful information to those who are hoping to visit Zimbabwe is that well before travelling a visitor must apply for an import licence and a licence to possess a radio transmitter—this is *not* a transmitting licence. Application should be made to Posts & Telecommunications, HQ, PO Box 8061, Causeway, Harare. The responsible official is Mr H K Brides, who is most helpful. Two passport-type photographs are needed, and for short-term operation the visitors' callsign /Z2 is issued. For longer stays a full Z21 call is given. Barry emphasizes that the licence is issued to the equipment and the operator merely has a certificate of competence to use it.

The N California DX Foundation has elected new officers. They include Bob Ferrero, W6RJ, as president. Bob replaces Jack Troster, W6ISQ, who recently resigned after 15 years' outstanding service to the foundation. Jack has been elected trustee emeritus and will continue to act as advisor and to lead activities relating to the beacon network on 14,100kHz. Full details of how to support this excellent organization can be obtained from PO Box 2368, Stanford, Cal, 94305, USA.

G6ZY/EA6 reports that Spanish amateurs now have 18 and 24MHz. He claims the first-ever G-EA6 QSO on both bands when he worked G6ZO on 9 June, and the first with GM on 10MHz on 10 June when he worked GM3HBT. Stanley favours 18,070 and 24,900kHz and finds that his Tet three-element Yagi seems to work well as a rotary dipole on these bands.

G8PG reports that from 17 April the Spanish authorities reintroduced the morse test requirements for amateurs wishing to operate on the hf bands. This followed massive support from Spanish amateurs, many of whom—to show their disagreement with the "no morse test" decision—voluntarily undertook and passed the morse test despite being offered a "no code" licence. From the same date EA stations were allowed to use the full 10, 18 and 24MHz bands. Minimum age for holding a licence is now 13 years.

Hungarian amateurs are now allowed to use 10W of A1A between 1,830 and 2,000kHz.

DX News Sheet quotes information received from Barry, VP8WTW, who has been elected as secretary of the new Falkland Islands ARC. This was inaugurated at Mount Pleasant Airport on 3 June for the purpose of bringing together active VP8 amateurs and providing a QSL bureau. The club has the callsign VP8FIR, and correspondence should be sent to the address given in "QTH Corner". Active members include VP8s WTW, BKK, BGX, GBO, LP, BTG, BJR, BKM, BKQ, and also G4YFB who was awaiting his VP8 call at the time of writing.

Ernie Stagnetto, ZB2FK, who has been a member of the RSGB for some years, reports that his callsign is being pirated by someone who appears to operate on 7 and 14MHz cw mostly between 0400 and 0500. QSLs are arriving and are mostly from eastern Europe and giving his name as "Ernst".

The Malta Amateur Radio League (MARL) wishes to point out that all QSLs for Maltese amateurs should be sent to the official MARL QSL bureau at PO Box 575, Valletta, Malta.

Drew Givens, GM3YOR. Licensed in 1969, he operates mainly cw on all bands 1·8 to 28MHz. Member of RSGB, ARRL, IDXF, NCDXF and RAFARS. Has operated from OY, TF, 9L, ZB2, VP2M and the Shetland Is

DX news

Leaders of the CRSA were due to meet during August, and the outcome may include the licensing of individual stations and licences for foreigners. There is now a Chinese net which meets at 0200 on Tuesdays on 14,330kHz. *DX News-Sheet* reports that the new BY4SZ station has an FT1 and FT757 with "caged dipole" antennas. BY4RB opened on 22 June and has an FT77 and an IC551.

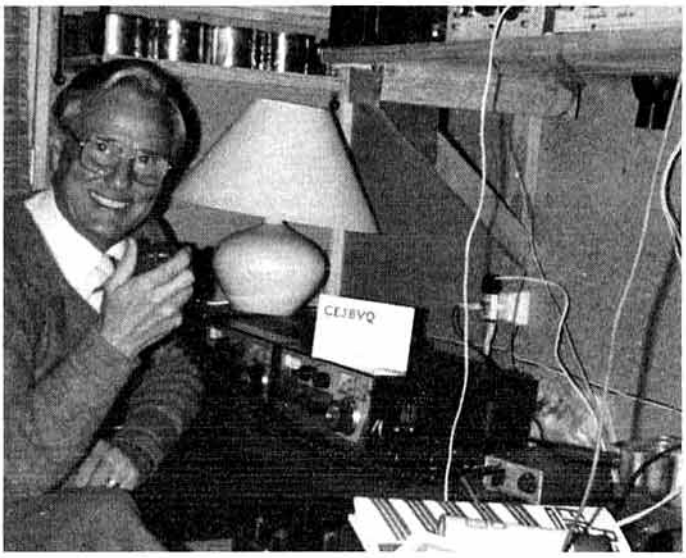
The *Long Island DX Bulletin* reports that there are 15 new club stations in India—supplied by the Indian National Institute of Amateur Radio. These are located in state capitals. The same news source says that KM1R, now back from Vietnam, confirms that neither he nor OK1AWZ were able to obtain an XV licence. Vietnamese law prohibits the import of any transmitting equipment into the country.

KC6IN, located in the Federated States of Micronesia (ie the East Carolines), is often active on 14,185kHz between 0500 and 0600. To mark the 25th anniversary of the Amateur Radio Association of New Caledonia, FK stations are permitted to use the prefix FK25 between 9 August and the end of 1986. From the Solomon Is JR6CMB is on the air as H44JA on 7 and 21MHz ssb. He will remain there until the end of 1987.

ZL1AMO still has logs and QSLs for contacts made as follows: VR6HI (March-April 1979); ZK1MB (Aug 1979); A35EA, ZK2EA. 5W1CW (Aug-Sept 1980); H44RW (Apr-May 1981); YJ8RW (Nov-Dec 1981); 3D2RW (Sept 1982); ZK1CQ (Aug 79 and April 82); ZL1AMO/C (Nov-Dec 80 and Mar-Apr 83); ZK9RW (Oct 83); ZL8AMO (Mar 84); ZL7AMO (May-June 84); FW0BX (Oct 84); A35EA (March 85); 5W1CW (Nov 85); A35EA, 5W1CW, ZK3RW, (Mar-April 86); and ZL7AA. Ron's address is 28 Chorley Avenue, Auckland 8, New Zealand.

AH9AD is still very active and checks into the RA4HA net which meets

*10 Knightlow Road, Birmingham B17 8QB



Edwin Chicken, MBE, G3BIK, of Morpeth, Northumberland, operating from Santiago de Chile in June 1986

on 14,175kHz at noon, and also into the net on 14,220kHz around 0800.

There may be another station on the air from Amsterdam Is from November. This will be operated by F6GWO.

Mike Smedal, A71AD, has recovered his log books from the Qatar Telecoms Authority and can now resume QSLing A71AD and A7XD contacts. He is now in Cyprus as 5B4TI.

ON7IP/ST is to be found between 14,176 and 14,195kHz often around 2230.

GM3YOR will be in Sri Lanka on vacation in October, and hopes to be active as GM3YOR/4S7 from 14 to 28 October, mainly on cw on the following frequencies: 3,503, 7,003, 14,033, 21,033 and 28,033kHz. He may also operate on ssb during the CQ WW Phone Contest.

Welcome . . .

. . . to the following who joined the Society during June: BY1QH, DK8ZV, EI4ALE, EI4BS, F6APB, HE9VGE, K3BN, LA3PT, N9FJO, OZ9YO, SV5RW, VK2XKK, ZS6AFA, 9L1NS, 9L1RR, 9L1RA, 4Z4IO and 5B4BBC. Among the listeners who joined were M Carshalton (Z), M Scannell (EI), J Coleman (EI) and R Dueno (KP4).

1986 28MHz COUNTRIES TABLE

G4JBR—89	G0AGP—69	G4DXW—35
G3VOF—84	G4XAH—67	G3BXM—31 (QRP)
G3XQU—79	G4MUW—61	4B4DN—2
G0AEV—76	G0DNV—57	G4YWG—1
G4RAB—74 (ssb)		

28MHz propagation—Part 2

Between 27 April and 26 May, EA3FHC and G8PG carried out a monitoring experiment on the band, both using QRP (3W or less), the object being to examine sporadic-E propagation from two widely-separated points in Europe. During the period EA3HFC (Barcelona) had 206 QSOs with 27 countries including OD, TZ, 4X and VU. The latter must have been F-layer rather than Es. G8PG had 104 QSOs with 24 countries, the best distance being to UA3. Although EA3HFC, as expected, did much better to the south, his most northerly contact was OZ, whereas G8PG worked LA, SM, UP, UQ and UR. The most interesting contact from G8PG was after the test period at 1121 on 7 June, when ZC4CZ was worked. This was almost certainly either full two-hop Es, or F at the ZC and Es at the G end. One does not hear much about the latter but it is probably more common than most people realize. From northwest England the band was open for 65 per cent of the days in May, and for the period 27 May to 24 June it was open on three days out of four.

SSTV

Until recently, users of the Walter Wrasse SC-1 slow-scan converters and Robot 1200C and 450C slow-scan converters have found their 24 and 48s line sequential colour systems incompatible and not interchangeable. The exception has been in the case of G3OQD, QTHR, who has developed his home designed and built slow-scan converter to cope with both systems most satisfactorily. Martin has now developed a substitute eprom for the Robot 1200C to completely overcome the incompatibility with excellent colour results and without affecting the normal functions of the unit in any way, and no extra switches are needed. G3WW, who has both these commercial systems, reports that he has fitted this modification and that it is fascinating to watch the 1200C automatically changing frame speeds and checking that it is being done on the SC-1's monitors.

QTH CORNER

FH5EB	Box 110, Dzaoudzi, Mayotte 97610.
FO0FB	R Forbes, WB6GFJ, PO Box 1, Los Altos, Cal, 94022, USA.
HC1MD/HC8	J Kroll, K8LJG, 3528 Craig Dr, Flint, Mich, 48506, USA.
SX1MBA	RAAG QSL Bureau, PO Box 3564, GR 102-00, Athens, Greece.
TA1A	Dr Ural Akbal, Box 787, Istanbul 34435, Turkey.
TA3B	Mustafa Tandogan, Box 839, 35214 Izmir, Turkey.
VP8FIR	Falkland Is Radio Club, PO Box 260, Mt Pleasant Airport, Falkland Is.
VR6HIJ	(see ZK1XP).
YM3KA	Box 937, Izmir, Turkey.
ZF2AH	via W3HNK, Box 73, Edgemont, Pa, 19028, USA.
ZK1XP	H Layton, G4AAL, 341 Stourbridge Rd, Bromsgrove, Worcs B61 0BN.
ZK1XV	R Crosby, VK2BCH, Box 344, Forster 2428, NSW, Australia.
ZL7BKM	ZL2HE, A Law, Mangatoro, Private Bag, Dannervirke, New Zealand.
4M4A	M Manafo, 2419 Willow St, Wesleyville, Pa, 16510, USA.
4X8T	Box 2002, Tel Aviv, Israel.
8R1Z	WI4K, Carol Shrader, 4065 Ophie Dr Manetta, Ga, 30066, USA.
9H QSLs	MARL QSL Bureau, PO Box 575, Valletta, Malta.

Award

RAAG Award

Offered to all licensed amateurs and listeners who have verified evidence of contacts with amateurs in Greece since 1 January 1975. At least seven stations from the call areas SV1 to SV9 must have been worked or heard. There are no band or mode limitations. Send certified copy of log extracts plus US$2 or eight ircs to: RAAG Award Manager, PO Box 3564, 102 10 GR Athens, Greece.

Contests

Scandinavian Activity Contest

1500 20 September to 1800 21 September (CW)
1500 27 September to 1800 28 September (Phone)

European entrants work Scandinavia. Single-operator all-band and single-operator all-band QRP, multi-operator single-transmitter all bands (which must remain on a band for at least 10min after the first QSO on it following a band change), and listener sections. 3·5 to 28MHz according to IARU band plans—please note that therefore 3,560-3,600, 3,650-3,700, 14,060-14,125 and 14,300-14,350kHz should be kept clear of contest traffic. Exchange RS/T plus serial number (from 001). The same station may be worked once on each band. Europeans score one point per QSO, and the multipliers are the different call areas worked on each band added together. Portable stations without a district number count as "0" (ie G3XYZ/LA = LA0). OH0 and OM0 are separate call areas. Final score is total QSO points times multiplier, and logs must show date, time, station worked, numbers sent and received, band, and if multiplier. Listener logs must contain date, time, Scandinavian station heard and message being sent by it, own report, station being worked, and multiplier and points claimed. All entrants must submit a "dupe" sheet if more than 200 QSOs are made on a band, and stations on this should be listed by DXCC country and call area. The usual summary sheet is required, and entries should be sent to EDR Contest Manager OZ1LO, Leif Ottosen, Bankveejen 12, Køng, DK-4750 Lundby, Denmark, and be mailed no later than 30 October. Copies of rules are available from G3FKM (saes please).

VK/ZL/Oceania Contest

1000 4 October to 1000 5 October (ssb)
1000 11 October to 1000 12 October (cw)

A maximum of 12h operating time may be done in one hour blocks, based on the even hour to the even hour (eg 1000-1100, 1300-1400 etc) and with minimum periods of 1h. The receiving section combines ssb and cw as above with a maximum of 24h. One QSO per band on all but WARC bands. Two points are scored for each QSO with VK, ZL and Oceania, and exchanges consist of RS/T plus serial numbers from 001. The multiplier is the sum of all VK/ZL/Oceania prefixes worked from each band, and Oceania stations are those which qualify for that continent for WAC. Submit separate logs for each band and for each section, show date, time, callsign, numbers sent and received. Underline each new prefix and state VK/ZL/O prefix's claimed for each band. Summary sheet must show callsign, name and address, total points claimed for each band, total multipliers on each band, points claimed and the usual declaration. Post to NZART Contest Manager ZL2GX, 152 Lytton Rd, Gisborne, New Zealand, to arrive by 15 February 1987. Copies of rules are available from G3FKM (saes please).

AGCW-DL Straight Key Party

1300 to 1600 4 October

CW only. 7,010-7,040kHz. Open to any licensed amateur using a straight key, and to listeners. Call "CQ HTP". Class A 10W input, Class B 100W input, and Class C 300W input. Class D is swl. Send RST plus QSO number, class name, and age (yls send "XX"). Points: QSOs between Class A and Class A = 9, Class A with B = 7, Class A with C = 5, Class B with B = 4, Class B with C = 3, and Class C with C = 2. Log time, band, call, numbers sent and received, class, description of station, points calculation and declaration. Submit by 31 October to Friedrich Fabri, DF1OY, Vor dem Steintor 3, D-3017 Pattensen, FR Germany. For results list enclose an irc.

IX Concurso Iber-Americano

2000 4 October to 2000 5 October

Work anyone. 1·8 to 28MHz, phone only. Class B is single-operator non-South American and Class D multi-operator non-South American. Exchange RS plus serial QSO number. Stations may be worked once per band. QSOs with Latin America count three points, with others one point. The multiplier is Latin American DXCC countries worked on each band. These are: CE, CO, CP, CR,

CT, CX C3, C9, DU, EA, HC, HI, HK, HP, HR, HT, KP4, LU, OA, PY, TG, TI, XE, YS, YV, ZP, 3C and their DXCC dependencies. Logs must show time, numbers sent and received, if multiplier, and points and duplicates must be clearly marked. Post before 30 November to IX Concurso Ibero-Americano, Gran Via de les Corts Catalanes, 594, 08007 Barcelona, Spain. A participation certificate will be given to those making 50 QSOs, and an award to the leader in each DXCC country.

Loano Elettra
0000 15 September to 2400 15 October
Phone and cw on 1·8 to 28MHz and vhf and uhf. Italian stations may only use 3,613-3,627 and 3,647-3,667kHz on the 3·5MHz band. Work stations in the Loano Division of ARI—they will use special prefixes IO1 and IY1, and visitors will use these as suffixes. Loana stations will give RS/T, QTH and progressive QSO number (from 001). Others only give RS/T. Each QSO is worth one point, and stations may be worked repeatedly on "different frequencies". The multiplier is the number of Loana stations worked—each counts once only. Listeners may enter. Logs should show date, gmt, station worked, exchanges and score claimed. Post before 15 November to I1XYN, ARI, Loana, CP16, 17025 Loana SV, Italy. The "Loano-Elettra" certificate showing Marconi's boat, will be awarded to all who make at least 2,000 points, and applicants should send US$5 to 10 ircs to the competition manager, I1XYN.

N California QSO Party
1600 27 September to 2200 28 September
Copies of rules available from G3FKM (saes please).

Band reports

Once again a good batch of reporters who managed to notice the slightly early deadline. Thankfully, things will be back to normal for the next issue. Those who contributed include: G2HKU, G3YY, G5BM, G5JL, GM3CSM, G3s GVV, KSH, PJT, XBM, G4s EHQ, JBR, GW4KGR, G4s LRS, MUW, RAB, UOL, UZN, XAH, G0s AEV, AGP, DNV, and RSs 10906 and 88639.

Stations listed in italics were using A1A.

1·8MHz 0300 *C30C, C30BAN.* **2200** *OH0MD/OJ0, ON4UN* (?), *UA2FGA, UA9AJX,* **2300** *UP2BW.*

3·5MHz 0300 HC5EA, W1-W4, W0.**0400** *C30BAN,* W5XZ. **0500** *FM5WU,* VE1CCX (P.E.I), ZL2BT. **2100** S79BV. **2200** CX9CO, JA4CYG, ZS6BWY. **2300** *OH0NY/OJ0,* YB0WR, *I0SNY/ZB2,* ZS5BK.

7MHz 0000 *ZF2CD.* **0100** *CE, FY4EE, TI4BGA/8.* **0400** *HK6BFC, TI2OY,* **0500** *C30BBC, CE0ZIG, CO, FM5BW, GB0SWR/MM* (nr. VR6), *HK, LU, OA, PY, VK2-5, VK7, ZF2AH, ZL2-4, 9J2BO.* **0600** *OH0MD, R9AL,* VK, *6F3RT.* **1300** *OY/OZ3QN.* **1800** *HB0/DL5BBI.* **2100** *OH0MD/OJ0.* **2200** *SX1MBA, I0SNY/ZB2, ZS1JI.* **2300** *HI8LC, SV9CG.*

10MHz 0400 *W7s, ZL2ADX.* **0500** *VK3, ZC4JV.* **0600** *K5HK/KP2, VK2-5, ZL3.* **0700** *OY7ML, VK5FE, W1HMD/4.* **0800** *C30C, YV1BVJ.* **1600** *OY1R, 4U1ITU.* **2000** *FP/K1RH, LU, OA, W1,2,4.* **2100** *VE1-3, W1-4.* **2200** *CT1YH, FM5WD, OY1R, 7X2AX.*

14MHz 0400 W6-7. **0500** JY9RL, VQ9RN, *VU2BK.* **0600** *FO8DP, KL7s,* VE8DX, W6-7. **0700** FO0ASJ, *KL7s,* VY1CO, ZK1XV, 5W1DZ, *TM3KA, SX1MBA.* **0800** TI8CBT, TR8CR, YI1BGD. **0900** DU7RLC, 3C0A. **1000** C30C, FR5DX, OH0MD/OJ0, OH1RY/5B4. **1300** JA (to 2000). **1400** K6AV, UZ0AXX, W6HX. **1600** A4XJL, *RV0YF,* VK6WC, VU. **1700** WB5IZH/KH8, UV100. **1800** HL1JE, HS3CE, *NN7X*(Ariz), VQ9ZZ, 5X5GK. **1900** A92EM, VY1CO, W6, *OE3EMN/YK,* 3C0A, 9L1AR, 9X5DH. **2000** *BT1BK,* OD5RH, VP8MT, ZD8TT. **2100** FH5DX, ON7IP/ST2, V44KI, *XEs,* 5B4MF. **2200** AL7BL, VK, W6-7. ZF1JT, *ZF2BN, 3C0BX,* 4U1UN. **2300** J88BK, *OK1XC/JT, KG4XO,* VP2MU.

18MHz 0700 *DL, F, I, LA, OE, OZ, SM, Y, YU.* **0900** *G6ZY/EA6, SV0AH.* **1100** *PY7XC, YU7AOP.* **1400** *ZS2A.* **1500** *C30BAV, F, Y,* **1800** *EA, PY.* **2000** *AZ1ARU, G6ZY/EA6, EA8, F, PY.* **2000** *FM5s BH, WD, OA4IU, OY1R.* **2200** *SM5HV/HK7, HH2CF.*

21MHz 0800 TA1D, YM3KA, ZS3GB. **0900** AP2P. **1100** *HV1CN.* **1600** *I0SNY/ZB2,* 9J2BO. **1800** C30C, HC5EA, OD5TC, 5N4TME, 9X5WB. **1900** CE, LU, PY, PZ1DV, TA2G, *6W1AD.* **2000** FM4DN, VP2MU. **2100** AZ1ARU/5, *9YNW.* **2200** HK, TI5CMM, YI1BGD, YV, ZF2FN, 5K3LR.

24MHz 0700 DL, EA6, HB, I, Y. **1500** *DL, G6ZY/EA6, EA, HB, LA, SM.* **1900** *KV4AD.*

28MHz 0700 OD5s AS, PL, 5B4DN. **0800** OD5WW, TK5EP, UG7GWL, *I0SNY/ZB2.* **1000** ZB2IF. **1100** A71BK. **1200** A92DZ, VE1BNN, 4X6. **1300** C30BXX/P. **1400** 7X2VMK, 9J2LG. **1500** EA9MM, LU1HOO, *OH0BA,* VU2CVP, ZS1DL. **1600** UI8BGS. **1700** CE3ESS, *PP5OV,* 3A2LF, 4U1ITU. **1800** CN2AQ, CU2DG, LX2PR, NP4A, *TA2A,* T77C, UM8MIG, OY/DL3LAB, 5N9GM. **2000** OH0MD/OJ0. **2100** CE0ERY, NP4A, PZ1DV, W1-4 (to 2300). **2200** CE, LU, PY, 3C0A, 8R1RPN.

As usual, thanks are due to the editors of the following for information extracted: The *Ex-G Radio Club Bulletin* (GI3OEN/W6), *Long Skip* (VE3IPR), *Lynx DX Group Bulletin* (EA2JGO), *DX Family Newsletter* (JH1KRC), *DX'press* (PA3CXC), *CQ Magazine* (W1WY), *DXNL* (DL3RK), *Long Island DX Bulletin* (W2IYX), and *DX News Sheet* (G4DYO).

Please send everything for the **November** issue to reach G3FKM by **25 September.** □

HF F-layer propagation predictions for September 1986

The time is presented vertically at two-hour intervals 00(00)gmt to 22(00)gmt for each band, ie 0 = 0000, 2 = 0200, 4 = 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	....	....	.....11.....	....133222..	...35666662.	..1555556883	645322224688	+52......3++
MALTA	....	....	.....1..12..	....2322341.	...26666785.	111665567894	876532234789	++52.....4++
GIBRALTAR	....	....	.........1..	.....11.131.	....4554475.	...276556893	663653334688	+++42....3++
ICELAND	....	....	....	....	.....243342.	...136656772	532543334677	+++42....35+
***ASIA								
OSAKA	....	....	....	.....11.....	...13442....	...23222321.	....1...1451	..........3.
HONGKONG	....	....	.....11.....	....1221....	...2444422..	....2222465.	1473	42
BANGKOK	....	....	.....111....	...12333....	...23544....	....1222135.	1.....1474	244
SINGAPORE	....	....	....11111...	...1233331..	...23545651.	....1222476.	1.....1471	244
NEW DELHI	....	....	....11111...	...123333...	...23445541.	1.1112224663	41.....1478	3.........24+
TEHERAN	....	....	....121221..	...2343443..	...43445673.	213211224784	741.....1478	+2........24+
COLOMBO	....	....	....1212....	...124342...	...224455...	1224243	21.....1478	3.........24+
BAHRAIN	.....1..1...	...1232231..	...2344453..	...33345672.	3121..224775	841.....1478	+2........4+
CYPRUS	.....11111..	...1343344..	...35656662.	..1666667972	645433345897	985211113589	++2.....2++
ADEN	.....1112...	...123345...	...2345672..	...3224576..	4121..124745	851.....1478	+3........4+
***OCEANIA								
SUVA/S	....	....	....	......1.....	....1232.3..	...33222.62.	...31....14..	....
SUVA/L	....	....	.........1.	.........2.	...2......5.	...521...23.	...31....31.	....
WELLINGTON/S	....	....	....	....	...12111....	...43222..2.	...31....131.	....
WELLINGTON/L	....	....	....	....	...1.......1.	..1.4......31	..131....21.	....
SYDNEY/S	....	....	....	....111.....	...34311....	...33222211.	...11....1431	....
SYDNEY/L	....	....	....	....	2	....2.....43	...11.....31	....
PERTH	....	....	....12.....	....2341.....	...35531....	1.113222232.	1....1....1461	242
HONOLULU	....	....	....	.........1..	.........31.	...2211.231.	.131....11..	....
***AFRICA								
SEYCHELLES	....	.....11121..	...1233453..	...23456761.	...322457851	3121..224786	841.....1478	+2........4+
MAURITIUS	.....1....	.....11221..	...1244554..	...24556771.	...333456861	1111.1224786	731.....1478	+.........4+
NAIROBI	.....11....	.....12332..	....234665..	...23457771.	...42235686.	4.22...24785	832.....1478	+5........4+
HARARE	.....1221..	.....12443..	....245676..	...14557882.	...43335687.	3.13..124685	854.....1478	++........4+
CAPETOWN	.....122...	....113441..	....335773..	...15567861.	...45445686.	...421124682	5642....1477	++3.......4+
LAGOS	.....1233..	....113455..	....3356782.	....5456894.	...35323688.	12.52...3684	7823....1478	5+4.......4+
ASCENSION Is	.....23....	....1.11451.	....3223683.	....5444686.	....6433479.	13..31..1585	78.21....278	++4.......4+
DAKAR	.....13....	.....112351.	....2334584.	....5445687.	....6433479.	131341..1485	68641....168	++5.......3+
LAS PALMAS	.....1.....	.....1..131.	....2332363.	....4554586.	...176667892	352564334688	897531112379	+++2......4+
***S. AMERICA								
Sth SHETLAND	....	.......121..	......23531.	......45662.	.....345666.	111122223354	67631...1124	4+5..........
FALKLAND Is	.....2....	.....11241..	....133574.	.....355676.	4455571	1..312222345	75541.....15	5+5.......2
R DE JANEIRO	.....2....	.....111141.	....333474.	.....554576.	5433571	241.221..257	78621.....27	++5.......4
BUENOS AIRES	.....2....	.........141.	.....322364.	.....544576.	5444561	2411.2211236	78631.....15	++5.......2
LIMA	....	.........11.	......11133.	......32245.	433342	331.2221..24	78621.....2	4+5..........
BOGOTA	....	....	.......1.122.	.....32244.	3432243	331.1221..25	78621.....2	5+5..........
***N. AMERICA								
BARBADOS	....	.........11.	.....111133.	.....332245.	5423363	331.132..136	88621.....14	++5.......2
JAMAICA	....	....	......1..11.	......22233.	432342	32...221..24	6851.....2	4+5..........
BERMUDA	....	....	......1..11.	......22233.	2433453	42...2211136	7851.....13	5+5..........
NEW YORK	....	....	.........1.	......11122.	343352	31...2221135	674.....2	3+5..........
MEXICO	....	....	.........1..	.......1122.	243221	21....221..2	3641.....	.45..........
MONTREAL	....	....	....	......11112.	333442	31...2221234	6741.....12	3+5..........
DENVER	....	....	....	....	22221	2.....122112	2441.....	.34..........
LOS ANGELES	....	....	....	....	.....1212.	1.....22111	13421.....	.24..........
VANCOUVER	....	....	....	....	.....122.	1.....113211	12321...1...	..4..........
FAIRBANKS	....	....	....	....	.....121.	...221123321	1.231...111.	....

No sunspot information has been received from SIDC Brussels in time for this issue

SWL

*Bob Treacher, BRS 32525**

Fourth HF Challenge

As the three previous hf challenges have proved to be successful, the fourth challenge will take place to coincide with the ssb and cw legs of the CQ WW DX Contests. The ssb leg will therefore take place from 0000 25 October to 2359 26 October, with the cw leg from 0000 29 November to 2359 30 November. As usual, the idea will be to log as many countries as possible. Only one station from each DXCC country can be logged on each of the six bands. The full rules are as follows:

(1) Entries may be single-band or multi-band, but not both.
(2) Each different country heard on each band will count for points. (*a*) Countries in the swl's own continent counts one point on 28, 21 and 14MHz, two points on 7 and 3·5MHz, and three points on 1·8MHz. (*b*) Countries outside the swl's own continent counts three points on 28, 21 and 14MHz, five points on 7 and 3·5MHz and 10 points on 1·8MHz.
(3) The final score should be calculated as follows:
(a) Single-band entries—the total points should be added together and multiplied by the number of DXCC countries heard (eg 180 points × 80 countries = 14,400).
(b) Multi-band entries—the total points from each band must be added together and multiplied by the total number of DXCC countries heard on each band.
(4) Entries must be on standard sized log sheets and written legibly and in ink. A multiplier check list showing the countries heard on each band in alphabetical order must accompany each log.
(5) Entries showing the full callsign of the station heard, the station being worked, the time and signal strength of the station heard. (Any entry of less than R3S3 will be deleted from the log—signals just are not R2S1 on 14MHz!) Logs should be sent to Bob Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ, to arrive no later than 24 November for the ssb leg and 22 December for the cw event.

1·8MHz successes

My reference to listeners with good 1·8MHz scores prompted four responses. BRSs 25429, 52543 and 1066 adding to my own entry. Firstly, the table:

Station	1·8MHz DXCC Countries heard	Countries confirmed	Mode
BRS25429	110	101	ssb
BRS32525	105	73	ssb
BRS1066	90	77	cw
BRS52543	83	0	ssb

Let us start with David's superb effort. He started listening on 1·8MHz seriously some time ago, the magic three figures taking a few years to materialize. David is very thorough with his QSLing and achieved the 100th confirmation earlier this year. His best confirmations are from CY0SP1, 6Y5NR/KP1, NR5M/KP5, OA4ZV and 5V8WS.

My effort to reach 100 countries heard suddenly gained momentum once the various administrations released the band to the amateur fraternity, the last 30 countries taking only two years. The highlight was most certainly hearing ZL3GQ at such good strength, logging CE8ABF working stations in the USA, and getting solid copy on a number of occasions from VU2GDG. Brad, BRS1066, still has 10 to go to reach the three figures. His best QSL is from 5A3CJ from a logging in 1963. Other choice cards have come in from HZ, J28, KP2, VK6, V2A, 3B9 and 5N2. Martin, BRS52543, needs 17 to reach the three-figure target, something he hopes to manage in the next two dx seasons. He does not send QSL cards, thus the zero in the confirmations column of the table. Hopefully, this piece will inspire other listeners to write with details of their 1·8MHz dx work. There must be other swls around the world who are near to or over the 100 mark.

HF news

Once again, not too many reports of hf activity. It must be summer! The major news had been the Annobon/Pagalu expedition, 3C0A. The expedition had certainly put big signals into G-land. On 7MHz ssb they were constantly 59. They had also been heard on 28MHz, and David Whitaker managed to get good copy on 3·5MHz for No. 246 on that band. Also reported was TZ6LPY on 7MHz ssb. Malcolm Harrington, BRS20249, mentioned Europeans on 28MHz, and V2AK and AP2MQ as his best dx of the month. Colin Watson, BRS46598, reported much activity on 14MHz, and noted V44KQ, VP2MDG and OD5YF. Mick Toms, BRS31976, had been going quite well on 28MHz. Apart from Es Europeans, he had heard stations from C5, CX, CP, EL, KP4, LU, PZ, TI, V4, VP5, VP8, XE, Z2, 3D6 and 5Z4.

*93 Elibank Road, Eltham, London SE9 1QJ.

1986 UHF/VHF Table

(Updates only)

Station	Loc.	70MHz Squares	70MHz DXCC	144MHz Squares	144MHz DXCC	432MHz Squares	432MHz DXCC	Total
BRS32525	JO01	0	0	68	15	27	7	117
BRS25429	IO93	0	0	61	16	25	8	110
BRS52543	IO83	11	3	39	12	18	5	88
BRS31976	JO01	2	1	51	20	0	0	74
F11ATZ	JN15	0	0	16	6	2	1	25
BRS62088	JO01	0	0	14	6	2	1	23

All-time countries table

(Entry score 750)

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS25429	280	314	337	258	245	110	1544	ssb
BRS32525	268	306	320	265	266	105	1530	ssb
BRS8841	256	293	317	244	227	68	1405	ssb/cw
BRS48909	216	255	275	205	189	80	1220	ssb
BRS52543	195	241	259	201	185	80	1161	ssb
BRS50134	178	218	244	185	175	89	1089	ssb/cw
BRS1066	195	210	270	174	128	90	1067	ssb/cw
ORS45992	215	259	275	159	134	16	1058	ssb
F11ATZ	203	197	232	75	98	33	838	ssb
Average	223	255	281	196	183	75	1213	

Dave Whitaker mentioned a card from AZ1A (South Orkneys) on 3·5MHz. He also recalled the second of the WRARS 28MHz Activity Periods when 17 European countries were heard at his QTH, and a DL was heard to say that he had worked VE1BNN on multi-hop sporadic-E. Some Central-European stations were heard working into Asia.

VHF corner

At the time of penning this piece, conditions at vhf and uhf had been good. Firstly, let us catch up with Mick Toms' vhf activities. Several small ms showers had produced OK2PZW, IW2BNA (EF) and EA6VQ for country No 30 and square No 140 on 144MHz. The QSLs had been coming in apace, including direct returns from I, SP and Y. Mick now has 63 squares confirmed in 20 countries. On 9 June he heard OE9CAK working a DL, but no other dx was audible.

Martin Parry, BRS 52543, mentioned YU1CF (KN03) and YU1LA (KN04) during the 7 June sporadic-E. Moving on to the tropo conditions from 20 to 22 June, Martin (YN) heard stations from CN, EQ, EK, DL and DK squares, while on 432MHz stations located in CL, CM, CN and DL squares were heard. From a /P location (IO76XH) Colin Watson heard stations in DL on 21 June, but he gave no callsigns or locators. LA7OO was heard on fm. Back home, LA8OJ was copied on ssb. Further south, Dave Whitaker (ZN) had a good time on 432MHz with DL6LAU (FO) giving a new locator. Other good dx was DL0EM/P (DN), DG2BBF (EN) and OZ1KMU (EQ). GM6TQF (YP) and GM4YPZ (YQ) were also heard. On 144MHz LA1BM (CT) and numerous OZs in EP, EQ and ER squares. David reported that OY9JD had worked into ON and PA on 144 and 432MHz, and Martin Parry mentions OY9RD/P had worked into PA on 1,296MHz. Even further south, in JO01, conditions to northern GM were good on 20 June with GM1SZF (JO88), GM4NHI (IO87) and GM6RGN(IP90) logged. GM4NHI was also heard on 432MHz. On 21 June conditions were fair to DL, ON and PA, with the best dx only DL0SY/P (JO44).

Moving on a few days, to 26 to 29 June, F3VG/P (JN35) was good copy for long periods on the 26th in London, but further north and west stations in JN33 and 34 were being worked. The 28th saw conditions to HB9 and into the E line of DL. The evening of 29th June saw Joan, BRS62088, logging PA and OZ on 144MHz, while the om was busy having a field day into Scandinavia on 432MHz. OZ1BUR and OZ1KLU (both JO46), OZ1HNE (JO57), LA1ZE and LA4IW (both CS) and SM6GWA (JO58) were heard around 2300. On 144MHz LA1BM (CT) was probably the best dx heard, while there were plenty of DLs and OZs to be had. Up north, Dave Whitaker reported a "fairly boring night". On 432MHz several OZs were heard, together with DLs and PA0s.

Andy Smith, GU1DWO/BRS50134, mentioned IW9AUH/9 via Es on 6 June, but nothing further by this mode until UB5DAA (KN18) was worked at 1635 on 1 July. Another Es event occurred on 2 July from 1600 to 1630 when UAs and UB5s in exotic squares were worked. Alas, I was at the office! As I pen this late piece, a fine Es opening has occurred to mid-SM —JO79, 89 and 99—and OH1AWW in KP10DL. More on this next month.

Finale

News, views and table scores for inclusion in the November issue must reach me no later than Monday 15 September, with late copy by Tuesday 23 September. □

MICROWAVES

*Mike Dixon, G3PFR**

More strange propagation on 1·3GHz

Arising from my comments in the July column, two more reports of strange propagation have come to hand.

The first, from Martin, G6ETA, of Whitstable, reported an occurrence on 28 June at 0900gmt. Martin said: "I worked Alec, G4PEC, by 'tail-ending' his QSO with, I think, G8XIR. The interesting thing was that I was beaming just south of the PA0QHN beacon to do so. Turning the beam (four by 23-element F9FT) to the north resulted in loss of signal. Alec was audible here until about 0920gmt when he faded out. I am 6km west of Herne Bay, where Pete, G6YLO, who raised the topic last year, lives."

The second report came from Jonathan, G4KLX, or Wirksworth, who said: "The first time I experienced it was on VHF NFD in 1984 when operating the Parallel Lines Contest Group 1·3GHz station from AN square. During the NFD, conditions had been very good and around dinner time on the Sunday we were calling CQ while beaming east and were called by GM3ZBE/P in YQ/YR. His signal was very weak, so we turned the antenna north and he disappeared. We promptly put the beam back east and completed the contact. He was very weak, being only a few decibels above the noise level—we discussed it after the contest but came to no conclusion as to the reasons. For the record, we were running 100W to eight by 23-element F9FT antennas and a GaAsfet preamp."

Jonathan went on to say: "I noticed the anomaly again in the good conditions at the end of June 1986. On 28 June I heard GM6MGS/P (YR) working a PA in CL with 5/9 reports both ways. The PA was 5/9 here, and the GM 5/1 with QSB plus radar noise. I called him while beaming southeast to D1 square. He received my call and we both turned our beams —he disappeared. I turned my beam back southeast and heard nothing more. About 30min later (2305gmt) I was beaming east to DM/DN and came across PE1AKJ (DM) calling the GM. The PE was 5/9 and the GM 5/1 with QSB to noise—the two were exchanging 5/9 plus reports. I called the GM again, this time neither of us turned our beams and just managed to make a contact, but it was very difficult. I was hearing PAs as far as the German border, but the DL stations were much weaker than I would have expected—DC9XO (EM, 500W to a 2m dish) was 5/2-ish—I would have expected the usual very strong signal from him under these conditions. To me this indicates some kind of boundary condition existing approximately where the GMs and my beam crossed, so to speak. Finally, on 29 June I heard G4PMK calling CQ on cw while I was beaming southeast —I assumed I was hearing him off a side-lobe but, turning the beam south, he disappeared. We did not make a contact so I do not know where he was beaming at the time."

"1·3GHz" radar

A most interesting letter regarding the sources of radar signals on 1·3GHz was received from John, BRS87607 ("hopefully shortly a G1, currently active on 934MHz—almost microwaves") of Hampshire. John is an Air Traffic Control officer and he opened his letter with "—may I give a few words of explanation, but I suspect of little comfort (unless you regard the provision of 'beacons' as something of a consolation)—"! He then briefly outlined the development of ATC radar, first the "long" range 600MHz and then the "short" range 3GHz radar, saying that the latter is in regular use but that the former "is not ideal as it shows too little weather, and aircraft responses are poor due to the relatively larger beamwidths of the radars". It appears that a Plessy system with sites in Shropshire (and most microwave enthusiasts will know that site!) and north Devon were the first to operate at 1·3GHz in the early 'seventies. Recently the CAA has commenced a replacement programme for the 600MHz system, based on 1·3GHz. Thus we can expect signals from Heathrow, Dibden (Essex), Sussex, Claxby (Lincs) Great Dun Fell (N Pennines), the Isle of Tiree and the vicinity of Gatwick as well as the original two sites mentioned above. The equipment in current use is of Philips design, and similar radars are sited throughout Europe "and indeed the rest of the world". John's closing comment was: "A trip round Farnborough in September may reveal a lot more European sites". From this it appears that as secondary band users we will, indeed, have to learn to live with a growing problem of co-existence. Maybe the choice of this frequency (to reveal weather) has a bearing on the propagation anomalies reported earlier.

*"Woodstock", Gaze Bank, Norley, Warrington, Cheshire WA6 8LL.

Operating news in brief

On 1·3GHz, Martin, G6ETA (mentioned above), between 28 and 29 June worked two GMs, two OZs, two SMs and one PA0 to give him three new countries and six new squares. The Norwegian beacons LA3UHG (up to 5/9 at times) and LA1UHG were heard, but no LA stations appeared to be active although conditions were extremely good to Scandinavia.

On 1·3 and 2·3GHz, Ian, G8IFT (Birmingham, IO82XJ) worked some nice DX as follows:

14 June	1·3GHz	DJ9BV	EN	812km
29 June	2·3GHz	PA0RDY	CM	470km
21 June	1·3GHz		"15+ PA0 etc"	
	2·3GHz	PA0WWM	JO22	441km
		PA0EZ	JO22	492km
		PA3BPC/P	JO21	421km
		DL0HC/P	JO41	733km
26 June	1·3GHz	HB9AMH/P	DH	876km
	2·3GHz	HB9AMH/P		

The latter contact was a "one-way" since Ian was unable to tune his receiver down to 2,308MHz: it may be remembered that it was indicated (March *Microwaves*) that the Swiss had special licences available for 2,308 to 2,312MHz only, and while HB9AMH was able to receive Ian's signal, the other way was not possible. Another good reason for common IARU Region 1 allocations!

Technical items

Dave, G4FRE, (and Charlie, G3WDG, and Petra, G4KGC) attended the Norwegian VHF/UHF Convention in Geilo, 6 to 8 June, reporting it to be well organized and attended. He commented on the "almost perpetual daylight" during the conference which rather upset the biological clock!

One most interesting feature of current microwave work in Norway is the development of microstrip circuits at 5·7 and 10GHz, using dielectric resonators as the tuning elements. We tend to think of the dielectric resonator as being the frequency determining element in GaAsfet trvo oscillators and converters, However, the resonators themselves have many more uses than this and are now available in the frequency range 1·54 to 25·3GHz. They consist of high-permittivity discs, rods or bars which exhibit extremely high Q (unloaded Q might be as high as 10,000 at 10GHz) which are used as tuned elements. In the dro they provide the feedback path between the gate and drain of the GaASfet which makes the oscillator so temperature insensitive. They are tunable over a small range and can therefore be used to produce very compact filters; for example, to select the wanted harmonics from a comb produced by a varactor multiplier. LA6LCA produced an interesting paper at Geilo which described his use of the resonators on pcb microstrip to produce "non-waveguide" multipliers (1,296 to 10,368MHz), amplifiers, ordinary mixers and active bilateral mixers and filters for both 5·7 and 10GHz and, indeed a complete 10GHz non-waveguide transceiver with +24dBm output.

Sam, G4DDK, has obtained more information on the range of resonators available under the trade name of "Resomics", and made by Murata, and some information on their characteristics and uses will be appearing in the *Microwave Newsletter* very soon. Coupled with GaAsfets and ptfe pcb, we can expect a radical change in the amateur approach to microwave equipment any time now, away from "plumbing" and into microstrip.

Provocatively, can I say that it is high time that we, in the UK got away from the simple wideband concept and into narrowband using these modern technologies. The potential ease with which the newer technology can realize narrowband reception and transmission, especially in the upper bands (from 5·7 to 24GHz) must mean that **really** effective and comparatively simple equipment is just around the corner. Imagine 10 or 24GHz narrowband equipment where the waveguide cavities are replaced by little bits of ceramic either glued to a pcb or fixed to it with a plastic screw and mounting pillar! That is the simplicity which the ceramic resonator **can** offer to the constructor. Furthermore, alignment is likely to be easier and the temperature stability higher than with the "classical" WG coupled-cavity filters, where equipment may go off-tune in the field because of temperature changes.

The components service will be prepared to stock both selected ceramic resonators and unetched Duroid board just as soon as there is an active demand for them from users of the service. Can I ask readers to let the Microwave Committee know their needs? In the interests of economy (it is expensive) the Duroid may need to be offered in "standard" sizes, and suggestions as to what this size of sizes might be will also be welcomed—remember it will cost around £1 per square inch. Steve Davies, G4KNZ/ZL2AZQ, suggests some simple ways of producing microstrip (*Practical Wireless* August 1986) and strip design programs have appeared in the *Microwave Newsletter* (04/85, May and 08/85, September). Why not "go to it" and produce a design suitable for entry in the committee-sponsored constructional contest? (More of which anon.) □

SATELLITES

*Bob Phillips, G4IQQ**

Amsat—UK colloquium

The weekend of 5/6 July saw the first colloquium in this country dedicated to the subject of amateur satellites; in fact, it was probably the first in Europe. The event was organized by Amsat—UK in co-operation with the University of Surrey, and was attended by 174 delegates from all parts of the UK as well as North and South America, South Africa, Israel, Holland, Belgium, Norway, Sweden, Switzerland and the Federal Republic of Germany.

The event was opened by Dr Arthur Gee, G2UK, chairman of Amsat-UK, who then proceeded to give an overview of amateur satellites over the last 25 years. Arthur paid particular tribute to the efforts and far-sightedness of the late Roy Stevens, G2BVN, in ensuring the awareness of the IARU and the regulatory administrations to the developments in amateur satellite activities and the need for clearly identified frequency bands.

Ron Broadbent, G3AAJ, followed with a description of currently-operational satellites, and an indication of the types of equipment needed for adequate performance for transmission and reception. Ron highlighted the usefulness and widespread use of computers in many aspects of satellite operation, but he stressed that a computer is not a prerequisite. Indeed, much of the required information for successful operation is available in the form of orbital calendars or from other sources.

After lunch, I provided an introduction to some of the terminology used in satellite communications, concentrating on orbital elements and a description of the essential orbital parameters. Next came Phil Karn, KA9Q, well-known compiler of Keplerian elements for all the current amateur satellites. Phil provided an insight into the subject of orbit determination and co-ordinate systems, and described the planned method for achieving the required orbit for the Phase 3C satellite. In order to minimize the risk during orbit manoeuvres, it is planned to carry out two separate burns to increase the orbital inclination to around 63° and increase the perigee height to 1,500km.

The capabilities of the two Uosat satellites were fully described by Martin Sweeting, G3YJO, which was followed by a summary, by Richard Macbeth, of the new command station which is now operational at the university. Karl Meinzer, DJ4ZC, has spent considerable time and effort since the end of May trying to diagnose the cause of the difficulties of Oscar 10. Karl's exposé on the inner workings of the satellite and its almost total reliance on the integrated housekeeping unit provided the first real insight to the gravity of the problems. It appears that the predicted gradual degradation of the computer memory reached a stage that the built-in error-checking software could no longer cope. New software has been written for the on-board computer, but as less-usable ram is now available the functions of the operating system have had to be limited. It is expected that the satellite will be brought back into operation in the near future, albeit on a rather limited basis. Whether Oscar 10 will survive until the launch of Phase 3C depends on many factors, including, I suspect, a substantial element of good chance.

The last presentation of the day was given by Martin Sweeting and Jeff Ward, who described the activities of the Amsat-UK Technical Group. The group had prepared a discussion paper which indicated a number of options for a future construction project. Four main areas of activity were presented:

low earth orbiting satellite similar to Oscar 6;
Highly elliptical orbit (package on T-SAT);
geostationary satellite; and
balloon flights.

Various ideas were being considered for a Uosat-C spacecraft which might carry a digital communications payload, imaging equipment and radiation experiments. Feedback was requested from all concerned so as to ensure that whatever is ultimately flown will satisfy as many users as possible.

A number of activities were organized for the Saturday evening, including a most educational and entertaining talk and demonstration by Dud Charman, G6CJ, on the subject of antennas and propagation.

The first lecture on Sunday morning was a continuation of matters concerning Oscar 10 and the soon-to-be-launched Phase 3C satellite, given by Karl Meinzer. The remainder of the morning was occupied by a series of five talks by staff from the university on the Uosat spacecraft:

"On board computer and software", Steve Holder;
"Telemetry and experiment data formats", Craig Underwood;
"Digital communications experiment", Jeff Ward;
"Radiation detector, particle wave experiment and ccd camera experiments", Jacky Radbone; and
"Attitude determination stabilization and control", Stephen Hodgart.

After lunch, Pat Gowen, G3IOR, gave a comprehensive talk on the history of the Soviet amateur satellite programme, including hints on how simple equipment can be used to obtain good results. Pat anticipated the launch of several ISKRA type satellites, which would probably be deployed directly from the new Mir space station.

The last formal session of the day was devoted to an open forum where a number of issues were discussed. On the subject of inconsiderate use of satellites, a great deal of concern was expressed, though it was felt that channelized transponders were not a viable solution. The increasing availability of high-speed digital signal processing technology gave rise to the possibility of identifying high-level signals and either reducing them to acceptable values or perhaps suppressing them altogether. A far more satisfactory solution would, of course, be for all users to show a little more respect for other amateurs, but this is true of many aspects of the hobby.

A number of those present expressed interest in the use of Mode L transponders—1,260 to 435MHz. Karl Meinzer indicated that the equipment requirements for the band were not particularly onerous (1m antenna and 10-30W) and he felt that this was within the capabilities of many more amateurs.

Arthur Gee closed the colloquium by thanking all those concerned with its organization and, in particular, Ron Broadbent and Martin Sweeting for their efforts over the previous months.

Oscar 10

As mentioned above, the health of the satellite is not too good, and its remaining useful lifetime is limited to six months or so. Under present conditions it is particularly important to observe requests from the satellite controllers. One additional difficulty that has arisen is that, due to the limitations in operating memory for the on-board computer, it will no longer be possible to carry the information bulletins in either morse or rtty. The only source of data from the satellite is on the 400 baud psk transmissions. As usual, the best method of obtaining information is via the Amsat-UK information nets or from the bulletin transmissions of both the Uosats.

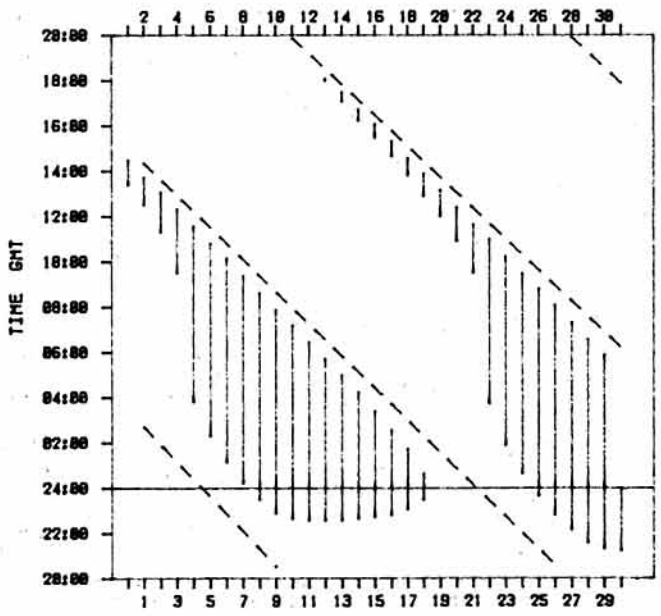


Fig 1 OSCAR 10 VISIBILITY (London area) - SEPTEMBER 1986

Fig 1 indicates the usual availability of the satellite for the month, showing the gradually improving situation in terms of operating windows. It should be noted that, for clarity, the time axis has been off-set to show only complete periods of visibility.

*Transvaal Cottage, New Barn Road, Swanley, Kent BR8 7PW.

DATA COMMS

*Ian Wade, G3NRW**

Packet news

The big packet news this month is the introduction of a new Z80-based tnc board designed by Pieter Meiring, G0BSX. The bare board costs £11, and requires only a handful of easy-to-get chips—the most expensive is about £4—and there is a 26-page documentation pack costing £2, with full operating instructions and schematics. The AX.25 software is also available at a nominal charge on a 2764 eprom. For more details send an sae to Pieter at 21 Cator Lane, Beeston, Notts NG9 4AY (not QTHR).

John Sager, G8ONH, sent a long letter about AX.25 packet activities in Suffolk. John recently lent his PK-80 tnc to G4SWX, a near neighbour with a 4 × 19-element 144MHz array on an 80-foot tower, and who proceeded to work packet stations all over the south of England, Holland and Germany —his list of stations heard or worked over a three-week period includes 39 Dutch and 23 German stations! G8ONH also put on a packet demonstration at the East Suffolk Wireless Revival in May, using the callsign G4MRS (Martlesham Radio Society), with a TNC-1 and a PDP-11 as the terminal. The demonstration generated a lot of interest, particularly with South Anglia Raynet who plan to carry out packet tests later in the summer.

A plea from Andy Witts, G1DIL, of Wolverhampton: he and Bill, G4TEC, are the only AX.25 stations active in their area and they are running out of things to talk about! Please turn your beam to the West Midlands to give them someone else to talk to. Alternatively, you could turn your beam southwards to Guernsey, from where Chris Le Tissier, GU4YMV, is now active with a PK-80 tnc and 100W to a 10-element parabeam on 144MHz.

Robin Harvey, G4BBR, has sent a useful list of reading material on packet. He mentions the articles by Harold Price, NK6K, in *QST* July and August 1985 ("What's all this Racket about Packet?" and "A Closer Look at Packet Radio", both very readable introductions); *CQ* November 1985 has a concisely-written introduction under the heading "Briefly Speaking"; the *Networks 85 Conference Proceedings* (sponsored by Online Publications, Pinner, Middlesex) has a paper by Jim Tully on the XNX and TCP/IP protocols; Plessey Controls of Poole in Dorset produce a pamphlet called *A Business Guide to Packet Switching*, giving an insight into packet systems as a whole; BICC of Hemel Hempstead produce a publication called *What is a LAN?* in similar vein and with a helpful glossary of terms.

Mike Thomson, G0AXM, writes with details of what he believes to be the first mobile AX.25 QSO in the UK, on 26 May, between himself and Tim, G1JOV. Mike's vehicle was equipped with an NEC 8201A portable micro, interfaced to a PK-80. It worked very well, although he could only operate while parked; he set the CTEXT message to say that he had his hands on the wheel, but would make the link when he could! I wonder who will be the first to claim a two-way mobile packet QSO between stations actually on the move? If you are tempted to try this, don't forget that the boys in blue will take a dim view of anyone who can see a tv screen from the driver's seat—mobile packet is strictly for back-seat drivers!

The top six packet questions

Over the last few months I have received many letters on packet, with the same questions coming up again and again.

Question 1: "Has the world agreed on any packet standards?"

There are several different packet protocols (or systems) in use today, but only AX.25 has been approved as an international standard by the ARRL, on behalf of the IARU. I was fortunate to be present as an observer at the historic meeting of the ARRL Digital Communications Committee in September 1984 when the standard (officially known as AX.25 Level Two Version Two) was approved, and my lasting impression of that meeting was the feeling of relief among the committee members that agreement had actually been reached on one standard. The general opinion was that there were already enough stations using it at that time to prove that it really worked, and rather than having several similar but incompatible standards it was more important to freeze Level Two and devote more time to the higher levels of packet networking software. The reality of the situation is that there are very few people throughout the world who are both data communications experts and radio amateurs, and so it is important to use their rare skills to address the more complex networking issues, rather than to dissipate their energies in a multitude of Level Two protocols.

The approval of AX.25 by ARRL opened the floodgates. Other national societies, including the RSGB, have since endorsed the standard, and several companies are now supplying the necessary tncs to make it work. The net effect has been an AX.25 explosion! Listening on 144MHz and on the hf bands, the number of new stations seems to be increasing almost by the hour, and we are already seeing severe QRM problems on some frequencies. Take a listen around 14,003kHz on a Sunday afternoon and you will see what I mean! A far cry from last winter, when there were just a handful of us scratching around for contacts; my list of AX.25 users in the UK last December amounted to only 22 stations. However, we still have some way to go to catch up with the Germans—I had a call recently from a station in Munich saying that there are now (in June) over 2,000 packet stations active in the Federal Republic. And in the USA they are fast approaching 20,000. There is no doubt about it: AX.25 packet has arrived.

Question 2: "What about the other protocols, such as Vancouver V2 or Cambridge? What is the future for these?"

For me, one of the joys of amateur radio is that we are free to devise and try out any new protocols as the fancy takes us, and I feel strongly that this should be encouraged. But the cold hard fact remains that for a protocol to be accepted universally it has to be approved by the IARU, which really means the ARRL Digital Communications Committee. The chances of the committee's even considering Vancouver or Cambridge at this time are probably remote, and so these protocols will, I think, remain just of parochial interest.

Question 3: "I can just about understand how my computer works, but all this talk of protocols, bit stuffing and NRZI leaves me cold. How on earth will I be able to cope with packet?"

Using packet is a bit like driving a car. All you actually need to know about driving is how to press the pedals and change gear; you certainly do not need to know what is happening under the bonnet (although you will probably be a better driver if you do). Likewise for packet. If you can type, you can work packet, and you certainly do not need to be a computer expert. Most of the tncs commercially available are easy to use once you have set them up, and setting them up is usually a once-only job which is quite straightforward and does not require any special test equipment.

Question 4: "Can I use any radio for packet, and is transmit/receive changeover time critical, like it is with Amtor?"

One of the big advantages of packet is that virtually any radio will do, and any necessary timing adjustments are made by software in the tnc (part of the setting-up process just mentioned), rather than in the radio itself. This means that you could blow the cobwebs off your old Westminster, re-crystal it for 144.675MHz, and dedicate it to packet, thus releasing your shiny synthesized multi-mode for more interesting activities (like working /M?).

Question 5: "Is it 'safe' to spend my hard-earned cash on a tnc, without the risk of its becoming out of date next week?"

It is certainly true that new and cheaper tncs are appearing on the scene, so it may make sense to wait a while for the market to stabilize. But if you do decide to take the plunge today I am sure that you will have no regrets. AX.25 will be around for a long time to come, and even if the standards were to change it should simply be a matter of plugging a new set of eproms into your tnc to bring it up to date—I have already done this with my 1983-vintage pre-standard TNC-1, and I assure you that it was quite painless!

Question 6: "Where can I see packet in action before spending my money on a tnc?"

If you live in the south of England there are plenty of people who will undoubtedly be happy to show off their packet stations, but the further north you go the fewer there are. To find out who is active in your area, send me an sae for a free copy of my latest master list of UK AX.25 stations. In addition, some of the more go-ahead emporia now include tncs in their wares, so they should be able to give you a demonstration. Be warned, though, that most people on packet tend to be very enthusiastic about it, and you will find it virtually impossible to keep your wallet closed after seeing packet in action!

RTTY bits

Iain McCallum, RS87859, of Roydon Hall, East Peckham, Tonbridge, Kent TN12 5NH, has a Tandy 100 portable micro with a liquid crystal display, and wants to use a tv set with it. He also wants to know how to get it going on rtty, Amtor, ascii and cw. Can you help? . . . Alan Lowe, G1INA, says that there was no mention of any rtty/cw package for the Electron in the survey published in this column in June, and wants to know if anyone can help him, or if he has to change his computer! (The survey was prepared from replies to questionnaires I sent out earlier this year to

* 7 Daubeney Close, Harlington, Dunstable, Bedfordshire LU5 6NF.

rtty suppliers; nobody sent me any information about the Electron. Another machine missing from the survey was the Amstrad, but Scarab Systems have since told me that they have a rtty package for it, plus other packages for the Electron, CBM 64, Vic 20, Spectrum and BBC) . . . Stan Horzepa, WA1LOW, of 75 Kreger Drive, Wolcott, CT 06716, USA, has a list of radio software for the TI-99/4A. Send him a large self-addressed envelope and a couple of ircs for details. □

QRP

*Rev George Dobbs, G3RJV**

QRP "down under"

After a quiet period for QRP operation in Australia, the VK QRP Club has been revived and is growing. The club and its activities are open to radio amateurs worldwide, and I have recently received the following information about membership.

VK CW Operators QRP Club

The CW Operators QRP Club is an international group, open to radio amateurs and short wave listeners in any country. It was formed with the aim of promoting QRP and the cw mode of transmission on all frequencies allocated to the amateur service. Members are encouraged to build their own equipment. Currently there are members in Australia, New Zealand, North America and England.

The club journal *Lo Key* is published quarterly in March, June, September and December. It contains articles of a practical nature on building QRP equipment, details and tips on home construction, and QRP news. The journal reports on QRP activity worldwide, including contests and awards. In the CW Operators QRP Club, QRP is defined as 5W output into the antenna, this being the limitation for contests and awards. The main mode of transmission used by club members is cw, but local VK stations get together from time to time on 3·5MHz QRO ssb to discuss club matters.

Annual membership fees are: Australian members, $A8; New Zealand members, $A10 (airmail); overseas members, $A12 (airmail). All money orders and cheques to be made out to: "CW Operators QRP Club". IRCs are not acceptable. Radio amateurs interested in joining the club should contact the club treasurer, Kevin Zietz, VK5AKZ, 41 Tobruk Avenue, St Marys, SA 5042, Australia.

In addition to the usual international QRP frequencies of 3,560, 7,030, 14,060, 21,060 and 28,060kHz, the members use the local frequencies of 1,815, 3,530, 7,025, 14,050, 21,130 and 28,125kHz.

I have seen several copies of *Lo Key* and can confirm that it is a worthy little journal full of good practical ideas and news. The CW Operators QRP Club did produce a small book of suitable circuits for the QRP equipment constructor. It was edited by Drew Diamond, VK3XU, and had 55 pages of circuits for transceivers, receivers, transmitters and station equipment from a variety of sources. I believe the book to be out of print but, if not, the G QRP Club may attempt to import some into the UK.

Mentioning books from that part of the world, I still have a few copies of that excellent little antipodean book from New Zealand: *The ZL2BMI DSB Transceiver*, which was mentioned in my last QRP column and outlines the story of ZL2BMI'S family of simple DSB transceivers for 3·5MHz. The book is full of construction ideas for simple and cheap DSB circuits for that band. A copy may be obtained from the address at the foot of this colum for 75p. Please make out cheques to "G QRP Club" and send a self-addressed stamped (12 or 17p) 9 by 6in envelope.

Also from the Australian QRP Club comes details of an interesting contest:

The Oceania CW QRP Contest 1986

0000gmt 15 November to 2400gmt 16 November.
CW only. Call "CQ QRP". 1·8 to 28MHz (not WARC bands). Full period 48h, half period any consecutive 24h within the 48h. Exchange RST plus serial number from 01 to 999. Maximum power 5W rf output. Scoring: between 1 and 2W 5 points, between 2 and 3W 4 points, between 3 and 4W 3 points and between 4 and 5W 2 points. Multipliers: every contact with a different ITU Zone counts as a multiplier on each band. Bonus score: field stations (/P) multiply their grand total. To qualify for entry a log must contain a minimum of 10 entries. Contestants may work each other once per band in each 24h session. All entrants must use a separate log sheet for each band. Each logged QSO to show date, time gmt, station worked, RST exchange, multiplier, power output, points claimed, grand total. The grand total is derived from the total points from all bands, multiplied by total multipliers from all bands, multiplied by bonus score. All entries must include a summary sheet showing calculation of grand total score, name and QTH, callsign and signature. Include the usual contest declaration. Certificates will be awarded to the 24 and 48h, single- and multi-band highest score for each class. There is also a class for swl entrants and for QRO (over 5W) entrants. Entries should be addressed to Len O'Donnell, 33 Lucas Street, Richmond, SA 5033, Australia, to arrive not later than 29 December 1986.

Although a QRP Contest at the other side of the world may seem a strange event to promote, I hope that as many QRP contesters as possible join in this event to encourage the club and its work.

VK and ZL QRP operators are a bold lot. I have a copy of a great circle map based upon Auckland in New Zealand. For the European operator it looks like a nightmare . . . nothing for thousands of miles. These fellows have to do a lot to get out of their "own backyard"!

A good read from New Zealand

Eric Sears, ZL2BMI, is a licensed Anglican clergyman, who, wanted to go it alone on 3·5MHz. In 1983 he build a simple double-sideband transceiver for the band, and since that time has built 10 further dsb transceivers for 3·5MHz, each improving on the last. Eric has difficulty in obtaining some components, and chooses to ignore other components because of their expense. So many other amateurs wrote to him asking for circuits of his equipment after working him or hearing of his little transceivers, that he decided to produce a small book describing the saga: *The ZL2BMI DSB Transceiver.* This little book is a real delight. Lots of circuit ideas, suggested layouts, and helpful notes and comments written in a folksy style. It is a real story of amateur radio enterprise. The transceiver is designed for portable use on dsb or cw, and capable of being built cheaply and simply by any radio amateur.

The ZL2BMI dsb transceiver would prove a useful and workable little project for any individual or group of constructors. After reading the book, I asked Eric to send a supply of them to sell at the RSGB Convention in April. I have a few left, and a copy may be obtained by sending me a cheque or Postal Order for 75p, made out to "G QRP CLUB" with a 12p or 17p stamped addressed 9 by 6in envelope.

Sporadic-E QRP on 28MHz

In an interesting report in *Sprat*, the journal of the G QRP Club, Miguel Molina, EA3FHC, describes some of his experiments on 28MHz during the summer of 1985. Miguel worked 28MHz from Barcelona with a converted cb rig running 1W on cw and 3W of ssb. The only antenna used was a simple 28MHz groundplane.

During the May to July, inclusive, EA3FHC made a total of 727 sporadic-E QSOs on the band. Threequarters of them were on cw, and of the remainder, all but 35 were on ssb. May proved to be the best month, with the band open for Es on 25 days and 373 contacts being made. The earliest the band opened was 0800gmt on 1 May, and the latest was 1850gmt on 13 May. During June the band was open on 23 days and in July for 13 days. The best paths were to the UK, Netherlands and Germany. During low periods of sporadic-E activity, Miguel has noticed further openings when there are sudden changes in atmospheric pressure. No complete report has been made of Miguel's sporadic-E work during this year, except a short note on his results in March 1986. The paths were open from Spain to Africa and Asia and during March, and he worked C53, D68, OD5, ZS, 5H3 and J28. The 28MHz total QSO count for 1985 was 1,135 contacts—not bad for a dead band!

More recently, Angus Taylor, G8PG, has reported successful QSO using QRP on 28MHz via sporadic-E. Never underestimate a band . . . and never underestimate the effectiveness of low power communication!

QRP vhf activity weekend

John Beech, G8SEQ, the vhf manager of the G QRP Club, has announced an activity weekend for 144MHz and above. It is not a contest, just a chance to go on 144MHz and higher with under 5W of rf and work as many other QRP stations as possible in any mode. The event is booked for Sunday 3 August, 0600 to 1800bst. A small prize will be awarded to the station who contacts the most members of the G QRP Club using QRP both ways. Logs for the QRP activity weekend should be sent to John Beech, G8SEQ, 14 Hollow Crescent, Radford, Coventry CV6 1NT as soon as possible after the event.

QRP events in the autumn

20, 21 September: Scandinavian Contest with QRP section. 11, 12 October: QRP ARCI (American QRP Club) Fall QSO QRP Party. 19 September: RSGB 21MHz Contest with QRP section. 1–7 November: HA QRP CW Contest on 3·5MHz. 29, 30 November: CQ Worldwide Contest with QRP section. Full details of these contests can be found in the appropriate journals. □

* St Aidan's Vicarage, 498 Manchester Road, Rochdale OL11 3HE.

Contest News

7MHz Contests 1986 results

The popularity of these contests remains high, despite poor conditions dominating entrants' comments in both of this year's events. The ssb section suffered a distinct lack of activity between midnight and 0400gmt, while the cw section would have benefited by greater support from North America.

The highlight of the contests must be the excellent opening to JA during the cw event, capitalized on by this year's winner of the G6QB Trophy, Steve Taylor, G4EDG, who worked 38 during the 2h from 0630. High first-hour QSO rates were available, with 80-90 being achieved by top stations. The ssb section winner, Keith Ginder, G3NAS, demonstrated that wire antennas can provide excellent competition on this band; perhaps a welcome thought to entrants without access to high Yagis.

Log-keeping standards were generally good, although again five stations were disqualified for exceeding the maximum of five unmarked duplicates. Several logs had to be re-scored as the entrants had difficulty in distinguishing between 5- and 15-point QSOs.

G3SJJ

Equipment used by leading stations

G4EDG TS830M, phased verticals—quarter-wave spacing.
G3NAS FT107M + SB200, four slopers and a 7MHz bi-square.

Summary of multipliers worked by leading stations

G4EDG CEO, CT, CT3, DJ, EA, EA6 EA8, EI, F, HA, HB9, I, J3, JA, LA, LZ, OE, OH, OK, ON, OY, OZ, PA, PY, SM, SP, SV8, TI, UA1; UA9, UB, UC, UD, UH, UJ, UL, UM, UP, UQ, UR, VE1-3, VK2-6, VP5, W1-4,6, 8-0, Y2, YO, YU, YV, ZS, 4X, 9V1, ZL1-3. (67)

G3NAS CE, CN, CT, DJ, EA, EA6, EA8, EA9, EI, F, HA, HC, HI, HK, HP, HB9, I, J3, JA, KL7, LA, LU, LX, LZ, OE, OH, OK, ON, OZ, PA, PY, SM, SP, SV4, TG, TI, UA10, UA1, UA9, UB, UC, UF, UH, UI, UL, UM, UO, UP, UQ, UR, VK2-6,9, VP2, Y, YN, YO, YU, YV, ZF, ZL1, 3, ZP, 4X, 5B4, 9H1. (69)

UK CW TRANSMITTING

Posn	Callsign	Points	Posn	Callsign	Points	Posn	Callsign	Points
1	G4EDG	255,270	19	G4UOL	47,520	36	G4WYG	22,910
2	G3KDB	230,750	20	G3ESF	45,540	37	GW4HBK	22,275
3	G4CNY	224,750	21	G4IQM	44,000	38	G0CLP	22,260
4	GW3WVG	125,232	22	G3PVA	43,020	39	G3BPM	20,100
5	G3JKS/A	111,450	23	GW3MPB	40,320	40	G3FXA	19,575
6	G3YEC	92,205	24	G3SWH	39,360	41	G3SXW	19,110
7	GM3YOR	77,070	25	G3OLU	38,280	42	G3AEZ	14,445
8	G4AMT	75,160	26	G4HVC	35,700	43	G3AWR	10,010
9	G4OBK	74,200	27	G3KSH	34,880	44	GM3VEY	9,750
10	G3MIR	68,670	28	G3VYI	34,350	45	G3ILO	9,460
11	G3TBK	65,322	29	G4KGK	31,200	46	G4EBK	7,560
12	GM4SID	61,560	30	GW6TM	31,155	47	G3GMM/A	6,405
13	G5LP	59,990	31	G3ZDW	29,400	48	G4BWP	5,700
14	GM3RAO	55,185	32	G4GLC	27,260	49	G4MBC	3,995
15	G2QT	52,355	33	G4UZN	27,150	50	G3JKY	1,680
16	G4BUO	50,610	34	G3RXP	26,400	51	GW4KVJ	780
17	G5MY	48,246	35	G4ODV	26,040	52	G4TJE	515
18	G3YDV	47,600						

REST OF WORLD CW TRANSMITTING

Posn	Callsign	Points	Posn	Callsign	Points	Posn	Callsign	Points
1	UH8EC	17,340	8	UA9CFV	2,760	14	VK3XB	660
2	UD6DKW	12,375	9	UA9AIA	2,070	15	UA9FM	600
3	RA9SUV	7,700	10	4X6IF	1,725	16	ZV2CW	315
4	UA9FGO	7,500	11	UA9SFV	1,440	17	UF6QAC	180
5	UJ8JA	7,050	12	JA7HMZ	1,350	18	UA9YC	140
6	UA9FAL	5,150	13	UM8MZ	1,200	19	UA9XDG	135
7	UA9AHH	3,200						

UK SSB TRANSMITTING

Posn	Callsign	Points	Posn	Callsign	Points	Posn	Callsign	Points
1	G3NAS	186,576	8	GI3TTJ	36,864	15	G4ODV	13,050
2	G3KFT	93,916	9	G3VLX	28,055	16	G3UHU	10,750
3	G4AMT	66,500	10	G3FNM	26,250	17	G4OKT	7,700
4	GW4UZL	62,780	11	G4PPR	20,223	18	G4OBK	4,446
5	G4OSY	48,792	12	G2OT	16,584	19	GI4VIZ	1,800
6	G4MET	38,046	13	G4KHM	16,530	20	G3ILO	810
7	G4VMM	37,800	14	G3AEZ	15,120			

EUROPE SSB TRANSMITTING

Posn	Callsign	Points	Posn	Callsign	Points	Posn	Callsign	Points
1	OZ5KG	17,255	22	HB9DX	1,155	43	Y23UL	445
2	OH2VB	10,320	23	ON8WN	1,110	44	Y63VN	425
3	EA2OU	7,800	24	DK7JO	1,050	45	Y36NC	375
4	LA9DI	5,915	25	EI7CC	875	46	EA2CR	372
5	F9KP	5,220	26	PA2NJN	840	47	DL2SBC	332
6	YO6BZL	4,200	27	DF5DK	805	48	Y32DN	325
7	ON6AB	3,850	28	Y25XG	800	49	SP7DZA	300
8	UO2GAG	3,420	29	F6BVB	785	50	DL1SN	280
9	Y24YH	3,060	30	FD6IVY	780	51	Y24GB/A	240
10	RB5AL	2,650	31	Y51TG	750	52	LA1IE	236
11	UR1RWW	2,430	32	LA0DY	745	53	EA5FHE	210
12	PA3DAF	2,400	33	Y31ZE	660	54	Y22VI	192
13	UC2OG	2,350	34	DK5KJ	656	55	Y36SG	177
14	YO5CYG	2,205	35	I2LVN	630	56	OH7NW	165
15	Y71KH	2,000	36	EA7EMK	600	57	Y24MB	152
16	UB4MZA	1,880	37	YO6AJI	570	58	UA1OT	120
17	HA7KPW	1,530	38	ON5JH	500	59	YO4US	115
18	YO4KAY	1,520	39	YO5KDX	498	60	YU7SF	70
19	DL2SBF	1,505	40	FD1HWB	475	61	OH8UV	20
20	EA3NA	1,395	41	Y37WB	470	62	OH3BU	5
21	Y53FD	1,340	42	OH1BV	450			

REST OF WORLD SSB TRANSMITTING

Posn	Callsign	Points	Posn	Callsign	Points	Posn	Callsign	Points
1	UF6VAX	6,345	4	UH8EC	2,000	6	UI8OAZ	140
2	UA9CI	3,115	5	4X6LD	1,710	7	RM8MA	120
3	EA8ZI	2,695						

EUROPE CW TRANSMITTING

Posn	Callsign	Points	Posn	Callsign	Points	Posn	Callsign	Points
1	LZ2AX	11,985	54	F3JL	3,100	107	YO8BSE	1,470
2	UB5IFZ	10,350		UB5VKO	3,100		OK2KOD	1,470
3	UA6LCN	9,520		ON4XG	3,100	109	YO4ZF	1,435
4	YO8DDP	7,840	57	Y71KH	2,970	110	LZ2AG	1,400
5	UB4FWC	7,770		EA3ALV	2,970	111	UV6LZ	1,365
6	UR2RND	7,200	59	RB5AL	2,950	112	Y24XJ	1,320
7	UA1DZ	6,655	60	I1XPQ	2,880		SM6ORZ	1,320
8	Y27IO	6,160	61	SP3MEY	2,800	114	SM6DUA	1,305
9	YU4EJC	5,995	62	Y24LE	2,745	115	UB5HKW	1,290
10	UB5FAN	5,670		DL2SAV	2,745	116	UA6LLI	1,260
11	UB5QJI	5,655		DL9CE	2,745	117	UA1AUA	1,240
12	UR2RDJ	5,650	65	UB5CGN	2,650	118	OZ5S	1,225
13	YO3CD	5,640	66	DF3QN	2,610		DL1SN	1,225
14	Y24YH	5,500		DL6RAI	2,610	120	Y26FL	1,200
15	4N2E	5,450	68	HA2NI	2,600		OK3CEL	1,200
16	Y22YO	5,390		EA1PR	2,600	122	Y23HJ	1,160
17	LZ2ZA	5,200	70	UP2BPO	2,550	123	OK3CDZ	1,155
18	DL7IC	5,060		UO2GMC	2,550	124	YO9CYD	1,120
19	SP2AVE	5,005	72	UO2GJV	2,520		UB5EF	1,120
	OZ3ON	5,005		PA0XAW	2,520	126	YO2GL	1,050
21	DL9OT	4,730	74	Y36NC	2,475	127	Y59WF	1,015
22	DL5JO	4,680		ON5WL	2,475	128	HA0HG	910
23	G3TXF/OE9	4,650	76	LZ1IT	2,430	129	DL8NAV	875
24	HA8RC	4,550	77	Y75PN -	2,400	130	OK1KZ	870
25	YU7SF	4,510	78	UO2GHG	2,280	131	PA2NJN	840
26	SM5IMO	4,450	79	OK1DXW	2,205		HB9DX	840
27	HA5HO	4,400		OZ4HW	2,205		OH6SC	840
28	OK1PDQ	4,300	81	Y21YA	2,160	134	Y62NN	825
29	Y37ZE	4,290		PA0KOR	2,160	135	OK1DKR	770
30	Y33OJ	4,250	83	EA2CR	2,120	136	Y23YE	750
31	Y54ML	4,180	84	UA1OGI	2,025		UP2BEI	750
32	UP2BN	4,150	85	HA8UN	2,000	138	SM6ECO	735
33	UP2BKA	4,095	86	Y87UL	1,980	139	OH6LQ	630
34	UA1AGL	4,000		Y32LL	1,980	140	OH2BXT	600
35	YU4BR	3,835	88	Y68WG	1,960	141	PA2JCG	540
36	SM6FPC	3,795	89	LZ1DV	1,920	142	OH5MX	525
37	UP2BBI	3,750		OK2PMM	1,920	143	HB9AYZ	500
38	OK1DAV	3,740	91	YO6BHN	1,890	144	UW3TN	480
39	YO9YE	3,685	92	HA2MJ	1,800	145	UA3ECO	360
	OZ1DPW	3,685		UB5DW	1,800	146	Y41ZF	350
41	HA4XX	3,575	94	Y51YJ	1,755	147	Y22WF	325
42	HB9AGH	3,550	95	Y51XE	1,750	148	SP3AZO	300
43	YU4JLM	3,510	96	UB5IHQ	1,720	149	PA0TA	250
	DF2UU	3,510	97	Y22UO/P	1,710	150	UP2BNL	240
45	UC2LAY	3,465	98	LZ2GS	1,680	151	YO2ADQ	225
46	Y25WE	3,375		UY5WA	1,680	152	YO5KDX	200
47	UO2GP	3,350	100	Y36TI	1,610		UB5KAG	200
	HA1VE	3,350	101	YU3UPI	1,600	154	UB5XBD	160
	LA1IE	3,350	102	UA3AAJ	1,539	155	UA4SSS	150
50	HA8XX	3,285	103	OK1MHI	1,520		UB5SBR	150
51	Y35ZK	3,200	104	UA3YAO	1,505	157	YU7ORO	135
	OK1FIM	3,200	105	UA1ANA	1,485	158	Y21HE	120
53	Y23RJ	3,150	106	Y22LE	1,480	159	OH8UV	75
						160	UB5KDD	70

CW RECEIVING

Posn	Station	Points	Posn	Station	Points	Posn	Station	Points
1	BRS1066	30,940	5	UA3-15528	4,050	9	UA3-142198	1,680
2	UA31211518	8,910	6	Y26953G71	3,850	10	LZ2-C-108	1,400
3	UP2-038794	4,100	7	UD6-001220	2,640	11	LZ2-C-105	750
4	OK3-27707	4,070	8	ONL-383	1,900	12	LZ2-C-102	425

SSB RECEIVING

Posn	Station	Points	Posn	Station	Points	Posn	Station	Points
1	BRS32525	42,750	9	OK3-27707	1,920	16	ONL-03257	480
2	BRS28198	13,920	10	UA2-125894	1,818	17	UAI-143447	400
3	BRS87156	12,900	11	ONL-383	1,708	18	UM8-036101	315
4	G1GMZ	8,250	12	Y210884043	1,485	19	Y211100F66	240
5	UL7-026587	4,800	13	Y29540A55	840	20	Y29291N47	235
6	Y217547C51	3,020	14	UR20831030	600	21	Y213091E39	60
7	Y2EA13732J	2,912	15	RS44984	495	22	JA1-3636	10
8	BRS31976	2,625						

Twenty-five checklogs were received and are gratefully acknowledged.

28MHz Cumulative Contests, first series 1986 results

At the request of a number of regular entrants to the Autumn 28MHz cw and phone cumulatives, an extra five sessions on each mode were held in April and May. A total of 19 logs were received for the cw event and 20 for the phone sessions. The phone entry included one multi-operator station and two swl entrants. Conditions were poor during both events, and although some South Americans and Europeans were heard (and called) by many entrants, only a few non-UK contacts were made. Congratulations to G4BLX, a regular high-scoring entrant in these events, who led in both sections.

Logs were generally accurate, but a few entrants forgot to include the check sheet for bonus contacts. Some logs were totalled incorrectly, and others showed the wrong bonus claims. The adjudicators corrected the scores this time, but it is extra work, so be warned for the future (see Rule 7). Certificate winners are shown in the table and it is regrettable that there were insufficient entrants for the swl and multi-operator sections to justify awards, (see Rule 10).

Most of the entrants to the cw section expressed their satisfaction with the contest, the rules and the scoring system, but such was not the position of the majority of phone entrants, who complained about the dates, the timings and the method of allocating bonus points. The overlap with phone and cw in the same week were universally disliked, and some have suggested making the sessions longer (1930 to 2230 gmt). The September date for the phone

section is thought to be too early as it conflicts with those taking a late holiday and a later date is preferred. The strongest criticism is levelled at the county bonus, which is thought to favour entrants who are located in, or adjacent to, areas of high amateur activity. Three entrants want the radial ring system (as used in vhf contests), one suggested a point/km bonus, while a number of others think that contacts with their own and adjacent counties should not count for bonus.

The adjudicators have considered all these comments and are not entirely convinced that changes will be of benefit but, as they have been requested, we are willing to change the dates and try the adjacent county rule for the autumn/winter sessions. In view of some adverse comments about changes to the timings, these will remain as 2000 to 2200gmt. The next cw sessions will be in October and the phone sessions in November, and the rules appear in this issue.

It only remains for the adjudicators to thank all those that entered, or sent in check logs, and those who took the trouble to write to the HF Contest Committee with their views. The analyses prepared by two entrants of the various scoring systems were of great interest.

G4RWW and G6LX

CW CUMULATIVES RESULT

Callsign	9.4.86	17.4.86	25.4.86	28.4.86	6.5.86	Total
G4BLX*	193	180	—	—	181	554
G4PIE*	157	155	166	Ck	—	478
G3TCT*	141	142	—	148	—	431
G4WJS/A	—	—	129	152	135	416
G4WVX	Ck	133	147	133	Ck	413
G3SYA	115	Ck	136	Ck	137	388
G3YDV	—	129	121	124	—	374
G4RCG	118	135	120	Ck	Ck	373
G2HLU }	110	142	—	113	—	365
G0BON }	123	121	Ck	Ck	121	365
G4UKM	104	—	—	109	125	338
G3MCX	102	100	Ck	105	Ck	307
G4PUR	Ck	108	96	92	Ck	296
G4RNF	63	—	79	Ck	66	208
G3SJX	—	—	60	—	98	158
G40BK	108	43	—	—	—	151
GM3YOR	43	—	27	—	75	145
G0DTI	31	—	—	34	—	65
G4BUO	Ck	—	—	Ck	—	Ck

*Certificate winners.

PHONE CUMULATIVES RESULT

G4BLX*	—	238	—	325	320	883
G4NOK*	171	221	Ck	190	—	582
G0CEI*	—	125	—	145	153	523
G3MGW	Ck	132	—	170	179	481
G3WHK	108	106	—	187	—	401
G2HLU	Ck	84	—	192	122	398
G0BIR	—	Ck	131	166	84	381
GW4HSH	—	124	—	—	202	326
G3SJX	—	—	—	123	196	319
G3UHU	Ck	—	80	82	81	243
G3WBM	52	65	Ck	—	121	238
G4OBK	88	38	48	—	—	174
G4PUR	—	51	32	65	—	148
G4SBD	Ck	34	51	39	—	124
G3EPO	—	22	17	20	—	59
G0DTI	—	58	—	—	—	58
G3XQP	—	—	—	Ck	Ck	Ck
MULTI-OPERATOR						
GW4EZW	Ck	211	Ck	308	341	860
SWL						
G1GMZ	68	—	75	113	—	256
G1JJA	—	Ck	89	78	77	244

*Certificate winners.

Town & County Contest 1986 results

The HF Contests Committee was very disappointed with the small entry for this contest; although 242 different callsigns appear in the logs, there were only 29 transmitting and eight receiving entries and a handful of checklogs. This is well down on last year, and raises the question whether members are interested in a 1·8MHz phone contest, or whether they would prefer a set activity period without the need to write-up contest logs. It is known that some stations are very disenchanted with 1·8MHz contests, particularly those who have limited antenna space and height, as they feel that they have no chance of being able to compete. It is also known that some stations only come on during the contest to collect new counties and are not interested in the competitive aspects of the event. These are points that the committee will have to consider, as it might not be worth continuing this contest in its present form.

To do well in the contest it is necessary not only to achieve a good QSO rate, but also to work as many counties as possible to collect bonus points. There was quite a battle for first place between four entrants, but G4BJM, who was operating on behalf of the North Bucks Contest Group and using the club call of G4NUT/A, managed to get the few extra contacts for first place. Using a dipole at 90ft, he made 138 contacts with 49 different counties. GW5NF (Gwent), also used a high dipole, and had 130 contacts with 50 counties. G4WQN worked 46 counties from 131 contacts using a 5λ/8 sloper. There were some excellent logs from the swl section which were most useful for checking purposes. Bob Treacher, RS32525, logged 82 QSOs in 45 counties; G1GMZ had 53 log entries in 34 counties, and RS20249 had 32 counties and 49 QSOs logged.

Most of the logs were first class and only a few lost points due to log errors or other mistakes. There were still a few logs that had been incorrectly scored, but the adjudicator took pity and added the unclaimed bonus points. It would have been helpful if all entrants had read the rules of the contest before submitting their logs!

The committee thanks all those who entered, or sent in check logs, and it will consider the various comments before the rules for the next event are finalized. Any entrants having suggestions how to make the contest more interesting so that there is a bigger entry, are asked to please write to the HF Contests Committee, Box 73, Litchfield, Staffs.

G4RWW

Posn	Callsign	Score	Town	County
1	*G4NUT/A	659	Milton Keynes	BKS
2	*GW5NF	640	Newport	GWT
3	*G4WQN	623	Nottingham	NOT
4	G3SJJ	621	Nottingham	NOT
5	GW4UZL	610	Haverfordwest	DFD
6	GW4IOI	527	Swansea	GNW
7	G3SSO	493	Cheltenham	GLR
8	G4NIF	439	Lydney	GLR
9	G3UEG/A	437	Harlow	ESX
10	G4UMS	412	Stanmore	LDN
11	G3BPM	410	Crewkerne	SOM
12	G0AVU	406	Wooler	NLD
13	G0AOZ	365	Abingdon	OFE
14	G3VYI	359	Farnham	SRY
15	G4ECI	353	Stockport	MCH
16	G4WEY	341	Wimborne	DOR
17	G4TGE	328	Barton	HBS
18	G4MET	253	Stalybridge	MCH
19	G4ODV	218	Redruth	CNL
20	G4YEK	209	Harrogate	YSN
21	G4OYY	206	Axminster	DVN
22	G3WHK	205	Morden	LDN
23	G4YDG	203	Halifax	YSW
24	GM4WEW	202	Girvan	SCD
25	G3ZRZ	178	Blackpool	LNP
26	G3GMM	172	Manchester	MCH
27	GM3UM	137	Lothian	LTH
28	G3KSH	121	Skipton	YSN
29	G3TXF	113	Kingston	SRY

*Certificate of merit

Check logs received from: G3MCX, G4KTI, G4OBK, G6LX.

RECEIVING SECTION

Posn	Station	Points	Posn	Station	Points
1	*BRS32525	471	5	G6GWR	274
2	GIGMZ	329	6	GIJJA	254
3	BRS20249	307	7	BRS87865	235
4	BRS87156	298	8	BRS62088	134

*Certificate of merit

March 144/432MHz Contest results

This dual-band event again attracted a reasonable number of entrants. More stations stayed in a warm home environment than chanced their luck with the snow ploughs! Very cold weather and generally poor radio conditions were apparent during the contest, with occasional lifts to Europe.

General comments received varied from "Lost one tent in the wind" to the more familiar cry of "Bring back the old QRA system, all is forgiven". In general there were no bad signal reports, and only one report of poor operating standards. One station requested that the contest be moved to later in the year, but unfortunately there are just not enough weekends in the spring and summer contest season.

Certificates go to G6XVV, G3XBY, Warrington ARS, Sheppey Western Contest Group and RS28198.

G4HWA

OVERALL RESULTS: SINGLE-OPERATOR SECTION

Posn	Callsign	144MHz	432MHz	Total
1	G6XVV	743	361	1,104
2	G3XBY	1,000	74	1,074
3	G8HHI	4	1,000	1,004
4	G0AHQ	57	904	961
5	G1DOX	708	209	917
6	G4DZU	0	788	788
7	G3JXN	0	699	699
8	G1KDF	295	376	671
9	G4DFI	347	167	514
10	G6IAT	268	239	507
11	G8DKK	0	446	446
12	G0CLP	406	26	432
13	G4XEN	136	247	383
14	G6XDM	365	2	367
15	G6HXU	163	118	281
16	G4VBG	166	72	238
17	G4ZNM	72	144	216
18	G8TZJ	35	113	148
19	G1IFL	105	13	118
20	G8UYD	61	39	100
21	G6BDV/A	0	92	92
22	G6CSY	28	7	35

OVERALL RESULTS: MULTI-OPERATOR

Posn	Group	144MHz	432MHz	Total
1	Warrington ARS	1,000	1,000	2,000
2	Sheppey Western CG	484	742	1,226
3	Flowerpot Men CG	664	548	1,212
4	North Bucks CG	433	359	792
5	Cotswold Co-operative	437	326	763
6	Isle of Man ARS	554	74	628
7	Harwell ARS	289	300	589
8	Havering & D ARS	173	399	572
9	University of Kent	481	1	482
10	Five Bells CG	158	320	478
11	Petersfield Area CG	315	124	439
12	Victory CG	402	10	412
13	Calamity CG	190	104	294
14	N Wakefield RC	101	183	284
15	Chester & D RS	144	39	183
16	Bromsgrove & D ARS	127	40	167
17	Aberdeen ARS	66	63	129
18	Macclesfield & D RS	44	50	94
19	G6UDM	37	51	88
20	Leicester RS	45	30	75

LISTENER SECTION

		144MHz		432MHz		
Posn	Station	Points	QSOs	Points	QSOs	Total
1	RS28198	482	84	88	14	1,683
2	RS31976	706	127	—	—	1,000

144MHz SINGLE-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx	Km
1	G3XBY	2,841	433	92DG	DD4PW	637
2	G6XVV	2,110	298	93JK	DL1YCE	691
3	G1DOX	2,012	254	84JC	G4TGK	447
4	G0CLP	1,154	252	92KT	F6FOE/P	512
5	G6XDM	1,038	183	92PB	DL0WV	553
6	G4DFI	987	121	01BL	DL8PC/A	640
7	G1KDF	837	134	83NN	PI4EME	684
8	G6IAT	760	150	91TV	PI4EME	465
9	G4VBG	472	52	94FW	DA1UM/P	734
10	G6HXU	464	118	83RF	ON4ASL/A	498
11	G4XEN	385	47	92PH	DA1UM/P	586
12	G1IFL	298	66	91VV	GD4IOM	387
13	G4ZNM	204	30	00BS	GD4IOM	493
14	G8UYD	172	44	93JD	G8LNC/P	272
15	G0AHQ	161	37	83UB	G4WWD/P	243
16	G8TZJ	100	14	84OA	G3UKC	396
17	G6CSY	76	20	01BJ	PE0MAR/P	283
18	G8HHI	11	3	91OH	G8VGM/P	181

144MHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx	Km
1	GW4CDA/P	9,749	880	82KW	HB9RCJ/P	966
2	G8KQW/P	6,472	891	03AD	FD1JFS	891
3	GD4IOM	5,400	480	74QD	DL9GS	854
4	G4GFX/P	4,717	596	81UQ	DF3BL	666
5	G3UKC	4,686	532	01MH	DB7OB	674
6	G4WET/P	4,261	614	81XU	DA1UM/P	672
7	G4NUT	4,217	519	92PC	DL0HN/P	792
8	G8LNC/P	3,920	522	90LU	GM4YPZ	671
9	G4WWD/P	3,070	502	91PC	—	—
10	G3PIA	2,816	447	91IO	DF0NG	589
11	G8VGM/P	1,851	374	82QL	F6HPP/P	490
12	G8HRC/A	1,686	286	01DM	DL8PC/A	629
13	G8ZHP	1,539	150	92TR	DK2JX	659
14	GW8GIZ/P	1,406	248	83JF	PE0MAR/P	510
15	G3VGG	1,238	230	82XH	DL2KBR	597
16	G4NOK/P	988	242	93FR	FC1CNE	537
17	GM4ZUK/A	644	44	87WB	G8LNC/P	694
18	G3LRS	439	104	92KP	F6HPP/P	486
19	G1MWS/P	432	126	83WG	PE0MAR/P	461
20	G6UDM	364	90	82WP	GM6LNM	402

432MHz SINGLE-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx	Km
1	G8HHI	612	108	91OH	PA0XMA/P	544
2	G0AHQ	553	113	83UB	GM6MGS/A	444
3	G4DZU	482	46	93ES	DF0SSB	783
4	G3JXN	428	65	91UM	DK8ZB/P	718
5	G8DKK	273	33	91TV	DF0SSB	644
6	G1KDF	230	38	83NN	GM6MGS/A	391
7	G6XVV	221	37	93JK	DJ6JJ	608
8	G4XEN	151	25	92PH	PA3BPC/P	424
9	G6IAT	146	28	91TV	DL2KBB	466
10	G1DOX	128	24	84JC	G6GZZ	355
11	G4DFI	102	30	01BL	GW4RNL/P	274
12	G4ZNM	88	16	00BS	GW4RNL/P	326
13	G6HXU	72	17	83RF	G8HHI	244
14	G8TZJ	69	11	84OA	G8HHI	330
15	G6BDV/A	56	29	91RN	G8TFI/P	122
16	G3XBY	45	13	92DG	—	—
17	G4VBG	44	6	94FW	G3NNG/A	368
18	G8UYD	24	10	93JD	G6HKS	102
19	G0CLP	16	6	92KT	GW4RNL/P	139
20	G1IFL	8	4	91VV	G4SIV	93
21	G6CSY	4	4	01BJ	G6CAQ	34
22	G6XDM	1	1	92PB	G6WZD	24

432MHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx	Km
1	GW4RNL/P	2,064	245	82KW	DF1SM/P	758
2	G8TFI/P	1,532	200	81UQ	DF0SSB	769
3	G8IFT/P	1,131	161	03AD	DL2KBB	485
4	G4HRC/A	824	120	01DM	DK8ZB/P	685
5	G3TGE	742	150	92PC	DK0VS/P	595
6	G8JAY/P	672	133	81XU	DK0VS/P	669
7	G4SIV	661	69	92TR	DK8ZB/P	754
8	G3NNG/A	619	122	91IO	GM6MGS/A	608
9	G3GWB/P	388	119	92LJ	—	—
10	G4SEQ/P	378	88	93FR	G1FBH	324
11	G0DAE/P	256	67	91PC	PA3BPC/P	435
12	G4WGE	254	67	91QF	G1KDF	320
13	G4ZQR/P	215	69	82QL	G1JEC	197
14	GD4GNH	153	15	74QD	G3JXN	411
15	GM6MGS/A	130	8	87WB	G3NNG/A	608
16	G6UDM	106	32	82WP	GI4GVS	334
17	G1NUS/P	104	44	83WG	G8HHI	235
18	G6VGG	83	29	82XH	G4HRC/A	183
19	GW8GIZ/P	81	37	83JF	G1ENX	106
20	G6XRS	61	24	92KP	G4WGE	161
21	G8NEH/P	20	4	90LU	G8IFT/P	265
22	G8KUC	3	3	01MH	G1NDH/A	31

Check logs gratefully acknowledged from G0DWJ and G8PHN.

May 1986 432-24GHz Contest results

This year's contest saw a reduced level of activity on 432MHz and 1·3GHz, but a welcome increase on the higher bands, and this was reflected in the number of entries received.

Most stations described conditions as poor to unprintable, though those in the east enjoyed some good propagation to the Continent for a while. Those inland and further north commented on the difficulty of obtaining contacts for the microwave bands from the 432MHz portables. Possibly more communication between tents to align the stations instead of just beaming east and monotonously calling CQ might result in even more contacts?

Once again log-keeping and scoring were to a high standard, most points lost were due to callsign errors. No problems were noted over the locator this time, most people now seem to understand and like it. However, G8TFI/P blamed the lack of activity on it, though G4RNL/P thought it was due to the Eurovision Song Contest! Congratulations to the winners and runners up.

G4NBS

OVERALL TABLE (MULTI-OPERATOR)

Posn	Name of group	Points	Band position 432 MHz	1·3 GHz	2·3 GHz	3·4 GHz	5·7 GHz	10 GHz	24 GHz
1	Sheppey Western CG	4,630	1	5	1	1	1	–	–
2	HADRABS & Addiscombe CG	3,631	5	2	3	2	–	1	–
3	Windbreakers	3,056	7	7	5	–	–	2	1
4	Parallel Lines CG	2,746	3	1	2	–	–	–	–
5	East Kent RS	1,871	8	3	4	3	–	3	–
6	Warrington CG	1,556	2	4	–	–	–	–	–
7	Hillbillies	1,238	6	6	–	–	–	–	–
8	Sheppey Outcasts CG	763	4	11	–	–	–	–	–
9	Hillingdon ARC	688	11	9	6	–	–	–	–
10	South Manchester RC	648	10	8	7	–	–	–	–
11	University of Surrey EARs	235	14	10	–	–	–	4	–

OVERALL TABLE (SINGLE-OPERATOR)

Posn	Callsign	Points	Band position 432MHz	1·3GHz	2·3GHz
1	G3XDY	2,911	2	1	1
2	G1DOX	1,259	3	3	6
3	G6DER	1,005	10	2	4
4	G1LSB	1,000	1	–	–
5	G4DDK	908	–	4	2
6	G8IFT	737	14	5	5
7	G8GDZ	706	–	6	3
8	G4FOH	688	4	–	–
9	G1KDF	627	6	8	–
10	G0DAZ	483	7	–	–
11	G4ZNM	273	8	–	–

432MHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (DbW)
1	G8TFI/P	2,991	300	01KK	741	26
2	G4RNL/P	2,688	293	93AD	759	26
3	G4CLA/P	2,248	230	03CE	716	26
4	GW4BVY/P	2,174	239	82KD	774	26
5	G4PUB/P	2,145	217	01QI	699	26
6	G4THB/P	1,933	157	94RJ	779	26
7	G4BCH/P	1,070	116	01PU	619	18
8	G6EKR/P	895	108	01OI	471	20
9	G4COR/P	852	137	93AC	721	25
10	G3FVA/P	843	171	93AE	518	23
11	G1DXY/P	680	157	91OQ	513	26
12	G5LK/P	675	156	91VG	547	18
13	G6UDM/P	493	113	82QJ	742	15
14	G4WGE/P	380	112	91XG	432	10
15	G4XVW/P	370	86	91DJ	367	21

432MHz SINGLE-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (DbW)
1	G1LSB	561	72	02CT	601	20
2	G3XDY	511	45	02OB	567	24
3	G1DOX	478	69	84JC	413	17
4	G4FOH	386	45	92XI	577	7
5	G0CLP/P	366	55	84IG	566	10
6	G1KDF	279	39	83NN	582	20
7	G0DAZ	271	42	82VF	709	17
8	G4ZNM	153	31	00BS	420	17
9	G1FHY	150	49	91WK	329	20
10	G6DER	145	19	93GN	460	18
11	G1EHJ	129	35	92EO	397	9
12	G6CSY/P	125	25	01BH	383	7
13	G6BDV	90	22	91TT	287	9
14	G8IFT	78	16	82XJ	309	17

Check log received with thanks from BRS32525

1·3GHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (DbW)
1	G4LIP/P	802	81	03CE	695	24
2	G0ALE/P	632	83	01QI	494	25
3	G6TRM/P	602	80	01OI	538	21
4	G3CKR/P	527	80	93AD	617	18
5	G4NXO/P	505	69	01KK	557	23
6	G4HWA/P	475	45	94RJ	695	25
7	G4ZTR/P	467	61	01PU	410	19
8	G3UHF/P	232	50	93AE	296	20
9	G4KPX/P	227	47	91OQ	416	18
10	G3IGQ/P	87	27	91XG	343	3
11	GW4GFX/P	29	7	82KD	216	0

1·3GHz SINGLE-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (DbW)
1	G3XDY	262	28	02OB	510	23
2	G6DER	105	18	93GN	457	19
3	G1DOX	102	17	84JC	391	6
4	G4DDK	88	14	02PA	266	12
5	G8IFT	87	19	82XJ	260	22
6	G8GDZ	79	17	92AK	257	20
7	G1FHY	60	18	91WK	230	10
8	G1KDF	34	8	83NN	251	10

2·3GHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (DbW)
1	G4FRE/P	6,113	35	01KK	310	16
2	G4CBW/P	6,074	27	03CE	395	19
3	G4ALE/P	4,921	29	01QI	342	16
4	G8FEZ/P	4,496	29	01OI	292	11
5	G4VIX/P	3,733	25	01PU	271	–3
6	G4UER/P	1,088	8	91OQ	416	14
7	G8LQO/P	471	6	93AE	149	–3

2·3GHz SINGLE-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (DbW)
1	G3XDY	3,187	18	02OB	510	9
2	G4DDK	1,823	13	02PA	268	4
3	G8GDZ	1,288	10	92AK	257	15
4	G6DER	1,103	5·5	93GN	415	15
5	G8IFT	847	9	82XJ	225	8
6	G1DOX	57	1	84JC	57	6

Contests Calendar

1 Jan–31 Dec	UBA SWL *(Rules in December* SWL News)
May–Sept	Microwave Cumulatives *(Rules in March issue)*
May–Sept	10GHz Cumulatives *(Rules in March issue)*
2 September	LZ DX (*Rules in August* HF)
3–5 September	Howdy Days (*Rules in August* HF)
6, 7 September	144MHz Trophy and SWL *(Rules in June issue)*
6, 7 September	IARU Region 1 SSB FD (*Rules in May issue*)
6, 7 September	IARU Region 1 VHF *(Rules in June issue)*
7 September	DF Qualifying Event, Slade *(Details in August issue)*
13, 14 September	BATC International *(Details G6IQM)*
13, 14 September	European DX (phone) (*Rules in August* HF)
20, 21 September	Scandinavian Activity (cw) *(Rules in September* HF)
21 September	70MHz Trophy and SWL *(Rules in August issue)*
21 September	DF National Final, Salisbury
27, 28 September	Scandinavian Activity (phone) *(Rules in September* HF)
29 Sept, 7, 15, 23, 31 Oct	28MHz CW Cumulatives *(Rules in September issue)*
4, 5 October	VK/ZL (ssb) *(Rules in September* HF)
4 October	AGCW-DL Straight Key Party *(Rules in September* HF)
4, 5 October	IX Concurso Ibero-Americano *(Rules in September* HF)
4, 5 October	432MHz–24GHz *(Rules in August issue)*
4, 5 October	IARU Region 1 UHF/VHF *(Rules in June issue)*
7 October	432MHz Cumulative *(Rules in August issue)*
11, 12 October	VK/ZL (cw) *(Rules in September* HF)
12 October	21/28MHz SSB (*Rules in May issue*)
15 October	1,296/2,320MHz Cumulative *(Rules in August issue)*
19 October	21MHz CW *(Rules in July issue)*
23 October	432MHz Cumulative
26 October	70MHz Fixed *(Rules in August issue)*
26 October	DF Treble Night Event, Mid-Thames
31 October	1,296/2,320MHz Cumulative
1, 2 November	144MHz CW *(Rules in August issue)*
3, 11, 19, 27 Nov, 5 Dec	28MHz Phone Cumulatives *(Rules in September issue)*
8 November	432MHz Cumulative
8, 9 November	European DX (rtty) (*Rules in August* HF)
8, 9 November	Second 1·8MHz
16 November	1,296/2,320MHz Cumulative
24 November	432MHz Cumulative
2 December	1,296/2,320MHz Cumulative
7 December	144MHz Fixed and AFS
10 December	432MHz Cumulative
14 December	70MHz CW
18 December	1,296/2,320MHz Cumulative

10GHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (Dbm)
1	G4JAR/P	194	3	01QI	181	5
2	G4VIX/P	98	2	01PU	56	17
3	G8ULU/P	12	2	01OI	6	10
	G8AHK/P	0	0	91XG	0	-

24GHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (Dbm)
1	G6CMS/P	1	1	01PU	1	9

3·4GHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (DbW)
1	G4FRE/P	1,057	8	01KK	302	33
2	G4JAR/P	339	3	01QI	273	27
3	G6YLO/P	25	1	01OI	25	17

5·7GHz MULTI-OPERATOR

Posn	Callsign	Points	QSOs	Loc	Best dx (km)	Pwr (Dbm)
1	G4FRE/P	47	0·5	01KK	94	22

28MHz Cumulative Contests, second series 1986 rules

Entrants should note that there are some changes to the rules for the autumn series of 28MHz activity contests.

1. The general rules for RSGB HF contests published in the January 1986 issue of *Radio Communication* will apply.

2. Dates and times. Each session 2000–2200gmt.

CW sessions: 29 Sept, 7 Oct, 15 Oct, 23 Oct and 31 Oct 1986.

Phone sessions: 3 Nov, 11 Nov, 19 Nov, 27 Nov and 5 Dec 1986.

3. Sections. Single-operator, multi-operator and swl. All entrants, including each operator of a multi-operator entry, must be fully paid-up members of the RSGB. Portable or /A entries are acceptable, but entrants must operate from the same location for all sessions.

4. Frequencies: CW 28–28·2MHz, phone 28·5–28·7MHz. Entrants are asked to spread out within the specified segments.

5. Exchange. RS(T), number (starting at 001 for each session) and RSGB county code (see *Rad Com* Jan 1985). For QSOs with overseas countries, RST and serial No (when given). SWL section, see Rule 11 below.

6. Scoring. Each session is scored separately, and the sum of the three highest scoring sessions to count. Each completed contact is worth three points. Additionally a bonus of five points can be claimed for the first contact in each session with a new county or country, other than the entrants own and adjoining counties, eg stations in LDN cannot claim a bonus for contacts with LDN, BRK, BKS, ESX, HFD, KNT and SRY. Any station (worldwide) counts for points, but no bonus can be claimed for contacts with other UK countries. Subject to the limitations in Rule 11, swl entrants score on the same basis as transmitting entrants.

7. Single log for each mode covering all sections entered. This to show: date of session, call, RS(T), serial No sent and received, county code, points and bonus claimed. Logs must be fully scored and totalled and should also show the county code sent. A separate list of counties/countries worked in each session **must** be included. RSGB HF Contest log sheets (or equivalent) should be used. Incomplete logs will not be accepted. A standard RSGB Declaration must be completed and included with the entry. This must show the county code sent.

8. Entries should be sent to HF Contests Committee, c/o Mrs R L Glaisher, G4RWW, 279 Addiscombe Road, Croydon CR0 7HY.

9. Entries should be postmarked not later than 10 Nov 1986 for the cw section and 15 Dec 1986 for the phone section.

10. Awards. Certificates will be awarded to the leading three entrants in each section for the phone and cw contests, subject to a minimum of 10 entries being received in the single-operator and five in the multi-operator and swl sections.

11. SWL section. Rules as transmitting section, except as detailed below:

(a) Entrants. British Isles RSGB members only, who do not hold a Class A transmitting licence.

(b) Logs must be headed date, time, call heard, call of station being worked, report, number and county code of station heard, points and bonus (where applicable). **Note:** the call of the station being worked may only appear once in every three contacts logged, unless it is a new country/county for bonus. A list of these bonus countries/counties must be included.

South Manchester Quad Night DF results

This year's event attracted a record number of 14 teams. All stations were audible at the start but approximate bearings were given for the hard of hearing!

Station A, G3WFT/P, was located some 16km east of the start in a small wood by the side of the Macclesfield Canal. As the antenna crossed the canal to the opposite side, some teams spent an entertaining night on the wrong side! First arrival, after much bush beating on both sides of the canal, was Ian Morrison at 2316.

Station B, G3FVA/P, was located 10km west of the start by the side of the Manchester Ship Canal. Several teams located this transmitter but none of those on the opposite bank were brave enough to risk a night-time dip!

Station C, G3UHF/P, was situated 2km north of the start between a railway line and the Bridgewater Canal. The overhead pylons and power lines caused considerable confusion and many teams spent their time searching the nearby Water Park and rubbish tip—actually walking past the transmitter and a member of the crew checking antennas! First arrival was Trevor Hopkins at 2108.

Station D, G3ZDM/P, was situated 12km north west of the start in a rhododendron jungle by the side of a motorway. The transmitter operators practised knitting by producing a patchwork of antennas. Over 500m of wire were used, which kept some teams searching all night, threatening the transmitter operator with various horrible tortures when they eventually found him. First arrival was George Whenham at 2153.

After the event, a hot-pot supper was provided to revive the competitors, and the results were announced. Geoffrey Foster of the Stratford club was declared the winner and was presented with the "Quad" Rosebowl.

The South Manchester club would like to thank all who took part, operated (and provided the supper afterwards!) and looks forward to the 1987 event.

			Time of arrival			
Posn	Name	Club	Stn A	Stn B	Stn C	Stn D
1	G Foster	Stratford	—	2052	2218	—
2	D Yorke	S Manchester	—	2115	—	2232
3	T Hopkins	S Manchester	2346	—	2108	—
4	G Whenham	Coventry	—	—	2354	2153
5	D Newman	Slade	—	—	2355	2224
6	C Wells	S Manchester	—	2036	—	2359
7	C Merry	Dartford Heath	—	2113	—	—
8	I Morrison	S Manchester	2316	—	—	—
9	G Laing	S Manchester	—	—	2343	—
10	C McKenzie	S Manchester	—	—	—	2358

Four teams failed to locate any transmitter.

While operating GB2FCL in May, Thornton Cleveleys ARS welcomed French visitor Patrick de Grancey, F6IHS, who had heard the station /P while in Blackpool. L to r: club member Roger Wood, G0AJQ; club chairman Mike Green, G4EZM; and F6IHS

Club News

The following is the latest information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue. Basic unchanged information on other affiliated organizations will be published again in **January 1987.**

RSGB affiliated organizations are requested to report all programmes and new items to their regional representatives regularly. Information for inclusion in the **November** issue should reach them by **16 September** and for the **December** issue by **21 October.**

Club programmes are given in order of date, subject, time and place of meeting. All callsigns of club secretaries and other contacts are QTHR (correct in the current *RSGB Call Book*) unless otherwise stated.

All clubs welcome visitors and would be pleased to hear from potential new members.

REGION 1—RR B Donn, G3XSN, 7 Thurne Way, Liverpool L25 4SQ. Tel 051-722 3644.

Bury (BRS)—9 Sept ("Ultrasonics and doppler shift", Peter Smith). 8pm. Mosses Youth & Community Centre, Cecil Street, Bury. PRO G0CUK, tel Bolton 706191.

Chester (C&DARS)—9 Sept ("An intro to microwaves", G3PFR), 16 (Video tapes "Satellite comms and packet radio", Ian Wade), 23 ("How an IBA local radio works", Julie Hallam of Marcher Sound), 30 (Visit by Lowe Electronics of Matlock). Morse classes 7.15pm. Main meetings 8pm. Chester Rugby Union Football Club, Hare Lane, Vicars Cross, Chester. Details G6IFA, tel 336639.

Congleton (CRC)—First Wednesday of each month, 8pm. The Library, Congleton. Details, G6OKN, tel Crewe 765005.

Crewe (South Cheshire ARS)—8 Sept (Talk on "Operation Raleigh"). 8pm. Crewe LMR Sports Club, Goddard St, Crewe. Details G1PUV, tel 07816 73185.

Ellesmere Port (EP&DARS)—Meetings are held on Mondays **not** Tuesdays, fortnightly, 7.30pm. The Grosvenor Hotel, Ellesmere Port.

Fylde (FARS)—2 Sept (Visit to Blackpool Airport Fire Station), 16 (Informal with morse). 7.45pm. The Kite Club, Blackpool Airport, Sec G8GG, tel 725717, or PRO 737680.

Leyland (Central Lancs ARC)—1 Sept (Planning for SSB Field Day), 15 (What went wrong on SSB Field Day), 1 Oct (Trip to *HMS Inskip*), 6 (Noggin and natter). 8pm. The Priory Club, Broadfield Drive, Leyland. Sec G4YWG.

Liverpool (L&DARS)—2 Sept (Open night), 9 (Quiz), 16 ("First impressions of the Isle of Man", G3XSN), 23 (Inquest into SSB Field Day, G4CVZ), 30 (TBA). 8pm. The Churchill Conservative Club, Church Road, Liverpool 15. Sec G1EXJ, tel 051-728 8811.

Ormskirk (O&DARC)—4 Sept ("Microwaves", G4UGH), 16 (Visit to Lancashire Police, Hutton Radio Workshop, 8pm). 2 October (Junk sale).

Penrith (EVRS)—18 Sept ("Simple receivers", G4AFU). 7.30pm. The Ullswater School Evening Centre **OR** at The Crown Hotel, Eamont Bridge. Details G4XPO tel Culgaith 462.

Sale (SMRC)—5 Sept ("The Great Egg Race—Part 5"), 12 ("TV sound outside broadcast", G4MYB), 19 ("Using and abusing the 4CX250B series", G4FRX), 26 (Bring and buy sale, non-radio items welcome), 3 Oct (Video lecture). 8pm. Sale Moor Community Centre, Norris Rd, Sale. Sec G3WFT, tel 061-973 1837.

Stockport (SRS)—10 Sept (SSB Field Day post-mortem), 17 (Informal), 24 ("Frequency meters", G8CZW), 8 Oct ("Logic circuitry", G8OMH). 8pm. The Magnet Inn, Wellington Rd North, Stockport. Details G4FFW, tel 061-224 7880.

Thornton Cleveleys (TCARS)—1 Sept ("Computers", G6BZD), 8 (Informal—club on the air), 15 ("Design and construction of rotator mountings", G0AJW), 22 (Informal), 29 (Talk by G4EFO of Microwave Modules Ltd). Morse class, G3ZRZ. 7.45pm. 1st Norbreck Scout HQ, Carr Rd off Fleetwood Rd, Bispham, Blackpool. Details G4BFH, tel 0253 853554.

Warrington (WARC)—2 Sept (Open forum), 9 (Junk sale). 8pm. Grappenhall Community Centre, Bell House Lane, Warrington. Info Paul, tel 0925 814005.

Wirral (WARS)—3 Sept (Sale of surplus equipment), 17 ("Protection in the electrical generating industry", G8RIX). 8pm. The Club Room, Ivy Farm, Arrowe Park. Sec G3VEB.

My thanks to Oldham ARC for inviting me to officially open their new radio shack on 12 June. It was a really enjoyable evening and I cut the tape with a morse key. First station worked was VP2MDY. The catering was excellent.

Thanks also to the Carlisle & DARS for their hospitality during my visit, and particularly to Tony and Jacky, John and Mary for their kindness.

Welcome to Rossendale ARS; Central Lancs ARC and Congelton ARC.

Please note that the area representatives for this region are listed on page 24 of the April 1986 RSGB **Call Book.** They are there to help with your problems. Why not give them a call? *RR1*

The official opening of the Oldham ARC radio shack by G3XSN, RSGB Region 1 representative. L to r: G1KJC, G6NCK, G3XSN and (seated) G4ARP. Photo: *Rochdale Observer* Group

REGION 2—RR P R Sheppard, G4EJP, 9 Elvington Crescent, Leconfield, Beverley, N Humberside HU17 7LX. Tel 0401 50397.

Halifax (H&DARS, G2UG)—16 Sept (AGM). Running Man ph. Details G0DLM, tel 0422 202306.

Hull (H&DARS, G3AMW)—5 Sept (DF hunt). West Park Recreation Centre, Walton St. Details G0DMP, tel 0482 862149.

Keighley (KARS, RS84851)—9 Sept (Informal meeting), 30 Sept (Talk by Mr R F Fleet, senior transmitter manager, BBC). 8pm. Victoria Hotel. DetailsG1IGH, tel 0274 496222.

Leeds (White Rose ARS, G3XEP)—3 Sept (SSB Field Day briefing), 10 (Meet your committee), 17 (Natter nite), 24 (Video on satellite comms). Moortown RUFC, Moss Valley, Kings Lane. Details G4ATZ, tel 0937 842790.

North Wakefield (NWRC, G4NOK)—4 Sept (AGM), 11 (Junk sale), 18 ("Contest operating", G3ZXZ, G4IAU and G4RCG), 25 (Monthly meeting). White Horse ph. Details G4RCH, tel 0532 536633.

Pontefract (P&DARS, G3FYQ)—4 Sept (Committee meeting), 11 (NWRC junk sale), 20 ("Went valley hike", Raynet exercise), 25 ("Raynet", G3PSM). Carleton Community Centre. Details G0AAO, tel 0977 43101.

Todmorden (T&DARS, G4WYT)—1 Sept (Chat night), 15 (Chat night). Queen Hotel. Details G1GZB, tel 070681 7572.

UK FM Group (Northern, G8KRM)—7 Sept (Monthly meeting). Royal Hotel, Barnsley. Details G4UNA.

Wakefield (W&DARS, G3WRS)—30 Sept (Demo for muscular dystrophy). Community Centre, Prospect Rd, Ossett. Details G4VRY, tel 0532 820198).

Wayne (Wayne Raynet Group, G4UWE)—1 Sept (Comms test with county Raynet groups), 15 (Group training meeting), 18 (Quarterly meeting at Humber Bridge), 14 (Humber Bridge Marathon—Radio support).

York (YRC, G4YRC)—9 Sept (Informal), 23 (Test your equipment with G4FUO). Ashcroft Hotel, Bishopthorpe Rd. Details G1FTA, tel 0904 704634.

NOTES

1. Hamnet Hull—New tel No 0482 465150 (300 Baud, 8 bit, no parity).

2. Scarborough—Welcome to Bob Wilkinson, G4YKO, the new area representative.

3. *OTI*—The talking book is desperately looking for assistance in Region 2, please ring 0765 6159 for details.

4. Many thanks to the following clubs visited in early '86 for their hospitality: Hornsea, Hull, Leeds, UK FM Group, Mexborough, Pontefract and Sheffield.

5. "Club News" items may be telephoned in up to and including the last date shown in "Club News". *RR2*

REGION 3—RR G Ross, G8MWR, 81 Ringwood Highway, Coventry CV2 2GT. Tel 0203 616941.

Birmingham (Midland ARS)—16 Sept (Surplus sale). Unit 5, Henstead House, Henstead St (off Bromsgrove St). Sec G8BHE, tel 021 422 9787.

Bromsgrove (B&DARC)—Thursdays (Club net—144.575MHz and morse tuition), 12 Sept (Surplus sale). 8pm. Alternate Fridays. Avoncroft Arts Centre, Bromsgrove. Sec G4NYH, tel Bromsgrove 73847.

Droitwich (DARC)—22 Sept (Microwave workshop, G8MWR). 8pm. 2nd and 4th Mondays in the month. Scout HQ, Droitwich. Sec G4HFP, tel 02993 3818.

Halesowen (MEBRC)—9 Sept (Open meeting), 23 Sept (General meeting). 8pm. MEB Social Club, Mucklow Hill, Halesowen. Sec G4RWH, tel 021 747 8784.

Hereford (HARS)—5 Sept ("VHF working", G4ASR), 19 (Informal). 8pm. Civil Defence HQ, Gaol St, Hereford. Sec G3WRQ, tel 0432 54064.

Kidderminster (KARC)—2 Sept (AGM), 16 ("VHF propagation", G8BKL), 30 (An evening with G3PGQ). Every other Tuesday, 8pm. Vice-presidents club, Harriers Football Ground, Hoo

The Royal Signals gave a demonstration of satellite communications equipment to members of the Stratford-upon-Avon & DARC on 9 June. Included in the photograph are G4MMF, G6MMD, G0EDT, G8HJS and G4YGY. *Photo*: G0CHO

Rd, Kidderminster. Sec G8WOX, tel 0562 751584.
Rugby (RATS)—16 Sept (Auction and barbecue). 7.30pm. Cricket Pavilion, "B" entrance, Rugby radio station. Sec G8TWH.
Shrewsbury (Shropshire (Salop) ARS)—4 Sept (Night on the air), 11 (Fox hunt), 18 (Natter night), 25 ("Slowscan tv", G4IUT). 8pm. Old Bucks Head, Frankwell, Shrewsbury. Sec G6OMJ, tel 0743 67799.
Solihull (SARS)—18 Sept ("Radio Investigation Service," G4PZA). The Shirley Centre, Stratford Rd, Shirley. Sec G8AYY, tel 021-783 2996.
Stafford (SARS)—2 Sept (Informal), 9 ("The RSGB", G8MWR), 16 ("Home brew wines", G3ZZS), 23 (Night on the air). 8.30pm. Coach & Horses, Pasturefields, Staffs. Sec G6DAT, tel 08894 2453.
Stratford upon Avon (SuA ARC)—8 Sept ("Setting up a station", 22 ("Raynet", G3STG). 7.30pm. Baptist Church, Payton Street, Stratford upon Avon. Sec G8OVC, tel SuA 750584.
Warwick (Mid-Warwicks ARS)—9 Sept ("Making pcbs", G0CHO), 23 ("A night with Norman", G8CXL). 8pm. St John Headquarters, 61 Emscote Rd, Warwick. Sec G6VHI.
Wolverhampton (WARS)—2 Sept ("Rig testing", G4WAS), 9 ("Discone antennas"), 16 (Committee meeting), 23 ("Antennas and feeders", G8MWR), 28 (DF hunt), 30 (Night on the air). 8pm. Electricity Sports Club, St Marks Rd, Chapel Ash, Wolverhampton. Sec K Jenkinson, tel 0902 24870.

REGION 4—RR M Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey DE3 2BJ. Tel Derby (0332) 556875.

Alfreton (A&DARC)—6 Oct (Homebrew Comp, buffet and night on the air). 8pm. ECP Social Club, Carnfield Hill Alfreton. Sec G1SFR, 7 Byron Ave, Alfreton.

Tom Douglas, G3BA, (l) with Jack Collet, then G3AMY and chairman of the Mansfield ARS, after he had judged a construction competition and given a talk entitled "Experiences of a radio amateur on the Burma-Siam railway". *Photo*: G4SVU

Derby (DADARS)—3 Sept (Bring and buy sale), 10 (75th anniversary lecture at St Helen's House, G2CVV), 17 and 24 (TBA), 1 Oct (Junk sale). 7.30pm. 119 Green Lane, Derby. Sec G3KQF, tel Derby 772361.
Glossop (GADARG)—25 Sept (Visit by Lowe Electronics). 7.30pm. Nags Head Hotel, Charlestown Road, Glossop. Sec G4GNQ.
Grimsby (GARS)—4, 18 Sept (TBA), 2 Oct (AGM and awards night). 8pm. Cromwell Social Club, Cromwell Road, Grimsby. Sec G4EBK, tel Grimsby 887720.
Loughborough (Worked All Britain Award Club)—Club net frequency 3,760kHz most days. Hon sec G4IAR.
Louth (LADARC)—Every first and third Wednesday, 7.30pm. The Charterhouse Club, Manby, near Louth. Sec G1IZB, tel Marshchapel 595.
Nottingham (ARCON)—4 Sept (144MHz foxhunt, Number 5), 11 ("CW the best thing since sliced bread", G4NZU), 18 ("Narrowband tv"), 25 (Activity night). 7.30pm. The Sherwood Community Centre, Mansfield Road, Nottingham. Sec G4PJZ, tel Nottingham 624764.
Scunthorpe (SARC)—2 Sept (Natter night), 9 (Video "Secret Listeners"), 16 (Construction contest), 23 (Homebrew QRP), 30 (Junk sale), 7 Oct (Natter night). 7.30pm. Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe. Sec G4ZGJ, tel 732268.
Worksop (WARS)—9 Sept (Visit to Sheffield Brewery), 26 (Visit to Maltby Club for quiz night). 7.30pm. The Maltkins, Gateford Road, Worksop. Sec G4ZUN, tel 486614.

REGION 5—RR J S Allen, G3DOT, 77 Rosslyn Crescent, Luton LU3 2AT. Tel 0582 508515 or at work on 0582 21151.

Cambridge (C&DARC)—5 Sept (Contest briefing), 12 (G6KND, topic to be announced), 19 (Informal meeting), 26 (G8VCN, topic to be announced). The Colleridge Community College, Radegund Road, Cambridge.
Dunstable (DDRC)—14 Sept (Trip to Alton Towers), 21 (National car boot sale, Old Warden Aerodrome). Details G6EES, tel Dunstable 607623.
Leighton Buzzard (LLRC)—1 Sept (AGM). Room A64, The Vandyke Community Centre, Vandyke Road, Leighton Buzzard, Beds.
Milton Keynes (MK&DARS)—18 Sept ("American scientists and and scientific discoveries", USAF lecture team). "The Meeting Place", Hodge Lea, North Milton Keynes.
Wisbech (WR&EC)—Now meets every Thursday from 1930 in two rooms above the RAFA Club in Astral House, Old Market, Cambridgeshire. Chairman is G8NIL, and sec G4DDH.

Jack Collett, G3AMY, (l) who retired as chairman of the Mansfield ARS prior to becoming GI3AMY, receiving a memento from new chairman Gordon Holdom, G4SVU. *Photo*: G4AAH

REGION 6—RR N P Taylor, G4HLX, 87 Hunters Field, Stanford in the Vale, Faringdon, Oxon SN7 8ND. Tel 03677 503.

Aylesbury (AVRG)—No meeting in Sept. Enquiries about GB3VA, GB3AV, GB3BV, GB3VB or group membership, contact G8BQH, tel 0296 641783.
Chesham (C & DARS)—Every Wednesday. Bury Farm, Pednor Road, Chesham, Bucks. Details "Liz", tel 09278 3911.

Chesham & D ARS's demonstration station on Chesham's Carnival Day, 14 June 1986, being operated by G8KVI, watched by ITN reporter Jeremy Hands, who opened the carnival, and Cllr Mrs Jo Franks, Chesham Town Mayor. *Photo*: G4UXA

Didcot (Vale of White Horse ARS)—16 Sept (AGM). 7.30pm. The Waterwitch, Cockroft Road, Didcot. sec G4SYL, tel Didcot 816845.
Harwell (HARS)—16 Sept ("History of the telephone", speaker from BT). 7.30pm. Harwell Lab Social Club. Sec G6MRP, tel Abingdon 848617.
High Wycombe (Chiltern ARC)—24 Sept (Lecture by Chris Bartram, G4DGU, from MuTek Ltd). 8pm. Sir William Ramsay School Science Block. Details G4XVP, tel 0494 35275.
Oxford (O & DARS)—24 Sept ("VHF antennas", Ian White, G3SEK). 7.45pm. Oxford Civil Service Sports Association Club, Government Buildings, Marston Rd, Oxford (entrance by gate marked Driving Tests). Sec G4PUU.

REGION 7—RR R Sykes, G3NFV, 16 The Ridgeway, Fetcham, Leatherhead, Surrey KT22 9AZ. Tel 0372 372587.

Bexleyheath (North Kent RS)—2, 16 Sept (Equipment evening or 50MHz evening). 8pm. The Pop-in-Parlour, Graham Road, Bexleyheath. Sec G4DIB.
Biggin Hill (BHARC)—16 Sept ("The work of the RIS"). 8pm. Downe Village Hall, 24 High Street, Downe, Kent. Sec G0AMP, tel 0689 57848.
Cray Valley (CVRS)—18 Sept (Natter night). 8pm. Progress Hall, Admiral Seymour Road, Eltham SE9. Details G3TAA.
Crystal Palace (CP & DRS)—20 Sept ("The history of the valve", C Jones). 8pm. All Saints

Parish Room, Upper Norwood, SE19. Sec G3FZL, tel 01-699 6940.
Dorking (D & DRS)—9 Sept (Informal), 23 Sept ("Raynet"). 8pm. Star and Garter (9th), Ashcombe School (23rd). Sec G3AEZ, tel 0306 77236.
Sutton & Cheam (S & CRS)—19 Sept (Visit to Surrey Police Headquarters). 8pm. Downs Lawn Tennis Club, Holland Avenue, Cheam, Surrey. Sec G4FKA, tel Epsom 21349.
Wimbledon (W & DRS)—5 Sept (144MHz df foxhunt). 7pm. Note new venue: St Andrew's Church Hall, Herbert Road, Wimbledon SW19. Sec G3DWW, tel 01-540 2180.

REGION 8—RR M Elliott, G4VEC, 20 Haysel, Sittingbourne, Kent ME10 4QE. Tel 0795 70132.
Brighton (B&DRS)—3 Sept (Talk by G3WR), 17 ("A blast from the past", G4DQS). 8pm. Seven Furlong Bar, Brighton Race Course. Details G4IIL, tel 607737.
Crawley (CARC)—10 Sept (Informal, courtesy Lech, G3KAU, QTHR), 17 (Committee meeting at Mick's, G3IPP), 24 ("RSGB", G4VEC). 8pm. The Leisure Centre, Haslett Ave, Crawley. Details G4IQM, tel 882641.
Dartford (DDFC)—7 Sept (RSGB hunt), 9 (Pre-hunt meet), 14 (Club hunt), 21 (RSGB Final). Pre-hunt meetings after 9pm. Horse & Groom PH, Leyton Cross, Dartford Heath. Details G8DYF, tel Greenhithe 844467.
Dover (SEKYMCARC)—3 Sept (Natter nite and committee meeting), 10 ("Raynet, how it works"), 17 (Natter nite), 24 ("Scarab"). 8pm. Dover YMCA, Godwynehurst, Leyburne Rd, Dover. Details: JH Dobson, tel Dover 211638.
Eastbourne (Southdown ARS)—1 Sept ("50MHz, past and present", G8VR), 3 (Exhibition at "Hobbyfair", Hailsham Leisure Centre), 16 (New RAE course starts at Hailsham Leisure Centre), 20 (Activity weekend on all bands to promote "Devonshire Award", GB2SAR special event), 6 Oct (Surplus equipment sale). Chaseley Home, South Cliff, Eastbourne. Various courses held Tuesday evenings. Friday evenings are chat nights. Hailsham Leisure Centre, Vicarage Lane. Details G4XNL, tel Eastbourne 638653.
Edenbridge (EARS)—10 Sept ("RSGB" G4VEC), 8 Oct (HF night/judging of construction contest). 8pm. The Scout Hut, High Street, Edenbridge. Details G8VCH, tel East Grinstead 24748.
Gillingham (Bredhurst R&TS)—4 Sept ("The G-QRP Club", G3RJV), 2 Oct (Inter-club quiz). 8pm. Parkwood Community Centre, Parkwood Green, Wigmore, Gillingham. Details G0AMZ, tel Medway 376991.
Gravesend (GRS)—Mondays, 8pm. The Windmill Tavern, Shrubbery Road. New sec G0DYX.
Hastings (HERC)—17 Sept ("Ron Hodgkinson, G4KYQ"). 7.45pm. West Hill Community Centre. Various activities on other nights. Details G4NVQ, tel Hastings 420608.
Maidstone (MYMCAARS)—5 Sept (Open evening to welcome beginners and new members) 8.30pm. 12 (Natter night, RAE and cw). 8.30pm. 19 (ATV demonstration/lecture). 7.45pm. 26 (Natter night, RAE and cw). 8.30pm. YMCA Sportscentre, Melrose Close, Maidstone. New sec G0BUW.
Meopham (MPRC)—14 Sept ("Direction-finding techniques and equipment"). 7.30pm. 21 (DF hunt). The Club House, Vigo Rugby Football Club, Vigo Village, Nr Meopham. Details G6TXP, tel 0732 883812.
Worthing (W&DARC)—3 Sept (Ragchew and HF SSB Field Day review), 10 (Microcomputer evening, G3LJK, G4SWH, G8VEH), 17 (Ragchew evening). 7.30pm. Lancing Parish Hall, South Street, Lancing. Sec G4SWH, WADARC, PO Box 599, Worthing BN14 7TT.

REGION 10—D H Phillips, GW4KQ, 17 Pentre Gardens, Grangetown, Cardiff CF1 7QJ.
Cardiff (CRSGBG)—8 Sept ("SSB power measurements", GW3NWS). 7.30pm. Pantmawr Hotel, Tyla Teg, Pantmawr Estate, Whitchurch, Cardiff. Sec GW0CUM, tel Cowbridge 3212.
Rhondda (RARS)—18 Sept ("Ellis Evans, GW3CDH, Worked all (USA) Counties" slide show), 2 Oct (Open meeting). 7.30pm. Union of Mineworkers Club, Tonypandy.

REGION 11—RR B H Green, GW2FLZ, 1 Clwyd Court, Ian-y-Bryn Road, Colwyn Bay, Clwyd LL28 4AH. Tel 0492 49288.
Colwyn Bay (Conwy Valley ARC, GW6TM)—11 Sept (Quiz). 8pm. Green Lawns Hotel, Bay View Rd, Colwyn Bay. New sec GW4KGI, tel 0745 823674.
Porthmadoc (P & DARC)—18 Sept (Video film), 16 Oct ("Basic fault finding", GW2HCJ). 8pm. Harbour Cafe, Ffestiniog Railway, Porthmadoq. Sec GW1EGQ, tel 0766 2684.
Rhyl (R & DARC GW4ARC)—1 Sept (AGM), 15 (Programme planning), 6 Oct (Activity night). 7.30pm. 2nd Rhyl Scout HQ, Vale Road, Rhyl. Sec GW8OYT, tel 0745 37284.

Would club secretaries please send to me their club programmes for November 86 onwards, as soon as possible, so that I may insert them in "Club News". *RR11*

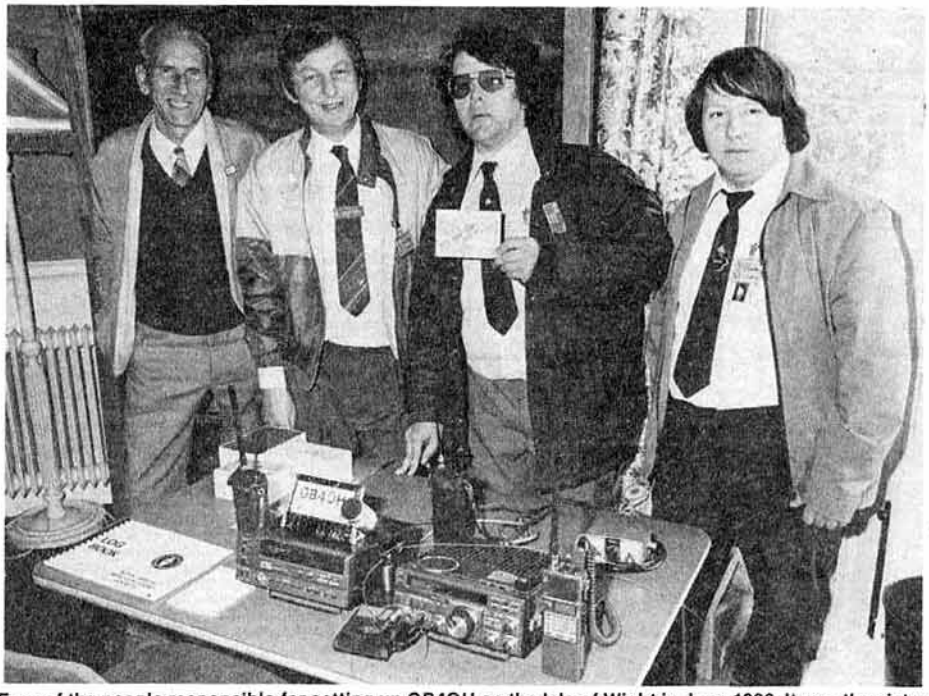
REGION 16—RR A Owen, G4HMF, 102 Constable Road, Ipswich, Suffolk. IP4 2XA. Tel 0473 51319
Braintree (B&DARS)—1 Sept ("Power supplies", G3PEN), 15 (Arrow electronics, G3LST). 8pm. The Community Centre, Victoria Road, (next to bus station), Braintree. Details G0EMK (temp 88 Coldnailhurst, Braintree CM7 5PY, tel 0376 25587).
Brentwood (BARC)—First and third Tuesdays in each month. 7.30pm. The Heritage, Shenfield Road, Brentwood. Details from chairman, G8WYM, tel (daytime) Basildon 403153.
Bury St Edmunds (BStEARS)—16 Sept ("FAX demo", G4UCW). 7.30pm. Westgate Primary School, off Hospital Road, Bury St Edmunds IP3 2EE. Details tel 0359 50271.
Chelmsford (CARS)—25 Sept ("Antartic surveying"), 2 Oct (AGM). 7.30pm. Marconi College, Arbour Lane, Chelmsford. A.C. Mead. Details G4KQE, tel 0376 83094.
Colchester (CRA)—18 Sept ("Electronic teleprinters", G8CKW), 2 Oct (AGM). 7.30pm. Colchester Institute, Sheepen Road, Colchester CO3 3LL. Details G3FIJ, tel 0206 851189.
Felixstowe (F&DARS)—8 Sept (Social), 22 (Alan Melia, G3NYK), 6 Oct (Social). 8pm. The Feathers PH, Walton High Street, Felixstowe. Details G4YQC, tel 0473 642595 (daytime).
Great Yarmouth (GYRS)—*This club is meeting again on Thursdays*, 7.30pm. The Drill Hall, York Road, Great Yarmouth. Details, G3NHU, tel 0493 721173.
Ipswich (IRC)—3 Sept (Planning SSB FD), 24 (TBA), 8 Oct (Planning JOTA). 8pm. Rose & Crown PH, Norwich Road, Ipswich. Details G4IFF, tel 0473 44047.
Kings Lynn (Norfolk CAT Student Union ARC)—Thursdays, 7.30pm. Norcat radio shack (at rear of) St John's School, London Road, Kings Lynn. Morse classes Fridays. Sec G4OZG, tel 0553 768701.
Leiston (LARC)—25 Sept (Social), 7 Oct (RTTY by computer). 7.30pm for 8pm. Sizewell Sports & Social Club, King George's Avenue, Leiston. Details G0CJX.
Norwich (NARS)—3 Sept (SSB field day planning), 10 (Visit to Yarmouth Coastguard), 17 (RR16 visit), 24 (Surplus equipment sale). 8pm. Valley Drive Community Centre, 97 Plumstead Road, Norwich. Details G4WTR, tel 0603 610874.

REGION 17—RR T Emery, Wilverley, Old Lyndhurst Road, Cadnam, Southampton. SO4 2NL. Tel 0703 812435.
Bishop's Waltham (Amateur Radio and Computer Club)—5 Sept ("Pacsat and JAS-1", K8KA), 3 Oct ("Enigma—over the shoulder", G3VA). 8pm. The Crown, Bishops Waltham, Hants. Sec G6DLJ, tel 0703 847754. (Also Prestel Mailbox 703847754).
Andover (ARAC)—3 Sept (Construction contest), 21 (Club barbeque), 1 Oct ("A night of conversation"). 8pm. Wolversdene Club, Andover. Club net, 8pm Tuesday evenings S18—G0ARC/A. Sec G0AMO, tel Andover 51593.
Basingstoke (BARC)—1 Sept ("Surface mounted devices", G4OXK), 25th anniversary of BARC in September—congratulations. 6 Oct (AGM). 7.30pm. Forest Ring Community Centre, Sycamore Way, Basingstoke. Sec G4WIZ, tel Tadley 5185.

The highlight of the Mid-Lanark ARS open day was the presentation of the GM3EHI Award to John Branegan, GM4IHJ, (centre) for his work on auroral sporadic-E and satellite prediction, together with honorary life membership of the society. The awards were presented by Tom O'Neil, GM4PRO, chairman, MLARS (l), and Jim Reid, GMLQR, vice-chairman, MLARS (r). *Photo*: GM4SRL

At the Mid-Lanark ARS open day in June, the winners of the joint Mid-Lanark and West of Scotland ARS 144MHz fm contest held in April 1986 were presented with their certificates. L to r: Jim Reid, GM4LQR, vice-chairman, MLARS; Bruce Steel, GM1KNP, leading portable station; Anne Hood, sec, MLARS, and contest organizer; Vic Budas, GM3VTB, leading unhandicapped station and second overall place; Derek Smith, GM0EEY, leading Mid-Lanark member; and Tom O'Neil, GM4PRO, chairman, MLARS. *Photo*: GM4SRL

Binstead, IoW (BARS)—Every Wednesday, Binstead Scout Hall, 7.30pm. Sec G4VJF, tel Ryde 66298.
Blackmore Vale (BVARS)—9 Sept (Junk sale), 23 (Project night). 7.45pm. The Bell and Crown PH, Zeals (on the A303). Sec G4YXX, tel 0963 32389.
Eastleigh (Itchen Valley ARC)—12 Sept ("Propagation", G3LTP), 26 ("A general view of QRP", G6BUE). 7.30pm. The Scout Hut, Brickfield Lane, Chandlers Ford. PRO G0EQG, tel Winchester 55339.
Fareham (F&DARS)—10 Sept ("Mountaineering", G1MCP), 24 ("Homebrew—the legal limit on 144", G4XZL), 3 & 17 (Natter nights). 7.30pm. Portchester Community Centre, Portchester, Hants. Sec G3CCB, tel Fareham 288139.
Horndean (H&DARC)—4 Sept (Junk sale), 2 Oct (AGM). 7.30 for 8pm. Murchiston Hall, London Road, Horndean. 1986 is 10th anniversary year of club with special award. Sec G4BEQ.
Isle of Wight—Fridays, 7.30-8pm. Unity Hall, Wooton Bridge, Sec G6XMI.
Liphook (Three Counties ARC)—3 Sept ("Propagation", G3LTP), 17 ("Amateur tv", G8LES), 1 Oct ("HF antennas and feeders", G5RV). 8pm. The Railway Hotel, Liphook. Sec G0BTU, tel Petersfield 66489.
New Forest Repeater Group, GB3NF—For information or to join the group and help support the repeater, please contact G6DLJ, tel 0703 847754.
Poole (PARS)—26 Sept (10th anniversary celebrations). 7.30pm. Commander's House, Constitution Hill Road, Poole. Sec G4XYX.
Portsdown Hill Repeater Group, GB3PH—For information or to join the group and help support the repeater, please contact Mr A L G Price, tel 0329 281852.
Southampton (SUARS)—29 Sept to 13 Oct: special event station (awaiting callsign) on hf, 144 and 432MHz to coincide with "Fresher's Conference" and to publicise club in the university. Meetings Wednesdays, 1pm. 65 University Road, Southampton. Contact G0ERI, tel 0703 559122, ext 2137 (work).
Swindon (S&DARC)—4 Sept ("Radio and tv broadcasting in the USA", G4YQZ), 18 ("Antennas", G4RZF), 11 and 25 (Natter nights). 7.30pm. Oakfield School, Marlowe Avenue, Swindon. Sec G4YQZ.
UK FM Southern Repeater Holding Group, GB3SN—For information or to join the group and help support the repeater please contact Mrs Jan Steele, tel Fleet 3311.
Waterside (WSWC)—Results of agm: chairman, G3YJJ; treasurer, G1MTR. Fourth Tuesday in every month, 7.30pm. Community Centre, Blackfield, Southampton. Sec G0BPA, tel 0703 893937.
Weymouth (SDARC)—2 Sept ("Radio control of model aeroplanes", G3YWW). 7.30pm. Royal Engineers Training Camp, Camp Road, Wyke Regis, Weymouth. Sec G1AHK, tel Dorchester 67596.
Winchester (WARC)—19 Sept (Presentation by McKnight Crystals). 7.30pm. Durngate House, Winchester. Sec G4ZNO, tel 0703 772191.



Four of the people responsible for setting up GB4OH on the Isle of Wight in June 1986. It was the sister station of GB0IOM at the same event. L to r: G4VJF, G4RTW of Binstead (IoW) ARC, with G6XMI and G6XVN of the Isle of Wight RS

Club secretaries in Region 17 are asked to note that I am on Prestel Mailbox No 703812435. There is now even less excuse for you not letting me know what your club is doing. *RR17*

REGION 18—RR Ian Gibbs, G4GWB, 61 The Gables, Widdrington, Morpeth NE61 5QZ. Tel 0670 790090.

Berwick (Borders ARS, G0BRS)—5 Sept (Field Day presentation), 6, 7 (Field Day, HF VHF/UHF), 19 Sept ("Top band working", GM3KMR/G3YOG. Tweed View Hotel, Tweed St, Berwick. Sec GM1IRN, tel 0289 82491.
Newcastle (NER & CC, G4YPT)—Members and visitors please note new club secretary. Meetings Monday evenings, Village Hall, Hazelrigg, Newcastle. Sec G1GNY, tel 091 236 5288.
Newcastle (Tyneside ARS, G3ZQM)—3 Sept (Informal), 6, 7 (Participation in 144MHz Trophy & SWL Contest), 10 (Activity evening), 14 (Operation of special event station GB2BBC from BBC HQ Newcastle), 17 (Informal), 21 (DF foxhunt (No 2)), 24 (Activity evening). Scout Centre, Harbottle St, Byker, Newcastle. Sec G4KDT, tel 091 234 1148.

REGION 20—RR C R Hollister, G4SQQ, 34 Battersby Way, Henbury, Bristol BS10 7SU. Tel 0272 508451.

Bristol (BARC)—9 Sept ("UHF matters", G6GN). 7.30pm. YMCA, Park Road, Kingswood, Bristol. Details G4YOC, tel Bitton 4116.
Bristol (BRSGBG)—29 Sept ("10GHz revisited", G8MWR, of Microwave Society). 7.30pm. Small Lecture Theatre, University of Bristol, University Walk, Clifton, Bristol. Details G4SQQ, tel 0272 508451.
Bristol (North Bristol ARC)—5 Sept (Natter night), 12 (Bring and buy), 19 ("GWR", talk and films by Ron Gardner), 26 (QSL card display). 7pm. SHE, 7 Braemar Crescent, Northville, Bristol. Details G4YQQ, tel 0272 690404.
Bristol (South Bristol ARC)—3 Sept (AGM), 10 ("Cellular radio", lecture and demo, G3PTO), 17 (Computer bring and buy), 24 (Preparation for the Bristol Rally, G4SQQ and G4KUQ). 7.30pm. Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol BS14 1LN. Details G4RZY, tel 0272 834282.
Cheltenham (CARA)—5 Sept (Test equipment evening). 7.30pm. Stanton Room, Charlton Kings Library, Cheltenham. Details G4VXE, tel 0242 26723.
Shirehampton (SARS)—19 Sept ("Packet radio", demonstration and lecture, G8NNU and G8IMB). 7.30pm. Twyford House, Shirehampton, Bristol. Details G4GTD.
Weston-super-Mare (WsMARS)—8 Sept (Natter night), 22 (Constructors' night). 7.30pm. The Rugby Club (off Drove Road), Weston-Super-Mare BS22 0SJ. Details G1DJW, tel 0934 514429.
Yeovil (Y&DARC)—11 Sept ("The transmission equation", G3MYM), 18 ("Inductance", G3MYM), 25 (Natter night). 7.30pm. The Recreation Centre, Chilton Grove, Yeovil, Somerset. Details G3GC, tel 0935 75533.

Note—Clubs not listed above have not sent copy to the RR.
Many thanks to all the members in Region 20 who voted for me. It is a great credit to the region that there was almost a 25% ballot.

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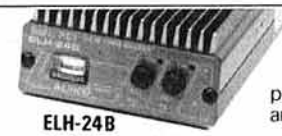

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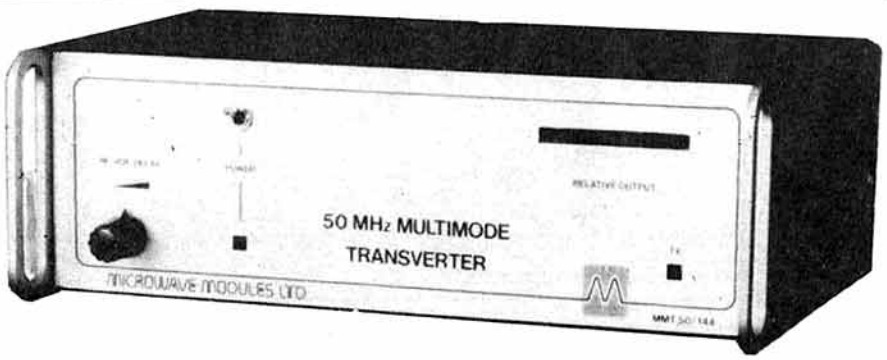

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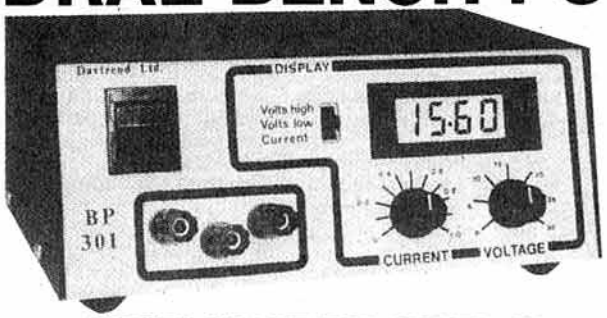

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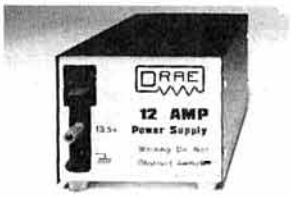

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MEMBERS. Use right-hand price columns. It is essential that you quote your call sign or BRS number so that you can be recognised as a member.

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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***Items marked with an asterisk may not be available immediately; please telephone before ordering to confirm availability.**

ORDER FROM: RSGB Publications (Sales), Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE

THE
RSGB News Bulletin
PAGES

OOPS..!!!

You know the old saying about "....to err is human"?

It's now been conclusively proved that RSGB staff are human - which is another way of saying we boobed.

In last month's RadCom editorial we grandly said "....one item of news that you are reading in the RSGB News Bulletin with this issue - that the Morse qualification now lasts for life....". How many people tore their hair out looking for this tantalising piece of news in the Bulletin? Did you curse those imbecile Bulletin writers for ruining your day? Well, it was all our fault - for various reasons relating to a last-minute change of story, the item about Morse qualifications lasting for life fell off the bottom of the page and we didn't notice its absence until it was too late. So (pause for fanfare of trumpets) here's the story you should have read last month....

AMATEUR RADIO MORSE TEST

NOW VALID FOR LIFE

In a press release dated 18 July 1986, the Department of Trade and Industry announced that a pass in the Amateur Radio Morse Test will now be regarded as valid for life. The previous rule was that, where a break of more than 12 months has occurred in licensed operation, or where a licence had not been obtained within 12 months of having passed a Morse test, a further test would be required.

This change of policy brings the currency of the Morse test into line with that of the Radio Amateur's Examination, where a pass is already valid for life. It's worth mentioning that this new provision is valid retrospectively.

So now you know...!

RSGB v EMC
- Round 2 -

You'll remember that one of the Society's chief concerns throughout this year so far has been the new strategy adopted by the Radio Investigation Service last January.

In the April 1986 edition of the Bulletin we outlined the story so far, and we said that the RSGB was contemplating what action it should take and how vigorous the action should be. Since then, we've been burning the midnight oil on this problem with a venegance. Staff and volunteers have had meetings and long sessions with various parties who could help - to the tune of more than 1,000 man-hours - and we're now beginning to get somewhere.

It's worth briefly going over the original problem. For some years now, many of the most important issues in amateur radio have been associated with breakthrough of amateur transmissions into various forms of domestic electronic entertainment equipment. Nowadays we refer to "EMC problems" - the letters standing for Electromagnetic Compatibility - and it's interesting to note that EMC in one form or another has become of much more concern to the electronics industry at large in this solid-state age. EMC problems between transmitting amateurs and neighbours were either solved by the amateur himself fitting appropriate filtering or by the neighbour whose equipment was affected invoking the assistance of the Radio Investigation Service. The RIS officer would often be able to take the heat out of a difficult situation by being an impartial intermediary.

Until 1984 the then Radio Interference (now Investigation) Service was operated by British Telecom (formerly the Post Office and, prior to that, the GPO) on behalf of the Home Office on an agency basis. With the passing of the 1984 Telecommunications Act, which privatised British Telecom, control of the RIS was transferred to the Department of Trade and Industry. Following this transfer, a review of the RIS took place; the September 1985 edition of the Bulletin gave what information was published concerning the outcome of this review. The essence of it was that the RIS would be re-orientated towards the enforcement role and would carry out what the Minister of State for Industry & Information Technology called "....a phased withdrawal from the time-consuming effort put into dealing with domestic TV and radio reception problems".

At more or less the same time as all this was taking place, the Society was (and still is) involved in two cases of breakthrough which, although technically no different from many others in scale or scope, had attracted the attention of Members of Parliament and thereby the Parliamentary Under Secretary of State. In the course of handling these cases, the Society became aware of the DTI's increasing interest in immunity standards for domestic entertainment equipment; the background to this aspect of the problem was set out in the April 1986 Bulletin.

As a result of the factors outlined earlier, which led to restrictions in budgets and staff numbers, the RIS began operating to a new strategy in January 1986. As we said at the time, the Society had (and continues to have) "....reservations about both the quality and the scope of the strategy". If you turn up page 7 of the April 1986 Bulletin, you'll see what else we had to say about it. In a nutshell, we were worried. We felt

that the situation as a whole was "....a grave potential threat to the well-being of amateur radio in the UK". Hence the enormous amount of effort which we've put into this problem during the past few months.

The Society has now produced a list of what seem to us to be important measures which must be taken in order to reduce or remove the "....grave potential threat". These measures are, if you like, what we're going to do about the EMC problem, at least in the short- and medium-term. You'll notice that the first item relates to the establishment of a "code of practice", and almost everything else in the list is somehow related to this. The point here is that, as users of transmitters in what is often an urban environment, we must all make sure that our own house is in order before getting involved with what may be difficult and sensitive problem areas with neighbours.

So here's the "RSGB 11-point plan of action" -

1 The RSGB intends to establish a "code of practice", to which it expects all UK radio amateurs will adhere. Implicit in this code of practice will be a way of assessing what is realistically possible in a given environment - i.e. not expecting to be able to run 400W on 144 MHz to four times 19 elements three feet away from your neighbour's TV antenna without a few minor EMC problems rearing their heads. The code will also advise amateurs on how to react when EMC problems do occur. We hope to agree the terms of this code of practice with the DTI, and we feel sure that they will give it strong support.

2 As well as the code of practice, the RSGB will produce a booklet similar to the one currently dealing with the obtaining of planning permission. This will advise members on all the precautions which should be taken at an amateur radio station to reduce the likelihood of EMC problems occurring. The booklet will deal with matters such as antenna installation and it will also act as a sort of first-aid manual. The Society intends it to be complementary to the forthcoming "EMC Manual"; this will deal with the more technical aspects of the problem. The booklet will set out the elementary theory and it will be sent free of charge to RSGB members on request.

3 The RSGB intends to set up a network of "EMC co-ordinators" all over the UK. The intention is that these co-ordinators will be prepared to assist amateurs with EMC problems on a voluntary basis; the hope is that there will be at least one per county. The co-ordinators will be given training by the Society in basic first-aid EMC problems and it is hoped that they will be able to solve what could be called "first-line" EMC difficulties by means of precautionary measures, filtering, etc. Since the majority of EMC problems do, in fact, fall into this sort of category, the co-ordinators should be able to advise members on how to clear up many EMC problems. The Society's solicitors are currently looking into the legal aspects of this scheme, particularly the requirement for proper insurance.

4 The Society is to make a wide range of filters available to members: some have already been evaluated and are available now and there'll be more to follow. More on that later.

5 We want the DTI to adopt a fair procedure to resolve conflicts between the radio amateur and the neighbour, for use in cases where all else has failed. The RIS/DTI must be involved in such a procedure, and must act fairly as far as both parties are concerned. If it is an RSGB member who is involved, the procedure will include the assistance and involvement of the Society.

6 The RSGB feels that the syllabus for the Radio Amateur's Examination should be revised, to provide greater emphasis of EMC matters and how to approach EMC problems. In the course of our recent work we've discovered that there is an enormous amount of myth, rumour and general misinformation about EMC matters in amateur circles, and that needs to be put right. Some of that can be done right at the beginning of the amateur's career.

7 The Society will continue to liaise with relevant bodies with a view to improving immunity standards. These include the British Standards Institution (BSI), BREMA and various elements of Government.

8 The Society also intends to work with organisations such as the Consumers' Association in order to identify receivers which are prone to EMC problems. This means that a) radio amateurs will know what they are likely to be faced with in their local "EMC environment" and b) the general public will be more aware of the nature of EMC problems and which receivers are less prone to them.

9 In the same vein the Society intends to liaise closely with the relevant part of British Telecom, with a view to reducing the alarmingly high number of cases in which telephones and telephone equipment either suffer from RF breakthrough or themselves generate interference.

10 The RSGB will shortly be setting-up a database at Headquarters which will list all known radio and television receivers and domestic entertainment equipment. This is obviously quite an undertaking, and the decision to mount this particular operation has not been taken lightly; however, since there appears to be no equivalent anywhere, and no centralised body of information on EMC characteristics of domestic equipment, we feel that the job simply has to be tackled and done. The intention of the database is to record case histories, together with information on modifications and filtering which have produced a successful solution.

11 Finally, the Society intends to seek Government finance - that is to say, from either the Department of Trade & Industry or the Department of Education & Science - to investigate further the problems associated with transmitter operation in an urban environment.

The "bottom line" is, as always, to obtain the best possible conditions under which UK radio amateurs can pursue their hobby. In this connection, there are two main points to bear in mind:

* The Radio Investigation Service has scaled down its activities as far as investigations of interference to domestic electronic entertainment equipment are concerned and is operating to what, in the Society's opinion at least, is a questionable strategy

* Provided that the amateur can be shown to have his own house in order - that is to say that his own installation is beyond reproach from an EMC point of view - the Society's subsequent

position is fairly and squarely on manufacturers to provide proper RF immunity in the first place and also, where difficulties persist, for the Government to operate a fair procedure. Whilst we are quite happy to go to the lengths outlined above where they are necessary, the Society's long-term aim remains as it has always been - to make manufacturers very aware of the growing requirement for proper RF immunity and the consequent need for their design department to do their job properly.

So - that's what the RSGB proposes to do in order to mount an attack on EMC problems. In the very short-term, we are now stocking filters - see point (4) above. These are made by a reputable company - Armstrong Kirkwood Developments - and they've been thoroughly tested by members of the Society's EMC Committee to make sure that they're right for the job. We're stocking five individual types, as follows, all prices by post:-

Model BB1 - a "braid-breaker" filter suitable for rejection of braid-borne interfering signals between 2 MHz and 50 MHz and it still possesses some useful rejection (15 dB) at 70 MHz.

Its quoted rejection is 25 dB at 30 MHz or below. This filter has less insertion loss in Bands IV and V than most other filters (around 2 dB) and should be tried first in areas where those signals are weak. It is also useful in Band II.

British Telecom equivalent FS74a. Order as FIL1 - price £5.49 to members, £6.46 to non-members.

Model HPF2 - a high-pass filter for Band II (i.e. VHF/FM broadcast) with low insertion loss above 88 MHz and rejection better than 50 dB below 30 MHz.

This filter is only effective on the inner of the feeder cable and therefore its main use will be where strong HF signals are directly affecting the tuner circuitry. It could be combined with BB1 to reject braid-borne interference as well.

HPF2 has no known British Telecom equivalent. Order as FIL2 - price £5.49 to members, £6.46 to non-members.

Model HPF1 - this combines the braid-breaking action of the BB1 and the high-pass filter action of the HPF2. However, it is only suitable for use in Band IV and V (i.e. UHF television) since it has a high insertion loss below 300 MHz - if you need the combined filter action below that, use a combination of BB1 and HPF2.

Specified rejection at 30 MHz is better than 60 dB, although our sample measured 50 dB, and usable passband is from 400 MHz upwards. HPF2 still has some usable rejection (about 10-15 dB) up to 200 MHz, so it might be useful if you run HF and 144 MHz.

Near British Telecom equivalent FS72a. Order as FIL3 - price £6.05 to members, £7.12 to non-members.

Model TNF2/2 - this is a 144 MHz tuned notch filter which will reject 144 MHz signals on both the inner and the outer of coaxial feeder cable whilst passing all other signals.

It is suitable for all UHF television channels in Bands IV and V with low insertion loss, although in Band II it still has between 3 and 5 dB - so it might not be suitable in fringe areas. Rejection better than 35 dB on the inner and 30 dB on the outer.

Better than near British Telecom equivalent FS64/1a and 2a. Order as FIL4 - £6.23 to members, £7.33 to non-members.

Model RBF1/70 - this is a 430 MHz tuned notch filter which will reject signals on the inner of the coaxial feeder cable. It has insignificant insertion loss to broadcast signals except in group A of Band IV, where slight signal degradation may be noticed. It has about 20 dB rejection, and in severe cases two could be cascaded.

Not quite as good as British Telecom type FS73a but a fraction of the cost! Order as FIL5 - price £5.49 to members, £6.46 to non-members.

For clubs and groups we're also offering a special kit of 11 filters at £46.50 if you're affiliated, £54.70 if you're not! Order code FKIT.

And finally - don't forget the ever-popular RSGB ferrite rings, which from what we hear seem to work really well. Price £2.54 to members, £2.99 to non-members per pair.

We'll keep you posted on further developments in the electromagnetic compatibility saga. We still think it's the biggest and nastiest problem facing radio amateurs in the UK, and as the national society it's up to us to sort something out.

NEC '87

Got your 1987 diary yet? Yes? Well, get it out and make a note of some of the most important dates of next year - the RSGB National Amateur Radio Convention at the National Exhibition Centre....

28/29 March 1987

Got that? Good. We'll see you there.....it'll be the best ever.

RAYNET ELECTION NEWS

Following the calls for nomination in the June issue, only three nominations were received;

Zone 5 (Greater London) - Mr I Jackson, G8RWH
Zone 6 ("South East") - Mr R Ray, G3NCL
Zone 8 (Wales) - Mr R Cardwell, GW4PUX

Consequently Messrs Jackson, Ray and Cardwell were elected unopposed for Zones 5, 6 and 8 respectively.

In the July issue, a call for nominations for Zone 11 (Northern Ireland) was made. Two valid nominations were received;

Mr J A Walsh, GI4JXM (nominated by GI4BWM, GI3RNY, RS7781, GI4PID and GI4SJA)

Mr J Chapman, GI4LVC (nominated by GI4MDD, GI4MCW, GI4MAF, GI8WBZ and GI0BEF)

Any currently registered Raynet member resident in Northern Ireland may record his or her vote for one of the above candidates in the following manner. No special ballot paper is required. The text of your vote should indicate clearly which candidate you prefer. Please do not include any correspondence in the same envelope. On the back of the envelope, which must be sealed, you must write in block capitals your name and callsign. The envelope must be addressed to "The Secretary (Raynet Zone 11 Election)" at RSGB Headquarters. Your vote MUST reach HQ by 1715 on Tuesday 30 September.

The result of the election will be announced on GB2RS and it will also appear in RadCom.

Mobile mics - DoT speaks

The Department of Transport is planning to introduce a new Highway Code rule which relates to mobile telephones but which also has an amateur radio spin-off. This new rule, Rule 49a, is currently before Parliament: it says "Do not use a hand-held microphone or telephone handset while your vehicle is moving, except in an emergency. You should only speak into a fixed, neckslung or clipped-on microphone when it would not distract your attention from the road. Do not stop on the hard shoulder of a motorway to answer or make a call, however urgent"

The Department of Transport, in a letter to the Society, adds that "The Highway Code is an advisory code of practice in that a failure to observe any of its provisions is not, in itself, an offence. Such failure, however, may be used as evidence in any court proceedings which may arise. Current legislation already places the responsibility on drivers to have proper control of their vehicles at all times. A motorist who fails to do so as a result of distraction or lack of concentration is liable to prosecution".

RS DIRECT TO YOUR DOOR

Are you a frustrated home-brewer?

How many times have you read through a constructional article which featured something you fancied building and then gnashed your teeth because the designer has specified RS Components part numbers? Join the gang - it drives RSGB staff mad too.

RS Components, who used to be known as Radiospares, are one of Britain's leading distributors of electronic and electrical components, but only to professionals - ordinary members of the public could only get RS parts via a local friendly dealer willing to order for them. Happily that situation's changed. RS Components have announced the launch of "Electromail", which is essentially a distribution service to make their components available to everyone. "Electromail" offers the full catalogue range of RS items and you can order by cheque or credit card. The catalogue can be obtained from Electromail, P O Box 33, Corby, Northants NN17 9EL, telephone 0536 204555, and it costs £2.50.

JAS-1 latest

The first Japanese amateur radio satellite, JAS-1 - which incidentally has now been renamed "Fuji" - was launched successfully at 20:45:00.5 hours UTC on Tuesday 12 August. JAS-1 separated from the H-1 rocket at 21:47 UTC and the beacon on 435.795 MHz has been successfully received. The University of Surrey has also copied telemetry. We have a Keplerian element set for JAS-1 at the end of this item, and it can also be found on the RSGB DataBox. AMSAT-UK also gives regular updates on its nets - these take place on Mondays and Wednesdays at 7pm local and on Sunday mornings at 10:15am local. Frequency is 3782 kHz and callsign G0AUK.

RSGB/DTI

REPEATER LICENSING TALKS

The Society held a meeting with DTI staff as part of a review of beacon and repeater licensing procedures on 22 July. This joint meeting took place as a result of substantial delays which had crept into the licensing process. Following the meeting, a statement was issued by the DTI in a letter dated 30 July 1986: it stated that "The DTI is very much aware of the considerable delays currently being experienced by many repeater (and beacon) groups in receiving approval for new or changed amateur repeater and beacon stations. Unfortunately, due to existing procedures within the Department and other pressures of work, such delays are affecting new applications and changes of frequency, site and antenna almost equally. The Department is well aware of the concern amongst amateurs about this unsatisfactory situation and is currently in discussion with the RSGB on how procedures may be simplified so such delays do not occur in future. A review of all amateur beacon and repeater licensing procedures is currently being prepared within the Department and it is anticipated that a new, hopefully streamlined, system will be introduced before the beginning of 1987. The intention is that procedures can be devised by which processing time can be reduced to weeks rather than months, although this is of course subject to the outcome of the review. In the meantime, existing applications will be dealt with as soon as possible under the current system"

P.S.

The annual "QSO Reunions" between members of RAOTA and the Dutch OTC on Monday and Tuesday 6 & 7 October from 0830 GMT to lunchtime each day. Initial calls on 3600 kHz SSB and 3550 kHz CW. If 40m is suitable, calls may also be made on 7070 kHz and 7025 kHz respectively.

The Derby & DARS's 75th Anniversary Lecture "A Glimpse Into the Early Years of Wireless" will be given by Fred Ward, G2CVV at 7.30pm on Wednesday 10 September in The Media Centre, St.Helens House, Duffield Road, Derby. Admission by ticket only from Ken Griffin, G4HDP.

Radio amateurs in Botswana will be able to use the special prefixes 802 and 800 during September & October as part of the 20th Anniversary of Independence. Special QSL cards will be available.

The familiar face of David Gough, G6EFQ will not be present behind the RSGB stand at this year's Lincoln Hamfest on 7 September. David is getting married the day before and says he has better things to do!!!

THE Members' Ads PAGES

FOR SALE ••••••

SEM Z-Match, £40. Microwave Modules 10m pre-amp, £15. Creed 444 teleprinter, £40. Pye B&W portable TV, £45. Sabtronics DMM incl ac adaptor and leads, £60. Yaesu FT200 plus FP200, ex condx, £250. Spare set of valves, £10. GPO type 300 relays, 6off, £2 ea. Old RSGB c/books, 1977-1982 incl, £1 ea. SWM binder, £3. WRTV Handbook 1978, £1. G4KZZ, QTHR, tel: Coventry 444160.

HEATHKIT HW100 TCVR, 3.5-30MHz c/w HB psu mic key 100W dummy load, £75 ono. 18AVT/WB vertical antenna 3.5-30MHz, £30. Storno Viscount 2m TCVR. 4 pairs xtals full data c/w 5/8 2m mag-mount, £25. Class D wavemeter, working, £5. B2 TX/RX HB PSU, some non-standard TX parts, working, full data, £15. 20' alloy pole, £5. TE15 grid dipper 400kHz-280MHz, £10. Boxed 832 valves (3), £3 ea. Boxed 829 valve, £5. Buyer collects or pays carriage. G3BNF, tel: Bath 859282.

SUPERB freehold split-level semi-detatched dormer house built on elevated land, ex accomodation on 3 levels, delightful panoramic view, 3 beds, gdns, brick garage, extra parking space, storage room, workshop, £30,000. Wright, 249 Sandy Lane, Hindley Wigan, tel: 55948.

TS940, TS440, Collins KWM2A, all in as new condx, ring for best price. Hart, tel: Derby 833684.

FT290R, muTek, nicads, chgr, rubber duck, 144-148 coverage, 25W linear, orig pkg, mint condx, bargain, £250. AR40 rotator, £50. Dressler 2m GAsFET masthead pre-amp, handle 50W+, little use (3 months), incl psu, £75. G6GGE, tel: 01-747 1506

IC-210 FM 2m TCVR, PLL synthesised vfo, built-in mains psu removable for mobile wkg, instruction manual, cct diag, ex condx, £150, buyer collects. G4KWA, tel: 01-777 9061.

FL2100Z HF LINEAR AMP, 3-years old, vgc, £350. G4GLT, QTHR, tel: 0530-35835.

COMPLETE HF STATION: TS930S c/w auto atu, NB filters, SP930 spkr, £900. CWR-670E telereader, £165. KR600RC rotator, HB33SP, tri-bander, 45' Altron triangular 3-section tilt-over tower, will split, £495. MK1024 message-keyer (programmable memory), £110. All as new, used one year only. Mick, G4WHH, tel: 01-398 7064 or 01-942 0012.

SX200N SCANNER RX, mint with mpu, 6 months old, cost £325, bargain at £190 incl p&p. R J Newey, 1 Barlow Close, Oldbury, Warley, West Midlands, tel: 021-544 4185, after 6pm.

YAESU FT726 2m/70cm/satellite, little used, immac condx, genuine reason for sale, £925 ovno, will p/exch FT2700RH with cash adjustment. G6WIL, tel: 01-520 6020, anytime.

IC735 , £650. Trio R600 RX, £200. CWR610 CW/RTTY decoder plus Morse tutor, £120. All plus postage. Chris, G3TUX, tel: 0428-56255, office hours.

KW TRAP DIPOLE c/w 75' coax, will swap for KW EZE-match or Supermatch with cash adjustment. G3YNC, QTHR, tel: Romford 49175.

70cm TRIO 8400, matching psu and spkr, base stn colinear, £200. SX200N, discone and SSB unit, £200 VFO120, unused, £50. HF5R ground-plane kit, unused £30. ND1 2m mobile, £70. Codar AT5 plus psu, £25. G1ALG, tel: 01-803 7459.

ICOM IC02E, 144-148MHz, chgr BC26E spkr/mic, manual, £210. Triangular 3x10' section tower for large beams, £120. G3FVB, tel: 082 581-3356.

EIMAC 3-500Z triode pair, brand new, boxed, c/w glass chimney and ceramic bases, £80 ea or £150 pr G3ZZQ, QTHR, tel: 0920 3740.

SILENT KEY SALE: Complete 2m stn, pwr/swr meter, FDK Multi 700EX, Dactron PH-500, Ringo Ranger, wavemeter, boxed near new condx, £250 ono. G0ESA, tel: 0535-46015.

RACKS 19", one 17" high with front and rear panels vgc, one 6' with rear door, gc, £20 ea. Vince, G8YPK, tel: 0702-218443.

DATONG D70 Morse tutor, as new, £35. Cheetah 32k RAM extension for Sinclair Spectrum, £10. Harry, GODQL, NOT QTHR, tel: 0388-834270.

FT480R 2m multimode, Drae 13.5V 24A psu, 2m 5/8 and 1/4 wave gutter mount, best offer secures. J Russell, 13 Stonebridge Lea, Orton Malborne, Peterborough, tel: 0733-59263, daytime.

TRIO TS820S with 12V dc inverter, £450. AT200 atu, £75. Trio 7600 with RM76 processor, £160. All little used in last 3 years c/w books etc. Norman, tel: 051-608 1504.

TR2200GX 2m FM TCVR, 10ch fully xtalled with nicads, chgr, £75. MML28/100S, 100W 28MHz linear with pre-amp, £75. Wood & Douglas 70FM05T3 70cm TX kit with toneburst and xtal, £38. GM4UKG, QTHR, tel: 0383-416688.

TOTALLY UNUSED ATV SYSTEM: MTV-435 ATV-TX, Wood & Douglas ATV-RX cvtr, 21-ele Tonna with RG214 feeder, £150. Hy-gain 18AVT/WB 80-10m vertical, gc £50. Large qty 6cm/3cm microwave components. SAE for details, G4ASR, QTHR, PO Box 73 Hereford HR2 9EW, tel: 0873-87679.

HETERODYNE FREQ METER, Schomandl FD1, overhauled, tracked and standardised to MSF, 30-920MHz, in first class condx, can be seen wkg, £85 ono. G8BIH, QTHR, tel: 0420-82739.

DRESSLER D200S 2m linear plus Dressler masthead pre-amp, £550. Yaesu FT208 handheld, £110. Yaesu FT726R fitted 2m/70cm/HF modules and full duplex satellite unit, £1,100. 2m Cushcraft 19-ele Boomer £65. 70cm 21-ele Tonna, £20. Mutek TVVF50c 2m-6m tvtr, £180. 6' Andrews aluminium dish with 10GHz feed, very slight damage, £50. G4TWJ, tel: 0706-57838.

YAESU FT480R, as new, £280. Tono 2m 100W linear, £90. Microwave Modules MMT1296 23cm tvtr, £150. Jaybeam D15 23cm Yagi, £20 or offers? All plus carriage. Julian Tether, Highview, Culworth, OX17 2AX, tel: 029576-8152.

YAESU FT102 fitted FM, all 9-bands, gc, £550. Printer/monitor stand, metal, very strong, £11. For BBC B, 20k shadow RAM board, £25. Orig ROMS, Wordwise, Toolkit, Disk Doctor, £10 ea. G6HVZ, QTHR Worthing, tel: 0903-65900.

RTTY TERMINAL UNIT, Scarab MPTU-1 c/w interface and program for Spectrum 48k, £60. ITC 9" mono monitor, gwo, £25. D'KTronics keyboard for Spectrum, £25. G4ODK, QTHR Basildon (Essex), tel: 0268-418058.

FRG7 RX, fitted FM, manual, vgc, £120. 2off double sided double-density 8" Shugart disc-drives SA850, brand new, boxed, manuals, £180 pr. Dave, G3ZWK, QTHR, tel: 01-894 5511 extn 282, daytime or Crowthorne 775316, after 6.30pm and weekends.

YAESU FL2100B linear amp, 10m-80m, 1200W pep, ex condx, selling as homebrew amp near completion, £365 ono plus carriage. Peter, G4BVH, QTHR, tel: Brighton 504634, Monday to Friday 5.30pm to 6pm only!!!

BEARCAT scanning RX, 40ch AM/FM, 7-bands, 66-512MHz incl aircraft, marine, 2m/70cm amateur, public service, £195 ono. HRO RX c/w psu, 7 coils, £45 ono. Buyer inspects and collects. Haselden, tel: 08293-2884.

WELZ DIAMOND CP5 5-band vertical, £75. G3IRM, QTHR tel: 0284-4318.

YAESU FT102 HF TCVR with FM/AM unit, SP102, mic, immac condx, hardly used, £550 the lot. FDK Multi U11, 70cm mobile or base, mic, handbook, £120 ono. G3HPC, NOT QTHR, tel: Plymouth 335759.

YAESU FT757GX, all mode gen/cov HF TCVR, gc, £595. G3TSO, QTHR, tel: Cirencester (028575) 532.

2m TRIO 7730, vgc, c/w mic and psu, exch only for SC lathe, local prefer re transport. Also Markon ac generator Honda GZ00 2.5kVA 250/110V exch for HF TCVR FT101ZD prefered, vgc, possible cash adjust. G4KFW, QTHR, tel: 021-357 2009.

FT290R, nicads, chgr, case, mobile mount, vgc, hardly used since new, £230. Interests now HF, could deliver, working Lincs, Berks, Yorks. G4UFE, QTHR, tel: 062882-2828.

WESTERN Ulti-mast telescopic tilt-over, mount post in concrete base, whole lot could be dug out if wanted, also head unit, £100 ovno. G4BUV, QTHR, tel: Caston (Norfolk) 520.

ANADEX DP8000 dot-matrix printer, gc, £100, GM4OXJ, QTHR.

FT290R, muTek front-end when new, case, boxed, £235. FT901DM remote vfo, ooxed, £95. Eric, G4XEH Cornwall, tel: 0726-63081.

PAPER CAPACITORS, 8uF 600V and 1000V wkg, £1 ea. 2m FM, G3TDZ TX/RX, completed boards c/w orig article and many xtals, £25. RadComs 1969-1981 inclusive, FREE! All buyer collect. G3PVX, QTHR, tel: 01-866 6432, evenings.

ICOM IC2E 2m FM TCVR c/w BC25E mains and CPI mobile chgrs, £100. FDK 700E 2m FM TCVR, variable o/p to 25W c/w mobile mount, MM202S remote mobile mic and Shure 444 hand mic, £100. G3YIU, QTHR, tel: 021-430 6926.

TS180S, rare opportunity to purchase Trio's previous solid-state flagship rig with supply, un-fitted WARC kit, extras, pristine condx, practically unused, prefer buyer inspects/collects £500. WANTED: Case for FT400/401/560. Richard, G3XPM, tel: 0423-871723, up to 4 September only.

EDDYSTONE 730/4 in new condx, £55. A H Baker, 34 Wenny Estate, Chatteris, Cambs, PE16 6BA.

HRO-ST R106 model, all capacitors neatly replaced, immac, superb performance, 8-coil packs, £100. Photocopier Xerox 3103, A4/A3 plain paper, ex wkg condx, swap for professional communications RX or HF TCVR, TS520, FT101 etc or WHY? Jim, G4XWD, tel: Kidderminster 3674.

IC251E, muTek, SP3, SM6, £545. TS430, PS430, FM430 £630. Creed 444, stand, paper etc, £35. Lucas 10m FM, £30. All ono, buyer collects or postage extra. WANTED: HD rotator, cheap please. G4XNG, 13 Broadway North, Walsall, West Midlands.

ICOM IC720A, all band HF TCVR, PS15 psu, narrow CW filter, pristine condx, £675. IC211E 2m multimode base TCVR, 240V/12V, Thanet fitted muTek front-end, ex condx, £375. Icom 240 FM mobile TCVR popular channels, £110. G4HXE, tel: 0304-825079.

50MHz/6m module for FT726R, ex condx, boxed, unused, with Jaybeam 4Y-6M antenna, £150. G1HIW, QTHR.

SUGIYAMA F850 all-band, all-mode TCVR incl 4m and 2m, £500. 120W HF linear, £95. 160W VHF linear, £100. 432/144R MM tvtr, £95. MM2001 RTTY/TU cvtr, £75. AMTOR TU incl KBDS and printer, £60. SX200 scanner, £130. Creed 2300 teleprinter, £40. All equipment little used, subject to offers. G4JOA, QTHR, tel: 0945-65716.

BRAND NEW ROTATOR with control box, c/w Jaybeam 5-ele crossed Yagi, buyer collects, £50 the lot. G4IXK, QTHR, tel: 0270-767594.

MML144/30LS LINEAR, perfect condx, £40. 'Osker' SWR200 swr/pwr meter, 4-ranges to 2kW, covers

3-200MHz, as new, £20. Atu with self-contained dummy load, 2A RF meter, swr bridge, £25. G3OXV, QTHR, tel: Daventry 702265.

YAESU FT209RH: Alistair, G1MNL has moved to USA and left me his handheld to sell. He needs CTCSS which is only reason for sale. Please call my machine on 01-221 4399 and offer £200. Robert, G4XDD, view Kensington or Somerset. Thank you!

FT102 with FM, FC102, SP102, vgc, £600. TS700G with VOX3, £200. Versatower P60, electric winch, h/duty rotator, beam, DC7011 round controller, £500. New Silver Eagle mic, £45. Shure mic, £20. Mobile whip, £10. G4OOM, QTHR, tel: Rotherham 850517.

YAESU FT480R multimode, gc c/w mobile mount, £250 ono. Eddystone 840A, ex condx, £45 ono, for sale again due to time-wasters! Buyer inspects and collects or pays all carriage. G1AFW, QTHR, tel: 0795-876447, evenings.

TRIO R600 RX, vgc, £200. Yaesu FRT7700 atu, £25. Ridler, tel: 0783-672130.

RECEIVING STATION CLEARANCE: B40, CR100, RX107, 3-section mast, manuals, accessories, magazines, many extras, £200 the lot, buyer collects, will split. Mr Thomas, RS41781, tel: Waterlooville 264466 extn 3528, daytime.

FL2000B plus 2 brand new 572B/T160L matched valves £300 or will separate, buyer to collect. G4MDL, QTHR, tel: 0782-314716.

PYE MF5FM hi-band 6ch mobile, less xtals, mic, mount, ideal 2m TX/RX, 12V mobile or weather satellite RX, £25 unmodified or £30 retuned but less xtals, carriage extra. Chicken, tel: 0670-513994.

BRAND NEW RADIO HARNESS, suit Burndept UHF range, £8.50 incl p&p. Pye A200 linear, gwo on 2m, £50. Pye PF1 TX/RX on RB6, with extras, £30. Burndept 470-471 modules, tested, SAE for details. WANTED: Pye PF6, BE600. Please write, G1DRR, QTHR.

YAESU FT2700RH dual-band mobile TCVR, new Feb 86, mint condx c/w Kenwood MA4000 antenna, £399. Also 15' GRP fishing boat with cabin, trailer, 5 hp outbaord, £350. G0BOM, tel: Gainsborough 617488.

RTTY SYSTEM: Texas TI99/4A computer, Kantronics interface, software on EPROM, split screen, type ahead, message staores etc., CW/RTTY/ASCII TX/RX, also printer interface, cassette leads and many Basic programs on cassette, £60. Dave, G0CAD, QTHR, tel: Oxford 863565.

MML144/100-S linear amp, vgc, £80. G6DEV, QTHR.

COMPLETE STATION FOR £495: FT101ZD, atu, swr meter dummy load, low pass filter, 33' mast, rotator, HQ1 mini quad, 3-band trap dipole, 267' long wire, coax leads, plugs etc. Moving house, low price for quick sale; G3VQG, QTHR, tel: 0406-362939, evenings.

KW2000B, with ac and mobile psu's, ex condx, one owner from new, spare tubes, £200. Sands, East Sussex area, tel: 0435-830102.

KENWOOD/TRIO AT230, mint condx, £100. 2off SEM Z-Match atu's, £70 and £55. G3XNP, QTHR, tel: Waltham Cross 32434.

3 KILOWATTS! Almost new Kubota generator, 240V and 12V o/p, has run for 30h only, substantial saving on new cost of £700, now at £495 due to time wasters. G6JNS, QTHR, tel: 0905-620041, anytime.

VALVES: YL1080 and YL1000, quick heat type, £20 ea. G4KDM, QTHR, tel: 0484-863489 or 0484-864086.

BRAND NEW Henry Radio 2KD Classic linear amp, cost £4,000+ UK, will sell for £1,000 or WHY? G4SFG, tel: 021-552 1770.

2m LINEAR AMP, NAG144XL, single 4CX350, built-in psu, built-in pwr/swr, 250W pep, vgc, £280 buyer collects. G0DXC, QTHR, tel: Reading 596485, after 8.30pm or at weekends.

TEN-TEC ARGOSY I, 1.8kHz SSB filter, CW filter, noise blanker, xtal calibrator, £300. FT77 with FM board, 160m mod, £400 ono or p/exch for IC720A. G3TXQ, QTHR, tel: 0604-859354.

KATSUMI MK1024 electronic keyer with 1024 bit memory, ideal for CW contesting, £75. G5LP, QTHR, tel: 0933-79539.

FDK700EX 2m FM, variable pwr 0-25W c/w mic, mounting bracket, as new, boxed with manual, £140. Icom IC2E handheld c/w nicads, chgr, spkr/mic, case, new April 86, £130. Ken, G1GPC, tel: Harlow 26647.

NEWBRAIN computer, model AD, built-in display c/w manuals, beginner's guide cassette, very versatile operating system in 24k ROM, 32k RAM, ex order, £80 only. Also Teletype KSR33, can interface RS232, old but working, £15. G3KRL, QTHR, tel: 022026-2315.

VIDEO GENIE computer c/w manuals, books, some software, built-in cassette, also incl excellent little assembler/editor, ZEN - very good intro to Z80 assembly language, 16k RAM only, hence £70 ex order. G3KRL, QTHR, tel: 022026-2315.

SILENT KEY SALE: Yaesu FT101E, FC901 atu, Trio TS130S plus homebrew psu. Offers to Mr Burns, tel: Hertford (0992) 553903.

MMT432/28-S 70cm linear tvtr, £70. Jaybeam LW16/2m Yagi, £25. Mike, G2XV, tel: Cambridge 871663.

SOMMERKAMP FT150 TCVR, 100W, 80/40/20/15/10m bands gc, 12V and mains internally, £175. G8UWS, QTHR, tel: Folkestone 77205.

KP200 memory keyer, £120. EK150 keyer, £75. MMS2 advanced Morse trainer, £85. G0BXA, QTHR, tel: 0454-413326, weekends.

KATSUMI Mk10 24-memory keyer, mint condx, £100. Hardman, tel: Blackburn 673184, from 9am to 4pm or 0257-480500, evenings.

TH7DXX as new, £525. 3' cabinet, £10. 6' cabinet, EX1131, £10. Pair quad spiders, £15. DX Edge, £5. G2QT, QTHR.

MICROWAVE MODULES MML432/30-L 70cm 30W linear, 1-3W i/p, £100. MuTek TVHF230c 2m to 9-band HF tvtr, £160. Roy, G4WTV, tel: 0903-67764.

IC02E, spkr/mic, chgr, £200. Trio AT230, £110. ICSM6, £25. GM4UQG, QTHR, tel: 0698-459301, evenings.

BARGAIN: Apricot portable 256k, super suite programs, voice recognition, BBC program converter with lead, async. activity tutor, parallel printer lead, 10 disks, little used, full MSDOS capability for £470 ono only. Write G4ZCO, QTHR.

STORNO CQM 600 series boot-mount FM box c/w control head, 10W, RO/R1/R2/R5/R6/S19/S20/S21/S22, wkg, £60 ono. Wylie, tel: 0505-22749.

YAESU FT225RD TCVR plus muTek, £400 ono. MMT432/144R tvtr, £100. Trio QR666 communications RX, £30. MMC432/144S cvtr, £15. G8SGI, QTHR, tel: Falmouth 40797, weekends only.

KW103 pwr/swr meter, mint condx, £35. G3YNC, QTHR, tel: Romford 49175.

JR310 RX, £40. BC221, £15. Jaybeam 4-ele 2m quad, unused, £20. MMC50/28 cvtr, £20. SEM HF up-cvtr, 100kHz-60MHz, £20. UHF coax relay, BNC skts, £4. QQV06-40As with bases, £5 ea. QQV03-10s, £1 ea. G4DSC, QTHR, tel: 0765-2230.

STANDARD C78 FM TCVR, matching amp, mobile mount, orig pkg, ex condx, nicads, chgr etc, £185. Trio 2300 2m FM plus amplifier, orig pkg, £100. Europa tvtr, £30. SSTV Wrasse SC160, £180. G4FBA, NOT QTHR (West Yorks), tel: 0977-82005.

YAESU FT230R 2m 25W mobile TCVR, boxed, £160. G6SKD, QTHR, tel: 0494-41653.

TRIO 7010 2m SSB TCVR, mobile/base, £90. Trio 2300 2m FM portable, £70. G8YTF, tel: 0706-350650.

A REAL BARGAIN: FRDX500 RX c/w CW filter, spkr, £80. FLDX500 TX c/w mic, lead for transceive operation, £80. Both in gwc for age, ideal first HF rig. Mike, G3ZFE, tel: 0323-845363, evenings.

YAESU 726R, 2m/70cm/HF/Satellite units, narrow CW filter, boxed, manual, ex condx, £1,000 ono. Consider exch HF radio with cash adjustment. G1IQJ, QTHR, tel: Epsom 42476.

R278 AIRCRAFT RX, £80. Eddystone 770/R, two for £70. Eddystone 830/7 RX, £180, with manuals. Tech scopes, £40. Large Hornby '00' layout, 12off engines, coaches, trucks, controller, 90% brand new, exch for FT221RD. BC221, £15. Nelson, tel: Thetford 810879.

FT77 plus FM, FC700, SP980, Drae 24A psu, £550. Western DX33 beam and Emotator 1035AX rotator, £125. FT270R with FVS1, £325. Buyer collects. G4YYN, QTHR, tel: 0272-553851.

YAESU FT101ZD MkIII, 250Hz CW filter fitted c/w 500Hz spare filter, £425. MuTek TVVF144a, 10m-2m tvtr incl patch leads and switching unit, £195. Harry Rice, tel: 0384 82-4441, 8am-4.30pm.

FT7B TCVR, analogue dial c/w mic, 80m G-whip and manual, £220. G4LHK, QTHR, tel: 0538-757225.

DATONG AD-270 active dipole antenna, 2-100MHz, £30. Yaesu YD844 desk/mic, 50k ohm impedance, £20. Pace Nightingale modem for BBC computer c/w Commstar ROM, £75. All items post paid. G3RDG, QTHR, tel: 01-455 8831.

CREED 444, 50 baud, vgc c/w Creed stand and spare machine for parts/repair, £45. Creed 2500 electronic, unmod, wkg order c/w spare machine for parts/repair, £30 the pair. Spectrum+ 48k, mainly used for RTTY from new, incl radio , serious software and some games, £75. 20', 2" dia Dural mast with h/duty custom-made stand-off wall brackets for swing-down action, £25. Barrie, G6DVO, QTHR, tel: Hertford 57225.

DUNSTABLE, Bedfordshire. Attractive 3-beds detatched house with attached garage etc, double glazed throughout, cavity wall insulation, well maintained, built for present owner by reputable local house builder in 1967 on plot 150'x35' in prime location some 525' asl, adjoining school playing field. Parking for caravan or up to 6 cars Planning permission granted for 30' mast for "Amateur Radio Purposes", £84,000. Mr Ashmore, tel: 0582-606983 for futher details.

TRIO TR9130 2m multimode TCVR c/w system base, never used mobile, mint condx, boxed with manaul, also 10A psu, £440 ono. G8TOE, QTHR, tel: 061-491 0721.

MAINS STABILISER, 200-252V in 240V out +/-0.2%, 13A continuous, heavy!, offers? G3RVM ACS keyer, £15. Pocketfones, RB0, £30. WANTED: 100VA toroidal transformers, 2x30V out approx, need 2off. Fraser, G4BJM, QTHR, tel: 0908-567362.

QTY of 2" MAST CLAMPS, unwanted, part of auction job lot, £2.20 ea incl p&p. GM8PNP, QTHR.

FT101E, £320. MM 2m tvtr, £80. 14-ele Parabeam, £30. 12AVQ trap vertical, £40. All ono. G4DPZ, QTHR, tel: Maldon 57175.

BURNDEPT 70cm, SU8/RB2/RB10, ex condx c/w 6off nicads, chgr, manual, £130. John, G6CZC, tel: 0274-614593, evenings or 0274-720504, office hours.

KATSUMI EK-150, keyer, £23. Aluminium tubing 18swg, various diam's for 10m and 15m 3-ele beams, offers. G3TMU, NOT QTHR, tel: 0276-32204.

YAESU FT7B, 100W TCVR with YC7B digital readout, Daiwa RM940 infra-red coupled mic, G-whip 10-80m mobile antenna, £350, buyer collects. G4GYG, QTHR, tel: 01-886 6843.

REALISTIC DX400 direct entry gen/cov RX +88-108MHz digital readout, scan, auto-scan, 12 memories, used twice only, mint, need money for UHF, £140. Richard, G1OKH, QTHR, tel: 0763-42638.

VIBROPLEX BUG-KEY, £35. New meter for KW109 atu, £10. Qty heavy guage alloy poles, 20' and 16' lengths, 80p/foot. GW3CBA, QTHR, tel: Barry 741520.

YAESU FT77, FM board fitted plus Transmatch atu, mobile mount, HF antennas, £400. G4URS, tel: Dereham 860015.

SX200 SCANNER, VHF/UHF AM/FM, 26-88MHz, 108-180MHz 380-514MHz, mains or 12V, cost £325 new, £175 ovno Olivetti printer 5V TTL ASCII compatible, 110 baud with keyboard and tape punch/reader, RTTY machine. G4YXS, Wilts, tel: 0373-88678.

ANTENNA ROTATOR CD40 Hy-Gain controller, £60. DX-33 beam, 10/15/20m, £50. G3NJU, tel: 0565-53199 daytime or 061-747 7965, evenings.

YAESU FT707, matching FP707 psu, FC707 atu, £500. Trio 9130, mint condx, £400. Trio 2500 handheld, case, spkr/mic, battery case, £180. Realistic DX200 RX, £40. G4WOC, QTHR, tel: Taunton 85091, evenings.

ICOM R70 communications RX with RTTY/SSB/AM/FM/CW wide/narrow, band-pass and IF notch filters, selectable amateur bands or gen/cov, a superb RX for £350 only. G4FCR, Sutton Coldfield, tel: 021-378 2198.

GENRAD HP MARCONI R&S sig/gens, bridges, pwr meters, slotted lines, admittance meters, Diagraphs scope c/w camera and plug-ins, noise/gen RXs, HR01155, H2900, valves, semiconductors, 10GHz A4 SAE for full list, viewing by appointment only. G2CPM, QTHR.

JAYBEAM 4m AERIAL 4Y4M, brand new in manufacturers box, £25 buyer collects. G8BIH, QTHR, tel: 0420-82739. Jaybeam 6m aerial 4Y6M, brand new in manufacturers box, £32 buyer collects. G8BIH, QTHR, tel: 0402-82739.

SHACK CLEARANCE: All Heatkit, ex condx c/w manuals HR1680 RX; HX1681 TX with psu; HW101 TCVR with filter, psu, spkr; IG82U square/sine-wave generator; IO18U oscilloscope; HD1410 electronic key; £500 the lot or will split. G3LP, QTHR, tel: 0452-34890.

CLASS 'D' WAVEMETER, No1 Mk2, 100/1000kHz xtal vfo 1900-8000kHz plus harmonics, mains, gc, instructions, £9. Valves: 6L6 metal, 12SK7(M), 12SQ7(M), 6SK7(M), 6Q7(GT), £2 ea. Mains transformer, tapped 6.3V 10A twice etc. G3MBL, QTHR Bury St Edmunds, tel: 0284-60984.

TR7010 2m TCVR, MML100S, PS30 20A psu, muTek SBLA144E masthead pre-amp, Hansen FS500V swr/pwr meter. all vgc, complete 100W 2m stn, £350 no split. Heathkit SB303 HF RX with MM 2m cvtr, £50. Datong RFC/M, unused, £10. G8KJA, QTHR, tel: 0904-708704.

FT101ZD Mk3, FM c/w FC902, FF501 filter, YD844D desk/mic, hand/mic, £650. Kenwood DM81 gdo, £40. TH3 Jnr c/w balun, £130. All ex condx, little used. GW4RQS, QTHR, tel: Deeside 817407.

SHACK CLEAROUT KW2000B vgc c/w psu/spkr, £120. W&D ATV1TX 70cm c/w W&D 430/600 RX, unused, £50. FT290R, c/w case, £180. MML144/30LS, £30. Rotator, £10. 5/8 wave mobile gutter mounted, £5. MBM48-ele 70cm, unused, £20. G6JVG, NOT QTHR, tel: Cheltenham 577412, evenings.

SHARPE XC-33H colour video camera, ex condx c/w psu, leads, zoom lens, in-built mic, manual, £140 ono. Shibaden TU-200K 19" monochrome TV monitor/UHF RX, fast warm-up, vgc, £40 ono. G4OSL, QTHR, tel: 0602-623755, evenings.

FT290R with muTek front-end, £230. Tokyo Hy-power HL-160V 2m amplifier, 3-10W i/p, 160W o/p, £150. Drae 24A psu, £90. MET 144/14T 2m Yagi, £20. FT780R, 10W 70cm multimode TCVR, £280. MML432/50 70cm amplifier, £100. MET 432/17T 70cm Yagi, £15. Welz SP-400 meter, 130-500MHz 150W, £35. Altron SM30 telescopic tilt-over mast with ground-post and rotator head, £200. Kenpro KR400RC rotator, 30m cable, £90. G6PXN, 30 miles N Birmingham, tel: Burntwood (05436) 4704.

KW2000B c/w psu and manual, gc, £220. IC290 2m multimode, 3 months old only, vgc, £330. Braun SE600 2m multimode TCVR AM/FM/SSB/CW, £120. Heathkit HW7 QRP HF TCVR, £50. 2m FM 6ch homebrew handheld, £60. G4KZY, QTHR, tel: 0703-611772.

IC02E HANDHELD, ex condx c/w spare nicad, spkr/mic case, chgr, covers 144-148MHz in 5kHz steps, £175 ono. G4JQI, QTHR Lancs, tel: 0254 82-3366.

TRIO TH21E, boxed c/w SMC30 spkr/mic, BNC adaptor, as new, under guarantee, plus homebrew dc cvtr, £180. G1OIO, QTHR, tel: 044 46-42122.

TRIO 3200 with carrying case, mobile mount, chgr, £130 ono. WANTED: Manuals for Pye Vanguard FM25B, AM25T and UHF base F30U. G8KVU, QTHR.

JAYBEAM PBM 14/2m, 12 months old, vgc, £35 buyer collects. G4HLW, NOT QTHR, tel: Wellingborough 626262.

TRIO R2000, fitted options, unused accessories, clean manual, Daiwa coupler, absolutely mint condx £510. G6EQC, QTHR, tel: 0923-26749.

TOWER: 2-section lattice galvanised tower, 30' extended, needs winch and mounting post, £45. G6RLH, QTHR Kent, tel: 03224-48194.

QUAD COLLECTORS ITEMS: Quad 22 control unit, Quad 11 power amp with spare output valves, offers please. G4FJA, tel: 0785-780327.

HF RIG: FL2000B linear, £150. FLDX400 TX, £125. FRDX400 RX, £125. All ono, offers considered, carriage by arrangement but prefer buyer collects. G3DNX, QTHR, tel: 061-480 9994.

TRIO 520 SSB TCVR with matching ext/vfo and spkr, Shure mic, £300. Trio TS700G 2m multimode TCVR, £225. Both in vgc. G3BXI, QTHR, tel: 037 184-235.

BELCOM LS202E 2m SSB/FM 2.5W handheld, 144-148MHz with rubber duck, nicads, chgr, case, boxed, £180. G4WTE, QTHR, tel: Medway 221061.

YAESU FT790R, nicads, chgr, boxed as new, £295. BNOS LP144-3-100, 100W 2m linear, vgc, £100. Jaybeam MBM28/70 70cm beam antenna, vertical or horizontal mounting, £15. Gary, G6TBT, QTHR, tel: 01-995 4701, after 5pm Mondays to Fridays only.

BUILDING A LINEAR? 2off 5-500 PA valves, brand new with one base and top-cap, £100 ono ea or exch WHY? G4LBY, QTHR, 22 Crown Street, Mansfield, Notts, tel: 0623-29473, evenings or weekends only.

IC260E, 2m multimode TCVR, ex condx c/w handbook, orig pkg, mic etc, £260. Would exch or p/exch for HF mobile/base TCVR eg TS120, TS130, FT7B, FT77 etc. David, G4ERW, QTHR, tel: 01-390 7694.

COMPLETE HF STATION: TS820, SP820, fitted 12V inverter, MC35s mic, SEM Tramsmatch (incl 160m), HQ1 mini-beam, orig pkg, £580 the lot. Penton, tel: 08894-78981.

DAIWA AUTOMATIC ATU, ex condx, cross-needle meter and dummy load built in, £90. Paxman, tel: Rhyl (0745) 4995.

FTDX500, recent £60 spent, new valves, bills shown, manual, £230. CNA2002 auto atu, boxed as new, £80. Aerial farm, HQ1, 7-ele Tonna, omni, tilt mast, brackets, UR67, rotator, controller, £200. 6A psu, £15. G4UEE, QTHR, tel: 0509-262957, evenings.

FT221R, muTek, YC221 display, variable pwr, manual, £300. FT101ZD, fan, manual, £375. Welz SP200 pwr/swr meter, 1.8-160MHz, £40. SEM Transmatch with Eze-tune, unused, £90. Dave, G4UKP, NOT QTHR, tel: 0782-813426, office or 0782-518207, home after 6pm.

TB3 TRIBANDER, brand new, never used, also KR600RC rotator, brand new with top-clamps and cables etc, still boxed, reason for sale - moving QTH, £350. GW4YLF, QTHR, tel: 0443-730492.

TELEPRINTER, ITT Creed model 2300/5, with tape perforator and reader, 1200 hours use, ex condx c/w ITT pedestal and 2off line terminal units, bargain, £100. Can deliver South East. Simon, GJ4ODX, "Arlberg" 5 Kendal Close, Tonbridge, Kent, TN9 1LY.

BBC 6502 second processor, complete as new for B, B+ or Master, £140 or consider exch IC2E/4E. G8TGH, tel: Chichester 265907.

PACKER COMMUNICATIONS 2m atu, ex condx, £14. Sun base colinear antenna, triple 5/8 wave, used only 3 weeks, £25. 70cm base colinear 2x5/8 wave, gc, £15. Hansen ZQM2 transistor tester, boxed, ex condx, £12. Mike, G6MNX, QTHR, tel: 0904-422773.

MICROWAVE MODULES 432MHz to 28MHz cvtr, works OK. but no instructions hence price, £60. Ground-plane antenna for 2m, unused, £5. Redifon GR74 marine TCVR, xtalled for 28ch, 1-25W, £60. Mike, G6MNX, QTHR, tel: 0904-422773.

RACAL RA17Mk2 with polished wood outer case, vgc, £180 ono. Eddystone 940 RX, ex condx, spare valves manual, £150 ono. Scott, BRS88597, tel: Blackpool 865929, daytime or 864555, evenings.

FT77, 100W, new 1985, mic, FM, narrow CW filter, ideal rig for /M /P /A use, no tuning required, built-in swr meter, exch HF linear or QRO HF rig, must be gc. G4ODV, QTHR, tel: 0209-820193.

CAPACITORS: 200,000uF 10V, £5. Finned heatsink, 15"x10", £10. WANTED: Case for WS52 RX, mains/batt psu WS52. Info for BC312, R147S, R4187, Sky Champion. RadCom for '72, '73. SWM '50s, early '60s. Jim, G4XWD, tel: Kidderminster 3674, evenings.

YAESU FT757GX TCVR, MMB-20 mobile bracket, MH-1B scan/mic, 5 months old, little used, £550. Capco SPC300 atu, used 3 times, £120. Going QRT. G3RCE, 9 Ripley Grove, Copnor, Portsmouth, Hants, PO3 6NH, tel: 0705-699977.

TITAN 12V electric drill c/w stand and tools, £18 incl p&p. KR500 elevation rotator, as new, £110 incl p&p. G8ESK, QTHR, tel: 0274-497438.

AX25 PACKET RADIO UNIT, £129. NEC 8023 dot-matrix printer, £140. FT230R 2m 25W FM mobile, £175. Standard C58 2m multimode with 25W linear, £200. T Tugwell, 50 Mayridge, Fareham, Hants, PO14 4QP, tel: 04895-81032.

FT790R 70cm multimode TCVR, 8 months old, fitted N-type socket otherwise unmodded, no nicads as used mobile and homebase only, offered £225 in p/exch by dealer, offered privately at £245. John, G4WLD, tel: 01-857 8096.

FT101E, fan, CW filter, modified 10MHz, mains/12V, desk/mic, £350. MM4000 teletype, touchpad keyboard £140. MM28/144 tvtr, £85. Prefer buyer collects. G3NFB, QTHR, tel: 0925-815394.

SENSIBLE OFFERS INVITED for TenTec 229 atu in as new condx, all HF bands to 2kW pep, has given excellent results. Also available, 2m Jaybeam quad. G3ADZ, QTHR, tel: Rugby 815222.

SHARP PC1500 handheld computer, CE151 memory expansion for 10k RAM, CE150 plotter and cassette interface, vgc with custom case, manuals, paper, pens and some radio software, £120 plus carriage. John, G6IBC, QTHR, tel: 01-790 8163, after 5pm.

YAESU 726R, fitted 2m/HF, SP102, £775 ono. Sota 2m amp, built-in psu, 100W o/p, £50 ono. All vgc, any test. G4PWX, QTHR, tel: 05436-6797, after 6pm.

YAESU FT902DM, £400. Mint SEM Transmatch, £35. Mint Welz Diamond DP-CP4 antenna, new, boxed, never used, £45. Kenwood DM81 dip meter, boxed, mint, £40. G4YFR, 1 Topfield Lane, Dalton Parva, Rotherham S65 3QU.

FT101Z, £420. Heathkit HW12 with mains psu, £90. Most new valves, some spares, TRS80 computer with lots software and books, £85. Going 10m mobile, as now flat dweller. G4RWL, QTHR, tel: 0228-49655.

FT790R 70cm multimode c/w nicads, chgr and case, never used mobile or portable, £300. TVVF144A muTek tvtr, little used, 10-2m, £210 ono. Both plus postage or buyer collects. G4UHM, NOT QTHR, tel: 0245-468149, after 7pm.

FT290R muTek c/w case, £240. 10' GRP mast tube, £9. 3off 18" guy stakes, chains and various brackets, £5 lot. All 16 months use. Tarren 3A psu £4. Nentone 5A psu, £4. Iambic key IKP60, new, £5. Chris, G1LJF, tel: Ringwood 474492, weekends only.

TELESCOPIC WINCH OPERATED 40' hardened aluminium mast, SS ropes and fittings, would support HF beam, £150. RTTY terminal units, ST5MCD, BARTC control board fitted, Catronics CT103, £65. Creed 444, £25. All ex condx. G4BYW, QTHR, tel: 0484-540867.

YAESU FT102, FM/AM board, filters etc, orig pkg, manual, ex condx, £495. Buyer collects or carriage extra. G4RUT, QTHR, tel: 0395-273157.

SAGANT EL-40X trap dipole antenna 80/40m (will load on 20m) with balun, £25 post paid. G3RDG, QTHR, tel: 01-455 8831.

COAX, one length 27m+ RG8-U foam, £11. Also 5m+ H100, £3.50. Both include postage. G3RDG, QTHR, 01-455 8831.

MOVING SALE: FV101Z, £65. FT101B, £285. 2.5" scope £15. 144 BP filter silver plated, £8. TK14 reel-to-reel tape recorder, £12. Mono TV MB portable, £20. 4m cvtr, £7. 6A psu, £8. AVO Mk2, £30. Solartron DB scope CD1014, £80. 10-ele X-Yagi 2m, £12. Murphy A92 radio PB mfg 1935/37, both ex order. HMV wind-up gramaphone, vgc, offers? G1LUG, tel: 0203-450476.

MORSEN ZX81 interface/terminal unit, decodes RTTY and CW, £75 (vost £150 new). ZX81 and 64k RAM plus keyboard, re-housed in hash-proof metal box, needs attn, £5. Monitor, £10. MMT144/28 tvtr, £60. Hirschmann rotator, £25. Hirschmann support bearing, £5. 2off AEC antenna switches, £5 ea. Robin, G4WIJ, NOT QTHR, tel: Egham 36693.

FDX750XX 2m multimode, little used as base/stn only, mint condx, orig pkg, plus CH22 colinear antenna, not used outdoors, plus HK702 Hi-mound key, as new, whole package, £350 ono. Alex, G4ZDX, QTHR, tel: Nottingham 625146.

QRT SALE: FT290, nicads, case, strap, chgr, boxed, no mods, £240. 2m 5x5 slot Yagi, new Hirschman rotator, 15m@RG8, 25m 3-core, £50. 2m linear, 4CX250, part assembled with psu, bits, £50. Mains transformer, hi-V capacitors, SAE list. G4VQI, QTHR, tel: 0803-528190.

FT207R 2m handheld TCVR, keyboard, microprocessor synthesised, case, helical, recently serviced, £170. Sanyo chgr, £5. YM-24 spkr/mic, £15. NC-2 chgr/dc adaptor, £30. The lot, £195 no offers. Taylor, G3UCT, 1 Harewarren Close, Wilton, Salisbury, Wilts, SP2 0LY, tel: 0722-744133.

SOMMERKAMP FT902DM HF TCVR, all new bands, dc-dc converter and cord, fan, £550 ono. G0BGY, QTHR, tel: 01-942 7094.

WIDE-SPACED high power transmitting variable capacitors, £19. Shipton Telstor answerphone, needs attn, £20. Philips VR2020 video, complete but not wkg, for spares, £25. Sealine MCS500 marine VHF RX, OK, £15. Auto-dial alarm system, £10. Paul, tel: 0843-61448.

50A HEAVY DUTY PSU, 13.75V, 19" rack size, will sell or exch for 20A type, PS30 or similar switched-mode type or WHY? to exch. Buyer collects it's heavy!!! Andy, G0AYZ, QTHR Gosport (Hants), tel: 0705-589560.

SILENT KEY SALE: G2DAF TX and psu, gc, 160-10m, CW/SSB, £40 ono. HF linear, 2x813s c/w psu, pristine condx but untested, £40 ono. Shure 444 mic, gc, £20. G3VDF, tel: Mansfield 557473.

T&R BULLETINS, 1925-1969, virtually complete, offers? Andy, G4HUE, tel: 01-989 0867.

2-ELE QUAD c/w spider, eight fibre-glass spreaders eight aluminium tubing, also element wire for 10/15/20m, £100 ono. G4SSX, QTHR, tel: Ruislip 630627.

DRAKE TR7 TCVR, PS7 psu, NB7, AUX7, MS7, all for £750 ono. Bob McHenry, G3NSM, QTHR Oxford, tel: 0865-56321.

MICROWAVE MODULES tvtr, 2m i/p 10m o/p, £50. G4VPR, tel: Tunbridge Wells 28947.

STANDARD C8800 2m FM TCVR, scans band or 5 mems, 1W/10W o/p c/w mobile bracket, mic, manual, gwo, £130 ono. Potter, tel: 01-661 0798.

MM4000KB RTTY TCVR and keyboard, £145. MM 70MHz tvtr, 144MHz i/p, offers? G3BHT, QTHR, tel: 021-308 4764.

KW EZE MATCH, £40. 2off pairs 2m xtals, 12 and 15MHz series on R3 and S18, suit Yaesu FT202R etc, £4 the lot. Martin Davies, GW4GNY, QTHR, tel: 0938-75441.

TRIO 9130, as new, 115 hours use, £400. Also 9-ele Tonna, Channel Master rotator, offers? G1GVY, QTHR, tel: 0323-763143, evenings.

HF SSB TCVRs: FT101 and 401, just re-aligned, £285 ea ono. 10m FM DNT, £30 ono. 2m FM 25W FDK Multi 700E, £155 ono. HF atu and wavemeter, offers? SW/Air RXs. David, GOFDV, tel: Luton 423495, anytime.

WRAASE SC1 SSTV/FAX TCVR unit, new, £700. Yaesu 6m module for FT726, new, £170. MuTek 6m filter, £23. Yaesu YH35 phones, new, £8. Icom SP3 ext/spkr new, £39. NEC 12" monitor, perfect, £40. G4XHF, QTHR, tel: 0293-515201.

IC701, 160-10m, digital synthesised TCVR with IC701PS, purchased from importer 2 years ago as second rig, used twice, £400. Trio VFO-200, £50. 20m synthesised CW QRP TCVR, 2.5W o/p, neatly built from WPO kit, £50. Stone, tel: 0691-831111, weekends.

AZDEN PCS-2000 2m FM mobile, separate control head for dash-mounting, remote cable kit, 25W, 144-148MHz, auto-search, 6 non-volatile memories, all control functions from mic, large digital display incl S/RF, handbook, as new, £190. G3AAG, Hants, tel: 0730-892143.

WANTED••••••••••

R390 RX for rebuild project, condx immaterial provided mains transformer OK, sensible price paid GODFF, QTHR, tel: 05827-63389.

BARLOW WADLEY RECEIVER. G14KJC, NOT QTHR, tel: 06626-61089.

FT107M rig and accessories, FTV901R tvtr, heavy duty antenna rotator, cheap 2m FM mobile rig Sommerkamp TS280FM or similar. P/exch my BBC B and double-sided 40/80 track disk drive if interested. G6ZYG, NOT QTHR (Northants), tel: 0933-318493.

SERVICE MANUAL for Pye W15U UHF Westminster, your price. G1GVL, QTHR, tel: Basildon 23882, evenings.

TRANSMITTING ATU for Joystick antenna, white-stick operator, any reasonable price paid. Trev, G4UPW, QTHR, tel: 0392-58697.

R390 RX for re-build project, condx immaterial provided mains transformer OK, sensible price paid GODFF, QTHR, tel: 05827-63389.

£700 OFFERED for a gc and wkg HP spectrum analyser 851B/8551B with or without manuals, will inspect and collect. G8BIH, tel: 0420-82739, anytime.

TRIO TS120V or TS130V with matching psu, prefer fitted narrow band CW filter. G8FF, QTHR, tel: 0263-713210.

EMI VALVE SPG, c1960 in green pull-out case. Large tow-a-van style trailer. CCT for Aids Electronics keyplus numeric keyboard for Apple II+. Brian, G8GQS, NOT QTHR, tel: 01-998 4739 or 0427-616210, evenings.

SHURE 444. G-whip c/w 80/40/20/15/10m coils. Yaesu FC707 atu. Yaesu RSM2 with RSL 3.5/7A/14/21/28 whip sections, no mods please, will collect if needs be. Keith, GOFDJ, QTHR as G6NVC (Essex), tel: 0268-680638, afternoons only.

MANUAL FOR COSSOR 1035 OSCILLOSCOPE, to borrow, purchase or hire for photocopying with deposit for security and postage paid. G3WNT, QTHR, tel: 021-445 1405.

YC601 DIGITAL DISPLAY FOR FT101E. Also FL2100B linear or equivalent. Mosely Mustang tri-band 3-ele beam. All must be gc. Johnston, RS88340, tel: 0394-460474.

TOWER: 50'-60' high, must be in gc, also heavy duty rotator. John, GW0CYI, tel: 05515-631, office hours.

BASE CONNECTIONS for ACR-10 and 3BP-1 scope tubes. Manual for AVO universal bridge to copy and return also TH41 valve for restoration project. G4IAD, QTHR, tel: 0942-817556.

YAESU FV901DM or FV101DM digital vfo. Also YO-901 multiscope, with or without bandscope. G0AQL, QTHR, tel: 0329-284105.

INFORMATION: incl cct diag on standard radio B46 RX please. G4UTM, QTHR, tel: 0823-87247.

FDK EXPANDER 430, good condx. G4KQE, QTHR, tel: 0376-83094.

XTALS OR INFORMATION on RF sig/gen type Tech model TE-200. G1NQX, QTHR, tel: 0679-62889.

SK610A or 620A valve bases. Mark, tel: Newton-le-Willows 5829.

PRC25 and any other synthesised ex-WD equipment such as any of the 'Clansman' range. Also looking for an MRC1 and RBZ RX. Keith, G4MSF, QTHR, tel: 091-469 3955.

TRIO TX310 TX or similar using 4.9-5.5MHz vfo, for use with JR310. G1CNT, QTHR, tel: Barrow-in-Furness 30069.

FTF101ZD Mk3, WARC bands, late model in mint condx will pay good price. Peter Woodhouse, G2BQY, QTHR, tel: Westbury (Wilts) 826698.

HF LINEAR required to complement school club station G4LYZ/GB2HC, consisting of TS430S and TH3. G3XWH, QTHR, tel: Harrogate 871027.

4m TRANSVERTER, prefer Microwave Modules 70/28. G3WZR, QTHR.

TR7A, top price paid for rig in top condx. Stuart Senior, G4MIB, QTHR, tel: 01-675 0280.

EUROPA B 2m tvtr. High voltage caps 700-1000uF 400/450V. TU5B, your price paid. FOR SALE: 2m cvtr 28/30MHz IF, £10. Daiwa Search 9 2m RX, brand new, £30. G3RB, QTHR Whitley Bay, tel: 091-253 0504

NEW SWL REQUIRES gen/cov RX AM/FM 10m SSB/CW. Ad Bren Byrne, 35 Farrant Close, Bishops Hull, Taunton, Somerset, TA1 5EN.

HELP!!! CW filter urgently required for Heathkit SB101 TCVR. G1IRK, QTHR, tel: 0392-214204, after 6pm.

BRITISH PROFESSIONAL RX: Racal, Plessey, Marconi, Eddystone etc, HF and VHF solid state. Also buy all manuals, catalogues, info, WHY? Jean Simon, FE5JX, 113 Rue Saudear, 59300 Valenciennes, France, tel: +27 33 4118

TELEFUNKEN M62: Does anyone have one of these reel-to-reel machines gathering dust? Any condx but prefer wkg, will negotiate and collect within reasonable distance. Alan, G3XQU, Church Lane, Great Warley, Brentwood, Essex, tel: Brentwood 223742.

HALLICRAFTERS HANDBOOK for RX type SX100 urgently required by school club. May we beg or borrow for photocopy and prompt return? G6VHI, QTHR or to Warwick School, Warwick, CV34 6PP, tel: 0926 496820.

2m FM RIG, something like Trio 2300 or 700, Yaesu FT207, FT227, but anything considered, any condx, even faulty considered. Steve, G4WXC, QTHR, tel: Grantham 77708, evenings.

MANUAL OR COPIES for Heathkit grid-dip meter model GD-1U. G0ELH, tel: Basingstoke 473508.

FT707, must be in gc, exch for Dentron HF linear GLA1000, cash adjustment. Also Icom 202, any condx and FT708 or similar. Mike, G0CVZ, tel: Peterborough 222588.

XTALS FOR SPHINX TX type HC6U or anyone with scrap TX please. Norman Birkett, G3EKX, 42 Halvarras Rd, Playing Place, Truro TR3 6HD, tel: 0872-862575.

EDDYSTONE EA12 RX, must be wkg order. Also HW7 or HW8. GODCL, QTHR, tel: 0206-47850.

LINEAR AMP + pre-amp, 50W, FM/SSB. Also copy 'Solid State Design for the Radio Amateur'. G4PDN, QTHR, tel: 01-777 2340.

GALAXY TCVR GT550A and Galaxy SC530 psu for spares or psu only. GM0CNY, QTHR, tel: 0546-2475.

SHIMIZU SS105 FM boards, TX and RX, must be pwo. Other SS105 parts also required, NB unit and xtal marker unit. Alwyn, G1OBFD, NOT QTHR, NO PHONE, 15 Glenwood Gardens, Sligo Road, Enniskillen, Co.Fermanagh, BT74 0AA, N.Ireland.

These subsidised flat-rate advertisements are accepted as a service to members of the RSGB only. They must be submitted on the Members' Ad form printed on the back of a recent address label carrier used to mail RadCom to the advertiser: this will automatically provide proof of membership and should not be more than 2 months old. No acknowledgement of receipt will be sent and advertisements not clearly worded, or which do not comply with the conditions of acceptance, will be rejected. NO CORRESPONDENCE CONCERNING THIS SERVICE WILL BE ENTERED INTO.

Trade or business advertisements, even from members, will not be accepted for "Members' Ads", these should be submitted as "Classified" or "Display" advertisements in the usual way. Traders who are members must enclose a signed declaration that the items for sale or wanted are part of, or intended for, their own personal amateur station.

The RSGB reserves the right to refuse advertisements and accepts no responsibility for errors or omissions, or for the quality of goods offered for sale. Advertisements for citizens' band equipment will not be accepted. Refunds will be sent for any advertisement which are rejected for any reason.

WARNING: Members are advised that they should, as far as possible, ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The "purchase" of goods legally owned by a finance company could result in the "purchaser" losing both the goods and the cash paid.

RATES: The current rate for Members' Ads is £2.30 (incl VAT) for 40 words or less. An additional cost of £2.30 is incurred for every additional 40 words or less. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to 'Radio Society of Great Britain'. When writing out advertisements, please ensure that you do not enter more than one word in each 'box' on the form. It is advisable to read some of the advertisements contained on these pages and familiarise yourself with the house style. Equipment type numbers, telephone numbers and certain abbreviations will count as one word. It may be necessary to edit certain advertisements in order for them to comply with the conditions of acceptance.

The following abbreviations are in common use for Members' Ads:-

TX - Transmitter RX - Receiver
TCVR - Tranceiver
tvtr - Transverter cvtr - Converter
gen/cov - general coverage
sig/gen - signal generator
vgc - very good condition
gc - good condition
ex condx - excellent condition
c/w - complete with

Post to: MEMBERS' ADS, RSGB, LAMBDA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTFORDSHIRE, EN6 3JW.
DO NOT POST TO THE ADVERTISING OFFICER

THE RSGB BOOKS PAGE

STOP PRESS ARRL HANDBOOK 1986 REDUCED TO £6.95 TO MEMBERS BY POST

RSGB CALLSIGN RUBBER STAMP SERVICE

We are pleased to announce a new service available to RSGB members. We can now supply individually made rubber stamps showing your callsign or RS number. Just the thing for adding to your stationery or for making personalised QSL cards.

The rubber stamps measure approximately 35 × 10 mm and come complete with a screw-on handle.

The cost of each stamp is £2.95 to members by post.

To obtain your callsign rubber stamp send a cheque or postal order for £2.95 to RSGB Headquarters. Don't forget to quote your callsign or RS number! As the stamps have to be individually made there may be a delay in delivery of up to five weeks as we expect demand to be high to begin with. We'll obviously do our best to get your rubber stamps despatched more quickly but please don't ring Headquarters with queries on your rubber stamp orders until the five weeks are up.

THE JOY OF QRP—STRATEGY FOR SUCCESS by Adrian Weiss W0RSP

The Joy of QRP—Strategy for Success, recently written and published by Adrian Weiss W0RSP is now available from RSGB.

The book contains eight chapters. The first, The Exciting World of QRP, begins with a history of QRP operation going back to the 1920s. It outlines some of the frustrations of QRP operating and tells how to put these feelings of frustration into perspective in order to enjoy QRP work to the full. It shows how QRP operating often brings out the best in high power operators who often become more determined than usual to listen for the weak signals of the QRP operator. It shows how QRP operation can take place on any mode and gives details of the fascinating experiments that have taken place with powers down to microwatt levels.

The second chapter, Sharing the Joys of QRP, gives details of QRP clubs and societies world-wide, QRP awards, QRP contests and activity periods throughout the year, and QRP calling frequencies and nets.

Chapter three, Planning for QRP Operation, is essential reading not only for low power enthusiasts, but for all who operate on the hf bands, particularly those who are relatively new to hf bands working. The chapter deals with the thought and planning that should precede operation of the hf bands—'What am I trying to achieve?', 'Is my antenna capable of achieving these aims?', 'What bands should I operate at what time of day to achieve the results I require?'—these, and many other seemingly basic questions are raised and many common-sense solutions are suggested.

The next chapter, Putting a QRP Signal on the Air: Commercial Gear, looks at ways of modifying second hand QRO transmitters and transceivers in order to transmit at low power levels. A useful list of features and specifications that should be kept in mind when purchasing second hand transmitters and receivers is given. The chapter concludes with a summary of commercial QRP equipment.

Chapter five deals with 'Homebrewing the First Rig'. This chapter takes the newcomer through the planning stages of home construction. It shows how to select the most appropriate circuits and components for a prospective project. Details of test equipment are given, the equipment being listed in the order in which it is probably desirable to acquire each item. Full constructional details, including printed circuit layouts, are given for a five watt transmitter covering any two bands between 3·5 and 14MHz. This is followed by two v.f.o. designs. These are intended to drive the previously described transmitter, but they would be equally useful as general purpose designs. Finally a regulated power supply is described which can provide between 1·5 and 15 volts at 3 amps. All these constructional projects are described in meticulous detail with particular attention given to explaining why specific components and designs are chosen.

The following chapter, General Operating Techniques, is good reading for the QRP and QRO operator alike. The chapter shows how to judge the mind of the operator at the 'other end'; whether he is really listening for weak signals when he calls CQDX or whether he is just looking for S9 signals at 30wpm. Various calling and transmitter netting techniques are described. Useful ways of maintaining contacts when signals are marginal are also detailed.

Chapter seven gives details for planning and operating QRP during field days, contests and in the various QRP activity periods and QSO parties. This chapter also has interesting sections on QRP mobile operation and QRP working on 160m.

The final chapter introduces the theory of r.f. power measurement and has a helpful section clarifying the various forms of r.f. power. Designs for an r.f. wattmeter and an r.m.s. r.f. voltage probe are given. At the end of this chapter is a thought-provoking treatise on standing wave ratio.
The Joy of QRP is essential reading for anyone who is interested in improving their operating skills on the hf bands. The author has used a thorough and in-depth approach to all the topics covered in this book, but in doing so he has maintained an easy-going and entertaining style. It would be difficult for anyone to read this book and not gain something useful from it.

The Joy of QRP—Strategy for Success by Adrian Weiss W0RSP is available from the RSGB for £7.99 to members by post.

QRP No—Book by Doug DeMaw W1FB

Another new book on low power operating is Doug DeMaw's QRP Notebook. Published by ARRL this book contains many technical tips for the construction of simple but effective low power stations. While complete details of several projects are given the emphasis of this book is on experimentation. The operation of each circuit is fully explained in 'building block' style so that the constructor can experiment with particular circuits in other configurations.

There are six chapters, The Essentials of Receiving, The World of QRP Transmitters, QRP Accessory Gear, QRP Transceiving, The QRP Workshop, and QRP Operating. The book, which can be recommended to anyone interested in the construction of simple receiving and transmitting equipment, contains 84 A4 format pages and costs £3.75 to members by post.

TUNE IN THE WORLD WITH HAM RADIO by ARRL Staff

The latest 1986 edition of this excellent book for beginners to amateur radio is now stocked by the RSGB. The first three chapters, Exploring Ham Radio, The Radio Spectrum, and Learning Your New Language, give a resume of amateur radio activity throughout the world, introduce the frequency spectrum, and give some tips on learning morse code. There then follow three chapters on Basic Electrical Theory, Circuit Components, and Practical Circuits.

Chapter seven, Selecting Your Equipment, gives lots of advice on what to look for when purchasing new and second hand equipment. Useful tips are given on how to save money on purchases and how to ensure that a particular piece of equipment will actually perform well in the situation in which it will be used. The following chapter, Choosing an Antenna, contains useful practical advice on antenna location, installation, and tuning. A number of simple practical antenna designs are given.

Chapter nine gives hints on putting a complete amateur station together, including tips on safety aspects and station location. This is followed by a chapter on operating procedures and practices, contesting, and awards. The following chapter gives advice on how to solve interference problems and basic problems with spurious emissions, modulation, keying, and antenna problems.

Tune in The World with Ham Radio contains 208 A4 format pages and costs £4.38 to members by post.

MORSE CODE—THE ESSENTIAL LANGUAGE by Peter Carron W3DKV

This new book published by the ARRL is essential reading for anyone interested in the use of morse code whether beginner or expert. The introductory chapter explains why the code is still of great importance in today's modern world of communication systems. Chapter two contains a fascinating history of telegraphy from 1792 to the present day. The next two chapters introduce the code and provide useful hints for learning morse together with morse exercises, Q signals and abbreviations.

The following chapter illustrates techniques for increasing code speed and details a number of different sending devices ranging from straight hand keys to computer systems. The final two chapters deal with handling distress signals and future morse techniques.

Morse Code—The Essential Language contains 126 pages and costs £3.39 to members by post.

MICROWAVE COMMUNICATIONS HANDBOOK by Dave Ingram K4TWJ

This new book by Dave Ingram K4TWJ is a useful addition to the library of anyone interested in communication by microwaves. The author aims to show that microwave operation need not be highly technical or unduly expensive. The introductory chapters describe the microwave spectrum and microwave electronic theory. The following chapters describe equipment for the 1·3, 2·3 and 10GHz bands.

There follows chapters on networking and packet radio, microwave radar, and TV broadcasting satellites. There are also chapters covering power supplies for microwave systems, setting up, tuning and operating microwave stations, and interfacing microwave systems with television and computers.

The Microwave Communications Handbook costs £10.84 to members by post.

FOR FURTHER DETAILS OF THESE OR OTHER ITEMS CONTACT THE CIRCULATION DEPARTMENT AT RSGB HQ

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THE WORLD's No1 HANDHELD RANGE

AUTHORISED YAESU

FT203R/FT703R

The FT203R/FT703R is packaged in a lightweight, high-impact plastic case providing comfort and convenience with high durability. The small size is made possible by using chip components.
Thumbwheel frequency selectors (with 5kHz up button) plus standard repeater shift. Volume and Squelch controls are on the top panel along with jacks for the antenna (BNC), external microphone and earphone.
With the optional external YH-2 Headset, the internal VOX system provides voice-actuated transmit/receive switching, for "hands free" operation when mobile or walking. (As FT209R).
Also included is an S/PO meter for monitoring of relative power output and signal strength. (As FT209R).
The FTE-2 1750Hz Tone Burst Generator, which is standard, is activated manually by a button on the side of the FT203R. (As FT209R).
A range of slide-on Nicad packs or AA-cell cases provides the optimum power source for your needs (As FT209R).

144-146MHz
-10kHz (+5kHz)
Supply: 5·5-13V DC
IF's: 10·695-0·455Hz
Selectivity: ±6kHz
@ -6dB (2:1SF)

430-440MHz
10kHz (+5kHz)
Supply: 5·5-13V DC
IF's: 21·6-0·455Hz
Selectivity: ±6kHz
@ -6dB (2:1SF)

FT209R/FT709R

The FT209R/FT709R with two 4-bit CPU's and a lithium backed RAM offers features far beyond anything yet conceived, in a package smaller and lighter than any previous CPU-controlled transceiver.
Ten memory channels allow storage of either standard +/- shifts, or independent Tx and Rx frequencies for any split/repeater shift on any channel, with touch-key reverse or simplex on either frequency. Scanning capabilities include step-programmable full or partial band memory bank priority scanning etc.
Battery life is greatly extended with a programmable Power saver which activates the receiver momentarily at programmable intervals.
Nineteen soft rubber dual function keys provide greater control than ever, yet operation remains easy: the keypad is carefully arranged, colour-coded and most commands are one-touch operations.
Fat ½" LCD digits are complemented by ten memory and nine special function indicators showing status at a glance.

144-146MHz
25/12·5kHz
Supply: 6-15V DC
IF's: 10·7-0·455Hz
Selectivity: ±7·5kHz
@ -6dB (2:1SF)

430-440MHz
50/25kHz
Supply: 6-15VDC
IF's: 21·6-0·455Hz
Selectivity: ±15kHz
@ -6dB (2:1SF)

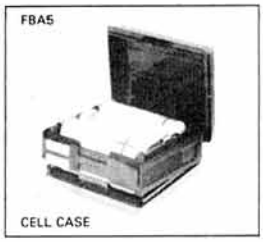
GENERAL SPECIFICATIONS

Good 50 ohm match to linears and antennas. Frequency modulation (FM-F3-G3E) variable reactance linear modulator

Sensitive, quality 2K ohm condenser MIC. ±5kHz max. dev, 16kHz max. bandwidth. Transmitter spurious output -60dB

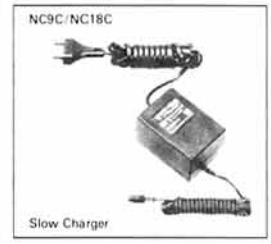
Sensitivity: 0·25μV for 12dB Sinad.
1μV for 30dB S/N.
AF O/P: 450mW into 80hms @ 10% THD

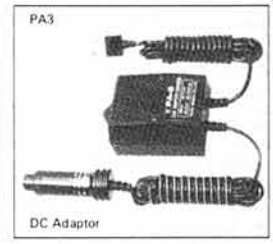
Large range of accessories available. Supplied with YHA 14A/YHA 44D helical antenna and appropriate soft case


FBA5
CELL CASE


FNB3
10·5V NiCd Pack


FNB4
12·5V NiCd Pack


NC9C/NC18C
Slow Charger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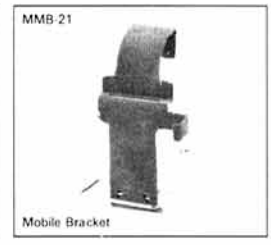
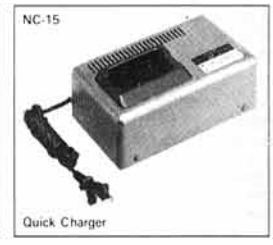

MMB-21
Mobile Bracket


NC-15
Quick Charger

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2·5/0·3W C/W FNB3 CSC6 65W, 34D, 153H, 482gms	2·5/0·3W C/W FNB3 CSC6 65W, 34D, 153H mm, 480gms	2·7/0·3W C/W FNB3 CSC10 65W, 34D, 168H, 512gms	3·0/0·3W C/W FNB3 CSC10 65W, 34D, 168H mm, 535gms	3·7/0·4W C/W FNB3 CSC10 65W, 34D, 168H mm, 512gms
3·5/0·4W C/W FNB4 CSC7 65W, 34D, 172H, 490gms	3·5/0·4W C/W FNB4 CSC7 65W, 34D, 172H mm, 495gms	3·7/0·4W C/W FNB4 CSC11 65W, 34D, 186H, 520gms	4·0/0·4W C/W FNB4 CSC11 65W, 34D, 186H mm, 520gms	5·0/0·5W C/W FNB4 CSC11 65W, 34D, 186H mm, 520gms

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