Volume 71 No 8 August 1995

RadCom

Radio Communication

The Journal of the Radio Society of Great Britain

THE VOICE OF AMATEUR RADIO FOR 82 YEARS

INSIDE: Stafford Show Guide

FIFTY YEARS AGO

". . . the job has been well done and as we look back over the dark years of war let us give thanks to Almighty God for a Great and Glorious Victory, remembering in our prayers all those who went forth but did not return. May their sacrifice not have been in vain."

John Clavricoats, G6CL

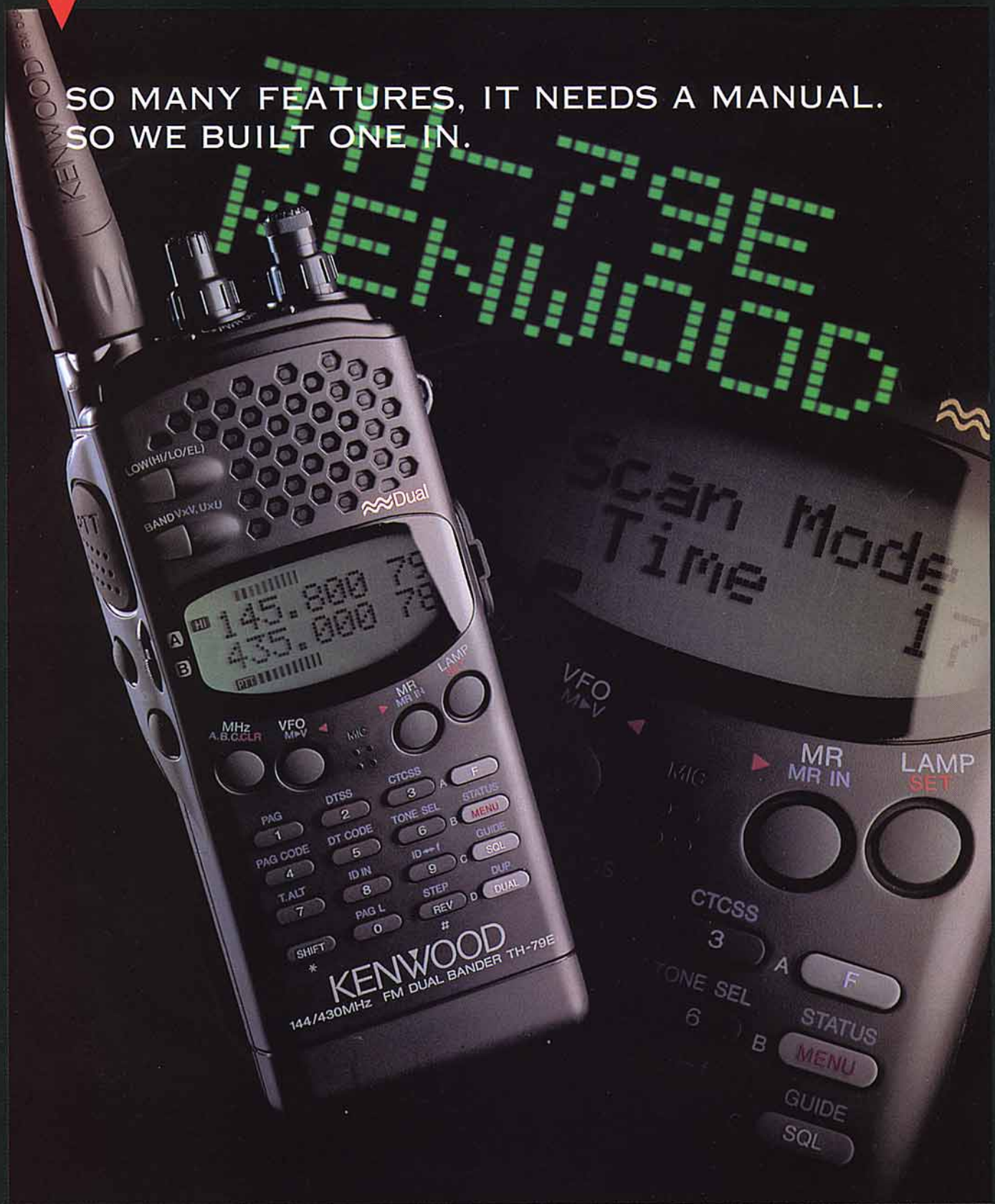
RSGB Bulletin, August 1945.

100 YEARS OF RADIO 1995

The Mother of all 10GHz Openings, October 1994. A Retrospective Look

THE THREE POINTS OF THE KENWOOD TRIANGLE REPRESENT ADVANCED TECHNOLOGY, QUALITY AND STYLE

SO MANY FEATURES, IT NEEDS A MANUAL. SO WE BUILT ONE IN.



Kenwood's TH-79E marks a new high in user-friendly handheld tranceivers. This slim-line FM dual-bander features a dot matrix LCD menu, which helps you to access the many class-leading features of this stylish unit.

Features that include an FET power module for longer battery life, 82 memory channels with ID, DTSS and pager functions, Automatic Band Change and DTMF memory function for auto-dial operation. Confused? You won't be. Just call up the menu. Or ring 0923 816444 for a full information pack.

KENWOOD

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RadCom

COVER PICTURE: The G3PHO portable 10GHz station which was used indoors to work into the Netherlands last October and again in June. The station runs 250mW of SSB / CW to a 60cm satellite dish.

NEWS AND REPORTS

TECHNICAL FEATURES

THE OFFICIAL RSGB STAFFORD SHOW GUIDE

REGULARS

PRODUCTS

UNIQUE PACKAGE DEAL! ONLY AT COASTAL!

IC-706 + 2m 100w AMP!

IC-706 RRP £1195

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£1195 CASH CHEQUE CREDIT CARD

"Yes — 3 into 1 does go!" says Coastal

ICOM have hit the amateur market with a real bombshell! They have come up with a unique base station/mobile rig that is low in cost, high on specification, will sit on your palm AND can pour out a full 100 watts on all HF bands and on six metres. Wow! No wonder the orders are streaming in! With our generous part exchange on your present shack full of rigs, you could be looking at a fantastically low residual price to pay. This ICOM has got to be the 'Rig of the Year'!

Of course, we amateurs are never satisfied! "Why doesn't it have 100 watts on 2?" we hear you say. As always Coastal try to rise to the occasion. For a limited period only, you will receive FREE OF CHARGE and fully guaranteed, an MM 100 watt linear for 2m when you buy your IC-706 from Coastal, paying only the normal RRP! Call us immediately to reserve your new ICOM-706.

100 WATTS HF ALL BAND + 100 WATTS 50 MHZ + 100 WATTS 144 MHZ

AND . . . Full general coverage on receive!

FREE MICROWAVE MODULES MODEL 144-100S 2 METRES 100W OUTPUT 12db PREAMP

Available free only with the above package but in stock at £179.95 RRP

SPECIFICATIONS

■ GENERAL

- Frequency coverage : Receive 30 kHz–200.000 MHz
  Guaranteed range: 500 kHz–29.995 MHz, 50.000–54.000 MHz, 144.000–148.000 MHz
  Transmit 1.800–1.99999 MHz*, 3.500–4.000 MHz*, 7.000–7.300 MHz*, 10.100–10.150 MHz, 14.000–14.350 MHz, 18.068–18.168 MHz, 21.000–21.450 MHz, 24.890–24.990 MHz, 28.000–29.700 MHz, 50.000–54.000 MHz*, 144.000–148.000 MHz*
  *Varies with version.
- Mode : LSB/USB, CW, RTTY (FSK), AM, FM and WFM (receive only)
- Number of memory channels : 101 (99 regular and 2 scan edges)
- Power supply requirements : 13.8 V DC ± 15%, 20 A
- Usable temperature range : –10°C to +60°C (+14°F to +140°F)
- Frequency stability : Less than ± 200 Hz from 1 min. to 60 min. after power ON. (After that, rate of stability change is less than ± 30 Hz/hr. at +25°C; +77°F).
- Current drain (at 13.8 V DC) : Receive squelched 1.5 A; max. audio output 2.5 A; Transmit 20 A
- Dimensions (projections not included) : 167(W) x 58(H) x 200(D) mm; 6 9/16(W) x 2 9/32(H) x 7 7/8(D) in
- Weight : Approx. 2.5 kg (5 lb 8 oz)

■ TRANSMITTER

- Output power

	1.8 to 50 MHz bands	144 MHz band
SSB/CW/RTTY/FM	5 to 100 W	0.5 to 10 W
AM	2 to 40 W	0.2 to 4 W

- Spurious emissions : Less than –50 dB (1.8–28 MHz); Less than –60 dB (50–144 MHz)
- Carrier suppression : Less than –40 dB
- Unwanted sideband : Less than –50 dB

■ RECEIVER

- Receive system :
  SSB, CW, RTTY, AM, WFM: Double conversion superheterodyne
  FM: Triple conversion superheterodyne
- Sensitivity (pre-amp ON) :

	0.5–1.8 MHz	1.8–29.995 MHz	50–54 MHz	144–148 MHz
SSB/CW/RTTY (10 dB S/N)	—	0.16 µV	0.16 µV	0.16 µV
AM (10 dB S/N)	13 µV	2.0 µV	2.0 µV	2.0 µV
FM (12 dB SINAD)	—	0.5 µV (28–29.7 MHz)	0.5 µV	0.25 µV

- Selectivity (normal) :
  SSB, CW, RTTY: More than 2.3 kHz/–6 dB; Less than 4.0 kHz/–60 dB
  AM: More than 6.0 kHz/–6 dB; Less than 20.0 kHz/–40 dB
  FM: More than 15.0 kHz/–6 dB; Less than 30.0 kHz/–50 dB
- Spurious and image rejection : More than 70 dB (HF bands)
- Audio output power : More than 2.0 W (with an 8 Ω load)

OPTIONS

AH-2b ANTENNA ELEMENT (for use with the AH-3)
AH-3 HF AUTOMATIC ANTENNA TUNER
AT-180 HF + 50 MHz AUTOMATIC ANTENNA TUNER
CR-502 HIGH-STABILITY CRYSTAL UNIT
CT-16 SATELLITE INTERFACE UNIT
CT-17 CI-V LEVEL CONVERTER
EX-627 HF AUTOMATIC ANTENNA SELECTOR*1
FL-100 CW NARROW FILTER (500 Hz/–6 dB)
FL-101 CW NARROW FILTER (250 Hz/–6 dB)
FL-103 SSB WIDE FILTER (2.8 kHz/–6 dB)
FL-223 SSB NARROW FILTER (1.9 kHz/–6 dB)
HM-103 HAND MICROPHONE
IC-4KL 1 kW HF LINEAR AMPLIFIER*1
MB-62 MOBILE MOUNTING BRACKET (for main unit)
MB-63 MOBILE MOUNTING BRACKET (for detachable front panel)
OPC-581 SEPARATION CABLE (3.5 m)
OPC-587 SEPARATION CABLE (7 m)
OPC-589 ADAPTER CABLE (modular mic con. → 8-pin mic con.)
OPC-598 ACC EXTENSION CABLE (7 m for the AT-180)
OPC-599 ADAPTER CABLE (13-pin ACC con. → 7+8 pin ACC con.)
IC-PS30 DC POWER SUPPLY (13.8 V, 25 A)
PS-85 DC POWER SUPPLY (13.8 V, 20 A)
SM-8 DESKTOP MICROPHONE*2
SM-20 DESKTOP MICROPHONE*2
SP-7 EXTERNAL SPEAKER (for base station use)
SP-10 EXTERNAL SPEAKER (for mobile use)
SP-12 EXTERNAL SPEAKER (for mobile use)
UT-102 VOICE SYNTHESIZER UNIT

*1 An optional OPC-599 is required.
*2 An optional OPC-589 is required.

All stated specifications are subject to change without notice or obligtation.

See also Icom's display on the inside back cover.

COASTAL COMMUNICATIONS

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THE "BANDIT" RETURNS!

To celebrate the Summer Solstice high in the Derbyshire Peaks, we decided to visit Bandit Bill in his retirement eyrie, and ask him for his advice on how to make the Company he founded even more successful. His advice was simple – "Give it to 'em cheap, lads"! So here we go . . .

LOWE'S MAD SUMMER SALE

Yaesu

FT-1000	RRP £3989	*Lowe price*	**£2995**
FT-840	RRP £959	*Lowe price*	**£725**
FT-900	RRP £1399	*Lowe price*	**£1099**
FT-990	RRP £2399	*Lowe price*	**£1895**
FT-2500M	RRP £399	*Lowe price*	**£319**
FT-736R	RRP £1999	*Lowe price*	**£1549**
FT-11R	RRP £324	*Lowe price*	**£259**
FT-51R	RRP £529	*Lowe price*	**£399**

Kenwood

TS-850S	RRP £1809	*Lowe price*	**£1399**
TS-690S	RRP £1649	*Lowe price*	**£1299**
TS-50S	RRP £1059	*Lowe price*	**£829**
TM-251E	RRP £419	*Lowe price*	**£329**
TM-742E	RRP £879	*Lowe price*	**£679**
TH-79E	RRP £479	*Lowe price*	**£379**

*Similar deals on **all** Yaesu and Kenwood Transceivers*

SEE THE NEW KENWOOD TS-870 AT STAFFORD

Needles to say, all items sold with full warranty and Lowe backup

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LISTENING TO

New from JPS Communications

JPS, leaders in the field of DSP filter technology now introduce the ANC4 Antenna Noise Canceller

*The **ANC4** cancels noise from:*

* Power lines
* Computers
* TV sets
* Refrigerators
* and many other electrical appliances

The **ANC4** is an r.f. device designed to provide cancellation of locally-generated noise from signals received by a primary antenna. The unit is employed right at the antenna connector of the receiver or transceiver to cancel locally-generated noise, to allow reception of signals well below the noise level induced by the local interference. This will typically give you a 40dB drop in interference signal level, so you can see just how effective it is!

This unit may be used with any receiver or transceiver with r.f. power out put of 150W p.e.p. or less. An r.f. detector built into the unit automatically bypasses the network whenever transmit r.f. is detected. This unit is NOT designed to be used at the output of a high power linear power amplifier, but must be installed at the lower r.f. level of the transceiver, if transmitting is anticipated.

Controls are provided on the front panel to allow adjustment of both the phase and magnitude of the local interference, providing extremely deep cancellation of the offending interference.

The unit connects between the main station antenna and the receiver antenna connector. The d.c. power mating connector for the **ANC4** is supplied with each unit. UHF (SO239), which mates with a PL259 plug) connectors are used for the outside antenna and the output to the receiver. A short wire antenna and a short collapsible unit to act as the noise pick-up antenna.

Also from JPS is the new NIR12 - a true state-of-the-art DSP audio filter.

***NIR12** Professional Dual DSP Noise and Interference Reduction Unit.*

★ Digs out weak, difficult to read signals
★ Both spectral subtraction and dynamic peaking noise reduction provided
★ Operates on audio from any radio receiver
★ All modes useable simultaneously
★ Greatly reduces listener fatigue
★ Manual and automatic NIR control
★ Dual digital signal processors
★ Notch filter removes all tones from voice signals, including c.w. and RTTY
★ Access to the dual d.s.p.s via RS232 for experimenters
★ **SPECIAL OFFER** – previous model NIR10 £299 to clear. While stocks last.

INTERNET ADDRESS:
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info@lowe.demon.co.uk
New check out Lowes new pages on the World Wide Web
http://www. demon.co.u.k/lowe/index. html

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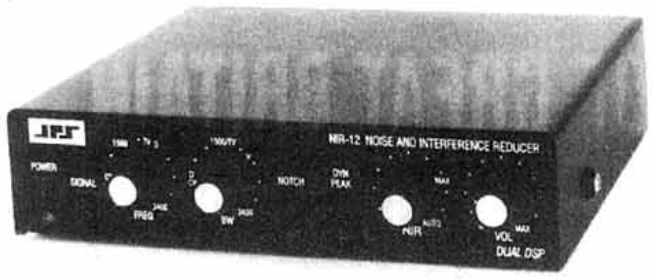
THE WORLD



The **NIR12** is an advanced audio signal processor designed to provide the user with maximum flexibility of removing interference from voice, c.w. and data transmissions. The unit uses dual Digital Signal Processing (DSP) to provide simultaneous bandpass operation, noise reduction and multiple tone/heterodyne removal. The special notch filter provides cancellation of multiple heterodynes from tune-ups adjacent carriers, c.w., RTTY or similar signals without interfering with voice signals when a voice bandwidth has been selected. The notch filter operates in five milliseconds or less. A multi layer printed circuit board provides superior shielding to virtually eliminate r.f. radiation from the DSP data bus.

For experimenters, access to the dual DSPs is provided via RS232 on an internal header. A section in the manual is devoted to describing how to use this input to generate your own filters and develop other uses for the dual DSP chips.

This is the ultimate DSP unit! If you haven't already invested in a d.s.p. filter, try this one out. By the time this ad appears we should have received our first batch - make sure you're one of the first and give us a call right now to reserve yours. Just £399 will get you the ultimate DSP.

Vårgårda Radio AB

All good things come in threes and our third bit of good news this month is that we've just been appointed UK distributors for the Vargarda range of antennas and what's more, our tremendous buying power has enabled us to make quite a few price reductions across the range. If you've never considered a Vargarda Antenna before, now's the time. These Swedish made antenna use superb quality materials and are really built to last. Long spacing between elements ensures higher gain for a smaller number of elements and gains figures are quoted in real dBs, not 'isotropic', so don't be fooled by the numbers when comparing them with other makes. If we are going to make any comparisons, I guess we could call Vargarda the 'Volvo' of the antenna world - we'll leave you to decide who the 2CV is!

	Model	Description	Boom Length	Gain	Price
2m antennas	VDIP2	144MHz vertical dipole	0.15m	0	**£30.00**
	HDIP2	Horizontal dipole 2m	0.15m	0	**£35.00**
	Active2	2-ele 2m beam	0.4m	5dBd	**£30.00**
	3EL2	2-ele 2m beam	0.8m	7dBd	**£35.00**
	6EL2	6-ele 2m beam	2.25m	10dBd	**£45.00**
	9EL2	9-ele 2m beam	4.5m	13.0	**£60.00**
70cm antennas	VDIP70	vertical dipole 70cm	0.15m	0	**£30.00**
	HDIP70	horizontal dipole 70cm	0.15m	0	**£35.00**
	6EL70	6-ele 70cm beam	1.0m	10dBd	**£35.00**
	13EL70	13-ele 70cm beam	2.5m	13dBd	**£50.00**
	19EL70	19-ele 70cm beam	3.95	14.5dBd	**£75.00**
6m antennas	3EL6	3-ele 50MHz beam	1.7m	7dBd	**£80.00**
	5EL6	5-ele 50MHz beam	3.6m	9dBd	**£120.00**
4m antennas	3EL4	3-ele 70MHz beam	1.6M	7DBD	**£70.00**

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RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS
Founded in 1913 incorporated 1926. Limited by guarantee
Member society of the International Amateur Radio Union

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

Headquarters and registered office:
Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE
Telephone: 01707 659015 - Members Hotline and book orders
Fax: 01707 645105.

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ANNUAL SUBSCRIPTION RATES (Prices valid to 31 August only)
Corporate Members: UK and Overseas (*Radio Communication* sent by surface post): **£32.00.** Airmail rates on request.
UK associate member under 18: £16.00. Family member: £14.00
Corporate (Concessionary): £27.00 over 65 or full time student under 25. (Applications should provide proof of age at last renewal date and/or include evidence of student status.)
Affiliated club or society/registered group (UK): £16.00 (including *Radio Commmunication*). (Subscriptions include VAT where applicable.)

Special arrangements exist for blind and disabled persons. Details are available from RSGB HQ.

Membership application forms are available from RSGB HQ

RSGB Main Switchboard:
01707-659015

The RadCom Leader

News From HQ

IT IS NOW NEARLY three years since the last subscription increase and, despite sound economic management and good financial results, it is time to review the subscription levels if the Society is to continue to prosper.

The Society has never been busier in support of amateur radio, both within the UK and within IARU Region 1, and with this increase in activity it follows that the overall costs rise accordingly.

With the subscription revisions detailed in the box opposite we have taken the opportunity to streamline the membership categories, reward loyal long-standing members and introduce a new junior membership in the form of the HamClub.

Members with 60 years or more of service will from 1 September enjoy free life membership. Members with 50 years or more service will receive a 50% discount to the Full Corporate rate. OAP rates have been pegged and will remain at £27.00.

Family membership and Overseas membership subscriptions have been reduced. There is a rise in the Full Corporate rate of £2 to £34.00 and clubs and Affiliated Societies rates will rise to £17.00, an increase of £1.

Although the Full Corporate subscription rate is to rise, a substantial proportion of members in other categories will enjoy a decrease in the level of their subscription.

Full details of the subscription rates and membership categories are shown opposite.

Working for You

YOU WILL HAVE SEEN in recent months much reference to the DSI Phase 2 proposals. I cannot emphasise how important it is that members and non-members realise the battle that lies ahead to protect the amateur radio spectrum. If this type of battle is to be won it is essential that we not only maintain but increase our membership levels. The RSGB, as the national society, is the only body within the UK that the national authorities will negotiate with on these issues, and we are working hard through the Licensing Advisory Committee to ensure that the feelings of the UK amateur radio community is heard. Further, through our IARU officers, we are taking the battle to the heart of Europe.

The message is fairly simple, please respond to our request for input on DSI Phase 2 and wherever possible convince non-members that it is in their own best interests to join the national society.

Failure to respond to this outside threat is bound to lead to the demise of the privileges we currently enjoy.

Convention

LASTLY, A SMALL advertisement. Coming up are the Stafford show and the HF Convention. At both these events there will be a large presence of the Society's committees and Honorary Officers. If members need advice on any amateur related problems help is at hand at these two events.

Peter Kirby, G0TWW
General Manager

RadCom NEWS

● THE CITY and Guilds of London Institute have issued a report on the results of the June 1995 Novice Radio Amateurs' Examination. Anyone wishing to receive a copy should send a stamped self-addressed envelope to the Amateur Radio Department at RSGB Headquarters.

● TOM LILLEY, G1YAA, RSGB Data Communications Committee Chairman, was invited to hold a packet seminar at the AGM of the Irish national society, IRTS, in April. The Irish are in the process of formalising their network.

● THE LATEST CALLSIGNS issued by SSL as of 12 July were in the G*0WF*, G*7US, 2*0AM* and 2*1EE* series.

HQ Open 19 Aug

A REMINDER that RSGB Headquarters is open on Saturday 19 August from 10.00am to 4.00pm. The bookshop, museum, library and GB3Rs shack will be available to visitors. RSGB Morse code tests are available on demand between 11.00am and 12.30; please bring two passport-size photographs with you.

Sir Michael Atiyah Unveils Plaque to Fifth RSGB President

Oxford University Honours Sir Oliver Lodge

Dr Pat Wilson demonstrates use of the Wimshurst machine, watched by Tom and Oliver Lodge, and Sir Michael Atiyah, President of the Royal Society.

THE RSGB attended the unveiling of a plaque at the University of Oxford Museum on 23 June. The plaque commemorates the first demonstration of a spark gap transmitter by Sir Oliver Lodge just over a hundred years ago. In August 1894 a spark gap transmitter was set up in the Clarendon Laboratory, some sixty metres from the museum, and a packed audience of the eminent physicists of the day watched as Morse code letters were transmitted to a receiver in the museum's lecture theatre.

The plaque was unveiled by Sir Michael Atiyah, OM, President of the Royal Society, in the presence of Tom, Colin and Oliver Lodge, grandsons of Sir Oliver. Dr Pat Wilson, lecturer in electronics at Keele University, also demonstrated replicas of Lodge's equipment from his own private collection.

In 1925, Sir Oliver Lodge, FRS, SCc, LLD, went on to become the fifth President of the RSGB.

Replica of spherical transmitter used in Sir Oliver Lodge's 1894 demonstration of wireless telegraphy.

Subscription Changes from 1 Sept

Rewards for long-standing membership . . . and a brand new Junior Membership!

The Council of the RSGB has approved measures to reward long-standing members of the Society when the subscription rates change in September 1995. So, if you have been a member for many years, you may well qualify for ***FREE*** membership to the Society you have supported loyally - this is our way of saying 'Thank You'.

In addition to this, the Society is now offering young people under 18 years of age the opportunity to become members of the brand new HamClub. They may become HamClub members for just £10 per annum, and will receive a special Junior Membership Pack, bursting with information and goodies. Their membership will include a ***FREE*** subscription to *D-i-Y Radio* magazine*, the Society's publication for newcomers to the Amateur Radio Service.

We have also reduced our rates to overseas members receiving *RadCom* by airmail, as we realise that overseas members are not in a position to enjoy **all** of the membership benefits that the Society has on offer. Also, for the first time, full-time students over the age of 25 can have a discount.

By the use of sound housekeeping we have managed to become a much more streamlined, efficient organisation and have improved our services to you, our members, in the process. From 1 September 1995 the membership rates will be as follows, the old rates are shown in brackets:

Home Corporate £34 (£32)	**Overseas ... £34 (previous airmail rate £69 or £79)**
Family Members £10 (£14)	**Affiliated Societies ..... £17 (£16)**
Senior Citizens £27 (£27)	**Affiliated Societies - Overseas ..... £17 (£32)**
Junior (HamClub) under 18* £10 (£16)	**Student Members ..... £20 (£27)**

*HamClub members will not receive *Radio Communication*

BUT Home Corporate members who have enjoyed 50 years of continuous membership will receive a 50% discount on their fee and, for Home Corporate members who have enjoyed 60 years of continuous membership there will be a 100% discount - from then on they will receive all the benefits of membership ***ABSOLUTELY FREE!*** The discount will commence when a member's annual subscription falls due and will be implemented only for subscriptions falling due after 1 September 1995.

Peter Kirby, G0TWW, General Manager

1996 President

AT ITS meeting on 8 July, the Council of the RSGB elected Peter Sheppard, G4EJP, as the Society's President for 1996. He is currently Zonal Member for the North of England.

RSGB Council Elections for 1996

COUNCIL IS the governing body of the Society, and although much of the Society's work is delegated to subordinate committees, the overall responsibility for the formulation and conduct of Society's policy rests with Council.

It meets, on average, six times a year in London, and all Council members are expected to attend. In addition, Council members undertake to deal with individual members' queries promptly and efficiently, represent the Society at various functions, and deal with various aspects of Society business on behalf of Council. Elected members are expected to publicly support the democratically-taken decisions of Council, whatever their own personal opinions on a particular matter. Council Members will regularly be called upon to take responsibility for major decisions having significant financial implications for the Society.

Being elected to Council is not an easy ride and the work of a Council Member requires considerable commitment - often at weekends. It is not a job for the faint hearted or indolent.

Because the Society is an extremely complex organisation, it needs Council Members that are not just enthusiastic and willing to participate, but who possess considerable financial or management experience. A successful candidate will also need significant inter-personal skills in order to progress the work of the Society and the interests of its members.

The initial indications are that there will be EIGHT vacancies on Council in 1996: THREE Ordinary vacancies and FIVE Zone vacancies - one in Zone A (North of England), one in Zone B (English Midlands), one in Zone C (South East England and East Anglia), one in Zone D (South and South West England) and one in Zone G (Scotland). A definitive list of vacancies will be published in the September 1995 issue of *Radio Communication*.

Qualifications for Election to Council

1 Candidates must have been Corporate Members of the Society for at least THREE years at the time of nomination.

2 Candidates must submit:
Written consent to accept office if elected and
A declaration of any commercial interest in amateur radio

Nomination Procedure

Each candidate must be nominated by at least TEN fully paid up Corporate Members. In the case of Zone candidates ALL nominators AND the candidate must reside in the relevant Zone.

Nominators may nominate ONE candidate only.

Nominations may be made on forms supplied by the Society or a plain piece of paper.

Additional Information

a) Candidates:

To assist the membership in voting, candidates may supply a statement of not more than 100 words covering their experience and qualifications in support of their candidature. This should stress any involvement in amateur radio. In addition, candidates may wish to supply a personal statement again of not more than 100 words stating why he or she wishes to stand for Council and what he or she hopes to achieve if elected. Outrageous or unattainable objectives will be edited out. Council is a team and elected members are expected to serve as part of a corporate body.

b) Nominators:

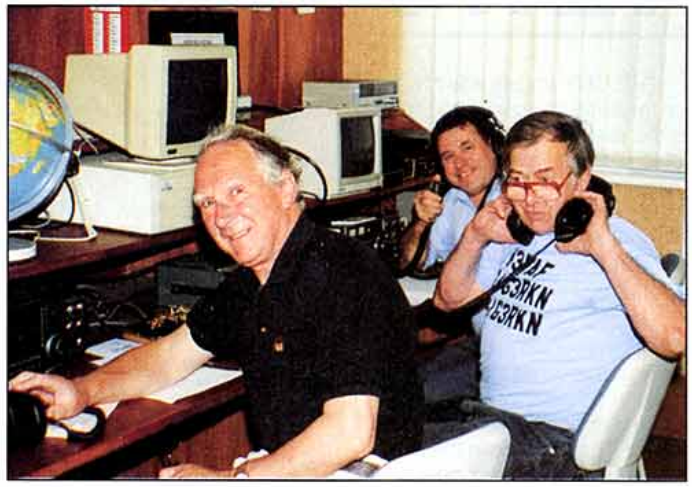
Nominators may find it helpful to supply details of how long they have known the candidate and furnish any other relevant information in support of their nominee.

c) Vacancies:

A list of those Council Members who retire and create vacancies at the end of 1995 will appear in the September issue of *RadCom*. However, those seeking election may apply to Headquarters now for the necessary nomination forms. Applications should be addressed to: 1996 Council Elections, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE.

J C Hall OBE, G3KVA
Company Secretary

Royal Signals - 75 Years Old



RSARS members operating GB3RS: from left to right Ken Brown, G0PSW; Stuart Tyler, G4UDZ; and Derek Leese, G3RKN.

THE ROYAL CORPS of Signals was officially founded on 28 June 1920 and on the occasion of the 75th anniversary four members of the Royal Signals Amateur Radio Society (RSARS), Roger Chastell, G4SXF; Ken Brown, G0PSW; Derek Leese, G3RKN; and Stuart Tyler, G4UDZ, visited the RSGB in Potters Bar to operate HQ station GB3RS. It is of course coincidence that the RSGB station's callsign is equally appropriate for celebrating the Royal Signals anniversary!

Other 'RS' callsigns were also in evidence in June and July: on 25 June members of the RSARS operated GB6RS from their stand at the Longleat Rally, and GB75RS was on the air from Scarborough College's Combined Cadet Force station on 28 June. The date of 28 June is an important one for the Royal Signals: it is Princess Royal Day,

The Royal Signals ARS display at the RSGB Bletchley Park Rally.

and HRH the Princess Anne is Colonel-in-Chief of the Royal Corps of Signals.

GB75RS was also on the air from the Royal Signals headquarters in Blandford Camp, Dorset, from 6 - 9 July, a period which culminated in a visit to the camp by The Princess Royal. The RSARS AGM was held at Blandford Camp on 9 July.

Harrogate Girls Go For Record

FOR SEVERAL YEARS, GB2HC has operated for a 24-hour period on the annual Speech and Open Day at Harrogate Ladies College. This year, on 22 / 23 June, nine licensed pupils from the college were attempting to beat their previous record of 450 contacts with 25 countries. Their target - 500 contacts and 30 countries. Richard Horton, G3XWH, the College's Head of Physics and Information Technology, reports that the local press were so interested in the girls' endeavours that they held up proceedings for 45 minutes at the start of the attempt. In the event they fell short by 20 QSOs, although they made contacts with no fewer than 45 countries. Richard feels that had they started on time, they would certainly have made the 500 QSO target!

● STOLEN from the car of G0KJM in Bedminster, Bristol, on 30 June: Kenwood TH-77 dual band handheld transceiver S/N 10800257, Yupiteru MVT7100 scanner S/N 30800376, Sony ICF-7600 shortwave radio S/N S01-0224156-6. Information to Broadbury Road police station in Bristol or direct to John, G0KJM, QTHR.

RSGB National Mobile Rally

SUNDAY 6 AUGUST 1995 OPEN 10AM

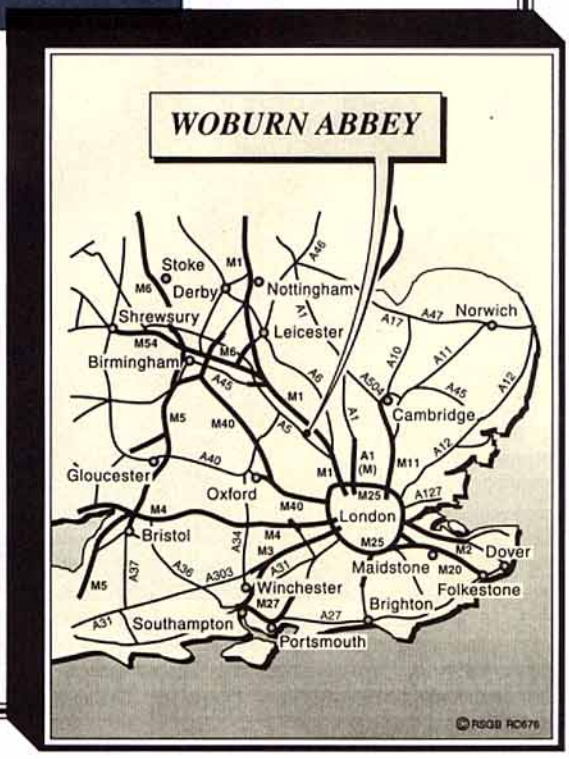
WOBURN ABBEY, BEDFORDSHIRE

HOW TO GET TO THE WOBURN RALLY

Via the M1 - leave the M1 from north or south at junction 13, not 12 as signposted, and then follow signposts through Husborne Crawley to Woburn Abbey.

Avoid routes signposted to "The Wild Animal Kingdom" or "Game Reserve". The rally takes place in Woburn Park, and correct routes are signposted to "Woburn Park" or "The Abbey".

(COACH PARK SITE AVAILABLE)



- **LARGE TRADE EXHIBITION (23,000 SQ FT)**
- **LARGE RSGB BOOKSTALL**
- **ALL UNDER COVER**

The RSGB makes no charge for entrance to the rally but all visitors must pay for entrance to Woburn Park, in which the rally takes place, at £5 per vehicle (including passengers), or £2.50 per vehicle (with single occupant).

Limited overnight caravan stay at £4 per night. Booking forms available from Norman Miller, G3MVV.

All the normal Woburn attractions will be available at small extra charges. Various bars and cafes are available nearby.

All enquiries regarding this event should be made to Norman Miller, G3MVV, 180 Warley Hill, Brentwood, Essex, CM14 5HF; Tel:01277 225563.

VJ-Day Special Event Stations

THE GR PREFIX, which was first used in May for VE-Day special event stations, has also been made available for special event stations commemorating the 50th anniversary of VJ-Day. The anniversary is being remembered over the weekend of 19 / 20 August. The GR prefix has been issued not in an act of celebration, but in remembrance of all those who lost their lives, and to commemorate the start of peace. It should also be noted that GR-prefix callsigns are not a general issue; they are being issued only as an alternative to GB callsigns for stations commemorating the 50th anniversary of the end of the Second World War.

The permanent special event station GB2IWM will be on the air on 15 August from the Imperial War Museum's Duxford Airfield on 7007 and 14007kHz CW and 3770kHz SSB. A list of special event stations can be found on page 92 this month.

VI50PEACE is the rather unusual callsign which has been issued to an Australian special event station celebrating the 50th anniversary of the end of WWII. It will be operated by the Hervey Bay Amateur Radio Club in Queensland, who will run the station from 1 August to 31 October. VI50PEACE is the first nine-character callsign ever to be issued in Australia.

An award is available if you contact VI50PEACE. It costs US$5, which covers printing costs and airmail postage. Alternatively, for the QSL only, send an SAE and 1 IRC. The address is: QSL Manager, HBARC Inc, PO Box 829, QLD 4655, Australia.

Duxford Radio Society will be operating as GB2IWM on 15 August.

● *HAGAL International*, the Israeli amateur radio news sheet, reports the sad passing of Reuven 'Bob' Avigor, 4X4CJ, who was the first active amateur in Israel. In 1936 Reuven was issued with the callsign ZC6AA in the then British mandated territory of Palestine, after petitioning HM King George VI. Later, in WWII, Reuven joined the British army, where he was considered an ace radioman and Morse instructor. When Israel gained independence, Reuven - since he was already licensed -was granted his 4X4 callsign.

RSGB Regional Meeting in GM

AN RSGB REGIONAL Meeting has been arranged in Inverness for 28 October. Further details will be published later in *RadCom* or may be obtained from Mrs Elaine Shread, GM7TZT, 15 Hardie Court, Aberchirder, Huntly, Aberdeenshire AB54 5TG, tel: 01466 780739.

PHOTOGRAPH: ROB MASON, G4ONM

The callsign G3JDY, which has been dormant since the 1950s, has recently been reactivated at the East Riding of Yorkshire RAFARS club, based at RAF Leconfield. From L to R: F/O Matt Clement, Seaking Pilot; Jack Handley, G0EAA; Les Navier, G3UYV; Jim Holbrook, G6VWF and David Boughton, G7PER.

The 'Daughter' of all Lifts?

FROM 28 JUNE until 1 July VHF, UHF and microwave operators experienced a spectacular tropospheric opening in which new records were set. Here are just a few examples of the amazing contacts made: G4NVD reports that on 28 June he worked DG0BBL in Oldenburg on 144MHz, at a distance of 557km, while using less than 200mW of FM. GM0CLN reports GM stations working into the Netherlands on 2.3GHz. Also on 28 June, G3PHO in Sheffield worked PA0EZ on 10GHz using 250mW and a 60cm dish set up indoors in a spare bedroom. Most spectacular of all, we have received a report that Sam Jewell, G4DDK, in Ipswich, worked PA0EZ on *24GHz*. This contact, at a distance of 268km, is believed to set a new UK record for that band. PA0EZ is located 50km from the North Sea coast and was running 80mW, whilst G4DDK was running 125mW. Congratulations to both stations.

It is possible that the propagation was very nearly as good as during that period in October 1994 which has now gone down in history as 'the mother of all lifts'. Turn to page 16 for a description by Peter Day, G3PHO, of the conditions experienced by microwave operators across north and west Europe then.

As if all this was not enough, there have also been extensive sporadic E openings on 50 and 144MHz. G4FVP in County Durham reports 2m sporadic E signals from the Mediterranean area on 1 July. The following week Geoff Brown, GJ4ICD, experienced 'what was probably the biggest sporadic E USA 50MHz opening since 1986'. For over 12 hours on 8 July the band was open to the USA and as far south as YV5ZZ in Venezuela. To the north, Geoff and several French stations worked OX3LX in Greenland (grid GP36).

Raynet at North Yorks Air Crash

RAYNET MEMBERS were asked to provide communications after the North Yorkshire air crash on 24 May. Twelve people were killed when a Brazilian-built Embraer Bandeirante commuter aircraft flying to Aberdeen crashed after taking off from Leeds-Bradford airport in bad weather conditions following a thunderstorm. Members of the Richmond Raynet group were training at the county emergency centre at Northallerton during the evening when news of the crash, south of Harrogate, was received. They telephoned members of the Nidderdale, Richmond and Ryedale Raynet groups and 20 operators were placed on standby.

Throughout the next two days Raynet provided links on 2m between the crash site and RAF Linton-on-Ouse, Harrogate police station, and the emergency centre at County Hall. Raynet was asked to assist the police because cellphone communications proved unreliable from the cornfield in the River Wharfe valley where the twin-engine aircraft disintegrated and caught fire. Radio paths over distances of 40 miles were also difficult, but 2m communication was achieved by relaying through Harrogate police station. RAF Linton-on-Ouse is designated as a temporary mortuary in the county emergency plan following lessons learned from the Lockerbie tragedy.

IEE Radio Conference

THE IEE WILL be holding an International Conference on 100 Years of Radio at Savoy Place in London between 5 and 7 September. One of the sessions, intriguingly entitled 'Tuning and the Amateur', is chaired by long-standing *RadCom Technical Topics* columnist Pat Hawker, G3VA, and lecturers at the conference will include Prof Martin Sweeting, G3YJO, from the University of Surrey UoSAT programme. For further details write to Conference Services, IEE, Savoy Place, London WC2R 0BL as soon as possible, or telephone 0171 344 5477 / 8.

Amateur Radio on the BBC

ON 25 MAY, listeners to BBC Radio Berkshire were treated to a 10-minute talk on amateur radio by Dave Sergeant, G3YMC, of the Bracknell Amateur Radio Club. Most BBC and commercial local radio stations feature a similar 'club spot' and this can be a good opportunity for radio clubs to gain some free PR within their local communities.

In the past, BBC Radio Berkshire has also featured the Reading and District Amateur Radio Club's record-breaking four consecutive wins in the RSGB National Field Day contest and a talk on the VK9MM Mellish Reef DXpedition.

Yeovil QRP and Construction Convention

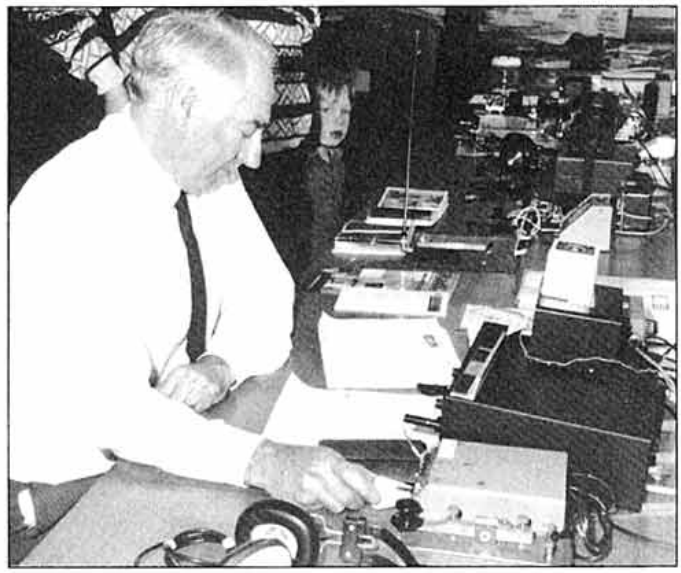
THE YEOVIL Amateur Radio Club held their 11th QRP and Construction Convention over the weekend of 20 / 21 May. On the Saturday evening a dinner and social gathering of Yeovil and G-QRP Club members took place, with guests of honour RSGB President Clive Trotman, GW4YKL, and his wife Maureen.

On the Sunday morning, the RSGB President formally opened the convention, which included presentations by *RadCom* Technical Editor Peter Dodd, G3LDO, on antenna measurements, as well as talks by G3MYM, G3MCK and G0FUW.

The Construction Challenge, to build a CW filter using no more than 10 passive components, was won by Ed Wetherhold, W3NQN. The convention also included a Novice and newcomers advice centre, a radio construction 'surgery', trade stands, presentation of awards and an HF special event station, GB2LOW, which was run by Yeovil Amateur Radio Club Chairman Joe Phillips, G3KSK, who made contact with amateurs in the UK and five European countries using less than 5W output.

A most enjoyable weekend was had by all, and reports from Yeovil state that the RSGB President was last seen heading for the Welsh hills with a flagon of the finest Somerset cider slung over his shoulder and a cheery smile on his face!

PHOTOGRAPH: G4PDG



Yeovil Amateur Radio Club Chairman Joe Phillips, G3KSK, operates QRP as GB2LOW at the club's 11th convention.

QRP Week in Ireland

INTERNATIONAL QRP Week is celebrated from Monday 28 August to Saturday 2 September. A get-together is being organised at the Marino Institute of Education in Dublin, with two major presentations by Rev George Dobbs, G3RJV, at the beginning and end of the week; practical electronics and engineering laboratory workshops; an operational QRP station (EI3RJV) and social and hospitality evenings.

The Marino Institute is set in peaceful parkland close to Dublin airport and the city centre and provides comfortable single and twin accommodation and full catering. Further details and an application form may be obtained from Gerardine Quinn, Marino Institute of Education, Griffith Avenue, Dublin 9, Ireland. Tel: 00 353 1 833 5111, fax: 00 353 1 833 5290, or email: donalmie@gpo.iol.ie

National Trust Centenary

THIS YEAR is the 100th anniversary of the foundation of the National Trust and, to celebrate the event, the very special callsign GB100NT will be operating from a number of National Trust locations throughout the country this summer. The events started in July with operations from Oxburgh Hall, Flatford Mill, Orford Ness and Penrhyn Castle.

GB100NT will also be on the air as follows: 29 / 30 July Patterson's Spade Mill (Ballymena ARC); 5 / 6 August Ickworth (Bury St Edmunds ARS); 12 / 13 August Wimpole Hall (Cambridge and District ARC); 19 / 20 August Sheringham Park (North Norfolk ARG); 26 / 27 August Aberdulais Falls (Swansea ARC and Port Talbot ARS); 2 / 3 Sept Calke Abbey (South Derbyshire and Ashby W ARG); 9 / 10 Sept Mullion Cove (Poldhu ARC).

The 1995 RSGB International HF Convention

EARLY NEXT MONTH, on 9 / 10 September, the 1995 RSGB International HF Convention will again take place at the Beaumont Conference Centre, Old Windsor, Berkshire. 'Something for Everyone' is the theme of this year's Convention - turn to page 20 for details of this year's events.

Wiltshire RLO

Ian Carter, G0GRI, recently resigned as RLO for Wiltshire. He is thanked for his service to the Society. Anyone wishing to volunteer for this position, which now falls vacant, should contact the RSGB Council member for Zone D, Dr Julian Gannaway, G3YGF, Dean Hill Barn, E Dean, Salisbury, Wiltshire SP5 1HJ.

CQ ET - Experimenters Wanted

RADIO AMATEURS and other microwave experimenters are being asked to help in the Search for Extra-Terrestrial Intelligence (SETI). The Executive Director of the SETI League Inc in New Jersey, Dr H Paul Shuch, plans to recruit radio amateurs who are willing and able to convert surplus satellite TV antennas into radio telescopes. Dr Shuch points out that with recent advances in electronics and computer technologies, today's amateur equipment vastly exceeds the performance of the best government facilities of a generation ago. The US Congress terminated NASA's SETI funding nearly two years ago and since then it has become a privatised concern. The SETI League proposes to search the entire sky for perhaps twenty years, or "until we make contact", for microwave signals being radiated by intelligent civilizations in space.

Experimenters interested in participating in SETI should contact Dr Shuch at the SETI League Inc, 433 Liberty St, P O Box 555, Little Ferry, NJ 07643, USA, tel: 00 1 201 641 1770, or via the World Wide Web at http://seti1.setileague.org/homepg.html.

TURN TO PAGE 85 FOR RAE/MORSE COURSES

French ARDF Championship

THE RSGB WAS represented by two competitors in the 1995 French International ARDF Championships, which took place in Nancy on 29 and 30 April. Phil Smith, GW1XBG, took part in the 'Seniors' category, and Robert Vickers, G3ORI, as an 'Old Timer'.

The championships comprised an informal training event on the morning of 29 April, followed by the 3.5MHz contest in the afternoon. The 144MHz event took place the next morning, followed by the prize-giving ceremony and banquet. The two competitions were held in different, but adjacent, areas of forest, made interesting by deep and steep-sided valleys which cut through them.

The two British competitors successfully located all the 'foxes' well within the time limits on both days. Phil finished second out of 15 on 144MHz (and was within six minutes of being the winner) and he was fourth out of 14 on 3.5 MHz. Robert's results were ninth out of 19 and sixth out of 22 respectively.

[For an introduction to 'fox-hunting', see pages 46 - 47 of the July *RadCom* and also see page 57 this month - *Ed*]

Hunting of the SNARC

THE SOUTH NOTTS Amateur Radio Club, will be operating GB2PIC from 29 July to 5 August. The station will be located at the Peak 95 Scouts and Guides camp held in the grounds of Chatsworth House, ancestral home of the Duke of Devonshire, in the Derbyshire Peak District National Park. GB2PIC will use HF and VHF. QSL via SNARC, PO Box 4, Clifton, Nottingham NG11 9DE, or via the RSGB QSL Bureau. Over 6000 Scouts and Guides from all over the world are expected to attend the event.

Vacancy

THE DATA COMMS Committee has a vacancy. The member must live in the Oxfordshire/Home Counties area, and must have a sound technical background in digital communications. They must also be prepared to give up large amounts of their spare time carrying out work for the committee. Applications must be sent in writing, including a short CV to Tom Lilley, G1YAA, Spylaw Cottage, Bilton, Alnwick, NE66 2TA.

NEVADA

HF ALL BAND 50 MHZ 144 MHZ

Icom IC-706

It Takes Some Beating!

Mobile communications just won't be the same anymore! This New and Unique all mode mobile transceiver from Icom is without doubt "History in the Making". It offers an ultra wide band coverage and a full 100 watts even though its no bigger than your average 2m Mobile Rig! But at what price? Lets take a closer look at what its offering:- Full all mode coverage @ 100 Watts on both H.F. & 6m together with 10 Watts on 2m and just for good measure - a receive coverage of 30 kHz - 200 MHz (with Wide FM)). Now that's progress! If you add up these 3 radios financially you wouldn't have much change from £2,200!

How do they do it? Why not come down and see for yourself, I guarantee you won't be disappointed. Oh yes! The price - all 3 in 1 for less than £1195.

Why not spread the load using our Post - Dated cheques scheme and don't forget our generous Part Exchange deals..... **£ Reserve Yours Now!**

Stop Press - Arriving Soon an Outbacker Mobile Antenna that covers HF plus 6 mtrs - an ideal companion for the new Icom IC706 or Alinco DX70

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Continuing with our "Best Buy British" the Drae Magnetic Loop Antennas & power Supplies are continuing to be a success. designed & manufactured to a very high standard the Drae Range of Amateur Products will not let you down! . . .

Magnetic Loop Antennas

Our new Drae magnetic loops use high quality semi rigid 13mm Japanese Ultra Low Loss cable for the radiating element, making loft mounting & portable operation possible. Packs easily away into the Car Boot. Fibreglass construction ensures full weatherproofing.

ML80 - 7 - 30 MHz (continuous)
Diameter - 80cms £169.95
ML170 - 3 - 10.3 MHz (continuous)
Diameter - 1.7 mtrs £189.95
Control Unit not supplied
Optional 2 way control unit allows remote tuning & switches between 2 loops... £24.95

Wire Antennas

New from Drae using "Flex Weave" antenna wire and high quality construction these are the Best!

G5RV ..... Full size ... (80 - 10 mtrs) £45.00
G5RV ..... Half size ... (40 - 10 mtrs) £35.00
GW40 ... Windom ... (40 - 10 mtrs) ... £55.00
GW80 ... Windom ... (80 - 10 mtrs) ... £65.00
EFW ..... End Fed Wire (s/waves) £59.95
DLB ..... Long Wire Balun £39.95
Flex Weave Wire ..... 74p per metre

G5RV Plus Antennas

For the perfectionist a G5RV that uses 450 ohm ladderline terminated in a balun for coax feed without cable radiation.

G5RV Plus Full size (80 - 10 mtrs) £75
G5RV Plus Half size (40 - 10 mtrs) £65

Power Supplies

Solid, reliable and fully protected - Why gamble, Buy the Best!

• Over Current, Over Voltage & Short Circuit protection • Over Temperature protection • High Peak Surge current • Meets full UK safety specs • Voltage 13.8V • 15 mins at full output

24 Amp Power Supply £109.95
12 Amp Power Supply £89.95

High Power ATU Components

. . . and for the constructors amongst us, take look at these High power ATU components:

TC 250 Variable capacitor
250pf @ 7.8 KV £24.95
TC 500 Variable capacitor
500pf @ 7.8 KV £34.95

TC26 Roller Coaster
Variable Inductor:-1 - 30µH
Pwr Handling:- 2KW
Size 55 x 105 x 160mm
Price £39.95

Control Knob
A professional graduated control Knob. 6cm outer diameter with 6mm shaft.
Price £3.57

TC48 Turns Counter
Dial indicates 1 unit for 1 revolution of counter. 48 turns maximum. 1/4 drive shaft for most applications £19.95

OUTbacker

One antenna does it all! 160m -10m including Warc bands, without the need for an ATU. Get mobile this summer on H.F. with Outbacker!

OB Junior ..... 80 - 10m 4ft..... £179
OB Full size ... 80 - 10m 6ft..... £189
OB(T) Full size 160 - 10m 6ft.... £219
OB Perth ..... 80 - 10m 7.5ft... £199
OB (T) Perth .... 160 - 10m 7.5ft.. £235
OB Spring Base £59
OB + 6 mtrs ..... £POA

Pro-Am

A superior range of HF mobile antennas designed for the Dxer. Slimline design & rated at 500W for top performance.

PHF-10 ....10m whip..... £19.95
PHF-12 ....12m whip..... £19.95
PHF-15 ....15m whip..... £19.95
PHF-17 ....17m whip..... £19.95
PHF-20 ....20m whip..... £19.95
PHF-30 ....30m whip..... £19.95
PHF-40 ....40m whip..... £22.95
PHF-75 ....80m whip..... £24.95
PHF-160 ....160m T.band..... £54.95
Pro AB5 ....A 5 band antenna.. £79.95

GAP Verticals

We are pleased to be appointed distributors for these super Verticals from the USA. Using an elevated feed system and no traps, coils or transformers these antennas dramatically reduce losses so more RF radiates into the air! Gap Verticals do not require tuning just assemble the antenna & your ready to go with full band coverage (at less than 2:1 SWR).

Challenger DV
Cvrs:- 2, 6, 10, 12, 15, 20, 40, 80 Mtrs.
Height:- 31.5 ft £259
Titan DX
Cvrs:- 10, 12,15, 17, 20, 30, 40, 80 Mtrs.
Height:-25 ft £289
Eagle DX
Covers 10, 12,15, 17, 20, 40 Mtrs.
Height:- 21.5 ft £269
Voyager DX
Covers 20, 40, 80, 160 Mtrs
Height 45 ft £399

Summer Madness

To own one of these receivers is a dream in itself - all mode - all filters plus optional

Matching Speaker £49.95
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Full W/Stop Manual £29.95
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The Drake R8E - Now Only £995

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FT840	RRP £959	£799
FT990DC	RRP £2399	£1759
FT 5100	RRP £679	£559
FT11R	RRP £324	£269
FT2500M	RRP £399	£329
FT41R	RRP £369	£299
FT 790 RII	RRP £749	£599
FRG 100	RRP £599	£490
FRG 9600	RRP £629	£575

Kenwood

TS-50S	RRP £1059.95	£955
TS-850SAT	RRP £1959.95	£1765
TS-450SAT	RRP £1649.95	£1485
TH-48E	RRP £369.95	£335
TH-79E	RRP £479.95	£432
R-5000	RRP £1059.95	£955

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A range of British made low cost transceivers - that offer outstanding value for money. At these prices we just can't keep up with the demand!

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WA2	VHF Wavemeter	£32.95
WA3	VHF Wavemeter	£32.95
HPF1	High Pass TVI Filter	£8.50
BB1	Braid Breaker Filter	£8.50

Alinco

DX70	New HF + 6	£995
DJ580	Twin Band H/Held	£389
DR130E	2M FM Mobile	£359
DRM06	6M Mobile	£299
DJ480E	70cm H/Held	£239
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For handheld transceivers 1-5 Watts input 50 Watts output max. Built in GaAs FET pre-amp £99.95

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Well known for their reliability and rugged design these amplifiers are back!

144-30LS	2m, 30W + P/Amp	£99.95
144-100LS	2m, 100W + P/Amp.	£199.95
144-100S	2m, 100W + P/Amp.	£179.95
432-30LS	70cm, 25/30W+P/Amp	£169.95
432-50S	70cm, 50W + P/Amp	£169.95
70-100S	4m, 100 W + P/Amp	£179.95
50-100LS	6m, 100 W + P/Amp	£199.95
50-100S	6m, 100 W + P/Amp	£179.95

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AEA Data Products

We are pleased to welcome Lloyd Arrow G1JAR. As one of the countries leading Data Experts Lloyd will be able to help and assist you with all the aspects of Digital Comm's.

PK-12

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THIS MONTH'S LEADING FEATURE

Oct '94 The Mother of 10GHz Lifts

by Peter Day, G3PHO, Editor *RSGB Microwave Newsletter**

IN A MONTH in which new microwave records have been set - see the News pages in this edition - it seems appropriate to look back at the spectacular conditions experienced in October last year, when microwave operators all over northern and western Europe experienced what has become known as 'the mother of all lifts'.

THE PERIOD OF 11 - 15 October 1994 saw a remarkable DX opening or 'lift' in propagation that was to break distance records on the 10GHz band and provide those who operate in the 'world above 1000MHz' with the most exciting operating experiences of their lives. Whether this opening was a one-off event or whether we will experience others in the years to come, no-one can say for certain. It may very well be that the upsurge in 10GHz narrowband activity in the UK over the past couple of years has uncovered something that is fairly frequent - let us all hope so! This report is an attempt to collate the information, largely from UK sources, sent to the RSGB *Microwave Newsletter* editor. There must be a great deal more information still out there!

THE START

AS FAR AS 10GHz is concerned, it is most likely that the opening began on 11 October when, at 0600UTC, G4FCD in Northamptonshire was receiving the PI7EHG and ON4RUG 10GHz beacons at good strength. Richard called CQ for an hour but received no replies. TV weather reports and co-channel TV interference in the UHF region alerted amateurs to the opening.

According to G8DKK, who kept a watchful eye on developments, the conditions favoured northern and western England at first. G3WDG was able to exchange P5 TV with G4CBW over 145km on 11 October, blowing up a TWT in the process! G8APZ in Essex also heard the ON4 beacon at S9 during the evening of 11 October, but no contacts were made with continental stations.

VISUAL DUCTING

PHIL SCORAH, GW3PPF/P, at Mynydd Maen, IO81LQ, made a detailed study of conditions over the period, monitoring beacon propagation between 0500 and 1000UTC on the 10th, 12th, 13th and 15th of the month (**Fig 1**). He found, like the rest of us, that Thursday 13 October was the best day. It was on that day that an unusual effect was observed. Phil found, as expected, that all signals - with the exception of the DB0JO beacon - dropped out during the afternoon. He noted a strange visual manifestation which coincided with the drop-out of signals. When a tropospheric duct can be visually observed, it appears as a low-lying, orange-brown layer that has an extremely sharp or abrupt interface with the clean air above. It sometimes has a layer of fog below it, but as the sun gets to work on it during the afternoon, the sharp interface gradually becomes less distinct and radio propagation falls off proportionately. When signals finally disappear there is sometimes left, as in the case described by GW3PPF, a tiny portion of the layer (just a few degrees of azimuth) that retains its sharpness and continues to allow good propagation in this direction only. He calls the manifestation the 'Afternoon Tunnelling Effect' and it is allied to a peculiar critical distance phenomenon whereby closer beacon signals cannot be heard while the more distant ones (300 - 500km) are very strong indeed. GW3PPF has observed the 'Afternoon Tunnelling Effect' on other occasions, notably 31 January 1981 and 31 January 1992.

Fig 1 shows the signal strengths of four beacons heard, plotted relative to the path loss in a perfect duct. Phil, GW3PPF, used EIRP data for all but the PI7EHG beacon, but estimates it to lie somewhere in the -25 to -10dB below free space region. He also heard the following beacons, all too weak to show on the graph: DB0JK, DB1BX (personal beacon), GB3MHX and GB3SWH. Equipment used for these interesting tests included a 4ft dish with Cutler feed and an SSB Electronics SSB transverter. Mynydd Maen is 1500ft above sea level. The duct must have been quite deep but somewhat elevated as G8AGN/P, 1200ft ASL in Sheffield, also heard PI7EHG at good strength, while G3JVL at sea level (Hayling Island) heard nothing!

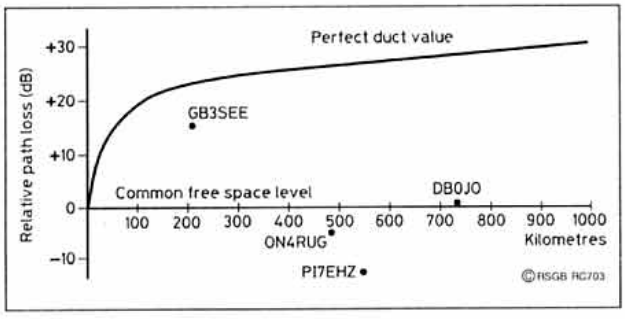


Fig 1: 10GHz beacons heard by GW3PPF/P at Mynnyd Maen (1081LQ) between 10 and 16 October 1994.

The duct formed during very high pressure conditions over north-western Europe. It is interesting to note that G3LQR at Woodbridge, by the Suffolk coast, also found all the DX was 'going over his head', yet G4BYV, inland a few dozen miles at Dereham, Norfolk, worked the DX with relative ease, including DC8UG on all bands from 70cm to 3cm on 12 October. On the 13th, the best day for UK operators, he found the German stations predominant, although he did hear SM6EHG and SM6HYG at S9+. Unlike one or two other stations further inland he found conditions did not extend down to HB9.

THE MIDLANDS

WITH G4FCD at Brackley in Northamptonshire the lift lasted from 11 to 15 October. He monitored the band at 0600UTC each day and found the PI and ON beacons at good strength, but very little other activity, most contacts being made in the evening. In future openings it might well pay off handsomely to try to get on in the early mornings. His log includes four SM stations at over 1000km. His last contact was at 2104UTC on Saturday 15 October, with DC8UG at a distance of 645km. Deep QSB was very obvious at this time.

G3WDG / G4KGC in Rushden, Northamptonshire, made a combined total of seventeen DX contacts during the period 12 - 14 October. Their log includes three SMs and OZ1UM. However, it is interesting to note that the reports they exchanged with almost all stations worked were rarely S9 and usually in the S1 / 2 region, contrasting markedly with the S9 signal levels being experienced by stations further north and west.

The West Midlands was also favoured by the opening. G3UKV at Telford found the band peaking on the 13 October. His location (rising ground to the east) limited his results but nevertheless he worked PA3AGS and had a one-way con-

*146 Springvale Road, Sheffield S6 3NU.

From left to right: Lyle, VK2ALU; Barry, G8AGN; G3WDG's son; Charlie, G3WDG. In the background the G3WDG 10GHz EME dish at Rushden, Northamptonshire.

tact (outward) with DL5KVD over 976km.

G4CBW, not too far away in Newcastle-under-Lyme, Staffordshire, found conditions excellent on both 12 and 13 October. Contacts included HB9MIN/P and HB9AMH/P, both in JO37OE at 937km. The Swiss stations were worked on 12 October at 2043UTC. G4CBW's log also reveals a contact with F6DKW at 570km, thus extending the lift along a bearing of 144° true. The lift appeared to favour a broad arc from at least 070° to 145° true, with maximum distances for UK stations of around 1170km.

WEST COUNTRY

THE FURTHER WEST, the better the conditions. Some excellent DX was worked by stations in Wiltshire and the West Country. G3FYX and G3JMY both worked SM6ESG over 1137km on 13 October, G4LDR in Salisbury, Wiltshire, found the lift building up as early as 9 October when beacons he had never heard before (GB3SEE and GB3MHX) were audible at fair strengths. On 12 October he was able to work PA0EZ at 487km before equipment failure, but he was back on again for the 13th and worked SM6ESG at 1118km at 2132UTC. He found Friday 14 October to be dead, whereas I was hearing PI7EHG all day from Sheffield! Neil was one of the few stations to report DX conditions prevailing until 15 October (Saturday), when he heard the beacons GB3MHX, ON4RUG and PI7EHG at good strengths and worked DF9LN on SSB at 1954UTC over 658km.

Another station located in the west is G4BRK. On 13 October he contacted no less than four stations over 1000km and probably held the UK record for a few minutes when he worked SM6HYG at 1733UTC over 1115km. His contacts, like those of others who sent in reports, are tabulated herewith. Neil suspects that he was right on the edge of the opening. He found the band open on 12 Oct and worked DL4EAU/P in JO51GO over a 844km path with 56 / 59 reports, as well as PA0EZ who was worked directly on 3cm, without any prior talkback.

G3PYB/P operating from Mereton Low in Staffordshire during at 10GHz Portable contest.

THE SOUTH

ON THE ISLE of Wight, G4BCH/P set up at Ventnor for 13 October, operating under the light of the moon and a torch! He too heard some beacons for the first time, including GB3MHX at S9. His log includes five DL stations (four of them over 600km), two PAs and two SM stations (both at QRBs of 1100km+). Using low power portable gear (700mW to an 18in PW dish with a 'penny feed') he was delighted to work SM6HYG to establish a new British DX record for the 10GHz band!

THE NORTH

G3PHO IN Sheffield found most DX was audible over a narrow range + / - 105° true, nearby buildings preventing reception of the Swedish amateurs. He worked all his European DX with his portable 250mW transverter and 60cm dish set up in an upstairs bedroom, the contacts being made through a foot thick wall and a double-glazed window!

The most northerly report comes from G3ZTR in Bridlington on the Yorkshire coast. He worked three Dutch stations and DL4EAU/P at 771km. His friend G3NWU to the north, in Hartlepool, heard no DX at all.

SUMMARY

THE MAP AND list of locations shown in **Fig 2** (over page) represents the paths over 400km worked from the UK last year. The map speaks for itself. Due to the outstanding tropo conditions in mid October, a large number of very long paths were worked, hence the density of black lines on the map. We had to set the lower limit at 400km; the map would have been just one black page had the limit been less! Most of the UK stations shown are home-based rather than portable: they are in the best position to benefit from tropo lifts, which are notoriously rare during portable contests! Note also the increasing numbers of long-distance contacts between GI, GM and the rest of the UK. These are largely due to the sterling efforts of Sam, GI8GJX, and Mark, GM4ISM, both of whom have developed high-power 10GHz home stations to take advantage of propagation modes such as rainscatter and aircraft reflection. Finally, just look at the numbers of paths exceeding 1000km (detailed in **Table 1**.) Who would have dreamt of this a few years ago?

LESSONS TO BE LEARNED

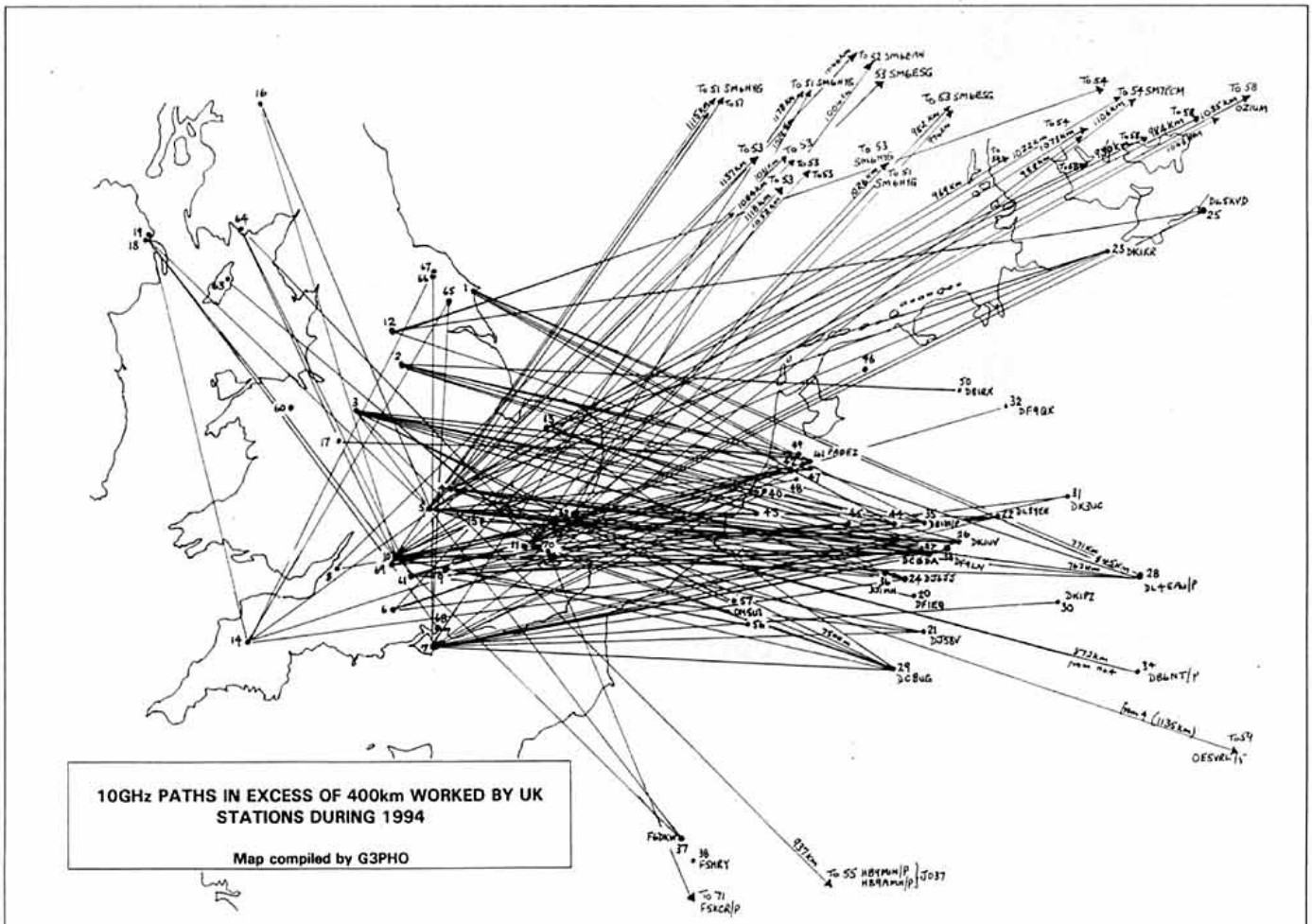
THE MAGNITUDE of this tropospheric lift surpassed any other in the past. PA0EZ said he had not experienced such good conditions in the whole of his thirty year's experience on VHF and UHF.

There are a number of lessons to be learned from those October days. Firstly it pays to monitor the UHF TV channels. The writer now has four channels permanently tuned to Dutch and German TV stations. Secondly, the better the opening the better the DX on the *higher* microwave bands. In fact 144 and 432MHz might appear to be relatively poor while 1000km DX is being heard on 10GHz. Very modest equipment can bring excellent results during microwave lifts. 100 - 250mW to a 45 - 60cm dish on 10GHz is quite easily attainable these days, using the excellent G3WDG kits available from the Microwave Components Service (via G4KGC, QTHR). Perhaps the most important lesson of all is that a home-based microwave station stands the best chance of catching the openings as and

G4EQD/P and G3PHO/P on Houndkirk Moor near Sheffield. Both stations run 250mW to 60cm dishes. The 144MHz beam is used for talkback.

km	Callsigns			Notes
1218	SM6HYG	-	F6DKW	New European record
1178	G4BCH/P	-	SM6HYG	New British record
1137	G3FYX	-	SM6ESG	
1137	G3JMY	-	SM6ESG	
1118	G4LDR	-	SM6ESG	
1115	G4BRK	-	SM6HYG	
1106	G4BCH/P	-	SM7ECM	
1084	G4BRK	-	SM6ESG	
1073	G4BRK	-	SM7ECM	
1062	G4FCD	-	SM6HYG	
1052	G4KNZ	-	SM6ESG	
1046	G4FCD	-	SM6EAN	
1035	G4BRK	-	OZ1UM	
1031	G4FCD	-	SM6ESG	
1026	G8APZ	-	SM6HYG	
1022	G4FCD	-	SM7ECM	
1008	G4KGC	-	SM6HYG	
1004	G8APZ	-	SM6EAN	

Table 1: 10GHz contacts exceeding 1000km made during the lift of 11 - 15 October 1994. British stations made at least 53 other contacts greater than 500km during the lift.



Site no	Location	Locator	24	DJ6JJ, Germany	JO31LG	48	PA0CJA, Holland	JO22JG
1	G3ZTR, Bridlington	IO94VB	25	DL5KVD, Germany	JO64AD	49	PA0AGS, Holland	JO22JP
2	G3PHO, Sheffield	IO93GJ	26	DK1UV, Germany	JO41CT	50	DB1BX, Germany	JO32OT
3	G4CBW, Newcastle, Staffs	IO93UB	27	DC0DA, Germany	JO31SL	51	SM6HYG, Sweden	JO58RG
4	G3WDG / G4KGC, Rushden	IO92RG	28	DL4EAU/P, Germany	JO51GO	52	SM5EAN, Sweden	JO57WQ
5	G4FCD, Brackley	IO91KX	29	DC8UG, Germany	JO30HH	53	SM6ESG, Sweden	JO67CC
6	G4LDR, Salisbury	IO91EC	30	DK1PZ, Germany	JO41TH	54	SM7ECM, Sweden	JO65NQ
7	G4BCH/P, Ventnor	IO90JO	31	DK3UC, Germany	JO42WK	55	HB9MIN / HB9AMH	JO370E
8	G3FYX / G3JMY, Bristol	IO81RM	32	DF9QX, Germany	JO42HP	56	ON7WR, Belgium	JN20EP
9	G4KNZ, Bracknell	IO91PJ	33	DF9LN, Germany	JO31VJ	57	ON5UI, Belgium	JO11VA
10	G4BRK, Swindon	IO91DP	34	DB6NT/P, Germany	JO50??	58	OZ1UM, Denmark	JO65DX
11	G8APZ, Brentwood	JO01DO	35	DB1DI/P, Germany	JO31QX	59	OE5VRL/5 Austria	JN78??
12	G4PMK, Leeds	IO93GT	36	DJ1MH, Germany	JO31EJ	60	Cyrn y Brain, Wales	IO83JA
13	G4BYV, Dereham	JO02LQ	37	F6DKW, near Paris	JN18CS	61	Walbury Hill	IO91GI
14	G3GNR, Highampton	IO70WT	38	F5HRY, Savigny	JN18EQ	62	Walton on the Naze	JO01PU
15	G8DKK, Letchworth	IO91VX	39	F5KCR/P, France	JN26IX	63	Snaefell, Isle of Man	IO74SE
16	GM4ISM, Lanarkshire	IO85BU	40	PA0WWM, Holland	JO22FE	64	Galloway, South West Scotland	IO74UU
17	G3UKV, Telford	IO82RR	41	PA0EZ, Holland	JO22OF	65	Warrendale, Yorks	IO93PW
18	GI8GJX, Belfast	IO74AQ	42	PA3FPS, Holland	JO22IJ	66	Helmsley Moor	IO94LI
19	GI8GJX/P, Carn Hill	IO74BR	43	PA0MAR, Holland	JO21BX	67	Cockayne Ridge	IO94LJ
20	DF1EQ, Germany	JO31NC	44	PA0BAT, Holland	JO31FX	68	G3JVL, Hayling Island	IO90MS
21	DJ5BV, Germany	JO30MR	45	PA0FPQ, Holland	JO21VX	69	G3KEU, Swindon	IO91CO
22	DL3YEE, Germany	JO42GE	46	PE1NTE, Holland	JO33DE	70	G4FUF, Benfleet	JO01GN
23	DK1KR, Germany	JO53HW	47	PE1NTE, Holland	JO22OE			

Fig 2: Key to map showing 10GHz contacts exceeding 400km in 1994.

when they occur. Openings rarely happen during a portable contest, as Murphy's Law clearly states!

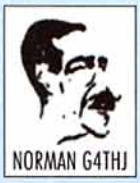
GET ON TO MICROWAVES

THE HIGHER microwave bands, those above 1.3GHz, are no longer 'plumbing' bands, involving long lengths of copper waveguide and shiny brass fittings. In fact, the use of printed circuit boards and microstrip techniques has seen the demise of waveguide, except perhaps for the final feed to the antenna. The 10GHz band has now become a fascinating haven for those who like 'real radio', free of black boxes, FM channels and the like - why not join us up there?

For further details you can contact the Chairman of the RSGB Microwave Committee, G4KNZ, QTHR. Also, look out for the Microwave Committee stand at the various RSGB exhibitions, particularly the VHF Convention at Sandown. ♦

A free sample copy of the RSGB *Microwave Newsletter*, which is edited by G3PHO and G8AGN, is available from RSGB Headquarters. An annual subscription to the *Microwave Newsletter* is available for £7.99 to RSGB members (see pages 90/91).

ARE COMMUNICATIONS



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LA-120	Ham	V.Good	HF 100W amp	£125.00
FT707	Yaesu	Good	HF Transceiver Amateur Bands RX/TX SState	£395.00
TS130S	Kenwood	Good	HF Transceiver	£399.00
FT102	Yaesu	Fair	HF Transceiver PA - 3 x 6416B's	£475.00
FT990DC	Yaesu	Good	HF Transceiver DC Model	£1,350.00
FT747GX	Yaesu	Good	HF 12 v Transceiver	£499.00
TS430S	Kenwood	Good	HF Transceiver	£650.00
TS830S	Kenwood	V.Good	HF Transceiver	£575.00
IC725	Icom	V/Good	HF transceiver, boxed	£624.99
IC726	Icom	V/Good	HF & 6m transceiver, boxed	£699.00
FT747	Yaesu	Good	HF Transceiver	£499.00
TS430S	Kenwood	Mint	HF TX/RX FM, CW filter	£650.00
FT890AT	Yaesu	Mint	HF Transceiver with ATU	£1,199.00

VHF/UHF TRANSCEIVERS

C500	Standard	Good	Dual Band Hand Held	£225.00
IC-P2ET	Icom	Mint	2m Handheld Keypad entry	£189.00
TS60S	Kenwood	V.Good	6m 100w mobile	£750.00
IC2ZE	Icom	Good	2m Handheld	£179.00
IC-W21ET	Icom	V.Good	Dual Band Hand Held	£299.00
FT530	Yaesu	Good	Dual Band Hand Held	£399.00
DJ580E	Alinco	Fair	Dual Band Hand Held	£250.00
FT290R11	Yaesu	Good	2m Multimode, case and charger	£299.00
TS770E	Kenwood	Good	2m / 70cms Base Station	£425.00
FT470	Yaesu	V.Good	2m / 70 cm Handie + charger + mic	£285.00
TH78E	Kenwood	Pristine	2m / 70 cm Handie as new	£325.00
IC125	Icom	Good	Commercial Radio	£80.00
C844	Stand	Fair	Handheld	£50.00
IC02E	Icom	V.Good	2m handheld + Bits	£150.00
FT728	Yaesu	V/Good	Transceiver	£299.00
M40FM	HRC	Good	Transceiver	£45.00
TEMPO		Good	2m handheld	£88.99

DATA/COMPUTER

MICROREAD	E.R.A.	Good	CW, RTTY, Decoder, Tutor	£110.00
5000E	Tono	V.Good	CW / RTTY / Decoder and Sender	£325.00
CD660		Excellent	Data decoder, boxed	

MISCELLANEOUS

AT250	Kenwood	Fair	ATU	£160.00
FAS14R	Yaesu	Good	Remote Antenna Switch	£70.00
PG1	Datong	Good	HF Converter	£65.00
HK703	HiMound	Good	Morse Key Straight	£25.00
BC11	Kenwood	Good	Charger + 2 Batteries	£50.00
LPM144/10	BNOS	Good	2m Linear Amp 10w in 100w out	£149.00
AT230	Kenwood	Mint	Antenna Tuner	£189.00
FC757AT	Yaesu	Good	Automatic ATU	£225.00
AL811X	Ameri	Mint	HF Amp 700watts	£550.00
KG2	Kurani		Pre amp	£44.74
PP1	Icom	Not Working	Phone patch	£139.00
SP520	Trio	Fair	Speaker	£20.00
SW100	Trio	Good	Meter	£49.00
SYNOPTIC	ERA	V.Good	Decoder	£75.00
UC-1	Daton		Convertor	£69.00
VLF	Daton	Good	VLF convertor	£30.00
FL2025	Yaesu	Unused	25 Watt Amp for FT290R11	£210.00
PS30411	Daiwa	As New	25 amp P.S.U unused	£89.00
VF0180	Trio	V.Good	Matching VFO for TS180	£90.00

RECEIVERS

ICR100	Icom	V.Good	Mobile / Base Scanner	£350.00
R5000	Kenwood	Good	HF Receiver + Internal converter	£825.00
AIR7	Sony	V.Good	Airband Scanner	£169.00
R537	Signal	V.Good	Airband Receiver Hand Held	£55.00
ICF PRO80	Sony	Good	Hand Held Shortwave RX	£179.00
2001D	Sony	Good	S/wave receiver	£169.00
FRG7	Yaesu	V/Good	HF receiver - Digital	£200.00
FRG7	Yaesu	V.Good	HF Gen Coverage RX	£165.00
AR1500EX	AOR	Good	Hand Scanner + SSB	£225.00
RF3100	Panas	V.Good	Receiver	£199.00

ARE Communications, 6 Royal Parade, Hanger Lane, Ealing, London W5A 1ET.
Opposite Hanger Lane Tube Station, South West side A406/A40 roundabout junction.

Tel: 0181 997 4476 VISA
Fax: 0181 891 2565 Mon-Fri 9.30-5.30 Sat 9.30-1pm

ARE

RSGB 1995 International HF Convention

BEAUMONT CONFERENCE CENTRE - OLD WINDSOR - BERKSHIRE
9 & 10 SEPTEMBER 1995

The theme of this year's Convention is 'something for everyone'. Just take a look at some of the talks already scheduled and we think you will agree.

- *The DXCC Program by Chuck Hutchinson, K8CH*
- *Amateur Radio on Internet by Mike Richards, G4WNC*
- *The Conway Reef DXpedition by Mats Persson, SM7PKK*
- *Top Band Antennas for Mere Mortals by Neil Smith, G4DBN*
- *Cluster Forum by John Clayton, G4PDQ*
- *Islands on the Air - the fastest growing DX award programme by Roger Balister, G3KMA*
- *Sunspots and Propagation by Martin Atherton, G3ZAY*
- *Bhutan - 40 Years of Amateur Radio, by Jim Smith, VK9NS*
- *The Camel Trophy by Richard Diamond, G4CVI*
- *HF Contesting by Chris Burbanks, G3SJJ*
- *Computers in the Shack by Don Field, G3XTT*
- *Activating Islands; the DOs and DON'Ts by a number of Island activators*
- *HF Data Modes by Mike Kerry, G4BMK*
- *Low Band Antennas - my way by Ron Stone, GW3YDX*
- *The Islands on the Air Awards Programme report by Roger Balister, G3KMA*
- *Equipment Reviews by Chris Lorek, G4HCL*
- *Contesting in the Caribbean by Bill Hudzik, WA2UD*

PLUS *talks on Tower Safety and Operating Techniques and a Novice forum on Sunday to which all Novice Instuctors and Novices are invited. A special feature of this year's Convention is the checking of QSL cards for DXCC: All claims must be accompanied by a DXCC application form, which also details the rules; this is available from Marcia Brimson at HQ.*

CONVINCED? This is your invitation to attend the Convention and join in the fun.

FULL DETAILS FROM MARCIA BRIMSON AT RSGB HQ, LAMBDA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTS EN6 3JE, UK

Organising Committee - G3OUF & G0TWW (Joint Chair), G3ZAY, G3KMA, G4XRV, G3NUG, G4BWP, G4IQM, G3RTU, G3PSM & G4PFF.

THIS YEAR'S INTERNATIONAL HF CONVENTION IS SPONSORED BY

MARTIN LYNCH
G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

YAESU
Performance without Compromise

TURN TO PAGE 93 FOR LECTURE SYNOPSES

HF NEWS

JOHN ALLAWAY, G3FKM
10 Knightlow Road, Birmingham
B17 8QB

I WAS SORRY TO learn that Brendan McCartney, G4DYO, former editor of the *RSGB DX News Sheet* had decided to give up the task. He was dedicated to producing the best source of information available for HF DXers and continued the tradition of the late Geoff Watts. His task has now been taken over by Chris Page, G4BUE. Thank you Bren and good luck Chris.

A BROAD APPEAL

THE RSGB 1995 International HF Convention promises to be the best so far and the theme this year is 'something for everyone'. The talks include 'The DXCC Programme' by Chuck Hutchinson, K8CH; 'Amateur Radio on the Internet' by Mike Richards, G4WNC; 'Top Band Antennas for Mere Mortals' by Neil Smith, G4DBN; 'Cluster Forum' by John Clayton, G4PDQ; 'Islands on the Air - the fastest growing DX award programme' by Roger Balister, G3KMA; 'Sunspots and Propagation' by Martin Atherton, G3ZAY; 'Bhutan - 40 years of Amateur Radio' by Jim Smith, VK9NS; 'The Camel Trophy' by Richard Diamond, G4CVI; 'HF Contesting' by Chris Burbanks, G3SJJ; 'Computers in the Shack' by Don Field, G3XTT; 'Activating islands - the Do's and Dont's' by 'a number of island activators'; 'HF Data Modes' by Mike Kerry, G4BMK; 'The Conway Reef DXpedition' by Mats Persson, SM7PKK; 'Low Band Antennas - my way' by Ron Stone, GW3YDX; 'The Islands on the Air Awards Programme Report' by Roger Balister, G3KMA; 'Equipment Reviews' by Chris Lorek, G4HCL; and 'Contesting in the Caribbean' by Bill Hudzik, WA2UDT. There will also be talks about tower safety, operating techniques and the DXCC QSL card checking facility - this is the first time that this has ever been available in the UK.

This looks like being a great event and the main problem will be choosing from the brilliant programme of talks! [See also pages 20 and 93 this month - *Ed*]

CHECK FACILITY

ANYONE WHO HAS wanted to apply for DXCC but has been loath to risk the loss of treasured QSLs in the mail system can now have them checked by the ARRL at the HF Convention on 9 and 10 September on a 'first come - first served' basis. This is what you have to do: (1) Send an SASE to Marcia Brimson at RSGB HQ and ask for a DXCC Application form. (2) Complete the form as instructed - but please note that *the maximum number of QSLs which can be checked is 110.* These can be in the form of a new application or as an endorsement for a further 110 countries. Cards should be grouped by band and mode but do not need to be in alphabetical order. Each application must be accompanied by the appropriate fee which is US$12.00 for ARRL members and US$22.00 for others. Note that ARRL membership will be available at the RSGB stand and that payments for this and DXCC claims can be made in Sterling.

CUBAN GREETING

DURING A RECENT trip to Cuba, Phil Jones, G3YLV, visited the Federacion de Radioaficionados de Cuba. The President of the FRC asked Phil to convey his best wishes to the RSGB and all its members. UK radio amateurs visiting Cuba are invited to contact the society. At present there are about 2,000 licensed amateurs in the country with about 1,000 active at present on all HF and VHF bands. Repeaters and packet radio are well used. Many use 7MHz for European contacts. FRC is anxious to forge links with the UK and there are many club stations there. Also, if any society is looking for a site for an expedition they would be certain of a warm welcome.

During a visit to Cuba Phil Jones,G3YLV, received a warm welcome from members of the country's amateur radio society. From left: CM2CE, G3YLV, CO2RP, CO2AA and CO2DC.

DX NEWS

A *DXCC NEWS Release* dated 1 June said that the DXCC Desk had announced that the number of unprocessed applications at the end of May was 150 (representing 18,930 QSLs). They received 350 applications (37,399 QSLs) for endorsements and new awards during the month. Applications being sent out at the end of the month were received less than a week earlier. A few applications received prior to that time were waiting for paper records to be converted or were being audited and so had not yet been completed. The DXCC Desk continues to operate with a reduced staff because of illness.

According to *RSGB DX News Sheet,* there is going to be an expedition to **Easter Island** (and Salad y Gomez Is) starting on 2 September and finishing on 23 September. The large group (according to the *Lynx DX Bulletin*) will consist of K4UEE, XE1XA, AH9B, XE1L, WT8S, G0LMX/F5MBO, W6MKB, W4ETO, WJ2O, K0IR, HB9AEE, KA3MUF, W3UM, PA0ERA, W8FMG, W6YA, NP4IW, N1COS, K9JSC, HB9AHL, KK6EK, W0ZV, and KF0UI. The callsigns used will be XR0Y and XR0Z. The same news source says that K4UEE and K0EU are planning a visit to nearby **Juan Fernandez Is** later. HR6/N7QXQ lives on Raotan Is in **Honduras.** He hopes to have the more permanent callsign HR6GK soon. He is active on all bands 3.5 to 28MHz and is installing a top band antenna. Ken, KG4MN, (ex-VP9MN) is in **Guantanamo Bay** and should be there for the next two years. He likes the WARC bands and seems to prefer CW. G6QQ was scheduled to visit **Antigua** from 21 July until 2 August as V2/G6QQ. He will be using 7, 14, 21, and 28MHz, mostly CW during the IOTA contest and he will QSY to SSB. On non-contest days he will be found mainly on 7.030 or 14.040MHz. His equipment will be an IC735 to a 7MHz dipole and an R3 vertical. VF1L will be active from Cape Breton Is until 31 August. Cape Breton amateurs are allowed to use the VF1 prefix until

28MHz COUNTRIES TABLE

G0AEV	113
G4OBK	104
G0DNV	90
G0MCT	55
G0NQC	36
GJ4GG	34
G3XBM	32
G2FQR	17
GM4CHX	16
G3ING	14

31 August to mark the 250th anniversary of the fall of the fortress of Louisbourg. According to *DXPRESS* AA4VK, WA4DAN, KW2P, and W5IJU will be operating from **St Paul Is** from 27 July to 22 August using their own callsigns /CY. They will be on bands from 1.8 to 50MHz on SSB, CW, and RTTY.

It is believed that FT5XJ will not be active from **Kerguelen Is** again until 15 December after which date he should remain until March 1996. TR8DF is located in **Gabon** and active usually on CW on all bands 7 to 28MHz (including the WARC bands). Eric, 5T5JC, is on the air from **Mauritania** as 5T6E until 25 August. Les, 7Q7LA, may have returned to the UK by now. It is not known if he will be returning to **Malawi.** *RSGB DX News Sheet* reports that D2/YO3YX is with the Romanian Army contingent in **Angola** until the end of 1995. Most activity seems to take place near 14.268 and 21.266MHz with his home built transceiver, 400W linear and rhombic antenna. He is willing to QSY to make CW contacts. WA4OBO has still not had his TT8OBO operation in **Chad** approved by the DXCC authorities. His TY8OBO license seems to be in order and he has recently applied for licenses in **Senegal** and **Ethiopia**. He expects to be making short business visits to the latter and also to **Benin** during the next two years. 3V8BB seems to be a permanent station located in the Institut Superieur de la Jeunesse de Bir-El-Bey, in Bir-El-Bey, **Tunisia.** According to *QST* the licence was issued to a school club in September 1994 and JI1HUC was instrumental in obtaining it. In November JF2EZA, JH2CFD, JL2OYI, and JR2RVL went to Tunisia to set up the station and train local operators. The group checked on the legality of 3V8AS and were told that no such licence had been issued.

Documentation for the recent P5/OH2AM operation from **PDR Korea** has apparently been submitted to ARRL and the addition of the new country (for DXCC purposes) is expected. Two members of the P5/OH2AM group - OH2BH and OH0XX - have been invited to mount a full scale expedition using the calls P51BH and P51XX. No time scale is mentioned but it may have already happened following their trips to Finland and the completion of tasks following the BS7H operation.

TA2/OK2ZW is now TA2ZW and will be in **Turkey** for three years. He is active on CW and SSB on 7 to 28MHz (including the WARC bands) and was hoping to erect antennas for 1.8 and 3.5MHz.

Ted, KH6YK, will be active from **Belau** until 25 August on all bands.

Steve, G4JVG, and Don, G3OZF, will be operating from the **Sovereign Bases in Cyprus** as ZC4DX during the IOTA Contest on 29-30 July. Outside the contest they will use their own calls with a 5B4/ prefix. 7Z5OO has renewed his contract in **Saudi Arabia** and will be there until June 1996. The Radio Amateur Society of Thailand has been given permission to use the callsign HS50A until May 1996 to celebrate the 50th year of the accession to the throne of King Bhumiphol Adulayadej, HS1A. WB2DND will be back in the **United Arab Emirates** as A61AD from 24 to 28 July and again from 31 July until 2 August. Operation will mostly be on CW and his son N1QMM will be with him and will operate some of the time.

It is reported that the Baghdad Radio Club has the callsign YI1RS.

A group of Belgian amateurs - including ON6QR, ON4LZ, and ON7PC together with N4XYA - is planning an expedition to the **Faroe Is** from 24 July until 6 August.

BEIJING EVENT

I NOW HAVE full details of the 1995 Beijing International DX Convention. Registration should have been made before 1 July 1995 but, in any case, I can provide photocopies of the details which were kindly passed on to me by Roger, G3SXW.

QTH CORNER

A92BE	Box 26844, Manama, Bahrain.
BV9P KU9C	12 Netherton Terrace, Morristown, NJ-07960, USA.
D2/YO3YX	via YO3YE, PO Box 55-36, Bucharest, Romania.
J28RQ	(1990/1992)76 Avenue de Magny, F-57157 Marly, France.
S92AA	(1991/1992)PO Box 1307, F-53013 Laval Cedex, France.
S92YL	Box 522, Sao Tome.
TA2ZWOK	DX Foundation, Box 73, 293 06 Bradlec, Czech Republic.
TL8CN	Box 22, F-67280 Urmatt, France.
V2/G6QQ	David Dutton, 55 Stalham Rd, Hoveton, Norwich, NR12 8DU.
VP8CQS	(new)SP2GOW, A Grotha, ul Mikolaja Gomolki 5 m I, 80279 Gdansk, Poland.

BAND REPORTS

A very short month this time because of the early deadline. Many thanks to the following who got reports to me in time: G2HKU, G3s GVV and YRM, GJ4GG, GW4KGR, and the UK DX Packet Cluster via G4PDQ.
All loggings were made between mid-May and mid-June. As always, callsigns given in italics were transmitting on CW:

3.5MHz	
0000	FG5FC, LU3EEM, V31RD, VP8CPC.
2000	BV2FI, ET3BN, HZ1AB, VK7AZ, XT2CH, YK1AO, Z22JE.
2100	A71CW, TL8CK, VK3EW, ZS6AMI, 9J2GA.
2300	D44BC, CE8EIO, *5Z4FO.*
7MHz	
0600	*CO2LT, D2KWN,* HJ6WQK, J37LF, *PY0FF, TL8OK, VK9NS, ZL2AGY, 3D2RW, 6V1A,* 8R1AK.
1800	BV9P, *DX1EA.*
1900	*HS7ECI, YI9CW, ZS6QU, 5H3EH,* 5Z4FX.
2000	*HS7AS, HV4NAC, VS6WO,* XT2CH, *9X/ON4WW.*
2100	*BV3BW, BV9P, EL4ML,* S92YL, *VP8CQS, 3V8BB,* 7Q7FN.
2200	ET3BT, *R1FJL,* TR8XX, 9G1BJ.
14MHz	
0700	*FO5BI,* KH3AF, KH6FKG, *N6VI/KH7, KH9/AL7EL,* KS6DU, TR8JH, YI0EB, *ZK1DXC,* G4MFW/ZL8.
0800	AH8A, *BV9P, JT1KAA,* V73C, VE7WRB, 3V8BB, *5W0XC.*
1000	A61AN, HH2JR, V51BO.
1300	BY1QH, HS9DSI/1, XX9AS, *VR2VM,* V51BG.
1500	JAs, JT1BG, V85BG, VU2GMC, 9M2AA, 9M8s BL, DJ.
1600	BV5BG, BV9P, S21YE, *TU2XZ,* VR2KF, *ZS9RWE.*
1700	A92FZ, FS5PL, RX1OX/FJL, YB0ARN, 7Q7AN, 9N1RHM.
1900	*D2EV, TJ1JB,* XT2CH, ZD7WRH, *OH2BBF/4U* (Rwanda).
2200	A71BK, FG/F6GNZ, FO8AA, VK2AMO (LP), 8R1WD.
18MHz	
0700	HL1SSG, *J28JA, NH2G,* VK6APH, *5Z4PT/A, 5W0XC, 7Q7LA, 8J1ITU.*
0800	JT1M, KH6CD, *T20XC, VK9NS.*
1000	BV2KI, JT1BG, *R1FJL,* XX9GD.
1100	*BV9P,* D44BC, PJ2MI, S92YL, *3D2ER.*
1400	A45ZZ, *A71AN, ET3YU, XU95HA, 3B8CF, 9Q2L.*
1500	*BV2FG,* ET3BT, XT2CH, ZS95WRT, 4U/KC0PA.
1600	D2RL, *TR8DF, VP8CQS,* W6s, *9X/ON4WW.*
1700	A22BW, BV9P, ZD7WRG, 7Q7JL, 9M8FC.
1900	HH2/KB0QNS, KH6CD, PJ8AD, S26ZQ, *9Q5MRC.*
2200	*HK0ER,* KL7HF, *S0RASD,* S92SS, *5W0XC.*

CONTESTS

AGCW STRAIGHT KEY PARTY

1300 - 1600 2 September

7.010 - 7.040MHz *using hand keys only.* Call "HTP". Exchange RST/serial number/class/name/age (ladies send "XX"). Class A = maximum output 5W; Class B = maximum output 50W; Class C = maximum output 150W; Class D = listeners. QSOs between Class As = nine points, A with B = seven points, A with C = five points. B with B = four, B with C = three and C with C = two points. Mail logs before 30 September to FW Fabri, DF1OY, Wolkerweg 11, D-81375 Munchen, Germany. I have copies of the rules (SASE please).

KCJ CONTEST

1200 19 August - 1200 20 August

CW only. 3.5 to 28MHz (no WARC bands). Exchange is RST plus continent code (EU = Europe), JAs send RST plus prefecture/district code. Multiband only. One point for each QSO and one multiplier for each of the 60 Japanese districts worked on each band. Logs must be sent to: Yasuo Taneda, JA1DD, 3-9-2-102 Gyoda-cho, Funabashi, Chiba 273, Japan, and must be received no later than 30 September 1995. Photocopies of rules are available (SASE please).

EUROPEAN DX CONTEST (CW)

1200 12 August - 2400 13 August

3.5 to 28Mhz (no WARC) observing IARU Region 1 band plans and avoiding the use of 3.550 - 3.800MHz and 14.075 - 14.350MHz. Single and multi-operator multi-band, multi-operator multi-transmitter and listener sections. Exchange RST plus serial number from 001. Work non-Europeans only. The rules of this contest are quite complicated and had not been received from DARC at the time this was being written. No doubt by the time that this is read they will have arrived and I will be able to supply photocopies (SASE please)

LZ DX CONTEST

1200 2 September - 1200 3 September

CW only following IARU band plans. 3.5 to 28MHz. Band changes may be made after being on a band for 10 minutes. Single operator single or multi-band, multi-operator multi-band single transmitter, and listener sections. Exchange RST and ITU zone. Six points for QSOs with LZ, three with other continents

1995 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G4YVV	73	103	60	236 (CW)
G3ING	69	72	28	169
GJ4GG	40	46	23	109
G0DEZ	57	28	3	88
G4OBK	17	39	17	73
G4CMZ	21	18	29	68
G4FVK	13	27	5	46

and one with own continent. Listeners get three points for logging two callsigns and two numbers, one for two callsigns and one number. The multiplier is the sum of ITU zones on all bands. Send logs within 30 days to: BFRA, PO Box 830, 1000 Sofia, Bulgaria. I can supply copies of the rules (SASE please). In the **1994** competition GM3CFS scored 7581 and G0DEZ scored 3892 points on 14MHz and G0TDX 45 on 28MHz.

AWARDS

WCTA - WORKED COPERNICUS TOWNS AWARD

Issued by the Torun District branch of PZK. Contacts/confirmed reports since 1.1.86. On HF European stations need 150 points. QSOs with Torun city count 20 points, with Torun district 10, with Olsztyn, Lidzbark Warminski, Krakow, Wlocawek, Koperniki Slaskie, Frombork, or Bydgoszcz (which form the 'Nicholas Copernicus Towns Federation') five points and with SP0TOR 50 points. Send a list of QSOs showing calls, dates, frequencies etc signed by the secretary of your local club or two other licensed amateurs. The award costs 10 IRCs and applications should be sent to: Waldemar Pawlowski, SP2EUI, PO Box 160, 87-116 Torun 17, Poland.

5TH IAAF WORLD CHAMPIONSHIP IN ATHLETICS AWARD

Available to licensed amateurs and listeners for contacting members of the Gothenburg Radio Amateurs Club between 4 and 13 August. European HF stations need to contact the special event station 7S6AG and five members of the club. Look around 3.515, 3.750, 7.015, 7.050, 14.015, 14.250, 21.015, 21.250, 28.015, and 28.450MHz for activity. Call 'CQ WCA'. Send a copy of your log plus US$5.00 *before* 30 September 1995 to: Goteborgs Sandareamatorer, Box 1143, S-436 23 Askim, Sweden.

SEANET CONVENTION '94

The 22nd SEANET Convention was held in Malacca, Malaysia, under the Chairmanship of William Tan, 9M2WT, and Organising Secretary Sangat Singh, 9M2SS. Anyone who knows either of these friendly extroverts knew it was going to be a success! An amateur station with the callsign 9M0SEA was operative on five HF bands. The opening banquet was a sumptuous Chinese dinner courtesy of the Malaccan State Government and attended by the Deputy Chief Minister of Malacca. On Saturday morning there was a tour of Malacca, and in the afternoon visits to a rubber plantation and to the home of 9M2GV were organised. The evening meal was a buffet around a swimming pool. On Sunday morning there were four short technical presentations followed by a Plenary meeting. SEANET'94 attracted 250 amateurs, wives, children and girlfriends who had come from 14 countries. SEANET'95 will be held at Kom Sumi Island in Southern Thailand over the weekend of 17 to 19 November. If you need more information the SEANET Net meets every day at 1200 on 14.320MHz.

THANK YOU

TO ALL WHO contributed to this month's column. Special thanks to the authors of the following for news items extracted: *DXPRESS* (PA3FQA), the *Lynx DX Bulletin* (EA2KL), the *Long Island DX Bulletin* (VP2ML), and *RSGB DX News Sheet* (G4BUE). Please send everything for the **October** column to reach me no later than **17 August.** ♦

VHF/UHF NEWS

NORMAN FITCH, G3FPK
40 Eskdale Gardens, Purley, Surrey CR8 1EZ

THE MAIN EVENTS in June were several excellent Sporadic-E openings on 144MHz. Meanwhile on 50MHz, many operators worked dozens of countries in Europe, with multi-hop Es to the Middle East, and there were some welcome transatlantic openings. Note that, unless otherwise stated, all times are UTC.

REPEATER NOTES

THE KENT REPEATER Group's June *Newsletter* carries brief status reports on its eight repeaters. The agenda for the Annual General Meeting on 23 June was included. The KRG made a loss of £361, subject to audit, in the 1994-95 year probably due to "an underlying trend of falling membership", according to the chairman's report.

Clive Mott-Gotobed, G4ODM (HPH), chairman of the Basingstoke ARC, sent a copy of a letter from Craig Bearley, 2E1DTQ, published in the May edition of the club's journal. It seems to illustrate the difficulty some Novice licensees have in contacting full licence holders. 75 CQ calls brought replies from only five Gs, including his novice instructor, G4ODM, and a family friend.

Craig was ticked off for hogging his local Farnham repeater for 30 minutes after which his 'G' accusers used it for *three hours*. Disillusioned by his experiences, he asks: "Was it worth buying a transceiver? Is it worth trying any other bands?" There is no excuse for treating Novice licensees in this manner. After all, they have opted for a challenging training course involving 'hands on' experience and represent the future life-blood of the hobby. G4ODM suggests full licence holders should monitor their local 70cm repeater and channel SU20 and "even put out a call for any Novice operators".

METEOR SCATTER

JUKKA SIRVIO, OH6DD, has posted OH5IY's data for the 1995 Arietids and Zeta Perseids meteor streams on the Internet. These work with version 4.2f. If anyone wants a copy of OH5IY's complete set of files, which total 570k, send me an IBM PC formatted 3.5in or 5.25in disk, with a strong SASE or 'Jiffy' bag for return mailing. Don't forget to state your Maidenhead locator.

The big August event is the Perseids shower. The radiant is above the UK horizon all day - Declination +58°, Right Ascension 46° at maximum. Times when reflection efficiency exceeds 50% in the various directions are: NE/SW 0800 - 1800; E/W 1000 - 0130; NW/SE 1800 - 0400 and N/S 0800 - 1330 and 2200 - 0400. The OH5IY program predicts the peak at 1630 on the 12th. In the last couple of years a significant second peak has been observed and last year it occurred 17 hours later. So listen for another surge in activity on the morning of the 13th. All times are UTC.

Alec Trusler, G0FIG (SXW), has obtained a digital tape recorder from DF7KF and finds it very easy to decode at 2,000 letters per minute. He is now looking for sked partners to carry out tests at 3,000LPM. On 2m in June he completed with IK5UBM (JN53), DL9GJW (JO54), LA4YGA (JO48), DL7VBW (JO62) and SP2OFW (JO93). John Hunter, G3IMV (BUX), completed QSOs with GW0KZG/MM in IO56, IN38 and IN47-49. During a family holiday to Jersey, Colin Morris, G0CUZ - operating as GJ0CUZ/P (IN89VE) - completed seven skeds and five random QSOs on CW in the 28 May to 2 June period with DL, I, EA3, 9A4, etc stations. This involved driving to the portable site at 0430 local time each day and setting up his 80W station and 9-ele Yagi.

MOONBOUNCE

NEWS

In his June *432 and Above EME News*, editor Allen Katz, K2UYH, reported that activity picked up in June. HP3/KG6UH and EI5HN (DF6NA expedition) were star turns on 70cm. The former is QRV from EJ88 on 432.029MHz with four Yagis. Al "desperately needs more technical material" for the newsletter. 118 E-mail addresses of active EME operators, including 12 Brits, are listed.

A Spanish group plans to activate the North African enclave of Ceuta, EA9, in the 11-16 August period. Likely callsigns are ED9VHF on 2m, ED9UHF on 432.080MHz and ED9SHF on 1296.080MHz. They will listen for sked stations on those frequen

cies, and for other calls 2kHz higher. 2m operating procedures, ie 2min periods, will be used on all bands. For skeds their transmission periods will always be the 'odd' ones, ie 00 - 02...34 - 36, etc. Nightly random periods will be: 11/8 2200 - 2400; 12/8 0000 - 0300; 13/8 0100 - 0500; 14/8 0200 - 0600; 15/8 0300 - 0700 and 16/8 0400 - 0800, listening up to 5kHz from their TX QRG. Skeds should be arranged via K1RQG on the 20m EME net. QSL via EA3DXU and any financial help would be appreciated.

RESULTS

Stefan Heck, LA0BY, posted a list on the Internet of all his Svalbard activity on 144MHz as JW0BY (JQ88AD) from 16 October 1994 to 6 June 1995. He completed with 125 'initials' in 100 grids, 25 fields, 33 DXCC countries, 22 US states, and made WAC in January. The only British Isles stations listed are G3IMV, G4SWX, GM4JJJ, GM4YXI and EI4DQ. He is to be congratulated on these remarkable achievements from such a harsh, northerly environment. Conditions were unfavourable on most weekends this year with high absorption and noise. He thanks VE7BQH and K1MNS who did most of the scheduling via the 20m EME net and the Internet.

Conrad Farlow, G0RUZ (IO93), was up to 69 initials on 70cm by 4 June. New ones since 15 April are JA5OVU, OK1KIR, W7FN, W9XQP, W7CI, K9BCT, WG3I, KB4WM, K5WXN, IN3KLQ, DL9EBL, K3EAV, K4QIF, GW3XYW and JR9NWC. G3IMV (IO91) is now up to 171 initials on 2m but John points out that it is increasingly hard to find new stations with just two Yagis.

Stuart Jones, GW3XYW (IO71), is QRV again on 70cm but at first could not hear any echoes. His S-meter indicated some sort of signal which was traced to his car's engine immobiliser system with a radio key. The receiver is a super-regen operating in the 433.92MHz ISM allocation, so he moved the vehicle out of range. On 3 and 4 June, he completed with K4QIF, G0RUZ, DL9EBL, K1FO, K3EAV and NC1I. He finds that the band is becoming increasingly polluted with packet splatter and computer hash.

LOCATOR SQUARES TABLE
STARTING DATE: 1-1-1979

Callsign	50MHz	70MHz	144MHz	430MHz	1.3GHz	Total
GJ4ICD	635	1	264	121	75	1096
G4IGO	565	-	250	-	-	815
G0JHC	543	-	48	-	-	591
G6HKM	501	-	259	121	65	946
GW4LXO	499	37	261	109	48	954
G3IMV	470	15	541	125	52	1203
GW6VZW	403	-	143	6	-	552
G4TIF	352	28	213	112	-	705
G0HVQ	339	-	71	-	-	410
G0EVT	286	-	278	71	-	635
G1SWH	286	38	201	68	16	609
G1UGH	246	-	124	-	-	370
G4DEZ	235	-	255	74	63	627
G0CUZ	221	-	398	80	-	699
G0FIG	200	-	219	72	32	523
G8TOK	186	25	131	51	23	416
G4RGK	183	-	333	211	74	801
G8XTJ	183	-	129	-	-	312
GM0WDD	138	-	-	-	-	138
G0GMB	135	-	226	108	-	469
G7HUD	135	-	87	25	-	247
G6RAF	134	19	184	119	16	472
GW7SMV	117	-	70	-	-	187
G0SOO	115	-	41	-	-	156
G7CLY	102	-	122	2	-	226
GJ7LJJ	102	-	54	12	-	168
GM0GLV	102	-	35	-	-	137
GI1CET	100	-	79	12	-	191
G3FIJ	85	26	85	35	10	241
G1AWF	68	-	176	17	-	261
G0HIK	52	1	62	20	-	135
G0HDZ	35	-	70	-	-	105
G8ESB	31	21	99	36	24	211
G7LIJ	25	-	181	-	-	206
G3UOL	11	-	66	-	-	77
G3NKS	2	45	2	2	-	51
G3XDY	-	-	226	160	105	491
G4YTL	-	43	303	54	-	400
G4RRA	-	-	317	80	-	397
G0EHV	-	38	199	87	-	324
GW8JLY	-	-	288	36	-	324
G1HWY	-	-	179	85	46	310
GW4FRX	-	-	249	-	-	249
G3FPK	-	-	246	-	-	246
GW0PZT	-	-	200	-	-	200
G6ODT	-	3	62	73	-	138
G4OUT	-	23	106	-	-	129
GU4HUY	-	-	84	-	-	84
G4ZHI	-	-	44	10	-	54
G6XRK	-	-	16	-	-	16

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Next deadline is 17 August. Band of the month 50MHz.

PROPAGATION

IN THE JULY *VHF/UHF News* I mentioned the reception report from Eric Parvin, G2ADR (YSN), of the CT0WW 6m beacon in the second half of April. This generated interesting correspondence in Peter Bowyer's, G4MJS (BRK), *VHF Reflector* on the Internet. OH6DD suggests the mechanism could be Es, adding "if there were stable conditions in the upper atmosphere over some point (wind shear, jet streams, etc) the Es cloud might exist for several days there". He wonders what was happening on 10m in this period.

Clay Lane, WA4TNV (FN05XD), has observed this kind of propagation from the W5VAS beacon in EM40XA, a QRB of 1,982km and attributes it to ionoscatter. In the 1950s he was involved with military links on 36MHz between New York state and Sonderstrom in Greenland and the WA4TNV/W5VAS path exhibits similar characteristics.

Concerning the G4UPS/SM7AED morning 6m skeds, OH6DD reckons they are ionoscatter mode. He states that on 2m he has worked an 80W, single-Yagi station by the mode, inferring it could be done with appreciably less ERP on 6m. Jukka says that more information is needed, such as how the signals vary from month-to-month during the year and the optimum time of the day. Also required is data on how long the conditions last and the percentage of time that SM7AED can hear G4UPS's 25W to a 6-ele Yagi. Thanks also to David Shaw, G8MDG, presently in the Netherlands, who related 2m propagation experiences with stations across the North Sea - all fascinating stuff.

50MHZ

NEWS

John Boudreau, VE8EV (Inuvik, NWT), reports that beacon VE8SIX on 50.008MHz started operating at 0500 on 14 June. It runs 85W to a 4-ele Yagi from CP38DI, beaming to Europe from 1400 - 2400. Keying mode is A1A. Reception reports to ve8ev@amsat.org or via packet to VE8EV@VE8YEV.#INU.NT.CAN.NOAM.

Ted Collins, G4UPS (DVN), reports that Hungarian stations became active in June for the first time. 5T5JC is using the call 5T6E from IL30LM and 5T5BN (IK28) is a new Mauritanian station, QSL via Box 1345 Nouakchott. RV6HF is a new Russian station, QSL via PO Box 1, Lemokumskoe 357960, Russia. YL2DX (KO26AW) is a new Latvian station, QSL via YL3AF.

From Western Sahara, 4U/KC0PA is QRV from IL46; Tim is with the UN and QSLs go via VE9RHS. S0RASD's cards go via EA2JG and those for S07URE (IL56EF) via EA4URE.

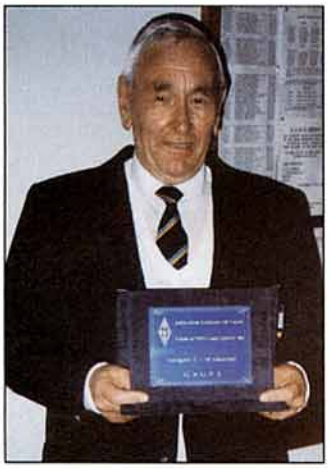
Gavin Stirling, GM0WDD (LTH), came across what appeared to be military stations in the 50.0 - 50.25MHz part of the band on 12 June around 1300UTC. Using FM, ZH21 was asking H42 for a "radio check", asked if the frequency was clear, then started a net. 50 - 52MHz is a shared band, ie nobody has exclusive use of it. Amateurs have primary use up to 51MHz, but secondary status in the 51-52MHz part.

ACTIVITY

Until the June deadline, the band had been awash with Es signals daily except for the 8th and 15th. But first news of the transatlantic openings, the first of which was on the 7th. At 2121 G4UPS heard EH7KF calling a VE1 and at 2123 Ted heard VE1PZ at RS56 for 13 minutes. The next minor opening was on the 18th when the VO1ZA (GN37) beacon was copied 1853 - 1920 peaking to S6, but with no activity.

The first major event was on the 19/20th when there were three openings; 1515 - 1605, 2045-2215 and from 0000 to beyond 0200. Stations heard/worked included K1DAT, K1TOL, W1YN, WA1OUB (FN43), KM1H (FN42), W2CAP/1 (FN41), K2MUB, W3EP (FN31), K3ZO, WA3HMK, N4MM, W4MY (FM07), WB4WTC (EM95), VE1PZ, VE1RAA (FN84), VE1YX (FN74), VY2KX (FN86) and VO1ZA. Those who reported these events were Darrell Moody, G0HVQ (GLR), G0RUZ, G4UPS, Ela Martyr, G6HKM (ESX) and Geoff Brown, GJ4ICD.

Nick Gregory, G0HIK (CBA), is now QRV using his IC-735 trans-



Ted Collins, G4UPS, proudly displays the plaque awarded to him by the Italian National Society for winning the category C section of the 1994 ARI Six-metre Activity Contest.

ceiver driving a transverter with an MMIC 'brick' to boost the output from the former. Running 18W to a dipole he accumulated 52 squares and 17 countries in the first two weeks. G0RUZ came back on 13 June after a five year absence and is running 50W to a 3-ele Yagi.

Shaun Ellis, G7ORH (CBE), uses an FT-690, 50W BNOS amplifier and a tri-band collinear antenna. He mentions that C31HK would appreciate callers adhering to his system of working stations from a short list, as is usually the case on the HF bands. If people persist in calling between overs and lists, he will go QRT. EH9EI is another operator using this method.

Using his novice call 2M0AEU, GM0WDD worked over 300 stations in 138 squares and 33 countries in the 20 May to 14 June period. This should encourage other novices who complain of lack of QSOs. Ron Adam, GM4ILS (GRN), uses an FT-690 with 30W to a 6-ele Yagi on a 20ft boom. He says the results are very good and he hopes it will survive the gales.

Several stations were worked in this period so, omitting the run-of-the-mill Euro-DX, the more interesting stations included; C31HK (JN02), EU6MS, HV3SJ and HV4NAC (JN61), I2ADN/8 (JM89), OH0/DJ2PJ (JP90), OY9JD (IP62), SV8CS, SV9ANJ (KM25), T72EB/A (JN63), UR5AGX (KO66), US2YW/P (KO50), ZB2IF (IM76) and 4U0ITU (JN36). The new HAs featured in many logs.

In the African direction the best DX included; CN2JA (IM65), CN8HB (IM63), CN8NS (IM64), CT3FT (IM13), EH8ACW, EH8BPX (IL18), EH9IB (IM85), EH9IE, S0RASD, S07URE (IL56), 4U/KC0PA and 5T6E (IL30). Long DX to the east were 4K6D (LN40), 4X4IF (KM72), 4Z4TT and 5B4JE (KM64). As usual, there appear to have been a couple of phoneys. On 9 June at 1516 G4UPS worked 5R8DG who gave no locator and was a poor CW signal, and next day a very similar-sounding station signing TZ6VV appeared at 1137.

The above information was extracted from the reports from G0CUZ, G0HIK, G0HVQ, G0RUZ, Frank Howe, G3FIJ (ESX), G4UPS, G6HKM, G7ORH, Ed Knight, G7UBB, Derek, G8TOK (KNT), GJ4ICD, GM0WDD, GM4ILS, Paul Baker, GW6VZW (GWT) and Jamie Ashford, GW7SMV (GWT).

THE D4 OPERATION

The Cape Verde Islands DXpedition by the GJ4ICD team was quite successful. The first contact was with GM3WOJ at 4,800km. Best DX was SM3EQY at about 6,000km. 46 Gs were contacted and they worked 26 countries. All QSLs go to D44BC at the *Call Book* address and *not* to GJ4ICD. Geoff has posted the full story on his Home Page on the World Wide Web - see page 72 in May's *RadCom*.

70MHZ

DEREK THOM, G3NKS (GLR), sent a copy of the 10-page June issue of *Four Metres News*. It is a very neat publication with an excellent balance of news, views, reports, equipment information, contest results, station profiles, etc. One item reports that the Cyprus beacon 5B4CY on 70.114MHz has been copied at least twice this year. On 2 June at 1800 it was 20dB-over-S9 at Dave Storrs, G8GXP's QTH in Leeds. Others who heard it were G3UKV (SPE) and G0DEZ (SFD). Dave copied it again on 9 June. For subscription details contact G3NKS who is QTHR, telephone 01242 241099 9am to 9pm only.

Eddie Ashburner, G0EHV (TWR), reports activity as almost 100% contest operating so would like to hear more stations on the band at other times. He finally worked GJ after seven years on the band. G0HIK is building a G3WPO transverter. Up to now, Nick has been using a PMR front end as a receive converter. Don't forget that Tuesday nights are activity nights on 4m.

144MHZ

SPORADIC-E

There were good Es openings on June 2, 5, 6, 9, 12, 14, 20 and 21. G3IMV caught most of these working 78 stations in 14 countries - CT1, DL, EA, EA6, EA9, HA, I, IS0, IT9, LZ, OE, YO, 9A and 9H. In the 2 June event David Sellars, EI5HP (Co Leitrim), recorded brief bursts from Is in JO52 and 54 at 1600 and from CT1DYX at 1900. Further east it was a good opening. Reg Woolley, G6RAF (LEC), caught his first Es for nine years and worked seven YOs, a few I0, I5 and I8s with an LZ in KN34 best DX at 2,251km. G6HKM worked YOs in KN16 and 34, ER5AA (KN45), LZ2FT (KN34) and some Is. GW7SMV worked his first Is in JN52, 53, 61 and 81. John Nelson, GW4FRX (PWS), got EA6FB (JM08) for a new square.

On the 5th EI5HP heard EA3, 6 and 7 stations, 1515-1648. G0CUZ worked EB4TT (IN70) at 1609. For G0EHV there were two openings; 1445-1526 and 1602-1637 in which Eddie worked EA5 and 6.

G0FIG contacted EA3DXU and EA3CRI (JN11), EA7UH (IM67) and EA4EHI (IM68). G6HKM worked EA6XQ and EA6SA (JM19), EA4EHI, CT4QP (IM59) and 9H5L (JM75). Frank Holland, GI0AIQ (ARM), only worked EA6s in JM08 and 19 between 1500 and 1545. Edward Allely, GW0PZT (GDD), just caught the last 5min of the opening working EA7DRH and EA7DBH (IM76). GW4FRX found three CT1s but only completed with CT1FAK (IN50). GW7SMV got EA6s and EA7 in JM08, 19 and IM87. Next day EI5HP was in on an opening to the south 1134 - 1211. Dave completed with EA9AI (IM75), EA7DBH and EA7TL (IM76), EA5FKW (IM98), EA4EHI and CT1CRR (IM58). GI0AIQ worked some of these, too.

There was an extensive opening on the 9th. In the 1625 - 1842 period EI5HP worked 9A2AE (JN86), OM3CQF (JN88), three DLs in JO61, 62 and 72, five OKs in JN99, JO60, 70 and 80 and nine SPs in JO72, 91, 93 and JN99. G0CUZ had two sessions. 1624 - 1641 brought DL, S5, YU and 9A QSOs, and SP2OFW and SP2MKO/A (JO92) at 1754 - 56. G0EHV worked 21 stations in DL, I, OK, S5 and SP in a hectic 13 minutes from 1625. Andy Wyspianski, G1AWF (LDN), managed YU1EV (KN04), HA1YA (JN87) and OE6IWG (JN77) from 1630. G6HKM got the YU and also 9A2AE (JN86). Rik Royall, G8ESB (YSN), caught S5s in JN75 and 76 and DL7LUM (JO62) while GI0AIQ contacted 9A, SP9, OK1, OK2 and DL stations. It was a good day for GW0PZT. After success in the earlier sessions, Edward made 22 QSOs in the 1747 - 1800 slot, best DX being SP5EFO (KO02MD) at 1,742km. Best DX for GW7SMV was YO2QC/P (KN15).

EI6HP did well again on the 12th, completing with EA6QB (JM08) at 1226. Meanwhile, 1449 - 1510 brought contacts with Fs, HB9RTE (JN36) and 10 Is in JN34, 35, 44, 45 and 53. G6HKM's successes included 9H1GB (JM75), EA5CHT (IM97), EA5GIW (JM08), EA9MH (IM85), IK7MCJ (JN80), EA5BY and EA5FKW (IM98) and EA7AG (IM86). G8ESB worked Fs in IN93, JN03 and JN04, also EA1BFZ (IN81), EA3DXU and EA3DUY. Welcome to John Grandshaw, G8IKP (DOR), who was QRT for 12 years. He uses an FT-7 transceiver, home-built transverter and 2 x 4CX250B amplifier to an 11-ele DL6WU Yagi. In this event he worked 23 stations in 10 squares, 1102 - 1235, comprising eight 9Hs, IT9VDQ (JM68), EA5, 6 and 7s. Lyn Leach, GW8JLY (GNS), completed with IT9 and 9H stations 0933 - 1000. From 1036 he worked IS0, EA3, 5 and 6 stations until 1225. Brief openings were reported by EI6HP to EA3 at 1902 on the 14th and to JN45 by G6HKM some time on the 20th.

TROPO

G0CUZ worked GW0KZG/MM in IO30 and 56, IN58, 59, 67-69 in the 22 May to 18 June period. G3IMV worked Andy in IN58, 59 and IO60. G0FIG managed to work the GI4CQR/P team in all six Ulster counties in the 31 May to 7 June period. Alec worked several Fs in southern France on 3 June. G1AWF also worked the Ulster DXpedition in all six counties and sends his sincerest thanks to Dave and Ron, G3DCZ, for a fine effort.

FINALE

THAT'S ALL there's room for this time so no 70cm and 23cm section, not that there was much to report. Please note the early deadline for **October** which is **17 August**. The November date is even earlier - **14 September**. The telephone answering and fax machine is on 0181 7639457. My CompuServe ID is 70630,603 and via the Internet the address is 70630.603@compuserve.com. The BT Gold mailbox is 87:CQQ083 but I can't recall finding any messages in it for years. ♦

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- 5 - 15V operation
- Scanning / Call
- Battery Saver
- DTMF
- 6 x AA dry pack

Maplin Code BD-74

£179

ALINCO DJ-180 2m 5W "A Great little Rig"

- 144 - 146MHz Tx
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- 5 Watts on 12V DC
- 10 Memories
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- 1750Hz Tone
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- Battery Saver
- Auto Power Off
- 7.2V Ni-cad Pack
- AC charger

Maplin Code CM-87

£229

Listing of Stores in Alphabetical Order

Belfast	01232 683 929	Hammersmith	0181 748 0926
Birmingham	0121 348 8411	Ilford	0181 599 0100
Bradford	01274 728 808	Manchester	
Brighton	01273 620 930	Cheetham Hill	0161 832 2550
Bristol	0117 923 2014	Oxford Rd	0161 236 0281
Cardiff	01222 464 554	Middlesbrough	01642 242 900
Chatham	01634 818 588	Milton Keynes	01908 692 720
Coventry	01203 550 504	Northampton	01604 756 726
Dudley	01384 465 051	Nottingham	0115 941 0242
Edinburgh	0131 313 5551	Portsmouth	01705 654 411
Gateshead	0191 488 9555	Preston	01772 258 484
Glasgow	0141 353 3323	Reading	01734 566 636
Leeds	0113 244 9200	Sheffield	0114 285 5492
Leicester	0116 262 3268	Slough	01753 551 419
Liverpool	0151 230 0366	Southampton	01703 225 831
London		Southend	01702 390 000
Edgware	0181 951 0969	Stockport	0161 480 4000
Forest Hill	0181 291 9192	Stoke-on-Trent	01782 749 947

Shop and Mail Order; 22, Main Rd., Hockley, Essex. SS5 4QS Tel: (01702) 206835 Fax: 205843
VISA Branch Shop: 12, North Street, Hornchurch, Essex. RM11 1QX Tel: 01708 444765 ACCESS
MAIL ORDER To Hockley - 24 Hour Answerphone and Fax. Open 6 Days 9am - 5.30pm

HF F-LAYER PROPAGATION PREDICTIONS FOR AUGUST 1995

The time is represented vertically at two-hour intervals UTC for each band, ie 00=0000, 02=0200, etc. The probability of signals being heard is given on a 0 (indicated by a dot) to 9 scale; the higher the number the greater the probability with 1 meaning 10 to 19 per cent of days, and so on. Additionally F-layer openings at 50MHz and 1.8MHz are indicated by a plus (+) sign in the 28 and 3.5MHz columns, with these latter bands having a probability of 9.

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.	..........11.	..........11.	....1211143.	..1345545882	3145554457797	7543222223578	+4.....24+
MALTA	..........22.	..........22.	..........22.	....121.155.	...355545893	5236555556798	9874322223589	++42....25+
GIBRALTAR	..........24.	..........24.	..........24.	34322782	3..4665557798	8756433333589	+++3....2++	
ICELAND	..........1.	..........1.	..........1.	2221351	2.1345555687	7465433333467	++52....234	
** ASIA								
OSAKA	..........11.	..........11.	..........11.	....11.....	...123221...	...132122142	241	.........2.
HONGKONG	111	111	111	....111111..	...12333441.	12123564	363	.........3.
BANGKOK	..........1..	..........1..	.....1.....	...112111...	...12433332.	1....1113574	1.......1366	33
SINGAPORE	..........1..	..........1..	.....1.....	...12311....	..1234332...	1....1111333.	2.......1362	34
NEW DELHI	..........1..	..........1..	.....1..11..	...1131134..	..1223335 73.	211..1113575	51......1367	2.........35
TEHERAN	..........1..	.........1..	....111.241.	...2232247 4.	..2323335782	4231..113588	741.....1367	5.........35
COLOMBO	..........1..	..........1..	....111.2...	...123224...	..1223335...	11...113253	41......367	2.........35
BAHRAIN	..........1..	.........1..	...11211241.	...2233246 3.	..2323335774	5331..113588	841.....368	5.........35
CYPRUS	.........1..	.....1...31.	...12321264.	...3454358 71	2.3656557896	7564333346 89	8741111112478	+4.....4+
ADEN	..........1..	.........1..	...1122132..	...2233355..	1.1322346734	7431....13578	851.....368	+2.....35
** OCEANIA								
SUVA/S	..........1..	..........1..	..........1..	..........1..	...1122..23.	..142211.431	...21....21.	....
SUVA/L	..........1..	..........1..	..........1..	..........1..	...1.....42	...4.....141	..12....21.	....
WELLINGTON/S	..........1..	..........1..	..........1..	..........1..	...21.....3.	..242..1..52	..12....12.	....
WELLINGTON/L	..........1..	..........1..	..........1..	1	3	2113.....33	..12.....2.	....
SYDNEY/S	..........1..	..........1..	..........1..	...11.....	..1431.....	..1331.12213	...1....1351	.........3.
SYDNEY/L	..........1..	..........1..	..........1..	1	1..........4	21.2.....34	...21....51	.........2.
PERTH	..........1..	..........1..	....12.....	...233.....	..13541.....	2111311132.	2.......1362	33
HONOLULU	..........1..	..........1..	..........1..	....1..1311	....1..1311	..2322..231.	..221....1..	....
** AFRICA								
SEYCHELLES	.........1...	.........1...	....112131..	...2233353..	..1323346 6..	..31..11355.	121.....366	+2.....35
MAURITIUS	.........1...	.........1...	....122242..	...2244465..	..1323345 74.	..31.1113573	511.....367	+2.....35
NAIROBI	.........1..	.....1.13..	....112247..	...2224468..	...4223467 3.	1.42...13574	613.....267	+5.....35
HARARE	.........2..	.....1124..	....123357 2.	...2234568 5.	...4333467 8.	4.331.113585	8351....267	++2.....35
CAPETOWN	.........11..	.....11....	....11232....	...1334542..	...4533455 1.	...52111356.	3512....262	++3.....35
LAGOS	.....13..	.....1251.	....1.2358 3.	....3134686.	...4522357 9.	5315 2...3585	8842....268	5+3.....35
ASCENSION Is	.....21.	.....153.	....11.1376.	....4212588 1	....5322479 5	3...31..1488	81..1....257	++.....25
DAKAR	.....21.	.....43.	....1.11277.	....3223488.	1..1532236 94	6524 31..1378	88521....157	++3.....25
LAS PALMAS	.....1.	.....23.	....1111156.	....4333278 2	2..2765558 97	8636543345 89	9974211113 68	++4.....3+
** S. AMERICA								
Sth SHETLAND	.....221..	.....23531.	.....33564.	1....1112565	6331....236	5+3.....3		
FALKLAND Is	.....1..	.....3..	.....11263.	.....23475.	.....133567.	...1.1112354	3442....126	++3.....3
R DE JANEIRO	.....11.	.....23.	....111156.	2223682	2....4333577	752.121..259	886.1....27	++3.....4
BUENOS AIRES	.....1.	.....23.	....111146.	2222672	2....4333577	7522.2111247	8862.....15	++3.....2
LIMA	.....1.	141	.....12125 3	3....1133224 6	8411311 1..15	78521.....2	4+3.....	
BOGOTA	.....1.	31	.....11125 3	3....2321246	7411221...14	68521.....2	3+3.....	
** N. AMERICA								
BARBADOS	.....1.	141	2111263	3....4321257	8411121...26	88521.....3	5+3.....	
JAMAICA	21	.....11.132	3....1221235	741..211..13	5852.....1	2+3.....		
BERMUDA	11	.....11.132	3....2221256	731..21...25	68511.....2	3+3.....		
NEW YORK	.....1..12	2....1222135	631..211..24	4751.....1	253.....			
MEXICO	.....1.111	2....221123	4211..11...1	2652.....	.33.....			
MONTREAL	.....1..11	2....1222245	621..2111124	47521.....1	.43.....			
DENVER	1	1....111112	311...111..2	1452.....	.23.....			
LOS ANGELES	11111	2111...121.1	.352.....	..2.....				
VANCOUVER	1111	2122111 12111	.2521.....	..2.....				
FAIRBANKS	...1111111111	1.24221 12221	..221.....	.....				

The provisional mean sunspot number for June 1995 issued by the Sunspot Data Centre, Brussels was 15.8. The maximum daily sunspot number was 30 on 5, 10 June and the minimum was 0 on 15,16 June. The predicted smoothed sunspot numbers for August, September and October, are respectively: (classical method) 16, 15, 4 (±4); (SIDC adjusted values) 11, 10, 9 (±2).

IARU

JOHN ALLAWAY, G3FKM
and
TIM HUGHES, G3GVV

AT THE RSGB HQ open day in April, Chris Cummings, G4BOH, offered an insight into the IARU Monitoring System and the way in which the RSGB's system forms part of it. G4BOH explained how, as co-ordinator, he receives reports from his team of RSGB Monitors, analyses them and forwards them to both the Radiocommunications Agency Monitoring Station at Baldock, and to the IARU Region 1 Co-ordinator G4GKO. Baldock is advised of the frequency, times, mode, traffic content and possible identity of the intruder. Once the complaint is confirmed by Baldock (which itself monitors the intruding station), it normally sends a service message to the intruder's national authority informing it of the details. Baldock continues to monitor the frequency at regular intervals and, if the intrusion does not stop, formal messages of complaint are sent. This normally has the desired effect. We are fortunate in having the enthusiastic support of the staff at Baldock who carry out this time consuming work.

Table 1 lists the main intruders who were removed from the amateur bands following action taken by Baldock, based on reports from the RSGB Monitoring system. In some cases, other countries' IARU Monitoring Systems also took action via their national authorities. Complaints about an intruder are far more effective when there are several of them!

NEW SOCIETIES

TANZANIA AMATEUR Radio Club held its first meeting on 6 May 1995, reported its secretary Bill Musoke, 5H3JB. The attendance was six, but apologies were received from 17 others, making total membership 23; an excellent start for a new society! They appear very enthusiastic and Bill says that steps have been taken towards the formal registration of the club. They plan to hold a weekly net on 7.080MHz each Sunday at 0500UTC and this is intended for Tanzanian amateurs and short wave listeners. In due course, the club hopes to have a callsign.

Interest in amateur radio is also growing in Madagascar and 5R8DS is working towards forming a club.

REGION 1 FORUM

THE ANNUAL MEETING OF the Region 1 Executive Committee took place at the end of April in Muscat, Sultanate of Oman.

Minister of Telecommunications of Oman, H E Ahmed Bin Suwaidan Al-Balushi (right), and chairman of IARU Region 1 Lou Van de Nadort, PA0LOU, at the Region 1 Executive Committee meeting in Oman.

FREQ (kHz)	MODE	DETAILS
18161.7	SITOR A	Australian Diplomatic, Paris
14322.0	ARQ E	French military. Reunion Is.
18093.0	FAX	Argentinian Weather Station
18116.0	POL-ARQ	Polish Embassy, New Delhi
18101.5	SITOR A	Indonesian Embassy, Ankara
18152.0	COQUELET 13	Belgian military, Somalia
Various	PICCOLO	UK Military overseas
14240.0	BC station	Radio Russia 2nd harmonic
7012.3	RTTY	Royal Navy
18081.0	RTTY	Royal Navy
18105.0	SITOR A	Medicine sans Frontieres, Africa
14280.0	BC station	Radio Moscow Int. 2nd harmonic
18150.0	LSB phone	Indian Military, Delhi - Somalia
18117.0	LSB phone	South African Miners (also 18135khz)
7100.0	BC station	Radio Tehran, activity reduced
14066.3	SITOR A	Unofficial coastal station, Athens
18160.0	NATO RTTY	South Atlantic

Table 1: Intruders removed from the amateur bands following action taken by the RA Monitoring Station, based on reports from the RSGB Monitoring System.

During the four and a half day gathering a great many issues were discussed, including the recommendations agreed at the joint meeting of HF and VHF/UHF/Microwave Managers earlier this year. Most were endorsed but will have to be put to the General Conference for final approval. The meeting was opened by His Excellency Ahmed Bin Suwaidan Al-Balushi, Minister of Telecommunications of Oman (also A41FK and Chairman of ROARS). His address was very complimentary about amateur radio and both His Excellency and ROARS are to be congratulated on doing so much for the good of amateur radio - especially in the Asiatic part of Region 1.

TEL AVIV IN '96

IARU REGION 1's next General Conference will take place in Tel Aviv, Israel, between 30 September and 5 October 1996. This will be the very first Region 1 Conference to be held in Asia - and is, in fact, the first to be held outside Europe. The RSGB will be taking a very active part in this and Society committees have been invited to provide proposals and documents for consideration. No doubt, the newer modes will prove the most talked about topic and the debate should turn lively when Internet is mentioned!

ADMIN TRAINING

ANOTHER AMATEUR Radio Administration Course (for administrators) was held in Newington, Connecticut, USA between 15 and 19 May. This was sponsored by the IARU and ARRL under the auspices of the United States Telecommunications Training Institute and there were six students from five countries in attendance. They came from Costa Rica, Honduras, Macedonia, Uganda and Zambia.

GLOBAL MESSAGE

AS HAS BEEN customary for many years, the IARU sent a message to the Secretary-General of the International Telecommunication Union on World Telecommunications Day on 17 May. 1995 is special as it marks the centenary of radio. In response to the message, Secretary-General Dr Pekka Tarjanne said: "The development of radio, more than any other science, has been the result of the combined effort of generations of experimentalists and an area in which amateurs contributed as much as professionals. I have in mind, particularly, the contributions of amateurs in enhancing the understanding of high frequencies and tropical bands. I have no doubt that the state of radio would not be the same minus the amateurs of the last few generations. To mark the occasion yesterday we had Professor Les Barclay [G3HTF - a member of the RSGB IARU Committee] deliver a lecture on the early development of radio."

Dr Tarjanne continued: "I take this opportunity to salute the spirit of inquisitiveness and adventure of the radio amateurs and in particular the International Amateur Radio Union."

● His Excellency Dr Carlos Menem, was re-elected as President of Argentina recently. He has the callsign LU1SM. ♦

NOVICE NEWS

MRS ESDE TYLER, G0AEC
43 Nest Est, Mytholmroyd, Hebden Bridge, W Yorks HX7 5BH

THE RSGB'S impressive Novice information stand attracted plenty of interest at the Yeovil QRP and Construction Convention in May. On the down side, however, there was an acute lack of visiting Novices and beginners. Local schools were offered complimentary tickets but did not take up the offer. Six students, who were given tickets, turned up to collect leaflets but then promptly left. All of which must have been very discouraging for the organisers.

However, their efforts were not totally in vain. For instance, the youngster shown in the photograph was among those who enjoyed some hands-on experience under the guidance of George Davis, G3ICO. The polythene drum on the bench is the amplifier made by a student while on the Novice course. It belongs to Malcolm Sadler, 2E1DLC, who found a handy case and could see no reason to change it as it works very well.

Amateur radio will also be on show to the public at the South Somerset District Council's 'Mid Summerset Youth Festival' at Huish Episcopi. The event, which takes place in August, is organised to offer youngsters ideas for filling their leisure time. If you live within striking distance, it will be well worth a visit. Perhaps you know an aspiring Novice or two to take along.

THREE YEARS ON

IT IS THREE YEARS since the first Novice callsigns were issued. Many of the holders have moved on to full licences and some are now training other students.

In view of this, it would be interesting to learn of the progress of some of the pioneer Novices. The *RadCom* News pages and the RSGB GB2RS broadcast report the latest callsigns issued but we don't know how many of these have been changed for Novice 'A' or amateur 'A' or 'B' licences. Counting entries in the 1995 RSGB *Call Book* would not be accurate as it was compiled and printed some time ago.

So, have the early Novices outgrown *Novice News* and is there a new generation of readers taking their place? Or do old habits die hard and is the column read secretly by former Novices? Is it time for *Novice News* to undergo a change in content? As I have stated before, this is your column. Let me know if you think that changes are required. Jot down your ideas and send them to the address above. At the same time, a brief account of your experiences over the last three years would be gratefully received. Replies will be sent to all letters.

KEY TO SUCCESS

FISTS CW CLUB, set up in 1987 to help new amateurs on to the bands using the key, has seen its membership steadily rise. The group was set up by George Longden, G3ZQS.

Thanks to the group, novice key-users are given the opportunity to send and receive Morse QSOs. This builds up their confidence and love of the mode.

The group's membership fee is a modest £5 and there is an monthly newsletter - with a talking version for the visually handicapped - plus a superb QSL bureau, club QSL cards at a reasonable price and a phone-a-sked service to arrange a personal contact with a fellow Morse-lover.

A new initiative from young Alex King, 2E0AJS, echoes Fist's aims. Alex plans to start a regular 80 metre net, probably on two evenings a week for new Novice 'A' licensees.

Alex, aged 13, earned his Novice 'A' licence in January but was anxious that other keyers might be too fast and he wouldn't be able to copy. But with the help of his Morse instructor Graham Bennett, G4LJO, he has developed his keying skills. His dad (now fully licensed) started to learn CW as well and, with practice, Alex was soon ready to communicate with the World.

Alex comments that without the help he received he may never have found the courage to persevere and would have never experienced the hours of pleasure that working the CW bands has given him.

Like all good radio amateurs, Alex now wants to give something back to the hobby. He believes his regular 80 metre net would enable Novice 'A' licensees to try out their skills with someone who can understand their insecurity. He suggested 3.575MHz (+/- QRM) as this is within the Novice section but outside the QRP/RSARS province.

George, G3ZQS, was delighted to hear of Alex's net and approves of what he is trying to do.

Indeed, it represents a chance for the newly-licensed to develop their hard-won skill. Perhaps when they cannot find any activity on their normal frequencies, Fists CW Club members might consider listening out for Alex.

SCOUT JAMBOREE

NOT TO BE CONFUSED with Jamboree on the Air, the 18th Scout World Jamboree takes place from 1 - 11 August in the Netherlands and an amateur radio station will be in operation using the callsign PA6WSJ. A station has been present at the event since 1957.

The site is 40km to the East of Amsterdam at 2.4 metres below sea level. This should not prove a serious drawback as tests have been carried out on the antennas used during the European Jamboree. It is hoped that, this year, messages will travel in both directions with Scouts hearing the latest news from home and sending their news back.

The station will operate on the 40 and 80 metre bands between 0900 and 1800UTC and patience may be needed as it is expected to be very busy. The authorities have extended the JOTA facility and are allowing Scouts to take part in the radio traffic themselves so you could be instrumental in helping Scouts to talk to one another across the miles.

Among those attending is David Carter, 2E1DGD, from Wakefield, Yorks who is hoping to help operate PA6WSJ. Meanwhile, Scout groups and Scouts who are not attending can perhaps make contact and feel the Jamboree atmosphere. There are many Scout Novices and I am sure they would like to join in the fun, even if only briefly. Many Scout groups will have made their own arrangements to make contact but if you know of a local group who do not have this opportunity, why not lend a hand? You could invite youngsters to your station or maybe help to set up a station for the local group. This could also be the means of introducing other Scouts to the hobby.

GX2UG AT SCHOOL

A RADIO STATION was run from Mixenden Junior and Infant School for a day, with the help of Halifax and District Amateur Radio Society. Many amateurs from all over the country spent a little time talking to the pupils and 47 of them had the chance to say a few words in reply. Most of the children have since received QSL cards.

The school used the club callsign GX2UG, one of the oldest club calls in the country. It was first heard in 1922 and is often heard from the base of a local, very high, folly. Details on the QSL card reads 'antenna 230ft vertical'.

The venture was made possible by the support of club chairman Steve Ortmayer, G4RAW. Meanwhile, the idea was set in motion by David Haigh, a parent governor of the school. He attended the STELAR (Science and Technology through Educational Links with Amateur Radio) course at Easter and took the RAE in May. At the time of writing, the results were still not known. If successful, David intends to gain his 'A' licence so that a radio station can be a regular feature at the school with all the resultant spin-offs in the curriculum. He is also keen to become a Novice instructor to guide the youngsters towards their own licence.

On behalf of the school, I would like to thank Steve and Paul Allen, G7GFT, who both took leave from work, along with the holders of GX2UG for lending it to the school for the day, and to Ken, G0ITI (my other, equal, half). Thanks are also due to all the amateurs who spent a little time to provide the children with a memorable experience. ♦

PHOTOGRAPH: G4PDG

A youngster gets some first hand experience of amateur radio with the help of George Davis, G3ICO, at the Yeovil QRP and Construction Convention.

QSL

JOHN HALL, G3KVA
Corfe Lodge, Ipswich Road, Long Stratton, Norfolk NR15 2TA.

A QSL BUREAU Sub Manager for the new G0WAA - G0WZZ series of callsigns has now been appointed. She is Mrs Kathy Catlow, G4ZEP, Ballingroyd Farm, Crossley New Road, Cross Stone, Todmorden, Lancs OL16 8RP.

Dave Keely, GW0OGI, has now given up his position as Sub Manager for the G3L to G3N series. The job has been taken over by Tom Bartlett, G3ITB, Yew Tree Farm, 19 The Street, Hardley, Norwich NR14 6BY. Before he left his position, Dave wrote that he hopes those who worked VE-Day Special Event Stations will send cards to their respective QSL Sub Managers. Amen to that, otherwise the poor old 'Subs' are going to have thousands of uncollected cards to throw away or to contribute to their compost heaps!

UNCOLLECTED CARDS

T J CHAPMAN, G3PTQ, wrote about uncollected cards and the problem they cause us. He says we should bin those cards we know will not be collected as they arrive. The problem is that until the cards get to the Sub Manager we don't know who the offenders are. By that time they have been sorted three times.

Let me explain. As the cards arrive from overseas the girls sort them into four lots. All G0s, all G3s, all G4s, and all others. That way we get about four equal piles of cards. Then we sub-sort them again into the respective Sub Manager's boxes and send them to him or her. They are then sorted by the Sub Manager into individual calls to await posting to the individual concerned.

It is only the Sub Manager who knows who does or doesn't collect cards on a regular basis. That's the system we employ and one that has been used for years. I don't pretend it's perfect and if anyone can think of an easier method I will gladly try it.

But before anyone suggests that we sort the cards on arrival straight into the Sub Manager's boxes, have a thought for the Bureau girls who would have to run up and down the pigeonholes like one-armed paperhangers with handfuls of cards, simultaneously referring to a list of non-collectors!

RSGB QSL Bureau, P O Box 1773, Potters Bar, Herts EN6 3EP, England.

Those of you who have worked Tomasz Rogowski, SP5AUC, currently operating as YI9CW, may like to see a picture of Tom. Here he is, looking very relaxed and efficient!

ACROSS THE POND

WHILST PARTICIPATING in the RSGB Headquarters Open Day back in April I met lots of interesting QSL punters. One, from the USA, told me a couple of things I was a bit hazy about. He said US amateur licences are issued for a period of years - I think he said five. What made me prick my ears up was the fact they are issued *free of charge*. Apparently, the licensing authority is forbidden by federal legislation from making a charge for any transmitting licence - amateur or commercial. SSL take note!

The other piece of information concerns the callsigns issued to US amateurs. An amateur living in California will get a '6' call when he or she receives their first licence. We will send QSL cards to the American 6 call area bureau for the amateur to collect. That is because all the American call areas have separate incoming QSL bureaux (in fact the 4 call area has two as I have previously reported).

What I didn't know was that if that amateur with the 6 call moves house to Ohio - in the '8' call area - he or she still retains the original 6 call issued on first being licensed. So if you had a QSO with him or her you would be working a W6 but located in the US 8 call area.

What I don't understand is how that US amateur will eventually get the cards we send out, as we will continue to send them to the 6 area bureau because we will not know any better. Does the US bureau know the person has moved house and, if so, how? Is it up to the individual amateur to make arrangements for collection? I know this column is read in W-land, so perhaps someone could put me right.

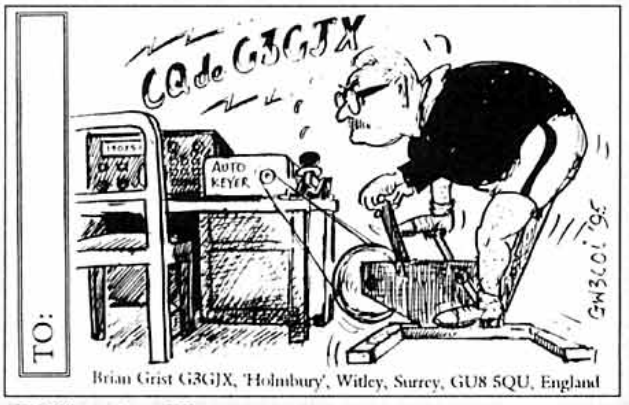
SORTING CARDS

WHILST ON the subject of American calls, please don't forget to sort them into numerical call areas when sending them to us at P O Box 1773. The easiest way is to regard all US calls as Ws and then sort them numerically, disregarding the alphabetical prefix completely. That way it makes it much easier for the bureau girls to sort into the outgoing US pigeonholes.

AWARDS

DON'T FORGET that some awards require a minimum signal strength in order to qualify. So before submitting cards always check the award requirements first. Sounds like I am stating the obvious, and I am, but people do get caught out by such things. ♦

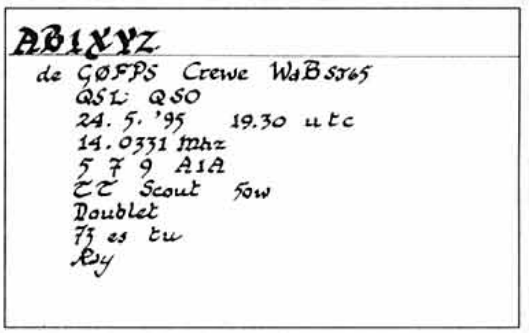
QSL DESIGNS



G3GJX's cartoon QSL.

BRIAN GRIST, G3GJX, got GW3COI, who advertises in *Radio Communication*, to draw the cartoon (above), and then Brian pasted up the text in Word Perfect. Brian says the cartoon is an excellent likeness and he does have an exercise bike! He also says that he went to his local print shop and was given a very competitive quote for QSL cards of £23 for 500 using a photocopy process. So that route is well worth thinking about if you are in the market for a new supply of cards.

Ray Watson, G0FPS, noticed the DIY QSL card produced by Ian Balloch, GM3UIQ, in the June *QSL* column and says that he wants to claim the prize for the 'meanest' QSL card! Ray says his card, pictured below, is a simple record card bearing the QSO details. He says that, at 72 years of age, cost is important. Being a fellow Yorkshireman, I quite understand his philosophy!



'Meany' QSL card from Ray Watson, G0FPS.

Contest Exchange

ANDY COOK, G4PIQ
Fishers Farm, Colchester Road,
Tendring, Essex, CO16 9AA.
G4PIQ @ GB7MXM.#36.GBR.EU

I AM WRITING this column, wrists padlocked to the keyboard, just a week before VHF NFD. Why, you may wonder, the need for a padlock? Well, when the Shetland 2m beacon at over 900km distant is louder than the Kent beacon at 90km it is very tempting to sit and play radio. However, I should be careful not to use up my quota of good conditions before VHF field day; it would certainly be very nice to see a repeat of the scorching weather and conditions that we saw during 1994. Anyway, by the time you read this it will all be history.

Sometimes we are moved towards having a rant after a contest goes badly, but all such mishaps were put into perspective by a recent posting on the Internet contest reflector from T91ENS in Bosnia. They reported their CW WPX score as the worst possible effort with a final result of zero points and gave special thanks to the Bosnian Power Company and T9MURPHY. At 1130 on the Friday before the contest the whole city lost electrical power. Being a normal occurrence, this was nothing to worry about. By 1500 they received a promise from the power company that they would have volts for the start of the contest, but at 1815, a 60mm shell cut the telephone wire so they were unable to call the power company anymore! This left their only means of communication as a 2m hand-held . . . enough said I think.

A CLEAN SWEEP

IN JUNE'S *RadCom* (page 41) I mentioned some of the incentives used in the USA to encourage participation in the Sweepstakes which at one time was a flagging contest. Dave Robinson, now WG3I, but also G4FRE, sent me a note in which he explained the situation in a little more detail. There are two types of award and it is not only the mug which has been used to great effect. The Sweepstakes mug is awarded to anyone who works a 'clean sweep' of all ARRL sections (basically, US states plus Canadian provinces and a few extras) but this is something that only about 50 people were eligible for in 1994, mainly because it was very difficult to catch the elusive VE8. However, what apparently really attracts the entry is that anyone who turns in 100 or more QSOs and includes $3 and a label with their entry receives a pin badge. Hundreds of people qualify for this award and, with separate pins for the CW and SSB legs, these have become collectors' items.

Dave feels that the format of the contest exchange helps to keep the contest interesting since it needs more than just 595, with ARRL section, power category, year first licensed and serial number all included. It is interesting to see that this is completely self-financed, yet seems to support lots of activity. If you think that this is the sort of thing that the RSGB ought to be considering then let G3SJJ have your comments.

CQ WW RULES

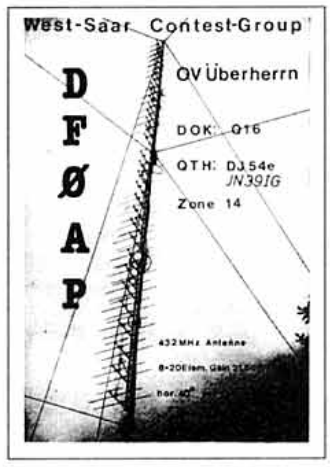
ROGER WESTERN, G3SXW, sent me a section out of the 1994 edition of the *CQ WW Contest Handbook* which is compiled each year by Bob Cox, K3EST, who is the real *CQ* WW guru and the main adjudicator of the events. The section which Roger sent me was the Annotated Rules for the contest. These run to 25 pages of the US equivalent of A4 and is probably the only place you can read about what is normally termed the 'spirit of the contest' in black and white. The document provides an insight into the detail of some of the rules. However, for me, it is the history behind some of the rules which is especially fascinating. It shows just how ingenious some people have been in the past in finding ways of stretching the existing rules right up to, and beyond, breaking point.

As an example, *CQ* WW has a policy of removing three additional QSOs for every unmarked duplicate or genuine 'busted call' found in a log, and if there are over 3% of such calls the log may be disqualified. The original rule was simply that if over 3% of such calls were found, the log would be disqualified, but some stations got wise to this and began to leave exactly 2.9% duplicates in their logs, and it was this action which resulted in the additional penalty of three QSOs being introduced.

'OCTOPUS' USER LIMIT

One rule which regularly arouses much discussion among the keen entrants is the '10 minute' rule. This means that, in the multi operator, single transmitter section, both the run and multiplier stations cannot change bands until 10 minutes has elapsed. This rule was introduced to keep the multi-single section under control after a system known as an 'Octopus' started to appear during the 1960s. This was a station which had at least one fully equipped and manned station on each of the six bands, with a facility to ensure that no more than one band could transmit at any one time. This made it possible for the one station to make QSOs on as many as four bands inside one minute. Although this in itself is not breaking the rules, it is impossible to verify whether this station is using his 'Octopus' to inhibit simultaneous transmission, or whether it is really a multi-multi situation where there can be one signal on each band simultaneously. It was this dilemma which bore the 10 minute rule.

Similarly, in the multi-multi section, there is a limit of one signal and running station per band and this was also a result of the threat of the 'Octopus'. Normally, it is very difficult to operate more than one station on each band at a single site due to the intense QRM from the local transmitters. However, during the past few years, this problem has been solved by some of the big multi-multi stations, and the possibility of having an 'Octopus' for each band became a reality. The rate achieved by any single station would be severely reduced by not being free to transmit just when it wanted to but this can be more than made up for by having several stations each running at the slower rate. How about the prospect of a multi-multi station with three stations on each of 20, 15 and 10m, a couple each on 80 and 40m, and maybe just one on 160m! A test was even carried out in the US Field Day contest to see what could be done with a single band 'Octopus', and, while a single station could run at around 200 QSO/hour, a three or four station 'Octopus' could take this up to over 300 QSO/hour. Consequently, this form of operation was outlawed!



Colinear arrays can make superb VHF contest antennas with their wide horizontal beamwidths. This is the best I have seen - from DF0AP a 160 element vertical stack for 70cm with the gain of four long yagis and the beamwidth of a five element! With a 1 degree vertical beamwidth, just make sure you get the mast straight though!

If you want to read more of not just the annotated rules, but also the history of the *CQ* WW events and the all-time records, and also see a photograph collection, the 1995 edition is expected to be out in July. Unfortunately, no-one in the UK has a supply, but they can be bought direct from K3EST in California at $20. Additionally, Roger, G3SXW, is very happy to answer questions about the book, or, in his capacity as a *CQ* WW International Committee member, about any aspects of the contests. Roger is QTHR or can be reached on the internet at 100260.342@compuserve.com.

FUTURE EVENTS

AUGUST IS PERHAPS the quietest month of the year on the contest front. However, matters liven up on the VHF front towards the end of the month, and the big 2m event of the year - the trophy - takes place at the start of September. This 2m contest always brings plenty of activity and is well worth a look. If you are short of time over that weekend, don't forget that there is a six hour single operator fixed station section where you choose the six contiguous hours for which you operate. This contest falls on the same weekend as HF SSB Field Day which is a great club contest with lots of opportunity for Class B operators to get some experience of HF as well. Check out the report of last year's event (*RadCom*, February 1995, page 80) for an idea of what it's all about, and don't forget that rate is not all, as you need to sort out those multipliers as well! If you are feeling really adventurous, your club could attempt both the 2m and the HF event to keep everyone occupied. Also, if you fancy a little CW practice, don't forget RoPoCo which will really test your accuracy on 80m on the 13 August, and the first of the 2m CW Cumulatives on the 29th. ♦

TURN TO PAGE 81 FOR CONTEST CLASSIFIED

SWL NEWS

BOB TREACHER, BRS 32525
93 Elibank Road, Eltham, London SE9 1QJ

AT THE TIME of writing this column in mid-June with the weather resembling something which March had left behind, attention switched from HF to VHF. Plenty of Summer Sporadic-E conditions affected 50MHz and there appeared to be more Es at 144MHz as well. However, both 24 and 28MHz provided some Europeans, livening up otherwise drab conditions on those bands. Indeed, on some evenings, Europeans could be heard on both bands after 2300UTC.

Even though there is something for the VHF SWL in this column, the HF SWL is well served with details of another Lighthouse Weekend and the ILA's 'Seven Day Amateur Radio Challenge'.

LIGHTHOUSE SWL

MIKE, GM4SUC, HAS provided details of the popular Northern Lighthouse Weekend. This year's event takes place from 0700UTC on 26 August to 1700UTC on 27 August. Stations will be active in the 10-80 metre bands. As usual, an award is available to SWLs who hear 6 of the 11 stations. A special award is available for hearing 10 of the 11 stations. To claim, send a certified copy of your log plus £3 to Ayr Amateur Radio Group, PO Box 36, Prestwick, Scotland. The stations which are scheduled to be active are shown in **Table 1**.

Most of these stations will be in rare WAB locations, so the event will be enjoyed by HABers, award hunters as well as special event station hunters. Good luck and let me know how you fared so I can include a follow-up piece in a forthcoming *SWL* column.

SEVEN DAY LOG

TO CELEBRATE THE 10th Anniversary of the International Listeners Association, the ILA have organised the Seven Day Amateur Radio Challenge. The aim is to log as many stations as possible which contain letters from the Club name 'International Listeners Association' in the suffix, ie: I, N, T, E, R, A, O, L, S, C.

Any seven days in September can be used and loggings can be made at any time during the day or night. Days may be split to suit yourself, eg two days first week, three days second week, one day third week, one day fourth week.

Logs have to show the date, time, frequency, report of the station heard, callsign, letters from the ILA name in the callsign and the country. The following examples might help to clarify what details have to be included and which callsigns can be counted for points:

10/9/95;0700;368759; HA9GLN; LN; Hungary.

12/9/95;0945;7067;57; SP4CIN; CIN;Poland.

You can score one point for each station logged. The final score will be the total points multiplied by the number of different countries logged. Any SWL can enter - membership of the ILA is not essential. Indeed, there is a section specifically for those who are not members. There are a number of prizes, too, including a trophy, book tokens and free ILA membership. The Challenge is a novel idea and one which deserves to succeed. Why not put in an entry? There are few rules to dissuade you from entering and there are no time constraints. This is just the thing to sharpen up your logging skills in readiness for my October Challenge which is not that far away!

VHF HAPPENINGS

THE MAIN REPORTS of activity came from David Whitaker, BRS25429, myself and Joan, BRS62088. On 144MHz, the bottom of the sunspot cycle appears to have thrown up some good Sporadic-E openings this year. The most interesting being fairly short openings on 6 and 12 June. The opening on the 6th provided I, EA4, EA7 and EA9 from 1123 to 1155, while the opening on the 12th gave loggings to I, EA and EA8. Several 'near misses' also occurred with Band II FM being heard as high as 107MHz, but no opening transpired on 144MHz.

Sporadic-E conditions were certainly above average on 50MHz and it remains a mystery to me why more listeners do not listen there during the summer months. During the first 12 days of June, stations were heard from most of the regular countries in Europe, but rarer countries such as OJ0, OY, HV, ES, EU and 4U1 were also heard. There were no openings to the United States and Canada, but Africa was well represented in the shape of S0URE, 5T6E (Mauritania), CT3FT, EH8ACW (Gran Canaria), EH8BPX (Tenerife), EH9IE and D44BC. In addition, the first stations from HA were heard. David Whitaker has now heard 100 countries on the band, but has only 92 confirmed.

HF ACTIVITY

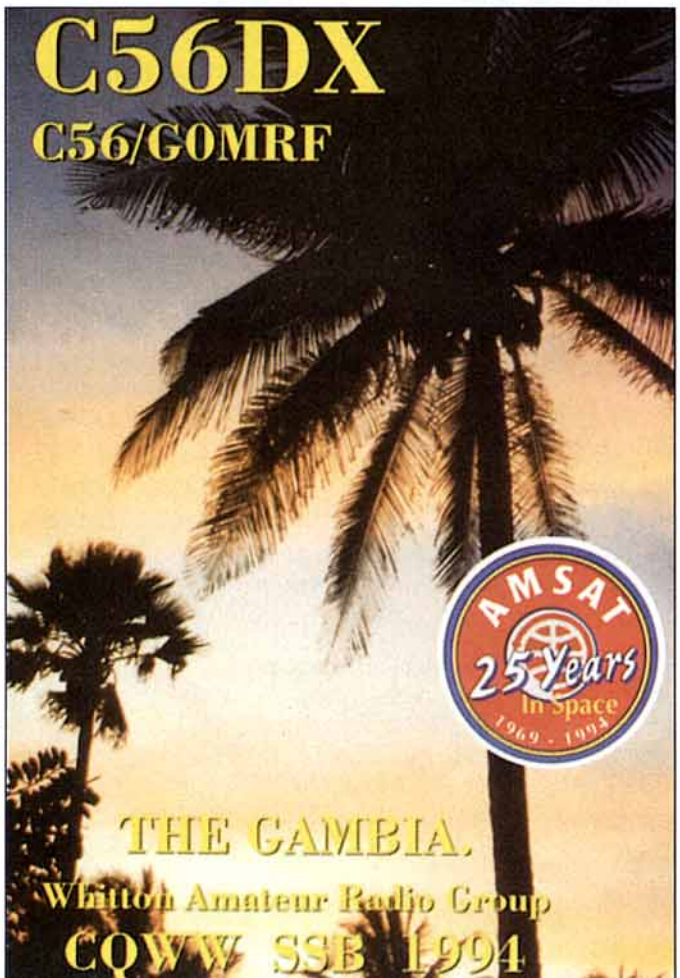
FEW REPORTS WERE received this month. This obviously reflects the poor conditions encountered when receivers were turned on. There were some bright spots but they seemed to be few and far between. Robert Small, BRS8841, referred to Pacific openings on 14MHz during early morning hours, but he was the only one. Graeme Caselton, RS44984, heard BV2FI and BV9P on 14MHz as well as TO9IS from French Guiana. 21MHz provided him with a new one in the shape of OJ0/OH8AA from Market Reef. Graeme also has an RTTY facility and mentioned three JAs, all with different prefixes - JL6, 7N1 and JS2. This simply highlights just how many licencees there are in Japan. Long gone are the days when Japanese amateurs used either a 'JA' or 'JH' prefix. Conditions on 18MHz were quite good around midnight local time, such that CP1FQ and 4U/KC0PA (S0) were heard. 24MHz and 28MHz both provided good inter-Europe QSOs (Sporadic-E) and 24MHz offered some South Americans at around 2200UTC.

As readers will gather, David Whitaker has returned from his Far East adventure. Although he had a receiver, the overhead electric cables and hotel air conditioning systems provided a constantly high level of QRN which made listening difficult. Some juicy Pacific DX was heard, but overall, the high QRN made listening less enjoyable than David had expected.

FINALE

NEWS FOR THE **October** *SWL News* must be with me by **9 August** - note the earlier date. ♦

The C56DX and C56/G0MRF QSL card which is now available. As most readers will know, I am handling the SWL QSL cards for the DXpedition. At the time of writing, over 50 SWL reports had been answered. Anyone who heard either callsign between 23 October and 8 November last year can apply to me for a card either direct with return postage or via the RSGB QSL Bureau.



CALLSIGN	LOCATION
GB2LS	Shetland Islands
GB2LO	Brough of Birsay
GB2LTH	Trumpan Head
GB2LCP	Channory Head
GB2LBN	Barns Ness
GB2LEN	Elie Ness
GB2LMG	Mull of Galloway
GB2LA	Ardnamuchen
GB2LL	Lismore Island
GB2LDH	Dunnet Head
GB2LT	Turnberry

Table 1: Stations due to be active on the Northern Lighthouse Weekend.

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FT-900	list £1399	our price **£1095**	TS-450S	list £1499	our price
FT-900AT	list £1599	our price **£1245**	TS-450SAT	list £1649	our price
FT-840	list £959	our price **£725**	TS-50S	list £1059	our pric

VHF TRANSCEIV

YAESU			KENWOOD		
FT-736R	list £1999	our price **£1549**	TS-790E	list £1959	our price
FT-8500	list £749	our price **£659**	TM-255E	list £949	our pric
FT-5200	list £729	our price **£595**	TM-455E	list £1059	our pric
FT-5100	list £679	our price **£515**	TM-733E	list £739	our pric
FT-2500M	list £399	our price **£295**	TM-251E	list £419	our pric
FT-2200	list £419	our price **£329**	TM-702E	list £579	our pric

VHF/UHF HANDI's & P

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FT-51R	list £529	our price **£395**	TH-22E	list £254	our pric
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PX	FC700	Yaesu	V/Good	HF antenna tuner	£169.00
PX	NC37	Yaesu	Good	Base Quick Charger - for FT470/23/411	£69.00
PX	NC42	Yaesu	Good	Base Quick Charger - for FT26/415/530	£75.00
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PX	MMX1268	M/M	As New	Sat transmit convertor s/s	£120.00
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A3S	14-21-28MHz Yagi	£349.00
A3WS	12/17m 3-ele Yagi	£275.00
A103	30m Extension A3WS	£115.00
204CD	4 ele 20m Yagi	£439.00
154CD	4 ele 15m Yagi	£249.00
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D3W	Dipole 12/17/30m	£169.00
A4S	3-4 ele Yagi 10/15/20m	£425.00

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A148-10S	2m 10-ele Yagi 13.2 dBd	£59.00
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13B2	13-ele 2m Yagi	£99.95
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424B	24-ele 70cms Yagi	£115.00
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HL100B/20	20M Linear, 10W in 100W out PEP	210	C
HL100B/80	80M Linear, 10W in 100W out PEP	210	C
HL66V	6M Linear, 10W in 50-60W out Rx Preamp	169	C
HL166V	6M Linear, 3/10W in Auto select 80/160W out Rx Preamp	299	C
HL37VSX	2M Linear, 0.5-5W in 20-35W out variable gain preamp	109	B
HL62VSX	2M Linear, 5/10/25W in 50W out preamp	235	C
HL36U	70cm Linear, 6/10W in 25/30W GaAs FET Preamp	155	B
HL63U	70cms Linear, 10/25W in 50W out GaAs FET Preamp	259	C
HL180V	2M Linear, 3/10/25W i/p auto select 170W out Rx Preamp	389	C
HL130U	70cms Linear, 3/10/25W i/p auto select 120W out Rx Preamp	485	C

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HX640	6M to HF Specs as above	299	B

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714X-3	3-4 ele Yagi 15-20-40m 3Kw PEP	£1369	E
CD218	3 ele Yagi 10-15 1.5Kw PEP	£289	D
CD318JR	4 ele Yagi 10-15-20m 750w PEP	£439	D
CD318	4 ele Yagi 10-15-20m 2Kw PEP	£539	D
CD318B	5 ele Yagi 10-15-20m 2Kw PEP	£589	D
CD318C	6 ele Yagi 10-15-20m 2Kw PEP	£899	D
CL10	5 ele Yagi 10m 2Kw PEP	£299	D
CL15	5 ele Yagi 15m 3Kw PEP	£450	D
CL4B-4	3 ele Yagi 40m 4Kw PEP	£1375	E
CV730V-1	V-Dipole 10-15-20-40m 1Kw PEP	£199	D
CY103	3 ele Yagi 10m 2Kw PEP	£179	D
CY104	4 ele Yagi 10m 2Kw PEP	£239	D
CV48	40m Vertical 2Kw PEP	£275	D
AD385	40/80m Switch box for CV48	£69	B

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HK707	Straight key, 0.5Kg similar 706 with cranked arm	£35.00	B
HK808	Straight key 2.5Kg deluxe marble plinth	£110.00	B
HK711	Straight key, knee mounting	£36.00	B
HK802	Deluxe straight key, bearing less solid brass construction	£82.00	B
HK803	Brass high deluxe telegraph key c/w base plate	£77.00	B
HK804	Brass high deluxe telegraph key w/o base plate	£82.50	B
MK702	Single lever paddle 1.0Kg	£34.00	B
MK704	Squeeze key 0.15Kg	£42.00	B
MK706	Squeeze key 0.7Kg	£34.00	B

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BSD	Bumper Strip Mount	£12.00
FB4N	Cable Assembly Low Loss 'N'	£14.50
SFA-4N	Cable Assembly Very Low Loss 'N'	£25.00
GCD	Gutter Mount	£9.00

COMET ANTENNA

COMET ANTENNA ACCESSORIES

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CK-3MB	Mini Cable Assembly	£24.00
WS-1M	Window Mount & Cable	£39.00

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CF-50MR	6M Low Pass Filter 1KW PEP	£39.00
CF-30H	HF Low Pass Filter 2KW PEP	£69.00
CF-30S	HF Low Pass Filter 150W PEP	£25.00
CF-50S	6M Low Pass Filter 150W PEP	£25.00
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CD-270D	SWR/PWR 140-525MHZ 15/60/200W	£89.00
CMX-2	SWR/PWR 1.8-200MHZ 20/50/200W	£119.00
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CA-14HR	14MHZ Mobile Whip	£46.00
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CHL21J	2M/70CM Mobile Whip	£19.00
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CFX-514	6M/2M/70CM Triplexer	£49.00
CFX-431	2M/70CM/23CM Triplexer	£49.00
CF-520	2M/6M Duplexer	£29.00

Novice Note Book

IAN KEYSER, G3ROO
Rosemount, Church Whitfield, Dover,
Kent CT16 3HZ

ANTENNAS AGAIN feature in *Novice Note Book*, but I make no apology as this is a subject that dominates amateur radio. The best radio transmitter in the world is useless if we cannot radiate the signal it generates.

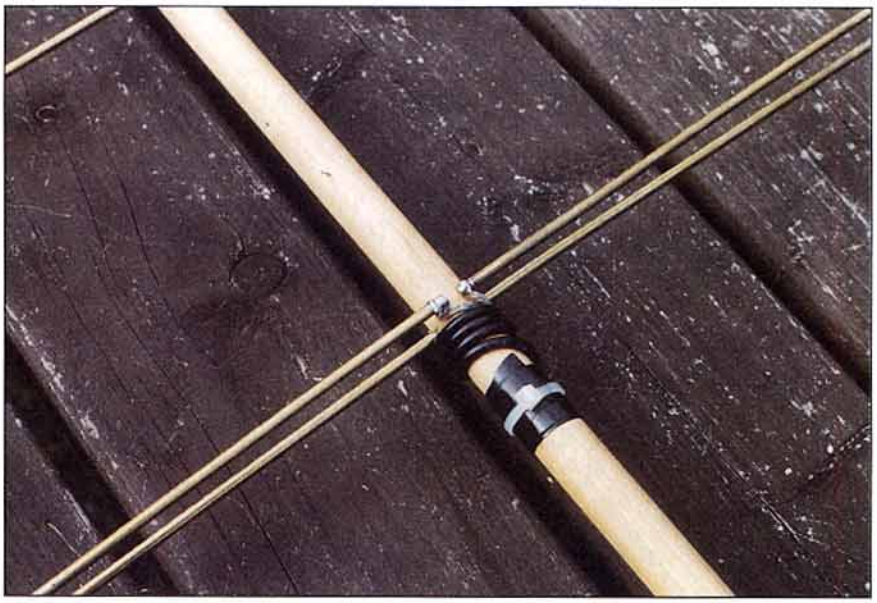
I have a requirement to contact three main areas all within five miles. They are the radio club three miles south of the home QTH, Dover town which is five miles to the South-west (but three hundred feet down in the valley with a mile to the valley edge) and the gliding club which is three miles to the North-west. Tests showed that handheld operation was possible from the home QTH to the two clubs but to the car in the town was very marginal.

A YAGI ANTENNA

WHAT WAS required was a high gain antenna on the car and a vertically polarised beam pointing towards Dover. The beamwidth of the antenna is wide enough to get a reasonable signal into the two clubs and coverage of the town.

I claim no originality for the beam in **Fig 1** as the dimensions were lifted from the RSGB *VHF-UHF Manual* [£8.93 plus P&P to members - see page 91 -*Ed*]. To keep construction simple I have used 3.2mm brazing rod for the elements and 15mm wooden dowel for the boom. The main advantage of the wooden boom is that the elements can be made a push fit into the wood and so require no further fixing. In fact, when the wood gets damp it will be virtually impossible for them to move as the wood will swell!

The boom should be carefully marked and drilled using a 3mm bit. The elements are cut to the correct length and the ends slightly tapered to help start them to enter the hole in the boom. However, before they are fitted it is necessary to construct the radiator element. The problem here is that it has to be inserted through the boom prior to bending! The way I did this was to bend one end, then push the rod through the boom and then bend the second end. To make the bending easy I heated the element at the point of bending. The element was bent around a 9mm drill to get the correct shape and correct spacing.



Home-made UHF Yagi showing driven element feed and balun.

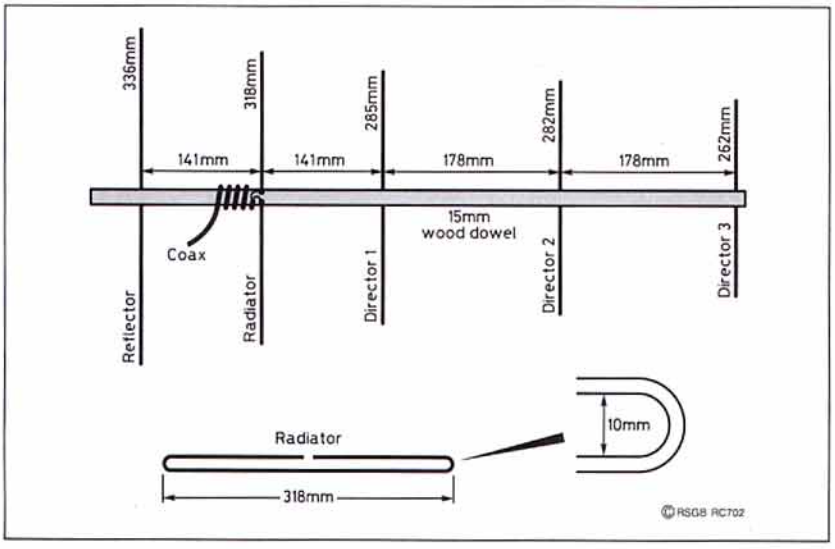


Fig 1: Dimensions and construction of a five-element 70cm Yagi antenna.

The overall length should be checked, and if necessary adjusted, using heat and a pair of pliers.

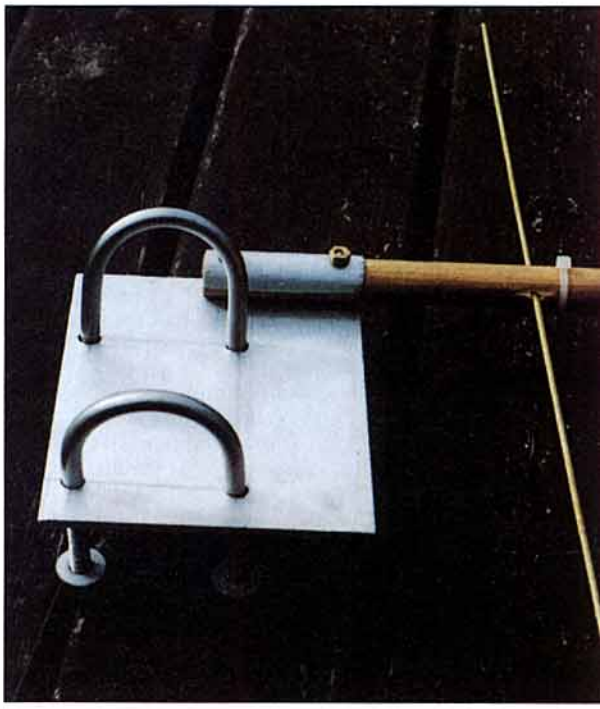
Having fitted the correct elements in the correct place it is necessary to add the feeder. I used a short length of thin 50Ω coaxial cable at the feedpoint where I have added a four turn choke balun wound round the boom to reduce unwanted currents on the outside of the feeder. The feeder is then routed back along the boom to a junction box where it connects to the coaxial feeder to the shack. On test the VSWR was found to be 1.6:1 on SU20 rising slowly with frequency. This was far better than expected so no experimentation was considered necessary.

FIXING TO THE MAST

AS YOU CAN SEE from the photograph below, I do not believe in buying a clip when I can make one from scrap! A piece of scrap aluminium, a couple of salvaged U-bolts and a scrap of aluminium tubing cut in half makes a very serviceable clamp.

HINT OF THE MONTH

THIS MONTH'S hint won't cost you very much. Green fibrous kitchen pan scourers make a good replacement for sponge for soldering iron tip cleaning. But for long life of the sponges never be tempted to use them dry. ♦



A cheap mast clamp can be made from two U-bolts and some scrap aluminium.

RADCOM TECHNICAL FEATURE

Coherent CW Made Easy by DSP

by Peter Lumb, G3IRM*

COHERENT Continuous Wave (CCW) is a method of sending Morse code which has been around for about twenty years. However, very few amateurs have heard of it and even fewer have tried to operate the system. The most comprehensive description of CCW appeared in *QST*, May and June 1981 headed: "Would you think that you could decrease your transmitter output by a factor of 10 and increase signal readability by the same amount - simultaneously? It's being done now." That is a sweeping statement and would appear to offer a system which showed a considerable increase in efficiency over an already very efficient method of communication, namely CW. So why isn't everyone using CCW?

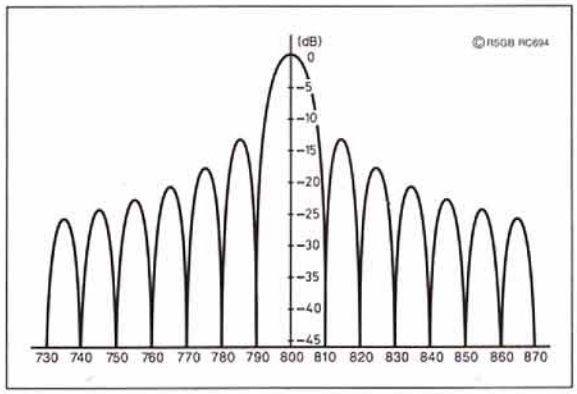


Fig 1: Amplitude response of an integrate-and-dump filter for a small range of audio frequencies near 800Hz [From *QEX*, February 1994].

A BRIEF HISTORY OF CCW

CCW WAS INVENTED by Raymond C Petit, W7GHM [Note 1] about 1975 and was described in the *QST* articles mentioned above and also in *CQ* Magazine, June and July 1977.

Several amateurs, myself included, built the various circuits but very few contacts were made. There was also a short description in *The Radio Amateur's Handbook* for several years though this has now been dropped. The contacts which were made showed that the claims made for CCW were well founded and contacts were made between various stations in America and between the West Coast of America and Japan using 100 milliwatts output.

Nothing much was then heard or written about CCW until Bert Arnold, G3RHI, and I decided that something ought to be done to revive a system which appeared to offer so much but which had been sadly neglected. We contacted those amateurs we knew who were likely to be interested and made various appeals in magazines. The result was that we had a list of about 80 amateurs in various parts of the world who had either experimented with CCW in the past or who had become interested as a result of our appeals. I collected all the information I could and made it available to members of the group and started issuing a short *Newsletter* at about three monthly intervals. A few members started to build equipment for CCW and some contacts were made. Now DSP has come on the scene and everything is likely to change, but more on this later.

SO WHY ISN'T CCW POPULAR?

IN 1975 THERE was no suitable equipment available for use with CCW so everything had either to be built or existing equipment had to be modified. That was the first problem, added to which extremely high stability and accuracy in timing was needed.

All CW and CCW signals consist of a series of digital units each of which can be broken down into frames. Ray Petit decided that he would use frames exactly 100 milliseconds long so that a dot and an element space are both this length and a dash is three times as long. This is important, every frame must be exactly 100 milliseconds long so normal hand keying is ruled out.

Everything in CCW must be accurately timed and the fundamental oscillator in the system must be accurate and very stable. Accuracy of one part in a million is the absolute minimum. All other oscillators have to have the same accuracy and stability and what is more the transmit frequency must not vary with keying.

The last item needed is the Petit filter which requires a number of digital devices. Suitable items of equipment with the required stability were not available when CCW was invented in 1975. Once the equipment has been assembled, operating has its problems. The bandwidth of the Petit filter is only 9Hz so tuning across the band looking for a signal could take days! The usual operating method has always been by prior arrangement on fixed frequencies. Fixed frequencies at least made stabilizing the transceiver a little simpler.

PRINCIPLES OF CCW

HAVING ESTABLISHED that the frame length is to be 100 milliseconds (about 12WPM) the transmitting side is comparatively simple. The transmitter is exactly the same as any other except for the high degree of stability needed. It is keyed by either a keyer or a keyboard which is controlled by the station frequency standard in such a way that all frames are 100 milliseconds long or multiples of this length. The calling operator sends a string of dots and the receiving operator adjusts his receiver and filter so that the dots are heard clearly.

This is done by a phasing control in the filter which, when correctly set, exactly matches the sending transmitter. The rising and falling edges of all frames are coherent. The receiving filter then knows exactly when the transmitting frames start and end and this is maintained during the contact as a result of the high accuracy and stability of all frequency and timing equipment involved.

As the receiving filter knows when each rising edge will occur it can start to integrate the signal received for the time of the frame. If the integrated voltage remains at zero it was a space, if there was some energy it was a mark. There is no way that a mark can start part of the way through a frame. There is no need for me to describe the way the Petit integrate-and-dump filter works as full descriptions can be found in the articles mentioned. It should now be obvious why CCW has remained something of a novelty for those who like that sort of thing.

CHANNEL USAGE

ONE OF THE ADVANTAGES put forward by Petit for his system was the very efficient use of the frequency spectrum which would result if stations adopted CCW. The response of the integrate-and-dump filter is shown in **Fig 1**. This shows that, if the received signal is exactly 800Hz, there are nulls every 10Hz on both sides of the received frequency. Ray Petit argued that if stations operate on frequencies which are multiples of 10Hz, all stations other than the desired signal would fall in the nulls and would therefore, in theory at least, not be heard. It should therefore be possible to have 100 stations operating in every kilohertz without interference to each other!

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DIGITAL SIGNAL PROCESSING

IN ONE OF MY *Newsletters* I suggested that it should be possible, as a result of the advances made in computer technology, to write a program to send and receive CCW. This was taken up by Bill de Carle, VE2IQ, who had designed and built a DSP system some years before but, as it needed fifty integrated circuits, he decided that it was most unlikely that anyone else would be ambitious enough to duplicate his work.

The design was never published. DSP has made considerable progress since those days and Bill decided to update his design. He had already published [1, 2] an article describing the use of a sigma-delta modulator with a suitable computer program for use as an audio spectrum analyser. The board uses nine easily obtainable integrated circuits and connects the audio signal to the RS232 port of an IBM computer. Everything else is done in software. Bill immediately realized that this could be the basis of a computer CCW program. I was amazed that, within a few days of receiving his copy of the *Newsletter*, he had written the whole program and posted me a copy. The original CCW program has been improved since and is still being carefully considered with a view to further improvements.

'COHERENT'

THIS IS THE NAME of the program which I will now describe.

The circuit samples the received signal 7,200 times a second converting these samples into numbers and passing them to the computer. To use the program the same procedure is used as was used in the Petit system.

A string of dots is first transmitted (the program uses a special key to do this) but the receiving operator does not have to adjust his phasing control; there isn't one - the computer does all the work itself. There is still the problem of finding other CCW stations and the same system has been adopted by which fixed frequencies are used.

I have suggested to those who have the board and program that 10.115MHz is a suitable frequency and, at the time of writing, am awaiting agreement or other suggestions from users of the program. In these early days of the program, operating times will also have to be decided. The computer display is divided into four screens - status, buffer, chat and escape. The use of buffer and chat screens is fairly obvious and is much like other keyboard programs. The escape field is used to initiate synchronization, help, buffer selection and similar functions. Each screen scrolls independently of the others. The status screen, updated every 100 milliseconds, shows a wealth of information.

The old Petit filter had ten possible positions for the phasing switch, making it possible to change phase in steps of 36 degrees. COHERENT has 80 steps as it does not use a manual switch to adjust the phasing. The phasing cycle is displayed on the screen. When a string of phasing dots is received the program hunts for the correct setting which is when the phasing number displayed on the screen remains steady. The two stations are then in phase. While the phasing process is taking place the status screen also displays the amplitude of the mark and space frames as well as the ratio of these two figures. While a tone is being received its frequency is displayed to within 0.1Hz. The program is intended for use with a beat note of 800Hz. The signal must be tuned in to within ±5Hz to ensure correct operation. Modern transceivers such as the Kenwood TS-850 and TS-450 are suitable as are other transceivers which can be set accurately. These models also have up/down tuning buttons which can be used to add another feature to COHERENT. The program detects any slight change in frequency and issues pulses on two of the RS232 lines which can be connected into the transceiver to give automatic correction for frequency drift. This is a big improvement over the original system which required accurate and stable frequency control - COHERENT will correct for any small drifts at either end of the contact.

In the original program the received signals were heard from the computer's speaker but the more recent versions will also allow the signals to be heard in headphones with the computer's speaker muted. As CCW depends on the ratio of the mark and space frames a threshold adjustment is also made. Ideally, there is no output during a space and output is there during a mark. Even noise causes some integration so there is always likely to be some indication for both the mark and space displays. COHERENT makes the adjustment automatically and slow, medium and fast simulated automatic gain control can be selected.

INTERFACING

THE IDEAL TRANSCEIVER for use with COHERENT is one of the modern ones with keypad entry and up/down tuning buttons, although others may be tried. All the features of COHERENT may not be available but operation should be possible in many cases. Three lines are needed for full operation - a keying line and the up/down frequency correction lines. All that is normally needed to interface the computer and transceiver are three opto-couplers or three IGFETS. The audio signal for the sigma-delta board can be obtained in various ways - the speaker, headphone or an auxiliary audio output can all be used.

SUMMARY

COHERENT simulates all the features of the original Petit design and improves on most of them, but the principle of operation is still the same. As an example of these improvements COHERENT runs three integrate and dump filters all at the same time which allows the program to decide if the frame phase is drifting so it can make its own corrections automatically. It will also look at the signal/noise ratio at the end of each frame and, if this would be improved if the frame started one cycle earlier or later it will move the frame as required.

The program is much easier to operate than earlier hardware versions and does not involve so much work or expense. If you have a computer (the faster the better though even an XT model will work) and a fairly modern transceiver COHERENT is worth a try. The program can be obtained on either size disk and the sigma-delta board can be bought either as a basic board or complete and ready for use [Note 2]. If any reader would like more information about the program I will try to help but all orders must be sent direct to Bill de Carle at the address given in Note 2.

REFERENCES

[1] 'A receiver spectral display using DSP', by Bill de Carle - *QEX* January 1992

[2] *The ARRL Handbook*, 1993 and 1994.

NOTES

[1] Ray Petit is also the inventor of the data system called CLOVER which is now available from Hal Communications Corp.

[2] COHERENT software package $20.00. Circuit board only $24.00. Assembled and tested board ready for use $95.00. All prices are in US dollars but please include an extra $5.00 for airmail postage. Order from: Bill de Carle VE2IQ, 29 Sommet Vert, St. Adolphe'Howard, QC, J0T 2B0, Canada.

[3] See *Technical Update* on page 80 this month for more on CCW and DSP. ♦

RADCOM TECHNICAL FEATURE

RATS: Receiver Alignment Test-Set

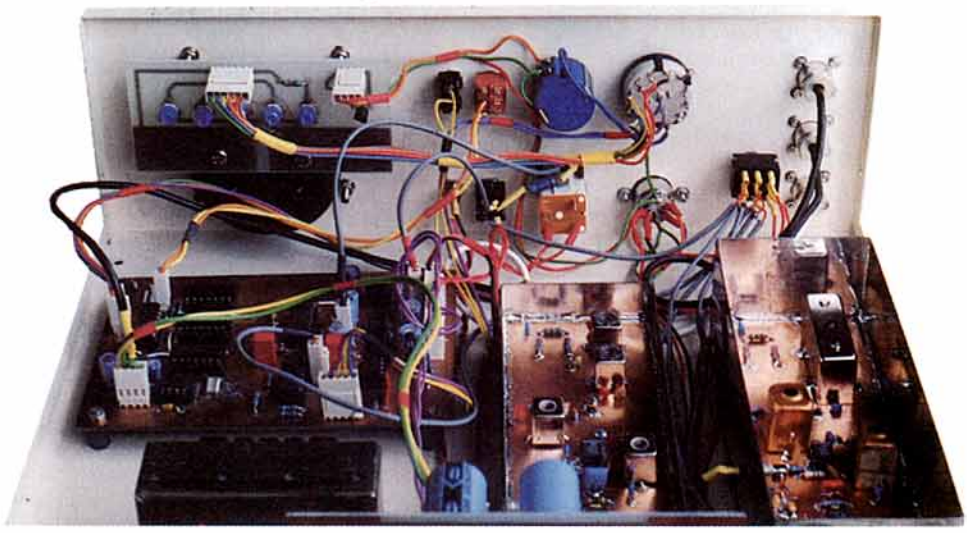
The concluding part by Roger Blackwell, G4PMK*

IT IS INTENDED to make Printed Circuit Boards available via the RSGB Microwave Committee's Microwave Component Service. For details, see the components list in Part 1.

RF UNITS

The essential here is to produce a stable well-screened unit. The PCBs must be fitted in standard tin-plate boxes (see components list) and seam-soldered around the edges. It's easier to mount the 144MHz helical filter and coils before mounting the board in the box. Don't even think of using IC sockets for the receiver boards! For the 144MHz version, screening cans should be fitted over L3 and L4 - mine came from some scrap IFTs, but you could easily make some out of thin sheet metal.

The modamp IC1 should be mounted in a clearance hole, with the two ground connections made to short U-shaped copper foil straps bridging the thickness of the board. The diagram for the gain block described later shows this and the connections for the modamp.



The component layouts for the 28 and 144MHz versions are shown in **Figs 9** and **10**. Pay particular attention to decoupling capacitors - use the best you can find. RF input can be via a miniature RF connector such as SMA, SMB or SMC, or indeed a square flange BNC. Use decent RF cable to a front panel socket which has rear cable entry. In that way screening of the RF section is maintained right up to the front panel. If you are building a 28/144MHz version, don't under any circumstances try to switch the RF inputs to a common socket! The outputs (RSSI and FM audio) should be taken via screened cable either directly to the analog board or to the band selection switch (see interconnection diagram) if you are building the 2-band version. This is simply a 3-pole 2-way switch which also switches power to the appropriate receiver box.

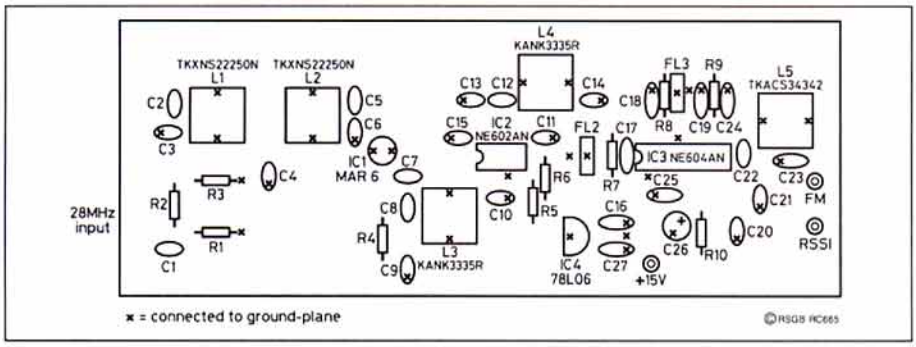


Fig 9: 28MHz Rx board layout.

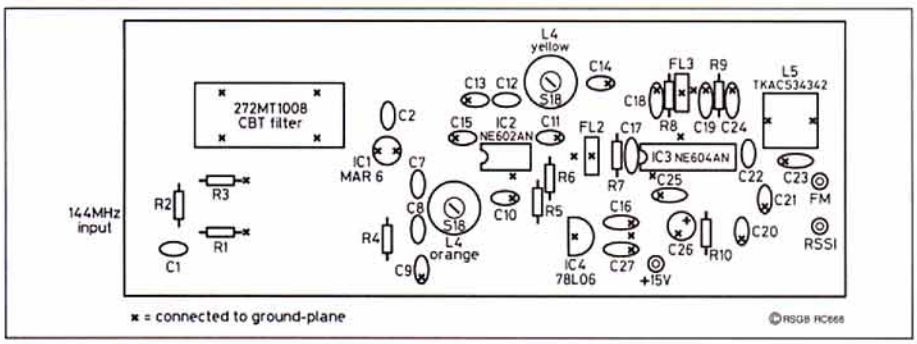


Fig 10: 144MHz Rx board layout.

CONTROL AND PROCESSING

This is built on a double-sided PCB as well. Component layout is shown in **Fig 11**. Note the links which need to be made on the top side - these will need insulating from the ground-plane. If you wish, you can use sockets for all the ICs except IC11. Connections to this board are made via multi-way PCB plugs and sockets.

A number of components (D1 - 2, RV3 - 6, R19, IC12) are mounted on a separate board on the back of the meter terminals, shown in **Fig 12**. Note also that C12 is not a board-mounted component; it is connected between the centre pole of S3 and the top of AF gain control RV1. Incidentally, don't skimp on the meter. The bigger the better, within reason. The ten-turn offset control RV2 should be fitted with a turn-counting dial with a lock. SK3, a 5-pin DIN socket, is mounted on the front panel and provides logic signals and power for some of the accessories described later.

*Any correspondence via RSGB HQ, or via Internet: g4pmk@marsport.demon.co.uk

POWER SUPPLY

The low voltage components are mounted on a small PCB, and the layout is shown in **Fig 13.** Note the provision of small heatsinks for IC1 and IC2 on the board.

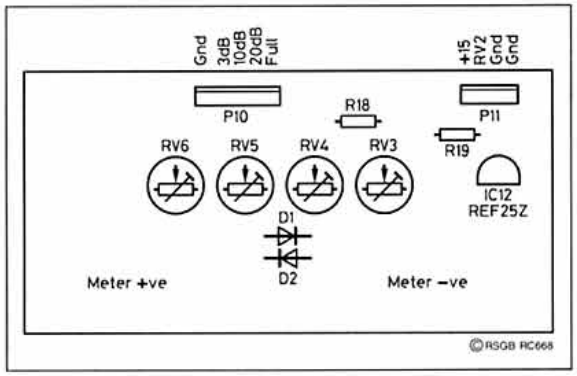


Fig 12: Meter board layout.

FINAL ASSEMBLY

BASIC TESTING of the boards should be done before final assembly of the system. A metal case is essential for this project. Use a filtered IEC socket assembly for mains input. I mounted the mains switch on the back panel as well, thus keeping the mains wiring away from the low-level circuits. Naturally the front panel arrangement is a matter of personal choice. **Fig 14** shows a connection diagram for a two frequency system. Virtually all board inter-wiring is via multi-way PCB mount connectors.

SETTING UP RATS

TO PERFORM THE alignment and calibration, a certain amount of test equipment is required. An oscilloscope, test-meter, low-level RF sources for 28 and/or 144MHz and a switched attenuator (1, 3, 10 and 20dB) or a set of fixed attenuators are required. You will also need the noise source you plan to use as well.

Firstly, build and check out the power supply! The RF sections can be tested and aligned by themselves using a signal source and a multi-meter. Apply a signal (not more than about -30dBm) to the RF input, and connect a meter (10V range) to the RSSI output. The input frequency is a matter of personal choice, depending where your interests lie; with an IF bandwidth of over 250kHz and when considering the bandwidth of the devices being measured, it isn't too critical. I chose 28.15MHz (transverting to 432.15, a compromise for SSB and CW) and 144.2MHz (transverting to microwave SSB calling).

For the 28MHz version it may be best to align the filter using a source and RF detector (which can be placed on the output of the modamp) first. If you have a frequency counter, this can be loosely coupled with a loop and the LO set. Carry out final adjustment with box base fitted on. Adjust the appropriate LO coil for a maximum meter indication; reduce the input as appropriate. The RF coils can then be finally peaked. As a guide, about -70dBm input should produce 2V output, with a minimum detectable signal (MDS) of about -110dBm. The RSSI output should be 500mV or less with no signal and the input terminated. If it is more, then there is some feedback around the IF amplifier, which will need correcting first.

To check out the control/processing board, first apply power via connector P1. Confirm that the oscillator is running with an oscilloscope connected to pin 3 of IC1, and that the dividers are working by examining their outputs. If you have an external trigger input or (luxury!) a twin-channel scope, you can observe the relationships between the NOISE and sample outputs. Now connect up the rest of the circuitry, including the meter (note the polarity!). Set RV2 fully counter-clockwise, and S2 to FULL. With S1 set to SS, apply a test signal of -30dBm and adjust RV3 for full scale. Reduce the signal input to give about half FSD. Using the attenuators, RV2 and the range switch, adjust the range presets (RV 4 - 6) to provide full scale ranges of 20, 10, and 3dB. Finally, if you have an FM signal source, adjust the discriminator coil in the RF unit for optimum audio output.

One further calibration step will be useful, if you have access to a calibrated signal source. Put a DVM on the RSSI output, and plot a graph of input signal (in dBm) against RSSI output. You will find that the curve is S-shaped, with a long straight slope in the centre. Mark the meter (or make a note) of the upper and lower points of the linear section which should be about -100 and -40dBm. **Fig 15** shows an example. These represent in SS mode the minimum and maximum signal levels for using RATS. If you don't have the equipment to carry out this procedure, you won't go far wrong by setting the meter to indicate FSD with 12.2V applied to R17 (disconnect P10 first), then marking the meter at 20% and 90% of FSD.

ACCESSORIES

AN ESSENTIAL ACCESSORY is a gain block. This is often needed for use with preamplifiers or low through-gain transverters. The design of the gain block is shown in **Fig 16.** Based on a MAR 6 modamp, it is similar to the post-filter gain stage in the receiver units. It should be built on the double-sided PCB in a small metal box with appropriate coaxial connectors. Although I've shown 1nF SMD capacitors, small leaded ceramics will also work well. Note the arrangement for the two modamp ground leads, and also the different connections of the alternative modamp. Power should be connected via a feed-through capacitor and taken from the front panel accessory socket.

A switched attenuator, or a couple of fixed pads are also very useful. A switched attenuator set was described in [2]. Two sections of 10 and 20dB will be adequate. This is used to reduce the input level to the meter when measuring transverters with excessive gain.

NOISE HEADS

IDEALLY, THE METER should be used with a high quality noise head. Some excellent surplus devices appear on the surplus market from time to time. A good quality design has appeared in [3], but is not cheap. A more

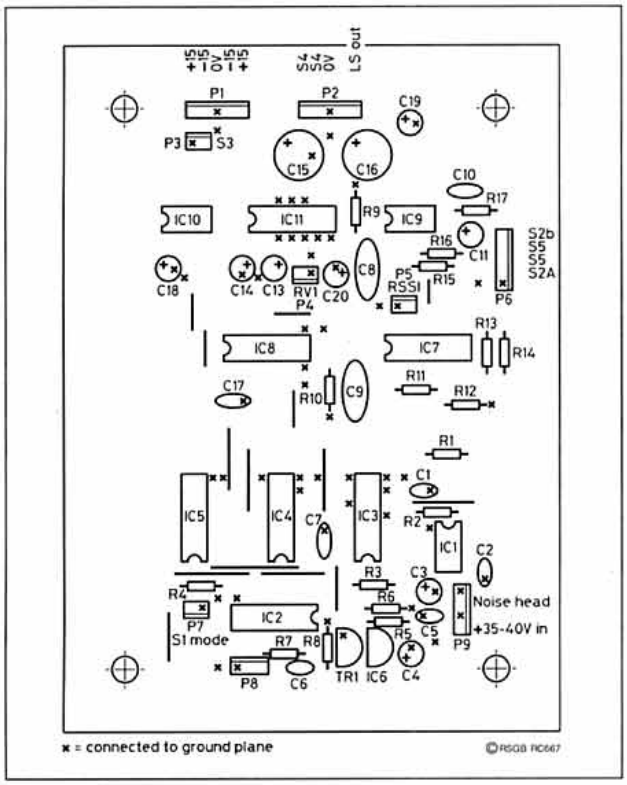


Fig 11: Control board layout.

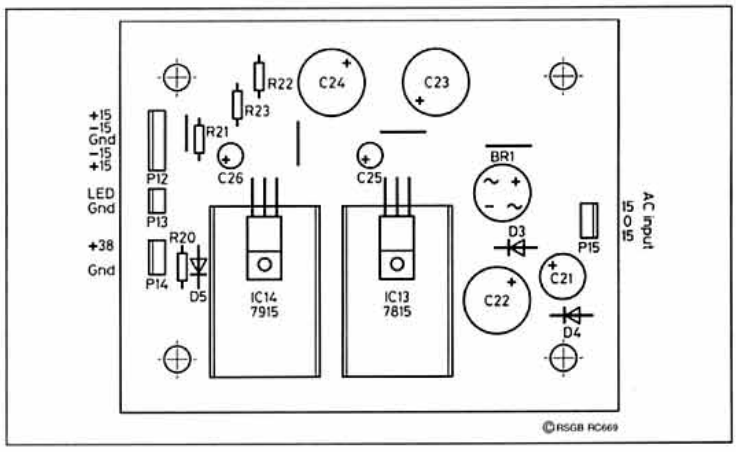


Fig 13: Power supply board layout.

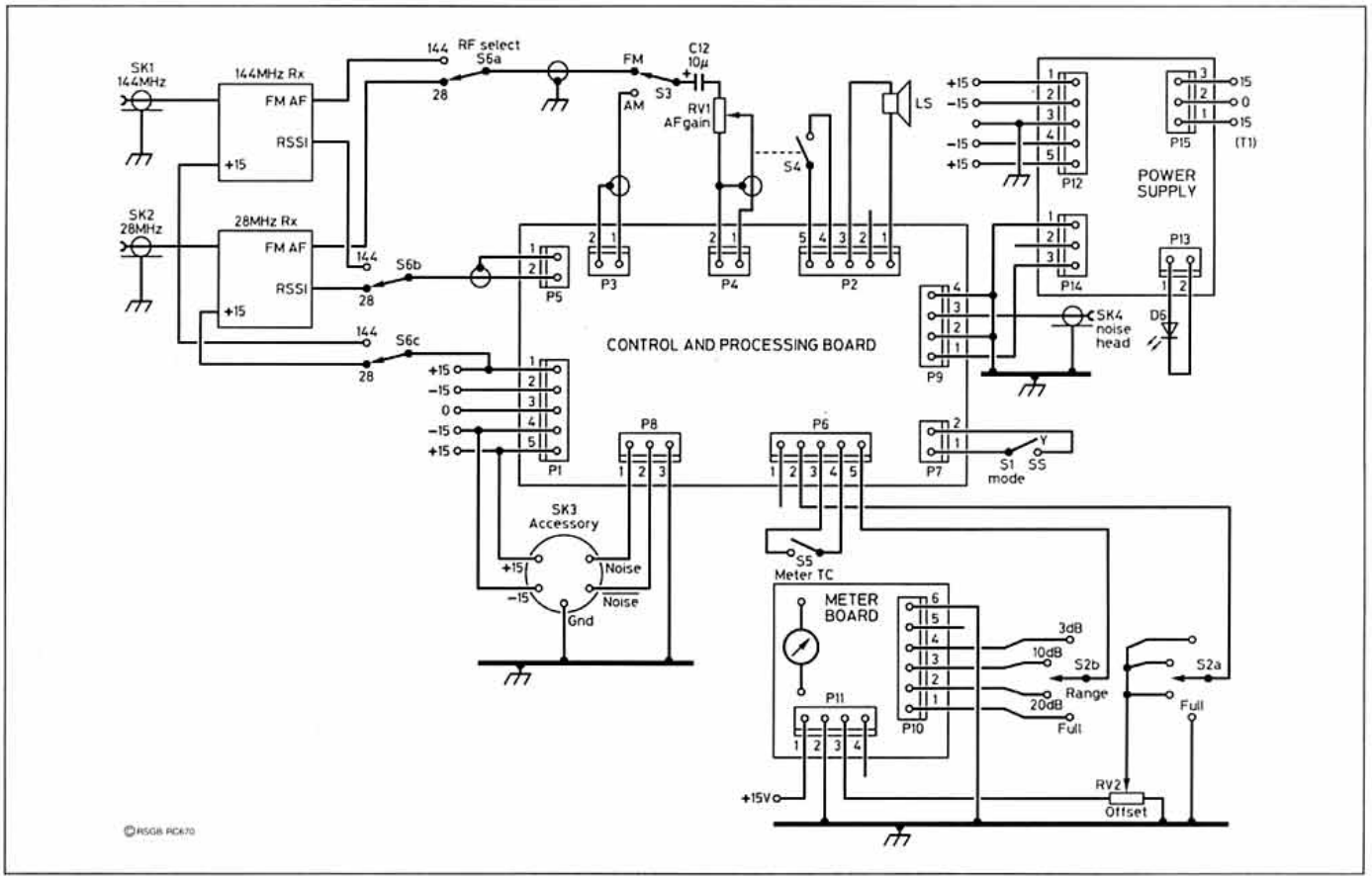


Fig 14: Interwiring diagram.

economical head was described in [2], and (slightly modified for use on a 28V supply), with constant-current drive is shown in **Fig 17**, and the corresponding PCB layout is shown in **Fig 18**. Whatever source you use, it needs to have an ENR of about 5 - 10dB, and a good return loss. Significant errors will result if the input return loss varies between the on and off states [3], particularly when adjusting GaAsfet amplifiers which will have low input return loss. In practice a substantial attenuator added to the output will go a long way towards achieving this.

The source of Fig 17 has one built-in, and is OK for most uses to at least 23cm at least in part because of the SMD resistor attenuator on the output. It is made in either a tinplate box or a small in-line module case. The double-sided PCB has its underside as a ground-plane, the components (both conventional and SMD) being mounted on the track side. It is important to link both sides of the board together with through-wire links, as shown. If the board is fitted in an in-line module case (rather than a tinplate box where it can be soldered in place) then it is important also to link the board edges with small strips of foil. Consider a BNC the minimum specification for the output connector - a chassis mounting N connector is a much better choice.

USING RATS

USING RATS IS really quite simple. However there's one important caveat that you should always bear in mind when using a noise source. Since such a source is broadband, anything that uses a frequency conversion system (such as a transverter), should have good enough front-end selectivity to reject the image sideband. If it hasn't then you won't get meaningful results. The receivers in RATS itself are OK, so this won't be a problem when measuring at 28 or 144MHz.

It is very important that the signal levels used during measurement fall somewhere within the linear part of the RATS response, as mentioned earlier. So the first step is always to check the RATS meter reading in SS mode. You can adjust the input level to RATS with the accessory gain block or attenuator if necessary.

Look back at Fig 1, which shows some example applications. Essentially in SS mode RATS is a calibrated receiver. Thus it is quite possible to measure gains and losses of system components such as attenuators and amplifiers using the SS mode and the range and offset controls. Example A shows a set-up for a 28MHz preamp. A dotted line shows a link used to take the preamp out of circuit. I've shown a 28MHz source being used, although you could use a noise source. Of course, due to the slight non-linearity of the RSSI (Fig 15) the standard of accuracy won't be perfect, but it should be OK for the majority of workaday applications. If you have a good quality switched attenuator, you can insert this in the path and merely use RATS in SS mode as a indicator, adjusting the attenuator to give the same meter reading as you got without the device under test (DUT). This 'substitution' method works well with the 3db range and the offset control, as it's possible to see a difference of 3.3% (0.1dB) very easily.

Example B shows how the loss of a length of cable could be measured at 3.4GHz. It's OK to use a noise source here (if the cable loss isn't too great) provided that the transverter has good enough image rejection. If it hasn't or you are looking at lossy cable, then you would need to use a 3400MHz signal source. To measure the loss in the cable, simply set RATS to SS mode with a back-to-back connector in the test set-up (dotted line) instead of the cable length. Using the range and offset controls, set the meter to full scale on, say, the 10dB range. Insert the cable length and measure the loss in dB directly from the meter.

Fig 1 also shows two examples of set-ups for NF optimization. Example C shows the simplest possible set-up, for a 144MHz preamp. In practice, you might well need the gain block accessory inserted between the preamp output and RATS to bring the signal level onto the

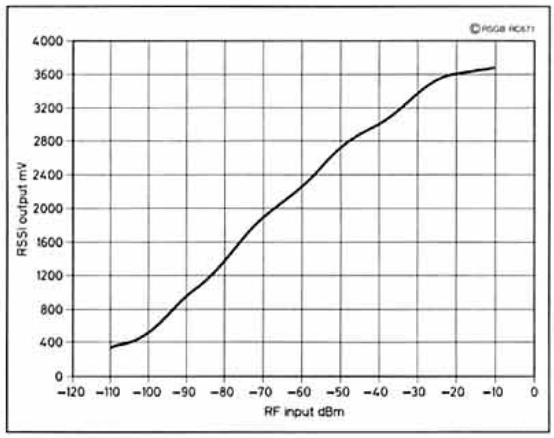


Fig 15: Typical Rx response curve.

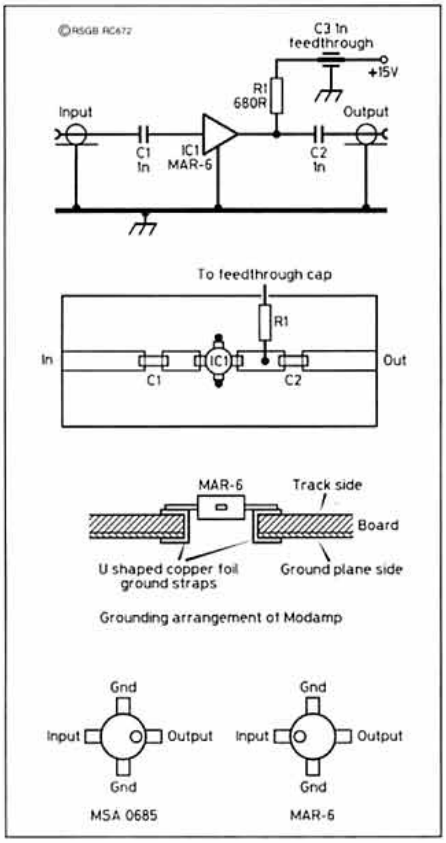


Fig 16: Gain block circuit and layout.

linear part of the RATS response curve. Example D shows an application where a transverter is needed - of course, the preamp might be built into the transverter anyway!

In summary, to optimize the NF, connect the output of the DUT to the appropriate RF input socket, and connect the noise head to the input of the DUT. Power up the test item and allow a few minutes to settle. Switch to SS mode and confirm that the meter is operating over the linear portion of its range, by examining the meter reading with the noise source on and off - simply done by disconnecting the 28V drive cable. If necessary, adjust the input level by using the accessory gain block or an attenuator. Switch to Y mode and, using the meter range switch and offset control, select about half-scale and, say, the 10dB range. Now simply tweak the input circuit for max! Resist the temptation to fiddle with the output tuning - that won't affect the noise figure, but can seriously reduce the gain - which you won't be able to see in Y mode. If necessary, you can use the higher resolution ranges. An occasional check in SS mode that operation is still occurring in the linear part of the range would be a good idea.

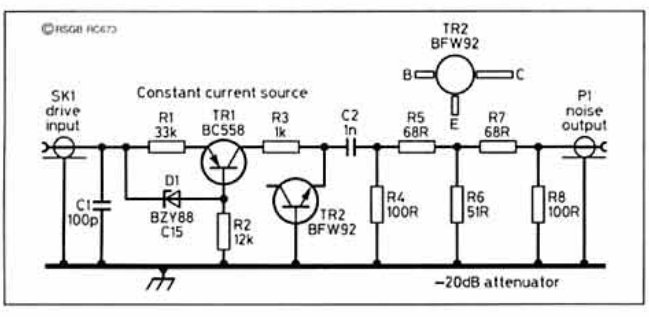


Fig 17: Noise head circuit .

You may hear the received signal as an 800Hz tone with the audio monitor, particularly in AM mode. It's a good idea to keep an ear on the audio monitor - any funny noises could mean the DUT is unstable, or there is break through from a local signal.

FURTHER MODIFICATIONS AND ACCESSORIES

ONE WORTHWHILE ADDITION is to use separate offset controls for SS and Y-factor modes, selected by an additional pole of S1. It would also be useful, if front panel space permits, to put an on-off switch for the noise source. This can consist merely of a SPST toggle switch in series with the supply to SK4. More ambitiously, the noise source could be switched between normal (pulsed) operation, continuous operation or off. This can be achieved with a SPDT (centre off) toggle switch. The pole of the switch is connected to ground and is used to ground the gate of TR1 (source continuously on) or the junction of R5 and R6 (source off). In the centre-off position the source is pulsed as normal.

If you have access to the appropriate equipment, it might well be possible to calibrate RATS in terms of absolute NF. Some information on this is in the Appendix. Of course, you can't expect such accuracy and stability as you would get from a commercial PANFI. The slight non-linearity of the RATS response curve prevents an accurate calibration over its dynamic range, so select a linear portion for the working range adjusting externally the applied signal level to RATS.

Under some circumstances, it might be appropriate to consider crystal control for the 144MHz LO if it is likely to be used away from a cosy shack. This can be achieved by removing the oscillator coil and feeding an external signal into pin 6 of the NE602, with pin 7 bypassed to ground by 100pF.

A most interesting use of a NF meter for EME stations was described in [4], an amateur application of the Dicke method used in radioastronomy for measurement of celestial radio sources. This technique can be applied to sun and moon noise measurement. Basically a diode switch is used to connect the receiver input to either a reference resistor or an antenna. For microwave use, this will need to be done at IF, substituting an artificial noise source (such as a spare receiver, amplifier or indeed a noise source!). A synchronous detector (as used in RATS) indicates the difference between the two. The two front panel logic signals (NOISE and NO NOISE, from SK3) can control the switch.

CONCLUSION

ALTHOUGH NOT A BEGINNER'S project, anyone with some RF project construction experience should be able to tackle it. I hope you find RATS a useful and interesting piece of test-gear, and that you find it earns its place on the workbench - mine certainly has. In conclusion, I'd like to thank my beta-testers: Russ, G4PBP and Ian, G3SEK for their help with this project.

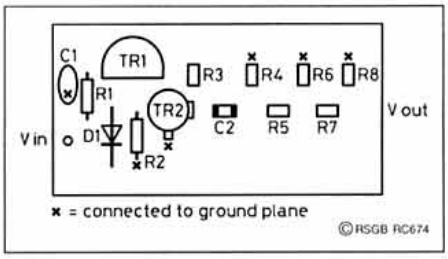


Fig 18: Noise head PCB layout.

REFERENCES

[2] *The VHF/UHF DX Book*, (DIR publications) Chapter 12 Test Equipment.

[3] 'Construction of a Precision Noise Figure Measurement System Part 2'. R Bertelsmeier DJ9BV, H Fischer DF7VX. *Dubus Technik III* p117.

[4] 'EME Tracking Aid using Thermal Noise on 13'. S Jones GW3XYW. *Dubus* 2/94 p56.

[5] 'Automatic Noise Figure Meter'. ET Gisske K9IMM. *Ham Radio*, February 1980.

[6] 'Novel Approach to Automatic Noise-figure Measurement'. R Bertelsmeier DJ9BV. *Dubus Technik III*, p117. ♦

APPENDIX

LET'S START WITH a derived definition of Noise Figure (NF) - if you're interested, a derivation is given in [5] and [6].

$$NF = ENR - 10\log\left(\left(\frac{N_{on}}{N_{off}}\right) - 1\right) dB$$

where NF is the noise figure, ENR is the Excess Noise Ratio of the noise source being used (in dB) and N_{on} and N_{off} are the receiver outputs with the noise source off and on respectively.

Putting this a slightly different way:

$$\frac{N_{on}}{N_{off}} = \frac{(NS_{on} + N_{rx})}{(NS_{off} + N_{rx})}$$

Here N_{on} is the sum of two components: NS_{on} is the noise power output from the noise source when switched on, and N_{rx} is the noise power due to the receiver itself. N_{off} similarly consists of two components, NS_{off} from the noise source (now switched off) plus the same N_{rx} from the receiver.

The quantity (N_{on}/N_{off}) is also known as the Y-factor, so RATS is displaying log(Y) on a linear scale of decibels. Going back to the definition of noise figure, we can rewrite this as:

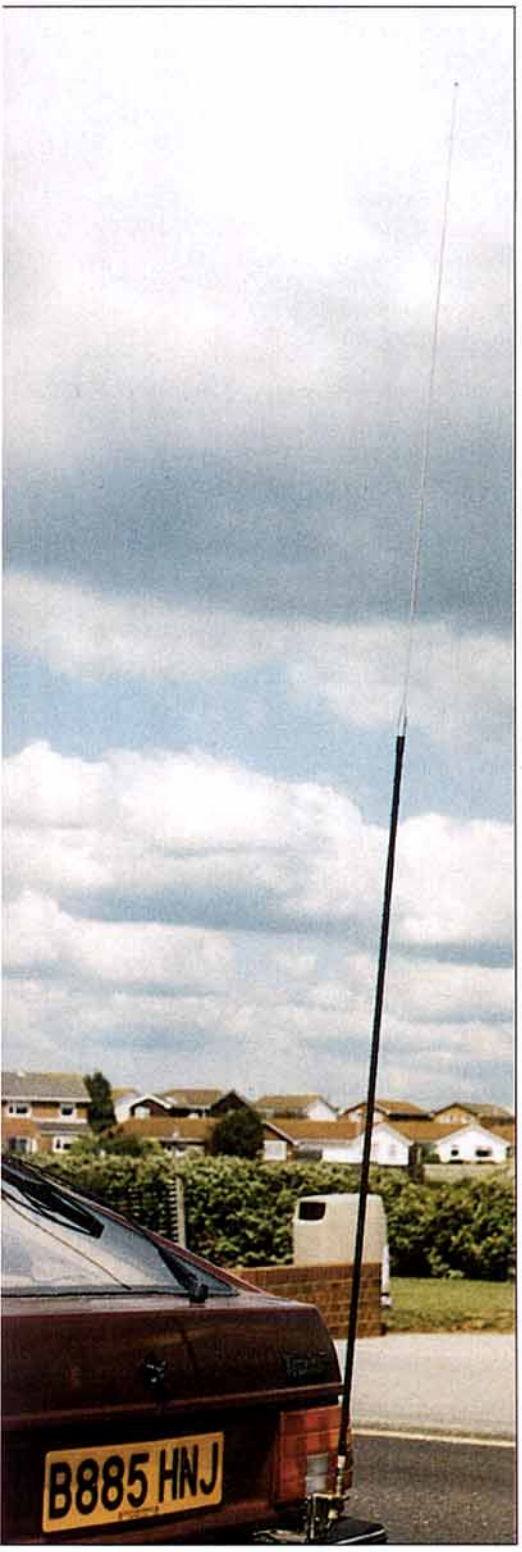
$$NF = ENR - 10\log(Y - 1) dB$$

Note that RATS is not displaying NF directly: it's displaying Y in dB. In order to calculate NF from the measurement provided by RATS, you have to convert Y(dB) into a ratio, subtract 1 and convert back again to dB. Then, if you know the ENR of your noise source, you can calculate the NF. This isn't as convenient as a professional PANFI which continuously computes and displays NF directly in dB, but RATS' indication of maximum Y-factor is just as reliable. All you have to do extra when using RATS is to make one single calculation at the end.

RADCOM USER REVIEW

Pro-Am Series of HF Mobile Antennas

Reviewed by RSGB HQ Staff



THE PRO-AM ANTENNAS are a range of mobile antennas, manufactured by Valor Enterprises Inc, Ohio, USA, for the HF bands. A list of antennas available is given at the end of this review.

This review covers two of the antennas in the range, namely the PHF80 for the 80 metre band and the PHF20 for the 20 metre band.

The Pro-Am antennas are very slender and have a low visual impact, see photograph (left). On the PHF20 the lower section of the antenna comprises a 125mm long fibreglass tube, only 10mm in diameter and the loading coil is wound as a helix along the full length, using a method called continuous loading. On the 20 metre antenna the coil is wound with a winding spacing of 18mm from the bottom to 24cm from the top. The coil is then close wound for 55mm followed by three turns over the last 17cm length of the fibreglass tubing. This last section is to accommodate the adjustable whip section; more about this later.

Construction of the PHF80 is similar except that the coil is close wound from the bottom to within 17cm of the top; nearly the whole length of the fibreglass tube.

AJUSTMENT OF RESONANCE

THE ADJUSTABLE WHIP section is fixed to the top of the fibreglass tubing coil with a stainless-steel bush and held in place with a couple of Allen screws. The effective length of the whip section is achieved by sliding the whip into, or out of, the fibreglass tube to set the resonant point of the antenna to the preferred section of the band.

The instructions with the antenna advised against a setting that results in the lower part of the whip inside the coil. They suggest that if operation is required at the top end of the band (where the whip section is shorter) then a short length should be pruned from the bottom of the whip section; steel cored coils are very lossy! This can easily be read as 'none of the whip section should be inside any part of the coil'. Subsequent examination of the whip section showed that the coil was designed so that part of the whip could be inserted into the top section of the coil with very little loss, see photograph (right).

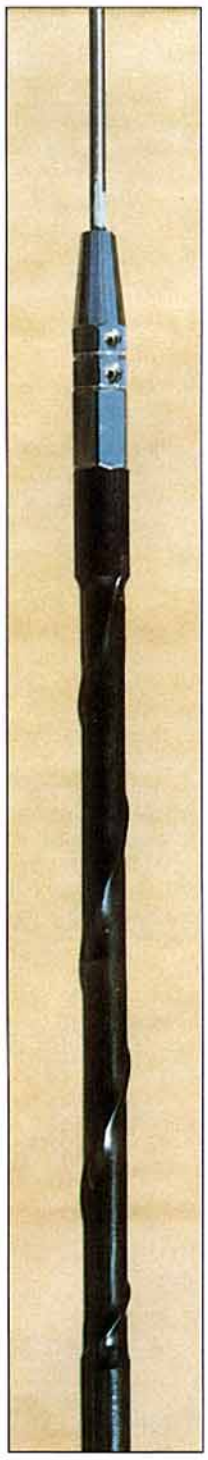
Left: The Pro-Am antenna has a low visual impact so is difficult to photograph.
Right: Top section showing the construction of the coil and the arrangement to accommodate the lower section of the whip without noticeable loss.

HELICAL WINDING

TRADITIONAL wisdom regarding mobile antenna design in most antenna handbooks favours relatively short, larger diameter coils with a high Q [1].

However, in a recent *RadCom* [2] Denis Walker, G3OLM, noted that an important parameter of mobile antenna design is low self capacitance of the loading coil; and that this may account for why the very long coils, favoured by the commercial manufacturers, have proved to be so successful. This view was also stated by John Belrose [3] who said: "Since the Q-factor for a helix can be the same or better than the Q-factor for a centre loaded whip, its radiation efficiency can be at least as good . . ."

The G6XN analysis [4] of an 80 metre quarter wavelength of wire helically wound on an 8ft former (1in diameter) is that its efficiency would be 3.6% compared with an efficiency of 4% for a centre loaded design. He does then goes on to say that the helix would be somewhat improved by coil spacing tapering, ie wider spaced winding for the lower half and closer spacing for the top half (this construction is used on the Pro-Am antennas).



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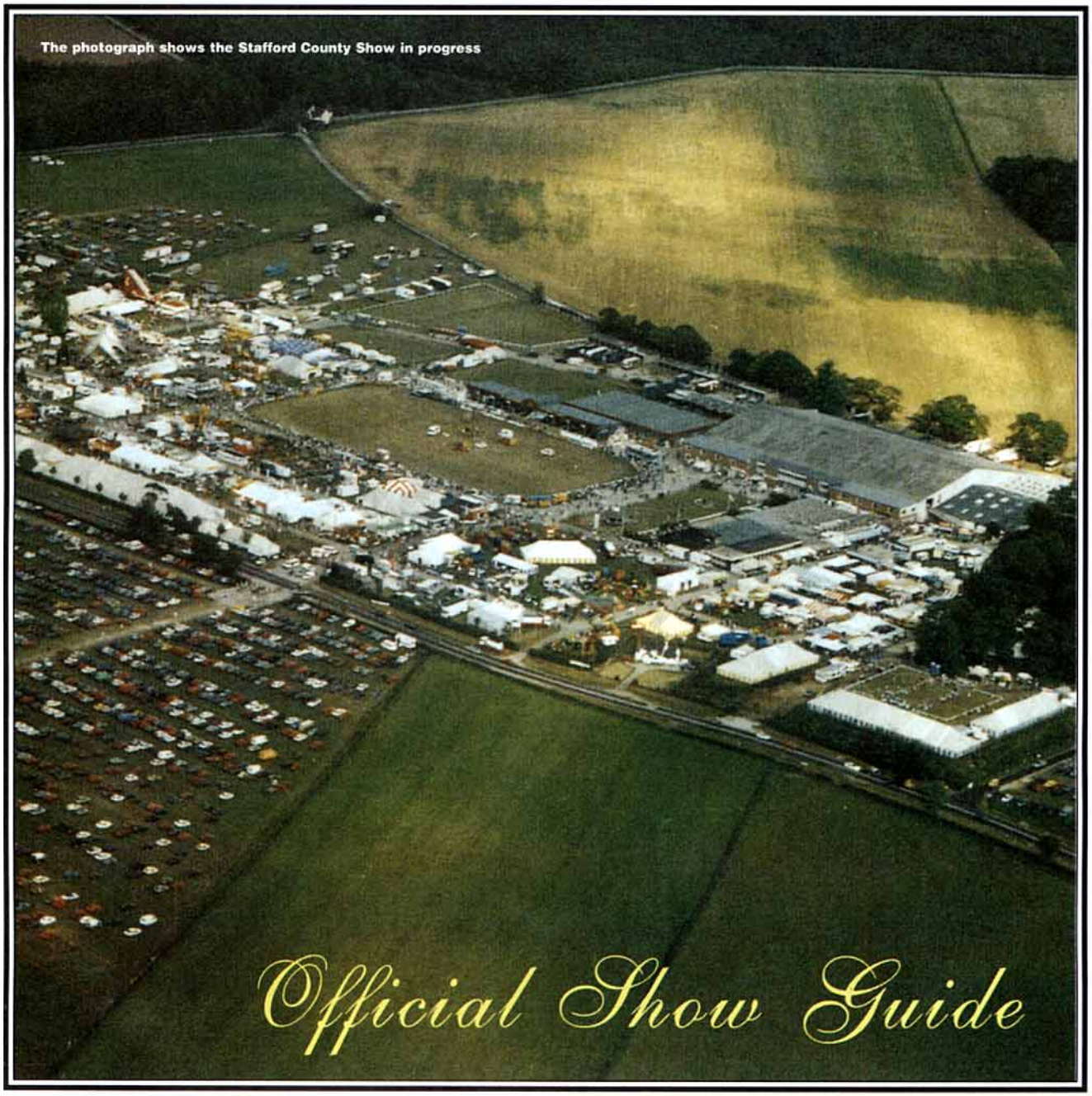

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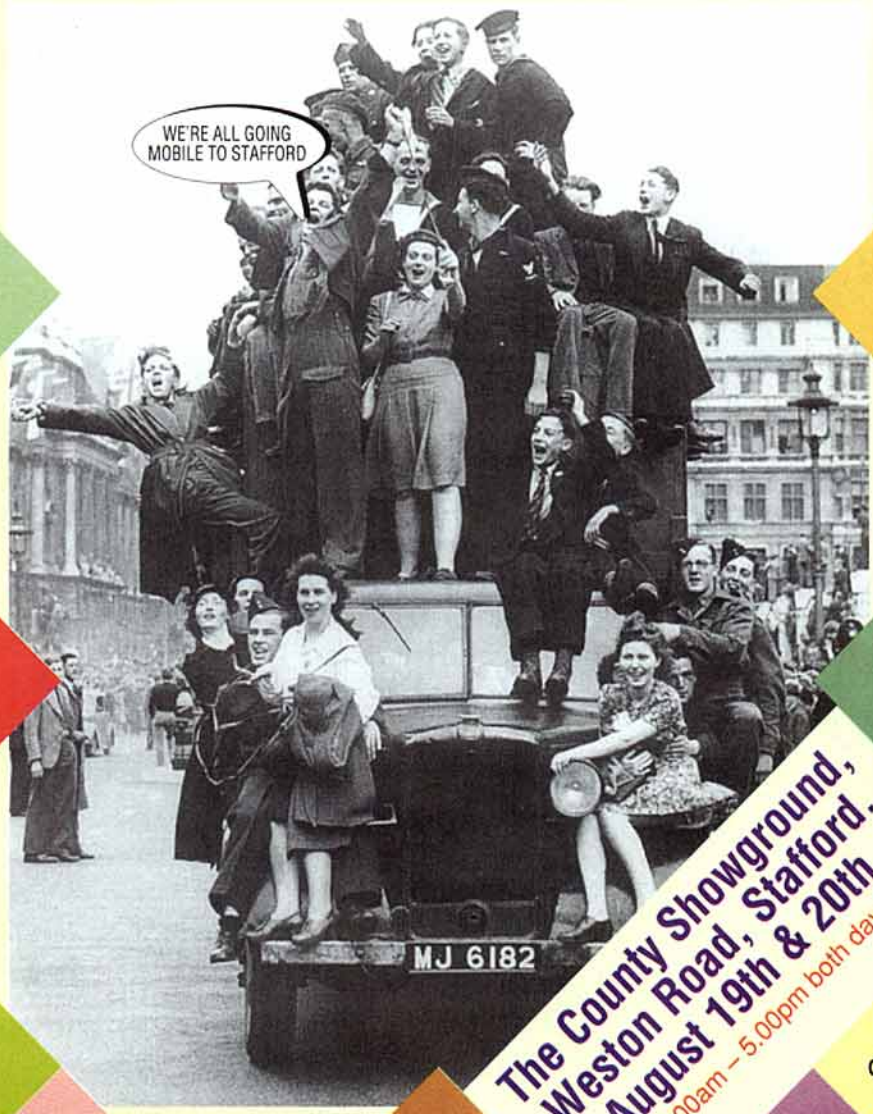

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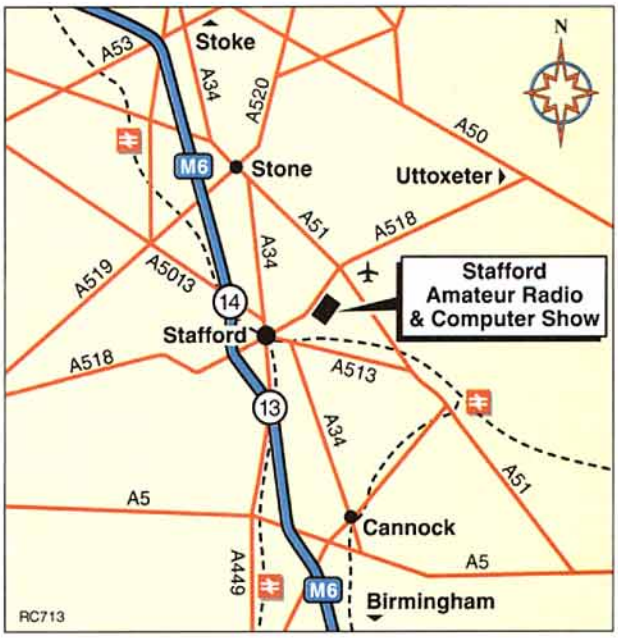
By Rail

Take the train to Stafford (100 minutes from Euston). Public transport passes the showground from the town centre (Saturdays only).



Accommodation

A number of hotels are within a few miles of the Show. The following have offered showgoers special rates:

Garth Hotel

Wolverhampton Road, Moss Pit, Stafford (tel: 01785 56124)

Accommodation: Double / Twin (two people sharing) - £45 per room. Single - £25 per room. This includes VAT and Full English Breakfast. Restaurant available.

De Vere Tillington Hall Hotel

Eccleshall Road, Stafford (tel: 01785 53531).

Accommodation: Dinner, Bed and Breakfast - £45 per person. Bed and Breakfast £35 per person. Restaurant and Health & Leisure Club available.

STAFFORD AMATEUR RA

Incorporating RSGB National

OPENING TIMES:

10am to 5pm on both days

- *RSGB Committees*
- *Lecture Programme*
- *Hourly Free Prize Draw*
- *Large Trade Show*

LECTURE PROGRAMME

SATURDAY

11.00am RSGB MORSE EXAMINERS SEMINAR (closed session).

12.30pm AN INTRODUCTION TO VHF CONTESTING by David Johnson, G4DHF (Chairman of the RSGB VHF Contests Committee). Specifically aimed at the newcomer to VHF contesting, the talk will cover a wide range of topics, including equipment, optimising the station, methods of operating and submitting an entry.

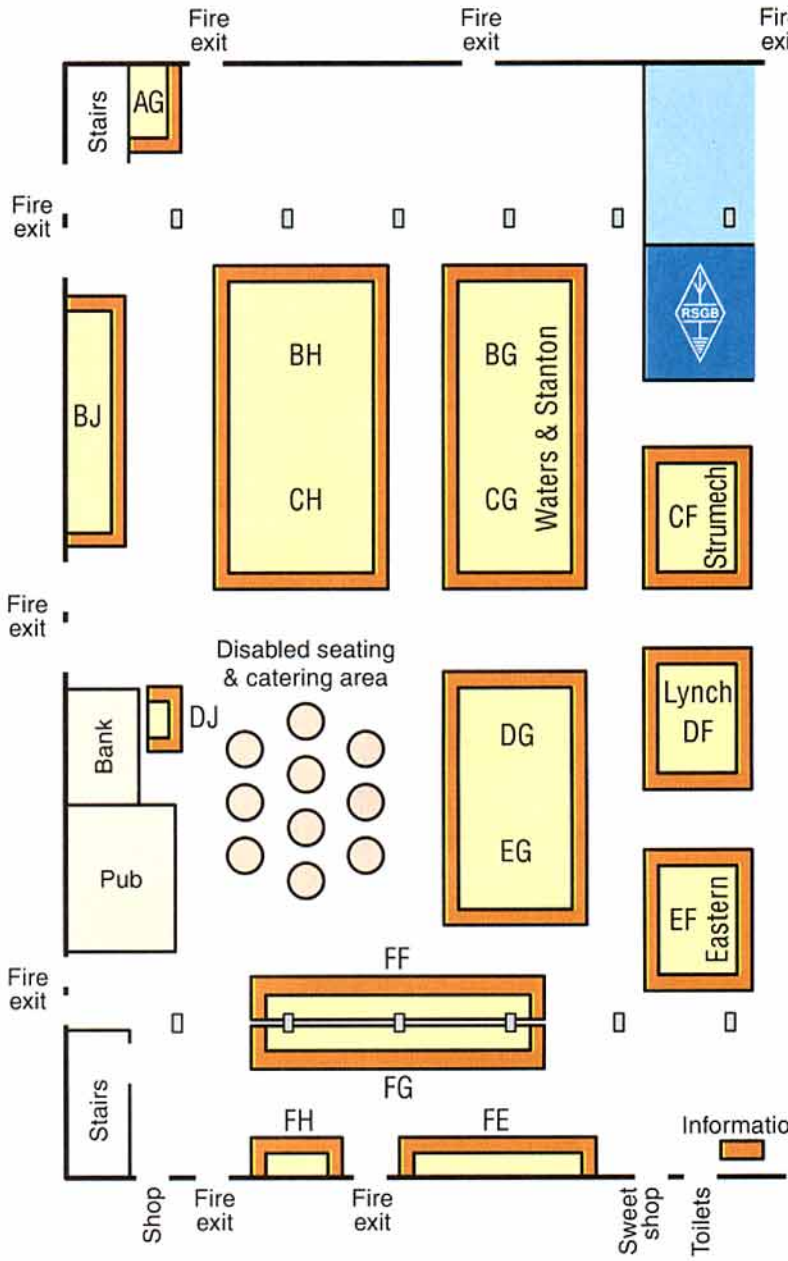
2.00pm LATEST REPEATER DEVELOPMENTS by Geoff Dover, G4AFJ (Chairman of the RSGB Repeater management Group). Hear the latest news regarding 50MHz repeaters, progress on resolving problems associated with 1.3GHz TV repeaters, etc. The talk will be followed by a REPEATER OPEN FORUM: Come and make your views heard on any repeater-related subject; eg 'How can the repeater network on 70cm be modified to accommodate novices?'

SUNDAY

11.00am RADIO AMATEURS, TRAINING THE NEXT GENERATION by Phil Mayer, G0KKL (RSGB Project YEAR Co-ordinator). The talk will begin with a brief history of the Novice Licence Training Scheme and a statement of the current position, followed by future training for the RAE and possible developments beyond that, including incentive licensing. Do you have difficulty in finding an RAE course in your area? If so, come and tell the committee. Come and make your views known on the subject of training, and let the committee know your suggestions for possible changes in the RAE syllabus.

12.30pm INSTANT MORSE by Steve White, G3ZVW. The most popular lecture at this year's RSGB London Amateur Radio & Computer Show comes to Stafford. Come and witness what many regard as impossible, as members of the audience learn the Morse code in minutes.

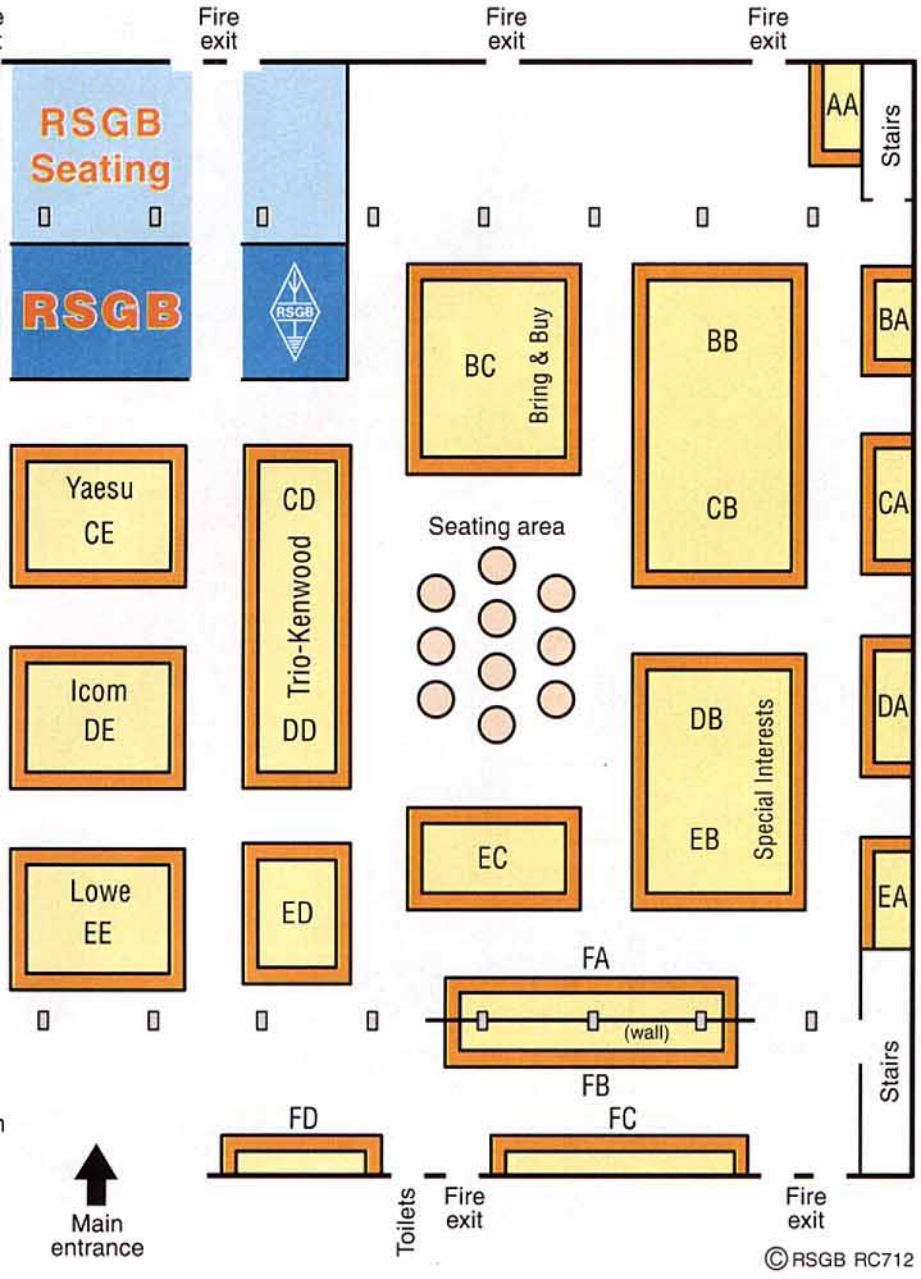
2.00pm PACKET RADIO OPEN FORUM by the RSGB Datacomms Committee. An opportunity for the committee to give a brief explanation of what they do, then to answer questions that anyone has on any aspect of digital comms, including site clearances. Tom Lilley, G1YAA, the committee chairman, will give an up-to-the-minute reaction to the DSI2 report, which relates to the European proposals for loss of 4MHz of the 70cm band.



DIO & COMPUTER SHOW

Amateur Radio Convention

- *Bring & Buy Sale*
- *Free Parking*
- *Morse Tests on demand*
- *Special Interest Groups*



ADMISSION

Adults: £2.00
Concessions: £1.50

WHERE ARE THEY?

EXHIBITOR	BLOCK
533 Software	CB
Agile Sales	FF
AJP Communications	AA
AMSAT UK	DB
Arnold G C & Partners	DG
BARTG	EB
Baymont	CB
BD Media	EG
Capital Products	EG
Computer Junk Shop	CH
CTI	DH
Dalkeith Associates	CB
Direct Computer Supplies	BA
Dosher J	CH
Eastern Communications	EF
Four Plus Computers	BJ
Graham Thomas	EH
GS Electronics	EC
Harding Electrical	EG
Haydon Communications	DA
House of CD Rom	EG
Icom UK Ltd	DE
Indigoquest Ltd	BB
International Listeners Assn	EB
ISWL	EB
Linear Amp UK	ED
Lowe Electronics	EE
Mailtech	FA
Manor Court Supplies	EC
Martin Lynch	DF
Maxpak	EB
Mirage	ED
OCI	DJ
Programme X	BH
Prosoft Multimedia	BJ
Ram Direct	EC
RNARS	EB
RSGB	BD - F
Satellite Surplus	FA
Second Chance Computer	BG
Software Shack	BH
Strumech	CF
SW Shareware	FF
Syon Trading	EA
Time Step Electronics Ltd	CA
Trio Kenwood	CD/DD
UKFM Group	DB
Valkris Communications	FA
Waters & Stanton	BH/CH
Wentworth Offices	DG
Woudstra	EF
Yaesu	CE

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G4HKS
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20818	11 ELE FIXED	£68.95
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20909	9 ELE FIXED	£39.95
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A3S 3ELE BEAM	£349.00
A3WS 18/24 BEAM	£275.00
D3WS 10/18/24	£179.00

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TSB-3315	2/70 BASE 8.5/11.9db	£119.95
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TSB-3301	2/70 BASE 6.5/9.0db	£74.95
TSB-3302	2/70 BASE 4.5/7.2db	£59.95
TSB-3302	2M BASE 6.5db	£37.95

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TSM-1005	2M 7/8TH 5.2db MOBILE	£39.95
TSM-1320	2/70 2.1/3.8db MOBILE	£19.95
TSM-1326	2/70 2.1/5.0db MOBILE	£27.95
TSM-1332	2.70 4.5/7.2db MOBILE	£42.95
TSM-1607	2/70/23 2.8-8.8db MOBILE	£49.95

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IF YOU WANT TO BE HEARD RUNNING MOBILE "HF", THEN CHOOSE THE FAMOUS "PRO-AM" RANGE FROM VALOR, USA.

PHF-160 Enormous 160M Centre Loaded Whip	£54.95
PHF-80 Almost as big 80m Centre Loaded Whip	£24.95
PHF-40 The nuts nuts on 40m, at a mere	£22.95
PHF-20 The way to DX, (safely) on 20m	£19.95
PHF-15 You guessed it, the same but on 15m	£19.95
PHF-10 I'll give you one guess	£19.95
AB-55 bander 10-80 in one antenna. It works!	£89.95
BB-2 Massive Spring mount for L.F. Whips	£49.95
116-NP gutter mount with 3/8 thread	£6.95
142-ADP Body mount with 3/8 to SO239	£9.95

DIGITAL FILTERS

TIMEWAVE DSP9+	£229.00
TIMEWAVE DSP9MK11	£179.00
TIMEWAVE DSP59	£279.00
JPS NTR1	£199.00
JPS NIR10	£399.00
MFJ 784	£239.00

AEA PRODUCTS

DIRECT USA FACTORY APPOINTED

PK-900
Deposit £47.95, 12 x £36.00 plus FREE software worth £29.95! ..... RRP **£479.95**

PK-232MBX
Deposit £29.95, 12 x £25 plus FREE software worth £29.95! ..... RRP **£329.95**

NEW!! PK-96 ..... RRP **£199.95**

ISOLOOP 10-30MHz The very best LOOP ANTENNA!
Deposit £39.95, 12 x £30.00.
FREE CARRIAGE! ..... RRP **£399.95**

IT-1 IsoTuner for ISOLOOP ..... RRP **£269.95**

KK-1 Keyboard Keyer
The ultimate Morse Keyer ..... RRP **£229.95**

IF YOU SEE ANY AEA PRICES CHEAPER - CALL US!!!!

!!NEW!!

PK-12
RRP **£139.95**

THE IC-706

Frequency Range:	RX:30kHz-200.000MHz continuous
Transmit:	1.8-30MHz+50-54MHz+144-146MHz
Modes:	LSB/USB, CW, RTTY, (FSK), AM, FM and WFM (RX only).
Power:	1.8-30MHz 100W, 50-54MHz 100W 144-146MHz 10W
Dimensions:	167(W)*58(H)*200(D) mm
Weight:	2.5kg (5.8lb)
Memories:	101, incl. 9 Alphanumeric.
AUTO ATU available:	Yes, as option (external)
Removable Front Panel:	Yes

with FIVE YEARS WARRANTY included

If I had a pound for everyone who's asked me "have you got the new IC-706 in yet?", I could probably retire. Icom's new baby has set the Amateur Radio world alight with enthusiasm and eagerness at its early, (bit too early) announcement.
There are all sorts of amazing offers on this little marvel, from a FREE PSU, to a FREE HOLIDAY with Tom Frisbie in MARBELLA. You name it, even though the new toy didn't exist in production form in JULY, it didn't stop the FREE GIFT brigade trying to tempt you. And why not indeed. I think, however, that a FIVE YEAR WARRANTY is far more interesting (and probably more sensible on a new design). Buy a new IC-706 off Lynchy and you can have a staggering 5 years worth of trouble free cost free operation at our expense.

IC-706 with FIVE YEARS WARRANTY THROWN IN. £1195.00
Also available on special LOW COST FINANCE TERMS, call SALES for details. 0181 566 1120

PLACE YOUR ORDER HERE

HEIL SOUND

New Products Corner

At last the excellent range of Bob Heil's Headset and Boom microphones, together with his famous replacement microphone inserts are now available.

Heil Proset-5
Professional Quality Boom Headset, dual padded earphones, flexible mic boom, includes HC-5 "Full range" insert for superb speech quality. Requires AD-1 cable ADAPTOR for KENWOOD/ICOM.
£119.95 incl. VAT

Heil Proset-4
Identical to Proset-5, but includes HC-4 "DX" microphone insert. Ideal for punching through the pileups. £119.95 incl. VAT

Heil HC-4. Replacement microphone insert for existing fist or base microphones. With 10DB peak at 2KHZ and the low end rolled off sharply at 500HZ, (12DB per octave), the HC-4 is the ultimate DX mic insert.
£28.95 incl. VAT

Heil HC-5
Identical to HC-4, but High Articulation, offering superb SSB quality, rolls off sharply under 350HZ and above 3100HZ, peaking at 2.4KHZ. "Hi-Fi" SSB Audio.
£28.95 incl. VAT

Heil AD-I/K/Y
Adapter leads to interface the proset Headset/boom microphones to 8 pin Yaesu, Icom or Kenwood transceivers.

AD1-I "Blue" Lead for Icom	£11.95
AD1-Y "Yellow" Lead for Yaesu	£11.95
AD1-K "Red" Lead for Kenwood	£11.95

Linear Amp UK

As used on by the award winning contest group, GWORDI on the recent RSGB 6M Trophy.

Peter Rodmell has been busy refining his excellent range of high power LINEAR AMPLIFIERS. New anode tuning mechanisms, new case design and much improved paint schemes have boosted the U.K. based company's export sales through the roof!
A full range of linears from HF through, to 70cm are now available. Employing Eimac 3CX800A7 high mu triodes for the VHF "Discovery" Linears, (or 8874's in the 70cm version), Eimac 3500-Z tubes for the "Hunter" HF Range, all units are fully self contained, including power supply, delay timer to ensure valve cathodes are thoroughly warmed up and if specified, a low loss set of change over relays.
Full legal output can be achieved with drive from as low as 10 watts, (400 watts) and where licensing permits, 1 kw output is obtainable with only 35 watts of drive. (Slightly less on 70cm).

Available on INTEREST FREE FINANCE, the new Linear AMP UK range is available from only £1199.00.

ICOM IC-775DSP - WITH FIVE YEARS WARRANTY!

First, a little history lesson... The new top of the range IC-775DSP is advanced today as the IC-701 was, fourteen years ago. Whilst the rest of the worlds Amateur Radio manufacturers were still producing sets with "VFO's", Icom steamed in with a world first - an HF transceiver with a REAL synthesizer. It was literally YEARS before the rest caught up. How long will it be with Icom's latest IC-775DSP - the worlds first HF Transceiver with proper Digital Signal Processing? Icom's new baby really deserves six pages to describe the advance in design the new IC-775DSP has to offer. It has been designed from the ground up using serious high quality components and offers features and performance you'll find nowhere else.

The new IC-775DSP is so good, MARTIN LYNCH is arranging appointments to fully explain the operating features offered by the worlds most advanced HF Radio. Compare with the very best YAESU and KENWOOD can offer, with all three sitting side by side. To arrange a "test drive" call the LYNCH Sales Desk today. 0181 566 1120.

For those of you who can't visit the London Showroom, we would be delighted to send you details. Just call or write.

ATTENTION FT-290R MK2 OWNERS!

Three years ago, muTek and LYNCH bought you an improved version of the Yaesu FT-736R. By installing the "RDX" boards the signal to noise and sensitivity on both two and seventy were greatly improved.
1995 brings another great muTek design - a newly developed "optimised" preamplifier for the Yaesu FT-290R mk2. The SLNA290S consists of a low loss relay for TX/RX switching, a low noise amplifier based on the BF998, a variable attenuator such that the gain can be varied without effecting the noise factor or dynamic performance of the L.N.A., and a matched filter to reject out of band signals.

Supplied with fitting instructions for the FT-290Rmk2 is £39.95 p&p £3.00 or fitted in our workshops for £79.00, + £7.50 return carriage.

, EALING, LONDON W13 9SB

Yes I Would Rather Buy From Martin Lynch!

NEW LIST PRICES FOR YAESU, KENWOOD & ICOM

HF EQUIPMENT

ICOM		
IC707	LIST £889	ML PRICE
IC738	LIST £1649	ML PRICE
IC736	LIST £1969	ML PRICE
FT840	LIST £899	ML PRICE
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FT900	LIST £1399	ML PRICE
FT900AT	LIST £1599	ML PRICE
FT990DC	LIST £2099	ML PRICE
FT990AC	LIST £2399	ML PRICE
FT1000	LIST £3999	ML PRICE
FL7000	LIST £2339	ML PRICE
FRG100	LIST £599	ML PRICE

PHONE FOR LATEST DISCOUNTED PRICES

KENWOOD		
TS50S	LIST £1059	ML PRICE
TS450S	LIST £1499	ML PRICE
TS450SAT	LIST £1649	ML PRICE
TS850S	LIST £1809	ML PRICE
TS850SAT	LIST £1959	ML PRICE
TS950SDX	LIST £3999	ML PRICE

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IC281H	LIST £449	ML PRICE
IC2340H	LIST £689	ML PRICE
IC820H	LIST £1795	ML PRICE
ICZ1E	LIST £529	ML PRICE

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FT41R	LIST £369	ML PRICE
FT23R	LIST £259	ML PRICE
FT51R	LIST £529	ML PRICE
FT290RII	LIST £599	ML PRICE
FT690RII	LIST £649	ML PRICE
FT790RII	LIST £749	ML PRICE
FT8500	LIST £749	ML PRICE
FT736R	LIST £1999	ML PRICE
FT5200	LIST £729	ML PRICE
FT2500M	LIST £399	ML PRICE
KENWOOD		
TS790E	LIST £1959	ML PRICE
TM255E	LIST £949	ML PRICE
TM455E	LIST £1059	ML PRICE
TM742E	LIST £879	ML PRICE

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TM733E	LIST £729	ML PRICE
TM251E	LIST £419	ML PRICE
TM451E	LIST £459	ML PRICE
TH79E	LIST £479	ML PRICE
TH22E	LIST £254	ML PRICE
TH42E	LIST £289	ML PRICE
ALINCO		
DRM06E	LIST £359	ML PRICE
DR150E	LIST £399	ML PRICE
DR-70	LIST £1095	ML PRICE

PHONE FOR LATEST DISCOUNTED PRICES

REMEMBER ! ANYTHING OVER £200 WE CAN FINANCE, EVEN HEAVILY DISCOUNTED PRICES, USUALLY AT ZERO APR! JUST CALL OR WRITE FOR DETAILED INFORMATION.

It's now June and I'm already writing copy for August! Yaesu and Kenwood have just sent me their new price lists. The Bad news is all prices are up. The good news is I've cleared Yaesu and Kenwood's stocks of popular lines in their warehouses and it's now sitting in mine - ALL AT PRE-INCREASE PRICES!!
If you are serious on buying that new piece of kit then hurry - otherwise suffer another 8-12% !!

TRADE PRICES ON NEW BOXED YAESU FT-736R

Part of the increase in prices, the versatile Quad Bander from Yaesu has almost pipped the £2000 mark. (Who said Amateur Radio wasn't a good investment?). I've got a vault full of the things and I'm prepared to sell them to you at TRADE PRICE!
Yaesu FT-736R RRP: £1999.00
ML PRICE: £1499.00

YAESU FLAG SHIP,
FT-1000 AT TRADE MONEY - TWO PIECES ONLY!!

Actually, LESS than Trade. I have two new boxed FT-1000's at 5% less than trade price. No catch, just helps when you buy stock before the prices leap up!
Yaesu FT-1000 RRP: £3999.00
ML PRICE: £2899.00

MICROWAVE MODULES

MICROWAVE MODULES ARE BACK! FIRST - FROM MARTIN LYNCH

MML432-30LS	25-30W 70CM LINEAR WITH PREAMP, 1/3 DRIVE	**£169.95**
MML432-50S	50W 70CM LINEAR WITH PREAMP, 10-15W DRIVE	**£169.95**
MML432-100S	3/10W DRIVE	**£329.00**
MML144-30LS	30W 2M LINEAR WITH PREAMP, 1/3W DRIVE	**£99.95**
MML144-100S	100W 2M LINEAR WITH PREAMP, 10W DRIVE	**£179.95**
MML144-200S	3/10/25W in	**£329.00**
MML 70-100S	100W 4M LINEAR WITH PREAMP, 10W DRIVE	**£179.95**
MML 50-30LS	30W 6M LINEAR WITH PREAMP, 1/3W DRIVE	**£99.95**
MML 50-100S	100W 6M LINEAR WITH PREAMP, 10W DRIVE	**£179.95**
MML 50-100LS	100W 6M LINEAR WITH PREAMP, 1/3W DRIVE	**£199.95**

SAVE TWO HUNDRED POUNDS
ON A NEW DUAL BANDER!

Another "bulk purchase", give me £529.00 and I'll give you a BRAND NEW BOXED FT-5200, High Power Dual Band Mobile. No catch, full manufacturers warranty. (RRP £729.00), If you order mail order add £10.00 for post & packing.

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One of the biggest advantages of moving to the new showroom eighteen months ago was the increase in workshop space. Graham Tingey heads the service team and together with Brian Greenaway our Customer Services supervisor, we guarantee to get your sick radio or accessory back quicker than anyone in the U.K. Our servicing rates are competitive too. Linked directly to the main distributors for spares and the only company able to offer a whole year of extra warranty once your set has been repaired, (provided it's less than eight years old), try MARTIN LYNCH next time you need a repair service. You'll be pleasantly surprised. Contact Brian, G3THQ on 0181 566 1120.

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Opening Times
Monday - Saturday 9.30 - 6.00

See us at the Stafford Show 19th & 20th August at Kings Lynn on August too!

RADIO READY PCs

PEACOCK

All items are available on Low Cost Finance, call for details. Please note: The QUAD speed CD-Rom, 16 BIT sound card & speakers shown in the photograph are optional extras costing £295.

All machines are loaded with HAM software, including Log Program, Packet Controller, Word Processor, DOS V6.2, Windows for Work Groups V3.11, plus lots more. *Pentium 90 and DX4/100 Machines are also available. Carriage extra at £20 per system, UK Mainland.

Specifications

Motherboard	VLB
Cache	256K
RAM	See each machine
HDD	See each machine
Controller	VL Bus
VGA card	SPEA VEGA PLUS
VGA Mem	1MB, VLB
FDD	3.5" 1.44MB
Keyboard	Yes - Cherry
Mouse	Yes - Logitech
Software	DOS V6.2, WFW V3.11
Monitor	14" SVGA .28 pixels Non-interlaced, Low Radiation with Power Management

FOUR OF THE BEST
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PEACOCK DX2/66 BASIC PC
4Mb RAM, 420Mb Hard Disk ..... **Price incl. VAT, £999.00**

PEACOCK DX2/66 'PREMIUM' MULTIMEDIA QUAD PC
4Mb RAM, 540Mb Hard Disk, 2Mb VGA Mem, Quad Speed CD-Rom, 16 Bit Sound Card, Speakers ..... **Price incl. VAT, £1499.00**

PEACOCK PENTIUM 75 PC
8Mb RAM, 730Mb Hard Disk ..... **Price incl. VAT, £1499.00**

PEACOCK PENTIUM 75 'TAKE' MULTIMEDIA QUAD PC
8Mb RAM, 730Mb Hard Disk, Quad Speed CD-ROM, 16 Bit Sound Card, Speakers ..... **Price incl. VAT, £1789.00**

NEW!!!!!! Peacock notebooks!!

From June '95, Peacock have introduced a selection of notebook PC's to their collection.

Peacock 450 Notebook	**Peacock 590 Notebook**
DX2 50MHz CPU	Intel 90MHz CPU
4MB Ram	8MB Ram
241.3mm Mono LCD (colour LCD see below)	10.3" Dualscan Colour LCD**
250MB HD (Upgradeable to 520)	250MB HD (Upgradeable to 520)
Dos, WFWG 3.11	Dos, WFWG 3.11
£1239.00 incl VAT, MONO.	£2799.00 incl VAT, Dualscan
£1599.00 incl VAT, COLOUR.	£3999.00 incl VAT, Active Matrix TFT Colour LCD

CONTACT STEVE JELLY - OUR DATA COMMS EXPERT FOR FULL INFORMATION

STAFFORD SHOW PRODUCT NEWS

We asked exhibitors to tell us what products would be launched or featured at Stafford Show. Here are their replies . . . .

The information below is compiled from information sent in by the manufacturers and distributors concerned. Details are published in good faith but the RSGB cannot be held responsible for false or exaggerated claims made in the source material.

Icom (UK)
Stand DE

FOUR NEW Icom models will be displayed for the first time in the UK at the Stafford show. These are the **IC-706,** the world's smallest 100W HF + 6m *and* 2m transceiver with 30kHz - 200MHz general coverage receiver (featured in *Product News* in the July *RadCom*); the **IC-T22E** (pictured here), a new 2m handheld; the **IC-T42E** a new 70cm handheld transceiver; and the **IC-2350H**, Icom's latest dual band (2m / 70cm) mobile transceiver. The IC-2350H, pictured to the right, offers 50W output on 2m and 35W on 70cm, switchable to 10W and 5W, and no fewer than 110 memories. Other recently-released models which will be featured on the Icom stand include the **IC-775DSP**, Icom's new top-of-the-range HF base station transceiver with full Digital Signal Processing and built-in second receiver (featured in *Product News* in the May 1995 *RadCom)*; the **IC-W31E** dual band handheld (details in July's *Product News*); and the **IC-Z1E**, another dual band hand-held which was first featured at the RSGB London Amateur Radio and Computer Show in March (see the *RSGB LAR&CS Product News* in the centre pull-out section of the March *RadCom*).

Linear Amp UK
Stand ED

LINEAR AMP UK is the name behind the popular **Hunter 750** and **Explorer 1000** HF linear amplifiers, which will be featured at the show. Both amplifiers use 3-500ZG valves to produce a continuous full legal limit signal on the 1.8 - 28MHz bands. The Hunter 750 uses a single valve, measures 14 x 9.5 x 16in and weighs 25kg. The Explorer 1000 uses a pair of 3-500ZGs, is in a slightly larger case, and weighs 38kg. Both amplifiers feature 'soft-start', which eliminates the high initial current suffered by most large amplifiers, pre-heated cathodes, pre-tuned input circuits on each band to provide correct matching to the driver, and front-panel ALC adjustment.

Martin Lynch - Stand DF

MARTIN LYNCH will be featuring the first imports in the UK of the **Icom IC-706** mini HF / VHF transceiver. See *Product News* in the July *RadCom* for more information on this latest marvel of miniaturisation - or see it in real life at the Stafford show!

Ask any DXer or contester what headset they use and the chances are they will reply 'Heil'. Martin Lynch will be showing the range of American **Heil Sound** microphones and headsets at Stafford this year, including the **HC-5** ('full articulation') and **HC-4** ('DX quality') mic inserts, designed to replace existing fist or base microphone inserts. Also on display will be the **Heil Proset** 'professional quality' boom headsets with padded earphones, microphone boom and HC-5 or HC-4 inserts. A range of cable adapters are available to connect the headsets to Icom, Yaesu or Kenwood transceivers.

Since the introduction of **Peacock's** 'radio-ready' PCs earlier this year, several higher specification models have been added to the range. **Pentium 75** and **Pentium 90 PCs** will be on show, fitted with multimedia systems with the latest CD-ROM drives and 16-bit Sound Blaster cards.

Also on the Martin Lynch stand will be a working display of the range of **AEA** data products including the **PK-900**, the **PK-96** and the ubiquitous **PK-232**.

Yaesu - Stand CE

THE FULL RANGE of Yaesu equipment will be featured at the show. New from Yaesu comes the **FT-8500,** a dual band (2m / 70cm) high-power mobile transceiver. With a removable front panel and three power output levels - 50 / 10 / 5W (high power 35W on 70cm) - the FT-8500 offers flexible mobile operation and easy installation. The 'Omni-Glow' orange-coloured LCD display includes a 'Spectra-Analyzer' which indicates activity on channels above and below your operating frequency. Other features include a built-in digital voltage display to monitor your car battery voltage and menu-selectable Packet baud rate (1200 / 9600BPS).

Trio-Kenwood UK Ltd
Stand CD / DD

THE USUAL WIDE range of Kenwood equipment will be on display at the Stafford Show. Please make a point of seeing David Wilkins, G5HY, on the stand for news of the latest Kenwood products.

Waters and Stanton - Stand BH / CH

THE NEW **Alinco DX-70** miniature HF transceiver with 6 metres is creating a lot of interest amongst amateurs everywhere and the DX-70 will be on display at the Waters and Stanton stand. [Recently we were fortunate enough to be able to put one of the first DX-70s imported to the UK through its paces. You can read the results in the user review on pages 59 - 60. The DX-70 was also featured in *Product News* in the May 1995 *RadCom - Ed*]

Waters and Stanton will also be featuring a wide range of MFJ products at the Stafford show, including the **MFJ-784B DSP Filter Mark 2**, the latest audio filter using digital signal processing; the **MFJ-411 portable Morse code tutor**; the **MFJ-1278DSP multimode data controller** with built-in DSP; the **MFJ-8621 two-metre packet-only transceiver**, which at just £139 is understandably selling very well; and the **MFJ-1798 multiband vertical antenna**. The latter covers all the HF bands from 80 - 10m plus 6m and 2m [a perfect combination for the DX-70 transceiver? - *Ed*].

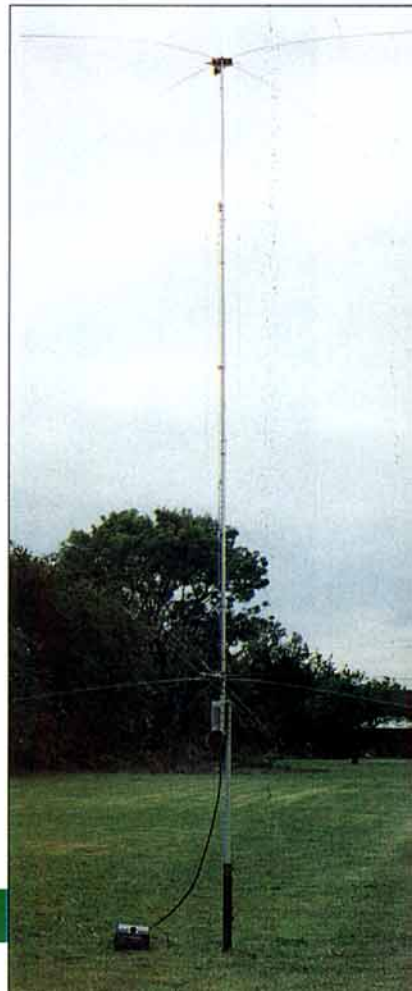
Waters and Stanton are now importing **Coax-Seal** direct from the USA. This is a 'space-age' putty-like plastic material which can be moulded around outdoor antenna connections for waterproofing and protection. It stays malleable at any temperature and will provide years of protection for all of your coaxial cables and connectors.

Make Sure You Visit the RSGB Stand BD-BF

Lowe Electronics
Stand EE

LOWE ELECTRONICS will be launching the new **JPS ANC-4 antenna noise canceller** at Stafford. The ANC-4 is designed to cancel out noise from sources such as TV sets, computers, power lines etc. It is connected at the antenna connector of the receiver or transceiver, or between a transceiver and linear amplifier, and can handle up to 150W PEP on transmit. It will provide typically a 40dB drop in local interference levels.

Also on display at Stafford will be the series of **Vårgårda antennas**. These Swedish-made VHF and UHF beams use top-quality materials and wide element spacing to produce superb high-gain aerials which are built to last. Lowe Electronics has recently been appointed the UK distributor for Vårgårda Radio AB.



LINEAR AMP UK

EXPLORER and HUNTER HF LINEAR AMPLIFIERS
10 – 160m incl. WARC

SEE US AT STAFFORD SHOW!

The Explorer and the Hunter linear amplifiers both use 3-500ZG valves in grounded grid configuration. The Hunter uses a single valve to produce around 750 Watts and the Explorer has two valves producing in excess of 1200 Watts.

Both of these two HF linear amplifiers cover the amateur HF bands from 10-160m including all the WARC bands. They are designed to give continuous operating for long periods, particularly the Explorer, so are ideal for contesting.

Specification:-

	EXPLORER	HUNTER
Supply	220-240V 50-60Hz @ 12A	220-240V 50-60Hz @ 8A
Control	12V @ 150mA	12V @ 150mA
Drive	10-130W	10-100W
Output	100-1200W + (RMS)	60-750W (RMS)
Dimensions	W 390mm. H 240mm. D 430mm (15.5") (9.5") (17")	W 360mm. H 240mm. D 405mm (14") (9.5") (16")
Weight	38kg	25kg

Features:-

- Soft-start fitted as standard which eliminates the high switch-on current that most large amplifiers suffer from, but more important the cold resistance of the directly heated cathode is pre-warmed before the full 5 volts is applied.
- Pre-tuned input circuits are incorporated on each band so your transceiver sees a 50 ohm input load on each band.
- Cooling is achieved using a Papst fan which passes a lot of air but is quiet in operation.
- Internal PSU means the whole unit is self-contained.
- ALC adjustable from the front panel so your transceiver gives the correct amount of drive for a selected max O/P from the amplifier.

EXPLORER 1000

HUNTER 750

Peter Rodmell G3ZRS

LINEAR AMP UK,
Field Head,
Leconfield Road,
Leconfield, Beverley,
E. Yorks., England.
HU17 7LU
Phone/Fax
(01964) 550921

STAFFORD
AMATEUR RADIO & COMPUTER SHOW

Incorporating RSGB National Convention

RSGB Book & Information Stand

Books

Come and browse through books from the RSGB, ARRL and many others, before you buy at over-the-counter prices. Amongst a huge range of amateur radio publications on sale are our two new books: *Practical Transmitters for Novices* and *Test Equipment for the Radio Amateur*.

Information

Ask HQ staff members and senior volunteers about the RSGB and its work on your behalf.

Committees

See the work of the specialist committees of the RSGB on display and consult committee members. Hear key RSGB volunteers speak on their specialist subjects in the lecture hall (see floor plan for lecture programme).

Subscriptions

Renew your membership, join a friend, or subscribe to one of our popular newsletters.

Software Demonstration

Try out the *RSGB SkyCall UK Callbook on Disk*. You'll be impressed.

100 Years of Radio

See an exhibition of photographs of historic radios and events, with the emphasis on Marconi.

Rest and Relaxation

Have a rest, chat to your friends, review your purchases or eat your sandwiches in a seating area provide by the Society.

Special Offers

Available at these prices only at the Show

- *Radio Communication Handbook* **£15**
- *Space Radio Handbook* **£8**
- *VHF/UHF Manual* **£7**
- *Technical Topics Scrapbook* **£6**
- *Subscribe to D-i-Y Radio at the Show and take away all 27 back numbers absolutely* ***FREE***.

But hurry as offers are only valid while stocks last.

Come and see us on Stand BD - BF

NEW DUAL BAND

Dual Band Mobile FT-8500

Never before has Yaesu technology changed an industry so dramatically.

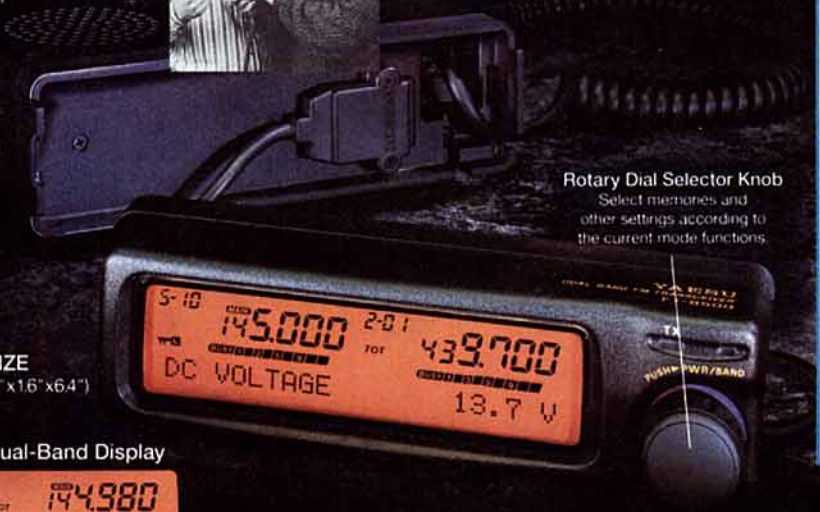
"With the Smart Controller Mic, all the radio functions are in your hand."

"And, look, the digital voltage display monitors my car battery voltage!"

"Spectra-Analyzer lets me check out channel activity in UHF, VHF and keep track of my favourite repeaters, too."

"Yaesu did it again!"

Rear-panel data jack for packet with 6-pin connections for Data Input, PTT, 9600 bps and 1200 bps Receive Data, Squelch Status, Ground.



Rotary Dial Selector Knob
Select memories and other settings according to the current mode functions.

ACTUAL SIZE
140x40x160mm (5.6"x1.6"x6.4")

Specifications

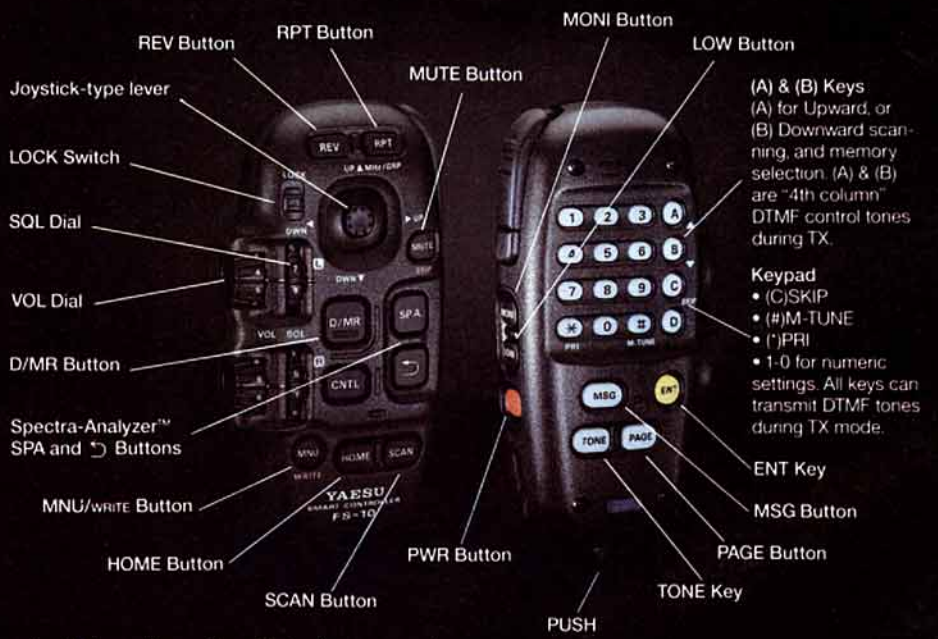
- **Frequency Coverage:**
  2m RX: 110-174 MHz
  TX: 144-146 MHz
  70 cm RX: 420-500 MHz
  TX: 430-440 MHz
- Spectra-Analyzer™ w/adjustable signal width, spacing & span markers
- 6-Character Alpha-Numeric Display
- 110 Memories (in 5 memory banks)
- Omni-Glow™ Display
- Digital voltage display
- Selectable 1200/9600 baud
- 3-Level Auto-Mute w/Mute Timer
- V+V, U+U, V+U Dual Receive
- 3 Power Output Levels
  2 m 50/10/5 Watt
  70 cm 35/10/5 Watt
- Built-in Auto Power Off (APO) and Time-out Timer (TOT)
- MIL-STD 810/C Rating
- 9 Memory DTMF Autodialer
- Handy Cloning Feature
- 3 Scanning Modes w/ Clear Scan
- Adjustable LCD Contrast/ Brightness Control
- **Accessories:**
  Consult your local Yaesu dealer.

Omni-Glow™ LCD Dual-Band Display

VHF&VHF, UHF&UHF, VHF&UHF
Select three dual band configurations. Menu loop contains 13 headings and 53 transceiver settings. Shown with custom 6-character alpha-numeric code.

Spectra-Analyzer™ displays station activity above and below the current operating channel. In Memory Recall, display signal strength of programmed channels.

Built-in digital voltage display monitors automobile battery voltage. Menu-Selectable Packet Baud Rate. Choose 1200 or 9600 bps.



The FT-8500 and Smart Controller™ Microphone demonstrates Yaesu's world leadership position in 2-way radio communication again! With just four simple flicks of the Smart Controller™ Microphone "joystick"-type lever, you command over 50 separate functions from the palm of your hand! The FT-8500 defines "high-tech" in mobile radio engineering.

The Smart Controller™ Microphone isn't the only engineering advancement. Watch the unique Spectra-Analyzer™ exhibit station activity above and below your current operating channel, and the digital voltage readout monitor your car battery voltage big and bold in the Omni-Glow™ display. In V+V, U+U or V+U view frequencies and custom alpha-numeric messages at the same time. Other features include handy cloning, selectable 1200/9600 baud, and a rear-panel data jack for packet! All of this and more in the deluxe, compact FT-8500.

The extraordinary FT-8500 Dual Band Mobile is at your Yaesu dealer now. Find out how this dramatic change will affect mobile technology for you from this day forward.

YAESU

Performance without compromise.™

YAESU UK LTD. Unit 2, Maple Grove Business Centre, Lawrence Rd., Hounslow, Middlesex, TW4 6DR

Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

This Month's Book Choice

AMATEUR RADIO DIRECTION FINDING

Edited by George Whenham, G3TFA.
85 pages (A4) soft covers.
Published by RSGB, issue 2, October 1994.
Price £4.95 from RSGB Sales, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

Reviewed by Richard Gaskell, G0REL

HAVE YOU ever thought about taking part in a Top Band DF hunt or a 2m 'Foxhunt', but not known how to get started? If so, this may be the book for you. It was published recently by the RSGB ARDF Committee.

The first part of this book describes 160m Amateur Radio Direction Finding (ARDF) contests. A summary of events and the trophies is followed by the competing procedure and the specification for a suitable receiver. Details are given for the construction of two receivers, one simple and one that is more advanced, and for a simple transmitter. The 160m National ARDF Rules complete this section.

The second part covers VHF ARDF, or 'Foxhunting'. Once again there is a description of the techniques and equipment employed, but this time with the emphasis on the two metre band. Constructional details are given for aerials, an attenuator, a filter, a 'sniffer' and several additions to standard 2m equipment, for example an audio S-meter.

A number of relevant articles that have appeared in amateur radio magazines, notably *Radio Communication* and *Radio-ZS*, are reproduced in seven appendices. There is a description of ARDF, a 160m receiver that has been designed specifically with Novices in mind, and finally a list of useful names and addresses.

This book is a good introduction to ARDF because the authors' style is enthusiastic and their descriptions are clear and simple. It will encourage those who have never tried direction finding to take part in their next local Foxhunt with a minimum of outlay.

The construction sections will appeal to those who have tried ARDF and want to improve their equipment. This book is particularly welcome as there are so few publications on this aspect of amateur radio. It should do much to popularise all aspects of ARDF. ♦

Mike Hawkins, G3WMM, takes a bearing in the RSGB Top Band ARDF National Final. This Month's Book Choice will help you join in the fun on 160m or VHF.

Amateur Radio Direction Finding is produced in-house by photocopying in order to keep costs as low as possible. It contains numerous diagrams, maps, circuits, photocopied photographs and a number of cartoons by G8RIW. The booklet is spiral bound - *Ed*

RADCOM Helplines FOR MEMBERS

● Douglas Byrne, G3KPO, would appreciate the loan of a handbook for the **Labgear LG300** transmitter. Contact Douglas at the address in the *RSGB Call Book*, phone 01983 567665, or fax 01983 564708.

● Des Shepherd, G3LCS, needs information on refitting the frequency indicating film strip on a **Racal RA17** receiver. He has BR1171 (Mar 1965) but there is no information in there. If you can help, please ring 01908 313379 any time.

● Information is required on the **Channel Master Crown antenna rotator** (model number 9519D), especially on the power supply connections to the drive motor. It is thought that it requires 25V AC at 1.5A, but there are four connections into the coil system - what goes where? If you can help, please contact Ron Ray, G2TA, QTHR.

● Rob Filby, G0HJR, is a keen collector and user of **Racal equipment**, including the RA17 and 117 receivers, the MA79 transmitter and MA350B synthesizer. He would like to hear from armed forces or civilian technicians with experience of servicing this equipment who can pass on their expertise. Please contact Rob on 01723 581472.

● Don Gibbons, EI5IA, needs charts showing the physical location of components and trimmers, together with alignment instructions, for the **Redifon 145 receiver**. All expenses covered. Please reply to Don's address in the latest *RSGB Call Book*, or telephone 00 353 98 21317

● RSGB member Ray Kockenpoo, ON4IN, needs a **Plessey IC, type SL 565C**, for repairing a counter, or an address from where to obtain one. He has looked all over the Benelux countries without success. If anyone can help please contact Ray at 35 Avenue de Ridder, 1870 Wemmel, Belgium.

● Paul Jeacock, in Uetersen in Germany, would very much like to hear from all ranks in all sections who served at **RAF Uetersen** in the 1950s, when it had a very large signals section. If you were there, please contact Paul at Markstrasse 26A, 25436 Uetersen, Germany.

● RSGB member Giancarlo Moda, I7SWX, is looking for **muTek replacement front end** circuit diagrams, and tips for Yaesu and Icom VHF transceivers, especially the FT-220 and IC-202. Copies and postage expenses paid. Write to: Giancarlo Moda, Via Azzone Mariano 24, I-70010 Casamassima, BA, Italy.

● If anyone knows the callsign of **Harold (Halifax) Brierley**, who was active from 94 Orchard Way in **Croydon** up to 1948 (when he emigrated to the USA) please contact David Butler, G4ASR, QTHR, tel: 0187387679 (evenings) or via packet @GB7MAD. This information is required by Mr Brierley's daughter, who is hoping to 'inherit' his callsign.

● John Winters is editing a book for a lady who is writing about her war-time experiences as a **WAAF**. She worked at Innesworth, RAF Stanbridge and Oxenden House in Leighton Buzzard, RAF Kirkham, Blankney Hall and Southwell (Rolleston racecourse). If anyone has photographs of any of these locations, or pictures of **GCIs** or **'sky sweepers'** in action, standing over a plotting table, he would be very interested in borrowing them to help illustrate the book. If you can help, write to John Winters, 4 Dukes Ride, Leighton Buzzard LU7 7JS, or tel / fax: 01525 852010.

● Derrick Price, G3LYU, needs the wavechange, BFO and volume rectangular control knobs for a **B2 receiver.** Contact him on tel: 0116 2876459, or write to him QTHR if you can help.

● T Pearce, G7BLB, is trying to obtain a model of the **1920 Model T Ford van** advertising the RSGB which was made by Lledo plc. The model was used in an RSGB promotion in 1991. If you can help, call 0191 3780402, or write to G7BLB QTHR.

● Roger Rowthorn is trying to convert a **Creed 444 RTTY** machine to 45.45 baud and needs a 44-toothed cog as outlined in BARTG's *RTTY The Easy Way*. Write to Roger at 19 Woodlea Gardens, West End, Southampton SO30 3GA or tel: 01703 476972 if you can help.

● W Gibson, GM0KMG, would like a copy of the *Radio and Electronics World*, date unknown, containing information on **receiver band-pass filters** using **Toko K3333/5 coils**. Contact GM0KMG QTHR or tel: 0141 649 4345. ♦

ALINCO - "NOW YOU'RE TALKING"

Look What's Being Said -

"Award Winner - absolute delight to use - Amazing first venture into HF"
- Rob Mannion G3XFD
- Editor, Practical Wireless

REVIEWED AUGUST ISSUE *PRACTICAL WIRELESS*

PREVIEWED IN JUNE *HAM RADIO TODAY*

"Superb for mobile use - Alinco have surprised the world" **- Chris Lorek G4HCL**

"Performed very well indeed during CQ worldwide contest"
- Mike Dennison G3XDV
- Editor, Radio Communication

"Very good transmit & receive audio" **- Andy Durrant G7OEC**
- Coastal Communications

DX-70

The DX-70 is the world's smallest HF transceiver - providing 100 Watts all- modes & 10 Watts on 6 metres. General coverage receive is included, and wideband transmit available for export. Detachable front panel for remote mounting & security. Plus superb specification and performance.

£1095

REVIEWED AUGUST ISSUE *RADIO COMMUNICATION*

"The audio is unbelievably good"
- Martin Lynch G4HKS

"It's brilliant" **- Chris Taylor G1FMH**

Two superb new transceivers for 1995

AVAILABLE AT ALL GOOD RADIO STORES

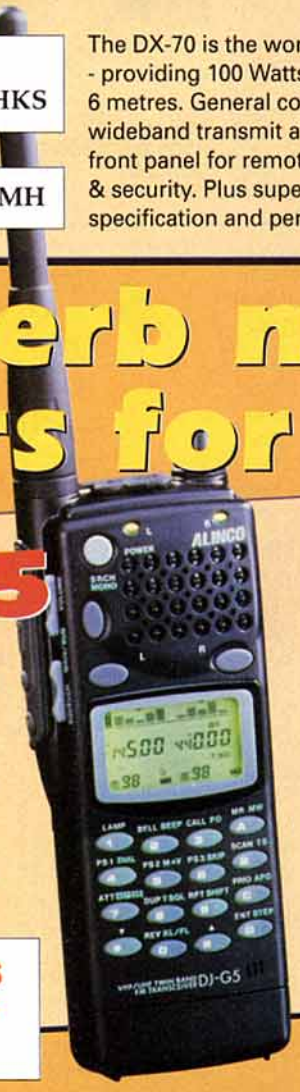
DJ-G5

£479

"I tried one at the Friedrichshafen Exhibition - it's superb"
- Mark Francis G0GBY

The **ALL-NEW** DJ-G5 compact dual band handheld transceiver replaces the well known DJ-580 which was a best-seller worldwide. Packed with state-of-the-art features including CTCSS tone encode & decode. 200 memory channels. Alinco's amazing 11 channel Monitorscope & new high efficiency power MOSFET module. Includes wideband receive coverage: 108-174MHz & 420-470MHz. Also 850-950MHz included.

REVIEWS COMING SOON



ALINCO

PHONE ON
01702 206835
FOR FULL DETAILS
OR FAX ON
01702 205843

ALINCO is distributed in the UK by:

Tel 01702 206835

WATERS & STANTON ELECTRONICS

RADCOM USER REVIEW

DX-70 Ten-band Transceiver

Reviewed by RSGB HQ Staff

The DX-70 is shown actual size.

FOR SOME YEARS, Alinco have been establishing a reputation for increasingly sophisticated VHF and UHF handhelds. Recently, their product range has expanded and Alinco is now arguably a contender for joining the 'big three' - Icom, Kenwood and Yaesu - as a company which can equip your entire station. The latest radio is a 100W HF transceiver with 10W of 6m built in - and plenty of 'bells and whistles' too.

The DX-70 is very small at 179W x 71H x 268Dmm (inc projections). It is quite astonishing that so much can be packed into such a tiny box. It can go even smaller, though, as the front panel is detachable. The radio comes with a long, double-fused power cable, a microphone, spare fuse and a manual.

The front panel is very full with no less than 23 controls and indicators in addition to the display panel. Double potentiometers control Audio Gain and Squelch, and RIT and IF Shift. On the bottom right of the panel is the tuning knob, grouped with the push buttons for VFO select, Memory and Split. A small button locks the controls and a screw adjustment varies the dial torque.

A secondary tuning knob - the Multi Function Dial - selects memory channels, changes band, tunes in 1MHz, 100kHz, 10kHz or 1kHz steps, and selects default settings.

As is normal these days, most buttons perform several jobs, selected by a function key which may be pressed or held down to access the various facilities.

Below the display are the buttons which control the attenuator, mode, filters, power level, AGC, noise blanker, automatic Aerial Tuner (optional extra), upper and lower CW sideband and CTCSS encoder (optional extra).

The rear panel carries a heat sink, power and accessory connectors, and sockets for external speaker, Morse key, ALC and an external relay for use with a linear. Two aerial sockets (SO239) are provided - one for HF and the other for 6m.

The supplied microphone includes UP / DOWN buttons which control frequency or memory channels, and commence scanning.

An LCD display, backlit in yellow, shows frequency to 10Hz, signal strength and output power level on a bargraph, and the various settings of VFO, noise blanker etc.

THE RF SIDE

THE DX-70 HAS A general coverage receiver from 150kHz to 30MHz, plus 50 to 54MHz, and provides SSB, AM (at 40% of maximum power), FM and CW on all bands. There are four filter widths fitted: 500Hz (CW narrow), 1kHz (CW standard and SSB narrow), 2.4kHz (SSB standard and AM narrow) and 9kHz (AM standard and NBFM). An interesting function is 'IF Shift' which moves the IF passband without changing the receive frequency; useful for 'nudging' an unwanted signal off the edge of the filter or for making an SSB signal more 'toppy' to enhance readability.

There are four levels of RF gain: 'normal', a +10dB preamplifier, and two levels of attenuation, -10dB and -20dB. AGC recovery time is switchable from the front panel - long for SSB / AM or short for CW - and can be stored in the band-switch memories.

CW enthusiasts are provided for by a 500Hz filter fitted as standard, and the facility to receive on the upper or lower side of the carrier. Full or Semi Break-in are available, as is 'Auto Break-in' which automatically adjusts the delay with keying speed.

The transmitter has a switchable built-in speech compressor for use on SSB and AM. FM transmission is available as standard on all bands, so use can be made of 10m repeaters and those due to be available on 6m.

Split frequency operation for DX working is easily achieved by use of the two VFOs and the Split button. Even more useful is the Quick Offset function which equalises the VFOs and allows any offset up to +20kHz and -30kHz to be selected on the main tuning dial - no need to do a calculation when the DX station says "listening up six". Listening on your transmit frequency is available by pressing and holding the Function key.

Although there are no dedicated data facilities, a diagram shows how to connect a TNC or modem to the mic and speaker sockets.

MEMORIES ETC

ONE HUNDRED memories are provided in an EEPROM (no need for a back-up battery), each stores mode, filter setting, split frequencies, AGC time-constant, attenuator setting and whether the noise blanker is switched in. Memories are selected from the Multi Function Dial or from buttons on the microphone; unprogrammed channels are simply skipped.

Those who operate both CW and SSB will find the memories more useful for changing bands (eg 1.82MHz CW, Fast AGC; 1.95 LSB, Slow AGC; 3.52MHz CW . . .) than the standard single-option band switch. Split frequencies can be stored, eg for Mode K satellite operation or repeater working. Memory settings can be transferred to either VFO.

Three types of scanning are provided: band, memory and priority. Band scan searches an entire amateur band (or, in general coverage mode, the space between amateur bands) in user-specified steps. Memory scan checks either all programmed memories or a group of them, and priority scan checks a VFO or memory for 0.5s every 5s whilst the radio is tuned to another VFO or memory. The scan can be programmed to stop completely when a signal is received, to wait until 2 or 4 seconds after the squelch has closed, or not to stop at all; this latter could be useful for plotting band occupancy etc.

CUSTOMISING

MANY FUNCTIONS can be customised. These include changing the RIT to TXIT; setting sidetone and CW offset; display brightness; automatic power off (switches the radio off if no controls are activated for an hour); locking the transmit button (a useful safety feature if you leave the radio on); memory over-write protection; memory frequency access inhibit; scan modes; auto LSB / USB selection (default is LSB below 10MHz and USB above); break-in delay time, beep (a short tone sounds each time a key us pressed) and switching in the speech compressor.

Internal adjustments are for sidetone volume, mic gain, maximum power output (50 or 100W), beep volume and frequency set.

MANUAL

The 100-page instruction book. It contains plenty of advice for the beginner, though it can take some time to learn how to use all of the facilities. On most pages is a handy and relevant tip. An 18-page Getting Started section covers installation at home and in a car, the controls, the connectors and the display, together with a Controls Quick Reference chart. The basic controls for each mode are covered, plus use of the general coverage receiver, SSB operating techniques and how to connect up a data modem or TNC. No circuit diagram is provided.

The later pages detail the more advanced options, including split frequency, memory mode, scanning, interference reduction and customising. Diagrams show how to connect the DX-70 to automatic antenna tuners from Alinco, Kenwood, and Icom. A helpful three-page troubleshooting chart aims to avoid a visit to the dealer when the problem is simple - usually mis-operation of the controls.

ON THE AIR

THE DX-70 WAS tried out by two HQ staff members. It was used on HF CW and SSB, and 6m SSB (no FM stations were audible).

The small size provoked a mixed reaction. One reviewer found the front panel rather crowded, requiring the use of the dial lock to avoid accidental mis-tuning when using adjacent controls. The other was quick to see the advantage that this is a radio you can take on holiday without its size or weight being a problem. It certainly won't fill up even the smallest shack and is ideal for mobile operation. Due to the overall size of the rig, the main tuning knob is by necessity much smaller than those found on other HF transceivers, although it did feel nicely 'weighted' and was very smooth in operation.

In use, good audio reports were received on both HF and 6m. The receiver was given the ultimate test: the *CQ* WPX CW contest. It performed extremely well, with the IF shift control, switchable CW sideband and variable front-end sensitivity giving the DX-70 an edge over less well-equipped radios. With the attenuators properly adjusted, no blocking was noticeable. The narrow CW filter on the review model appeared to be misaligned as the 'S' meter and AGC responded to zero-beat signals - this proved a little distracting.

On the 50MHz band, the pre-amp brought in DX signals with just an untuned wire aerial.

CONCLUSION

THE ALINCO DX-70 is a comprehensive rig, which not only offers ten bands, but also has features such as an audio compressor and adjustable IF. It is also one of the tiniest HF rigs around.

At just over £1k, it represents a relatively inexpensive way to get going on all of the HF bands plus 6 metres. As a mobile or portable radio, it really comes into its own, and the addition of 6m means catching the Sporadic E whilst on holiday or being able to use the repeaters which should be appearing on the band shortly.

AVAILABILITY

OPTIONAL EXTRAS ARE: automatic antenna tuner, power supplies, CTCSS tone encoder, remote extension cables, and a mobile mount bracket. The DX-70 costs £1095 and is available from various dealers including Waters & Stanton (see their advertisement in this issue), who are thanked for the loan of the review model. ♦

SPECIFICATIONS

(SOURCE: ALINCO DX-70 HANDBOOK)

LATEST: UK Novice version available with 3W low power level

GENERAL

Operating modes	USB, LSB, CW, FM
Number of memory channels	100
Antenna impedance	50Ω unbalanced
Power requirements	13.8V DC +/- 15%, negative ground
Current drain	Receive 1.0A max, Transmit 20A max
Operating temperature	-10°C to +60°C
Frequency stability	+/-10ppm (-10°C to +50°C)
Dimensions	178 (W) x 58 (H) x 228mm (D) 179(W) x 71(H) x 268mm(D) (inc projections)
Weight	Approx 2.7kg

TRANSMITTER

Frequency coverage	1.8000 - 1.9999MHz		17.9000 - 18.4999MHz
	3.4000 - 3.9999MHz		20.9000 - 21.4999MHz
	6.9000 - 7.4999MHz		24.4000 - 24.9999MHz
	9.9000 - 10.4999MHz		28.0000 - 29.9999MHz
	13.9000 - 14.4999MHz		50.0000 - 53.9999MHz
Power output	HF	SSB, CW, FM	100W (high), approx 10W (low)
		AM	40W (high), approx 4W (low)
	50MHz	SSB, CW, FM	10W (high), approx 1W (low)
		AM	4W (high), approx 0.4W (low)
Modulation system	SSB	balanced modulation	
	AM	low power modulation	
	FM	reactance modulation	
Spurious emissions	HF	Better than -50dB (-45dB in the 10MHz band)	
	50MHz	better than -60dB	
Carrier suppression	better than 40dB		
Sideband suppression	better than 50dB (at 1kHz)		
Maximum FM deviation	HF	+/-2.5kHz	
	50MHz	+/-5kHz	
Microphone impedance	2kΩ		

RECEIVER

Circuitry	Double conversion superheterodyne	
Frequency range	150kHz to 30.0MHz, 50.0 to 54.0MHz	
Intermediate frequencies	71.75MHz and 455kHz	
Sensitivity	SSB, CW	
	(10dB S/N)	0.5 - 1.8MHz 0dBμ (1μV)
		1.8 - 30MHz ..... -12dBμ (0.25μV)
		50 to 54MHz ..... -16dBμ (0.15μV)
	AM	
	(1kHz 30% mod, S/N 10dB)	0.5 to 1.8MHz ..... +20dBμ (10μV)
		1.8 to 30MHz ..... +6dBμ (2μV)
		50 to 54MHz ..... +6dBμ (2μV)
Selectivity (-6dB / -60dB)	SSB, AM (narrow) ..... 2.4kHz / 4.5kHz	
	SSB (narrow), CW (standard) ..... 1.0kHz / 3.0kHz	
	CW (narrow) ..... 500Hz / 3.0kHz	
	AM (standard), FM ..... 9kHz / 20kHz (at -50dB)	
Spurious and image rejection	better than 70dB	
Audio output power	More than 2.0W into 8Ω at 10% total harmonic distortion	
RIT / TXIT range	+/- 1.4kHz	

RADCOM TECHNICAL FEATURE

Capacitor Calibration for the RF Z-Bridge

by Jack Gentle, G0RVN*

A PRECISE calibration of the capacitance dial on the RF Impedance Bridge described in 'RF Impedance Bridge for 2-30MHz' (*RadCom*, July '95) is of utmost importance if accurate impedance measurements are to be made. Most amateurs do not have the good fortune to own an accurate digital capacitance meter to cope with this task. However most amateurs comply with the terms of their licence and can measure frequency with a high degree of accuracy.

Given this ability, the simple resonance detector described in this article and a handful of high tolerance silver mica capacitors, I propose to show how the variable capacitor in the RF impedance bridge can be calibrated to provide a very acceptable performance. There are several pitfalls to be avoided but the basic method is simple and can be made even simpler if the necessary calculations are done on a spread sheet with a PC. Using the methods described here I found that I could calibrate the capacitance dial accurately and obtain an overall bridge performance that was far better than my most optimistic expectations.

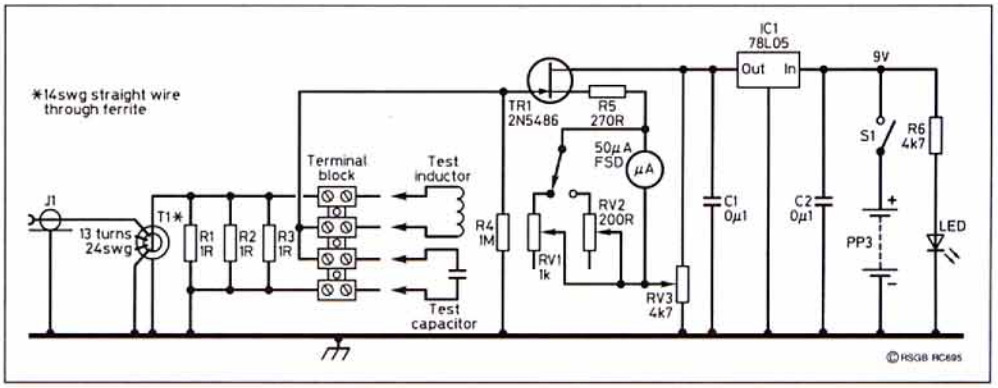


Fig 1: Digital display, circuit diagram.

RESONANCE DETECTOR

THE CIRCUIT DIAGRAM of the Test Rig is that of a resonance detector and is shown in **Fig 1**. It is based upon the Simple Inductance Meter described in the *ARRL Handbook* [1].

The transformer T1 consists of a primary of 23 turns 30SWG enamelled copper wire wound on an Amidon FT-50-43 core [Note 1]. The secondary is formed by a straight piece of 14SWG wire passing through the same core and connected between the outer terminals of a terminal block. The secondary is shunted by three 1Ω carbon film resistors and provides low impedance signal injection into the LC test circuit without significantly affecting its Q. A simple detector using a JFET and a micro-ammeter provides the indication of resonance.

For the test inductor I used approximately 5µH which was wound on an air core with 13 turns of 24SWG enamelled copper wire on a piece of ABS plastic overflow pipe 7/8" outside diameter. (Don't be tempted to wind this inductor on a ferrite core as I did the first time - the reasons for which I describe below.)

The completed test unit was housed in an ABS plastic box with the terminal block mounted on top. A phono plug without its outer casing was connected with very short leads to one side of the block and was left in place during all measurements.

The silver mica capacitors were connected in turn to the opposite side of the terminal block. During final calibration, the phono connector was plugged into the Additional Capacity socket on the Bridge. The unit was fed with approximately a half-volt signal from a 45 year old AVO valve signal generator whose frequency was checked against my receiver. The resonant peaks on the micro-ammeter were repeatable to within some 5kHz which gave an acceptable frequency accuracy.

THE THEORY

THE FORMULA FOR the frequency of a circuit resonant at frequency f is:

$$f = \frac{1}{2\pi\sqrt{LC}} \quad \ldots\ldots\ldots(1)$$

rearranging and squaring both sides we get:

$$C = \frac{1}{4\pi^2 f^2 L}$$

or if we put $\frac{1}{4\pi^2 L} = K$ then $C = \frac{K}{f^2}$

In our particular case C is made up of the capacitance that we want to measure plus sum of the self capacitance of inductor and of all the strays (say C_o).

So the capacity we want to measure is:

$$C = \frac{K}{f^2} - C_o \quad \ldots\ldots\ldots(2)$$

If our measurements and standards were without error, a measurement of the frequencies at which two known value capacitors resonated in circuit would be all that is needed to calculate the value of both K and C_o.

However in the real world we must allow for measurement inaccuracies and take the more considered approach which will be described later.

SOURCES OF ERROR

BEFORE MAKING ANY measurements the sources of potential error must be identified and as far as possible their effects minimised.

INDUCTANCE

It is important that the value of inductance does not vary over the range of frequencies in use. I finally used an air cored inductor because, in spite of the advantages they bring, ferrites can cause a slight variation of inductance with frequency.

CONNECTING LEAD INDUCTANCE

The lead length between the capacitor to be

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	L = 0.04µH			
FREQ	20	100	200	300
	INFLATED CAPACITANCE			
30	21	117	279	523
20	20	107	229	370
10	20	102	207	315
5	20	100	202	304
1	20	100	200	300
0.5	20	100	200	300
	L = 0.02µH			
FREQ	20	100	200	300
	INFLATED CAPACITANCE			
30	20	108	233	350
20	20	103	213	320
10	20	101	203	305
5	20	100	201	301
1	20	100	200	300
0.5	20	100	200	300

Table 1: Apparent capacitance of a capacitor with series inductance.

Variable capacitance calibration meter.

calibrated and the test rig must be kept as short as possible otherwise the apparent capacitance measured will be greater than the true capacitance [2].

For example a length of 1.5in of 22SWG wire has an inductance of 0.02µH and for 1.75in the inductance is doubled [3]. **Table 1** shows the extent to which values of capacitors of 20, 100, 200, and 300pF can be apparently increased at different frequencies as a result of these unwanted series inductances of 0.02µH and 0.04µH.

From this Table it can also be seen that the frequency at which the measurements are made must be kept as low as possible. However there is a compromise here because if the frequency is too low the accuracy with which resonance can be determined becomes less. I chose to keep the frequency of all measurements below about 15MHz which gave a compromise inductance of around 5µH. Fortunately, both during calibration and in use, the higher values of capacitance are used when the frequency is lower so it is not too difficult to stay within the safe regions of Table 1.

ACCURACY OF STANDARD CAPACITORS

The capacitors which I used to determine the values of C_o and K were all 1% silver mica of values between 20pF and 100pF. I used them separately and in parallel to give a range of 10 different capacitors between 47pF and 174pF as shown in **Table 2**.

SPREAD SHEET CALCULATIONS

ALTHOUGH A SPREAD sheet is not absolutely necessary to calibrate the Test Rig it makes life very much easier. The results of the calculations and the final evaluation of K and C_o are shown in Table 2 and here I will describe each of the columns in turn below.

a) The actual capacitors I used. (Nothing special about their values).
b) Frequency of resonance.
c) The nominal values of capacitance.
d) C_o as calculated by Excel Solver (see below).
e) The value of K as calculated for each reading from $K = (C + C_o) \times f^2$. At the bottom of the column is the average of the ten values for K.
f) This is a factor calculated from the square of the difference between the value of K and its average value, and at the bottom of the column is the sum of the squares. If all the capacitors were accurate and the measurements were perfect there would be no difference between each value and the average of all the values so the sum of the squares would be zero [Note 2].

In a practical case the best we can expect is for the spread sheet to calculate the minimum value by varying the value of C_o. This can be done either by trial and error by inserting different values for C_o until a minimum is obtained or as in the case of my Microsoft Excel spread sheet, ask the Solver program to do it for you.

g) The final column calculates the value of the capacity measured using the values of K and C_o. From this column you can see a very good agreement between the measured and the nominal values of capacitance. At this stage I felt confident to use the Test Rig in earnest to calibrate the variable capacitor in the bridge.

A	B	C	D	E	F	G
	F	NOMINAL	C_o	$(C=C_o)*F\hat{}2$		MEASURED
47	11.220	47	15.4	7855	1708	47
100	8.255	100		7864	1078	100
101	8.193	101		7813	6954	102
73	9.448	73		7891	33	73
73	9.520	73		8012	13216	72
73+73	7.059	146		8042	21231	143
101+20	7.587	121		7852	2046	122
101+47	6.920	148		7825	5203	150
20+47	9.802	67		7917	406	67
73+101	6.457	174		7897	0	174
				k = 7897	51876	

Table 2: Test rig calibration.

CALIBRATION OF THE VARIABLE CAPACITOR

AS MENTIONED EARLIER it is very important that the leads are kept short between the Test Rig and the variable capacitor and this includes any wiring within the bridge itself. I connected the rig to the phono socket on the bridge as shown in the photograph. This socket is normally used for adding fixed capacitors in parallel with the variable. I then set the dial on the capacitor at 0, 5, 10, 15, etc through to 100 and measured the resonant frequency at each point.

Using the K factor and C_o determined above and using another spread sheet I calculated the capacitance at each setting using equation 2 above. In fact I entered all the values into a look-up table together with resistance dial calibration and the bridge equations. From this I was able to get a direct display of series resistance and reactance from the spread sheet.

The variable capacitor was nearly linear at dial readings greater than 15. For this reason, and as suggested by G3PJT, I balanced the bridge at dial 15 with the offset trimmer. In use readings below 15 were ignored.

The final results tests on the bridge are shown in Table 2 of last month's article and these show that this method of calibrating the bridge provides an entirely acceptable degree of accuracy.

REFERENCES

[1] *ARRL Handbook*,1992, page 25-24.
[2] Carron, *ARRL Antenna Compendium Vol 3*, 1992, Page 227.
[3] *ARRL Handbook*, Page 2-19.

NOTES

[1] Available from Ferromagnetics, PO Box 577, Mold, Clwyd, CH71AH
[2] This is a simplified version of the 'method of least squares' which I have used because the error in frequency is so small. ♦

COMPONENTS

Resistors

R1, R2, R3	1R0
R4	1M
R6	4k7
RV1	1k
RV2	200R
RV3	4k7

Capacitors

C1, C2	100n

Inductors

T1	see text

Semiconductors

IC1	78L05
TR1	2N5486
LED	

Additional Items

4-way screw terminal block
Phono jack
Single pole, one-way switch
50µA FSD Meter

Pat Hawker's Technical Topics

PAT HAWKER, G3VA
London 37/SE22 8SS

VEHICLE ANTENNAS FOR HF NVIS

THOUGH COVERING all types of communications systems, the recently published book *Naval Shipboard Communications Systems* by John C Kim and Eugen I Muehldorf of TRW Inc (Prentice Hall PTR, 1995) points out that "over the past few years HF radios staged a comeback as an alternative means of shipboard long-haul communications, since HF communications feature portability, versatility of location, and long-distance connectivity. In addition, users became aware of problems associated with satellite communications due to high costs and congested satellite channels. Newly automated and micro-processor-controlled (HF) radios now offer capabilities previously not available for automatic HF link establishment (ALE)".

A standard form of US Navy HF antenna is the 10-metre Fibreglass whip antenna but such antennas have a null in the vertical direction, and for near vertical incidence skywave (NVIS) medium-distance operation a form of this antenna, known as a 'Towel Bar' antenna, comprises a whip bent over to run 14in above a metal deck.

As mentioned previously in *TT*, NVIS HF systems, which minimise the 'dead zone' (skip zone) by maximising radiation vertically upwards, are of increasing interest for all forms of military and some civilian communications systems. A paper 'Novel antenna configurations for vehicle-borne NVIS applications' by K P Murray and Dr Brian Austin (G0GSF), University of Liverpool, was presented last April at the IEE's Antennas and Propagation Conference (ICAP95) in Eindhoven and is published in *IEE Conference Publication No 407* (Vol 1, pp415-418).

This again emphasises that "HF (3-30MHz) propagation still has an important role to play in certain communication scenarios. Of particular importance is the so-called Near Vertical Incidence Skywave (NVIS) mode of propagation where the ionosphere is utilised for relatively short-range communication . . . Of particular importance is the ability to communicate beyond the line of sight (BLOS) but within the normal HF skip-zone associated with the usual vertical whip antenna. The only way to achieve this, without the use of artificial relay facilities, is skywave propagation with a high angle of incidence to the ionosphere. However, this presents particularly demanding constraints on the antenna designer, especially when the terminals are mounted in vehicles.

"Firstly, in order to ensure signal return, frequencies close to the prevailing critical frequency must be employed. The electrical size of the vehicle is generally below the first fundamental resonance. Hence, the input impedance characteristic is generally categorised by a small resistive component with a relatively large reactance. Secondly, the usual vertical whip antenna is inherently unsuitable because of the pronounced null (greater than 20dB) in its radiation pattern towards the zenith."

The paper analyses two types of tilted whips and a vertically mounted (magnetic) loop using the Moment Method (NEC). In the first simulation, a typical 4.8m whip antenna was mounted at the rear corner of the vehicle roof and was tilted forward and backwards along its longest dimension. The best performance was seen with the whip tilted backwards away from the vehicle at a substantial angle. At tilt angles less than 50° from the vertical, performance remains similar to that of the vertical whip. This introduces severe practical constraints in terms of the antenna's robustness. (And for civilian vehicles would hardly be popular with other road users! - G3VA).

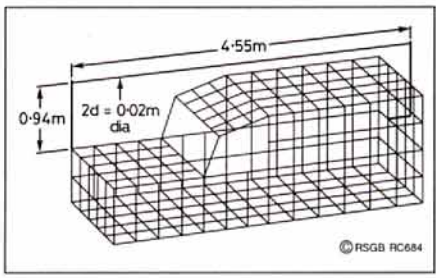


Fig 1: The vehicle wire grid model with loop antenna used for computer simulation by the Moments Method at the University of Liverpool.

The authors conclude that for NVIS systems "a better antenna was found to be the vertically mounted loop (simulated as in **Fig 1**) . . . A variety of configurations is possible using either single and multiple feed-points. On the basis of robustness, the percentage of radiated power at elevations greater than 45° and the power lost due to coupling into lossy ground, the loop is clearly a superior antenna to the whip. A possible disadvantage, though not considered here, is the lower loop input resistance and the associated feed-system efficiency".

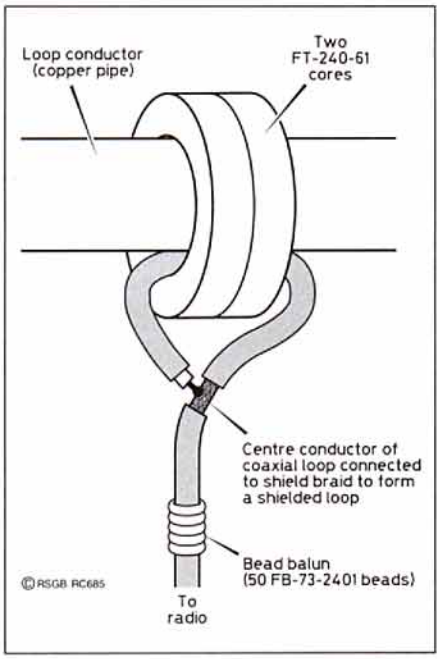


Fig 2: Feedpoint detail as used by K6HP for a mobile (magnetic) loop antenna on the 1.8, 3.5 and 7MHz bands.

This ICAP95 paper is concerned with computer simulation rather than practical hardware and one wonders how the preferred multiple feedpoints could be implemented.

Ken Hirschberg, K6HPX, in the 'Technical Correspondence' section of *QST* (March 1995, pp72-73) reports on his use of a ferrite toriod core as a current transformer to feed a compact transmitting loop (**Fig 2**). He views this as a preferred alternative to coupling by a one-turn link (transformer), a tap, or by a capacitive divider that can also be used to resonate the loop.

He writes: "The central feedpoint of the loop (directly opposite the resonating capacitor) is passed through the toroid, making the loop itself a one-turn secondary of the transformer. In this particular set-up, the coaxial feed line was used as the primary by passing it through the core, then soldering (terminating) its centre conductor to its shield through a small hole cut into the cable jacket (ie a Faraday link - *G3VA*). This forms a shielded link, which serves to reduce the capacitive coupling between the feed line and the loop.

"Based on limited experimentation, I have discovered that (at least at the moderate power level of 100 watts) this means of coupling is physically smaller, does not have to be adjusted for use on different bands, and can be made rigid and weatherproof (eg by encapsulation) for mobile operation. The toroid transformer provided the same apparent coupling as that observed with an ordinary link or balun, each of which encompassed an area about 20% of the size of the main loop's area. For these experiments, the loop I used was an 11 by 4.5ft rectangle made from 1in diameter copper water pipe, with a coaxial capacitor or vacuum variable capacitor; the toroid was made of two Amidon FT-240-61 cores.

"I operated the loop on 1.8, 3.5 and 7MHz bands with an SWR of near 1:1 easily obtained at resonance without the use of an antenna tuner. The antenna - designed for mobile NVIS use - exhibited the expected high-Q properties, and a quite narrow bandwidth. The loop is mounted in the vertical plane, with its feed just above the metal roof of the van. On-the-air results are outstanding, with S9+ reports on 3.5MHz over western North America in the early morning".

KITES AND BALLOONS - THE REGULATIONS

PAT PAINTING, G3OUC, noted the *Product News* item in June's *RadCom* on Allsopp Helikites. He is concerned at the possibility of amateurs using kites, balloons or these new kite/balloons as antenna supports without being aware of the civil aviation legislation governing the flying of large kites or tethered balloons.

He writes: "I have used kites for many years to support antennas for 1.8MHz portable operation with much success. The use of balloons has never been attempted due to the danger of line breakage allowing the wire to drag over power lines etc. With a kite this problem is not so serious since the kite will descend when the line breaks."

G3OUC has sent photocopies of letters he received in March this year from the Airspace Utilisation Section of the National Air Traffic Services (NATS) setting out the current regulations pertaining to both kites and balloons, since he feels that many amateurs who use or may use such means of supporting antennas are unaware of them. Flying of both kites (if more than 2kg in weight) and captive balloons is governed by Air Navigation Order 1989 and the Rules of the Air Regulations 1991 in which both large kites and captive balloons are classified as 'aircraft'.

For example, Article 75(1) of the Order requires that, if kites (of more than 2kg in weight) or captive balloons are to be flown above 60 metres above ground level, within 60 metres of any vessel, vehicle or structure, or within 5km of an aerodrome at any height, then written permission is necessary from the Civil Aviation Authority and if granted its validity will be subject to certain conditions. Again, Article 50 requires that a person shall not recklessly or negligently cause or permit an aircraft to endanger any person or property. Rule 14 describes the need during night-time flying at heights exceeding 60m to display lights. A copy of a CAA "Application for Permission to Fly Above 60 metres or within 5km of an aerodrome" requires completion of some 10 sections and a signed declaration "that I have checked the above information and that to the best of my knowledge it is correct and that I am aware of my obligations under the Air Navigation Order 1989 as the operator of a kite".

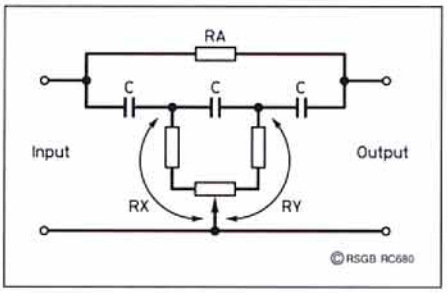


Fig 3: The tuneable notch filter redrawn to indicate how the filter frequency can be calculated.

G3OUC adds: "I am often taken to task by those who tell me my antenna is too short and that 300-400ft of wire would produce better results. One amateur often flies a kite using 500ft of wire. Not only is this amount of wire a danger to aircraft but it puts the operator at risk from lightning as the gap between ground and charged cloud is much reduced. It is my fear that if a problem arises in which injury occurs the 'powers that be' may well see fit to ban all antennas supported by kites or balloons or kite/balloons. Yet, if people are careful, there is little risk when employing this interesting means of radiating a good signal on 1.8 or 3.5MHz".

UNDERSTANDING THE TUNEABLE NOTCH FILTER

JUNE'S *TT* (p71, Fig 7) provided the circuit diagram of a '40-120Hz tuneable notch filter' recalled by Peter Cole, DA1PE/G3JFS, from notes he made some 20 years ago. He confessed that he had no idea of its origins, "but it certainly works", and he appealed for information on the derivation of the circuit and the design equations.

Bob Pearson, G4FHU, has responded. He writes: "I have worked out the required relationships as follows based on the circuit as redrawn in **Fig 3**.

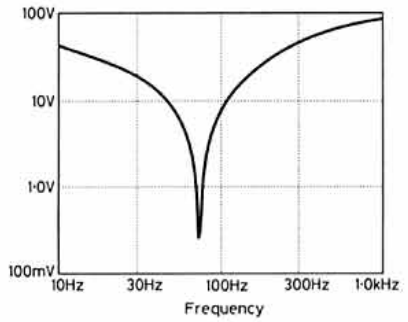
$$\text{Notch frequency: } f = \frac{1}{2\pi C\sqrt{3 \times RX \times RY}}$$

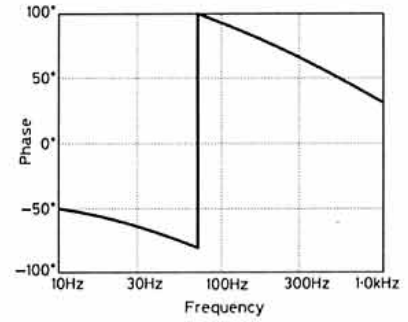
$$\text{Resistance } RA = 6(RX + RY)$$

"Substituting C = 100nF, RX = 3000 ohms, RY = 52,500 ohms which correspond to the *TT* circuit when the 5kΩ potentiometer is centre, then f becomes 73.218Hz and RA becomes 333kΩ. To check my algebra I used a PSPICE circuit simulation and obtained the same result.

"The circuit as redrawn in Fig 3 shows that the filter is related to, although not identical with, the arrangement used long ago by Dippy in what, strangely, has ever since been known as the 'phase shift oscillator' (when, in fact, virtually all oscillators use a phase shift network).

"The simplest mathematical procedure for deriving this kind of solution is to note that if the network is to produce a true null at the output, then *at the frequency of the null*, one can solve as if the circuit has a short circuit at the output and find the condition for the cur-





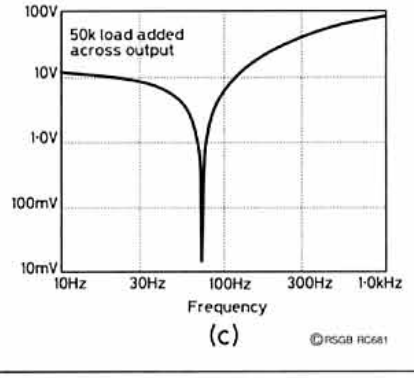


Fig 4: (a) Amplitude response of unterminated filter. (b) Phase shift swings virtually instantaneously at the notch frequency. (c) Amplitude response when filter is loaded by 50kΩ.

rent at the output to be zero. This is simpler than producing a general expression for the output at all frequencies.

Nevertheless, it still involves a certain amount of algebra with complex numbers to be inserted and sorted out at the end. For the circuit shown, the tuning range would be 55.4Hz to 175Hz. (Rather than the 40-120Hz suggested but covering 60Hz as claimed for the given component values - *G3VA*).

"If the output is loaded by a further resistance, it does not change the notch frequency but does reduce the response at frequencies below the notch frequency but at the same time sharpens the notch. **Fig 4 (a)** shows the amplitude response unloaded **Fig 4(b)** shows the phase shift which swings virtually instantaneously at the notch frequency. **Fig 4(c)** shows the amplitude response when loaded by 50kΩ. In each case the simulation input voltage was 100V and the output plotted on logarithmic scales. The output voltage theoretically goes to zero at the notch frequency but the calculating and plotting limitations mask this. In practice, of course, parasitic effects would also make the result less than perfect".

SIMPLE SPEECH PROCESSOR

REG MOORES, G3GZR, writes: "**Fig 5** shows a simple, very cheap but effective, speech processor which I developed many years ago for mobile operation. In my case, it was used with a miniature electret microphone but the circuit can be used in the shack with a dynamic microphone providing excellent quality. However, when used with a dynamic (moving coil) microphone the voltage feed shown in Fig 5 for the electret microphone (components marked ∗) is not required.

"With relatively few components it can be made small enough to be incorporated into most rigs; if used with a stand microphone it can be mounted in the base. It is based around a 1458 (dual 741 op-amps) IC, with the first op-amp providing the required microphone gain; the second op-amp sets the processed audio signal delivered to the transceiver. The variable 50kΩ resistor sets the microphone gain; the 4.7kΩ potentiometer sets the output audio level.

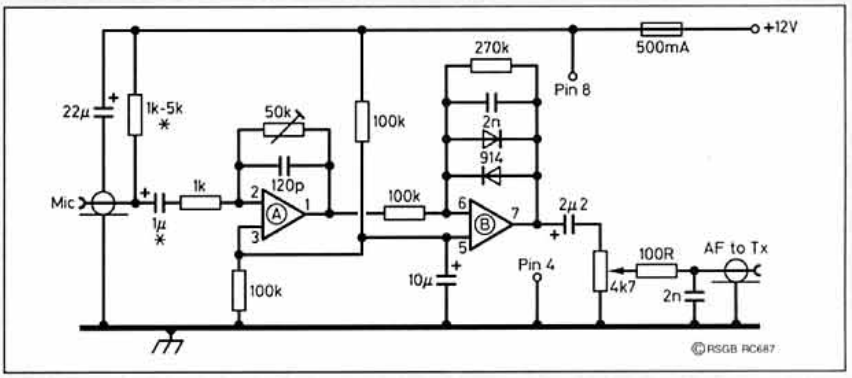


Fig 5: G3GZT's 'KISS' speech processor.

It would presumably be possible to use this filter configuration as a sharply peaked CW filter by placing it in the feedback loop of an op-amp or similar amplifier.

COAXIAL TRAVELLING WAVE ANTENNA?

SEVERAL ARTICLES IN the Australian *Amateur Radio* since 1992 have drawn attention to a form of antenna based on a patent granted in 1927 to a Romanian inventor, Emil Geles. This appears to have interesting features which, if achievable in practice, could offer significant advantages as a broadband 'travelling wave' antenna, for example, as a vertical antenna without the usual significant RF ohmic earth losses. It needs to be used with a suitable antenna tuner or balun providing balanced output from a coaxial cable feedline. However, although successfully exploited by several Australian amateurs, it still calls for a degree of experimentation.

The latest article, by Leo Weller, VK3YX (*Amateur Radio*, June 1995, pp 4-6) acknowledges that his work was initiated by an article written by George Thatcher, VK2EHN, in the September 1993 issue, and after re-reading the earlier note by Clive Cook, VK4CC, which drew attention to the UK patent issued in 1927 to Emil Geles of Bucharest. Although VK4CC did not give the Patent Number, it was possible to trace the full patent specification at the National Science Reference Library in High Holborn, London. It proved to be UK patent No 260,005 (UK Application Date October 19, 1926, accepted March 24, 1927).

In summary, this covered a closed-circuit antenna comprising a central wire surrounded by a tubular conductive (metal) structure (**Fig 6**).

"The central wire may be completely separated from, or connected directly to, the top of the tube; or it may be capacity coupled with the tube as shown in **Fig 6 (b).** The outer tube screens all radiation from the inner wire. The system functions practically as an ordinary open aerial with small ohmic losses. No earth or counterpoise is required."

In more detail, the patent states: "This invention relates to an improved aerial for the transmission of electromagnetic waves such as used in wireless telegraphy or telephony.

"It is stated in various text books on wireless telegraph that the radiation of a closed circuit aerial is nil. This is not strictly true and the proof is that in certain cases use is made of frame aerials for transmitting purposes. On

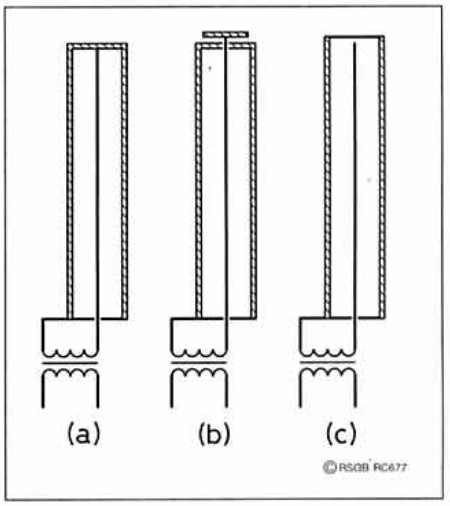


Fig 6: Coaxial closed-circuit antenna principle from UK Patent 260,005 of 1927. (a) Internal wire connected at top to metal tubes as with VK3YX's antenna. (b) Wire coupled capacitive to top of tube. (c) Wire left isolated from tube.

the other hand, it has been shown, and can be verified experimentally, that the radiation of an aerial increases with the surface of the aerial . . . It is also known that the penetration of high frequency currents either from the outside to the inside or vice versa through the walls of a metallic screen is very small.

"Aerials for transmitting and receiving purposes are broadly known in which a vertical wire or inner tube is enclosed in an outer vertical tube from which the said wire or inner tube is insulated and connected to earth or a counter-poise. The invention consists of a transmitting aerial constituted by a vertical tube wherein is enclosed a vertical wire with which the said vertical tube forms a radiating closed circuit without earth connection or counter-poise . . ."

"The field produced by the wire is completely stopped by the tube which acts as a screen. Consequently, it can no longer destroy the field produced by the outer surface of the tube which is free to radiate exactly as an open aerial. The aerial may be excited by connecting the lower ends of the tube and of the inner wire to the transmitting apparatus, for instance through the intermediacy of a transformer as shown in Fig 6. The losses of such an aerial are reduced to the ohmic losses which are exceedingly small and to the losses produced by eddy currents".

It was claimed that the main advantage of such antennas is that no earth connection or counter-poise is employed and that, consequently, neither a large earth area nor a great number of poles which are required for a high power transmitting antenna is required. It is claimed that this would be of special advantage "for use on aeroplanes".

It does appear that a coaxial antenna of this type, together with a black box tuner, was marketed in Australia some years ago (CTW Antenna Coupler), the CTW standing for 'coaxial travelling wave'. If, in fact, this structure does represent a true form of travelling wave antenna (ie an antenna with constant current along the radiating element rather than a resonant standing wave), then clearly this would represent a further valuable feature. Experimental systems by both VK2EHN and VK3YX seem to bear this out, with VK3YX warning that the antenna should not be of a length resonant in any amateur band.

In effect, it appears to be a low impedance closed-circuit antenna of a form rather like an extended transmitting loop antenna but without the complication of the high-Q tuning associated with compact loop antennas. Provided that the losses in the tuner/balun can be kept low, there seems no reason why this type of antenna should not be reasonably efficient both for transmission and reception, and should avoid the major problem of conventional monopoles of the high RF ohmic ground losses and the inconvenience of elevated ground-plane radials.

VK3YX's practical realisation of this form of antenna is outlined in **Fig 7**, with details in

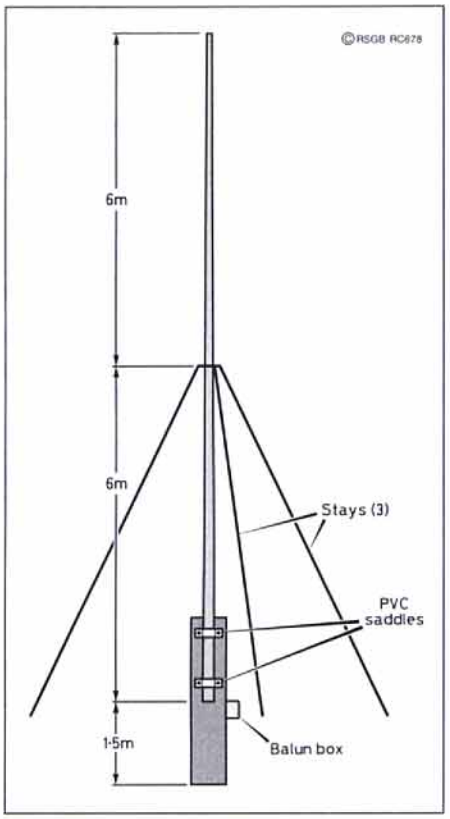


Fig 7: The coaxial travelling wave antenna as implemented by VK3YX based on three lengths of aluminium tubing of total length of 12m, mounted with insulated saddles to an insulated mast stub.

Fig 8 (a), (b) and **(c).** His antenna is constructed from three equal lengths of imperial aluminium tubing of total length 12m. As the three lengths are of different diameters (1.75/1.5/1.25in), its characteristic impedance as a 'coaxial cable' is not constant, but this does not seem important. In the centre of the tubing, kept in place by triangular spacers as in Fig 8(a), is a PVC covered wire of 5mm diameter, or 47/03.

VK3YX emphasises that "with so little information available it is an experimenter's delight. Nevertheless, looking through my notes, more than 80 different baluns have been wound with an endless number of readings. Although this was time consuming the result is most gratifying".

He concludes: "It is unlikely that, in the first experiment, maximum performance can be achieved. Much more work will be needed to arrive at fully understanding this system, and the real design considerations. I would like to collect data from other experimenters by letter, telephone or amateur radio regarding their experience with this project". (His address is 46 Peperell Avenue, Syndal, VIC 3150, Australia).

VK3YX lists a number of observations, stressing that "with an antenna so different from all accepted theories and practices, one does not know what to expect and every observation is a discovery for which one tries to find an explanation: (1) I noticed no reverse TV interference, which has plagued me for years. (2) No TVI and I could remove all suppressers, braid-breakers and the like from my own TV set. (3) No earth wire or radials . . . every attempt to use them reduced receive sensitivity. (4) Easy and smooth tuning with a Z match antenna tuner . . . SWR of 1.1 right across the band, even on 21MHz. (5) Good signal to noise ratio which compared favourably with a 3.5MHz dipole with open feeders. (6) Sensitivity on receive and field strength on transmit increases step by step on each higher frequency amateur band. (7) No high voltage spots. Even at 50 watts, a sensitive neon bulb did not glow. Touching the antenna with the hand pushes the SWR meter off the scale. (8) High current. I measured 0.5A at 5 watts on all bands, except the 7MHz band, including 1.8MHz and all WARC bands. (9) The 7MHz band needs more power to achieve 0.5A and tuning is different. This does not affect performance. (10) Three turns of heavy, insulated wire around the tubing and short circuited reduced receive sensitivity. This is the reason for the PVC saddles and clamps . . ."

It seems important to note that the RF feed to this form of 'closed-circuit' antenna must be balanced. There is also an interesting possibility that, at least for low power, it might be possible simply to use a length of conventional coaxial cable - short circuited at the far end - rather than the home made variety with a wire enclosed within a metal tube used by the Australian experimenters. I tried this on receive, using the ATUs that I use for my large looped wire antenna mentioned in June's *TT* and certainly it seemed to receive signals quite well. It seems as though the 1927 idea is worth reviving and developing further, whether or not it forms a genuine 'travelling wave' antenna. It could presumably be used as a horizontal or sloping antenna.

It should be stressed that this form of

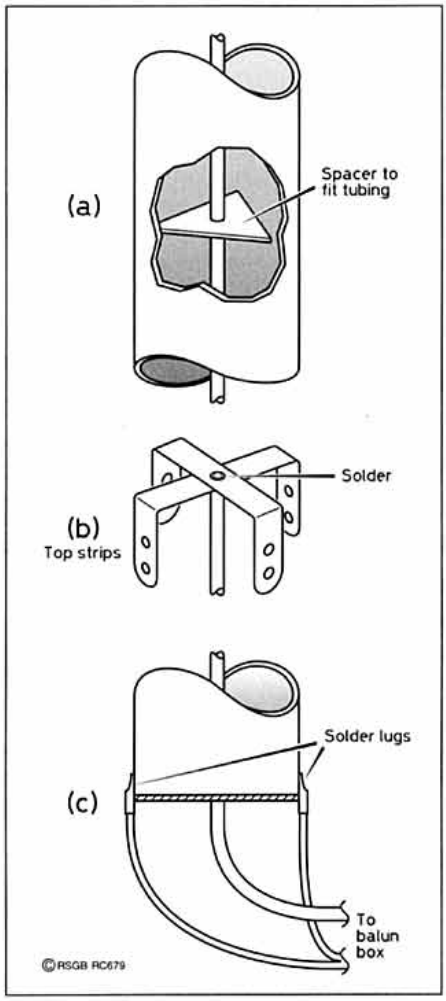


Fig 8: Constructional details of VK3YX's antenna. (a) Triangular perspex spacers 2mm thick and spaced 30cm apart are used to keep the PVC covered wire centred in the tubes, held in place by suitable plastic to plastic glue. (b) The centre wire is connected to the outside on the top of the tubing, via two crossed copper strips. After soldering, the strips are bent down over the outside of the tubing and secured with 8 self-tapping screws. (c) On the base of the antenna, on the outside, are two solder lugs 180° apart. These are fastened with 6mm copper screws, washers and nuts. Note that half way up the mast is a PVC clamp holding three 6mm polyester stays.

untuned closed-circuit (loop) antenna requires a low RF ohmic resistance approach akin to that of a compact (magnetic) tuned transmitting loop. Otherwise, there is the likelihood of low transmit efficiency due to RF power losses in both the antenna structure and the tuner or balun transformer needed to provide a low-impedance balanced-output. It must be noted that there will be high RF currents flowing even at relatively low power. As with a conventional frame or loop antenna, the very low radiation resistance may be of minor consequence on receive but could greatly reduce efficiency on transmit. This is presented as an interesting experimental project rather than a fully-proven design. Good performance on transmission cannot be guaranteed!

DAYTIME SKYWAVE PROPAGATION ON 1.8MHZ

P HOBSON, G4HOJ, reported in *TT* (August 1994, p48-49) the results of investigations he had made into daylight propagation of 1.8MHz signals. He showed that on this, the only amateur MF band, "contrary to simplified theory, skywave propagation is not limited to night-time".

For example, he found that over a 126-mile path during a September day with "daylight" existing for some 12 - 13 hours, only 4 - 5 hours showed low levels of skywave enhancement. Even then signals still peaked at regular intervals (*TT* August, 1994 Fig 11). In general, he noted that from a quiet site, skywave enhanced signals are useful on almost every day with, occasionally, high signal levels even at noon. He argued that his results proved, to his satisfaction, that 1.8MHz completely out-performs the alternative bands, particularly for mobile working, when short/medium distance working is the objective.

In an introductory note, I pointed out that in the 1970s when I was involved with answering listeners' complaints about interference with the reception of the early Independent Local Radio medium-wave stations, it became obvious that the D-layer which absorbs MF sky-waves from distant high-power stations during 'daylight' does not reform immediately at dawn and (particularly in the winter months) begins to lose its absorptive characteristics some time before dusk, so that interference from distant stations could be quite severe during much of a 'winter day'.

It was therefore interesting to come across a paper 'LF/MF skywave propagation at daytime' by John C H Wang of the American Federal Communications Commission (*IEEE Transactions on Broadcasting*, March 1995) replying to an ITU-R question on this topic which is of current concern to broadcasting service planners etc. The FCC writer notes that interference from the daytime skywave signal of one broadcasting station to the groundwave signal of a co-channel station located several hundred kilometres away has been observed in certain parts of the world. He stated: "It is extremely difficult to collect skywave data during the day. First of all, signals are very weak. Secondly, groundwave signals may be strong enough to mask skywave reception. Furthermore, co-channel interference from stations near the monitoring site may also be a problem . . . Night time data has been studied extensively and the literature is fairly rich . . . Daytime data, however, has not been studied systematically".

The paper presents daytime measurements of more than 30 MF/LF paths both in the USA and in Europe. It discusses (1) the effects of seasonal variation; (2) effects of latitude; and (3) effects of solar activity.

Among the points made are that daytime field strengths display a consistent seasonal variation pattern with maximum occurring in winter months and minimum in summer months, both on MF and LF. The winter-to-summer ratio is typically 10 to 20dB.

Daytime field strengths display much less dependence on latitude than during the night when low-latitude paths may be some 11dB stronger than high-latitude paths. As might be expected from amateur radio experience, skywave field strengths tend to be maximum in the year immediately after a sunspot minimum in both night time and daytime.

NEW FORM OF HELICAL-BEAM ANTENNA

DR JOHN D KRAUS, W8JK, has long been recognised by amateurs and professionals as one of the world's leading antenna specialists. He is highly regarded both for the many designs he has pioneered - including the 8JK which in 1936 was the first array to make use of close-spaced driven elements; the first folded dipoles; the first corner reflector; the first axial-mode helical antennas - and for his classic textbook *Antennas*, first published in 1950.

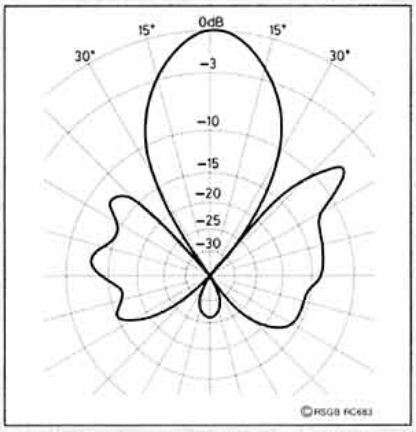


Fig 10: Radiation pattern of the experimental 10-turn antenna shown in Fig 9 at its centre frequency of 1680MHz. Half-power beamdwidth is 34°.

In *IEEE Antennas & Propagation* Magazine (April 1995, p45) he contributes a short article, 'A Helical-Beam Antenna Without a Ground Plane', in which he writes: "The helical-beam antenna (also known as axial-mode helix), which I devised in 1946, was fed via a ground plane. This arrangement has proven very satisfactory for many applications. Now, almost 50 years later, I present a version in which the ground plane is replaced by one or more loops. This design is well suited for pole mounting, as shown in **Fig 9**. It has less wind resistance, and presents a much-cleaner appearance, while providing equivalent performance to a helix with ground plane.

"The inner conductor of the coaxial line feeding the antenna is connected to the end of the helix, and the outer conductor to the base of an adjacent loop. A second (buffer) loop may be situated 1/3 to 1/2 wavelength from the feed point. This loop may or may not be continuous. A third loop, one wavelength or less from the feedpoint, is optional. The helix and all loops are approximately one wavelength in circumference at the centre frequency of operation. A typical pattern is shown in **Fig 10**".

Dr Kraus stresses that the new version retains the broadband and non-critical nature of the ground-plane helix to a marked degree. In the 'Microwaves' chapter of the current *Radio Communication Handbook* (p9.57), it is noted, in describing an axial-helix antenna (with ground-plane) for 1.3GHz, that such antennas "are useful both as test antennas and also as a general-purpose, medium-gain antennas of wide bandwidth. An eight-turn antenna will have about 10dB gain over an approximately 2:1 frequency range".

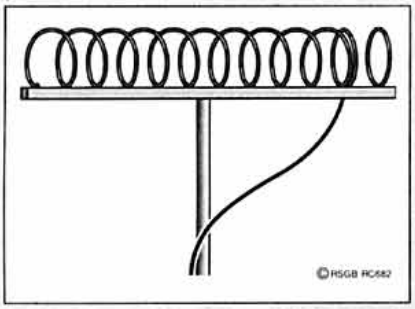


Fig 9: A ten-turn pole-mounted helical-beam antenna, using loops instead of the conventional ground plane. The turn spacing is 0.27-wavelength, and the gain is about 15dBi.

The new form of 10-turn, pole-mounted antenna with a centre frequency of 1680MHz and a turn spacing of 0.27-wavelength, as described by Dr Kraus, is stated to have a gain of about 15dBi.

The American MF broadcasting band has for some years extended to 1705kHz so that results in this region of the broadcast band are close to what can be expected in the 1.8MHz band. It would appear from measurements made in Germany and Japan that the annual median value of skywave field strength at noon is about 45dB lower than the corresponding value six hours after sunset (SS+6). The difference could be slightly more than this at 1.8MHz although, for the entire band 535-1705kHz, John Wang suggests that a figure of 42.5dB would be reasonable.

However, he notes that short-term fluctuations of daytime field strengths at the higher frequencies are usually much larger than those at lower frequencies. "Consequently, the difference between the upper-decile and the median values vary with frequency. At 1500kHz, for example, the upper-decile value is typically 10 to 15dB greater than the median value . . . On 1% of the days of the year, field strengths are expected to be 20dB higher than the median value."

It is interesting that this paper complements rather than detracts from the findings reported last year by G4HOJ and should give a further stimulus to the use of 1.8MHz in daytime as we approach and pass the coming sunspot minimum.

HERE & THERE

TT (*RADCOM*, April 1995, pp61-62) and *Product News* (*RadCom*, June 1995, p47) drew attention to the range of high power RF valves, including popular 3CX, 4CX and 5CX types now being manufactured in Russia and marketed in the USA by Svetlana Electron Devices Inc. David Porter, G4UYX, who works at the BBC Woofferton HF broadcasting site points out that the exclusive UK distributor of Svetlana products is Force Associates, 3 Twyford Business Units, Station Road, Twyford, Berkshire RG10 9TU (tel 01734 320711). The range includes some 40 types, including very high power broadcast types, and also several sockets including the SK2A/4CX250B socket.

A press release from Ampsys Electronics Ltd (Ampsys Laboratories, University of Paisley, High Street, Paisley, tel 0141 848 3444) announces the introduction of the company's 'FM 201 Demodulator' based on an 'Amplitude-Locked Loop' added to a normal FM demodulator for use in PMR, Cellular and Radiopaging FM systems (and presumably applicable to amateur FM transceivers). This apparently enables two stations of equal strength, and using the same channel, to be received and understood "without the head-on crash effect and mutual destruction" as in conventional practice but heard simply as cross-talk similar to a hard-wired telephone link. No further technical details were provided.

Arguments about the possibility of a cancer risk from low-level electromagnetic fields show few signs of fading away. A letter from Jeffrey D Saffer and Sarah J Thurston of the American Pacific Northwest Laboratory, in the 'Scientific Correspondence' section of *Nature* (May 4, 1995, p22), notes that the issue of health hazards associated with weak, extremely low-frequency electromagnetic fields as produced by power lines and household appliances continues to be debated.

They state: "Epidemiological studies . . . have not clarified the issue. Thus, researchers have looked to laboratory studies on EMF effects to determine whether there is biological plausibility for increased cancer risk. Unfortunately, those laboratory studies themselves remain equivocal.

"Kobayashi *et al* have now raised an important concern, suggesting that magnetite particles may be responsible for the apparent biological effects of weak EMF fields. Investigators reporting these effects have not controlled for such particles.

"Nevertheless, we do not consider it necessary to invoke this alternative explanation for much of the bioelectromagnetics literature. Before considering the role of potential confounders to explain the effects of EMFs on biological systems, it is of foremost importance to determine whether there is indeed an effect to explain - that is do the data reported support the conclusions drawn by the investigators?

"Almost all the reported biological effects of EMFs have been at the limit of resolution for the assays used. Given this situation, one would expect that every useful control would be included. But, on the contrary, even the most highly cited reports of EMF biological effects . . . lack essential controls"

Later the writers conclude: "Even though our data question the entire notion that changes in gene expression can be induced by magnetic fields, the results do not necessarily imply that field effects on gene expression or other cellular processes would not occur under different conditions. They do, however, demonstrate the importance of essential controls in this research. Critical evaluation of much of the bioelectromagnetics literature uncovers similar shortcomings . . ." ♦

EARTH RODS

MAY'S ITEM ON EARTH rods was followed by a trawl through the packet network and the DXcluster. This produced a great deal more information.

BECAUSE GAS AND WATER pipes can no longer be relied on for domestic electrical earthing, it seems that earth rods are more readily available than in the past. The normal material is copper-coated steel, which is cheaper and easier to drive than solid copper or hard copper alloy, and almost as effective. The standard length is 4ft, but the larger-diameter rods are designed to be extended using screw-on couplers which you buy separately (**Fig 1**). The extendable rods also require a drive head, which screws on the upper end to protect the threads while you persuade the rod into the ground. There are many sources of 4ft x 3/8in non-extendable rods for domestic electrical earthing. Various people have mentioned electrical dealers, SMC, rally dealers and even large B&Q stores. Prices range from under £5 to more than £9 for a single 4ft rod. The quality of the rods and of the accessories such as electrolytically compatible clamps may vary with price, though the dearest don't necessarily seem to be the best - so shop around.

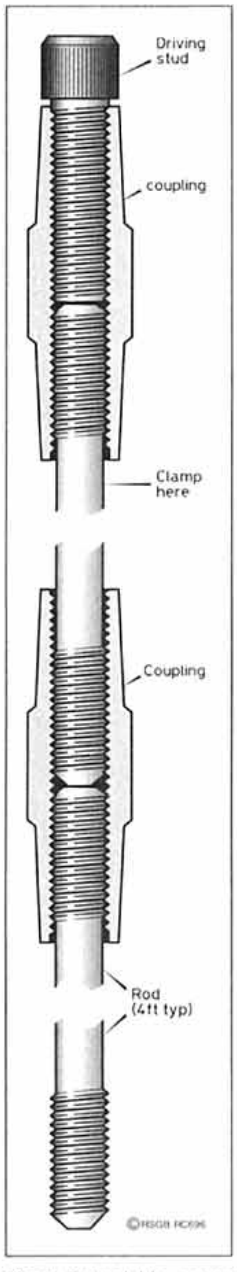


Fig 1: Extendable copper earth rods and accessories.

One electrical wholesaler who does stock 5/8in extendable earth rods is Newey and Eyre Ltd (tnx G6DER and G3NKC). There are many others of course, but I recently came away from N&E with two 5/8in x 4ft extendible rods in heavily copper-clad steel, two screw couplings in bronze, a re-usable driving stud and a wire clamp, all for under £19. Although nominally wholesalers, they're happy to take anybody's cash over the counter. N&E and many other electrical wholesalers can also order in the Furse range of rods and accessories, which are the 'Rolls-Royce' of lightning protection (and cost more, of course).

Most of the literature on earth rods relates to their effectiveness for electrical supply grounding and lightning protection. Furse produce some excellent technical literature on lightning protection for buildings and anti-surge grounding for computer installations. For these purposes at least, the diameter of the rod is not very important because the thicker rods don't reduce ground resistance very much. However, if you plan to drive the rods deep, the 5/8in diameter is obviously much easier to handle. In light soil or clay which is free from stones, you don't need any special techniques to drive a 4ft rod, such as the 'wet' methods described in May's *In Practice*. For deep driving, professionals use a Kango-type rotary hammer which vibrates the rods into the ground, rather than belting them in with a few very heavy blows.

Multiple rods should be spaced at least one rod's length apart horizontally (**Fig 2**). You can space them closer but that won't realise the full benefit of the extra rods. Note that this advice may not be directly applicable to RF grounding, being derived from DC and low-frequency AC measurements. However, lightning behaves very much like RF because of the extremely rapid rise-time of the pulse.

Thanks to everyone who provided information, and I'm particularly grateful to Eric, G3LPS, for sharing his long professional experience with grounding systems.

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GROUND-LEVEL RADIALS

WHAT IF I CAN'T use full-length radials for my HF vertical? Should I earth the far ends of my radials? Should the wires be insulated or bare?

IN A CLASSIC SERIES of measurements [1] W2FMI determined the efficiency of vertical monopole antennas for 7 and 14MHz as a function of radial number and length. The efficiency will depend on the proportion of the RF current induced from the quarter-wave radiator that is collected and returned to the feedpoint by the high-conductivity wire radials rather than lossy earth (**Fig 3**). Although the antenna's effectiveness as a very low-angle radiator for DX is determined by earth conductivity over a radius of many wavelengths, at least we can do something about the efficiency in terms of minimising local earth losses, so this is where W2FMI concentrated his efforts.

The first conclusion from **Fig 4** is that a small number of radials is pretty ineffective. Regardless of the length, they fail to collect very much of the return current. The good news is that a large number of short radials - even as short as $\lambda/16$ - can outperform a smaller number of quarter-wave ones. Unfortunately, these very short radials show diminishing returns for numbers beyond about 20, presumably because the first 20 are already collecting almost all the available current within their reach. Longer radials can also collect current from further out, and increasing the numbers to 48 or even more will continue to show some benefit.

How do W2FMI's results relate to your own back garden? These measurements were obtained over earth of 'average' conductivity, and if your radial system is very scanty you'd obviously expect much lower efficiencies if the earth conductivity is poor as well. Putting this in a more positive way, if your earth conductivity is poor, you can make large gains in efficiency by improving your radial system! The back garden of the average British semi is too narrow for a quarter-wave radial system for 7MHz (21m diameter), much less for the lower bands, so we have to do whatever we can. W2FMI's results suggest using as many short radials as possible (or a mesh screen as recommended by G3PJT in his article in May) to cover the first 0.1λ radius quite intensively, plus whatever longer radials we can manage.

W2FMI also found that the larger and denser the radial ground screen, the less important it becomes to earth the far ends of the radials with a spike. With very short radials (4ft on 14MHz, 8ft on 7MHz) he tried 6in, 12in and 18in earth spikes at the far ends, and found very little improvement in efficiency beyond 12in in soil of average conductivity (**Fig 5**). Clearly, with a small number of very short radials there is some advantage in using earth spikes to collect some of the earth

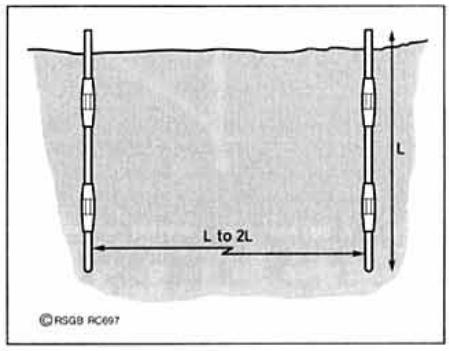


Fig 2: Place multiple earth rods at least one rod's length apart.

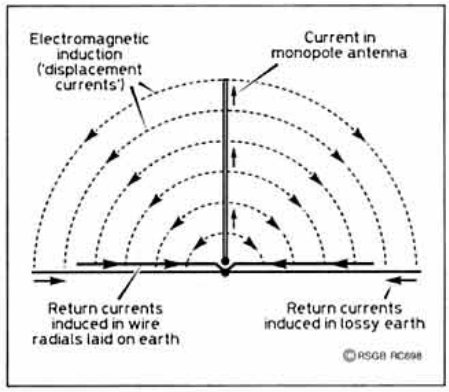


Fig 3: The efficiency of an HF monopole antenna depends on the proportion of the RF currents induced by the monopole that are collected and returned to the feedpoint by the high-conductivity wire radials rather than by lossy earth.

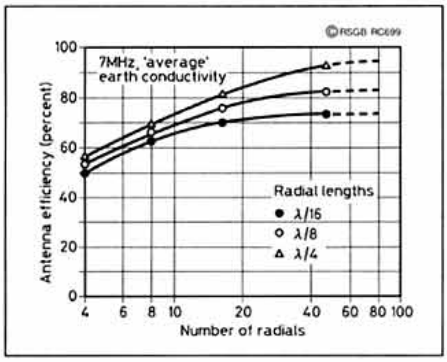


Fig 4: Even very short radials can be very effective if there are enough of them, although longer radials benefit even more from large numbers (W2FMI).

currents that are flowing inwards from beyond the radials. With radials of 0.25 wavelength or longer, W2FMI found no detectable improvement from terminating spikes. This latter result seems to quash the persistent myth that quarter-wave radials laid on or just below the ground surface are 'resonant' in the same way as radials up in the air. If a quarter-wave radial was resonating strongly, the far end would be 'hot' to RF and there would be a marked change on earthing it. However, since it didn't make much difference whether the allegedly 'hot' end was earthed or not, the radial cannot be showing any significant resonance. Similarly, it doesn't seem to matter whether or not the radials are insulated, except from the corrosion point of view. What seems to be important for any particular radial is its length - whether there is some metal out there to collect the induced currents as shown in Fig 3.

LITZ AND BRAID

FOLLOWING ON FROM the discussion on skin effect [in April's In Practice*], what's the difference between Litz and braided wire?*

LITZ IS THE NAME given to wire made from a large number of individually insulated strands. You find Litz typically in low-frequency inductors such as IF transformers for 455kHz and below, and on LF/MF ferrite rod antennas. It usually uses pink enamel insulation which is self-fluxing and helps you to solder all the strands together when terminating the ends of the wire. At these low frequencies the skin depth is quite a considerable fraction of the wire diameter (see April's *In Practice*) and much of the current flow is inside the conductor, rather than on the surface as it would be at HF and above. The main purpose of the multi-strand construction of Litz is to avoid eddy-current losses inside the wire, by dividing the conductor into very thin insulated strands (for the same reason as mains transformer cores use thin insulated laminations). The reduced losses mean that Litz wire will increase the Q of a LF/MF inductor, compared with an equivalent winding of solid wire.

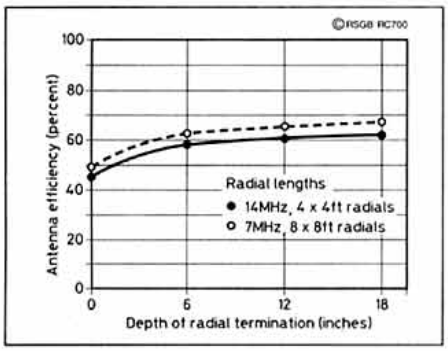


Fig 5: The better the radial system, the less it matters whether or how well the far ends of the radials are earthed. This diagram shows some advantage for earthing with only a few short radials, as you would expect (W2FMI).

Litz is usually not heavily twisted or braided, but is a parallel bundle of wires with only enough twisting to hold the bundle together. At higher frequencies the advantage of Litz wire disappears, because the skin effect tries to confine the RF current to the outermost conductors in the bundle and the RF resistance rises sharply. Litz is much more flexible than solid wire of the same diameter, so it is occasionally used at higher frequencies for mechanical reasons, eg if a power amplifier has an extra pi-network inductor switched in for 1.8MHz only, this may be a large toroid wound with heavy Litz.

It's a different matter with braided conductors. The strands are never insulated. Indeed, the opposite applies; as the skin effect makes the RF current cross from strand to strand to stay on the outside of the braiding, the strands need to be in very good electrical contact. Unfortunately, this cannot be guaranteed so copper braid has a greatly increased RF resistance compared with round or flat solid copper of the same overall surface area. Corrosion transforms woven copper braid into an inferior form of Litz, with a very high RF resistance indeed. That's why braided coaxial cables are ruined if the outer cover is nicked and water gets in. To repeat the point: the only advantage of braided - or indeed stranded - conductors is their flexibility. But that isn't to suggest that braided coax or stranded or woven antenna wires are electrically inadequate for most normal uses; in many cases their flexibility makes them the better choice overall. However, in critical applications braid has to give way to solid conductors. The most obvious examples are very low-loss coaxial cables, which always have continuous tubular or foil shielding.

Another critical situation is in the tank circuits of high-power amplifiers where very large RF currents flow, multiplied by the Q of the tuned circuit. W8JI has found that when the flattened braid from 'RG8' coax (RG213/URM67) is used to link together various parts of a tank circuit, it is no better than 2mm solid copper in terms of temperature rise. He has measured braiding to be between two and five times the RF resistance of the same size flat copper foil. And as I stated earlier, corroded braiding is very much worse, and even indoors bright copper will corrode in time.

Where you have to use braiding outdoors because flexibility is essential, use whole coaxial cable, complete with its inner and outer insulation. If you're using braiding for a link that doesn't really need to be flexible, then try replacing it with a thin, flat strap made from solid copper or aluminium.

75Ω BNC PLUGS

DEREK, G8LSN, has queried my assertion in April's *In Practice* that 75Ω BNC plugs will mate with 50Ω sockets. Because the 75Ω plugs have a longer taper to the centre pin, he has found that they may not make a physical connection with a 50Ω socket. On a computer network he found that many connections were unreliable, depending very much on the tolerances in components from different suppliers. Squeezing the socket spill helped as an emergency repair (dirty trick: use a pin pushed down between the split spill and the PTFE insulation) but all the problems disappeared when the 75Ω plugs were replaced with the proper 50Ω devices. The conclusion is that 75Ω plugs will only connect reliably to 50Ω sockets if the plugs or sockets are bent out of shape!

ANY IDEAS?

HERE'S AN INTERESTING QUESTION from Alan Ibbetson, G3XAQ. Has anybody solved this one?

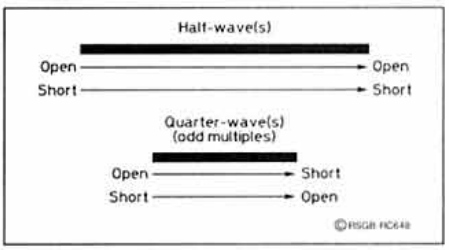
"I SEEM TO BE IN an increasing group of UK amateurs who have a 'wind it down when not in use' condition attached to their tower planning permission. Although cranking down is no problem for the triband yagi, the LF inverted vees are a pain because I have to walk around the garden taking up slack at the end supports. Are there any automatic solutions to this seemingly trivial mechanical problem?"

There's the challenge: have you any ideas on ways to tidy-up and let out 10-20m of slack automatically? Let's assume that the mechanism only needs to handle flexible wire and/or string antenna guys, in which case one or two kilograms of tension would seem to be plenty. The problem is how to apply such a force continuously over the distance required. We've already dismissed ideas involving enormously long springs or 10-20m deep holes in the ground - so please can we have something practical, proven and reproducible?

REFERENCE

[1] 'Short Ground-Radial Systems for Short Verticals' by Jerry Sevick, W2FMI. *QST*, April 1978, page 30. ♦

CORRECTION



Apologies for the error in this diagram last month. As shown correctly here, a quarter-wave stub which is shorted at one end produces a RF open-circuit at the other end. An open-circuit quarter-wave stub produces a RF short at the other end. By the way, the technique described last month is equally effective for cutting stubs of cable of 75Ω or any other impedance; you can still use normal 50Ω test equipment without any loss of accuracy.

IF YOU HAVE NEW QUESTIONS, or any comments to add to this month's column, I'd be very pleased to hear from you by mail, packet or E-mail (see head of column). But please remember that I can **only** answer questions through this column, so they need to be on topics of **general** interest.

IDEAS FROM ABROAD

EUROTEK

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

One reason for the spectacular growth of VHF amateur **FAX** is the simplicity of the interface hardware required between a PC and an FM transceiver. **Krysztof Dabrowski, OE1KDA** has collected several circuits which he described in *QSP* (Austria) 7/94.

THE FOLLOWING SHOWS interface circuits between an FM radio and an IBM-compatible PC running programs such as DK8JV's JVFAX (currently v.7) or ON5KN's SSTVFAX (currently v.4). They are not suitable for the reception of weatherfax.

The interfaces have three functions: On receive, the audio taken from the speaker or headphone socket of the radio is converted to an RS232-compatible [Note 1] square wave which is then sent to the PC on the DSR line. To transmit, a positive DTR line opens a transistor which operates the radio's PTT, while the computer-generated audio tones on the TXD line are low-pass filtered, attenuated and fed into the radio's microphone input.

THE SIMPLEST CIRCUIT

THE DIAGRAM OF THE CONVERTER pictured in DK8JV's JVFAX software is shown in **Fig 1**.

On receive, the op-amp [Note 2] is used open-loop, ie without gain-setting inverse feedback; if the instantaneous voltage at the + input is as little as a millivolt higher than that at the - input, the output will go into saturation just below the positive supply voltage. Similarly, if the + input voltage drops below the - input, the output will go to near the negative supply voltage. This circuit is also known as a bang-bang comparator. It has the effect of turning a small audio signal into an RS232-compatible square wave.

Power for the op-amp is also derived from RS232 voltages and is under software control. When receiving, there is no Request To Send, hence the RTS line is positive, approximately. +10V, depending on the PC model; similarly, the terminal (computer) is ready to receive, so the DTR line is near -10V; these two voltages will adequately power the op-amp. The rectifier bridge serves to protect the op-amp against supply reversal during non-receiving periods and when running other programs.

[The HamCom modem uses a very similar bang-bang comparator but it is preceded by a 10x op-amp amplifier. That this should be necessary is surprising as the bare comparator works perfectly well on an audio input of a few tens of millivolts - *G4LQI*]

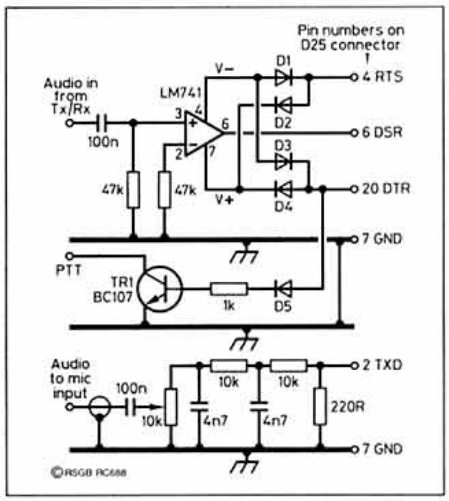


Fig 1: The original DK8JV converter. Its PTT and transmit audio circuitry is used with all receive converters. The power supply scheme also applies to Fig 2.

The PTT and transmit audio circuits work as described above and are the same for all the interfaces in this article.

The following receive converters are claimed to have better immunity to QRM/QRN than the one in Fig 1 without adding much cost or complexity.

HYSTERESIS AND ROLL-OFF

CONFIGURING THE OP-AMP AS A Schmitt trigger (**Fig 2**) rather than as a comparator eliminates interference from signals below the trigger's hysteresis level.

Some high-pass filtering is provided by the CR input network (22nF and 10kΩ, approximately 720Hz cut off) while the 1nF capacitor between pins 1 and 5 of the op-amp limits the high-frequency response and protects against parasitic oscillation. Power for the op-amp is obtained as in Fig 1.

ACTIVE FILTERING

HIGH- AND LOW-FREQUENCY roll-off are sometimes obtained by configuring the op-amp as an equal-component (150kΩ & 10nF) multiple-feedback bandpass filter [3] [The op-amp is not running open loop in this circuit and a much larger audio input or a following comparator or limiting amplifier will be required - *G4LQI*]. Power for the op-amp is obtained as in Fig 1.

A PHASE-LOCKED LOOP

ANOTHER WAY TO GET SELECTIVITY along with the desired square-wave output is a phase-locked loop, achieved with an obsolescent NE565 IC in **Fig 3**; its advantage is that its centre frequency and band width are set with one component each; with the values shown the lower cut-off is 700-800Hz, the upper 2500-2600Hz.

The NE565 can be operated on the positive-only supply shown in Fig 3, with a single diode for reverse-voltage protection, or on a dual supply (with pin 1 connected to -10V) like that for the op-amp in Fig 1 [An NE565 may be hard to get; the smaller, cheaper NE567 may be used instead but it requires more components for bandwidth and centre frequency setting and is designed for a single 10V supply only - *G4LQI*].

An RS232 link requires a signal of more that 6V p-p. The output of an IC operating off a single supply may be too low; if so, it can be boosted by a CMOS gate or Schmitt trigger.

WARNING

JEAN BLINEAU, F6HCC, in an article on the same subject in *Radio-REF* 10/94, makes two points:

Never make interconnections to a PC or radio with the power on; the chassis are not necessarily at the same potential and the component connected to the first plug-pin to make contact may be destroyed.

Do not assume that the speaker in your radio or PC is at zero DC level. If you want to pick off audio from across a speaker, use an isolation transformer; you may salvage one from an old telephone.

NOTES

[1] For RS232 voltage levels and the designation of lines used between a modem or TNC and a terminal or computer, and their pin numbers on 9-pin and 25-pin D connectors, see *Eurotek* 4/95.

[2] Op-amp (operational amplifier) basics are explained in the *Radio Communication Handbook*, 6th edition, RSGB, p5.33-ff.

[3] Active filter basics are explained in the *Radio Communication Handbook*, 6th edition, RSGB, p22.16. ♦

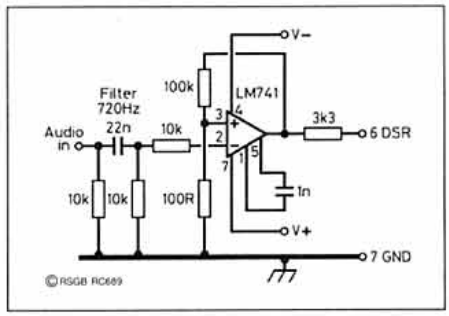


Fig 2: The op-amp operates as a Schmitt trigger. Hysteresis and some high and low frequency roll-off improve immunity to QRM/QRN.

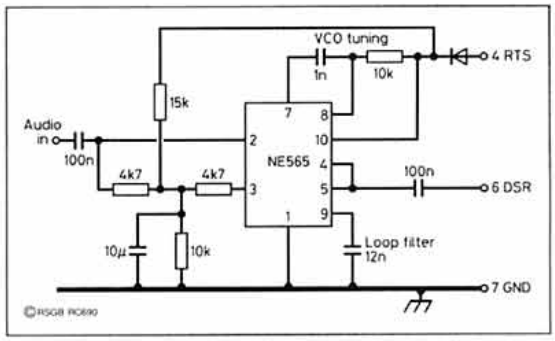
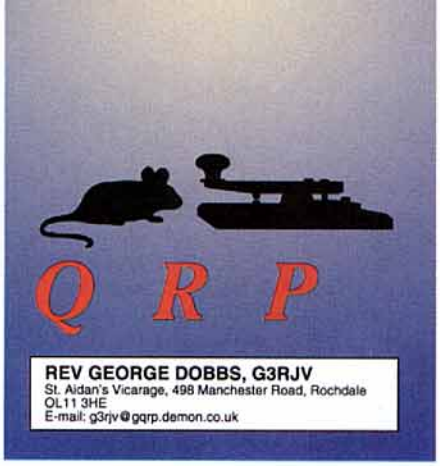


Fig 3: A phase-locked loop provides easily adjustable selectivity, but may need a CMOS gate to boost its output to RS232 level if operated on the single power supply shown.



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TECHNOLOGY MOVES rapidly, so it seems, as demonstrated by further changes to the QRP lists on the Internet. In the last *QRP* column (*RadCom*, June 95, page 74) I gave corrections to the UK QRP list and now, to confound us all, both the UK QRP list and the USA based QRP list have both changed addresses.

THE GQRP LIST

To join, send mail to Majordomo@blacksheep.org and include the words "subscribe GQRP-L" in the body of the message; leave the subject line blank. The first mailing will be an introduction to the list which will give operational procedures and the aims and purpose of the list.

THE QRP-L LIST

To join, send mail to listserv@Lehigh.edu and include the words "subscribe QRP-L name & callsign" in the body of the message; leave the subject line blank. The first mailing will be an introduction to the list.

Both lists serve the needs of QRP orientated radio amateurs. The American list is very active and will certainly put plenty of mail on to your computer. The G QRP list is somewhat smaller and mailings tend to be more to the point.

SIMPLE SIDEBAND ON AIR

IT IS OFTEN ASSUMED that HF QRP operation is restricted to CW. Certainly CW is a very convenient mode for QRP operation with its reliability in difficult conditions and the ease with which simple low-powered equipment can be built. But that is far from the total picture. For many years there has been a dedicated group of SSB, and some DSB, operators using low power. A significant number of these operators have used home built equipment. In recent years many straightforward designs for QRP SSB transceivers have appeared. Several kits are also produced, the main ones in the UK being from Hands Electronics and Walford Electronics.

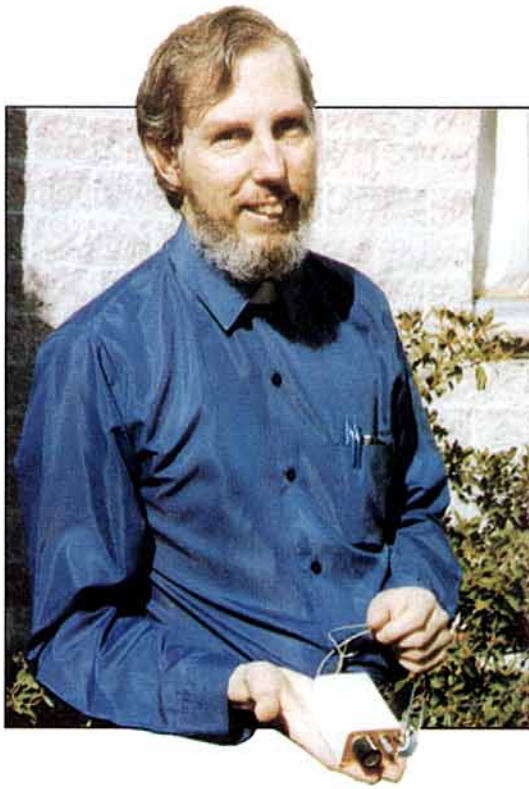
Derry Spittle, VE7QK, has been a frequent visitor to the Annual QRP Mini-Convention in Rochdale. Over the years he has shown several miniature SSB Transceivers; one of them builds into a pack for 20 cigarettes. The transceivers have been designed for emergency use in the wilderness of British Columbia. Although there are VHF emergency channels, the back-up is provided by an emergency frequency on 80 metres SSB. Last year he unveiled the latest version called the Epiphyte. The full construction details were published in the G QRP Club journal *SPRAT* (Winter 1994).

The Epiphyte is a superhet SSB Transceiver using a 455kHz ceramic filter and NE602 chips as mixers and sideband generator. Ceramic resonators are used in the oscillators and a CMOS switching device controls the paths of oscillators and the filter between transmit and receive. The whole transceiver, in its basic 1W output form, fits onto a single printed circuit board. An outboard 5W power amplifier is also available.

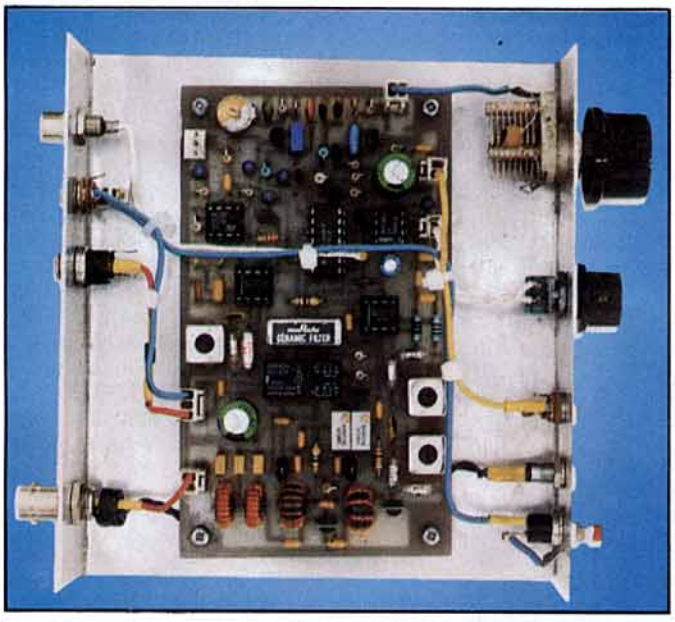
Many examples of this simple SSB transceiver have been built in Canada and also in California, where it appeared in the journal of the Northern California QRP Club. Regular skeds are now maintained between British Columbia and California using the Epiphyte. Several have also been in use in the UK. Terry Poole, G3VMT, has used an Epiphyte to good effect. Using only a simple 66ft end fed wire, G3VMT made contacts into France, Germany and Switzerland. He added the 5W amplifier to coincide with the VE Day Special Event stations and succeeded in working 22 of these special calls on 80 metres with good reports.

An even simpler approach to phone operation on QRP has been attempted by Eric Sears, ZL2BMI. The ZL2BMI Double Sideband Transceiver has become something of a local legend. Eric, a clergyman in New Zealand, has built many versions of this simple transceiver. Examples have been published twice in the national amateur radio journal, *Break-in*. The latest version also appears in *SPRAT*.

These miniature transceivers, again designed for backpacking, are a 'real' amateur radio project. ZL2BMI makes use of whatever he has to hand to build the transceivers. All the parts are commonly available at low cost and the design has changed as new options have become available. Cake tins and cutdown conduit pipes have provided cases for the smaller versions.



Like all good experimenters, VE7QK and ZL2BMI are still working on their projects. The Epiphyte 2 is now working and this includes the 5W power amplifier on the same board, which is also the same size as the 1W version. ZL2BMI has now produced a Single Sideband version of his transceiver using the NE602 chip and he is also working on a compact, low parts count, phasing transceiver. Low power SSB construction and operation are certainly alive and well. ♦



Above: The complete VE7QK Epiphyte SSB Transceiver. Top right: Eric Spears, ZL2BMI, shows off a version of his DSB Transceiver.

EUROPE FOR QRP WEEKEND

THIS IS A POPULAR annual event jointly organised by the G QRP Club and the OK QRP Club.

Dates and Times: From 1600UTC on 29 September to 2359UTC on 1 October.

Modes and Frequencies: CW only on 3560, 7030, 14060, 28060 all plus/minus 10kHz.

Stations Eligible: Any licensed radio amateur.

Call: Call CQ EU QRP.

Contest Exchange: RST, Power Output and Name.

Scoring: Only QRP/QRP QSOs count. Contacts with your own country do not count. European Stations score one point for each European QSO and three points for each QSO outside of Europe. Final score is the sum of points on each band.

Logs: Separate Log Sheets for each band showing for each QSO: date, time, call, exchange sent / received.

Logs to: Petr Doudera OK1CZ, U1. Baterie 1, 162 00 Praha 6, CzechRepublic.

Emergency

GREG REILLY-COOPER, G0MAM
PO Box 98, Northwich, Cheshire CW9 5SZ.
Telephone: 0606 783270.

ONE OF THE VERY few drawbacks of being Emergency Communications Officer is that much of my available time (and, according to my wife, much that is not available as well) is so occupied by administrative matters that I have limited opportunities for what I regard as the 'real' Raynet work; being out there on the radio. However, to compensate for this I have the privilege of an unparalleled overview of the network and, thanks to your support and feedback, often receive suggestions and ideas which you feel would benefit us all. This has already led to a number of new initiatives and I am delighted to be able to report another.

There have, in the past, been few opportunities to recognise publicly the significant contributions our colleagues have made to the network. Recognition by our peers - those who know best of all how those efforts weigh against the norm - has always been the highest accolade. Now we can mark our colleagues' achievements by recommending them for admission to the new Raynet 'Roll of Honour'.

The Roll of Honour is still in its infancy and I would be glad to hear from anyone who may have suggestions regarding its administration and operation.

At present, it is not specifically an RSGB award but is recognition of Raynet members by the network itself. It will therefore be controlled, for the time being, by the Emergency Communications Officer (ECO) to whom all nominations and suggestions should be sent. There will be no unnecessary restrictions or conditions involved so there will be no committees meeting at pre-determined intervals to consider a limited number of awards. Neither will there be any specific qualification; it will be enough that one or more of you feels strongly enough that a colleague should be enrolled, and for the ECO, balancing the details reported against the wider view of the whole network, to agree. As it is a Raynet award, every member of the network is eligible, regardless of length of service, RSGB membership or affiliated status. Members enrolled will receive individual certificates which will be signed by the ECO of the day and countersigned by another appropriate party.

This is your award; please feel free to use it and, if you feel it should be used differently, let me know.

HEROES RECEIVE AWARD

THOSE OF YOU WHO read the RSGB Raynet news on packet each week, or saw the May 1994 edition of *RadCom*, will recall how three Raynet members, Anthony Lewis, G6LBC; Graham Pemberton, G7NEH; and Peter Baston, GW0PJA, of Cheshire Raynet rescued a young lad, Alfie McLelland, from a perilous situation.

Most importantly, a life was saved but the ensuing publicity reflected extremely well upon Raynet and on amateur radio generally. As a result, the three Raynet members have become the first to make it onto the Raynet Roll of Honour.

It was arranged that the three should be on duty together at the Lord Mayor's Show and Festival of Transport at the RooDee Race Course in Chester on Sunday, 14 May 1995, to allow the presentations to be made.

At the presentation, the certificates were counter-signed by RSGB President Clive Trotman, GW4YKL, and awarded by him in the presence of the fully recovered Alfie and his family. Alfie then made his own award of an engraved plaque to each of his three rescuers, in gratitude for their efforts. Also present were the Lord Mayor of Chester, Councillor Gordon Smith, and President of the Chester Lions Club, Gareth Williams, at whose invitation the proceedings took place in the VIP marquee.

The citation on the certificates read: "This certificate confirms that *(name and callsign)* has been added to the Raynet Roll of Honour in recognition of his contribution to the location and safe recovery of Alfie McLelland (aged 12 years) who, on 26th December 1993, had fallen from his bicycle and lay injured alongside the river Alyn fifty feet below. *(Name)* and his two companions, all Raynet volunteers, summoned the emergency services by use of their amateur radio and remained on the scene to tend to the casualty and guide the emergency services to his location. His actions on that date materially benefited Alfie's recovery and reflected very creditably upon himself, Raynet and Amateur Radio generally."

Cheshire Raynet Groups are company members and so, in addition to the Emergency Communications Officer and local Raynet members, Ron Cowan, GM4SRL, Chairman of the company, and David Hicks, G6IFA, Zone 10 Co-ordinator, attended, along with Bruce Williams, G1ORS, Cheshire County Controller.

Echoing the sentiments expressed by the Cheshire EPO and emergency services at the time, the Lord Mayor congratulated the three for their prompt teamwork and for contributing through their hobby to the community in a way which was of benefit to others.

A RESCUE IN DEEP SEAS

WITH THE HELP OF Raynet members, an extensive air-sea rescue exercise was successfully mounted at Beaufort's Dyke, the deepest section of the Irish Sea. The following report was submitted by Gordon Gibson, GI4MDD.

On 30 November 1994, HM Coastguard District Controller at MRSC Belfast invited Raynet in Northern Ireland to take part in his exercise 'Beaufort's Dyke', which had been planned over the previous 12 months.

The exercise was scheduled for Sunday, 26 February 1995. Its aim was to demonstrate the ability of HM Coastguard, maritime search and rescue units, emergency services and local authorities to respond to all aspects of a passenger-ferry incident occurring in the North Channel, using declared and additional rescue facilities. More than eight million passengers are transported annually within the West of Scotland and Northern Ireland Region by passenger-ferries plying between the Scottish mainland, Northern Ireland and the Western Isles. Such a high volume of maritime commercial activity clearly dictates the need for contingency plans to be drawn-up and tested for use in any emergency situation.

During the exercise, 210 people were evacuated from the cargo ship *MV Spheroid* (acting as a ferry) by Search and Rescue Units involving Royal National Lifeboat Institution lifeboats from Donaghadee, Portpatrick and Bangor (Co Down), as well as helicopters from 819 Squadron, *HMS Gannet* and RAF helicopters from RAF Aldergrove.

Contingency plans were set down by HM Coastguard, Fire Brigade, Ambulance, Police, Belfast Freight Ferries, Health Boards, Regional and District Councils and voluntary services. Raynet was invited to provide a safety back-up role by providing a secondary, independent, personnel accounting system to protect those involved as players in the exercise.

Two Raynet members boarded the *MV Spheroid* and another member went to Mew Island so that those acting as players could be identified, and to initiate the casualty count of players. Three simultaneous Raynet 'nets' were established at Bangor (Co Down) where most of the action took place; Stranraer (Dumfries and Galloway), which was the alternative casualty clearing centre; and MRCC Clyde, the control centre for all Coastguard activity in the West of Scotland and Northern Ireland area. A Raynet Control established in Ayr

Cheshire Raynet members (from left) Peter Baston, GW0PJA, Tony Lewis, G6LBC, and Graham Pemberton, G7NEH, are awarded Roll of Honour certificates by RSGB President Clive Trotman, GW4YKL. They were also presented with an engraved plaque each by Alfie McLelland, the young lad they rescued.

linked the three nets on different 2 metre frequencies using 2m/70cm cross-band Talk-Through Units on the Mull of Kintyre and Meall Mor.

Lifeboat landing points were designated at Bangor and Portpatrick Harbours, along with helicopter landing sites at Glenola School in Bangor and at Stranraer Rugby Ground. An amusing episode occurred at the Stranraer site when several rugby and soccer players turned up, innocently expecting to have their normal Sunday practice sessions!

The main Casualty Clearing Centre was based at Bangor Leisure Centre, adjacent to the temporary helipad, and a similar arrangement in Stranraer used Stranraer Academy. Raynet members manned all of these points as well as the ferry terminals in Stranraer and Cairnryan and the minibus used to transport 'casualty' players in Northern Ireland and the Bangor (Co Down) Leisure Centre.

Bangor Harbour in Northern Ireland was one of the locations used during Exercise 'Beaufort's Dyke'. Raynet members are seen here counting and logging players rescued by Donaghadee Lifeboat.

The exercise started early for some while the rest of us were still enjoying our sleep, as they boarded the *MV Spheroid* at 0530 to count the players who were due to board at 0600. *MV Spheroid* left its Belfast berth at 0700 to arrive in the exercise area by 0900. As a safety measure, players were not taken from the ferry by boat and were not expected to take to lifeboats or enter the sea. To simulate a sea rescue, players were taken to nearby Mew Island and joined the exercise from there.

Raynet members were asked to be in position at their assigned points for the start of play at 0930, when the Captain of the *MV Spheroid* - playing the ferry - sent a Mayday (Mike Delta) distress call to the Coastguard. He informed it that his vessel had collided with a partially submerged object which had disabled his vessel. He reported that this had caused a fire in a vehicle on the car deck, with noxious fumes issuing, and a pollution scenario quickly developing.

As the casualty players were evacuated from *MV Spheroid*, Raynet had the task of accurately and independently logging who was on board which flight and where they were subsequently landed. Four helicopters provided a shuttle service to Bangor (Co Down) or Stranraer, and two flights left their players on passenger ferries en route to Scotland. Meanwhile, the lifeboats played their part by landing players at Bangor and Portpatrick Harbours. Additional players, in the form of dummies or oil drums, entered the sea to necessitate a Search and Rescue phase after the *MV Spheroid* had been evacuated by 1300. The sea search was completed in a shorter time than had been anticipated and the exercise finished at 1530.

Throughout the exercise, all progress messages from the local nets in Northern Ireland and Dumfries and Galloway were sent via the Raynet Control in Ayr to the Coastguard Station in Clyde. The Exercise Direction staff introduced a few extra scenarios for Raynet to handle and, at the end of the day, Raynet had succeeded in meeting all the objectives set, with all players safely accounted for. Some from Northern Ireland, who ended up in Scotland, were given a complimentary ferry passage home.

IDENTITY CARDS

I AM STILL RECEIVING enquiries about the availability of standard format Raynet Identity Cards. If you are interested in using the nationally recognised style ID Card please note that, although they are almost identical to the cards last issued by the RSGB, neither the Society nor myself administer their issue. The cards are sourced from within the network itself, and are available to RSGB-affiliated Raynet Groups, but are issued by Kevin Snelling, GW7BSC. Kevin is QTHR and can also be reached via packet at GB7IMB.

A STRANGER REMEMBERED

PERSONAL SAFETY IS A very important issue and one which, if overlooked, can have tragic consequences. It would be the cruellest irony if a Raynet member, whether through over-enthusiasm or plain ignorance, overlooked his own basic needs and became a casualty whilst on duty for the purpose of helping others.

With this in mind, I should like to share with you the words of John Clark, G0OWN, of Kent Raynet who has illustrated the point very ably:

A stranger, though but likely clad
Arrived to help - a strapping lad.
Insisted that he wished to stay
Although a cold, wet windy day.

He wore no wool for body glow,
No windproof over 'gainst the blow.
No hat to save the heat from brain,
Still worse, no waterproof for rain.

That day he'd eaten only once
And carried nought for sustenance.
Thus calories were now deplete,
But on he worked, still on his feet.

Body heat dispersed quite fast.
Strangely, he felt warm at last.
Yet, he was bemused, astray,
Staggered, sank, as knees gave way.

Then, as operation wound-up
"Ops" began the helper round-up.
"Where's the stranger?" someone asked.
Thus a wide-spread search was tasked.

Daylight gone and spirits jaded
And their batt'ries all but faded.
There they found him, live no more,
Prostrate, lone, upon the shore.

Sad it is that one so willing
Came to such an end so chilling.
Though he'd been in best of health
Hypothermia killed by stealth.

AND FINALLY . . .

A REMINDER THAT THIS is your page and your opportunity, shared by the whole network, to illustrate what Raynet is and what it does. *RadCom* is widely read and reports of Raynet Group activities are always of interest to other groups as well as the wider readership. If your group writes about something it has done, please consider sending a copy to me for possible inclusion. Some of the reports I receive need no editing at all; other contributors prefer just to send the details and leave the composition to me. Either approach is fine - just so long as you all have an opportunity to use the page. Photographs, especially colour, to accompany the text are always welcome but are not essential - so please do give it some thought. ♦

EMC

HILARY CLAYTONSMITH, G4JKS
115 Marshalswick Lane, St Albans,
Herts AL1 4UU

SEVERAL MEMBERS HAVE sent me the same news items from *Electronics Weekly* (23 March 95) about the hi-tech system Trafficmaster. At present, the system comprises infra-red sensor units on motorway bridges which measure traffic speed and relay information back to the traffic information centre. This is then processed and transmitted via a radio paging network to the in-car units. Later this year, Trafficmaster is expecting to market an in-car transmitting unit which can be attached to the existing Trafficmaster YQ (Why Queue!) units. Its transmitting frequency is expected to be 433MHz.

TELEPHONE EMC

IN THE LAST *EMC* column, in June's *Radcom* (page 75), I looked at certain aspects of telephone EMC. Other areas of interest include equipment associated with telephones such as fax machines and modems. We are also keeping a close watch on the use of existing unscreened telephone cables for high speed data transmission, such as ISDN (Integrated Services Digital Network) and video on demand.

CORDLESS PHONES

With standard UK cordless phones which meet MPT 1322, the base station transmits an FM signal on one of eight channels below top band. As the handset receives this signal using a 2in long ferrite rod, it is not surprising that radio amateurs using a 102ft long G5RV aerial find the second harmonics of channels 7 and 8 in the 80 metre band at 3524kHz and 3564kHz respectively. It is not unknown to find a fourth harmonic on 7048kHz or even eighth harmonics around 14096kHz or 14256kHz. The cordless phone handset can be susceptible to interference from some answering machines, mains wiring, alarm systems or other cordless phone users on the same channel nearby. It can also suffer breakthrough from amateur transmissions in the 1.8MHz band. The handset transmits on a VHF frequency about 2.5MHz below the 50MHz amateur band so the base station can suffer breakthrough from 50MHz amateur transmissions. However, this is more likely to occur with some of the non-approved models mentioned below.

The EMC Committee has heard of cases of breakthrough onto cordless telephones which turned out not to be BABT approved. If the base unit has no BABT approval sticker or has a US FCC (Federal Communications Commission) approval sticker, then it is likely that the phone's transmitters are not licensable for UK operation. With modern US models, the base station transmits between 46.61 and 46.97MHz and the handset transmits between 49.67 and 49.97MHz. As this is very close to 50MHz, the base station receiver can suffer breakthrough from 50MHz amateur transmissions. We have also heard of cordless phone base stations which transmit around 1945kHz but these are rare nowadays. There are a few unlicensable long range cordless telephones around, where the base station transmits around 49MHz and the handset transmits around 160MHz or 70MHz, in some cases within the 70MHz amateur band.

FAX MACHINES & MODEMS

A potential problem with fax machines and modems is RFI which they can radiate via overhead telephone wires, particularly on 1.8 and 3.5MHz. Fax machines normally use switch-mode power supplies and, although BABT approval tests RF emissions via the phone line up to 8MHz, further reduction may be desirable. With modems, RFI could come from the modem itself or from the computer which is connected to it. Until recently, a significant proportion of the modems on the UK market were not BABT approved and some may not incorporate the required RFI filtering on the telephone line. With HF emissions from modems or fax machines, a Freelance RFI filter at the phone socket and a ferrite ring on the phone line cable may help. At VHF, emissions tend to be radiated directly from the equipment itself so filtering is less likely to be effective.

Ian Kyle, GI8AYZ, has provided a detailed report on the RFI from a Samsung model SF 1700 fax machine which he uses at home. On 28MHz, with a turnstile aerial in the roof space, there is an increase in noise level of 4-6dB across the whole band with stronger signals on certain spot frequencies which are multiples of 300kHz. With a different 28MHz aerial 11 metres from the fax machine, the increase in noise level is 2dB. On 50MHz with a 4 element yagi 11 metres away, the RFI is barely detectable apart from spot frequencies at multiples of 300kHz. On 70MHz, with a 4 element yagi 11 metres away, there is continuous 'machine noise' 3-8dB above the background noise level. There are also various emissions on the 144MHz band. Fortunately, GI8AYZ can switch his fax machine off when necessary but some amateurs, such as B G Jones, GW6ZYI, have suffered from neighbours' fax machines which run 24 hours a day.

The BT DF200 is a fax machine, telephone and answering machine in one compact plastic cased unit. Voice messages are recorded on a chip so there is no tape. GW6ZYI reports that when a DF200 was installed at a garage about 100 yards away from him, he suffered broad band noise between 144 and

The BT DF200 combined fax machine, telephone and answering machine.

146MHz at levels of S5 to S9 when using a 3 x 5/8-wave collinear aerial. After GW6ZYI complained, BT fitted a filter at the phone socket and changed the fax machine's power supply unit but this made no difference. He complained again and they tried a DF90 model but this did not help either. When a new model, the DF200C, became available, BT were eventually persuaded to exchange the DF200 for a DF200C and most of the VHF RFI disappeared.

We understand that some of the VHF RFI came from the external 24V, 1.5A switch-mode power supply unit which is housed in a plastic case. Inside the fax machine, there are two switching regulators which convert 24V down to 5V.

A CASE HISTORY

The following letter from a member is too well constructed to condense. It begins with our member enjoying his FT101ZD running 100 watts when "after a few days, I was approached by the office manager of a firm of solicitors a few doors away. 'You will have to stop messing about with your CB,' quoth she! A brief discussion revealed that there was breakthrough onto the telephones in her office. The lady was highly indignant about the whole matter.

"Being on good terms with a senior partner in the firm, I went to him and we discussed the matter. As a result he instructed his office manager to call in BT. A few days later, a somewhat flummoxed engineer arrived at my door, asking how to cure the problem. After several coffees and much perusal of all the published matter on the subject, he went away looking more flummoxed than before!

"Having spent several hours on the job, he left saying that he would return the next day. This he did, in company with a colleague. More coffee, more perusal, more bafflement! Two days work achieved nothing except that they used up my whole stock of ferrite rings. Eventually they left, expressing the view that the problem was solved.

"Next day; yes, you've guessed, matters were worse than before. The following morning a quite different engineer arrived and *instructed* me to shut down my station. I remarked that I was willing to reduce power until such time as the problem was solved and that I had indeed done so but that I

Ferrite rings and cores for EMC use. Top left, Fair-Rite 2643802702. Top right, Philips 4330-030-3445. Centre, a pair of Neosid 28-041-28. Lower left, Maplin BZ34M. Lower right, large CRT deflection yoke ring.

would not shut down upon his instructions, as he did not have the authority to require me to do so. His response was, somewhat crudely, to the effect that he would have my licence cancelled. I wished him good fortune in his endeavours and closed the door.

"Nothing further was heard for about two weeks, during which time I was enjoying QRP operation, during office hours. Isn't it surprising what can be achieved with three watts?

"Next, a knock on the door which revealed the DTI, in all their glory, complete with spectrum analysers *et al.* Two highly professional, courteous and amusing gentlemen put my station through its paces and pronounced it clear of any unwanted radiation. More coffee and some very funny anecdotes later, they left suggesting that the matter would soon be resolved.

"Within a week, two very high-powered gentlemen arrived from BT. They had travelled up from London to deal with the matter. Several hours concentrated effort on their part resulted in my putting out a full power signal on all bands without creating any difficulties with the BT installation. All was sweetness and light until the girls in the office switched on the fax machine. I was called in to hear the problem. Naturally, as I was in the office with them, there was no sound coming from the fax! They needed some convincing of the fact that I was unable to be in two places at any given time. However, I took a look at the fax machine and solved the problem by turning down an unused volume control on the back of the machine.

"One might think that this was the end of the story. Not quite. Some weeks later, a gentleman wearing a very expensive suit and driving a very exotic motor car arrived at my front door. He remarked that he was sorry to hear that I had been having problems with my aerials. My turn to be flummoxed as I had not experienced any such problems. His response was to the effect that undoubtedly there would be problems in the future due to the high winds which we experience in this area. He proceeded to struggle from the boot of his car a large, canvas wrapped and very heavy object. This he rolled into my home saying that he and I had never met, that he knew nothing of electronic telephones and had never heard of amateur radio. Smiling, he got into his car and drove away.

"Very puzzled, my wife and I proceeded to unwrap the canvas, only to discover a two thousand foot coil of fourteen gauge copper-bronze wire. Yes, it did have a metal tag on it which identified its origin but I don't intend to say any more on that subject.

"It's nice to be able to say that my popularity in the local radio club seems to stem from the fact that there are an awful lot of wire aerials doing a grand job around this area, which were not there a few months ago. Various pensioners and disabled people have benefited from my 'telephone problem'. I never did get my ferrite rings back."

FERRITE RING UPDATE

FERRITE RINGS CAN BE used to solve many EMC problems, particularly on the HF bands if RF signals are picked up or radiated by cables. References [1] and [2] explain how they are used. To stand the best chance of success, it is important to use a suitable grade of ferrite with a suitable number of turns. For thin cables, such as some loudspeaker cables, good results can be obtained at 3.5MHz and above with six turns on a Maplin BZ34M clip-on computer data line noise filter (see photograph, bottom left). In many cases, however, larger ferrite rings are required.

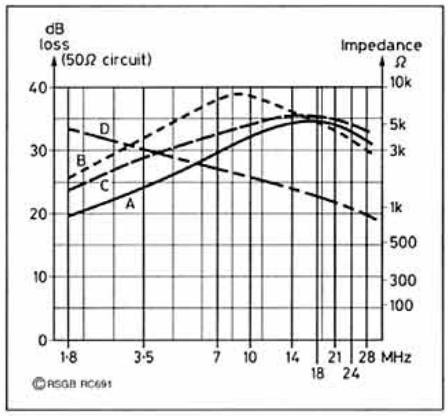


Fig 1: Typical characteristics of various ferrite rings on the HF bands:
Curve A, 12 turns on one Fair-Rite 2643802702.
Curve B, 12 turns on two Fair-Rite 2643802702.
Curve C, 12 turns on one Philips 4330-030-3445.
Curve D, 14 turns on two Neosid 28-041-28.

The EMC Committee has tested various ferrite rings and although there is no single type which gives the best possible performance for EMC use on all amateur bands, we identified the pink coated Philips 4330-030-3445 for good all-round performance from 3.5 to 70MHz [3]. As these rings were on 16 week delivery and subject to a substantial minimum order charge, a more easily available and lower cost alternative has been found.

The new rings are made by Fair-Rite Corporation in the USA and are now being sold by RSGB in packs of four at a members' price of £3.90 per pack, plus postage (See *Book Shop* in this issue, pages 90/91).

These are wide rings (0.5in/12.54mm), although they are not quite as wide as the Philips rings. Both types have the same internal diameter (0.9in/22.85mm). In **Fig 1**, curves 'A' and 'B' show the characteristics of the Fair-Rite rings which are made of type 43 material.

For maximum effect up to 10MHz, use 12 turns on two Fair-Rite rings although one ring may be adequate in many cases. Above about 10MHz, the stray capacitance of the winding becomes a very important factor. This should be minimised by keeping the two ends of the winding separated using the recommended winding method shown in [1] and [2]. Winding multiple rings separately rather than as a stack, reduces the overall stray capacitance but stacking them is neater and requires less cable. For 14-28MHz, 12 turns on one ring is recommended. For 50MHz, between 6 and 12 turns on one ring may be used. For 70 and 144MHz, use 6 turns on one ring.

For cables over 5 - 6mm diameter, 9 turns on two rings or 6 turns on 4 rings can be used instead of 12 turns on one ring. For even thicker cables, where 6 turns will not fit through the Fair-Rite rings, an alternative is to wind 15-20 turns on a large ferrite yoke ring from a scrap TV or VDU scan coil assembly [4]. The grade of ferrite used in yoke rings normally gives good results in EMC applications at 3.5MHz and above but other surplus ferrite cores such as transformer cores are not generally suitable except at 1.8MHz and possibly 3.5MHz.

At 1.8MHz, higher permeability rings such as Neosid 28-041-28 give the best results. They are also very good on 3.5MHz but their performance falls off on the higher HF bands. They are narrow rings (0.25in, 6.25mm wide) so two are normally stacked together. They were sold by the RSGB in the past and are still available from AKD (tel 01438 351710). The AKD price is £3.50 per pair including VAT. Postage and packing for one pair is 50p including VAT. For more than one pair, the cost of postage should be checked with AKD.

A pair of the rings used by BT engineers, which are known as 'core ferrite 103A', gives similar results to one RSGB Fair-Rite ring although the BT rings are not as good at 3.5MHz and below. BT engineers can achieve an impedance of at least 2kΩ from 1 - 30MHz by combining a pair of BT type 103A with a pair of Neosid 28-041-28. The four rings can be stacked together and wound with a single 12 turn winding but a separate 12 turn winding on each pair gives better results. A pair of 28-041-28 can also be combined with one Fair-Rite 2643802702 ring to achieve a similar effect.

INFORMATION WANTED

IF YOU HAVE A car alarm with a Foxguard MW15 microwave sensor or you know where we can obtain a Foxguard MW15 for testing, the EMC Committee would like to hear from you urgently. Please write to me QTHR.

The recent introduction of compact HF transceivers such as the Kenwood TS-50 seems likely to make HF mobile operation more popular. Now that almost all new cars have electronic fuel injection, we would be interested to receive any reports of car electronics being affected by amateur transmissions or affecting amateur reception.

We would also like to hear from anyone who has experienced problems with hi-fi systems which use a loop aerial for AM. Tuners which use these seem to be more susceptible to breakthrough from amateur HF transmissions than radios with ferrite rod aerials.

A recent development in television receivers is the 'home cinema system' which has external loudspeakers. Predictably, their cables can act as unwanted receiving aerials for amateur transmissions. We would like to hear of any cases of RF breakthrough on such systems.

We would also like to hear from anyone who suffers interference emitted by PABXs (Private Automatic Branch Exchanges) and control panels for alarm systems.

REFERENCES

[1] EMC - 'Dealing with Interference', *RSGB Amateur Radio Call Book*, 1994 and 1995 editions.
[2] 'Filters and Ferrites in EMC', D Lauder G0SNO, *RadCom* Dec '93 and Jan '94.
[3] *EMC* Column, *RadCom* June 1994.
[4] *EMC* Column, *RadCom* Dec 1993. ♦

RMS VOLTAGE

I THINK IT should be mentioned that the RF RMS voltage probe (*RadCom*, April, p67) is not named according to normal practice and therefore might mislead those without experience of measurement errors. The .707 calibration factor used applies only to sinusoidal waveforms (and very rare oddities that give the same result).

Most commonly available AC voltmeters respond either to rectified average, or as in this case, peak voltage. By long standing convention, more appropriate in the electricity supply industry, a scaling factor then sets the scale to read RMS on the assumption that the waveform is sinusoidal. Also by convention, the term RMS meter or TRUE RMS meter is reserved for instruments that really do respond to the RMS magnitude of the signal to be measured whatever its waveform. This requires one of several possible special techniques for processing the waveform. Such instruments are normally very limited in frequency response or very expensive.

R H Pearson, G4FHU

Technical Update

COHERENT CW, LATEST

Since the article on page 38 was written there have been important new developments. The original frequency suggested has now been changed to 35kHz up from the bottom of each band.

A new program called PCW (Precision CW) has been written by Dr.-Ing. Ernst Schroder DJ7HS developing COHERENT further and making it more acceptable to the average operator - COHERENT is more for the experimenter and includes features not available in PCW. However, PCW is an excellent program for the operator who just wants to operate CW coherently. It uses the same interface board as COHERENT and will not work without it. The program is shareware and should be available from shareware dealers in the near future. In the meantime if anyone would like a copy I will be pleased to supply one. In America copies can be obtained from W6HDO, 950 Pacific Street, Morro Bay CA 93442.

In both cases a contribution towards the cost of the disk and postage would be appreciated. DH7HS is making his own arrangements to distribute the program in Germany.

Peter Lumb, G3IRM

THE AMAZING ERROR

IN THE JUNE EDITION, we published Part Two of 'The Amazing 1-T-1 Receiver'. Amazingly we managed to get the callsign of the author wrong both in the article's byline (G3DXW) and on the contents page (G3DXN). Chas Fletcher's real callsign is G3DXZ - apologies to him. *RadCom's* Technical Editor has been sent on a typing course. ♦

PRO-AM SERIES OF HF MOBILE ANTENNAS

CONTINUED FROM PAGE 44

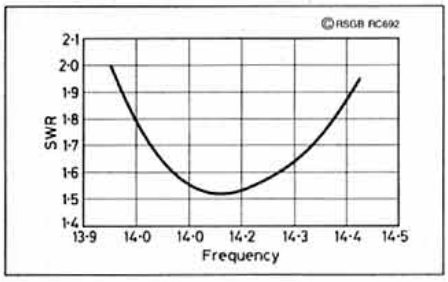


Fig 1: SWR curve for the PHF-20.

PERFORMANCE

IT WAS INTERESTING to see how the Pro-Am would perform. The ideal antenna test arrangement is to be able to compare one antenna with another. This is not a practical solution for mobile and the best that can be done is to use it over a period of time and the log book should tell its own story.

The antennas were rear bumper mounted (although well earthed to the car metalwork) and connected directly to the transceiver via 50Ω coax without any matching arrangements. SWR curves for these antennas are given in **Figs 1** and **2**.

The first test QSO on 80 metres was with LX5OV. QSOs throughout the UK and Europe were easy to achieve although the narrow bandwidth (in common with all small 80 metre mobile antennas) restricted one to a relatively small section of the band while driving.

On 14MHz European contacts were achieved even under even the most difficult conditions and DX contacts were possible when the band was open. Stateside QSOs were fairly common, usually with 5/5 reports. One unusual mobile contact was with W4XJ, which lasted over an hour, on a journey from the south coast to Potters Bar.

CONCLUSION

THESE ANTENNAS performed better than expected for such a low profile design. Some earlier commercial helix designs were not always successful, possibly because of the choice of wire and the winding spacing.

It would appear that, performance-wise, there is little to choose between the helix and the conventional centre loaded design. Where the Pro-Am scores is in the mechanical construction. Not only does it have a low profile and low windage but the manufacturers appear to have addressed the problem of weatherproofing. There is no sign of corrosion on either of these antennas after a year of use.

The only criticism is the documentation. The description of setting the resonant length is a bit ambiguous. And additional information on how to use shunt capacitor matching to obtain a lower SWR than shown in Figs 1 and 2, would have been useful.

The antennas are available for all bands from 160 to 6 metres. Pro-Am antennas are available from Martin Lynch, 140-142 Northfield Avenue, Ealing London W13 9SB. The prices are as follows: PHF6 to PHF20 £19.95; PHF30, £26.95; PHF40, £22.95;

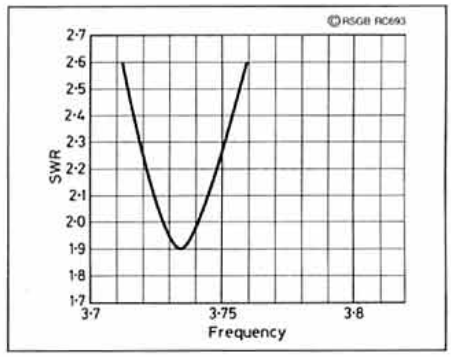


Fig 2: SWR curve for the PHF-80.

PHF80, £24.95; PHF160, 54.95. (The PHF160 is a much larger antenna than the ones described in this review).

REFERENCES

[1] *The ARRL Antenna Book*, 17th edition, chapter 16.
[2] *Technical Update*, *RadCom*, June 1995, Denis Walker, G3OLM (see also *Technical Update*, July 1995).
[3] *The Handbook of Antenna Design, Volumes 1 and 2*. IEE, page 1323.
[4] *HF Antennas for All Locations*, (RSGB) L A Moxon, G6XN. ♦

CONTEST CLASSIFIED

All rules should be read in conjunction with the General Rules published in *Contest Classified*

DIRECTION FINDING RESULTS

TOPBAND ARDF NATIONAL FINAL 1994

The 1994 National Final was organised by the Mid-Thames Radio Direction Finding Club. The event was held in the Northamptonshire area and used two adjoining 1:50,000 series Ordnance Survey maps (numbers 152 and 141). Transmitter 'A', G3TRY/P, was located at NGR 945775, 27km from the start; transmitter 'B', G4MDF/P, was at NGR 755785, 9km from the start; and transmitter 'C', G3UJO/P, was at NGR 842602, 21km from the start. All three stations were heard loud and clear, giving all competitors an equal opportunity in the pursuing competition.

At the end of the competition at 1630 seven competitors had managed to locate all three stations. The wining team arriving at their third station at 1611. The competitors returned to the community centre in Long Buckby for the normal discussions as to what went wrong and to listen to the winning team informing the other competitors as to how they had won.

Prizes were presented by Clive Trotman, GW4YKL, President-elect of the RSGB.

Pos	Name	Club	A	B	C
1	Dick Brocks	Chelmsford	1500	1407	1611
2	Brian Bristow	Mid Thames	1427	1521	1615
3	Alan Simmons	Mid Thames	1417	1456	1616
4	Trevor Gage	Mid Thames	1424	1521	1626
5	Chris Plummer	South Manchester	1418	1516	1627
6	Bob Gray	Mid Thames	1420	1522	1629
7	Andy Collett	Chelmsford	1431	1629.20	1522
8	Mike Hawkins	Chelmsford	1522	1450	-
9	Phil Cunningham	Chelmsford	1557	1453	-
10	Dave Holland	South Manchester	1600	1435	-
11	Steve Stone	Mid Thames	1609	1456	-
12	Geoff Foster	Mid Thames	1426	-	1615
13=	John Hall	Ripon	1503	-	-
	Colin Metcalf	South Manchester	1503	-	-
15	Graham Nicholls	Banbury	-	-	1611

SOUTH MANCHESTER TOPBAND QUALIFYING EVENT

Twelve teams assembled for the start of the South Manchester event close to the M6 in the northern half of the Stoke-on-Trent map. At the start, the 'B' station was very clear but the 'A' station was weak, and most teams remained at the start to note the approximate bearing for the 'A' transmitter. Station 'A' was located 27km east of the start beneath a holly bush, beside the Staffordshire Moorlands walk. The site could be approached from four directions, the most direct route being from the west, though this involved a steep climb back up the hill to the car after locating the transmitter.

Station 'B' was located in Wrinehill Wood, 26km south of the start. The operators here did very well to find the aerial wire which had been put up in the wood four days earlier by the organiser. The aerial which they found the end of, but were never able to trace through the trees, led the competitors round in a large circle before they located the station, much to the amusement of the operators.

Pos	Name	Club	A	B
1	Chris Plummer	South Manchester	1428	1542
2	Brian Bristow	Mid Thames	1447	1556
3	Andrew Mead	Chelmsford	1605	1427
4	Dave Holland	South Manchester	1605.30	1437
5=	Geoff Foster	Mid Thames	1606	1437
	Mike Hawkings	Colchester	1446	1606
7	Trevor Gage	Mid Thames	1607	1442
8=	Bob Gray	Mid Thames	1445	1613
	George Whenham	Coventry	1613	1453
10	Andy Collett	Chelmsford	1615	1440
11	John hall	Ripon	1507	1626
12	Tony Judd	Mid Thames	1450	1626.30

BANBURY TOP BAND QUALIFYING EVENT

Seventeen teams assembled at Chipping Norton School in the extreme north west corner of the Oxford OS map. Station A, G4MDF/P, was located 25km east of the start, along the southern bank of the River Thames at Thame Side Farm. Contestants could reach the transmitter either across country from the south or along a muddy towpath from the east, both involving walks of about 1.5km. The station operators, G4XPY and G0LDB, having gained the owner's permission, were able to drive within a short distance of the site. About 50m of aerial wire and a barbed wire fence combined together to radiate a useful signal across the competition area.

Station B, G3TRY, was located 36km east of the start (and about 45km by road from the A station) within a small patch of unmanaged woodland. Again a large aerial was used to ensure good signal strength across the competition area.

Afterwards a fine tea awaited 35 stiff-limbed direction finders at Cheney School, Headington, Oxford. The winner, Mike Hawkings, received a bottle of wine and the Banbury Amateur Radio Society DF shield, whilst runner up Alan Simmons also received a bottle of wine. Both then spoke of the afternoon's events. A framed photograph (Trevor Gage in action!) was presented to Trevor in recognition of the considerable work he had put in during his term of office as ARDF Top Band Contest Manager. A presentation was also made to Brian Bristow in recognition of the sterling work done with the RSGB on behalf of the DF fraternity, during his office as ARDF Committee Chairman. Both have recently resigned from the committee.

George Whenham

Pos	Name	Club	Stn A	Stn B
1	Mike Hawkins	Chelmsford	1602	1442
2	Alan Simmons	Mid Thames	1603	1452
3	Brian Bristow	Mid Thames	1603.15	1455
4	Andrew Mead	Chelmsford	1603.25	1442
5	Andy Collett	Chelmsford	1604	1451
6	Geoff Foster	Stratford	1606	1457
7	Bill Pechey	Mid Thames	1458	1607
8	Dick Brocks	Chelmsford	1615	1458
9	Colin Merry	Dartford	1615.30	1456
10	Steve Stone	Mid Thames	1625	1458
11	Trevor Gage	Mid Thames	1626	1451
12	Bob Gray	Mid Thames	1629	1435
13	Colin Boyce	Mid Thames	-	1459
14	Min Standen	Mid Thames	1527	-
15	George Whenham	Coventry	1529	-
16	Ray Goodearl	Mid Thames	1605	-

One competitor failed to find either transmitter. Mike Hawkins and Alan Simmons qualify for the National Final.

MID THAMES TOPBAND QUALIFYING EVENT

The event started at Yatley Common with 18 teams from different clubs in the UK. The northerly station, G4MDF/P, operated by Ron Ray, G3NCL, was hidden in Butter Wood, Hook, east of Basingstoke, 9 miles from the start. The wire aerial was placed around several small ponds near the footpath. The southerly station, G3TRY/P, operated by Neil Savin, G0SVN, was hidden in the body of a tree on Noel Hill of south of Selbourne, 18 miles from the start. The adjacent fence was used as the main connection for radials laid in the trees and woods. Competitors had difficulty in finally finding the operator as the signals from the wire fence overpowered their receivers when near to the fence or operator's tree.

Seventeen teams found both sites within the time period, due to the new-style less competitive DF rules which are designed to encourage greater family participation. Congratulations go to the team from Echelsford (Ashford, Middlesex) who returned to Topband DF after 16 years absence and only completed their receiver that morning.

Pos	Name	Club	A	B
1	Mike Hawkins	Chelmsford	1432	1525
2	Andy Collet	Chelmsford	1431	1526
3	Mick Williams	TARS	1431	1526.30
4	Andrew Mead	Chelmsford	1435	1527.40
5	Geoff Foster	Mid Thames	1424	1427.42
6	Brian Bristow	Mid Thames	1432	1527.45
7	Ray Goodearl	Mid Thames	1435	1529
8	Bob Gray	Mid Thames	1503	1542
9	Chris Wells	Mid Thames	1455	1542.28
10	Bill Pechey	Mid Thames	1502	1557
11	George Whenham	Coventry	1434	1559
12	Chris Plummer	South Manchester	1456	1600
13	Steve Stone	Mid Thames	1502	1601
14	Alan Simmons	Mid Thames	1503	1602
15	Dave Gething	Mid Thames	1456	1608
16	Colin Merry	Colchester	1530	1619
17	Trevor Gage	Mid Thames	1526	1620
18	Graham Phillips	Echelsford	1609	-

Andy Collett and Andrew Mead qualify for the National Final

HF RESULTS

FIRST QRS CUMULATIVE CONTEST 1995

It is good to see some new entrants to the contesting scene, but disappointing that the number of Novices was down on last year. Congratulations to Paul, 2E0AJE, who not only was the highest Novice but also the overall winner. Certificates of merit go to George, G4EBK, for the highest placed Full Licence holder and Laurance (Loz), G0NMN, highest placed first-time entrant. Welcome to G0SKW and G3UGF who were also first-time contesters. Many thanks to the stations who sent in check logs: 2E0ADL, G3SAD (G7PPI), G3XYF, G0ROT, G4DDY, G4DDX, G3BPM and G3HEL. A special mention for Roland, G3FNM, who was using an original B2 Tx (spy Set) from WWII with an FT-902 as the receiver.

Looking over the logs it was apparent that a number of points have been lost due to copying errors. It's hard enough to get the points, so here are a few of the errors to avoid and so help increase your position overall. There was one duplicate in a log, so if you have lost fifty points that's the reason. Always make out a check log, after the event if necessary, but during it if possible, and send it in with your logs. One log had all the Transmit and Receive reports reversed, another copying error, simple but could cause a loss in points. There weren't many actual CW errors, which is a good sign, but remember, if a station sends their name, try to copy it down correctly and not add any letters even if it doesn't look correct. To the station who sent in his log without any cover sheet, was it a check log, what name did you use?

There were some very favourable comments: "deserves more publicity" - G3BPM, "suggest publicise the event in *D-i-Y Radio* for more Novices" - G4PTE, "very enjoyable, can't wait for the next one" - G3UGF / G0SKW, "very friendly, advise anyone to have a go" - G0NMN, "I liked this contest very much, operating period just right" - G0UPU. See you for the 2nd test later in the year.

G3RXP

Posn	Call	April 4	12	20	28	1 May	Total
1*	2E0AJE	C/L	285	315	335	-	935
2*	G4EBK	C/L	212	215	185	-	612
3	G3JSR	C/L	C/L	210	182	186	578
4=	G3MCK	-	-	185	220	150	555
4=	G3KNU	-	-	155	215	185	555
6	G2HLU	-	C/L	165	180	175	520
7*	G0NMN	C/L	C/L	163	150	160	473
8	G3VNG	C/L	-	170	135	160	465
9=	G0HIN	C/L	132	-	195	123	450
9=	G3FNM	C/L	C/L	165	160	125	450
11	G4BLI	125	130	190	-	C/L	445
12	G0ILN	C/L	C/L	115	148	168	431
13	G0TEB	C/L	C/L	145	150	135	430
14	G0IZU	-	168	110	140	C/L	418
15	G3RSP	-	-	145	135	135	415
16*	G0SKW	C/L	125	130	145	C/L	400
17	G0VQR	-	C/L	160	113	115	388
18	G0UPU	C/L	120	150	C/L	115	385
19	G4ORC	C/L	C/L	115	135	130	380
20	GD0LQE	C/L	110	120	120	-	350
21	G4BJM	-	C/L	110	110	105	325
22*	G3UGF	-	C/L	80	115	105	300
23	G4CZB	-	-	25	130	135	290
24	G4PTE	73	-	105	105	-	284
25	G3ZDD	-	95	80	-	95	270
26	G0TIB	-	75	105	-	75	255
27	G3UNM	-	-	60	85	95	240
28	G0RRI	-	-	23	85	45	153
29	G0SJC	20	50	-	-	50	120
30	G4PVB	25	35	40	-	-	100
31	G0VTE	-	-	18	5	20	43

ARDF RULES

COVENTRY / NORTHAMPTON QUALIFYING EVENT (TOPBAND)

Date: 13 August 1995.

Map: 152 (Northampton and Milton Keynes).

Assembly: 1300 for start at 1320.

Location: Irchester Country Park, NGR 912658.

Competitors requiring tea should notify George Whenham, tel: 01926 812367, no later than 6 August.

ROPOCO 1 1995

Last year G4BJM won both the Ropoco Contests, with David Cree, G3TBK, second in one and third in the other. This year, in Ropoco 1, David Cree triumphed by the narrowest of margins, winning by just one point. However, not to be outdone, Fraser Robertson won the Verulam Silver Jubilee Trophy, for the highest scoring entrant with a perfect log, for the second year in succession. Congratulations to you both. Mention also should be made of Paul Williams, 2E0AJE, who, I am sure, must be the first Novice to enter this contest. Running just 3W, he managed a score of 351 with only three errors. There were also two or three other Novices competing who did not send in their logs. Ropoco 2 takes place on 6 August, when we hope to see more Novice entrants. A check log from GW0KZW is gratefully acknowledged.

G4DUS

Posn	Call	Points	Code
1	G3TBK+	691	4C7
2	G4BJM+*	690	4C7
3	G3KNU+	675	3C
4	G4BUO	661	4C5
5=	G3LHJ	634	3W
5=	G4OGB	634	3C3
7	G3XTT	617	4C4
8	G4TLS	614	4C2
9	G3GLL	607	3C3
10	G3HEJ	604	4C5
11	G0ORH	586	3C6
12	G0JQN	581	3C3
13	G4CZB	578	4C3
14	GM3POI	574	4Q8
15	G3VYI	557	4G3
16=	G2HLU	551	3C3
16=	G3RSD	551	3C3
18	G3WUX	548	3W
19	G3IZD	540	3C2
20	G3JJZ	534	3W
21	G0LZL	524	4C4
22	G3IGU	507	3W3
23	G3JSR	505	3W
24	G2AFV*	500	2C4
25=	G4BLI	498	3C
25=	G4EBK	498	3C
27	G0OPB	494	3C5
28	GM4SID*	480	3C
29=	G0IDE	477	3C4
29=	G4EIX	477	3W2
31	G3JJG	474	4C1
32	G3MA	463	3C
33	G3BPM	394	3C/G
34=	G3VNG	377	3C
34=	G0TYY	377	3W
36=	GM4DGT/P	370	3C
36=	G3GMS*	370	3G2
38	G4XHE	361	4W1
39	GW3SB	354	3W1
40	2E0AJE	351	1W/C
41	G3CQR	344	3C
42	G4PTE	327	3G
43	G4RLS	318	3C
44	G2RSA	315	4C
45	G4KDL	305	3C1
46	G4XPE	274	3G
47=	G4KTI	247	1C2
47=	GM3UM	247	4W
49	G4RCG	244	3G
50	G0PDZ	208	3W
51	G3GMM	194	3C1
52	G4PVB	77	0W

+ = Certificate Winner. * = Perfect Log

21 / 28MHZ SSB CONTEST 1994 - CORRECTION

The score for G0TSM on 28MHz was incorrectly calculated and should have shown 5400 points, not 525. This places G0TSM in second place and G0IHB third place in the 28MHz section, but does not affect the overall contest tabulation. Apologies to all concerned.

G3OZF

VHF RULES

70,144 AND 432MHZ FIXED STATION OR PORTABLE STATION

26 / 27 / 28 / 29 December, 1400 - 1600UTC

General rules apply. Each band serial starts 001. Each day carry on with sequential serial number (if on first day you worked 20 stations then on day two start with serial 021). Single band entries will be accepted. Rule 14c applies (County / Country / QTH Locator multipliers). Scoring: use radial ring for all distances. County / Country / Locator multiplier can be claimed for each band.

Example: on day 1 you work 5 stations on 144MHz for 30 radial points, and 4 counties and 3 countries, and on the same day work 11 stations on 432MHz in 5 counties and 2 countries, with 50 radial ring points the days total will be (4 + 3) x 30 + (5 + 2) x 50. Totalling up you get 7 x 30 = 210 and 7 x 50 = 350 equals 560 points. It does not matter that on 70, 144 or 432MHz you worked the same counties or countries or even the same stations. On the next day you start again with the counties or countries (you can work the same station, county or country on each day and on each band, all will count as multipliers). Please include list of claimed county / country / QTH locator multipliers for each day, and band. Once you have totalled each day then just add all the daily totals together to get your final score! And the best of luck.

Forms: *One* cover sheet for each band entered (only one form for all the days you operate), *one* summary sheet, giving daily totals for each band for the whole contest. That means only *one* summary sheet for the whole contest.

Adjudicator: c/o PO Box 29, Bridgend CF35 5YA.

VHF CONTESTS CALENDAR

20 Aug	432MHz Fixed / SWL (May 95)
29 Aug	144MHz CW Cumulatives (May 95)
2/3 Sep	144MHz Trophy / SWL (Jun 95)
3 Sep	4th 144MHz Backpackers (April 95, page 83)
13 Sep	144MHz CW Cumulatives (May 95)
24 Sep	70MHz Trophy / SWL (Jun 95)
28 Sep	144MHz CW Cumulatives (May 95)
3 Oct	1.3/2.3 Cumulative (June 95)
7/8 Oct	432-24GHz (Jun 95)
11 Oct	432MHz Cumulative (Jun 95)
13 Oct	144MHz CW Cumulative (May 95)
18 Oct	1.3/2.3GHz Cumulative (Jun 95)
26 Oct	432MHz Cumulative (Jun 95)
29 Oct	1.3/2.3GHz Fixed/SWL (June 95)
30 Oct	144MHz CW Cumulative (May 95)

HF CONTESTS CALENDAR

29 / 30 Jul	IOTA (Mixed Mode) (Mar 95)
5/6 Aug	YO-DX (mixed mode) (July 95, p20)
6 Aug	RoPoCo 2 (CW) (Apr 95)
12 / 13 Aug	WAE-DX (CW) (Aug 95 p22)
19 / 20 Aug	KCJ (CW) (Aug 95 p22)
19 / 20 Aug	SEANET SSB (July 95, p20)
2 Sep	AGCW Straight Key (Aug 95 p22)
2 / 3 Sep	SSB Field Day (Jun 95)
2 / 3 Sep	LZ DX CW (Aug 95 p22)
4 Sep	2nd QRS Cumulative (Aug 95)
12 Sep	2nd QRS Cumulative (Aug 95)
20 Sep	2nd QRS Cumulative (Aug 95)
28 Sep	2nd QRS Cumulative (Aug 95)
1 Oct	21/28 SSB (Jun 95)
6 Oct	2nd QRS Cumulative (Aug 95)
15 Oct	21/28 CW (Jun 95)
28/29 Oct	CQ WW DX SSB

VHF RESULTS

144MHZ CW CUMULATIVES 1994

Conditions were quite varied throughout these events with generally good conditions occurring in sessions 1, 3 and 4. The events were generally well supported with many contest stalwarts and DX chasers giving points away. It is therefore a little disappointing to receive so few entries. As the saying goes, "You can't win the raffle unless you buy a ticket!", so thanks to all those who did submit an entry. It would appear that these events continue to be enjoyed by those who took part, as many were frequently rewarded with some good contacts, including GM0USI/P who operated on more than one occasion from IO76XA. Congratulations to G4OUT who won the overall contest by a convincing margin, and to G0ADH as runner-up. G3FIJ also wins a certificate for being the leading station running 25W or less into a single antenna.

G4DHF

Pos	Callsign	Loc	30/08	14/09	29/09	14/10	31/10	Best 3
1*	G4OUT	IO92AT	225	68	230	180	94	635
2*	G0ADH	IO91KO	185	79	68	107	66	371
3*	G3FIJ	JO01KV	133	54	152	83	63	368
4	G4KDL	JO02UL	123	-	-	223	-	346
5	G4MMH	IO92FD	112	40	82	-	-	234
6	G3JJZ	JO01AJ	-	-	60	35	69	164
7	G4XPE	IO92GU	-	33	56	-	32	121
8	G4TJE	JO01AK	55	25	-	-	37	117

144MHZ CW CONTEST (JANUARY 1995)

Conditions were less than inspiring for this event, but even so the number of entries is almost the same as last year. It is a tribute to those fortunate operators and nature of the mode that some DX was worked, albeit on a limited basis. Looking at the numbers of QSOs made, particularly into the UK, it is a shame that more entries were not received. It was obviously hard going most of the time judging by the comments: "Dreadful" (G3FPK), "Rain and drizzle. Beacon at Kent only just audible" (GW4VVX), "Could not hear any EU stations" (G3FIJ). G0PZO was incapacitated due to illness and had to operate lying on his back and was unable to rotate his antenna - quite some achievement, well done! G4OUT had to finish early due to family commitments, but still managed to win a certificate for being the leading station running 25W or less into a single antenna. Congratulations to both G4RGK and G0PNT for winning their respective sections, and to G0NYL as runner-up.

G4DHF

SINGLE OPERATOR FIXED

Pos	Callsign	Loc	QSO	Mult	Pts	Pwr	Ant	Best DX	Km
1*	G4RGK	IO91ON	63	30	10530	225	17Y	DL3WL/P	571
2*	G0NYL	IO93QN	43	27	8424	100	13Y	GI4OWA	460
3	G0ADH	IO91KO	51	30	7140	100	13Y	ON4APZ	389
4*	G4OUT	IO92AT	34	25	4350	25	12ZL	GM3JSX	252
5	G3FIJ	JO01KV	21	20	2780	10	9Y	G0PZO	312
6	GW4VVX	IO81JP	15	14	1302	140	17Y	G4PIQ	293
7	G4XPE	IO92GU	18	15	1230	10	10Y	GM3JSX	260
8	G3FPK	IO91WH	16	13	1196	60	16Y	G0NYL	252
9	G0PZO	IO83LJ	14	11	968	10	12ZL	G4PIQ	325
10	G3JJZ	JO01AJ	20	12	912	25	8/8Y	PA3EQK	329

OPEN SECTION

1*	G0PNT	IO91VJ	63	36	12960	160	16Y	DL3WL/P	528

70MHZ CUMULATIVES 1995

It is quite remarkable to be able to report a 600% increase in entries to this contest for 1995, making it the largest entry for some years. This has very successfully rescued this event from the axe for 1996! Conditions were generally average although they did vary from session to session. There was a degree more activity than in some previous years, but what was more noticeable were the number of people who were on the band without a winning entry, but who still sent a log in - please do keep it up. Special mention should go to Stewart Copper, GM4AFF/P, and Allan Duncan, GJ4ZUK/P, on their one-man portable expeditions from the extreme corners of the country! (Stewart was snowed off for the second session.) There was one request for the contest to be moved a little later to help the portables, and another for the sessions to be extended to 3 hours each - any comments?

The winners in each section were quite clear, but the runner-up position was more closely fought. G4SEU took the runner-up position from G3UKV in the Single Operator Fixed station section with a more accurate log, and GJ4ZUK/P's good log enabled him to keep GM4AFF/P well in check. Congratulations to the winners and runners-up in each section. The certificate for the leading fixed single operator station with 25W or less and a single antenna goes to G3NKS.

Andy Cook, G4PIQ

SINGLE OPERATOR FIXED STATION SECTION

Pos	Callsign	23-Jan	30-Jan	13-Feb	27-Feb	13-Mar	Norm	QSO	Loc	Pwr	Ant	km
1	G4AEQ	0	0	179	209	224	3000	95	93PE	160	6Y	447
2	G4SEU	137	0	145	141	0	2404	98	92FM	80	8Y	495
3	G3UKV	149	94	118	119	137	2366	130	82RR	120	5Y	467
4	G1SWH	0	0	75	175	170	2015	72	83QO	100	8Y	483
5	G4AFJ	52	133	94	78	53	1898	99	92HO	50	8Y	374
6	G3NKS	78	0	106	67	105	1584	79	81XU	15	3Y	566
7	G3HYH	99	57	87	80	88	1579	85	92JO	30	5Y	489
8	G3FIJ	66	72	0	0	107	1462	29	01KV	15	4Y	353
9	G3FDW	71	111	0	0	0	1311	40	84ME	50	7LPY	386
10	G0UPU	40	44	37	91	73	1092	70	91AX	10	5Y	269
11	G4SJH	0	0	50	41	70	788	31	91PI	50	5Y	281
12	G4OUT	22	0	24	47	55	618	42	92AT	10	3Y	294
13	GW8GSQ	0	0	0	0	28	125	4	81FL	5	Dipole	270

ALL OTHERS SECTION

Pos	Callsign	23-Jan	30-Jan	13-Feb	27-Feb	13-Mar	Norm	QSO	Loc	Pwr	Ant	km
1	G4RFR	306	314	333	272	326	3000	191	90AS	1602	x 12Y	666
2	GJ4ZUK/P	54	124	251	203	0	1895	51	89WG	70	4Y	483
3	GM4AFF/P	109	0	124	152	155	1407	36	86RW	7	7Y	686
4	G4SSO	85	105	139	118	177	1394	72	80FI	25	9Y	403
5	G4BBU/P	0	0	0	102	108	706	67	82XH	13	4Y	338

CHRISTMAS FUN CONTEST

This year's Christmas fun contest was, as usual, well supported. The contest moves from strength to strength, to such an extent that the original idea of a 'fun' event to fill the gap between Christmas and New Year seems to have been lost in the mists of time. The event is treated by many who enter it just as seriously as a major summer contest, if not more so.

The committee has looked carefully at the format for this event: we feel that the rules in particular need significant simplification. We intend to run the 1996 event (the 1995 rules have already been published) on a cumulative basis, retaining the multipliers but standardising the entry formats. A number of entrants complained, justifiably, about the amount of paperwork required for this event. I feel exactly the same way: the adjudication is not made easier by the current rules.

It is encouraging to see a number stations entering the contest for the first time. However a large number of experienced contesters misinterpreted the rules! This arguably was due to the complexity of the rules, hence I have re-scored those entries where obvious omissions were made. After putting in all this work I was dismayed to find that no significant difference had been made in the results tables, so I decided to 'let sleeping dogs lie'. Certificates and congratulations go to the band leaders and runners-up, as well as the overall winners and runners-up.

G4WKN

70MHZ SINGLE OP

		26/12	27/12	28/12	29/12	Total	Norm
1*	G4SEU	1044	1825	493	980	4342	1000
2*	G0UPU	260	297	275	300	1132	261

144MHZ SINGLE OP

		26/12	27/12	28/12	29/12	Total	Norm
1*	G4UDE	4025	9928	9800	13932	37685	1000
2*	G8ZRE	4060	14400	5445	6868	30773	817
3	G1BFK	6664	6222	4988	4321	22195	589
4	G4ZTR	5704	8575	2814	0	17093	454
5	G0UWS	84	2289	2679	4810	9862	262
6	G1TWS	2254	2668	2346	1638	890	236
7	G0TDF	1309	1168	2616	3475	8568	227
8	G4IDF	1403	1936	1680	2626	7645	203
9	G0OVA	16	408	1848	4512	6784	180
10	G7MHZ	480	451	506	390	6547	174
11	G3RHH	0	840	2800	2640	6280	167
12	G7AZP	574	2369	1440	1764	6147	163
13	G7HHK	480	1254	2000	986	4720	125
14	G0TIB	140	912	2210	1408	4670	124
15	G0IBZ	0	403	2070	494	2967	79
16	G0HDV	480	1296	992	184	2952	78
17*	PE1EWR	0	1080	189	1376	2645	70
18	G7OZE	680	432	630	736	2478	66
19	G0RRC	0	885	360	1207	2452	65
20	G0UPU	200	975	518	637	2330	62
21	G0PZO	230	126	312	950	1618	43

432MHZ SINGLE OP

		26/12	27/12	28/12	29/12	Total	Norm
1*	G4UDE	1072	3952	2712	2254	9990	1000
2*	G0TDF	2185	2050	2300	3090	9625	963
3	G0MLY	1691	950	1944	2132	6717	672
4	G4JZF	150	663	680	252	1745	175
5	G7AZP	689	336	136	279	1440	144
6	G3RHH	0	78	310	250	638	64
7*	PE1EWR	0	189	0	45	234	23
8	G0IBZ	0	6	180	9	195	20
9	G0RRC	0	40	133	9	182	18

144MHZ MULTI-OP

		26/12	27/12	28/12	29/12	Total	Norm
1*	G6QM	5712	8496	5880	2033	22121	1000
2*	G0FDX	2156	3213	4590	0	9959	450

432MHZ MULTI-OP

		26/12	27/12	28/12	29/12	Total	Norm
1*	G6QM	70	310	133	196	709	1000

OVERALL POSITIONS, SINGLE OP

Pos	Call	Score
1*	G4UDE	2000
2*	G0TDF	1190
3	G4SEU	1000
4	G8ZRE	817
5	G0MLY	672
6	G1BFK	589
7	G4ZTR	454
8	G0UPU	323
9	G7AZP	307
10	G0UWS	262
11	G1TWS	236
12	G3RHH	231
13	G4IDF	203
14	G0OVA	180
15	G4JZF	175
16	G7MHZ	174
17	G7HHK	125
18	G0TIB	124
19	G0IBZ	99
20*	PE1EWR	93
21	G0RRC	83
22	G0HDV	78
23	G7OZE	66
24	G0PZO	43

OVERALL POSITION, MULTI-OP

Pos	Call	Score
1*	G6QM	2000
2*	G0FDX	450

144 / 432MHZ CONTEST MARCH 1995

A wide variety of comments, mostly adverse, accompanied logs for this weekend. East coast stations viewed conditions as roughly average, but this could not be said for locations elsewhere, where snow was widespread and the ether was dead. G3MDG summed it up with "absolutly awful". G8TIC closed down when the temperature in the tent dropped to -3°C, and had to use a hairdryer to wake up the transvertor LO on Sunday morning. They questioned the sanity of going portable at this time of year. (I think I remember this contest used to be in January, with solid milk and beans frozen in the tin - GW8GSQ). An aurora on Saturday evening brightened life for a few, although GM4VVX was bitterly critical of stations in both UK and Germany, whose persistant calling over QSOs caused him to lose "very many contacts".

Thanks to all those who sent entries on disk; this didn't change the degree of scrutiny applied to anyone's log, but it helped enormously to speed the process of checking. Thanks also to G0ADH, G4HEV and G7MHZ/P for their checklogs. A number of positions were closely contested, in particular it took a long time to separate G6HKM and G4RKV, with the lead changing hands numerous times as checking progressed.

Finally, a special mention to the generous folks at Kidderminster RS, who set up their club stations but allowed newly licensed and Novice ops from the Stourport Scouts RG to do most of the operating. Congratulations to them and all the other certificate winners (marked * in the tables).

Steve Thompson, GW8GSQ

144MHZ SECTION M

Pos	Pwr	Call	Pts	QSO	Loc	Power	Ae	DX	km
1*		G0VHF	5461	431	01PU	350	2x15	SM5BSZ	1275
2*		G4DSP/P	5190	354	03CE	400	80el	OH2BNV	1689
3*		G0MSA/P	4413	431	00EW	350	4x11	DL3LBK	761
4		G8TIC/P	3020	269	02PV	400	2x17,2x9	F6KBF/P	707
5		G4CRA/P	2087	215	01LP	100	2x14	DF0CR/P	697
6		G3MDG/P	1633	228	91PX	400	2x13	DL6FBL	756
7		G6CTU/P	1380	240	91XG	400	2x19	DL0TS	609
8*		G3KMI	1323	193	90HW	125	4x17,2x17	F/G8MBI/P	695
9		G4NOK	769	104	93FR	300	4x10	ON1LPA	618
10*	L	G6SRC/P	669	60	01II	25	13	DF0CI	660
11*	L	G6QM	504	62	94DB	12	14	DK0MU	650
12*	L	G6YLV/P	393	119	91RR	25	2x9	TM5KRK	373
13	L	G7TQR/P	164	38	81RK	25	17	F6KBF/P	588
14*	L	G0KRC	153	43	82UI	25	9	ON4BBW	439

144MHZ SECTION S

Pos	Pwr	Call	Pts	QSO	Loc	Power	Ae	DX	km
1*		G8DWD/P	3045	200	02QV	200	17	DF0YY	759
2*		GM4VVX/P	1487	57	78UB	150	17	SM5BSZ	1214
3*		G3RHH	614	60	82UB	200	9	DF0RI	779
4*		G4AEQ	606	43	93PE	120	9	DF0GVT	699
5*	L	G1TWS	439	77	01HO	25	11	GM4CCC/P	580
6*	L	G3FIJ	249	33	01KV	10	9	GM4CCC/P	581
7	L	GW4WVO	114	11	81IL	25	2x8	ON5OF/P	660
8		G3XDY	112	8	02OB	400	14	DF0RI	541

144 MHZ SECTION SS

Pos	Pwr	Call	Pts	QSO	Loc	Power	Ae	DX	km
1*		G6HKM	1097	138	01FT	160	15	DL9YEY	555
2*		G4RKV	1073	112	01OI	400	2x9	DL0FC/P	566
3		G8ZRE	354	60	83NE	100	8	TM5KRK	595
4*	L	G6FQZ	330	51	91JR	25	9	F6KBF/P	550
5*	L	G0UJK	250	73	01AK	25	11	G6QM	315
6		GM7SJC	148	9	87WC	100	6	SM6MVX	898
7		G7AZP	143	23	90AS	100	9	PA0FHG	482
8	L	G3JJZ	121	34	01AJ	25	8/8	GM4CCC/P	587
9	L	G0SOO	113	35	91QG	10	9	G4NOK	280
10		GM7ASN	74	8	78TA	150	10	G6RAF	642
11	L	GW7SMV	20	10	81LN	25	13	G3MDG/P	155

432MHZ SECTION M

Pos	Pwr	Call	Pts	QSO	Loc	Power	Ae	DX	km
1*		G1DSP/P	2304	173	03CE	400	4x28	DL0ET/P	761
2*		G0VHF	1712	143	01PU	400	4x21	DL0NF	751
3*		G1MDG/P	882	110	91PQ	400	4x19	DF9FD	681
4*		G4IAU	474	56	93FR	150	4x21	ON5OF/P	628
5		G8MNY/P	400	77	91XG	200	27	GM0USI/P	589
6		G0UTT/P	321	50	01LP	100	2x21	DC8VJ	460
7		G0MSA/P	292	45	00EW	30	96	DK4VW	585
8*	L	G6SRC/P	233	25	01II	25	19	DF0CI	660
9		G6YIN/P	231	31	02PV	100	21	DJ9DL	446
10*	L	G7RIH/P	204	59	91RR	25	48	PA3BPC/P	321
11		G8KMI	178	38	90HW	75	2x21	ON5OF/P	524
12*	L	G6KRC	87	17	82UI	10	13	PA3BPC/P	489
13		G6QM	50	8	94DB	35	19	G4JXV	335
14	L	G7TQR/P	3	3	81RK	25	22	G1KHX	31

432MHZ SECTION S

Pos	Pwr	Call	Pts	QSO	Loc	Power	Ae	DX	km
1*		G3XDY	206	15	02OB	250	21	DF0CI	626
2*	L	G3RHH	126	19	82UB	25	21	ON5OF/P	604
3*		G8DWD/P	105	10	02QV	60	21	DK2PH/P	526
4*		G4AEQ	93	13	93PE	40	19	ON5OF/P	550
5		G8JXV	85	24	91VE	120	88	ON5OF/P	444
6*	L	GW4WVO	70	6	81IL	25	2x8	ON5OF/P	660
7	L	G3FIJ	32	8	01KV	10	19	PA3BPC/P	223
Pos	Pwr	Call	Pts	QSO	Loc	Power	Ae	DX	km
1*		G0MLY	225	34	92AP	75	21	ON5OF/P	601
2*	L	G3JJZ	91	23	01AJ	25	19	PA3FPQ	401
3*	L	G7AZP	51	9	90AS	20	16	PA3BPC/P	442
4	L	G6FQZ	6	2	91JR	10	8	G8MNY/P	95

OVERALL RESULTS, SECTION M

Pos	Pwr	Group	Call	144 MHz Norm	Call	432 MHz Norm	Tot Norm
1*		Spalding & Dist ARS	G4DSP/P	950	G1DSP/P	1000	1950
2*		Windbreakers & HADRABS	G0VHF	1000	G0VHF	743	1743
3*		E Sussex CG	G0MSA/P	808	G0MSA/P	127	935
4		Chesham & Dist ARS	G3MDG/P	299	G1MDG/P	383	682
5		Black Sheep CG	G8TIC/P	553	G6YIN/P	100	653
6		Colchester RA & Dengie 100 ARS	G4CRA/P	382	G0UTT/P	139	521
7		11th Hour CG	G6CTU/P	253	G8MNY/P	174	426
8*		North Wakefield RC	G4NOK	141	G4IAU	206	347
9		Southampton Univ RC	G3KMI	242	G8KMI	77	320
10*	L	Swale ARC CG	G6SRC/P	123	G6SRC/P	101	224
11*	L	Dacorum ARTS	G6YLV/P	72	G7RIH/P	89	161
12		Queen Mary AR CG	G6QM	92	G6QM	22	114
13*	L	Stourport Scouts RG	G0KRC	28	G6KRC	38	66
14	L	Bristol ARG	G7TQR/P	30	G7TQR/P	1	31

OVERALL RESULTS, SECTION S

Pos	Pwr	Call	144 MHz Norm	432 MHz Norm	Tot Norm
1*		G8DWD/P	1000	510 +	1510
2*		G3XDY	37	1000	1037
3*		G3RHH	202	612	813
4		G4AEQ	199	451	650
		GM4VVX/P	488	0	488
6		G8JXV	0	413	413
7*	L	GW4WVO	37	340	377
8*	L	G3FIJ	82	155	237
9		G1TWS	144	0	144

OVERALL RESULTS, SECTION SS

Pos	Pwr	Call	144 MHz Norm	432 MHz Norm	Tot Norm
1=*		G0MLY	0	1000	1000
1=*		G6HKM	1000	0	1000
3		G4RKV	978	0	978
4*	L	G3JJZ	110	404	515
5		G7AZP	130	227	357
6*	L	G6FQZ	301	27	327
7		G8ZRE	323	0	323
8	L	G0UJK	228	0	228
9		GM7SJC	135	0	135
10	L	G0SOO	103	0	103
11		GM7ASN	67	0	67
12	L	GW7SMV	18	0	18

70MHZ FIXED CONTEST 1995

This is another contest whose popularity seems to be growing significantly from year to year - entries are up by 50% this year. Conditions were not great, although from the spread of comments on the logs, you could place them as being anything between lousy and excellent! The only point on which there seemed to be any agreement was that things were not at all good to GM. Operating conditions weren't so good for some people though - Ian Cornes, G4OUT, had recently had an accident in which he had broken parts of his right (writing and CW!) arm. In spite of this, Ian managed to get on and make a few QSOs, including some left-handed CW ones. The South Devon Radio Club, G7FDC, also had some problems when the coax tail from the antenna unscrewed itself from the main feeder in the middle of the contest.

Congratulations to the winners and runners-up in each section, and in particular to Robert Ferguson, GD4GNH, who won the overall contest by a good margin with a quite a small station. G8IMR takes the certificate for the leading single operator using 25W or less to a single antenna. Thanks to GJ4ZUK/P and GM4AFF/P for taking the time to give many people good DX and sending in check-logs.

Andy Cook, G4PIQ

SINGLE OPERATOR SECTION

Pos	Callsign	Points	QSO	Loc	Pwr	Ant	Best DX	km
1	GD4GNH	658	52	74QD	40	5Y	GJ4ZUK/P	568
2	G3FDW	440	47	84ME	75	8LPY	GJ4ZUK/P	550
3	G4AEQ	416	56	93PE	160	5Y	GJ4ZUK/P	447
4	G6YIN	365	48	93ET	100	5Y	GJ4ZUK/P	506
5	G3UKV	312	50	82RR	100	5Y	GM4AFF/P	467
6	G3WHK	244	42	91VJ	100	4Y	GD4GNH	426
7	G3NAQ	228	38	91HL	50	8Y	GD4GNH	369
8	G4AFJ	213	39	92HO	50	8Y	GJ4ZUK/P	374
9	G0JBA	206	30	01II	90	7Y	GD4GNH	475
10	G3TCU	189	31	91QE	150	6Y	GD4GNH	425
11	G8IMR	183	27	90IV	25	4Y	GD4GNH	426
12	G3HYH	178	32	92JO	30	5Y	GM4AFF/P	489
13	GW8GSQ	175	23	81FL	25	5Y	G4ZTR	309
14	G3NKS	165	31	81XU	15	3Y	GD4GNH	308
15	G3FIJ	112	14	01KV	15	4Y	GD4GNH	445
16	G4OUT	111	23	92AT	10	3Y	G7FDC	294
17	G0TCD	79	15	91SS	25	HB9CV	GD4GNH	384
18	G1EHF	78	16	91PJ	35	HB9CV	GD4GNH	403

MULTI-OPERATOR SECTION

Pos	Callsign	Points	QSO	Loc	Pwr	Ant	Best DX	km
1	G4RFR	513	61	90AS	160	2 x 12Y	GM4AFF/P	686
2	G4ZTR	327	43	01KW	150	5Y	GD4GNH	442
3	G7FDC	310	31	80FI	60	9Y	G4CAY	496
4	G3VGG	205	39	82XH	15	4Y + 5Y	GJ4ZUK/P	338

1ST 23 / 13CM FIXED CONTEST 1995

This is yet another contest which has seen a big increase in entries over the last two years' levels - 23cm is up over 100% on the 1994 entry. There was a little debate over the state of conditions; the general opinion was that they were flat, but, typically enough, things would have been distinctly better has the contest been held 12 hours earlier! Unfortunately, we don't have access to 1 year distant weather forecasts when we set the contest calendar! Many stations commented on the good level of activity on 23cm with a number of new stations in evidence. It was particularly nice to have an entry from 2E1BMU, and he will receive a certificate for his efforts. On 13cm there was also a little more activity than in the past. In fact, in G8NEY's first outing on 13cm, he won the band! Congratulations to the winners and runners-up in each section, and the '25W, single antenna' award goes to G6XDI.

Andy Cook, G4PIQ

23CM SINGLE OPERATOR SECTION

Pos	Callsign	Points	QSO	Loc	Pwr	Ant	Best DX	km
1	G8XVJ	236	28	83RJ	300	2.5m + 55Y	G0FIG	321
2	GD4GNH	194	17	74QD	50	8 x 23Y	G4ZTR	441
3	G3XDY	193	31	02OB	300	4 x 23Y	G3JYP	370
4	G8NEY	169	25	81VK	250	55Y	GD4GNH	342
5	G8ZOB	168	34	92JN	150	40QLY	GD4GNH	286
6	G4GCM	162	20	90EX	300	8 x 23Y	GD4GNH	406
7	G4ZTR	157	27	01KW	100	2 x 55Y	GD4GNH	442
8	G3MEH	133	33	91QS	100	2 x 50QLY	PE1EWR	289
9	G1SWH	98	14	83QO	100	55Y	G4RFR	318
10	G6XDI	89	19	91SM	20	28QLY	GD4GNH	404
11	G6HKM	81	15	01FT	10	43Y	GD4GNH	428
12	G3JYP	81	7	84SN	40	2m	G4GCM	402
13	G8ESB	60	6	94IG	100	34QLY	G4RFR	392
14	G0JDL	40	6	02UK	15	23Y	G4RFR	314
15	2E1BMU	29	5	02UK	3	23Y	G4RFR	314
16	G6IQM	10	8	92JH	20	48QLY	G3OHM	52

23CM MULTI-OPERATOR SECTION

Pos	Callsign	Points	QSO	Loc	Pwr	Ant	Best DX	km
1	G4RFR	286	41	90AS	180	8 x 37Y	GD4GNH	416
2	G3OHM	194	36	92AJ	150	4 x 23Y	GM0USI/P	425

13CM SINGLE OPERATOR SECTION

Pos	Callsign	Points	QSO	Loc	Pwr	Ant	Best DX	km
1	G8NEY	6	2	81VK	4	44QLY	G1JRU	87
2	G4GCM	4	2	90EX	2.5	84QLY	G8NEY	65
3	G8ZOB	2	2	92JN	8	1.6m	G4LRT	21

HF RULES

2ND SLOW CW (QRS) CUMULATIVE CONTEST 1995

1. General. The aim of this event is to provide training and encouragement for Novices and newly-licensed operators wanting to experience CW contesting.

2. The General Rules for HF Contests, as published in the January 1995 issue of *Radio Communication* will apply.

3. Sections: (a) Transmitting **(b)** Receiving. Single or Multi operator entries will be accepted in section (a). There is no limit to the number of operators in a team, nor need they be the same for each session. Section (b) is Single-operator only.

4. Eligible Entrants: This contest is open only to stations in the British Isles (excluding Eire). Stations outside this area may not be contacted or logged for points.

Section (a) All operators must be members of RSGB.

Section (b) Individual RSGB Members who do not hold a Class A Full or Novice licence.

5. Dates / Times: Five sessions, each from 1900 to 2030UTC on: Monday 4 September, Tuesday 12 September, Wednesday 20 September, Thursday 28 September, Friday 6 October.

6. Frequency / Mode: CW only between 3540kHz and 3580kHz.

7. Exchange: RST and First Name. Multi operator stations must send only one name during any particular session, regardless of who is operating, although different names may be used during different sessions.

8. Maximum Power: 3 Watts RF output for Novices, 10 Watts RF output for holders of Full licences. There is no restriction on the method of generation.

9. Speed Limit: No faster than 12WPM, and never faster than the other station is sending. Please join in with the spirit of the contest - don't use a keyer; get out that straight key and keep your log on paper (at least during the event).

10. Scoring: Section (a) Any UK station may be worked once for points during each session. Any contact with a Novice callsign at either or both ends scores 20 points. Contacts between two Full licence-holders score 5 points. The overall score is the total of the best three sessions.

Section (b) Listeners may log for points only stations actively participating in the contest. Each Novice logged scores 20 points, each Full callsign counts 5 points.

11. Logs: Entrants are requested to submit logs for all sessions during which they are active, in order to assist with the adjudication. Full details of the correct format, and the address to which logs must be sent are given in the General Rules. The name of the operator worked / heard should be recorded in column 5. Logs must be postmarked no later than Monday 23 October 1995.

12. Awards: Section (a) Certificates of Merit to the leading Novice and Full licence-holder, and also to the highest-placed station entering any RSGB HF CW Contest for the first time (please note on your Cover Sheet if you qualify for this last award). **Section (b)** Certificate of Merit to the leading listener.

At the discretion of the Contests Committee, additional certificates may be awarded if there is sufficient support.

NEXT MONTH

Full HF and VHF Contest Rules for 1996

RAE and Morse Courses

South-East

● A **Morse** course will be held on Wednesdays and an **RAE** course on Thursdays at the Smitham CET Centre, in **Coulsdon, Surrey.** Enrolment will be on 27 and 28 September respectively. For further information contact Robert McEwan Reid, G4GTO, on 0181 660 2532.

● The Burnham Adult Education Centre, **Burnham, Bucks** is offering an **RAE** course starting in September. The lecturer will be Roy Smith, G0IWU. For further details, and to enrol, tel: 01628 665513.

● M J Brooker, G4UWU, will be one of the lecturers at the **City of Westminster** College **RAE** course, which commences early September for the May 1996 examination. A **Morse** course will run concurrently for those intending to take out a full 'A' licence. There will also be an **Advanced Morse** course to take students up to 22 / 25WPM. The courses will be conducted by professional college lecturers. Prospective candidates should contact the Science and Humanities Department of the College on 0171 723 8826 as soon as possible for details of enrolment.

● An **RAE** course will be held at Bradbourne School, **Sevenoaks, Kent**, on Monday evenings, with a **Morse** code course on Tuesday evenings at the same venue. Both course will be run by Brian Davies, G3OYU. You are advised to book places on these courses immediately. For further information, contact the Sevenoaks Adult Education Centre on 01732 451618.

● The 'Hilderstone' **RAE** course in **Canterbury, Kent,** commences on Tuesday 3 October. The course contains one or two low-cost practical projects to help with the theory. For further details contact the instructor, Ken Smith, G3JIX, on 01304 812723.

● Len Buck, G0DLR, will be running an **RAE** course in **Meopham, Kent,** starting in October for the May 1996 examination. Special arrangements can be made for shift workers etc who may not be able to attend the evening sessions regularly. For further details, contact Len at 21 Willow Walk, Culverstone, Meopham, Kent DA13 0QS or tel: 01732 823483.

South-West

● Chris Budd, G0LOJ, is the tutor for an **RAE** course which will be held at Twyford House, **Shirehampton, Bristol**. The course will be on Monday evenings commencing 18 September, and is scheduled for two terms (about 30 sessions). There are considerable discounts for those over 60 or in receipt of benefits. For further details call Liz on 0117 9683112 (office hours).

East Anglia

● In **Norfolk**, Pat Gowen, G3IOR, will be the tutor at no fewer than three **RAE** courses to be held in parallel, starting on Tuesday 19 September. On Tuesday evenings they will be held at the Hellesdon Adult Education Centre, Hellesdon High School, Middletons Lane, **Hellesdon, Norwich** (tel: 01603 41156); on Wednesday evenings at Thorpe Adult Education Centre, Thorpe St Andrews School, Longfields Road, **Thorpe St Andrew** (tel: 01603 35857); and on Thursday evenings at Ormesby Middle School, North Road, **Ormesby, Gt Yarmouth** (tel: 01692 670432). Enrolment will be on the same week day of the previous week.

Midlands

● **RAE** and **Morse** code courses are being offered at the School of Media and Communications, Tile Hill College, **Coventry**. For further information, contact Mike Dixon at the college on 01203 694200 ext 221.

● **RAE** classes will be held on Monday evenings and **Morse** classes on Thursday evenings, starting on Monday 18 September, at the Wombourne Youth and Community Centre, Church Road, **Wombourne, Wolverhampton**. Enrolment is on 11 / 12 September or by post and further details may be obtained from Brian Fereday on 01902 820826.

● The Sandwell Amateur Radio Club, at **Oldbury, Warley, West Midlands**, will be running an **RAE** course on Thursday evenings. The tutor will be Barry Hudson, G0VLO. The enrolment evening is 7 September at 7.30 pm. For further details contact the club Chairman, Martin Prestidge, G2BXP, on 0121 552 4902.

● The Arnold and Carlton College of Further Education, **Mapperley, Nottingham**, will be holding a **30-week RAE** course beginning on Wednesday 20 September, and a **12-week RAE** course starting on Thursday 21 September. The latter is an intensive course, not suitable for absolute beginners. A **Morse** class will be held on Wednesday evenings, commencing 20 September. For further details contact Alan Lake, G4DVW, on 0115 9382509.

● The West Nottinghamshire College of Further Education in **Mansfield** will be holding an **RAE** course starting on 11 September. For further details contact Alan Lake, G4DVW, on 0115 9382509.

● Doug Earnshaw, G8BAA, will be running an **RAE** evening course commencing on Tuesday 19 September at Audley and Halmerend Adult Centre, **Audley, Stoke-on-Trent, Staffordshire**. For further details, contact Doug on 01782 723444.

North-West

● North Trafford College, **Stretford, Manchester**, is offering **RAE** courses on Monday evenings and Wednesday mornings, a **Morse** code course on Wednesday afternoons and computing and electronics courses on Tuesdays. The full day course on Wednesdays should appeal to the retired or unemployed, as a successful student could apply for a full class 'A' licence at the end of the first year. Enrolment dates are 4, 5 and 6 September. The course tutor is John Beaumont, G3NGD, and further details may be obtained from him on 0161 872 3731, ext 347.

● A six-month **RAE** evening course will take place at the Avondale School, **Stockport**, starting in September. Enrolment is in early September, and further details may be obtained from the lecturer, Dr Eric Chantler, G0ORD, on 0161 427 1027.

● Also in Stockport, the Reddish Vale Evening Centre, in **Reddish, Stockport**, will be holding both **RAE** and **Morse** code courses beginning on Monday 18 September. For further details, contact course tutor Dave Wood, G4UJD, on 0161 430 6246, most evenings.

● The **Oldham** Amateur Radio Club will run an **RAE** course beginning on 14 September, leading up to the May 1996 examination. Enrolment will be on 7 September at 8.00 pm at the Moorside Conservative Club, Rippondon Road, Moorside, Oldham. For further details, contact Nick, G0ULA, on 0161 627 1639.

● The Nautical Campus, **Fleetwood, Lancashire**, will be running an **RAE** course commencing 12 September. For further information telephone 01253 352352 ext 4021.

North-East

● Stuart Wisher, G8CYW, has provided **RAE** evening classes since 1981 and this year is no exception. This year he will also be introducing a more advanced **radio and electronics** course leading to a formal electronics qualification. Enrolment for both courses will be at Astley Community High School in **Tyne and Wear** in early September. For further details, contact Stuart on 0191 414 6189.

● Several courses are being offered by **Hull** College, including a two-year **RAE** evening course, a one-year evening **Morse** code course, a one-day RYA Yachtsmen VHF certificate course, and a radio and electronics club which will allow members access to a wide range of test equipment not normally available to the average enthusiast. You may enrol by telephone now, or in person at the college from 4 September. Contact Steve Brett, G4COT, Head of the School of Electronics and Telecommunications, on 01482 329943.

Scotland

● The Glenrothes and District Amateur Radio Club is planning to run an **RAE** course on Monday evenings, starting in late September, to prepare students for the examination in May 1996. The club will also be running a **Morse** code course on Tuesday evenings, both for beginners and for amateurs wishing to increase their speed beyond the 12WPM test requirement. Both courses will be held at Balwearie High School, **Kirkcaldy, Fife**. For further details contact Ken Horne, GM3YBQ, on 01592 265789 (evenings).

Members' Advertisements

RSGB Members wishing to place an advertisement in this section must use the official form incorporated on the label carrier of Radio Communication. This will prove membership and must be for the current month. No acknowledgment will be sent. Ads not clearly worded, or which do not comply with these conditions will be returned. If an ad is cancelled no refund will be due. An advertisement longer than 60 words will be charged pro rata. Trade or business ads, even from members, will not be accepted. Traders who wish to use this facility must send a signed declaration that the items for sale are part of, or intended for, their own personal amateur station. The RSGB reserves the right to refuse ads, and accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into. Licensed members are asked to use their callsign and QTHR, provided their address in the current edition of the RSGB Amateur Callbook is correct. RS members will have to provide their name and address or telephone number. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available edition of *RadCom*.

Warning: *Members are advised to 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.*

FOR SALE

AR88LF with S meter & some spare valves; £50. BC 221 frequency meter with spare valves; £50. G3EHG, 01902 700609 (Wolverhampton).

ATU MFJ949E 300 watt crossed needle forward reverse SWR dummy load balun eight position antennae switch manuf. guarantee; £129 ono. 01222 755190 (Cardiff).

COMPLETE station, Drake TR7 tcvr with PSU, MN2700 ATU, ext. spkr Drake mic, full service man, excellent condx; £950. Icom R71 HF rcvr (as new condx), £525. Icom ICR7000 VHF/UHF rcvr (as new condx) £475. Yaesu FRG7700 HF rcvr (good condx); £275. Alinco DR119E 50W 2m mobile with mic, bracket (bxd as new); £195. Astatic classic chrome mic; £60 ono. 3 pairs Icon Headphones (new in box); £15 pair. Racal RA217D HF rcvr with MA323 FSJ unit (audio fault); £100. Alinco DJ160 handheld US version (works okay); £100. 0435 873434 (Mayfield).

CUSHCRAFT A3S Yagi all as new, together with some additional parts for the 40m add-on kit; £230. Prefer buyer to collect. GW0GDK 01244 541303 (Nr Chester).

DXCC limited space stacked Dipole. No traps for 80, 40, 20, 15 & 10. Made by Alpha Delta, USA, unused, still in box; £130 (cost £250). GW0GDK, 01244 541303 (Nr Chester).

FT290 MK1, fitted spkr mic with PTT/SCAN buttons. FT790 Mk1, both have NiCads chargers soft cases and owners man; £200 and £225 respectively. Heatherlite mic with PTT/SCAN controls suitable for the above, other extras available. RN Electronics 2m-6m transverter, mint, unused; £175 or swap for 70cms h/held. Will deal for duel bander h/held. Colin, G1VJH. 01260 252057 (Macclesfield). All enquiries answered.

FT-730R 70cm tcvr, 10 watts output, in immaculate condx with mic, man & original box; £185. Post paid tel Mike on 01704 892088 (Ormskirk).

ICOM IC 735 bxd: £550. AT150, bxd: £250 mint condx. Pneumatic mast 50ft: £200. 01279 843125.

ICOM VT200T 4m 40 channel scanning tcvr as new, bxd; £150. Datong Morse Tutor; £35. Star Master keyer; £30. High mound paddles on marble base; £20. 0191 416 8211 (Washington, Tyne & Wear).

JAPAN Radio NRD 505 receiver with NSD 505 transmitter. Beautifully engineered to last a lifetime. One of the few Japanese collectable classics; £1500. Morriss, G4GEN, QTHR. Tel; 01825 712205 (Nutley).

KENWOOD TM441E + man, M/bracket Comet B-22 144 + 430MHz antenna: £250. Cushcraft ARX450B Ringo Ranger II; £25. ARX2B Ringo Ranger II; £25. AKD 2/70 Wavemeter; £20. Tet 10 el 2m beam; £20. Jaybeam MBM88/70cm; £30. VCI Vectronics ATU model VC300 DLP; £95, bxd as new. TSA. 6601 SWR power meter; £25. SWR power meter; £25. All as new, will haggle. 0181 949 5549 (New Malden).

KENWOOD TR2300 10W mobile PA, 10W mains PA/charger, user & service mans; £95 - may split. IBM PCXT 640k RAM, ideal packet, logging. Excellent EMC (400W linear PSU suitable for new PC project, Pentium?) Keyboard, monitor, 10mb HDD, spare 20mb HDD, extra RAM card, original man, Dos 3.3, Xtree Norton, menu, WPs d-base 123 Clone, contest log; £45. Dave, G8FMC, QTHR. 01442 824948 (Tring).

KENWOOD TS850S complete with P552 power supply & SP-31 external spkr, also MC80 desk mic. Postal offers to G0OBO, QTHR.

KENWOOD TS950S HF transceiver with handbook, bxd as new; £1550. MFJ-941D ATU; £50. ETM-9C memory keyer; £100. Bencher paddlekey; £30. Hi mound HK 703 key; £15. Tim Norton, G0OCX (Formby), QTH. 0174 878912.

KENWOOD TS950s HF transreceiver with handbook bxd as new; £1550. MFJ-941D ATU; £50. ETM-9C memory keyer; £100. Bencher paddle key; £30. Hi mound HK702 key; £15. Tim Norton G0OCX (Formby), QTHR, 0174 878912.

MODERN 3-bedroomed semi-detached house. Pleasant cul-de-sac in attractive Cardiff suburb. Convenient for rail and bus. Within walking distance of parks & local shops. Gas c/h, d/g. High spec property in good order throughout. Purpose-built, sound-proofed shack. Gardens front and rear with 80/40m trap dipole and Cobwebb at respectable heights. Garage and hardstanding. Security alarm. freehold. £84,950. GW4BVJ, QTHR. 01222 751746 (Cardiff).

MOSELY TA33 3 element HF beam with extra set of Hustler traps for driven element; £60. Ham M rotator with 110V amd 230V controllers; £120. Very large 230V Variac; £25. All in gwo. Buyers collect. 01444 412420 (Mid Sussex).

SILENT key TS520S mic key; £250. HRO 8 coils spare valves; £50. DSP JPS GIO filter, hardly used; £100. Keyers ETM 4C; £20. MFJ482B; £20. Antenna bridge MFJ204B; £10. Kenwood Griddip; £10. 01303 814194 (Ashford).

VACUUM capacitors. Jennings 7-1000 pF SKV. Mounted, heavy duty casting, complete with insulators & mechanical activator; £75. English electric U1000/3/40 Vacuum capacitor; £45. Kent keyer PCB (built) & instructions, needs box; £20. 1960s Minimitter Rx converter 10-80m; £30. G0KTN, QTHR. 01225 703726 (Melksham).

VERSATOWER 60ft no basepost, Jaybeam tribander 3, Rotator, 2m Yagi, 70cm Yagi, all for £300. Codemaster CWR-61OE, £60. Call eves 6-9pm. 01993 811100 (Woodstock, Oxon).

VINTAGE & audio valves. New (unused); £3. ea. 5R4GY, 5Y3GT, 6V6G/GT, 807, 832, 1616, 1622, AC/P, AC/P1, ECC/81, ECC/82, ECC/83, EF55, EL38, EL84, EZ81, FW4/500, KT44, KT67, PP3521, VR150/30, 12AT7, 12AU7, 12AX7, 12BH7, also good used, tested valves from 50p. Many more available (SAE with enquiries).

YAESU FT290R multimode, in excellent condx, bxd with spkr, mic, soft case & carrying strap; £220. Tel; G1HAB, 0191 267 8811 (Tyneside).

YAESU FT411E 2m Tx/Rx, h/held with spare 12V NiCads. Yaesu NC-29 quick charger; £225. Icom IC32E 2m & 70cm Tx/Rx, h/held with spkr/mic & spare 12V NiCads. Icom BC-35 quick charger; £225. Plus many accessories & postage. Richard, G8ITB, 01689 852177 (Orpington).

2 x PYE MX293 16 channel ideal for 4 metres, come with mics. Meet MPT 1302 approval; £30 each or £50 pair. Call Joe, G7OOX, 0973 442969 (Hertford).

286 PC, 32 meg h/d, 640k RAM, 1.4 F/D VGA graphics with 2 VGA monitors, one colour, one mono. Keyboard, lots of s/ware including Packet 6.0, Geoclock etc; £200. Yaesu FTC-703A 4m h/held, 6ch, sp/mic, Pye A200 4m amp, Jaybeam 4m G/plane; £150. Swap both for good FT-290 or similar. Buyer collects or may deliver Notts area. G7PHL (not QTHR), 01623 514509 (Mansfield, Notts).

6146Bs new 30f. Transformers AR88. KW2000E. 2400V. 350MA, plus others. 20 400V 400uF electrolitics wide spaced variables. CT436 Hartley scope. 01203 504982 (Coventry).

AEA PK232 MBX with mans, leads, SW; £195. Also Phillips 50MHz DB scope, man, probes; £145. Both vgc. 01203 450 476 (Coventry).

ADI 2m FM handheld. Extended Rx 138 to 174 MHz. 2 battery packs filled with 6xAA NiCads. Packs can be charged from 12 volts without removing cells. Also pack for 4xAA dry cells. Man, Helical, belt clip; £95, carriage extra. 01734 619162 (Wokingham).

AEA PK88 TNC suitable for both HF & VHF packet, excellent condx, with software, cables & man; £85. G3KZU, QTHR. 01865 63000 (Oxford).

AERIALS ZA7/ZA14 coax end fed zepps 7/14MHz; £25 each. Yaesu FRG9600 Rx 100KHz/950MHz video board fitted; £280. Icom 740 extra CW/SSB filters, internal power; £95. Trio PS6 DC power matches TR7500; £40. Telequipment scope D61A scope; £30. Heath SB230 linear, daily use. Would make complete spares for SB230 owner; £225. All + carriage. 01252 548561 (Farnborough).

AKD 4001; £115 VGA/SVGA multisync NEC 2A monitor; £85. 4M 1/2 ANT; £20. 4m HB9CV; £12. MM 4M xverter 10m drive; £95. BNOS LPM 70-10-100 4m linear; £140. BNOS LPM 432-10-100 70cm linear; £250. Icom 1271E 23cm M/Mode xceiver; £650. 4x48 70cm MBMS & frame; £120. Two 2m 9xY Tonnas new; £60 ea. 25-1300 Disconne; £25. 23cm Tonna; £30. Alvin, 01372 277945 (Ashtead).

ALTRON SM30 2 section telescopic tower. Wall mounted, extends over 31ft, wind up & tilt over. Base bracket & wall brackets included. (Tilts away from wall at 90 degrees, not parallel); £220 ono. Buyer collects. Steve, G0UIH, 01536 712848 (Northants).

ANTENNA Altron AQ6-20 Mini-beam, 3 element 4 band, complete with all hardware & instructions; £50. + carriage. G3UXJ, QTHR. 01608 662609 (Moreton-in-Marsh).

ANTENNA KLM KT34A, 4 element Triband beam (2 driven elements), brand new in box, unused due to planning problems. New price; £570, will accept £350. Contact after 7pm Gary, G0FWX. 01562 862820 (Kidderminster).

ASTATIC D104 bxd new; £30. Eddystone black bug key, offers? Key type 'D' complete; £15. Drake CW75 keyer new, man; £75. Marconi 6460 12.4GHz 1mW power meter, man, new; £75. Questar 3.5in MCT OTA complete superb offers? Drake FS4 Synth for 4-line; £75. Hallicrafters S20-R rcvr with man, offers? Phasetrack Lineplex F1-2 rcvr. Synth input, man, mint; £300. G3YFK. 01743 884858 (Shrewsbury).

AT1000 Global SWL ATU mint condx, bxd, man; £60. Niall G0VOK/G6MHN, QTHR. 01606 871413 (Northwich).

ATARI STE maze game with 5 mazes. Uses joystick. Intriguing; £5. Mr V McClure, 43, Roman Way, Seaton, Devon EX12 2NT. 01297 23421 (Seaton).

ATARI STE morse tcvr with control panel & tone Spectrum analyzer tuner for use with digital filters; £25. (Seaton) 01297 23421.

BIRD wattmeter mod. 43 + selection plug-in coils, new; £40. Avometer mod.40X in leather case, both mint condx; £55. Nevada Delta-1 Cybernet tcvr 934MHz 20-channel complete with mic, bxd, new & unused; £105. Lafayette KT-320 communications rcvr. Valve job with man & set spare valves; £35. Sony ICF-7600A SW radio, 7 bands + MW + FM, good condx; £60. 01555 892399 (Lanarks).

CABINET for RA17/117; £30. 17ele Tonna for 2 metres, in excellent condx; £35. 01734 781782 (Wokingham).

CAPCO ATU SP300 10in x 13.5in x 3.75in heavy 1 KW PEP; £100, ono. Please collect. G4JIZ, QTHR 01629 812398 (Bakewell, Derbyshire).

CLEARANCE TH78E dualbander, CTCSS, soft case vgc; £330. FT901DM 100W HF; £380. FT280R 144/10W multi modes vgc; £230. Wanted FT767GX 2/70/6 Modules. Joe, 01236 720204 (eves) (Cumbernauld).

COLLINS 51S1 general coverage rcvr. Late. Round emblem. 312B3 spkr, excellent condx; £600. Collins S-line 75S3C, 32S3, 312B4, 516F2, SM3, vgc; £650. Icom AT100 fully automatic ATU. For IC 701, 720a,730, 740. AC/DC good condx; £135. Eddystone EA12; £80. Eddystone 770R mk2 looks like EA12 18 to 165MHz; £75. Gerry, G0AQH, 01273 454108 (Brighton).

DETACHED three bedroomed bungalow on edge of village of Rhuddlan, Clwyd. Fairly large garden at rear facing on to farm land on which is sited tiltover mast with 3el beam 14/21/28MHz (planning permission obtained) willing to leave mast if required. Very good location for QSOs in all directions; £54K George, GW4SLZ, 01745 591667 (Rhuddlan).

DRAKE station R4C T4XC MS4 MN2000 ATU gwo; £700. H/B Linear 2x813 2kV PSO; £100. Watkins Johnson signal monitor; £100. Muirhead HRO type dial; £20. Various Johnson variable caps Collins filter F455-05; £20. Buyers collect evenings & weekends 01379 783657, weekdays 01284 753049.

DRAKE TR7, RV7, remote VFO, MN7 ATU, PS7 power supply, full workshop manual, AUX7 TR7ASPEC; £850. FT757GX mic, man; £450. FT757AT auto ATU with man & connecting cables; £175. Superstar converted. Approved multi mode 10m repeater Toneburst; £100. MMT144/28 transverter man; £50. 01342 843866 (South Godstone).

ERA microreader MKII Morse & RTTY decoder with excellent built-in tutor. Self contained unit with LCD display. vgc, bxd with man. Offers. Yaesu FT-416 2m handheld, CW battery, 2 antennas, power pack, loud spkr, eartalker & charger, hardly used & in excellent condx; £200. Ring Phil, G0VQD, QTHR. 01737 762753 (Redhill).

FT101B 1.8-30MHz 260W PEP G3LLL processor mic, AC/DC leads; £190. Oscilloscope RADAT 3106C Horiz TB/amp faulty; £25. RadCom 1960-90 SWM 1960-9 offers. G3ETY, QTHR (Rochdale).

FT202R xtals; £2/pair. Advance counter; £30. Venner counter; £25. Marantz tuner/amp (110V); £50. Diablo -+V 8A PSU; £10. Wireless intercom (baby alarm?); £18. BBC/Tech software RTTY setup; £150. Compaq XT/PC (must collect); £120. EXP-420 printer; £95. Pye bundle (inc Linear & ATU; £325. Much more! Messages; 0161 477 5303 for items, but SAE please for detailed lists. G0OZK, QTHR (Stockport).

FT2100Z as new; £500. MM4001/KB RTTY tcvr; £100. WHY. Mutek GFBA 144E Masthead pre-amp; £65. Datong FI3; £90. G4ROA, QTHR, 01203 412201 (Coventry).

FT290R NiCads charger case mobile - slide mount FL2010 power supply; £360. Tono 100 watt linear; £100. AR40 rotator; £40. 01843 834120 (Margate).

FT690II 6m multimode with carry case & BNOS L50-3-25W linear in excellent condx, hardly used + aerials; £350. G1ECC, QTHR 1995. 01254 772342 (Darwen).

FT736R excellent condx, complete with 1.2GHz unit free 50 ele 1.2.69GHz Tonna. Buyer collects or pays carriage; £110 ono. G0DLJ, QTHR. 01623 513573 (Sutton-in-Ashfield).

FT77 80m-10m 8 bands SSB/CW FM digital read out, AM board, fan, mic CW filter. 01203 307272 (Coventry).

FT901DM gwo mic, antenna leads, SWR man, VHF converter; £400. 01732 465011 (Sevenoaks).

HEATHKIT SB200 HF linear amplifier 1200W input 80-10m recent overhaul, brand new valves; £225. Wanted: Past copies of QST, WHY? 01777 248080 (Retford, Notts).

IBM XT mono - many progammes CW Epsom RX80 printer - KPC3 - latest edition CW manuals; £250 & digital VT.240 terminal unit - ideal for Packet - £50, stroke has affected useage. GW0FYF, 01633 864446 (Cwmbran, S Wales).

IC725 all band HF tcvr with general coverage rcvr. FM board, man, mic, etc. Original packing superb condx; £450. Yaesu FL2100Z all band legal limit HF linear. New valves, original packing, perfect condx. Yaesu FT470 dual band 2m/70cm handie with battery, man etc; £195. Bob Harris, G4APV, 0114 2363641 (Sheffield).

IC735 tcvr fitted 250Hz CW filter matching mic;

£470. KWE-ZEE match; £15. KW match; £15. Samson ETM-2 EL keyer; £17. New Manson DCPSU EP925 regulated to ISV 25A; £60. All items gwo with relevant mans etc; G3UVS, QTHR. 01752 774405 (Plymouth).

ICOM BC72E base charger with one small battery pack; £60. Icom M11 Marine handheld; £150. 0181 310 2067 (London).

ICOM IC735 HF tcvr with PS55 power supply desk mic & narrow CW filter. Boxed as new; £575. R216 low VHF Rx with accs. No PSU; £55. R210 HF Rx for spares; £10. 01823 413870 (Taunton).

ICOM IC735 HF Tx/Rx FM, narrow CW options, superb sensitivity, gen cov Rx box, man, mic, perfect; £700. Kenwood TS440S auto ATU SSB CW filters; £750. TS140S HF gen cov; £600. Perfect. G3TCO, QTHR, 0117 968 1068 (eves) (Bristol).

KENWOOD AT250 auto antenna tuner vgc, little used; £250 no offers. Les Cartwright, G0UVL, 01942 700762 (Wigan).

KENWOOD TR-9130 multi mode 2m tcvr MC-42 hand mic MC-60A desk mic BO-9A system base mobile bracket cables, mans, Hy-gain 2m base Colinear antenna, all in good condx; £475 ono. 01276 65951 (Camberley).

KENWOOD TS-440S with auto ATU YK-88SN SSB filter, VSI voice synthesizer boxed as new; £800 ono or exchange for best 486 multi media PC system, also Kenwood AT230 ATU bxd as new; £150 ono. 01474 357795 (Kent).

KENWOOD TW4000A 2m/70cm, mobile/base, 25W/5W, voice module fitted, Diplexer, fist mic, brackets, man, excellent condx, original packing; £275. G3XZO; 01789 740073 (Stratford-on-Avon).

KLM KT 34A 4 ele Tribander complete man & Balun, vgc; £335 ono. Bob, 01538 754553 (Cheadle, Staffs).

LINEAR FL2100Z plus 3 spare valves used about 12 times, as new, manual, boxed; £600. ATU FC902 as new, boxed, manual; £120. 01707 322862 (Welwyn Garden City).

LOWE HF225 Rcvr in vgc with mains power unit; £275 no offers. G3SPE, 01566 781493 (Bude).

MARCONI spectrum analyser 200MHz - DC TF2371; £650. TF2700 portable bridge LCR; £95, TF2603 1.5GHz RF MV; £50, TF1300 value voltmeter; £35. TF1313A precision bridge LCR; £70. TF2330 wave analyser; £80. Texas 6613 15MHz double pulse generator; £30. Gould 053000 35MHz scope; £70, Tektron H 434 portable 25MHz storage; £165. 7603 double beam 75MHz; £180 0S4000 digital storage scope; £180 all working. 01344 27869 (Slough).

MAST Altron HD45 wall mount, includes head unit, vgc; £325. MFJ antenna analyser 207; £48. 01780 52504 (Stamford).

MIZUHO MX 14ST 20m ORP - Mizuho MX 7ST 40m ORP. Extra crystals for both; £150 each. Spkr, mic; £18. Side tone & ATU/SWR module; £25. All items less than 8 months old. Phone evenings; G0LNV, 0114 2553103 (Sheffield).

MONOCHROME 17in video monitor by Panasonic with composite video imput C/W service manual; £50 ono. Phone office hours only. GW4BVT; 01633 214147 (Newport, Gwent).

MOVING QTH - Antenna system as follows: Altron mast tilt-over with ground post, plus cage HD rotator - 2m vertical - 2el ZL special - Tri bander 20-15-10M buyer to dismantle & collect almost new real bargain - plus controller - freq counter 10Hz - 120MHz. Will accept first; £500 KW1000 Linear amp new valves 572B refurbished first; £200. World clock Yaesu; £10. 01621 855648 (Maldon).

MUIRHEAD fax receive only machines. Mufax courier wet paper type; £30. Muirhead fax dry paper type; £45. G8AOL, QTHR. 0181 310 6555 (Bexleyheath).

MUTEK S-band converter, 60cm dish, Helical feed, also loop yagi 175 data interface CW JVFAX, Hamcomm. PKTMON £20. G4JBH, QTHR 01935 28341 (Yeovil).

NAVICO AMR1000S 2 metre mobile, good condx as new; £110. 01204 308412 (Greater Manchester).

PF5Y ideal for 70cm Pye MZ93 complete and xtalled up on 86.4375; £120. 01773 761412 (Smalley).

PK232 MBX complete leads, mans, Pakratt software as new; £245. G3ASE, QTHR. 01480 463129.

QTH four bedroom detached in Hamlet with far reaching views, with garage and approx quarter acre plot. 42ft tower 4x 19 el for 70cm. Regular daily skeds to Germany. Offers around £175,000. G3KPV, QTHR. Tel; 01734 832739 (Reading).

RACAL RA117 Rx, technical man, good condx, buyer collects; £150. 01245 359894 (Chelmsford).

RACAL RA17, very good condx, for sale including mans; £150. Colin, G0NJM, (eves) 01384 866189 (Dudley).

RARE Hellschribers transmit & receive hand written text Zetfax transmitter Zetfax recorder with full handbooks; £150 pair. 01384 394360 (Stourbridge).

SALE Yaesu FT200; £65. Shure 444 mic; £10. Lowe HF-225 rcvr, vgc; £290 ono. 01367 253644 (Lechlade, Glos).

SET of 8 fibreglass poles for Triband Quad antenna with Labgear Boomless Spider to suit; £40 ono. Buyer collects. G5KM, QTHR, 01226 790986 (Barnsley).

SILENT key (G6WYJ). Tcvr Trio TR9130, bxd, never used, mobile; £250. Mic Kenwood MC50, unused; £40. Tcvr Kenwood TH78E, bxd as new; £325. Power supply Daiwa 120m, bxd, gwo; £60. SWR meter Daiwa CN460M, bxd, gwo; £30. All negotiable. G6BOR, QTHR. 01260 272 454 (Congleton).

SILENT key - G4VNJ, last few items, any reasonable offers to clear. EP1500 power supply 13.84 probably 20-25 amps. Bremi power supply 13.8V 3 amps. Azden & realistic external spkrs. Auto antenna rotator. AC / DC converter 6-9-12 volts 1 amp. CW & RTTY Telereader CWR 680. Philmore transmission analyzer model FSM55. Aftronics superscaf audio filter. Assistance with postage appreciated. Offers to G0GPO, QTHR. 01227 711261 (Canterbury).

SILENT key sale (G7LFI) DT290R; £100 ono. PROU4 scanning receiver; £100 ono. FT200; £250 ono. ATU AT100 Global Rx, contact G0IID, QTHR. 0191 5483301 (Sunderland).

SPECTRUM analyzer HP141T, 8552B, 8555A, 10MHz-18GHz; £450. Marconi 200MHz freq. counter; £55. Buyers collect; G3VXZ, QTHR. 01628 27350 (Maidenhead).

TECHNICAL software RX8 multimode rcvr for BBC Micro complete Eprum tape comprehensive man, gwo; £75. G4ZVT, 01480 300737 (Huntingdon).

TH28E 2m handy talkie, 70cm cross band & air band receive; £220. G4DPZ, QTHR. g4dpz @cix. compulink. co. uk. Tel 0121 561 3891 (Dudley).

TNC KPC4 dual port VHF/UHF £225 ono. Navico AMR1000 2m FM good packet radio. Lead for TNC supplied £150. 01626 773301 (Teignmouth).

TOWER 6.3m high 300mm triangle section. 600mm 600mm base plate, ideal for extension or support for tube - mast. Fully galvanised in good condx, delivery could be arranged, open to offers. G4BGX, 01258 857019 (Wimborne).

TR751E Kenwood multimode 2m good condx, £450 ono. Fairmate HP200E handheld scanner 0.5-1300MHz 100ch memory, bxd as new; £200. TH77E dual band handheld, bxd as new; £220. Meteosat weather system 1.2m dish, receiver doconconverter, PC-card, software; £350. SR100 linear-2m 100W; £80. R/N electronics 2M-6M transverter 25W - O/PE120 Storno 2m synthesised tcvr; £50 Nolton Nova 281 4m synthesised tcvr AM/FM full band; £45. 0191 469 1906 (Gateshead).

TRIO TR7010 2mtr SSB tcvr; £95. Also Trio TR3200 70cm FM Trans; £135. PSU; £20. Phone QTHR magazines for sale. PW every day Electron SWM back dates open to offers, Phone 0181 451 1611. (London).

TRIO TR9000 2m multi mode vgc, bxd, service man; £260. G0RAU, QTHR (Gerrards Cross). 01753 883299.

TRIO TS530S all bands too expensive to use for CW only! Little used. Carriage paid £380. 01642 644061 (Stockton-on-Tees).

TRIO TS530S HF Tx Rx; £360 VHF frequency counter Racal 9915 10Hz 520MHz; £100 met 2m beam 19el vgc; £50. Oscilloscope HP1222A dual trace probs manual; £95. Kenpro KT-22 2m hand held; £80. Please phone between 7pm and 10pm. 01509 261780 (Loughborough).

TRIO TS700G 2m base tcvr, USB, LSB AM, FM CW fitted pre amp, bxd, first class condx, good classic rig; £300. Yaesu FT727 dualband 2m/70cm handheld CW NiCads, charger, soft case, bxd; £195. Paccom TNC220; £45. Comet dualband base aerial unused; £45. 01827 58004 (Tamworth).

TS-830S tcvr, VFO-120, SP-230. 500/250Hz filters, spare PA/DVR valves, transverter mods. Classic DX machine; £575. G3SEK (QTHR). 01235 531559 (Abingdon, Oxon).

TS530 tcvr external VFO 120; £450 ono. TenTec Century 21 HF tcvr; £60. KW107 ATU; £60. Drake 2C Rx; £120. 01242 672705 (Cheltenham).

TS530S with narrow CW filter MC50 desk mic; £375. FC902 tuner, like new; £100. 2 pairs 6146B RCA tubes, new; £40 - all items like new, unmarked. 01179 642867 (Bristol).

TS850-S Filters. 500/455 500/8.8 1.8/8.8. Set for; £110. G3ZLS. 9-5pm. 01392 413479 (Exeter).

TYPE 18 Rx. Any offers? John, G4DEW, QTHR, 01780 740025 (Stamford, Lincs).

VERSATOWER mobile mast 10m high, 4 sections including head unit, winches & detachable base plate; £995. 4m tcvr A.K.D 4001; £110. 2m linear A200; £27. 4m linearA200; £27. Steve, 01296 720161 (Mursley, Bucks).

VIBROPLEX single paddle electronic bug key & Dewsbury electronics Supa-Keya, both bxd as new. Contact Alvin, GW4ODN, 01646 693991 (Milford Haven).

WAVECOM W4010 decoder/analyser. V5.0 software. Fax option also fitted, as new with man & leads; £485. GW3SFC, QTHR, 01685 874880 (Aberdare).

YAESU ANT tuner FC102; £120. Yupiteru MVT 7100 handheld Multi band rcvr vgc; £250 ono. Low Airmaster (Acars) Demodulator + software + books as new; £90 ono. RF power triodes TY4-400 new offers. Sivertone 6 volt car radio 1930s; £50. 1916 WWI brass key; £50. Tim, G0AUI. 01444 458390 (Haywards Heath).

YAESU FT-ONE; £598 (bargain). General coverage H/F tcvr excellent condx. Buyer collects as owner disabled. G0UAU, QTHR, 0121 358 3639 (Birmingham).

YAESU FT102 excellent condx, spare PA valves, mans, mic; £450 ono. Epson HI80 Plotter. SER/PAR HP compatible; £70 ono. 01536 790094 (Northants).

YAESU FT102 HF Tx/Rx excl condx. mic, man; £450 ono. Forest of Dean, phone after 6pm. 01594 544409 (Gloucester).

YAESU FT726 with 6M 2M 70cm & Sat board vgc, bxd with man; £750. Would consider part exchange against Kenwood TH78E dual band handheld or similar WHY up to £3550. Terry, G0WAB, 0151 608 0794 (After 2pm please). (Wirral).

YAESU FT727R dualband handheld with NC-15 rapid charger, NC18C trickle charger, mobile mounting bracket, speaker-mic, case, mans; £250. 01394 274795 (Felixstowe).

YAESU FT736R 2m + 70cm as new. Boxed FVS-1A fitted. Recent service; £1250. Call Ian 0956 475619 (24hr) or 0121 4273609 after 7pm (Birmingham).

YAESU FT990AC 500Hz & 250Hz (455kHz) filters. Auto ATU, bxd, man, good condx, genuine reason for sale; £1500. Spectrum 50MHz transverter 20W + output interfaced for Kenwood TS930S last used 1989 when rig sold, hence; £50. Leads & circuit diagrams included. Kenwood TL922 linear amplifier 1kW output plus; £800. 01723 370532 (Scarborough).

WANTED

ANTIQUE wireless equipment, crystal sets, horn speakers, early valves, pre-war television, spy sets, early military gear; cash and collect. G4ERU, 5 Luther Road, Winton, Bournemouth BH9 1LH. Tel/fax; 01202 510400.

AP1086 issue 1 (RAF radio stores ref nos) Also AP1186A B-C-D-E all sections & APs relating to radio, radar equipment. Would purchase post-war to current Magnetrons, Klystrons, T/R cells, Ignitrons, Thyratrons, Microwave Planar tubes, TWTs & special CV-types required R1355 10D/13032, IFF-Rx R3002, R3067, R3121 control unit type 17/18 all unmodified, excellent price offered, tel or fax anytime; 0171 511 4786 (London).

BATTERIES for Motorola personal radio. Type as used by police HT800. 01795 842127. G4LUO, (QTHR) (Kent).

CRYSTAL sets quality vintage radios from 20s/30s & full set of trader servicing sheets wanted by private collector. Answerphone, G1CNN, 0181 993 4946 (Ealing).

DAIWA RF bridges U66S2 13/23cm bridge also U66V VHF/UHF bridge. G3ZUM, 0121 747 5077 (Birmingham).

DRAKE ATU MN2000 or MN2700. Also R4C Rx with Sherwood filters with or without T4XC Tx. G3TKR, QTHR. 01535 645574 (Keighley).

DRAKE CW75 keyer MS7 spkr, CS7 coax switch P75 phone patch Icom Sm-10 desk mic, all gwo. Des, G0JCF, QTHR. 01895 633118 (Ruislip).

EDDYSTONE 960 EB35 EC10 870. Mimco. Camper & Nicholson, any condx; £10. for non workers collection possible. Lepino. 0374 128170 (Surrey).

EDDYSTONE EC10 receiver either Mk1 or Mk2, any condx considered, will arrange transport if rqrd. 01633 423904 (Newport, Gwent).

FT707 or TS120/130 or similar wanted, in good condx. John, G4DEW, QTHR. 01780 740025. (Stamford, Lincs).

ICOM IC736 HF + 6m tcvr must be vgc & reliable rig. 01723 370532. (Scarborough).

KENWOOD AT250 auto ATU for TS140 or SGC SG230 Smartuner. Please telephone G3PTN, QTHR. 0113 2654644.

KENWOOD MC-50 desk mic. Please telephone 0181 688 4563 or write to G0CTE, QTHR (Croydon).

LIGHT pump-up mast 25ft transportable by roof rack. Prefer seller lives North West England. Offering £60 ono. Write G3CSY c/o LA4 4PZ Morecambe. 01524 410058 (MoreCambe).

MURPHY type 618 HF Tx (AP100333) plus PSU R109 R206 MKII any CT test equipment. G4FUY, QTHR. 01734 733633 (Wokingham).

PHOTOCOPY of item in Wireless World probably 1945-1960 describing Potentiometer-tuned audio boost or reject Heterodyne filter using triodes and called 'Select-O-ject'. Can you help me please? All costs refunded, all letters answered. E F Cowen. 28 Chartfield Road, Reigate, Surrey. RH2 7JZ.

PYE PFX UHF model for conversion to 432 MHz. Standard or long case. Also CTCSS module. TC32/TC22 (ex). Richard, G8ITB, 01689 852 177 (Orpington).

PYE Westminster fronts in as new condx wanted, no dents or scratches, may also consider as new lids. 01773 761412 (Smalley).

WANTED any handbook &/or paperwork giving details of circuit & component valves & other information for rcvr type R107 MK1. Reasonable prices paid for genuine offers, will also pay postage. Ring or write; Alan, Mossleigh, Highfield Close, Northwood, Middx HA6 1EX. (01923) 836593.

WANTED video heads for Phillips system 2000 V 2020 etc. 01902 781726 (Wolverhampton).

YAESU FC107 man reqd or loan of one, expenses paid. Expansion unit for Sharp PC700 Computer offers to G4GYU, QTHR. 01623 27257 (Mansfield).

EXCHANGE

GRC9 (angry nine) tcvr. Complete working, swap for Racal Syncal 30 or other interesting gear. WHY. Jim, G4XWD, not QTHR. 01692 630285 (Norwich).

AMSTRAD portable 512 PC 512k complete, PSU, software exchange for FRG7 or similar rcvr, nominal valve; £90 WHY. 01480 468330.

PATERSON auto colourtherm colour processor largest print 16in x 12in, hardly used, instructions. Exchange for 70cm tcvr FT790 etc. G3ANG, QTHR. 01257 279665 (Chorley, Lancs).

TS830S in vgc, + MFJ versa tuner & a Welz 50r dummy load. Exchange for a 2 metre all mode base station only. No cash involved, please ring Ted; 01229 77037 (Cumbria).

Please add £2.00 postage. Cheques to: K. Bailey, 40 Seymour Close, Selly Park, Birmingham B29 7JD.

EVENTS DIARY

CLUB NEWS

DEADLINE - Items for inclusion in the October 1995 issue must be sent to HQ marked "Club News - DIARY", to be received by 21 August latest. If news is received by the published deadline, it should appear in the listing. It is your responsibility to ensure that items are sent DIRECT to HQ in good time. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

NOTE: This is primarily a service for clubs affiliated to the RSGB, to whom priority will be given.

AVON

BRISTOL ARC - 3, Ideas night; 10, HF equipment and aerials; 17, VHF CW/SSB; 24, Barbecue; 31, HF/SSB; September 3, 144MHz Backpackers; 7, Needs of the club; 14, HF/CW. Details 0117 9654886.

RSGB CITY OF BRISTOL Group - 29, Video. Details 0117 9672124.

SOUTH BRISTOL ARC - 2, Magazine Evening - Donate or Exchange; 9, Computer Shareware; 16, Barbecue night; 23, Club aerials - checks on emissions; 30, Preparation for Bristol Radio & Computer Rally; September 6, 2m Challenge - Work All Bristol; 13, Review of Bristol Rally. Details 01275 834282.

THORNBURY & DARC - 23, VHF/HF activity night; 30, Preparations for club display at Motorama '95. Details 01454 612689.

BERKSHIRE

BRACKNELL ARC - 9, Radio Treasure Hunt. Details 01344 420577.

READING & DARC - 24, HF SSB NFD planning. Details 01734 698274 (eves).

BUCKINGHAMSHIRE

CHESHAM & DARS - 2, General meeting; 9, Silly contest; 16, CW practice; 23, Talk 'Switch Mode Power Supplies' by Mike, G0DNJ; 30, On the air evening; September 6, General meeting. Details 0494 676391.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 4, Get equipment ready for GB100NT; 11, Rig SES GB100 at Wimpole; 12/13, GB100 at Wimpole Hall; 18, Talk on type approval; September 1, Preparation for 2m trophy contest. Details 01954 200072.

CHESHIRE

MID CHESHIRE ARS - 2, On the air evening; 7, Committee meeting; 9, Shareware swap night; 16, On the air evening; 23, Quiz night; September 4, Committee meeting; 7, On the air evening; 14, Video night. Details 01606 592207.

CLWYD

CONWY VALLEY ARC - 2, Talk 'Memories of the Old Anglesey Radio Station' by Gareth, GW3RXD; September 6, Talk 'Microwave Techniques' by Miles, GW4RCE. Details 01745 855068.

CORNWALL

SALTASH & DARC - 4, HF Field Day planning; 18, Treasure hunt. Details 01752 844321.

DERBYSHIRE

BUXTON RA - 8, Quiz night; September 12, Rig alignment with Ron, G4MRQ. Details 01298 25506.

DERBY & DARC - 2, Junk sale; 9, Rally preparation meeting; 16, Talk on the British Amateur Radio Teledata Group by Ian, G4EAN; 23, Talk 'History of the Telephone' by Simon Bullimore; 30, Talk 'The International Shortwave League' by Chris, G0IYZ; September 6, Junk sale. Details 01773 852475.

SOUTH NORMANTON, ALFRETON & DARC - 9, Committee meeting; 14, On the air evening; 21, Quiz night. Details 01773 521456.

DEVON

EXMOUTH ARC - 5, Visit to Devon Fire & Rescue HQ Control Room; 19, Fox hunt. Details 01395 279574.

NORTH DEVON RC - The club meets each second Wednesday of the month. Details 01271 23525.

TORBAY ARS - 18, Barbecue. Details 01803 526762.

DORSET

FLIGHT REFUELLING ARS - 6, Video 'Early Radar and Radio Location Techniques'; 13, Hamfest; 20, NFD preparation and strategy; 27 Surplus equipment sale. Details 01425 653404.

EAST SUSSEX

SOUTHDOWN ARS 7, Short presentations by members; September 4, Talk 'The Biggest Aspidistra in the World' by Les, G3FET. Details 01825 763022.

ESSEX

CHELMSFORD ARS - 1, Talk 'A Computer aided Look at the G5RV Antenna and Feeder System on all HF Bands'; September 5, Talk 'Centenary Marconi Lecture' by Stanley Wood. Details 01245 256654.

FIFE

GLENROTHES & DARC - 9, Presentation on Novice Courses. Details 01592 265789.

GLOUCESTERSHIRE

CHELTENHAM ARA - ***NEW VENUE*** Meetings will now be held at Prestbury Library, the Burgage, Prestbury, Cheltenham. 4, Talk by United Artists Comms; September 1, Fun with ELNEC by G3SZS. Details 01242 242336.

GLOUCESTER ARS - 12, Club DF hunt; September 2/3, SSB Field Day. Details 01452 421510.

GREATER LONDON

ACTON, BRENTFORD & CHISWICK RC - 15, Talk 'The FT1000' by G4GD. Details 0181 992 3778.

BROMLEY & DARS - 15, Barbecue. Details 0181 777 0420.

COULSDON ATS - 14, Barbecue; September 11, Talk on EMC by Derek, G6MFM. Details 0181 684 0610.

CRAY VALLEY RS - 3, On the air evening; September 7, Talk 'Police Radio' by G3ZPS. Details 0171 739 5057 (office hours only).

EDGWARE & DRS - 24, SSB Field Day briefing; September 14, On the air evening. Details 0181 204 1868.

SOUTHGATE ARC - 10, Barbecue; 24, DF equipment check; September 14, Talk 'Computer Simulated CW Contest' by Ron, G3KTZ. Details 0181 360 2453.

SUTTON & CHEAM RS - 17, Talk 'WAB Expedition in the Emerald Isle' by Ron, G3DCZ and Dave, G4CQR. Details 0181 644 9945.

WIMBLEDON & DARS - 6, Summer camp; 11, On the air evening; 25, On the air evening. Details 0737 351313.

GREATER MANCHESTER

BURY RS - 8, Talk 'Life on the Ocean Waves Part Two' by G0PNL; September 12, Talk 'Radio Amateur Relief Expedition' by G7NYD. Details 0161 762 9308.

ECCLES & DARS - 1, Talk 'PME' by G6FEI; September 5, 'Computer Based Learning' by G4UOT. Details 0161 773 7899.

SOUTH MANCHESTER RC - 4, Talk 'A Siberian Experience' by G8APD; 11, Talk 'Manchester Ship Canal' by G8TYH; 18, Talk 'Back to Brass' by G0BJK. Details 0161 969 1964.

WIGAN-DOUGLAS VALLEY ARS - The club is currently meeting at the temporary location of The Hesketh Arms, Shevington, Wigan. Details 01924 211397.

GWYNEDD

DRAGON ARC - 7, Demonstration of home brew equipment; 21, Surplus equipment sale; September 4, Talk 'The Function of an Evacuation Hospital in the Gulf War' by Ieuan, GW4FQU. Details 01248 600963.

HAMPSHIRE

BASINGSTOKE ARC - 27, 2m DF competition. Details 01256 25517.

HORNDEAN & DARC - 22, Talk 'HF Propagation' by Ian, G2BDV. Details 01705 472846.

THREE COUNTIES ARC - 2, Construction competition; 16, Video Night; 30, On the air evening; September 13, Junk sale. Details 01428 606298.

WATERSIDE ARS - 26, Waterside Gala. Details 01962 714585.

WINCHESTER ARC - 18, Talk about the tea business by David, G0OZD. Details 01962 860807.

HEREFORD AND WORCESTER

BROMSGROVE ARS - 8, Talk on technical topics; 22, DF hunt. Details 01527 542266.

DROITWICH ARC - September 5, PMR Conversions. Details 01905 778794.

MID WARWICKSHIRE ARS - 8, Fox hunt; September 12, Open Day. Details 01926 424465.

HERTFORDSHIRE

CHESHUNT & DARC - 2, Junk Sale; 16, Talk 'Amateur Radio for Beginners' by John, G3WFM; 30, Portable on Baas Hill Common. Details 01992 464795.

HODDESDON RC - 4, On the air evening; 18, Barbecue. Details 01992 460841.

WELWYN - HATFIELD ARC - September 4, Talk on cross field antennas by Maurice, GM3HAT. Details 01920 462241 (eves) or 0181 982 7298 (day).

HUMBERSIDE

GRIMSBY ARS - 3, Talk 'Data Bases' by Chris, G7BRZ; 31, SSB NFD Organisation; September 14, Visit to Cleethorpes Observatory. Details 01472 825899.

HORNSEA ARC - 9, Talk 'The Buccaneer' by G3RMX; 16, Technical forum; 23, Test equipment; September 6, Committee meeting; 13, Test equipment of old. Details 01964 562258.

KENT

EAST KENT RS - September 1, Talk 'A Guide to Military Communications during WWII' by Brian, G8DIU. Details 01277 743070.

LANCASHIRE

PRESTON ARS - 3, Check of the society's equipment; 31, On the air evening; September 14, Quiz night. Details 01772 686708.

THORNTON CLEVELEYS ARS - 7, Club 70cm Project; 14, Barbecue; 21, Talk by Les, G0ETV. Details 01253 853554.

LEICESTERSHIRE

LEICESTER RS - 7, Junk sale; 14; Committee evening and night on the air; 21, GB3GV TV Repeater; 28, On the air evening; September 11, On the air evening. Details 0116 2917250.

MERSEYSIDE

LIVERPOOL & DARS - 8, On the air evening; 15, Projector demonstration; 22, RAE discussion; 29, Surplus sale; September 5, Quiz; 12, On the air evening. Details 0151 722 1178.

WIRRAL ARS - 2, Visit to RARE; 16, SSB Contest preparation. Details 0151 644 6094.

NORFOLK

NORFOLK ARC - 2, On the air evening; 9, Talk 'Science for All' by Arnold, G3PTB; 16, On the air evening; 23, Talk 'Packet for Beginners' by John, G4VEL; 30, On the air evening; September 6, Talk 'PW and My Former Years' by Rob, G3XFD, Editor of Practical Wireless; 13, On the air evening. Details 01603 789792.

YARMOUTH RC - 10, Technical talk by G3PPD; 24, Field Day preparations. Details 01493 721173.

NOTTINGHAMSHIRE

MANSFIELD ARS - 14, Ashfield Show preparation. Details 01623 792243 or 01623 423697.

WORKSOP ARS - 22, Club picnic. Details 01909 487741.

OXFORDSHIRE

VALE OF WHITE HORSE ARS - 5, 2m DF contest. Details 01865 725094.

SHROPSHIRE

OWESTRY & DARC - The club now meets the first and third Wednesdays each month. Details 01691 830328.

SALOP ARS - 3, Visit to Shropshire Star; 24, Telford Rally preparation night; September 14, Packet radio with Salop Packet Users Group. Details G7SBD QTHR or @ GB7PMB.

SOMERSET

WEST SOMERSET ARC - 1, Multichoice marker; September 5, Bring and buy auction. Details 01984 631470.

YEOVIL ARC - 3, Club Project - the Taunton HF Multiband Rig by G3PCJ; 10, Talk by RSGB RLO G4NOI; 17, Talk 'Aerial Tuning Units' by G3MYM; 24, Talk 'Microwave Background to the Big Bang Theory' by G0PWJ; 31, Committee meeting. Details 01258 473845.

SOUTH YORKSHIRE

DRONFIELD & DARC - 7, On the air evening; 14, Joint fox hunt with Sheffield ARC; 21, On the air evening; September 4, Treasure hunt; 11, Quiz night. Details 01246 290250.

SUFFOLK

FELIXSTOWE & DARS - 21, Talk 'Sniffer Dogs' by Ken, G4RHR; September 4, Talk 'Antennas' by Neil, G0ORG. Details 01394 273507.

SUDBURY & DRA - September 5, AGM. Details 01787 313212 (before 10pm).

SURREY

ECHELFORD EARS - 24, Two Talks, 'Sun Dials' by G3MCK and 'Slim Jim' by G3KKQ; September 14, Talk 'German WWII Radios - Part 3' by Richard, G4PRI. Details 01344 843472.

SURREY RADIO CONTACT CLUB - 7, Barbecue. Details 0181 668 7517.

WEST SUSSEX

WORTHING & DARC - 2, Talk 'Packet Radio' by G8DHE; 16, DF hunt; 23, Barbecue; 30, 'Hints and Tips' from G8MSO. Details 01903 753893.

WEST YORKSHIRE

DENBY DALE & DARS - 2, Sommer Camp meeting; 16, Talk 'OUI' by Sue, G7TJF. Note: Denby Dale & DARS has appointed Malcolm Mckenzie, G8RWN as its new secretary. His telephone number is 01484 861782.

HALIFAX & DARS - 15, Talk 'History of SSB on 2m' by Neil, G3AAV. Details 01422 202306.

KEIGHLEY ARS - 17, Visit by Bob Horrell, the 'Model Man'; 31, Treasure night; September 14, Ideas for '96. Details 01274 496222.

WAKEFIELD & DRS - Talk 'QRP in France' by G3WWF and G4JMT; 8, 2m Fox hunt; 15, Rally planning; 22, 144MHz Trophy contest preparation; 29, On the air evening. Details 0113 282 5519.

WILTSHIRE

TROWBRIDGE & DARC - 2, Visit to Wilts Fire Brigade HQ. Details 01225 864698.

CONGRATULATIONS

To the following who our records show as having reached fifty years continuous RSGB membership this month:

Mr G D N Wilcock, G2FKS
Mr J A Caley, G2FSS
Mr F E Lancaster, G3BJP
Mr D R J Adair, G3BVB
Mr A Seed, G3FOO
Mr J B Gurney, RS10548
Mr R J Baker, RS10817
Mr N A Champness, W2CIH

RALLIES AND EVENTS

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

28 JULY - 5 AUG

AMATEUR RADIO CARAVAN & CAMPING CLUB Rally - Lytchett Matravers, Dorset. Details G4LWA QTHR, tel 01494 531755.

29 JULY

COMPUTER/RADIO RALLY/GAMES fair - Clayton Arms Sports Hall, Furtherwood Rd, Boundary Park, Oldham, Lancashire. Next to Oldham Athletic Football Club, tel 0161 627 2502.

30 JULY

RUGBY ATS 7th Annual Amateur Radio Rally - BP Truckstop on A5, three miles east of Rugby, 2.5 miles north west from M1 junction 18. Open from 10am, Admission £1 per car. Talk - in on S22 by GB7RRR. Pitches are £7 pre-booked or £10 on the day, tel 01788 824214.

6 AUGUST

RSGB WOBURN Rally - Woburn Abbey, Bedfordshire. M1 Junction 13 follow signs for 'Woburn Park' of 'The Abbey'. Doors open at 10am. Over 100 exhibitors and large RSGB bookstall. Talk-in stations by Dunstable Downs RC. Details from Norman Miller, G3MVV, 01277 225563.

13 AUGUST

38th ANNUAL DERBY Mobile Rally. Details 0332 556875.

FLIGHT REFUELLING ARS Hamfest'95 - Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. Doors open from 10am to 5pm. Includes the usual mix of traders, bring and buy, craft exhibitors, car boot sale and field events. Overnight camping facilities available for Saturday 12 August. Talk-in on S22. Please note new traffic routing and follow signs. Details Richard Hogan, G4VCQ 01202 691021.

18 AUGUST

COCKENZIE & PORT SETON ARC Radio Junk Night - Tables will be provided on a first come first serve basis (no charge for the table). Raffle at approx 8.30pm. Entry fee is £1 for all persons. Refreshments available. All the money raised is to be donated to the British Heart Foundation. Details Bob, GM4UYZ on 01875 811723 or via GB7EDN.

19 - 20 AUGUST

STAFFORD Amateur Radio and Computer Show (incorporating RSGB National Convention) - The County Showground, Stafford. open from 10am to 5pm on both days. Large trade presence plus special interest groups, Morse tests, talk-in, bring and buy, lectures each day. Other attractions include free parking, bars and catering plus free stands available to radio/computer clubs and societies. Details 01923 893929.

20 AUGUST

6th GREAT EASTERN Rally - The Cattle Market, Hardwick Narrows, Nr Kings Lynn. Opens at 10am (9.45am for the disabled). Features outdoor car boot area, bring and buy sale, talk-in on S22. With a spacious indoor area with national exhibitors. Easy access for the disabled plus free parking and refreshments. Details Ian, G0BMS 01553 765614 or at GB7OPC.

WEST MANCHESTER Radio Clubs 'Red Rose' Rally - Silverwell St. More than 75 trade stands plus a bring and buy sale with facilities for the disabled. Refreshments available all day. Doors open at 11am, 10.30am for the disabled. Admission £1, children free. Details Albert, G7RZW 01204 62980.

25 - 28 AUGUST

AMATEUR RADIO CARAVAN & CAMPING CLUB Rally - Stratford upon Avon, Warwickshire. Details G4LWA QTHR, tel: 01494 531755.

26 AUGUST

COMPUTER/RADIO RALLY/GAMES fair - Manchester University, Refectory Hall, Oxford Rd, Manchester. Admission 10am to 3pm. Adults £2.00, child/OAP £1.00. Details 0161 627 2502.

27 AUGUST

COLERAINE & DARS Annual Rally - Lodge Hotel, Coleraine. Doors open at 12 noon. Admission £1.50 which includes draw. Large number of traders in attendance. Details GI8LTB, tel 01265 58664.

TORBAY ARS ANNUAL Mobile Rally - Clenon Valley Leisure Centre, Paignton, Devon. Doors open at 10am. With trade stands, bring and buy, special interest displays, used of leisure facilities, restaurant and bar. Family attractions include the beach, boating lake, steam railway and flume water park only four minutes walk away. Details John, G3YCH, QTHR on 01803 842178.

EAST COAST Amateur Radio & Computer Rally - Details 01473 272002.

28 AUGUST

HUNTINGDONSHIRE AMATEUR RADIO SOCIETY Seventh Annual Bank Holiday Monday Rally - St Peter's Road, Huntingdon, Cambridgeshire. Doors open at 10am. Admission is £1. Refreshments available. Features two halls and a car boot sale on hardstanding surface. Details David, G7DIU 01480 431333.

CONTINUES ON P92

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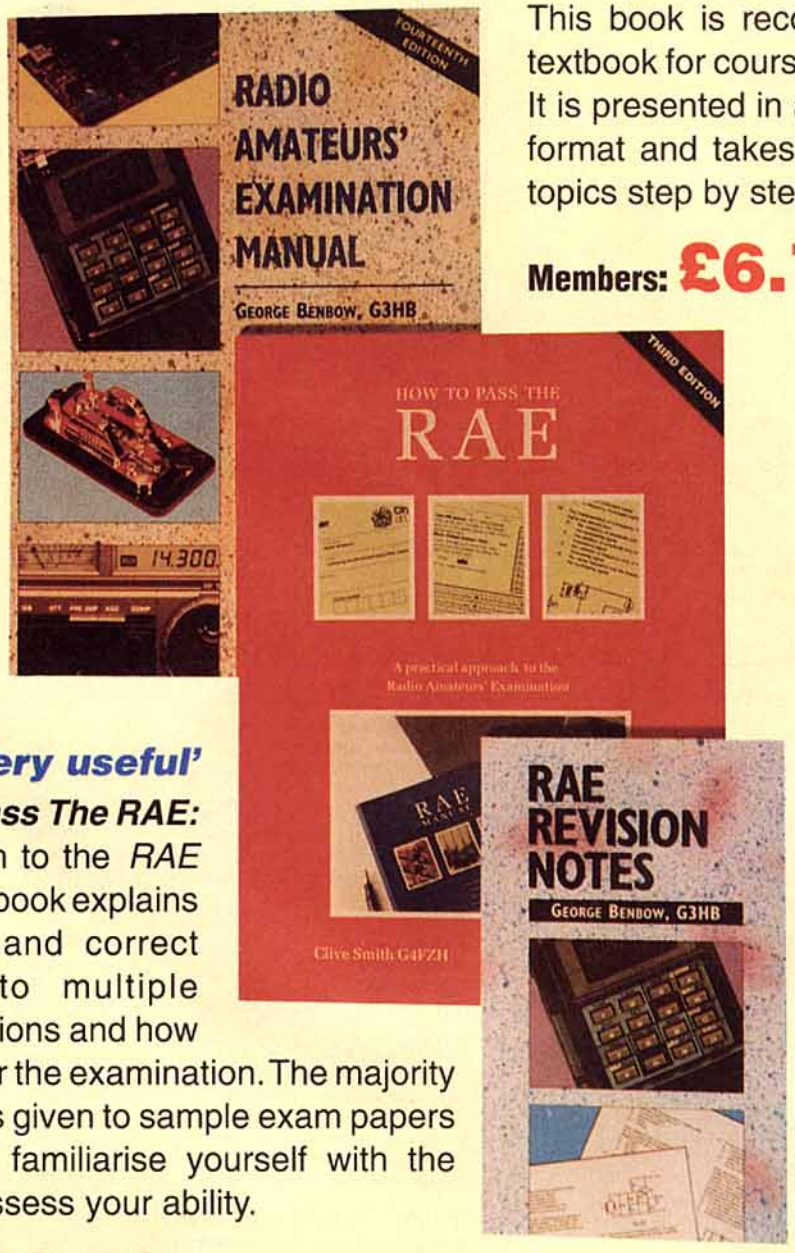

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Low Band DXing (2nd Edition)	(ARRL)	£12.99	£11.04
Super DX Edge Software For The PC	(XANTEK)	£13.99	£11.89
DX Edge Propagation Aid	(XANTEK)	£13.99	£11.89
ARDF Handbook	**(RSGB)**	**£4.95**	**£4.95**
QRP (LOW POWER)			
G-QRP Club Antenna Handbook	(GQRPC)	£6.99	£5.94
G-QRP Club Circuit Handbook	**(RSGB)**	**£8.50**	**£7.23**
QRP Classics	(ARRL)	£11.00	£9.35
W1FB's QRP Notebook (2nd Edition)	(ARRL)	£7.40	£6.29
QST MAGAZINE (ARRL)			
One Year (airmail)	(ARRL)	£88.24	£75.00
One year (surface mail)	(ARRL)	£34.41	£29.25
Two Years (surface mail)	(ARRL)	£70.73	£60.12
Three Years (surface mail)	(ARRL)	£103.24	£87.75
OAP One Year (surface mail)	(ARRL)	£30.88	£26.25
RADCOM BACK ISSUES AND BINDERS			
Radio Communication Easibinder	**(RSGB)**		**£5.99**
Bound Vols: 1986, '87, '91, '93 '94 available	**(RSGB)**	**£22.00**	**£18.70**
Back Issues: Please telephone for availability	**(RSGB)**	**£3.50**	**0.50**
RSGB NEWSLETTERS			
DX News Sheet	**(RSGB)**	**£28.24**	**£24.00**
Microwave Newsletter	**(RSGB)**	**£9.40**	**£7.99**
RLO Newsletter - NEW	**(RSGB)**	**£7.06**	**£6.00**
Free samples of newsletters and overseas rates are available on request.			
SATELLITE			
The Mir Spacecraft Handbook	(AMSAT)	£4.51	£3.83
Satellite Anthology – 3rd Edition	(ARRL)	£8.00	£6.80
Satellite Anthology – 2nd Edition	(ARRL)		£3.50
Satellite Experimenters Handbook	(ARRL)	£12.75	£10.84
The Space Radio Handbook	**(RSGB)**	**£12.50**	**£10.63**
The Weather Satellite Handbook	(ARRL)	£17.07	£14.51
SHORT WAVE LISTENER			
Complete Shortwave Listener's Handbook 4th Ed.	(TAB)	£23.25	£19.76
Short Wave International Frequency Handbook	(W&S)	£12.95	£11.00
World Radio & TV Handbook '95	(BPI)	£16.60	£14.94

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for the Radio Amateur and SWL

		NON-MEMBERS	MEMBERS
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1995 Super Frequency List (CD-ROM) - NEW	(KLINGENFUSS)	£25.30	£22.00
ARRL Radio Designer - NEW	(ARRL)	£139.90	£118.91
SPECIAL MODES			
The Amateur TV (ATV) Compendium	(BATC)	£5.75	£4.89
An Introduction To Amateur Television	(BATC)	£5.00	£4.25
NOSintro	(DOWERMAIN)	£11.80	£10.03
Am Packet Radio Link Layer Protocol	(ARRL)	£6.50	£5.53
RTTY Awards	(BARTG)	£4.26	£3.62
Slow Scan TV Explained	(BATC)	£6.40	£5.44
VHF/UHF			
All About VHF Amateur Radio	(RPI)	£9.50	£8.08
Radio Auroras	**(RSGB)**	**8.99**	**£7.64**
VHF-UHF Manual 4th Edition	**(RSGB)**	**£10.50**	**£8.93**
VHF Contesting Handbook - NEW	**(RSGB)**		**£4.00**
VHF/UHF DX Book	(DIR)	£18.00	£15.30
MEMBERS' SUNDRIES			
Badges: Callsign standard*	**(RSGB)**		**£3.00**
Callsign deluxe*	**(RSGB)**		**£3.50**
Lapel mini	**(RSGB)**		**£1.00**
Lapel standard	**(RSGB)**		**£1.00**

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RSGB Diamond	**(RSGB)**		**0.84**
I Love Amateur Radio	**(RSGB)**		**0.99**
I'm On The Air	**(RSGB)**		**0.99**
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Packet of 4 Ferrite Rings, FAIR-RITE 43 Material - NEW		£4.00	£3.40
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HOW TO ORDER

PRICES. Retail prices are followed by members' discounted prices. If you are a member, please quote your call sign or RS number when ordering. All prices include VAT (where applicable) and are subject to change without notice. Except where otherwise stated, please add postage as follows.

POST AND PACKING: Please add £1.00 (overseas £1.75) for one item and £2.00 (overseas £3.50) for two items or more. For orders over £40 post and packing is free. Overseas deliveries are by surface mail.

Newsletter and magazine prices include postage. This does not apply to back numbers which incur postage as above. Overseas Airmail and first class UK post prices are available on request.

AVAILABILITY. Goods are available over the counter at RSGB Headquarters 9.15am to 5.15pm, Monday to Friday. However, you are strongly advised to confirm availability of goods by telephone before visiting Headquarters.

PAYMENT. Payment may be made by post, enclosing a cheque or postal order. These should be crossed and made payable to 'Radio Society of Great Britain'. If sending cash please use registered post. We accept Visa and Access (Mastercharge) cards and our telephone number for credit-card orders is 01707 660888. Our Giro account number is 533 5256.

DELIVERY. Goods will be despatched to UK destinations by 2nd class letter post or parcel post, or surface mail to overseas destinations. Please allow 28 days for delivery.

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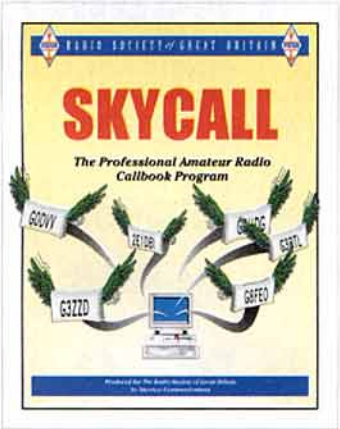
THE RSGB CALLBOOK ON DISK



SKYCALL IS the professional amateur radio callbook program for Windows 3.1. Produced for the RSGB by Skyview Communication, SkyCall gives you instant access to details of over 55,000 UK callsigns plus data on hundreds of repeaters and packet radio bulletin boards. See *RadCom*, April 95, page 45 for full information on this exciting new product.

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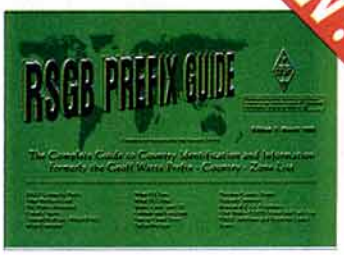
THE RSGB PREFIX GUIDE

NEW!



FOR MANY YEARS until his death last year, Geoff Watts produced his *Prefix - Country - Zone List* which was the definitive guide to identifying those tricky callsigns so often used by special event and contest stations, not to mention the new countries that pop up from time to time.

Now the RSGB has taken on this task and has produced the *RSGB Prefix Guide*, which will be regularly reprinted to ensure that it contains the very latest information.

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CONTINUED FROM P88

2 SEPTEMBER

ANNUAL WIGHT WIRELESS Rally - National Wireless Museum, Arreton Manor, Newport, IOW. Open between 11am and 5pm. Free admission to the Wireless Museum and the extensive gardens plus free parking. Also, no charge for trade stands or the bring and buy sale. Collection for the Radio Invalid and Blind Club. Refreshments from the Cafeteria and talk-in on S22. Details Douglas, G3KPO 01983 567665.

3 SEPTEMBER

BRISTOL RADIO RALLY - Doors open from 10am until 4pm. Admission £1 and free to accompanied children under 12. Features include more than 100 tables with table hire at £15 each, a large bring and buy sale, refreshments, ample under cover parking and talk-in on S22 Details Muriel, G4YZR 01275 834282 (24 hour answerphone.)

18th TELFORD Rally - Telford Exhibition and Racquet Centre, Telford. Easy access from M54 - well sign posted. Free parking, trade stands, flea market, bring and buy, special interest groups and RSGB in attendance. Conference room available if required. Details 01952 588878 or 01743 249943. Traders only contact Jim on 01952 684173.

VANGE ARS Rally - Laindon Community Centre, Laindon, Basildon, Essex. Centre is only a short walk from Laindon Station (Fenchurch Street to Shoeberyness line). Signposted from the A13 and A127. Open 10.30am. Entrance £1. Morse tests on demand plus refreshments, free raffle, talk-in on S22. Details Stuart, G1VWB 01375 859632.

8 - 10 SEPTEMBER

AMATEUR RADIO CARAVAN & CAMPING CLUB Rally - Details G4LWA, QTHR, tel 01494 531755.

9 SEPTEMBER

BALLYMENA ARC Annual Rally - Ballee High School. Details GI4HCN, QTHR, tel 01266 659769.

9 / 10 SEPTEMBER

RSGB 1995 International HF Convention - A full Convention Prospectus will be available shortly, which will include an advance booking form. Send and SAE to: Marcia Brimson, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE, UK.

10 SEPTEMBER

BARTG Rally - Sandown Exhibition Centre, Sandown Park Racecourse, Esher, Surrey. Ten minutes from junc 10 of the M25. Set in a large, spacious hall with plenty of free parking. Most aspects of radio catered for with a special emphasis on Data Communications. Other features include more than 250 tables with computers, computer peripherals, software, books, publications, aerials, kits, components and test equipment. Details Peter Nichol, 38 Mitten Ave, Rubery, Rednal, Birmingham B45 0JB, tel 0121 680 5963.

THE 14th LINCOLN HAMFEST - Lincolnshire Showground. Entry is £1.50. Morse tests available plus all the usual attractions. Details Sue, G8VGF 01522 525760.

SOUTHEND & DRS 75th Anniversary Radio & Computer Rally - ***New Venue*** Cliffs Pavilion, Southend-on-Sea. Admission £1.50, concessions £1. Doors open at 10am. Parking plus refreshments from Maritime Bar. Morse tests available on demand but two photographs must be provided. RSGB in attendance and a display of historic radios from the Essex police. Talk-in on S22. Details Ron, G0UAW on 01702 353676 or fax Martin, G0OQR on 01702 602271.

17 SEPTEMBER

CENTRAL LANCASTER Radio Rally - Central Lancaster High School, Crag Road, Lancaster, five minutes from junc 34 of the M6. Doors open at 10.30am. Entrance fee is £1.00. Features include the usual traders, special interest groups, bring and buy plus refreshments. Details Susan 01524 64239 or 01384 896199.

PETERBOROUGH RADIO & ELECTRONICS SOCIETY East of England Rally - Peterborough Showground. Easy access from A1, A605, A47. Trade stands, radio car boot sale and plenty of free parking. Plus full parking and bar. Doors open at 10.30am, 10am for disabled visitors with talk-in on S22 via G3DQW. Admission £1. Details Vince, G8NGZ on 01733 331211.

23 SEPTEMBER

RADIO AMATEUR TABLE TOP SALE - St Mary's Hall, Reddish, Stockport. Starts 10am with talk-in on S22. Details John, G4ILA on 0161 477 6702.

24 SEPTEMBER

HARLOW AR AND COMPUTER SHOW - Harlow Sports Centre. Easy access off junc 7 of the M11, A414. Doors open at 10.30am. The large ground floor main hall will feature a selection of traders both old and new with products ranging from complete radio/computer systems through to software, electronic components and second hand equipment. There will also be a special interest area and a large club bring and buy stall. All car parking and free and there is talk-in on S22 and 70cm SU22 by G7REF. Full facilities for the disabled plus parking next to the entrance. Details Mike, G7BNF on 0850 487863.

NORTH WAKEFIELD Radio Club Rally - Outwood Grange School, Potovens Lane, Outwood, Wakefield. Doors open at 11am, 10.30am for the disabled. With traders of radio, peripherals and computers. Also features special interest groups, repeater groups, bring and buy sale, canteen facilities, licensed bar and Morse tests on demand with two photos needed. Details John, G4RCG on 01924 362144 or John, G0EVT 01924 825443.

THE THREE COUNTIES Radio Rally, Malvern Worcs. Doors open 10.30am (entrance by the brown gate only). £1 admission, free for children. Free car parking. Includes trade stands and bring and buy sale. Nearby attractions include a craft fair and flea market. Details & bookings Eddie, G4PQZ on 01905 773181.

29 SEPTEMBER-1 OCTOBER

WACRAL 1995 CONFERENCE - Highbury Hotel, Weston-Super-Mare. On air activities with G3NJB. Cost will be £70 including meals and accommodation. Details G4EZU, 124 Darnley Road, Gravesend, DA11 0SN.

AMATEUR RADIO CARAVAN & CAMPING CLUB Rally - Thurlaston, Leics. (AGM). Details G4LWA QTHR, tel 01494 531755.

1 OCTOBER

BLACKWOOD & DISTRICT ARS Rally - Community College, Oakdale, near Blackwood, Gwent. Doors open at 10.30am. Features traders, bring and buy, raffles and talk-in on S22. Details Norman, GW0MAW on 01495 227550.

THE GREAT LUMLEY Amateur Radio Rally - Held at the community centre in Great Lumley, near Chester-Le-Street, Co Durham. Doors open at 11.00am, 10.30am for the disabled. Features a wide range of trade stands, bring and buy stand and refreshments. Entrance fee £1 which includes programme. Free admission for children accompanied by an adult. Details G1JQT on 0207 237927.

8 OCTOBER

COMPUTERCATIONS 95 Computer & Radio Rally - Hillhead Campsite, Dartmouth Road, Brixham, Devon. With overnight camping, car boot sale, trade stands, professional flight simulator demonstration, bring and buy, refreshments, unlimited free parking and talk-in on S22. Special event station GB2CPU. Morse test available on the day but please send registrations by 3 August. Details 01803 522216.

KIDDERMINSTER & DARS Rally - Details G8JTL on 01384 894019.

13-15 OCTOBER

AR CARAVAN & CAMPING CLUB Rally - Elkington, Nr Welford, Northants. Details G4LWA QTHR, tel 01494 531755.

20/21 OCTOBER

LEICESTER AR Exhibition - Details Frank, G4PDZ on 0116 287 1086.

29 OCTOBER

HORNSEA ARC Rally - Details Duncan, G3TLI on 01964 532588.

4 / 5 NOVEMBER

NORTH WALES Radio/Computer Rally - Details Barry Mee, GW7EXH on 01745 591704.

5 NOVEMBER

NORTH DEVON RADIO Rally - Details from G8MXI on 01409 241202.

12 NOVEMBER

THE GREAT NORTHERN Hamfest - Details Ernie, G4LUE on 01386 748958.

MARS-STOCKLAND Radio/Computer Rally - Details Norman, G8BHE on 0121 422 9787.

19 NOVEMBER

BISHOP AUCKLAND RAC Rally - Details Mike Shield 01388 766264.

26 NOVEMBER

BRIDGEND & DARC Radio Rally - Details Mike, GW7NIS on 01656 864579.

WEST MANCHESTER Radio Club's 'Winter' Rally - Details Albert, G7RZW 01204 62980.

3 DECEMBER

GLASGOW RADIO, ELECTRONICS & COMPUTER Rally - Details John, GM0OPS on 0141 638 7670.

THAMES VALLEY Electronics Rally - Details 01494 450504.

VERULAM ARC Rally - Details Ian, G0PAU on 01923 222284.

21 JANUARY

OLDHAM AR CLUB MOBILE Rally - Details 0161 652 4164.

4 FEBRUARY

LANCASTRIAN Rally - Details Sue Griffin on 01374 290088.

SOUTH ESSEX ARS Radio Rally - Details David, G4UVJ on 01268 697978.

11 FEBRUARY

CAMBRIDGE & DARC - Details John, G0GKP on 01954 200072.

17 MARCH

TIVERTON SOUTH RADIO's 10th Rally - Details 5 Butter Leigh Drive, Tiverton, Devon EX16 4PN.

12 MAY

DRAYTON MANOR Radio & Computer Rally - Details Norman, G8BHE 0121 422 9787 (evenings).

GB CALLS

The list below shows special event stations licensed for operation during this month. The information was taken from the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

AUGUST

1	GB0CWR	Civilian Wireless Reserve
	GB0VJ	Royal Sigs Ar Soc
	GB2CDX	Coastal Defence X
	GB2OG	Oxfordshire Guides
	GB4VJD	Victory Japan Day
2	GB2RAF	Royal Air Force
4	GB0CNF	Campatrol '95
5	GB0VIC	Victory
	GB100NT	National Trust Centenary Year
6	GB2ASM	Aerospace Museum
7	GB4ECC	Exercise Common Cause
8	GB0NPD	National Play Day
9	GB2MRI	Marconi Rathlin Island
11	GB0LOS	Liberation of Singapore
	GR0VJ	VJ Day
12	GB0BLC	Berkhamsted Lions Club
	GB100NT	National Trust Centenary Year
	GB2AMC	Ashington Methodist Church
	GB2HAC	Herts Army Cadets
	GB2TS	Tollerton Show
	GB2VJ	Victory Japan
	GB4MNR	Merchant Navy Remembered
	GB5SF	Special Forces
	GB50VJ	Victory Over Japan
13	GB2CAM	Cosford Aerospace Museum
14	GB2BPF	British Pacific Fleet
15	GB2EV	Europe Victory
16	GB2TAM	Tangmere Air Museum
	GB4EC	Eden Camp Museum Parade
17	GB1YAM	Yamaha
	GB4YAM	Yamaha
18	GB8VJ	Victory Japan
19	GB0LCS	Lairg Crofter Show
	GB0SSC	Somerford Centenary Show
	GB2CPC	Castell Penrhyn Castle
	GB2SAC	Somerford Agricultral Centenary
	GB5GB	5GB Original C/S Daventry RT
	GB5XX	Daventry Radio Station Own C/S
20	GB100NT	National Trust Centenary Year
	GB50VJ	Victory Over Japan
21	GB0GCB	Ghyll Church Barnoldswick
24	GB2SGS	Suffolk Guides
	GB5FI	Flat Holm Island
25	GB2LBN	Lighthouse Barns Ness
	GB2LO	Lighthouse Orkney
	GB2LS	Lighthouse Shetland
	GB2YAM	Yorkshire Air Museum
26	GB1ECR	East Coast Rally
	GB100NT	National Trust Centenary Year
	GB2LT	Lighthouse Turnberry
	GB2LTH	Lighthouse Tiumpan head
	GB4DAR	Derwentside Amateur Radio
	GB5EPN	Ellesmere Port & Neston
27	GB2NJA	Prefix to Club's Own Callsign
	GB2QE	Queen Elizabeth II
28	GB6RG	Rotary Gala

SILENT KEYS

WE REGRET to record the passing of the following radio amateurs:

G0FNZ	Mr J Hall	15.05.95
GWOEKA	Mr J Bishop	03.05.95
G3CES	Mr L Beeby	10.05.95
GW3JOL	Mr V W Cole	25.04.95
G3OBB	Mr K J Rhodes	
G3QI	Mr R Bean	04.05.95
GI4BBV	Mr R H Willis	26.05.95
G4DIM	Mr W B Taunton	April 1995
G4FQQ	Mr R E Deane	08.05.95
G4HWG	Mr D Swift	14.05.95
G4KNE	Rev N J Eva	April 1995
G4OKL	Mr A M Smith	25.05.95
GI4MKC	Mr J Johnston	29.04.95
G4PHI	Mr R Hattersley	
G4PSY	Mr T Langley	02.05.95
G6SU	Mr E A Parsons	21.04.95
G8BNO	Mr C R Street	03.05.95
RS94542	Mr J C Davis	Jan 1995

RSGB 1995 International HF Convention

SYNOPSIS OF LECTURES

The DXCC Program by Chuck Hutchinson, K8CH

ARRL Membership Services Manager, Chuck Hutchinson, will show a series of 35mm slides that will take us on a tour of ARRL HQ and W1AW. He will also share the basics of today's DXCC program and explain how the DXCC rules are made and changed. Are you confused by the DX Advisory Committee and the Awards Committee? Who are they? How do they relate to one another? To whom do they answer. Will there be field checking of DXCC applications outside the USA? Chuck will explain all that and tell us what's on the agenda these days and share with us plans for the future of DXCC. There will be time for questions and Chuck says he will try to answer them all.

Amateur Radio on Internet by Mike Richards, G4WNC

Although most people have heard of Internet, few understand its workings and potential. Mike Richards gives an overview of the Internet from its origins through to its present day form. Perhaps, more importantly, the lecture will illustrate how all radio amateurs can use the Internet to increase their enjoyment of all aspects of the hobby. The lecture will conclude with a run down on how to link with the Internet, including tips on the best software and how to choose your information provider. As a further bonus, Internet FactPacks will be available to all attendees.

Top Band Antennas for Mere Mortals by Neil Smith, G4DBN

Neil Smith relates his experiences in getting the best DX performance from low budget 160 m antennas. His talk is a mixture of science and engineering mixed with anecdotal solutions. Included will be modelling, loading, feed methods, using balloons, making your own hydrogen; with experimental results from the amazing EWEs and snakes, plus the Minooka special and variants, Beverage and magloop receiving antennas. In early 1995 G4DBN worked over 100 countries on 160 metres in 8 weeks using small but practical antennas that really work.

Cluster Forum by John Clayton, G4PDQ

Packet Clusters; the modern equivalent of the old telephone and VHF FM DX alerting nets where dedicated DX operators combined their skills to help each other get that rear DX station. You either love Clusters or hate them, but whatever your feelings the Cluster Forum is the place to express them. This is your opportunity to ask all those questions that you have been holding back from your local SysOp. Most of the UK SysOps will be at the Forum and there will be the opportunity to find out how to connect to your local Cluster as a user or fine tune some of the more advanced features of the network. Find out about the latest software and everything you need to know to get the best out of the system.

Computers in the Shack by Don Field, G3XTT

Don Field, a leading expert in Information Technology will talk about hardware and software selection, software applications and will also look into the future. This talk is a must if you are thinking of buying hardware or amateur radio software or upgrading.

Islands on the Air - the fastest growing DX award programme by Roger Balister, G3KMA

If you are a casual island hunter or a DXer looking for a new challenge this talk will interest you. Find out how to enter the IOTA awards programme and learn how IOTA has become one of the top awards programmes in the World today; plus the answers to all your other questions.

Sunspots and Propagation by Martin Atherton, G3ZAY

Martin Atherton will describe how sunspots affect HF propagation. He will explain what they are and why they run in an 11 year cycle. He will tell you how to measure them and explain how to know when a new cycle has started. They mysteries of the 'A' and 'K' indexes will also be unravelled so that you can always get the most from your HF operating.

Bhutan - 40 Years of Amateur Radio, by Jim Smith, VK9NS

The HF Committee is delighted that one of the best known DXpedition operators in the world is able to talk at the 1995 HF Convention. Jim has activated a great many rare countries, especially around the Pacific, but is probably best known at present for his work in getting the Kingdom of Bhutan (A5) back on the world amateur radio map. The A51MOC operation in 1994 was an important step forward. By 9/10 September, the dates of this year's HF Convention, amateur radio activity in Bhutan may have moved further forward. Watch this space and be at the Convention to see Jim's unique and refreshing presentation.

Activating Islands; the DOs and DON'Ts by a number of Island activators

Obtaining permission to land and permissions to operate can be two quite separate issues. Experienced Island activators will describe their experiences including operating techniques, taking suitable equipment and personal safety. An equipment checklist is essential and will be discussed. If you are thinking of activating an Island this presentation is a must.

HF Data Modes by Mike Kerry, G4BMK

Mike Kerry has been involved with HF Data Comms for 12 years including writing and marketing software for amateur radio use. This talk will cover the salient features of the main HF Data Modes of RTTY, AMTOR, PACTOR / PACTOR-II, and Clover. Hardware and software requirements will be discussed and where possible illustrated. The world of HF Data Communication has seen many changes over the past few years. This talk will appeal to everyone interested from the beginner to seasoned data user.

The Conway Reef DXpedition by Mats Persson, SM7PKK

Mats Persson, the team co-ordinator, will talk about the adventures of this DXpedition. Conway Reef was selected as a new DXpedition location after the team saw their plans for T31 'go down the drain' before it had even started. They only had 2 months to reorganise the entire DXpedition. Conway reef is about 200 by 50 metres in size, lying about 300 miles from the closest island. The team turned over two dinghies landing on the reef, losing a lot of equipment as well as causing risks to the operators. Despite being at the bottom of the sunspot cycle and despite many hardships, after a delay of 2 days, the group managed to make some 30,000 QSOs in 7 days.

Low Band Antennas - My Way by Ron Stone, GW3YDX

Ron Stone gained his 5 band DXCC (no 587) from a suburban site in Essex in 1977. The move to Wales provided more real estate and an opportunity to work over 250 countries on 160 metres. This presentation will cover low band antennas, verticals, wires and beams, literally from the ground up. It includes a discussion of the current antenna system at GW3YDX and of the antennas that are currently available commercially.

The Islands on the Air Awards Programme, a report by Roger Balister, G3KMA

Roger Balister, G3KMA, the Director of the IOTA awards programme will describe the events of the most successful year in IOTA's 30 year history. This will be followed by a short presentation and demonstration on the new computerised application system that now puts IOTA into the forefront of awards administration. The session finishes with a question and answer session which is your chance to raise any issues about the programme. These and other talks are scheduled for the 1995 HF Convention

Equipment Reviews by Chris Lorek, G4HCL

Chris Lorek regularly reviews the latest amateur radio equipment in the *Ham Radio Today* magazine. He has a wealth of experience in the field and will not only describe the tests he carries out but will guide you towards the sort of features that you will need in a transceiver. Chris has multi-page hand outs for those attending and a complete list of the reviews that he has carried out, plus copies of some of the very latest reviews.

HF Contesting by Chris Burbanks, G3SJJ (Chairman RSGB HF Contests Committee)

A guide to maximising enjoyment and success for newcomers and established entrants wishing to climb the ladder in this exciting area of amateur radio. Alternative methods of gaining experience, including the concepts of guest operating, restricted sections, and part-time entry will be explained, as well as the differences between single operator and group events. Contesting consists of three important aspects, pre-event work, including research and preparation, the contest period itself and post-event administration; each of these will be discussed in detail. Computer logging and the current software available will also be discussed.

Other planned talks include: The Camel Trophy by Richard Diamond, G4CVI, Tower Safety, Novices Forum, Contesting in the Caribbean and Operating Techniques by FOC members.

TURN TO PAGE 20 FOR MORE DETAILS ON THE HF CONVENTION

The LAST WORD

LONG TERM MEMBERSHIP

The recent correspondence in *The Last Word* (May and July 95) has brought forth an interesting post-bag from a number of long-time members:

. . . I would like to be included in the 'over 60 years membership clan', having joined the RSGB on 17 January 1934 as BRS 1341. Later in 1936 I received the AA call 2AYP, becoming G3MA on 1 June 1938. Perhaps a listing and congratulatory column in *RadCom* for the 'over 60 years' could be envisaged, as many must have exceeded in subs the amount required for life membership, if this has not already been obtained.

E A (Pat) Perkins, G3MA

[Pat and many other members will be pleased to see the good news about subscriptions for members of long standing on page 9! - Ed]

. . . I was issued with the number BRS 186 in 1926. I have held this callsign [G6GL] continuously since 1930. However, I am bound to admit that I cannot claim unbroken membership of the RSGB, as during WWII and for a few years thereafter my membership lapsed.

Russell Lee, G6GL

[Arrangements are being made for members of long-standing to 'buy' back missing years in order to qualify for periods of continuous membership - Ed]

. . . My late husband G6NZ had a licence for 73 years and was a member of the RSGB for 69 years. He could not join previously as he was an impecunious student and had to wait until he earned a salary before he could afford his subscription. I took over Leon's callsign in 1994, so the membership of G6NZ has been going for 70 years now. As a matter of interest he was a very early 'pirate' in 1919!

Margaret Alice Newnham, G6NZ (ex- G8ODO and G4HSV)

COMPUTER RALLIES?

As an active radio amateur, who has been to several amateur radio rallies so far this year, I would like to ask "where is the *amateur radio* interest at these events?" Increasingly I find that these rallies are glorified computer and software shows, together with all the accessories that accompany that hobby, eg floppy disks, CD-ROMs, tape drives, printers, displays, modems etc. Whilst I understand that the modern computer can be an invaluable aid in the radio amateur's shack for such diverse things as logging, packet, RTTY, SSTV and satellite tracking, why does this mean that the traditional radio rally has now become synonymous with the computer and all its accessories?

Whilst I admit to using a computer to some extent when communicating with other amateurs, I do not feel that it has become so important as to become the only reason to go to an amateur radio rally or exhibition.

Or is this just another case of the tail wagging the donkey?

Terry Thirlwell, G8AHS / G0VFW

[At Friedrichshafen we understand that the amateur radio and computer traders were in separate areas. Perhaps organisers of UK events could consider this idea? - Ed]

TECHNICAL REQUIREMENT FOR MORSE TESTS?

If there really is a genuine technical requirement for a Morse test then there is no need to ask the opinion of amateurs about it. Governments should *insist* on the test if it is needed to regulate the radio spectrum properly. If, as many of us suspect, there is no technical reason for the Morse test, then the RA should be honest and get rid of it. Once again the opinion of amateurs is of no value.

Thus we are left with the situation that the only reason the Morse test survives is because the amateurs think it is a good thing. Having technical hobbyists driven by an historic standard is bizarre. If we think that HF operation requires extra care then let's add that into the RAE - perhaps a practical operating test should be put in the exam?

Removing the Morse requirement isn't about making the test easier, it is about bringing the hobby into the late 20th century, rather than leaving it in the 1940s.

Steve Townsley, G7SPN

COMFORT KEYING

It is possible to achieve the comfort G0UUC describes (*The Last Word*, July 95) without the need for wood and hardware. Simply turn the key through 90°, so that the arm of the key and the hand are at right angles. Keying is then done with a slight rocking of the wrists and forearm, the hand and forearm being at the angle G0UUC so wisely recommends.

D Evans, G4YND

THE G5RV CRYSTAL

I read with interest the letter by F A Jefferies, G8PX (*The Last Word*, July), and would like to congratulate him and other existing RSGB members of long standing. I wonder how many present members remember the 'artificial aerial' licences? These were issued to permit 'new boys' to build transmitters using input powers of up to 10W. They could only be connected to what we now know as a dummy load, in order to conduct experiments and thus gain invaluable experience in the construction and operation of transmitting equipment. Later one could apply for a 'full' (radiating) licence by writing a letter to the Post Master General containing a description of experimental work carried out, a resumé of the results obtained, and reasons why an up-grade to a full licence was required in order to be able to progress with the experimental work.

During 1927 and 1928 my dear old friend Jack Hum, then 2AJI (later G5UM), and I were investigating Zincite, Borhite and Galena oscillating crystals. The idea was to introduce a third electrode (an extra 'cats-whisker') suitably biased by a voltage positive or negative with respect to the 'base' of the crystal, the metal cup in which it was mounted. This experimental work gained us our 'full' licences. Alas, we were unable to achieve world-shattering results - and we were too ignorant of basic physics and electronics to be able to invent the transistor some 20 years before it was discovered in the USA! Nevertheless, a resume of our joint experimental work in a letter to the PMG in 1929 resulted in our 'upgrading' to radiating licence status - Jack to G5UM, me to G5RV.

Louis Varney, G5RV

[It was exactly 50 years ago this month that the RSGB Bulletin *published a form for pre-war artificial aerial licensees to apply for full callsigns - Ed]*

EPISTLE FROM ROBERT TO THE ANTI-CONTESTERS

Once upon a time there was a man who did complain bitterly about a plague of contests. Then, lo, wondrous to behold, there came a summer weekend without a single contest! "Ah, heaven at last!", he thought, in all innocence. But, alas, he was mistaken. For verily all the multitude of deprived contestants did descend on the bands in their thousands, to chat of this and that and of Auntie Susie's hernia, as was their inalienable right, just like any other licensee. And ten seconds begat ten minutes, and there was chaos in the land. And the man who complained did perforce switch off, and sigh: "Thank goodness there will be a contest next weekend".

A Grim(m) possibility, or just a fairy tale? Think about it.

Robert Taylor, G4KTI

Please note that the views expressed in *The Last Word* are not necessarily those of the RSGB. We reserve the right to edit letters for publication. All letters are acknowledged and may be passed to the relevant department or committee.

SOMETHING FOR THE WEEKEND?

The letter regarding the support of aerials using gas-filled balloons (*The Last Word*, July 95) brought quite a smile to my face and a memory from the past. I used to be a member of the Durham City Radio Society group which entered NFD. It was always a serious entry.

One year we decided to use helium and a 6ft met balloon to support an 80m dipole. However, some locals thought we had erected the balloon for their target practice with air rifles and just prior to the contest shot it down. If caught by the irate members of the club there would have been two little crosses in the middle of the NFD site. We only had the one balloon and no other way of supporting the 80m aerial. How do you find a replacement balloon on a Saturday with a couple of hours to go?

Well, someone mentioned an easily-purchased alternative made by the London Rubber Company. So we visited the local barbers. This little packet contained three 'balloons' which were inflated to an enormous size - quite a sight. 80m aerial was airborne and working.

By the way we won the single station part of the contest that year.

Johnny Melvin, G3LIV

NOVICES AND SELF-ESTEEM

Why are Novice licence holders "hated and vilified?" asks James Neale, G7OJZ (*The Last Word*, June 95). Yes, I can offer the "rational explanation" which he seeks. British society has changed from having a co-operative to a competitive structure. This change has been greatest over the last 15 years or so, but to make the point, compare present-day attitudes to the 'wartime spirit'.

It is harder for the ordinary person to gain what is recognised by psychologists as that all important self-esteem. It could come from a feeling of being part of, and contributing to, a successful society. In our case, this is increasingly unlikely.

Instead we seem to have degenerated into looking for a quick-pay-off, 'cheap' means of temporarily boosting self-esteem by continually finding that others are inferior to ourselves - I'm a Class A, so I'm better than a Class B, who in turn gets his own back by criticising Novices, who in turn can compare themselves with SWLs.

Although this brings short term 'feel-good', it does nothing to provide a long-term feeling that participating in a mutually-shared hobby is fulfilling. Class A, B, Novice and SWL hobbyists are all enjoying and contributing in their own ways and it is sad that this isn't recognised and encouraged.

Dr Godfrey Manning, G4GLM

TOO MUCH OF A GOOD THING

Your review of the Helikite (*RadCom*, July 95) reminds me of an amusing incident which happened many years ago, so that now it can be told.

A good friend of mine, long since a silent key, was determined to achieve the ultimate in Top Band 'sky hooks'. He took his car to Mablethorpe in Lincolnshire and parked as near the sea as possible, using the briny as an earth and doubtless the best ground-plane possible.

For the aerial he launched a kite and fed out as much wire as it would hold: even Marconi would have congratulated him on such a wonderful set-up. The test came when my friend made his first CQ call, for astonished replies came from far and wide - all giving excellent reports and many queries as to how he was managing to transmit such a wonderful signal.

Within a very short time my friend was rather shaken by a very annoyed voice declaring "This is Humber Radio. Close down immediately. Your signals are so over-powerful and are blotting out all the ships. You must be using far more power than the permitted 10W on Top Band".

My friend replied rather laconically, "Message received and of course I will close down as you direct, but I am only using 9.8W".

"That is absolutely ridiculous" said the Humber Radio officer, "with your tremendous signal you must be using well over 100W. I shall report you to the chief GPO Radio Inspector in your city for using power far above the limit".

Then came the final punchline; "Very good. I will await your report with interest, as *I am* the Chief GPO Radio Inspector there, and I repeat once again that I am only using 9.8W, measured on certified GPO equipment". As *Punch* used to write, "collapse of fat party".

Douglas Byrne, G3KPO

RSGB – at Your Service

SOME OF THE RSGB'S TEAM OF VOLUNTEER EXPERTS — AVAILABLE TO HELP YOU

Zonal Council members

Zone A (North of England): Peter Sheppard, G4EJP, 89 St Catherines Drive, Leconfield, Beverley, North Humberside HU17 7NY. Tel: 01964 550397.

Zone B (Midlands): David Whalley, G4EIX, 1 Lees Farm Drive, Madeley, Telford, Shropshire TF7 5SU. Tel: 01952 588878.

Zone C (SE England and East Anglia): Neil Lasher, G6HIU, 8 Highwood Grove, Mill Hill, London NW7 3LY. Tel: 0181 201 1578.

Zone D (SW England): Julian Gannaway, G3YGF, Dean Hill Barn, East Dean, Salisbury, Wiltshire SP5 1HJ. Tel: 01794 340895.

Zone E (Wales): E Paul Essery, GW3KFE, 287 Heol-y-Coleg, Vaynor, Newtown, Powys SY16 1AR. Tel: 01686 628958.

Zone F (Northern Ireland): Ian Kyle, GI8AYZ, 1 Portulla Drive, Pond Park Road, Lisburn, Co Antrim BT28 3JS. Tel: 01846 665034.

Zone G (Scotland): Post vacant.
In locum until 31/12/95 - Ian Suart, GM4AUP, 37 Meldrum Mains, Glenmavis, Airdrie, Lanarkshire ML6 0QR. Tel: 01236 765937.

For general advice and details on local clubs, or if you don't know who to contact:

Your **RSGB Liaison Officer** see January and February *At Your Service.*

Specialists

Antenna Planning: Booklet free to members from RSGB HQ. Planning application refused – RSGB Planning Panel, via RSGB HQ. Planning Advisory Committee Chairman – Geoff Bond, G4GJB, QTHR.

Audio Visual Library: Coordinator – David Simmonds, G3JKB, QTHR.

Awards: For contest awards, refer to the appropriate contest committee. For other awards, enquiries and applications go to the: HF Awards Manager – Fred Handscombe, G4BWP; IOTA (Islands on the Air) Awards Manager – Roger Ballister, G3KMA or VHF (and Microwave) Awards Manager – Ian L Cornes, G4OUT. Trophies Manager – David Simmonds, G3JKB.

Band Plans and operating practices: See the *RSGB Call Book* or April 95 *RadCom* for latest bandplans. For policy, contact the appropriate spectrum manager or committee chairman: HF Committee Chairman – David Evans, G3OUF, QTHR; VHF Committee Chairman – Peter Burden, G3UBX, QTHR; Microwave Committee Chairman – Steve Davies, G4KNZ, QTHR; HF Manager – Post vacant; VHF Manager – Dave Butler, G4ASR; Microwave Manager – Mike Dixon, G3PFR.

Beacons: HF Beacon Coordinator – Prof Martin Harrison, G3USF, QTHR. VHF Beacon Coordinator – John Wilson, G3UUT, QTHR. Microwave Beacon Coordinator – Graham Murchie, G4FSG, QTHR.

RSGB Contests: First contact the appropriate contest adjudicator (see the contest rules). For policy, contact the respective Committee Chairman: HF Contest Committee – Chris Burbanks, G3SJJ, QTHR; VHF Contest Committee – David Johnson, G4DHF, QTHR; ARDF (direction finding) Committee – Post vacant.

EMC: Advice on solving breakthrough and other electromagnetic compatibility matters: First contact your local EMC Co-ordinators - see April *At Your Service.* Committee Chairman – Robin Page-Jones, G3JWI, QTHR.

Emergency: Emergency Communications Officer – Greg Reilly-Cooper, G0MAM, PO Box 98, Northwich, Cheshire, CW9 5SZ.

Exhibition & Rally Committee: Chairman – Norman Miller, G3MVV, QTHR.

History: Society Historian – George Jessop, G6JP, 32 North View, Eastcote, Pinner, Middx, HA5 1PE.

IEE: Liaison Officer – Peter Saul, G8EUX, QTHR.

Licensing: LAC Chairman – Julian Gannaway, G3YGF, see Zone D (left).

Membership Liaison: MLC Chairman – Peter Sheppard, G4EJP, see Zone A (left).

Morse: Morse Practice Transmissions Coordinator – David Pratt, G4DMP, 11 Moorleigh Close, Kippax, Leeds L525 7PB. Chief Morse Test Examiner – Roy Clayton, G4SSH, QTHR.

Packet Radio: Datacomms Committee Chairman – Tom Lilley, G1YAA, QTHR.

President: Clive Trotman, GW4YKL, QTHR.

Propagation: Propagation Studies Committee Chairman – Charlie Newton, G2FKZ, QTHR.

QSL Bureau: Outgoing cards – PO Box 1773, Potters Bar, Herts, EN6 3EP. Incoming cards – your QSL sub-manager (see *RSGB Call Book* or July/Aug *RadCom*, for a list). QSL Bureau Liaison Officer – John Hall, G3KVA.

Repeaters: Repeater Management Group Chairman – Geoff Dover, G4AFJ, QTHR.

Spectrum Abuse: Packet – Via Datacomms Committee. Repeaters – Via the Repeater Management group. Other – Via Licensing Advisory Committee. Intruder Watch Coordinator – Chris Cummings, G4BOH.

Technical & Publications: Committee Chairman – Dick Biddulph, G8DPS, QTHR.

Training and Education: Committee Chairman – John Case, GW4HWR, QTHR. Radio Amateur's Examination – George Benbow, G3HB, QTHR. Novice RAE – Hilary Claytonsmith, G4JKS, QTHR. Project YEAR Coordinator – Phil Mayer, G0KKL, QTHR.

The Society has a large number of volunteer experts available to help and advise members on a wide variety of subjects. Each month we will be focusing on a different section of the volunteer workforce, whilst still giving brief details of the main office-holders. See also the Information Directory section of the *RSGB Call Book.*

RSGB QSL Bureau Sub-Managers

Part 2: G4FAA - Novice

Callsign Series	Sub-Manager
G4FAA-FZZ	Mrs A Burchmore, G0ARQ, 49 School Lane, Horton Kinby, Dartford, Kent DA4 9DQ
G4GAA-GZZ	Mr J C Terry, G4GEU, 126 Dawberry Fields Road, Kings Heath, Birmingham B14 6NZ
G4HAA-HZZ	Mr D Roebuck, G0LJM,c/o 92 Owlet Rd, Windhill, Shipley BD18 2LT
G4IAA-IZZ	Mr C J Webb, G4JFF, 68 Higgs Field Crescent, Cradley Heath, Warley, West Midlands B64 6RB
G4JAA-JZZ	Mr J A Towle, G4PJZ, 63 Digby Avenue, Mapperly NG3 6DS
G4KAA-KZZ	Mr K Draycott, G3UQT, 28 Ladywood Road, Kirk Hallam, Ilkeston DE7 4NE
G4LAA-LZZ	Mr C Lennox, G4LXU, Blazefield House Farm, Blazefield, Pateley Bridge, Harrogate, N Yorks HG3 5DR
G4MAA-MZZ	Mrs C Wilding, G4SQP, 92 Ravenhill Drive, Codsall, Wolverhampton WV8 1BW
G4NAA-NZZ	Mr M Musgrave, G4NVT, 49 Vowler Road, Langdon Hills, Basildon, Essex SS16 6AQ
G4OAA-OZZ	Mr W Dykes, G1UKE, 9 Severnmead, Hemel Hempstead, Herts HP2 6DX
G4PAA-PZZ	Mr I Humphrey, G0SWY, 4 Bluebell Road, Bassett, Southampton SO2 3LQ
G4RAA-RZZ	Mr D Buckley, G3VLX, 'Little Oaks', Park Road, Marden, Tonbridge, Kent TN12 9LG
G4SAA-SZZ	Mr D Lavis, G0DMT, 48 Gilda Cresent, Polegate, East Sussex BN26 6AW
G4TAA-TZZ	Mr J Porter, G3YZR, 94 Oaken Grove, Haxby, York YO3 8QZ
G4UAA-UZZ	As for G4SAA-SZZ
G4VAA-VZZ	Mr R C Powell, G4VAA, 11 North Park, Fakenham NR21 9RG
G4WAA-WZZ	Mr L Gaunt, G4MLV, 31 Moat Hill, Birstall, Batley, West Yorkshire WF17 0DX
G4XAA-XZZ	Mr S R Tyler, G4UDZ, 2 John Court, Hoddesdon EN11 9LZ
G4YAA-YZZ	Mr D J Newbury, G0ENR, 8 Mayfield Road, Pershore, Worcs WR10 1NW
G4ZAA-ZZZ	Mr J Densem, G4KJV, 'Cotswold', Startley, Chippenham, Wilts SN15 5HG
G5 series and reciprocals	Mr R Pasquet, G4RAA, 64 Bricks Bury Hill, Upper Hale, Farnham, Surrey GU9 0LY
G6AA-ZZ	Mr F Harris, G4IEY, 4 Merestones Drive, The Park, Cheltenham, Glos GL50 2SS
G6AAA-ZZZ	Mr C R J Healey, G0NCS, 22 Stirling Road, Plymouth, Devon PL5 1PD
G7AAA-ZZZ	Mr D J Hudson, G6OVO, 62 Derron Avenue, South Yardley, Birmingham B26 1LA
G8AA - ZZ	Mr F Harris, G4IEY, 4 Merestones Drive, The Park, Cheltenham, Glos GL50 2SS
G8AAA-ZZZ	Mr J F Purvess, G0FWP, 14 Hunger Hills Drive, Horsforth, Leeds LS18 5JU
GBxAAA-MZZ	Mr G Whaling, G0PPR, 32 The Croft, Little Snoring, Fakenham, Norfolk NR21 0JS
GBxNAA-ZZZ	Mr A Devereaux, G0TTZ, 39 Lower Green Road, Rusthall, Tonbridge Wells, Kent TN4 8TW
GD series	Mr G W Ripley, GD3AHV, Corlea Bungalow, Ronague Road, Ballasalla, Isle of Man
GI series A	Mr E Barr, GI7FFF, 'Ed-Mar', 1 Onslow Drive, Bangor, Co Down BT19 7HQ
GJ series	Mr R Allenet, GJ3XZE, Les Sablons, Le Bourg, St Clements, Jersey JY9 9LE
GM0AAA-LZZ	Mr G W Spiers, GM0AGN, 43 Sheuchan View, Stranraer, Dumfries & Galloway DG9 7TA
GM0MAA-ZZZ	Mr J E Clough, GM0MDD, 84a Main Road, Fairlie KA29 0AD
GM1,4,6,7,8	Mr E Bell, GM4LKJ, 21 St Andrews Crescent, Dumbarton G82 3ER
GM2AAA-3ZZZ	Mr J Johnston, GM3LYY, 'Dolphins', 2c Montgomerie Drive, Fairlie, Largs KA29 0DY
GU series	Mr S T Henry, GU4GNS, 'The Hermitage', L'Ancresse, Vale, Guernsey, Channel Islands
GW series	Mr K Hudspeth, GW0ARK, 67 Bloomfield Road, Blackwood, Gwent NP2 1LX
RS	Mr D Borne, G4CYW, 'Roughways', Chub Tor, Yelverton, Devon PL20 6HY
Novice	Mr M Shread, GM6TAN, 15 Hardie Court, Aberchirder, Huntly, Aberdeenshire AB54 5TG

Amendments and additions to list of RSGB QSL Bureau Sub-Managers Part 1, published in the July 1995 *Radio Communication.*

G0GAA-GZZ	Mr N P Roberts, G4KZZ, 13 Rosemoor Cl, Hunmanby, N Yorks YO14 0NB
G0MAA-MZZ	Mr H C Foster, G4EZS, 23 Ghyllroyd Drive, Birkenshaw, Bradford, W Yorks BD11 2ET
G0TAA-TZZ	Mr J Taylor, G0RFN, 121 Garesfield Gardens, Burnopfield NE16 6LQ
G0WAA-WZZ	Mrs K Catlow, G4ZEP, Ballingroyd Farm, Crossley New Road, Cross Stone, Todmorden, Lancs OL16 8RP
G3LAA-NZZ	Mr T Bartlett, G3ITB, Yew Tree Farm, 19 The Street, Hardley, Norwich NR14 6BY
G4AAA-AZZ	Mr D Roebuck, G0LJM, c/o 92 Owlet Road, Windhill, Shipley BD18 2LT

CLASSIFIED ADVERTISEMENTS

Classified advertisements 55p per word (VAT incl) minimum 14 words (£7.70). Please write clearly. No responsibility accepted for errors. Latest date for acceptance — 5 weeks before 1st of issue month.

All classified advertisements MUST be prepaid.

NB: CHEQUES SHOULD BE MADE PAYABLE TO RSGB.

Copy and remittance to: **Victor Brand Associates, 'West Barn', Low Common, Bunwell, Norwich, Norfolk, NR16 1SY.**

NB. Members' Ads must be sent to "Members' Ads," RSGB Hq.

FOR SALE

G3LLL'S SUMMER SALE Closed for two weeks July/August so must cut prices to boost sales. FT990, FT840, FT900, IC736, IC738, FRG100 etc. Call in with cash/cheque to haggle (no quotes on phone we don't want to upset competitors). Huge S.H. stock. *But check we are open! First!* Holdings Amateur Electronics, 45 Johnston St., Blackburn BB2 1EF. 01254 59595. Usually open Tues, Wed, Fri & Sat. lunch 12-1.30pm.

G4TJB QSL Cards printed to your specification, send large SAE for samples and full product list. Unit 6, Worle Industrial Centre, Coker Road, Worle, Weston-super-Mare, BS22 0BX. Tel/Fax: (01934) 512757.

"RAYNET" YELLOW REFLECTIVE TABARDS with "RAYNET". Medium £11.00, Large £11.50, XLarge £12.00. "RAYNET CONTROLLER" 50p extra. EPSON PX4+ lap top computer, built-in printer, charger Eprom for packet £46.50 inc. pp. Nonreversible battery connectors line/panel mounting (10 pairs/pack) £6.50. Mike Watson G8CPH, Ipswich (01473) 831448.

MOSLEY ANTENNAE — All the famous British Manufactured Antennae, direct from us including spares/replacements. Mustang, Elan, TA-33Jnr etc. Full details shown in our Handbook, price £1.25 refunded upon purchase of Antennae, Mosley Electronics, 196 Norwich Road, New Costessey, Norwich NR5 0EX (Administrative address only).

ANTI-T.V.I. CUSTOM BUILT AERIALS, Trap-dipoles, multibanders, traps, baluns, parts. Reconditioned TX/RX's, Linears ATU's. Data 38p SAE, Aerial Guide £1.50. G2DYM, Uplowman, Devon EX16 7PH. Tel: 01398 361215 any time.

QSL CARDS. Gloss or tinted cards. SAE for samples to Twrog Press, Penybont, Gellilydan, Blaenau Ffestiniog, Gwynedd LL41 4EP.

ALUMINIUM TUBE. Heavy-duty (scaffold) tube approx. dimensions 20' long, 2" dia, 11/64" (4.5mm) wall thickness. 20' and 10' lengths available @ £1.80 + VAT per ft. C.W.O. Rusper Hire (Crawley) 01293 87 1621 office hours only.

QSL CARDS — low cost, quick delivery, superior designs, quality guaranteed, personal designs our speciality. L.S.A.E. for samples: The Standfast Press, 5 South Drive, Inskip, Preston PR4 0UT.

AMIDON TOROIDS, SAE for price list. "Choke Baluns" Models for G5RV £28.25, Dipole £36.54, Yagi to fit 1.5" or 2" booms £37.15, VHF model, covers 30-250 MHz £18.00, all prices inc P&P or send SAE for full details. Ferromagnetics, P.O. Box 577, Mold, Clwyd, N. Wales CH7 1AH.

DIY Z MATCH ATU BFO. Loops. PRE Amps. Field strength meter. SAE G2VF, 39 Parkside Avenue, Southampton SO16 9AF.

LANDWEHR VHF/UHF MASTHEAD PREAMPLIFIERS 2 metre 145mas £147 and 70cm 435ma £152. Post & packing £4. Write or phone for leaflet. Qualitas Radio, 23 Dark Lane, Hollywood, Birmingham B47 5BS, Tel: 0121-430 7267.

ESSEX AMATEUR RADIO SERVICES. New and used amateur equipment bought & sold. PX welcome. All warranted & serviced. 8am till 9pm. Ring Alan — 01268 752522, 4 Northern Avenue, Benfleet, Essex SS7 5SN.

AERIAL WIRES, strong pvc coated £6.50, hard drawn 14swg £14, 16swg £11.50, all per 50 metres post/VAT paid, 30p stamps for full list of cables etc — W. H. Westlake, Clawton, Holsworthy, Devon.

G3PPD "INSECT FILTER". That is a SUPERB SIGNAL ENHANCER of weak, noisy, DX, MORSE CODE signals, used by QRP operators, those without an elaborate antenna, and the HARD of HEARING. For a free information pack, with user testimonials, technical information etc., send 25p stamp or ring R.S. DODSON, G3PPD, 01502 732322. Please state if G-QRP, FISTS, RNARS, RAFARS, RSARS or other membership.

QSL CARDS: MAKE YOUR OWN from our transparent callsign labels (eg on local picture postcard views) 250 £6.95 + 95p P&P per order — also address labels (gold, silver, white) 5 lines, 30 characters/line 50mm x 19mm; send to J Lewis, 27 St Leonard's Road, St Annes FY8 2PF (G3 WBI).

RSGB AMATEUR RADIO INSURANCE SCHEME

"ALL RISKS" INSURANCE for portable/mobile/base station amateur radio and ancillary equipment. A service for RSGB members only. Also public liability and equipment insurance for affiliated clubs and societies. Details and leaflets from Jim Stroud, Amateur Radio Insurance Services Ltd, Shepheards Hurst Green Lane, Outwood, Surrey RH1 5QS. Tel: 0134-284-4000. Fax: 0134-284-4554.

COMPUTER SOFTWARE HARDWARE

G4UXD's 'QSO' MORSE TUTOR/PRACTISE DOES EVERYTHING! See Feb/95 'Novice News'. IBM-PC's, Archimedes, BBC's. 150 tests, teaches keying. Guaranteed: delight or refund! £10.99. SAE details. P. Brandon, 1 Woodlands Rd., Chester, CH4 8LB, 01244 683563.

SUPER-DUPER, the PC CONTEST LOGGER. "Highly recommended" — RadCom, September 1993. With printed manual and upgrades for 12 months. HF £25.00, VHF £25.00, both £39.00. Paul O'Kane EI5DI, 36 Coolkill, Sandyford, Dublin 18. (00 353 1 295 3668). E-mail okanep@iol.ie. Web Home Page http://www.iol.ie/~okanep/

SHACKLOG4 *the* PC logging system. Real time and post event QSO logging. QSL labels. Database analysis, reports, import, packet terminal etc. Optional IOTA database (G3KMA). Plus lots more!! Still only £27.50!! SASE (+disk for demo copy) for full details. G3PMR, 30 West Street, Gt Gransden, Sandy SG19 3AU. 01767 677913.

JVfax/SSTV, HamComm, PktMon. 9FD or 25FD PC Transceive Interface, Programs, Manuals, Pictures. £28.50. G8SLB (QTHR). 0181-595 0823.

G0LOV/G4LUE UK CALLBOOK for PC. Data April 1995. Database includes amateurs, repeaters, mailboxes, nodes, European repeaters WAB £12.50. £1.50ppi Hamfax, TX/RX FAX, SLOWSCAN, RTTY, MORSE, KIT £21.00 BUILT £25. £1.50ppi. Bailey, 8 Hild Avenue, Cudworth, Barnsley, S/Yorks.

SWISSLOG PC Station/Contest log. Supports Packet, Rotator & Rig Control, DXCC, WAB Quick Screen Reports. Probably the best logger in the world! £50 inc. P&P. SAE Tony Pritchard, 29 Brockley Road, Leonard Stanley, Stonehouse, Glos GL10 3NB.

HF EXPERT PROPAGATION PREDICTOR. The Complete HF Windows Based Calculation System. Includes Local Time/UTC. Solar Zenith Angle. E&F1 Control Points. Automated CCIR nomograph calculations. Monthly Medians. Geograph to Maidenhead Calculates MUF/FOE. No need for manual methods. Includes database links. £29.99 inclusive. For details or order: Barker Webb Associates, Software Innovation Centre, 1 Michaelson Square, Livingston EH54 7DP. e mail phil.bwp@cityscape.co.uk

INTERNET email and Newsgroups. NO joining fee, NO connect charges. Subscriptions from £28 (Offpeak user) or 10% discount off ordinary subscription for RSGB members. *MidNet* OnLine, 9 Ilfracombe Grove, Green Lane, Coventry, CV3 6DX. Tel/Fax: 01203-415815 Email: G8FRA@midnet.com.

HOLIDAY ACCOMMODATION

FLYING FROM GATWICK? Stay at Mill Lodge Guest House. 4 minutes from airport. Transport available. Telephone (0293) 771170.

NORTH WALES. Elevated site, B&B, caravan, bunkhouse, camping, open all year, use of shack. "Tynrhos", Mynytho, Pwllheli, LL53 7PS, (0758) 740712.

DX FROM SPAIN. 2 bedroom villa, 60ft tower and antennas, idyllic position Costa Blanca. 01773 823284.

TORQUAY QUALITY APARTMENTS. Couples only. Heated swimming pool, sun terrace, parking, summer Sunday barbecue. Sea views, quiet location, G4NOA. Telephone 01803 607333.

MISCELLANEOUS

VIDEO TAPE CONVERSIONS to and from all modes N.T.S.C.; S.E.C.A.M.; P.A.L.N.; P.A.L.M. Digital processing. Fast and economical service. Also 'cine' conversions. Phone G4WMP 0932 846139.

RAE COURSES TAUNTON: Somerset College of Arts and Technology, Wellington Road, Taunton will again be offering the RAE Course for the May 1996 examination. The course will be held on Tuesday evenings from 6.30pm to 8.30pm commencing September 1995. Course tutor is Peter Upton G7CCV (Golf, Seven, Charlie, Charlie, Victor). For enrolment details please telephone 01823 283403 extension 211 or 219.

COURSES IN AMATEUR RADIO AND MORSE are being held from September 1995. Please telephone Farnborough College of Technology — 01252 317228 for further details.

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While the publishers will give whatever assistance they can to readers having complaints, under no circumstances will the magazine accept liability for non-receipt of goods ordered, or for late delivery, or for faults in manufacture. Legal remedies are available in respect of some of these circumstances, and readers who have complaints should address them to the advertiser or should consult a local Trading Standards Office, or a Citizens' Advice Bureau, or their own solicitor.

Readers are also reminded that the use of radio transmission and reception equipment (including scanning) is subject to licencing and the erection of external aerials may be subject to local authority planning regulations.

ADVERTISERS INDEX

NEXT COPY DATE

The display advertisement copy date for our October 1995 issue will be **9th August 1995**

ICOM

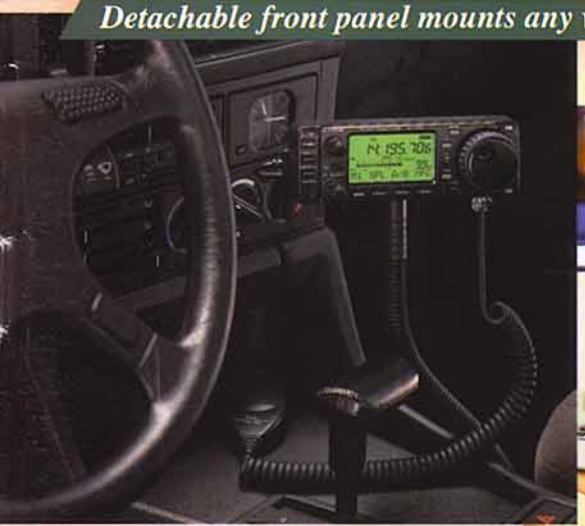
706

HF all band + 50 MHz + 144 MHz !

- Powerful 100 W from HF to 50 MHz and 10 W for 144 MHz
- 101 memory channels with dotmatrix display
- All mode including SSB, CW, RTTY, AM and FM.

The front panel photo is **Actual size.**

Detachable front panel mounts any where.



Super compact at 167 (W) × 58 (H) × 200 (D) mm

Full functions to compete with big rigs

For more information,
call your authorized Icom dealer.

HF/50/144 MHz ALL MODE TRANSCEIVER

IC-706

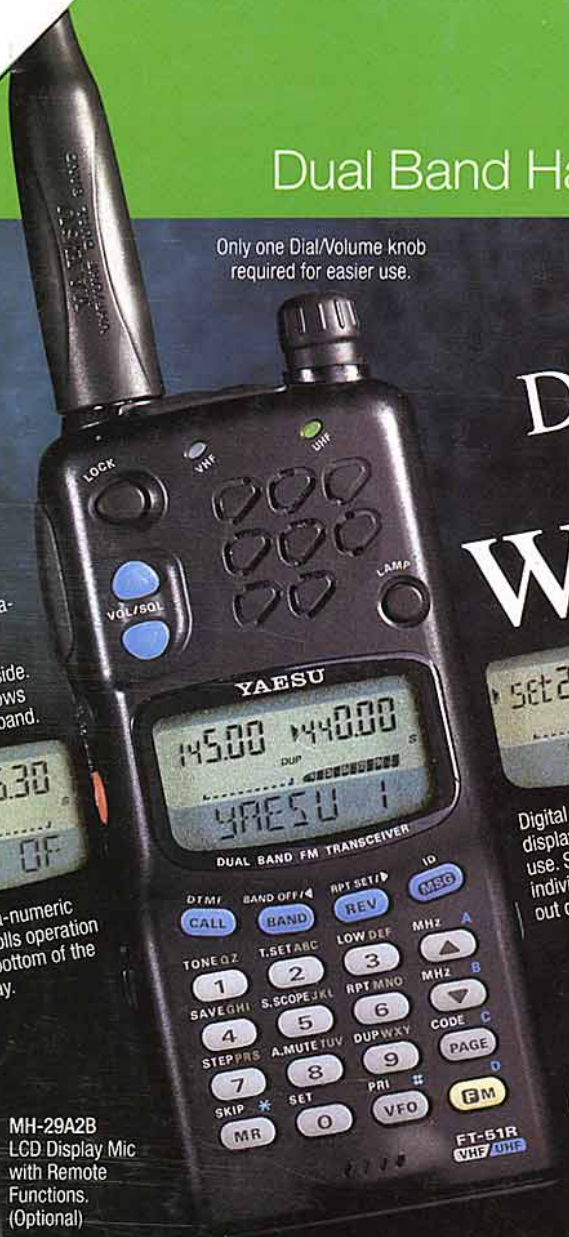
Icom (UK) Ltd.
Unit 9, Sea St., Herne Bay, Kent, CT6 8LD, U.K.
General operator : 01227 743000
Sales & Service : 01227 741741
Fax : 01227 741742

YAESU, Principal Sponsor of the IOTA Programme

Dual Band Handheld **FT-51R**

The First Dual Band HT with WINDOWS!

Only one Dial/Volume knob required for easier use.



Three dual receive configurations VHF/VHF, UHF/UHF, or VHF/UHF with main band frequency on right or left side. Flexible programming allows transmit on main or sub band.

An 8 character alpha-numeric user help menu scrolls operation instructions in the bottom of the large, backlit display.

Digital battery voltage readout displays condition of battery in use. Scan skip function allows individual memory channel lock-out during scanning mode.

Spectrascope™ displays active adjacent frequencies in real time with relative signal strength.

FT-51R
2¼"W x 4¾"H x 1⅛"D
(2 Watt version shown.)

MH-29A2B
LCD Display Mic with Remote Functions. (Optional)

The new FT-51R Dual Band HT is state-of-the-art, and easy to use! So easy, you won't need an operating manual. Its exclusive, scrolling instruction menu located in the large, backlit display "window", guides you through total operation while simultaneously viewing the main display window.

You'll like some of the other new, exclusive features, too. Like Spectrascope.™ This unique feature displays real time, continuous scanning of activity on adjacent frequencies in VFO mode or 8 of your favourite memories. A cloning feature duplicates favourite channels to another FT-51R.

A digital battery voltage display, five power output levels, the largest backlit dual band HT keypad made, Smart Mute,™ two VFOs on both VHF and UHF, as well as available 2 Watt and 5 Watt versions, round out the exciting FT-51R. Plus, the optional MH-29A2B Display Microphone allows you to control volume and also access Memory, VFO, Call Channel, Band Selection and scanning functions. All of this in world's smallest dual band HT radio!

See the FT-51R with "windows" at your Yaesu dealer today!

"I can see two frequencies and alpha-numeric all at the same time."

"Scrolling instructions tell me what to do next!"

"I use the Spectrascope to find new contacts faster."

"Yaesu did it again!"

Specifications

- Frequency Coverage
  VHF RX: 110-180 MHz
  TX: 144-146 MHz
  UHF RX: 420-470 MHz
  TX: 430-440 MHz
- Spectrascope™ Display
- Scrolling User Help Menu
- Alpha-Numeric 8 Character Display
- Up/Down Volume/Squelch Controls & Display
- Selectable Sub-Band TX Mute
- Automatic Tone Search (ATS)
- Digital Battery Voltage Display
- AM Aircraft Receive
- Scanning Light System (SLS)
- 120 Memory Channels (80 w/Alpha-Numeric)
- Large Backlit Keypad & Display
- Automatic Repeater Shift (ARS)
- Multiple Scanning Modes
- 3 Selectable Scan Stop Modes with Scan Skip
- User selectable lock function w/15 combinations
- Automatic Power Off (APO)
- TX/RX Battery Savers Built-in
- Handy Cloning Feature
- 5 Selectable Power Output Levels
- Message system with CW ID
- Selectable RX Smart Mute™
- Cross-Band & One-Way Repeat Functions
- DTMF Paging/Coded Squelch Built-in

Accessories
Consult your local dealer.

YAESU
Performance without compromise.℠

YAESU UK LTD. Unit 2, Maple Grove Business Centre, Lawrence Rd., Hounslow, Middlesex, TW4 6DR

Specifications subject to change without notice. Specifications guaranteed only within amateur bands.
Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.