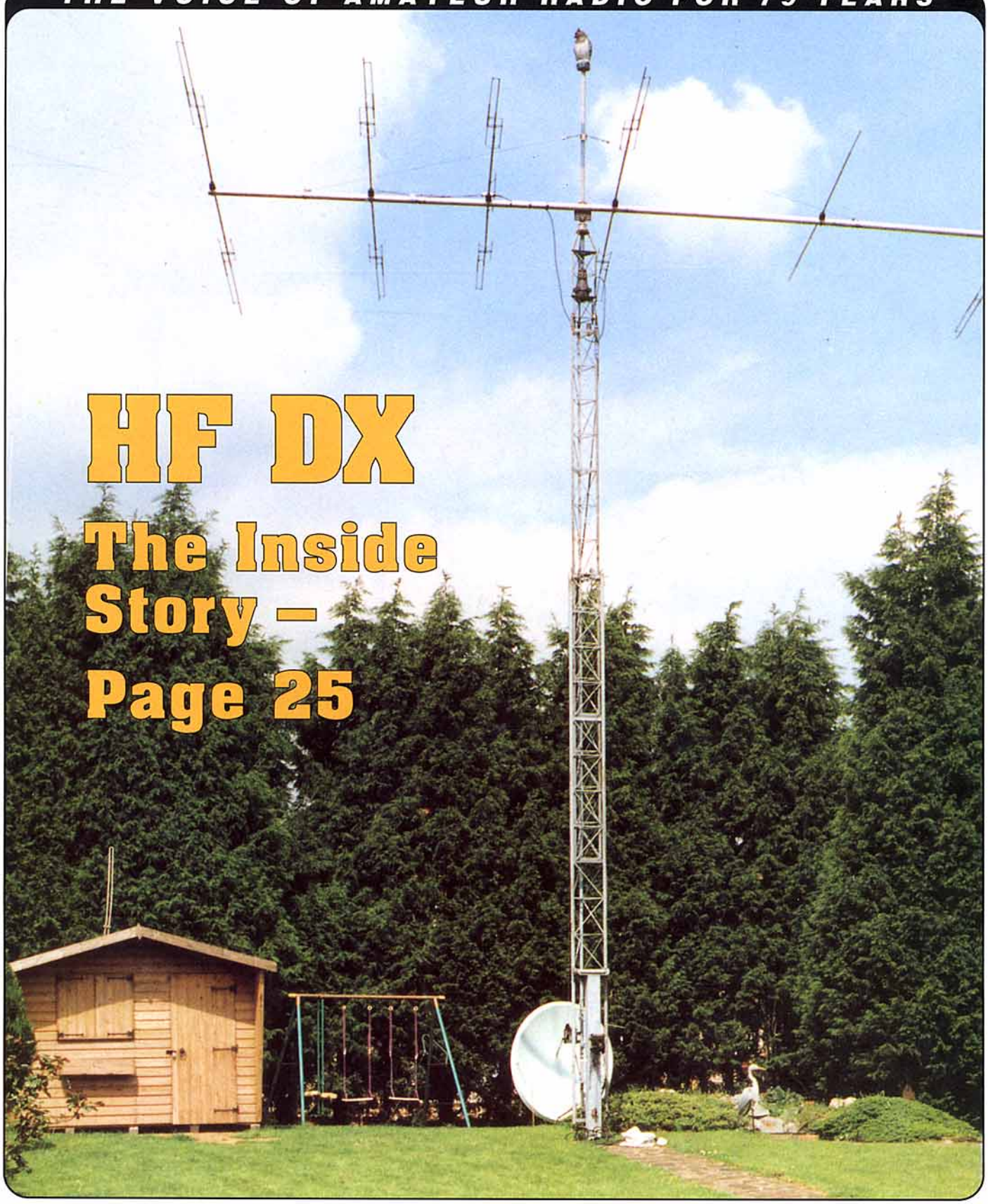
Radio Communication

The Journal of the Radio Society of Great Britain

July 1992

Volume 68 No 7

THE VOICE OF AMATEUR RADIO FOR 79 YEARS



HF DX

The Inside Story –

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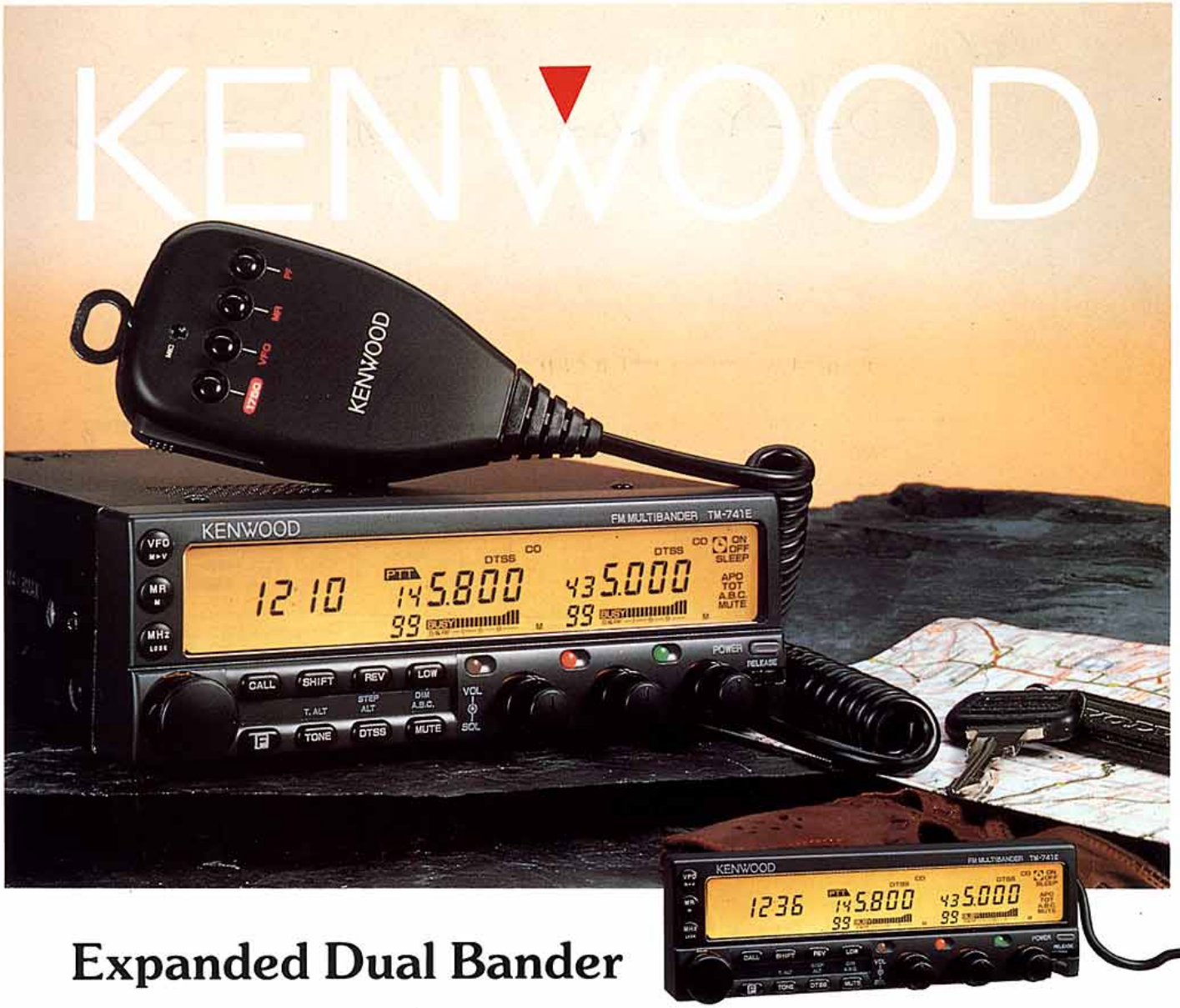

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N.B. for all other RSGB telephone numbers see page four.

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All display and classified advertising enquiries (excepting Members' Ads) should be directed to our advertisement agents:
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RSGB membership at 30 June 1991: 34,581

Radio Communication

Learning by doing . . .

Our hobby is all about learning the theory of radio whilst enjoying the practice. RadCom aims to provide construction articles which help members do this. This month we have *A Practical Synthesizer for ex-PMR Transceivers* by Bernie Pallet, G3VML and *Eurotek*'s 'A 12V 20A Switch-Mode Power Supply', both of which will save you money, too.

NEWS AND REPORTS

TECHNICAL FEATURES

COVER PICTURE:
The impressive tower of M G Foster, G3VOF, carries his KT34XA. Part One of 'HF DX: the Inside Story' (published last month) deals with antennas and rotators. This month's Part Two moves on to Receivers and transmitters. Page 25.
PHOTOGRAPH: G3VOF

REGULAR ARTICLES

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.

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Morse practice co-ordinator: Mike Thayne, G3GMS
Audio visual library co-ordinator: David Simmonds, G3JKB
QSL Bureau Liaison Officer: John Hall, G3KVA

Correspondence to honorary officers should be passed directly to them (QTHR), not to RSGB HQ.

ANNUAL SUBSCRIPTION RATES
Corporate Members: UK and Overseas (*Radio Communication* sent by surface post): **£30.00**
UK associate member under 18: £15.00. Family member: £12.00
Corporate (Concessionery): £25.00 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): £15.00 (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

Members Hotline and Book Orders:
0707-49855

NEWS & REPORTS

● THE CITY of Sydney Sesquicentenary Celebrations *[Warning! members with false teeth should not try to read that aloud - Ed]* take place this year, commemorating the 150th anniversary of Sydney's elevation from town to city on 20 July 1842. Hundreds of celebrations are planned for the whole of 1992 and the Wireless Institute of Australia will operate VI150SY on the HF bands.

● THE RA has announced that there is now a Reciprocal Licensing Agreement between the UK and Sri Lanka. A UK Class A licence is reciprocal with the Sri Lankan Advanced or General Class.

Applications from the UK should be passed through the Radio Society of Sri Lanka who will forward the application to the Sri Lankan Ministry of Defence.

● GB4EWE WILL BE at the Euro Wheels Extravaganza Transport Show, Vauxhalls Show Ground, Ellsmere Port, South Wirral, 27/28 June. Details from G4YWD, QTHR or tel 051 334 9200 (evenings).

● STOLEN FROM G0JAR's vehicle in Snodland, Kent, a Kenwood TM231E s/n 10803009 and Heatherlite mobile mic system. Information to West Malling Police on 0732 870055.

● DURING THE Olympic Games, EH92JOB (Juegos Olimpicos de Barcelona) will operate from the contestants' village. Spanish stations will use the special prefix AM25.

● BURNHAM BEECHES RC is fund-raising for the ITV Telethon. Sponsorship is by the number who sign the club's visitors book at the McMichael Rally on 19 July (see page 73).

● BOTH JOHN, GW4HWR, and Joan Case are artists. The painting shown on page 6, June, was by John not Joan. Sorry John.

● STOLEN FROM Bracknell on April 22, a TR-751E s/n 7060157. Any information to G0OVA, QTHR.

New General Manager

THE SOCIETY has appointed a new General Manager. He is Peter Kirby (42), an ex Royal Navy communications Warrant Officer. He is due to take up his appointment at the end of June.

The Queen visited the University of Surrey Satellite Unit

Royal Command Station

IF THE WORK OF THE University of Surrey's UoSAT Unit needed any further recognition, it was certainly provided by the visit of Her Majesty the Queen, when she visited Guildford during the University's 25th Anniversary on 20 March.

She took the opportunity of unveiling a hologram of UoSAT-Oscar-22, to mark the start of construction of the new £1.5M building for the Centre of Satellite Engineering Research, which will house the UoSAT Unit and other satellite engineers from the University. This will have Clean Rooms, laboratories, offices and a new Satellite Control Room. It is scheduled to be completed by the autumn. From the construction site, the Queen went to the UoSAT Control room where Jacky Radbone, G1WJN, General Manager of Surrey Satellite Technology and Neill Bean, G8NOB, described the UoSAT programme. Whilst there, UoSAT-Oscar-22 came into range transmitting a digitized voice greetings message, which the Queen listened to on a hand-held UHF receiver. The UoSAT-3 PACSAT Communication Equipment also delivered a message to the Queen from President Chiluba of Zambia - a Commonwealth nation - and the Queen left a reply message which was also carried by UoSAT-3. This exchange marked the formal inauguration of the SatelLife Health Net network on UoSAT-3.

PHOTOGRAPH: UNIVERSITY OF SURREY

Professor Martin Sweeting, G3YJO, showed Her Majesty the Queen the UoSAT Mission Control Centre and demonstrated images taken by UoSAT-5 in orbit.

SATELLITES page 60

New Home Insurance for RSGB

In Association with ARIS

We are delighted to announce, with the full support of the RSGB, a highly attractive new home insurance package from Amateur Radio Insurance Services. The package is called 'Homeplans' and is designed to complement the existing scheme for radio equipment.

Key features are as follows:

1. An automatic discount on Cornhill's normal rates of premium for contents and buildings cover.
2. Every member will receive a voucher worth up to £30.00 which will be issued on completion of each successful application, please see example.

Example

Premium to £75.00 - voucher £5.00
Premium to £125.00 - voucher £10.00
Premium to £175.00 - voucher £15.00
Premium to £225.00 - voucher £20.00
Premium to £275.00 - voucher £25.00
Premium to £276 and above - voucher £30.00

3. Members over the age of 50 will also receive an age discount of 10%.
4. Members who have approved alarm systems will also receive a 10% discount on premiums.
5. The new policy provides a basic sum insured of £30,000 whatever the value of your contents. Premiums are simply calculated on the number of bedrooms and are highly competitive with very effective cover for RSGB members.

Qualification for this special project is as follows:-

1. You must be a member of the RSGB.
2. You must already have an Amateur Radio Insurance Services policy, or apply for one at the same time.
3. Payment may be made by cheque or direct debit mandate on a monthly basis. In addition, you may use your RSGB credit card, thereby benefiting the Society.

The voucher that you will receive on successful application may be used to purchase products and services from the RSGB or, indeed, pay your annual membership when it becomes due. In many cases, therefore, your RSGB membership could be free.

It is proposed to publicise this scheme to all DTI licence holders to encourage them to become members of the RSGB, as they cannot have the policy without membership. By increasing the numbers of people who are both members of the RSGB and Amateur Radio Insurance Services jointly we can provide better services at more competitive rates and, we hope, more attractive schemes to be considered in the future.

World ARDF Championships

EUROPEAN DIRECTION Finding Contests can be described as a combination of orienteering and amateur radio. Every two years a world championship is organised using IARU rules. This year it will be held in Hungary on 8 - 13 September. Teams comprise an Old Timer (over 40), a Senior (18 - 40), a Junior (under 18) and a woman *[any complaints of ageism and sexism to the organisers, not me please - Ed]*. Anyone interested in forming a team to compete in Hungary, or who are interested in similar events in this country, should contact Geoffrey Foster, G8UKT, on 0789 266402, or by letter to Foster's TV, Unit One, Avenue Farm Industrial Estate, Stratford-upon-Avon, Warks, CV37 0HR.

In 1990, G8UKT became the first entrant from the UK in the European DF Championships. Here's what he found:

ALTHOUGH I HAVE BEEN a competitor in Top Band Contests for many years, my only knowledge of European DF came from a book written by a Norwegian Scout Leader in 1975. No other information seemed to be available.

When Brian Bristow called for a volunteer last April I jumped at the opportunity. Information on the event and accommodation was obtained directly from the organisers in Czechoslovakia.

With no information available on the receiving equipment necessary, I hurriedly built a 3.5MHz DF set, dug out my orienteering compass from years ago and bought the necessary orienteering clothes. Whilst the clothes were very necessary, the Czechoslovakian national team kindly loaned me equipment for both bands. There was unfortunately no opportunity to try the equipment under contest conditions, but I am very grateful to them for all their help.

As an inexperienced continental traveller and with no travel agency prepared to make individual bookings, I set off with my sleeping bag in the back of the van and arrived without problems a day early in the Eastern end of Czechoslovakia.

It was a very well organised contest, the best example of which is to mention the 17 interpreters provided to translate for the teams. The 144MHz contest took place on the Wednesday and the 3.5MHz contest on the Friday. There were many meetings concerned with the organisation, International Jury and running order of competitors etc. I fully appreciate the need for a team leader or manager to take care of these very important details.

The 144MHz contest was held in very wet conditions and I was surprised at the variation of signal strength and number of false bearings caused by the terrain and wet trees.

After wasting much time looking under bushes etc, I found a transmitter in the open just to the side of a track.

Determined to be classified as a finisher, I then followed the beacon transmitter, apart from a short detour chasing a very strong signal which, when I paused to listen, turned out to be TX 5 (MO5) the one an Old Timer is not meant to find. I got to the finish within the time allowed and, despite only having found one transmitter, was pleased to find that I was not last.

With the knowledge gained from the 144MHz contest I hoped to do well in the 3.5MHz contest on the Friday. I found my first transmitter quite quickly and then waited for its next transmission to calibrate the attenuator on the receiver. 0.5 showed that the TX was within 10 metres and 1.0 that it was within 100 metres.

Armed with this information I set off at a run after my next transmitter. I stumbled and, although the receiver did not hit the ground, the jolt made it intermittent and eventually it died. I was unable to dismantle it to attempt a repair through lack of a screwdriver etc.

Using the bearings already plotted on my map I found a second transmitter and then set out for the finish. I found the lower part of the course very slow going and navigation difficult without the beacon transmitter and ended up a few minutes over time, but still not last - some competitors, it seems, had fared even worse.

I very much enjoyed the competition and am very keen to use the knowledge that I have gained in the next World Championships.

RSGB Albania Mencap Appeal

A VERY BIG "thank you" to all members and their families who are helping us to raise money for mentally and physically handicapped people in Albania. These children need our help *now* and if you haven't yet organised your event - start now!

Micky Mouse was recruited to help raise funds at RSGB'92 and this, with raffles on both days, raised over £170 towards the appeal.

The closing date for the appeal is **14 August**, so you still have time to arrange a sponsored event or, perhaps, a raffle. See page 25 of June *RadCom* for full details of prize categories - act now, you may win yourself a valuable prize!

Hans, DF5UG, visits the *RadCom* Stand at RSGB'92.

Victor Brand Associates Ltd have donated a prize of an autumn weekend break worth up to £300 to be awarded to the non-radio-amateur raising the most funds for the appeal.

- The RSGB Mencap Appeal is this year's charity for Special Event Stations GB2BST and GB1BSG operating at the Kirkleatham Hall show ground in Redcar, Cleveland, on Sunday 5 July on all HF bands using SSB and CW. On show will be a vintage radio display, RSGB novice licence video and other attractions.
- RSGB HQ has a stand at the Potters Bar Carnival on Saturday 13 June and will be raising funds by running a tombola. Prizes have been kindly donated by members of staff and their families.

Many thanks to the following companies for their support in this appeal: Strumech Versatower, AKD, Waters & Stanton, Nevada, Martin Lynch, Hateley Antennas, Siskin, Bredhurst, ICS, Datong, RN Electronics, G4ZPY Paddle Keys, Dewsbury, AMDAT, ERA, Victor Brand Associates, Mark Furness Ltd.

Calling all Clubs!!

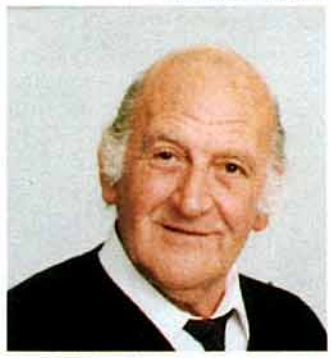
RAISING MONEY to help Albania is a great way for a club to win one of our valuable prizes, so start ***NOW***. If you have not arranged your sponsored event yet, how about:

* **Arranging a sponsored contest entry?**
* **Holding an amateur radio junk sale?**
* **Organising a raffle at the next club meeting?**

Subscription Services Limited

MANY MEMBERS have reported difficulty in obtaining or renewing their Amateur or Amateur (Novice) Licence. It appears that Subscription Services Ltd, who were awarded the licensing franchise by the RA from 1 April, had some 'teething troubles' but the situation has recently improved. The RSGB has already raised the matter with the RA and will continue to monitor the situation.

PHOTOGRAPH: GORDON ALLIS



RSGB HQ Despatch Manager Bert Mair retired in May but will continue to help out at the Society's rally stands.

Council Brief

Council Meeting held on 26 March 1992

- Minutes of the Council meeting of 11 January, the January and February accounts, and the reports of the Hon Treasurer and General Manager were accepted.
- As a result of the entry of G4NXO in the 144MHz Fixed Contest in December 1991, Council determined that entry in any RSGB contest by C Easton, G8TFI, would not be accepted until after 31 December 1997. This includes operating in multi operator contests, and is because:
  - i) operation took place outside the spirit of the rules of the contest, and
  - ii) a false statement was made on the cover sheet submitted for the contest, alleging the presence of a Class A licence holder who was not present.
- Council accepted the following Committee recommendations:-

  Chairmen of Committees to receive Council Minutes (F&S).

  Dr G Brown, G1VCY, to be confirmed as a life member (F&S).

  RSGB vote in favour of the entry of the Lithuanian Amateur Radio Society and the Albanian Amateur Radio Association to IARU (IARU).

  Attendance of IARU Committee Chairman or deputy at the IARU Region 2 Conference in Curacao (IARU).

  (The originating committee is shown in brackets)
- It was agreed that the President and Company Secretary should meet with the Chairman and Vice-Chairman of the Raynet Committee for further discussions regarding the relationship of the proposed company RAEN Ltd, and the RSGB.
- It was noted that the General Manager's contract was coming to an end, and it was decided that the post should be advertised, and the present holder invited to apply.
- The interest in tendering for the 1993 and 1994 AGMs was noted, and those groups who had responded are to be asked to prepare formal tenders.
- A proposal to open RSGB contests to members of Affiliated Societies who are not RSGB members was not carried.
- A report on the activities at WARC, by David Evans, G3OUF, was noted. The report was referred to the IARU and LAC committees for their comment and recommendations. The Company Secretary was requested to write to G3OUF on behalf of Council, thanking him for his efforts at WARC.
- Council confirmed current practice regarding *RSGB Call Book* entries, wherein the first three characters of the postcode are shown.
- The report of the Company Secretary on his visit to the Electoral Reform Society was received. Council approved in principle the changes proposed by the Company Secretary to the ballot paper, and agreed to provide pre-paid envelopes for this year's ballot.

  GW4YKL reported on the issue of speciality number plates by DVLA. This appears elsewhere.
- Meeting finished 1845 hours.

Planning for the Future of Our Society

THE RSGB's Business Strategy Conference is being held on 10 and 11 July at Warwick University. Full details were published on page 7 of April *RadCom*. By the time many of you read this, much of the planning will have been completed. As this is being written, in early June, the momentum is building up and papers have been written by many Council members, Committee chairmen and members of the Society including Affiliated Societies. A wealth of ideas have been submitted and thank you to everyone who has written in with their thoughts. These have been circulated to the different syndicates by their chairmen and help to focus thought on matters which you the members consider important for the future.

The survey has been most successful with a high response rate of about 40%. This will be the subject of an article in next month's *RadCom* highlighting some of the findings. It will provide important input to many of the syndicates.

The conference will be attended by about 75 people who will spend the time producing a draft strategy covering the next three to five years. This draft will then be finalised and presented to a subsequent Council meeting for adoption. Full details on the conference will follow in the September edition of *RadCom*.

Peter Tucker, GU4DWZ, Honorary Treasurer

PHOTOGRAPH: JAMES BELL

MP for Derby South, Margaret Beckett, visited GB1ECD and sent a greetings message to one of her constituents Paul Simpson, G7LKQ. The station was operated by members of Radio Link which provides a radio service for several hospitals in the Derby area. GB1ECD was located at the Eagle Shopping Centre, Derby, owned by CIN Properties Ltd who have sponsored Radio Link's daily request programmes over the last two years. John Huddlestone, G1UJX, is logging and Noel Hutchby, Eagle Shopping Centre Manager, watches.

Morse Code

SEVERAL MONTHS AGO, the Licensing Advisory Committee discussed with the RA the implications of a change in the licensing requirement whereby a Morse test is required for operation below 30MHz. In addition, the HF Committee has been asked by the LAC for their comments. The Morse requirement is part of the ITU Radio Regulations but an individual government may choose to modify it. However, a significant disadvantage to this would be the exclusion of the UK from most reciprocal licensing agreements, including the very useful CEPT 'instant licence' which has taken the national governments and their administrations several years to achieve. Clearly, a great deal of discussion is required before a change can be supported.

RadCom Reviews

THERE ARE TWO types of review published in *RadCom*. The laboratory-type review contains measured data and is usually provided by Peter Hart, G3SJX. The much more subjective user-review is contributed by various authors, including amateurs on the editorial staff.

A user-review may be commissioned by the *RadCom* editor or sent in by an enthusiastic user who wishes to share his satisfaction with others. In each case, checks are made to ensure there is no financial connection between the author and the company manufacturing or distributing the product.

GB3WL Jammer Prosecuted

AT CHILTERN Magistrates Court on 23 April, a radio amateur pleaded guilty to two charges of using radio apparatus except under and in accordance with a licence, contrary to Section 1(1) of the Wireless Telegraphy Act 1949. The defendant was fined £150 and ordered to pay £300 costs.

The prosecution followed complaints from numerous amateurs of alleged jamming and music playing on the West London repeater GB3WL.

Young Amateur Deadline

THE CLOSING date for nominations for the Young Amateur Of The Year is 31 July. Full details of this prestigious award can be found on page 4 of May *RadCom*, and spare application forms are available from Justine Coles at RSGB HQ.

Cambridge RLO

THE NEW RSGB Liaison Officer for Cambridgeshire is Mike Brooke, G8HXR, 70 Wooton Avenue, Old Fletton, Peterborough, PE2 9EG; telephone 0733 340485.

- THE DARC's major radio convention at Friedrichshafen in 1991 had 17,351 visitors and 250 exhibitors from 13 countries. 66% of visitors bought something at the show. This year's event is being held from 26 to 28 June.

Raynet

RSGB COUNCIL issued the following statement on 17 May to clarify the position as regards Raynet:

"The RSGB totally accepts that many amateurs who are involved in emergency radio communications wish to be part of an organisation quite separate from the Society. The RSGB has no wish to hinder that taking place.

"However, the Raynet Committee as currently composed has a Chairman whose term of office is scheduled to expire on 30 June 1992 and the Society recognises the fact that no practical purpose would be served by appointing a new chairman or continuing with the present system now that arrangements for cessation from the parent organisation are well in hand.

"Nevertheless, the Society's Council considers that it is of paramount importance that liaison and support should continue to exist between the RSGB and **all** those involved in this public service aspect of amateur radio.

"Consequently, with effect from 1 July 1992, the responsibility for such liaison and support will be assumed by an Emergency Communications Officer appointed by the Membership Liaison Committee of the Society.

"In addition, as a continuing sign of its support for emergency radio communications, the RSGB will, for the present time, provide insurance cover for all involved in this aspect of amateur radio whether or not they are members of the Society providing their names and callsigns are lodged with the Emergency Communications Officer.

"It is essential that names and callsigns are recorded by group rather than individually and, until an Emergency Communications Officer is formally appointed, groups wishing to record their details should write to the Chairman of Membership Liaison Committee, Clive Trotman, GW4YKL QTHR.

"This statement can be taken as notification of a vacancy for the position of Emergency Communications Officer and any RSGB member interested in serving the Society in this capacity should contact Clive Trotman as soon as possible."

Details of Group membership are required for insurance purposes only. Existing Raynet registration records will be used and

continued on page 74 ▶

Repeater Franchises – An Update

THE RSGB IS IN a unique position as a network facilitator, being responsible for the overall management of the repeater network. It is important to stress that as sole licensee, RSGB holds the repeater licences, and is responsible to the RA for ensuring that repeater groups comply with all licence conditions. This management includes the frequency planning, network coordination and setting overall technical standards and parameters.

In the last few years, the RSGB has been looking closely at various aspects of administering the repeater network, and has introduced several changes. This note outlines some of the background to them.

Aware of the cost of running the network which then contained about 270 stations, RSGB put proposals to the RA in November 1990 to charge for the repeater franchises. These proposals were agreed and implemented in February 1991, and about 72% of the groups paid the charge. However, in reply to correspondence from some groups in March 1991, the RA stated that the RSGB was not able to omit a station from the licence schedule for non payment of the franchise charges.

Following this development and in response to RA's concerns about repeater abuse, and as part of a general tightening-up of the repeater franchising procedures, the RSGB put forward a very comprehensive set of improved procedures to the RA in November 1991. These included the franchise charges, and we specifically asked for assurances that these procedures could be enforced in the event of groups refusing to pay the charges. These proposals were examined in detail, agreed by the RA, implemented, and renewal requests sent out in February 1992.

The RA supported the action taken by the Society and initially considered that it would be possible for the RSGB to enforce the franchise charge. In March 1992, while the renewals were being processed, it became apparent that a few groups would not accept the Society's charges. The RA then considered this aspect further, and informed us that refusing to process licence documentation for these groups was not an option.

It was agreed to delay the deadline for payment to the end of June while this aspect was considered more fully. However, the RA did emphasise that groups who did not complete the paperwork should not be renewed.

The current position is that approximately 173 have completed the renewal process well within the deadlines, and have been sent their letters of authority,

A small number (24), who have completed the renewal paperwork, but not yet paid the charges, will be sent an authority to operate, but their position will be reviewed at the end of June (deadline for payment of the administrative charges).

A smaller number (19) have returned the renewal paperwork, but these have still to be processed as there are some queries to be resolved. Once these have been resolved, the authorities will be issued.

We are disappointed that in approximately 34 cases, no response at all has been received from the groups, despite use of the telephone closedown list, and these will be receiving letters informing them that they are no longer licensed, and must cease operating immediately.

The administration of a national network of repeaters, including compliance with the requirements of the RA, does cost a considerable amount of effort and money, and has grown to a level that cannot be funded entirely from the RSGB subscription. We fully understand and appreciate the efforts that are put in by the groups who run these stations. However, at the end of the day, someone has to fund the costs of managing and maintaining this network.

We are very concerned that our attempts to put this on a business-like basis seem to be being resisted by a few of the groups who do not seem to appreciate the work that has to be done on their behalf to maintain the network.

The three possible sources of funding, together with an argument that might be put forward for each, are:

The Repeater Groups: Repeaters are largely for the benefit of the locals who use them and who should fund them.

The RSGB Subscription: Not all users join the groups. The network should be funded by RSGB.

The General licence fee: Not all users are RSGB members. The repeater network is of benefit to all amateurs, and so should be funded from the general licence fee.

Some possible ways forward are:

a) We could accept that the vast majority of groups will pay these charges, and allow the few who will not to continue operating. However, we feel that this would be unfair to the groups that are paying.

b) We could abandon charging the groups and fund these activities from the RSGB membership subscriptions. This does not solve the problem that we cannot afford to fund these activities from the existing subscription, and it would mean increasing the sub to cover it. It would mean that members are funding facilities used by non members.

c) Ask the RA to fund these activities from the general licence revenue.

We consider that c) is probably the fairest and most practical way to fund the network in the long term.

The Way Forward

THE WORK can be broken into two main areas: the licensing administration, and the technical management of the network, eg frequency and geographical coverage planning/coordination. These two aspects can be covered by either of the following options:

Option 1:

a) RSGB continues to take overall responsibility for running the network as at present and holds the repeater licence, but seeks partial or full funding from the RA for these activities.

Option 2:

a) Each group pays a fee, and holds a licence issued direct to them by the RA.

b) Each group is responsible to the RA for the correct operation of the station.

c) Each group deals directly with the RA on administrative matters, eg licensing records, closedown operators, abuse etc. This work by the RA would be funded by a combination of the repeater licence fee and the general licence revenue.

d) Each group is responsible for its own public liability insurance.

e) RSGB will continue its site sharing agreements with bodies such as NTL and BBC, but will charge groups for this arrangement, including public liability insurance.

f) RSGB will perform the technical management and coordination of the network. eg vetting of site clearance forms, frequency planning, coordination of coverage areas, linking, technical standards, special licence conditions and facilities. The RA would sub contract this work to RSGB, and fund it from their licence revenue.

These proposals have been produced following a meeting with the RA, where they have had to reconsider certain aspects of the original agreement because a few repeater groups are refusing to participate in the scheme. We consider that Option 1 is the most advantageous for amateur radio in the long term, but since a few groups still refuse to cooperate with the Society, then we will reluctantly have to follow option 2.

We are here to represent you - we need your views urgently to enable us to recommend to the RA the appropriate system for 1993. Please write to the Chairman of the Repeater Management Group, 31 Newbold Road, Kirkby Mallory, Leicester, LE9 7QG, with your comments.

Geoff Dover,
RMG Chairman.

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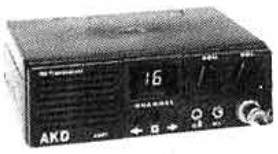

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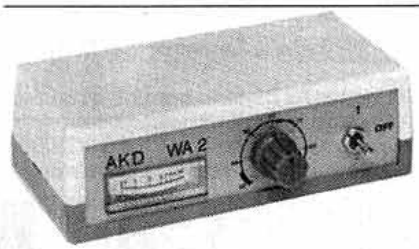

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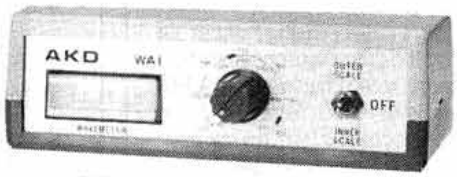

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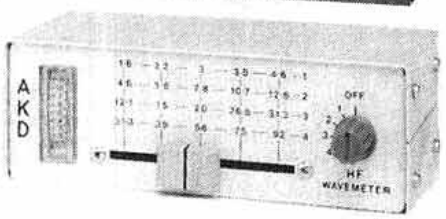

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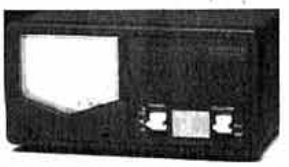

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RS40X	1-15v Variable	32A/40A max	£189.00 D

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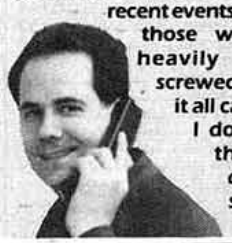
Who's kidding who . . . . .

Over the last few months I've been reading with interest my competitors referral to the recession and how they are going to be around in 150 years to serve you for various strange reasons. Another point raised is the question of discounting. Yes, I will agree that it is not possible to offer 'discounted prices' and still maintain a level of back up and after sales service that you deserve. No doubt in some of the most recent events in amateur retailing, those who continued to heavily discount finally screwed themselves so hard it all caught up with them. I don't agree however, that you should be dictated to on price, so much so that whether you are spending £5 or £5000, you will not get a penny off. I have never thought that way, neither has my mentor (?). I am always prepared to 'talk turkey', provided the deal is sensible and still leaves me enough margin to continue offering you the best possible 'after sales' service in the U.K. If you can get a better offer, phone and tell me. If I can match it and know that I can look after you in the event of something going wrong, we've got a deal.



Why I'll always "Talk Turkey" . .

On the subject of who's kidding who, when you next spend your cash on a new rig, make sure you know who you are buying from. The name on the door or indeed the adverts do not always give you the answer. As an independent retailer I will always be able to offer objective advice on all products sold. I won't be biased towards one particular brand, because I don't have to. Thank you for your continued support. For unbiased and objective advice, call me today.

by Martin Lynch
73 MARTIN G4HKS

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5. YAESU FT1000 – It's confirmed – the ultimate in H.F. base station - £3K is a lot of money, but for a life long investment? I don't think so. If you want the best engineered transceiver and appreciate quality, ring me for a super deal.

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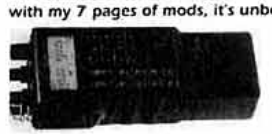


3. ICOM ICW2E – The milestone and bench mark to which other dual band handies are compared - full duplex, dual band 2/70, A.M. RX on airband, 900MHz receive and lots more, together with never ending range of accessories. **£395.00**

4. ALINCO DJ580E – The latest dual band handie hosts features that others are still catching up on, how many for example can still operate at below 3.8 volts?! Patented by ALINCO, this is one of its many outstanding features. All for a very low price of **£369.00**

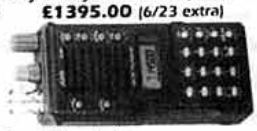
5. KENWOOD TH-78E – Can't keep up with the ever changing range of dual banders? Neither can I!! The successor to the TH-77E, this one is splendiforous. (Splen what?). The only handie to offer you dual band RX on both bands, i.e. two frequencies on 2 or 70CM's in addition to its dual band TX capabilities. Beats the hell out of me! **£395.00**

6. KENWOOD TH-28/48E – Along the lines of their new TH-78E, these new single banders offer you single band TX on either 2 or 70, together with dual RX on one band (i.e. two frequencies in-band simultaneously received), plus RX on the opposite band i.e. for the TH-28E transceiver on 2 and RX on 70CM, or visa-versa for the TH-48E. Phone.

7. ALINCO DR-599E – Dual watch, remote head high power mobile 2/70. Special attention to U.K. operation - one of the few to offer tone burst inside the rig, not built into the mic like most. New bright lit display and a host of features. **£539.00**

8. ICOM IC275H/475H – The best in high power base station multimodes. These two supremos from ICOM have killed the competition dead - there isn't any! 100W on either 2 or 70, only enquire if you are serious on VHF or UHF operation.

9. YAESU FT736R – Like the FT767GX, YAESU have as yet, no competitor alternative to this one - all mode 2 & 70 with 6M and 23CM all in one box. P.S.U. included. ICOM & KENWOOD wakey wakey! Is there a patent pending on this idea?? **£1395.00** (6/23 extra)



10. ALINCO DJF1E/S1E – Small, neat, tough, versatile, 2M handies with AM air band. **£239/£179**

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Manufactured in the U.K. by Airwave Systems, this is the very latest in advanced electronic keyers. Based on the Motorola 68HC705 microcomputer, the designers have eliminated the requirement of input keyboards and rows of switches and knobs – in favour of you telling it what you want – by the key itself!!

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- Housed in a tough steel case
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IC04E 70cms Handheld/keypad TCVR	£165	IC551D100w dig.multimode 6m TCVR	£549	TS530S Top perf HF TCVR +cw filt	£569
IC211E 10w, 2mtr basem TCVR	£399	ICR72 Communications RCVR	£499	TS780 2m/70cms base TCVR	£699
IC228H2m FM,45w -20mem, 12v.	£220	**KENWOOD**		TS830S HF TCVR various specs. from	£595
IC251E2m, all mode base TCVR	£425	PS50 Heavy duty psu for 440	£165	TW4100E Dual band FM mobile 45w from	£399
IC271E2m multimode 25w TCVR from	£499	R1000 Communications RCVRs from	£239	**YAESU**	
IC275E2m base TCVR 25w ssb/fm/cw	£595	TS950S HF gen cov RCVR	£1895	FC902 ATU various from	£165
IC28E 2m fm mobile TCVR	£175	TH77E Dual band handy TCVR	£325	FRG7 RCVR g.c.500kHz-30mHz from	£150
IC2KL/PS Linear 1kw!!	£750	TM431 70cms mobile TCVR	£225	FT ONE HF TCVR	£795
IC322OE Dual band 2/70cm mobile	£425	TR9000 2m multimode TCVR	£249	FT101ZD HF TCVR Mk3	£529
				FT101ZD HF TCVR +warc	£549
				FT107M Solid state HF TCVR +psu	£595
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				FT757GX HF TCVR g.cov various from	£499

What on Earth's going on at the EALING Shop?

Together with new equipment lines and longer opening hours, I've increased the merry band of staff still further! Four new members have recently joined me to help with the increasing level of enquiries, more details next month. Suffice to say, I'm overwhelmed at the continuing support for the company. I'll continue to offer you good prices and the very best in advice and after sales support. This is my seventeenth year in retail amateur radio . . . hands up those who bought a brand new FT101 or IC22A off me all those years ago!!

Make a note of our new opening times: Monday to Saturday inclusive, 10am until 6pm every day. Late night Thursday.

MARTIN LYNCH 'T' SHIRTS AND SWEAT SHIRTS!

Beam me up Scotty!

By popular demand, I can now offer the same high quality sweat shirts as worn by the Lynch mob. Available in three sizes, large, XL & XXL, these can be washed over and over again. They won't shrink or fade and still look as good as original.

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Order yours today!

How many of you have spotted "I've been Lynched" 'T' shirts at the summer rallies? They are still available free to anyone who asks at the rallies throughout the summer.

NEWSFLASH!

ATTENTION ALL CLUBS PROGRAMME SECRETARIES!

The Silverthorne Amateur Radio Club of Chingford celebrated their 40th year at Martin Lynch in Ealing. The evening was very well attended by its club members and a good time was had by all.

Throughout '92 Martin Lynch holds free open evenings to bonafide clubs, at the retail shop in London. Between 10 and 35 members at one time can be accommodated, special prices at the event are available, together with all refreshments provided free to those who attend. It's an excuse to visit the most popular store in the U.K. – when it's shut to everyone else! No hard selling, you are simply invited to spend your club night in an alternative friendly atmosphere, at my expense. Write today.

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HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham
B17 8QB

ONE OF THE best known amateurs in the world became a silent key on 14 April. Father Moran, 9N1MM, who was born in Chicago, ran a school in Kathmandu. He was 85 years old, had been on the air for more than 40 years, and there can be few active HF DXers who did not know him or of him. I had the pleasure of meeting him several times and always enjoyed his lively manner. He will be missed by many.

A tale of woe from John Jones, G4PKP. He entered the 1986 WAE RTTY contest and was first G, only to get a certificate made out to G4PRP. His next big day was when a CT station told him that he had won outright the 1990 Portugal Day Contest (June 1990) but he didn't hear anything until November 1991 when he received a letter saying "results enclosed" - but they were not! However, a nice winner's plaque arrived in February 1992. He has recently received *CQ Magazine* which shows him at world seventh in the 1990 CQWW SSB contest on 3.5MHz - but no mention in the 'Top Ten' list !

How about it contest organisers - entrants really *do* care about results and receiving their trophies . . . .

CONTESTS

RESULTS OF the **1991 CQ WPX CW Contest** have now been published. In the single-operator section **GB8FX** came fourth in the world listings on 14MHz with 2,293,530 points and **G4FAM** was world second on 3.5MHz with 352,618 points.

In the QRP listing **GM4HQF** scored 54,036 in the all-band section. In the multi-operator (single transmitter) category **GW8GT** came world fifth and **GB5AA** world eighth with 5,927,582 and 4,403,147 points respectively - followed by GB0WPX with 3,695,076 and G4BUO with 2,613,318. In the single operator listings (All-band) **GB6MX** scored 1,104,220 points, **GX0AAA** 775,304, G4ZFE 530,208, G3ESF 477,416, G3SWH 377,400, G4ZME 98,588, and G3TXF 61,690. (21MHz) **GB0DX** 573,254. (14MHz) **GB8FX** 2,293,530, G4ZOB 259,700. (7MHz) **G5LP** 451,360. (3.5MHz) **G4FAM** 352,618. Certificate winners are listed in bold type.

Results of the **1991 UBA SWL Contest** have arrived. In category 1 (Phone) BRS 22643 was top UK station (10th in the listing) with 138,656 points and BRS 91529 19th with 32,086. In the CW section BRS 84869 was placed 12th with 6,059, and in the all-mode multi-operator class ISWL came fourth with 237,312.

AGCW DL QRP SUMMER CONTEST

1500 18 July - 1500 19 July

Single operator CW on 3.5 to 28MHz (no WARC bands). IARU contest-preferred band segments must be observed where applicable. Exchange RST/serial number/category. Non-contest stations may be worked in which case only RST is needed. Nine hours *minimum* of rest must be taken. QSOs with own continent count one point and with others two. Contacts with VLP, QRP, and MP stations count four. There are four categories - VLP - up to 1W, QRP - up to 5W, MP - up to 25W, and QRO - above 25W - in all cases *output* power. Logs go to Dr Hartmut Weber, DJ7ST, Schlesierweg 13, DW 3320 Salzgitter, Germany to arrive by 15 September. I have copies of rules (usual SASE please).

BEACONS

THE LATEST from John, W6ISQ, IARU Beacon Coordinator, brings us up to date with the NCDXF/IARU beacon network. The three-band beacon at W6WX/B is now on the air as a prototype and it is adjusted to work like this: the 14MHz transmission is one minute long, as are all the other eight beacons. W6WX/B transmits at one minute after the hour and again at subsequent ten minute intervals. Immediately after this transmission the beacon switches to 21.15MHz and sends a 10 second transmission "W6WX/B beacon, dash, dash, dash, dash". After this it switches to 28.2MHz and sends the same ten second message. These two transmissions are repeated every two minutes. The four dashes are at decreasing power levels from 100 to 10 to 1 to 0.1W, the same as the four nine second dashes on 14.1MHz.

Evaluation is still taking place and it has still to be decided if 10s is the optimum transmission time. Using 10s, 18 beacons can key in three minutes, 24 in four - in other words a listener could in three or four minutes fairly well determine the state of propagation around the world on five or six bands! In due course other beacons will appear on 18.110 and 24.930MHz and Jack wonders if it might be possible to choose a 10MHz frequency - he suggests 10.149MHz. Comments would be welcomed by John Troster, 82 Belbrook Way, Atherton, CA 94027, USA.

EXPEDITIONS

NOT EXACTLY DX but of interest - the Wiesbaden Amateur Radio Club, DA1WA - will be going to the Castle Frankenstein (near Darmstadt) between 2000 on 31 July and 1200 on 2 August and will be operating 3.5 to 28MHz, CW, SSB, and digital modes with 100W to wire and vertical antennas. Special QSLs will be available.

The Royal Omani Amateur Radio Society has received permission from the Tanzanian authorities for the A4-DX Group for A41JV, A41KG, and A41KY to operate from **Zanzibar** (IOTA AF-032) from 15 to 31 July as 5H0ROA, and from **Pemba Is** (IOTA AF-040)as 5H0ROA/A from 21 to 27 July. They will be on all bands 3.5 to 28MHz (including the WARC bands) and will use CW, SSB, and data modes. QSLs go to the address in *QTH Corner*.

VK9NS has told *RSGB DX News Sheet* that he may visit **Wake Is** in June. Too late to catch him there of course but following this, Jim is considering operations from **Willis Is**, **Mellish Reef**, and **Canton Is**.

It seems that there was a pirate using VK0ML's callsign and alleging to be on Macquarie Is. VK5ABV, who operated from there says that he has received a number of cards for contacts not made. He was on the air extremely infrequently and operated in the CQWW DX contests for only a short time. If anyone has sent a QSL and not received a reply it is probably because the 'contact' was not in the log.

PHOTOGRAPH: JULIE, XYL OF KEVIN

Peter, G4BVH, and Kevin, VK6LW, during a recent vsit to VK6/8 by Peter and XYL Irene.

AWARDS

THE TRAC AWARD

TRAC FOUNDATION DAY AWARD

Both of these are being issued by the Turkish Amateur Radio Club to celebrate it's 30th anniversary and they are for listeners and licensed amateurs. The first requires evidence of contacts with 30 different Turkish stations between 30 Jan 1985 and 31 Dec 1992 - on any band or mode. Endorsements will be made for single band or single mode if requested.

The latter requires contacts with five TA stations *with special callsigns* made on 16 July 1992 on any band/mode.

Apply before 15 March 1993 and include ten IRCs or US $10. Send a list of contacts/confirmed reports certified by two members of a radio club to TRAC Awards Manager, PO Box 14, 06510 Emek, Ankara, Turkey.

THE IRAQ RADIO AMATEURS CLUB

Rodger Collins, G1WAG, has sent me a copy of a document under this title. It was written by YI1RJ: "The story of amateur radio in Iraq began in 1978 when the first station in YI-land was established with the callsign YI1BGD. In addition several special calls were authorised with YI0 prefixes ie YI0BIF (Baghdad International Fair - November), and YI0SW (Scientific week).

In recent months we have

BAND REPORTS

Thanks to G2HKU, GM3CSM, G3s GVV, OUF, YRM, G4DJC, GW4KGR, G4s MUW, NXG/M, XRV, G0KDS and the UK Packet Cluster (via G4PDQ). Stations using CW are listed in italics:

10MHz

0100 *RH8AQ, 3X0HNU*
0500 *OY2H, VK9NS, VP2EOH, 3A/DF2UU, G4SMC/8R1*
0700 *OY7ML, 4K2MAL, ZL4HB*
1500 *TA7A, VP5P, 9V1WW*
1900 *S79CK/D, Z21HS*
2100 *HL1IUA, 5H3RA*
2200 *FY5FW, OK1IAI/YA, 5N0ZKJ, 7Q7XX*

14MHz

0600 AH9AC, C21BR, FO4LJ, *FO5BI/P*, H44MS, *KH6IJ*, ST0/PA3CXC, V73EU
0700 *FK8FG, FO5IV*, KH3AF, VR6BX, *9M8FC*(LP)
0800 *FO5JR, NL7BE*, V85GA
1500 *BV4CT*, TL8NG, XV7TH, XX9GD, 9M8FH
1700 *A22SG, S2/HA5BUS, TR8MD*, V73DC
1900 *AP2HA, 3X0HNU, 7Q7XX*, 9M2SH
2000 BV4HF, P29FS, S92AA, VP8CKA, 4S7VK
2100 D2APZD, V63OM, VK9LV, VP8CKZ, *ZA1TAE*
2200 *HF0POL, K7OXB*(Utah), *VK5QB*, G4SMC/8R1
2300 HH2JR, *HK0ER, HS0ZAA*

18MHz

0800 *AH6JF, NL7VJ, VK7JB, ZL1MH*
0900 *BT0AA*, JT1BR, KH3AE, VY1PM, *3D2QB*
1400 *OK1IAI/YA, 3D8CF, 4L2D*, 7X2WAK
1500 JAs, *V85KX*, 9M2DM
1700 A71BS, *JW5NM*, KH2FT, 9M8ZZ
1800 HZ1AB, PJ8AD, *8Q7WP, 9V1OK*
2000 IK1ACX/C6A, *EA9PB*, 5Z4BI (5W input), 9Q5PL
2200 JD1AMA (Ogasawara), *VP5/WB9HRO*, ZF2SO, *4K2OKV, 7N1ELO*, G4SMC/8R1

21MHz

0700 *AH6JF*, BY5RY, V73DO, *3C1EA, 3D2QB*
0800 A35KB, BY1BH, KH6ALF, KL7FAL, T20AA, 3D2AG, 9M2AB
1000 AH9A, BZ4RBX, HL5FRG, US6CH, VK9NS, 3D2ER
1100 T20AA, T30A, F6BAZ/TT8
1400 V63DM, YA/OK1IAI, YI1BGD, ZA1BM, ZS9A
1500 *HL1KSE*, S79CK/D, *TU4SR*, XX9AS, *YK1AO, 3C1EA*
1700 A92C, BV5BG, 7Q7s AP, JL
1800 KH6IDU, S2/HA5BUS, 8Q7HO
1900 A22JP, *KH6IJ*, ZL4JO, 3D2CC, 9Q5LN
2000 FH8CB, HF0POL, S79KMB, S92LB, 5R8GW
2100 P43JP, TJ1PD, VKs, VQ9JY

24MHz

1600 A71BS, A92BE, TL8CK, XX9AW, 6W1QJ, 7Q7XX, *9K2MU*
1700 *V47YD*, VP8CFM, *5T5CJ, 8Q7WP*
1800 KP2J, S79HP, G4SMC/8R1

28MHz

0800 JT1/RB5LUK, NH6WM, 3D2AG, 5Z4FM
0900 A41KL, A92EV, BY5RT, C9RTT, HS0AT, N0PMF/KH8, *S2/HA5BUS, VQ9AC*
1100 J28FH, P29CG, TL8NC, ZD7DP, 4S7AVR
1400 C9RDM, SV9ANH, *V85KX*
1500 FH8CB, HF0POL, *KP2BL*, S0RASD, 6T2YD/SA, 3B8FQ, *3X0HNU*
1600 C9RTT, *TA7I*, TJ1PD, XX9TQL, YI1BGD, 9M8ZZ
1700 CE250TA, N6QHO/D2, HS0ZAD, VP8s CEH, CKP, 3DA0BP
1900 J68AX, PY0FF, VK6MST, 9M2FR (SP)

QTH CORNER

A22MN K S Scheper, WA8JOC, 5875 Cedaridge Dr, Cincinnati, OH 45247, USA.
A5/HA5BUS Globex Foundation, Box 49, Budapest 1311, Hungary.
VP8CBG KJ9I, 4014 Carstens Lake Rd, Manitowoc, WI 54220-9595, USA.
VP8GAV D.Warburton, GM0LVI, 'Law Vista', High St, Errol, Perth, PH2 7QQ.
F6IRF/4U J Guillot, Route de Cheusse, La Gabardeliere, F-17139 Dompierre sur Mer, France.
5H0ROA (see below)
5H0ROA/A A47RS, PO Box 981, Muscat, Sultanate of Oman.
6T2YD/SA F6AJA, 515 rue du petit Hem, F-59870 Bouvignies, France.
G4SMC/8R1 G4CCZ, P Simons, 'Westwood', Faris Lane, Woodham, Surrey, KT15 3DJ.

1992 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G4OBK	48	**89**	**123**	260
G2VJ	41	74	85	200
G3KKJ	51	84	68	179
G3ING	34	30	28	92
G4NXG/M	-	50	28	78
GM0KMJ	-	-	59	59
G4XRV	**59**	-	-	59
GW4RGT	13	21	16	50
G4MUW	-	13	35	48

managed to move the cause of amateur radio forward rapidly. For the first time in our 14-year history we have managed to have the first personal callsigns allocated. These are : YI1RJ (myself - director of IRAC), YI1AFC (Abdul Mohmood - assistant director), YI1IY (Imad Najy), YI1AB (Saad Al Taie), and YI1MH (Majid Rasheed). These are the only - repeat *only* - authorised personal calls in Iraq. In addition to these there is of course the club station YI1BGD and shortly the new club stations at the University of Technology (YI1UOT) and Medical City (call to be allocated). The following is a list of authorised operators of YI1BGD - Alee Najy, Omar, Rafat Jamil, Dr Gazaala, Imad, Hussein, Haider, Yasser, and Abbas. In the past many of you will have worked Ali and Dhiya, - unfortunately they are no longer licensed." [apologies to any of these whose name is incorrect, the original was very indistinct - *G3FKM*]. "We are currently applying for our 3.5MHz allocation which we lost two years ago and are quite hopeful of an allocation at 50MHz following the submission of our application backed up by the letters of support and scientific data provided by the UK 6M Group of the RSGB. It is appreciated that many of you are awaiting cards from YI1BGD but as you are aware we had postal difficulties of late. Please be assured that as soon as circumstances allow we will catch up. In the meantime contacts with me since 1 March 1992 can be QSLed via G0MMI".

Three generations of Bazleys: John, G2BOZ (left), his son John, G3HCT, and Judy, VK4VJC, G3HCT's daughter. G2BOZ's other son is VK6HD.

DX NEWS

G1SWW HAS NOW returned from Halley V Base in **Antarctica** so that his VP8CES call is no longer operational. He has given me a list of Antarctic stations who are licensed for 1992. The base stations are VP8HAL (Halley station), VP8FAR (Faraday station), VP8SIG (Signy station), VP8ROT (Rothera station), and VP8SGB (Bird Island station). Personal calls are VP8CFO (Halley), VP8CKD (Halley), VP8GAV (Faraday), VP8CFN (Signy) and VP8CGK (Bird Is). Other news from the VP8 area is that VP8CDJ has now left **S Georgia** but that VP8CKB has now joined VP8CGK who is still there. If you hear a VP8 using the suffix /92HY this is to mark their Heritage Year. VP8CFM, on **S Orkney** keeps a sked with his QSL manager GM4KLO most nights at 1930 on 21.215 or at 2000 on 14.165MHz. Brian now has RTTY and 1.8MHz facilities. VP8GAV, at Faraday (IOTA AN-006), is now very active on 3.5 and 7MHz CW only - he does use SSB but only for skeds with QSL manager GM0LVI on Wednesdays and Sundays on 18MHz around 2000. VP8CGK and VP8CKB share the same shack and have beams for 7, 14, and 28MHz with wires for the other bands (including WARC).

If you hear 4A3NMP you might like to know that this a special station from **Mexico** operating from a replica of one of Columbus' ships.

The new callsign of 9L1US - who is now in **Botswana** is A22MN. He was very active when in Sierra Leone and will no doubt be heard frequently.

XT2BW should remain in **Burkina Faso** at least until the end of the year and he seems to be the only active XT station at present. He operates on all bands (including WARC) from 7MHz upwards and has been found on 10.110MHz at 2130.

9X5JA is a new callsign active mostly on 21MHz RTTY from **Rwanda**, and F1MXQ (ex-J28NU) is 9X5KM for a short period - he seems to prefer CW. According to the *Long Island DX Bulletin* TZ6VV, in **Mali** makes regular appearances between 28.480 and 28.490MHz at 1300. The same source says that 3B8CF, on **Mauritius** is now on the WARC bands and appears nightly on 10.105MHz at 2300. Marcel, ON4QM, is in **Sao Tome & Principe** and has the callsign S92QM.

According to *RSGB DX News Sheet* Mario Ambrosi, I2MQP, (secretary of ARI), has offered to help with QSL cards for contacts with Albanian amateurs. The Albanian postal service is not good, but Mario is prepared to receive cards and mail them to Albania monthly. Also, he is able to forward any enclosed money to Albania by bank transfer to ensure that it arrives safely. QSLs will be mailed direct from ZA. This may seem slow but it will be reliable!

According to *DX'press* W2ZWW now holds the callsign HS0ZAA and hopes to operate from **Thailand** on CW, SSB, and RTTY. Apparently use of the WARC bands is not allowed at present but he appears on 21MHz between 1300 and 1500, 14MHz from 2100 to 0000, and 7MHz around 1100. More activity from

continued on page 19 ▶

VHF/UHF NEWS

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

QUITE A THICK wad of letters and fax messages arrived this month. An unexpected, and intense, aurora on 10 May, some good tropo a week later and Sporadic-E openings on 50MHz were mainly responsible for this welcome upsurge in literary activity.

RECORDS

A DATABASE of 'firsts and furthests' is being established at the instigation of the VHF Committee. As previously reported, two readers volunteered to tackle this task. They are John Morris, GM4ANB, and Pat Allely, GW3KJW. Both are QTHR and Pat can be reached on the packet network. If you have any claims or useful information, please contact either of them.

VHF COMMITEE

AT OUR 16 May meeting, chairman Peter Burden, G3UBX, asked if anyone knew who had the 1962 VHF Committee Cup? This is supposed to be awarded annually for the best home constructed equipment but we seem to have lost track of its whereabouts. Can anyone help?

Another point mentioned was non-amateur interference in the VHF/UHF bands. There are examples of so-called security firms, and outfits dealing with repossessing motor vehicles, which have been supplied with transceivers operating in our bands. Illegal base stations in cordless telephone networks operate in the 70MHz band.

In some instances, groups of amateurs have discretely accumulated enough information to enable the Radio Interference Service (RIS) to take the necessary action. If any readers are troubled by such activity in our bands, they should log frequencies and times and preferably make tape recordings of the traffic. All data should be passed to the Society's Intruder Watch (IARUMS) officer, David Owen, G0OES.

PUBLICATIONS

THE FIRST issue of Dave Hardy's, G8ROU, *VHF-UHF DXer* contains some interesting articles. These include a table of noise figure measurement results from the Martlesham VHF Round Table; a 144MHz GaAsFET preamplifier by G1WBZ; quick and easy Yagi elements by G3SEK; recent WWV propagation data; an Es table covering May to August, from 1977 to date, and TV DXing by G0GTF. For subscription details, contact Dave at Thorntree House, Wensley, Matlock, Derbys, DE4 2LL.

DX NEWS

STEWART COOPER, GM4AFF, sent details of proposed operation from IO88CB square - or YS72g if you prefer - scheduled for 9 - 14 August. The operating frequencies (QRGs) for SSB and CW MS are 50.155 and 70.210MHz, 144.095MHz for CW MS, 144.210MHz for SSB tropo and MS, with all-mode activity on 432.210 and 1296.210MHz. The group will be QRV on the 14.345MHz VHF net throughout and can also be reached on packet to GM0FRT @ GB7CQV to arrange skeds.

METEOR SCATTER

DAVID Hilton-Jones, G4YTL (OFE), passed on details of this year's BCC Meteor Scatter Contest promoted by the Bavarian Contest Club. The dates are from 0000GMT on 8 August to 2400GMT on the 14th. Send me an SASE if you want a copy of the rules. Last year's event was during the December Geminids and attracted 24 logs, compared with 31 in 1990. However, more stations were active - 162 compared with 135. Multi-op station UB4EWA/UB5V (KN58XA) was the clear winner with 2240 points from 56 QSOs. The sole UK entrant was Colin Morris, G0CUZ (IO82WM), who was 16th with 64 points from eight contacts.

There are no showers in July likely to enhance the normal random reflections to any noticeable extent. Next month we will have the Perseids stream, predicted to peak on 12 August at solar longitude (LS) 139.9 degrees at right ascension (RA) 46 degrees and declination (DEC) +58 degrees. More details next month.

MOONBOUNCE

THE PROBLEM of QRM in the EME segments of the 144 and 432MHz bands was discussed at the IARU Region 1 VHF/UHF/Microwave Committee meeting in Vienna in March. The main cause is harmonics from 8 and 16MHz crystals in widespread use in home and business computers.

Recommendation D states: "Societies should publicize the use of 144.140 to 144.160MHz as an alternative for EME operation. The results of this should be monitored with the aim of incorporation into the usage part of the band plan if successful." This is the FAI section of the band, also a weak signal mode, so the idea makes sense. No recommendation was made for 432MHz EME.

GM4AFF reports having worked CX9BT for a claimed 'first' 144MHz GM/CX QSO on any mode. Stuart also worked C53GS which he hopes is another first from Scotland. To dispel the idea that successful EME operation on 144MHz requires very high power and big antenna arrays, Mark Holloway, G4YRY (DOR), has completed 18 contacts with 12 different stations, or 'initials' as they are referred to in the trade. He has heard a further nine.

From mid-March to mid-May his new ones were SM7BAE, VE7BQH, DL8DAT, OK1MS and WA6MGZ, some QSOs being made with just 80W and no masthead preamp. Geomagnetic disturbances, such as an aurora, often adversely affect EME tests but this was not the case on 10 May. Mark completed at moonset with WA6MGZ who was RST529 during the aurora.

Doug Mallett, G3HUL (NOR), sent details of his 432MHz antenna system which was shown on page 65 of the May *RadCom*. All eight 28-ele Yagis are fed in phase using 200Ω open wire feeder. Four feeders are fed to the centre of each bay of four to a 50Ω balun, then the two 50Ω lines are combined at a two-way power divider. The claimed gain is 25dBd. Beamwidths between the -3dB points are 7° and 14° in the horizontal and vertical planes respectively.

He operated in the 9/10 May sked weekend and completed with SM2CEW, DF3RU, F6CGJ, F1FHI, K1FO, F6HYE, DL9KR, JL1ZCG, N4GJV, SM0PYP and UT5DL. All were random QSOs and DL9KR peaked at 15dB over noise at times. Doug runs 700W with a 0.37dB GaAsFET preamp, a noise figure measured at the recent Martlesham meeting.

4/5 July could be a useful day (PM) sked weekend, but as it is also VHF NFD, some operators may be otherwise occupied. 25/26 July is the next favourable weekend with the Moon's declination over 20 degrees.I imagine most readers interested in EME have computer programs to predict the Moon's position, so, unless there is a demand, I do not intend printing detailed information.

50MHZ

PROPAGATION

Your reports show that Es was the most frequent propagation mode from late April; this is the usual pattern on 50MHz from midspring and throughout the summer months. Openings to selected parts of the Americas and to central and southern Africa were also reported.

Next a puzzle for the propagation gurus set by Chris Tran, GM3WOJ (HLD). At 1322 on 10 May, during the intense aurora, he ". . . . was amazed to hear ZS6RAD with a tone A signal calling CQ on 50.105MHz CW, peaking about S5 among S9-plus Europeans." He worked him, then contacted ZS6AXT, ZS6PT and ZS4S in the following quarter hour.

He continued: "These signals peaked at 105° approximately, with no T9 signals detectable on the usual 135-140° TE-plus-Es path. ZS6AXT was very strong and made a tape recording of this unusual event. ZS4S faded slowly, inaudible after 1340." Chris suggests a link-up from aurora to TE or perhaps aurora/Es/TE. At the time assorted tone-A video and unmodulated carriers were audible on an easterly azimuth.

NEWS

Ted Collins, G4UPS (DVN), sent his usual information. In Turkey, F1JKK is now licensed as TA5ZA. OZ1DOQ and OZ1FTU should be on from TA2 and TA8 in Turkey, 14 - 29 July; squares are KN40, 41, 51, 61, 62, 71 and 72 and QSLs should go via OZ1DOQ.

Stations in the Republic of Croatia are using the 4N2 prefix retaining their original suffix letters, but the Slovenians are still using their YU3 calls. YU7AU(KN04HU) is now QRV from Vojvodina province. LZ1JH (KN22WR) has been QRV since mid-May and is thought to have a permit.

Geoff Brown, GJ4ICD, learned from UL7GCC that UA2FJ (KO04) is now on from Kaliningradsk with a transverter, 400W amplifier and

5-ele Yagi. (UA2 is a separate country from UA1, 3, 4 and 6). SP4TKK (KO03) has been sent an FT-690 transceiver and is likely to be the first legal 50MHz station in Poland; he is QRV crossband on 10m. A 5-ele Yagi has been sent to the club station on Ascension Island. ZD8SA should be active, too.

ACTIVITY

Neil Carr, G0JHC (LNH), listed many interesting contacts in May including ES6QB (KO37) on the 12th and ES5MC (KO38) on the 18th. CX4HS (GF06) was worked at 1950 on the 13th when there was a double-hop Es selective opening to VE1, 1955 - 2110. Probably the best DX was FR/DJ3OS/G (LH38) on Glorieuses Is. on the 14th and D68BR, alias DJ3OS, in the Comoros (LH18), on the 23rd during Bernd's two-day operation on his way home.

Between 1236 and 1516 on the 10th, Terry Chaplin, G1UGH (SFK) worked 16 near-continentals in the aurora. He contacted a wide spread of Europeans via Es mode on 18, 22 and 23 May from CT to SM3, IS0 and ES. Shane Hogarth, G7EWL (NHM), reckons around 1630 to be a good time for Es. On 18 May he worked OH3, SM0, 5 and 6, LA and OG2LQO (KP20).

G4UPS reported Es on 24 April, but no more until 5 May. Ted listed many Europeans heard/worked on May 6, 7, 9, 11-16, 18, 19 and 21. African stations were coming through on May 6, 12-14, 18 and 20 in the late afternoon/early evening period. South Americans were heard on 7, 13 and 16 in the mid-evenings. In the 10 May aurora, Ted heard/worked 16 countries from EI to YU and F to SM.

Ela Martyr, G6HKM (ESX), worked 15 countries in the aurora including HB9 and OK1DDO (JO60), her first Czech station, filling three log pages. Good Es on 5, 9, 12, 14, 21 and 22 May brought more table points and best DX was FR/DJ3OS/G on the 18th.

GJ4ICD logged Es from 0730 on 5 May with OY9JD worked at 1400. There was a nice opening to A2, Z2, 7Q7 and 9J2 from about 1700 on the 6th. FR/DJ3OS/G was Geoff's 122nd country and 526th square at 1708 on the 18th. He reported a QSO with G3SED/EA8 on CW next day. Why are foreigners 'allowed' to operate on 50MHz from Spanish territory when the natives aren't?

Al Harvey, GU7DHI (GUR), wrote that a group of Guernsey amateurs hope to activate the island of Sark, 10 - 13 July, using the special call GB6SIX. In his fax of 30 April he said they were waiting permission from Sark and looked forward to no ignition QRM, since cars are not permitted on the island.

From Wales, Paul Baker, GW6VZW (GWT), is only QRV on 50MHz and has already amassed 45 countries this year. The highlights in May were GU0ING (SRK) on the 4th; A22BW, 9J2MK and V51W on the 6th; CX4HS and G4SMC/8R1 on the 7th; the 10 May aurora in which he made 83 contacts as far south as IN94; FR/DJ3OS/G and 7Q7s on the 14th and ZB0/G1SWH on the 21st.

144MHZ

STEVE CRANE, G0CUH (IN69UV), keeps the Scilly Isles on the VHF/UHF map and caught the aurora on 10 May. Unfortunately TVI problems with a neighbour curtailed operation. He mentioned a contact with GW7KES/MM (IN58), but didn't give the date. He plans to concentrate on the higher bands but will continue on 144MHz.

Geoff Grayer, G3NAQ (BRK), asks if anyone has information on FE6BPB heard sending "FE6BPB test balise VVV VVV" on 144.860MHz? This was first heard around 1700 on 4 May at S3 peaking at QTE 115°. French beacons have an FX prefix, so this may have been FE6BPB operating in 'keyer' mode, if that is permitted in France.

Dave Butler, G4ASR (HWR), had a whale of a time in the 10 May aurora which was a two phase event, 0930 - 1830 and 2125 - 2325. He made 146 QSOs on CW in 66 squares and 17 countries, the breakdown being 25 OKs, 13 HGs, eight each YUs and Is, six HB9s and assorted OH, SP, OE and the more usual stations. Optimum azimuths for most of the time were 60-70°.

David Mitchell, G4WPS (LNH), is back on CW after a five year lapse. He would like to see reports including the mode used, eg SSB or CW, plus more equipment details. G6HKM filled up two log pages with SSB QSOs in the 10 May aurora. Ela's first contact was with IW4BAI (JN45), and OE3UP was worked later. Good tropo on the 17th brought seven EIs and GM4PSX (OKE).

G7EWL missed the auroras but did work GU0ING. In the 16 May contest Shane contacted GI4KSO/P for a new country and next day worked several new squares in GM, DL, PA and OZ. He has started building a 4CX250B amplifier. Ian Harwood, G8LHT (YSS), had 90 contacts in the 10 May aurora, best DX being 4N2RD (JN65) and FC1BRV (JN26) on SSB. In a smaller event on the 22nd he found GW8VHI/P (GNW).

Frank Holland, GI0AIQ (ARM), runs an FT-767GX with 10W 2m module, a Sentinel 100 amplifier and a 2 x 9-ele cross-polarized Tonna Yagi. Between 1245 and 1545 on 10 May he made 25 CW QSOs in the aurora with stations in DL, EI, F, G, GM, OK, ON and PA. The optimum QTE was 50 - 60° throughout.

Arlen Pardoe, GM0HUO (FFE), spent most of his time in the 10 May aurora on SSB as the CW end got so crowded. His first contact was on CW at 1116 with PA3FBN and the last was DJ2IE on CW at 1449. The first phase faded around 1600, the second starting at 1730. He enjoyed the good tropo in the contest on the 16th and again on the 17th, working into DL and PA on both SSB and FM. UA1NAW/MM on the 18th was a rare one - but he was only in Leith!

Doug Smillie, GM4DJS (SCD), first heard the 10 May aurora at 0940 and monitored it for nearly nine hours till 1830. He recorded up to ten changes of magnetic deviation per hour till 1700 after which the trace stabilized. There was a large transient pulse around 1830 with slow and rapid deviations, followed by a second large transient around 2130. Pulses continued till 0700 on the 11th.

Edward Allely, GW0PZT (GDD), now runs 100W to two stacked 9-ele Yagis, 700ft ASL and worked several southern European squares in the 10 May aurora. His best DX were SP3TYF (JO82) 1427km, HG1YA (JN87) 1633km and OK1AUN (JO70), the only one worked on CW, at 1425km. The good tropo on 16/17 May brought lots of DLs, Fs, ONs and PAs plus HB9DF/P and LX2LA.

430MHZ

RICHARD GIRLING, G4FCD (OFE), lists his best May DX as LX/PA3FPS/P (JO30) on the 2nd, DF1VW/P (JN39) on the 3rd, and on the 17th DL5YEE (JO42), OZ9IT (JO46), LA1ZE (JO28) and OZ6AQ (JO44). On 15 May, G0CUH could hear stations 200 miles away working DLs and ONs but nil from St Mary's.

G4YTL has been back on the band since last summer for the first time in 18 years. David runs 20W from an LT70S/IC735 combination to a 17-ele CueDee Yagi. He has 39 of the 40 counties needed for his Senior Award. Direct QSLing with SASE has had no effect on: "One culprit, worked /P from two different counties"; any ears burning out there?

G6HKM gave away a few points in the Trophy Contest on 3 May, working DF1VW/P (JN39)

continued on page 19 ▶

ANNUAL VHF/UHF TABLE
January to December 1992

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Points
G4FCD	39	18	-	-	85	20	47	18	31	11	269
G6HKM	62	39	-	-	60	20	23	15	14	7	240
G1SWH	8	20	17	5	38	10	21	9	2	1	131
G4LDR	12	10	21	2	34	11	25	9	-	-	124
GW6VZW	71	45	-	-	-	-	-	-	-	-	116
G8ESB	7	3	15	2	37	9	14	3	7	2	99
G7EWL	24	9	3	1	45	15	-	-	-	-	97
G0JBA	-	-	18	1	26	11	15	9	10	5	95
GW0PZT	-	-	-	-	59	20	-	-	-	-	79
G3FIJ	-	-	13	2	31	8	19	4	-	-	77
G3FPK	-	-	-	-	52	15	-	-	-	-	67
G4OUT	-	-	17	3	32	9	-	-	-	-	61
G7JAF	-	-	-	-	32	10	4	1	-	-	47
GU4HUY	-	-	-	-	24	8	-	-	-	-	32
G7CLY	-	-	-	-	17	8	1	1	-	-	27
G6AJE	-	-	-	-	8	2	-	-	3	2	15
G8LHT	-	2	-	-	2	10	-	-	-	-	14

British counties are those listed on page 65 in the January 1992 RadCom; 77 in all. Up to three different stations allowed in all 12 GM regions. Do not include EI counties. Countries are the usual DXCC ones plus IT9. Deadline for the next appearance is **30 July.**

HF F-LAYER PROPAGATION PREDICTIONS FOR JULY 1992

The time is represented vertically at two-hour intervals 00(00)GMT for each band, ie 00=0000, 02=0200, 04=0400 etc.
The probability of signals being heard is given on a 0 (indicated by a dot) to a 9 scale; the higher the number the greater the probability with 1 meaning 10 to 19 per cent of days, and so on. Additionally 50MHz F-layer and 1.8MHz openings are indicated by a plus (+) sign in the 28 and 3.5MHz columns.

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.	...121111441	212444324674	646665556788	875433334578	652111111357	32.....24
MALTA	.....	.....11.	1..222222442	312454445775	866766667899	998543344689	885211112368	+52.....35
GIBRALTAR	.....	.....	....1....22.	1..132222453	633665555787	987654445689	886422122468	++4.....35
ICELAND	.....	.....	.....	121	311233222565	765554444567	676422222345	343.....2
** ASIA								
OSAKA	.....	.....	....11..1111	...121112342	....21..2573	351	.....2.	.....
HONGKONG	.....	.....21.	...121112441	1..122113664	2....1.12686	365	32	.....
BANGKOK	.....1..	...111..132.	1.1222223652	211112224775	5.....12688	3.....367	1.....35	2
SINGAPORE	.....11.	...1111.133.	1.1233224663	311123224786	51.....12688	3.....367	1.....35	2
NEW DELHI	.....11.	..111111232.	112222224653	322112224786	73.....12688	61.....368	3.....35	2
TEHERAN	...111..122.	..1222213441	214323335774	535212235787	864.....2689	851.....368	62.....135	3.....2
COLOMBO	...1111.1.1.	..1222213221	212323335553	532213235686	84.....2688	62.....368	4.....135	2
BAHRAIN	...111112321	1.2322223542	324333335776	645211235898	974.....2689	851.....368	62.....136	3.....3
CYPRUS	...111111321	1.1333323552	424655556886	756766667898	987543345789	985211112478	762.....257	43.....24
ADEN	...212223431	212323435654	535433446887	866312335899	9851....2689	862.....368	64.....136	4.....3
** OCEANIA								
SUVA/S	.....	.....	.....11.	...111.11331	..2321..1551	..12.....22.	.....	.....
SUVA/L	1.....32	3211.....53	3334.....75	23561.....74	.1551....151	..23.....23.	.....	.....
WELLINGTON/S	.....	.....	.....2.	..1211....42	114421....63	..32.....141	.....2.	.....
WELLINGTON/L	1.....1	321.....3	5432.....16	5564.....47	34651....165	.133.....252	..1.....2.	.....
SYDNEY/S	.....	...11.....	..13221....1	1125321....4	212521..1225	...2.....353	31	.....
SYDNEY/L	1.....1	21.....3	4213.....6	53351.....17	21362.....56	...3.....153	...1.....31	.....
PERTH	...111.....	..12222.....	2134433.....	42334321....	63112...111.	4.....25.	1.....134	2
HONOLULU	.....	.....	.....11.	....11..1211	..2321..13..	..23.....	.....	.....
** AFRICA								
SEYCHELLES	...212223211	1.2333435432	524434446766	756312235788	975.....2689	862.....368	63.....136	4.....3
MAURITIUS	...212323432	..2333445654	2.5534446887	5.6423235899	9361....2689	873.....368	65.....36	42.....3
NAIROBI	1..212334522	312333556744	635534456877	867522335899	9972....2689	884.....368	662.....36	33.....3
HARARE	1..112445642	4..333556765	722643456888	945732235899	9875....2689	8862.....368	763.....36	43.....3
CAPETOWN	...1113554..	...23356672.	...554456851	...753235873	31.52...2687	8613.....368	762.....36	43.....3
LAGOS	1..111355642	31.232456864	643553446887	875742225899	99862...2589	8863.....368	763.....36	44.....3
ASCENSION Is	21233541	11..32345762	43..53346886	762153224798	99642...1589	8863.....268	763.....36	43.....3
DAKAR	1...21233541	321232354763	753553344887	986653122798	99863....489	8863.....168	763.....35	43.....2
LAS PALMAS	....1..11221	1..121232442	521454455776	864676666898	998765455689	997532122478	87521....157	552.....24
** S. AMERICA								
Sth SHETLAND	......2435..	......35572.	......45585.	.....123477.	1584	411.....267	753.....35	43.....2
FALKLAND Is	132431	354663	2....2355886	5....2234788	8321.1..1579	8752.....258	6631.....26	33.....3
R DE JANEIRO	1....1132331	31...2244553	653..3344786	875113223688	998421...379	8863.....47	6631.....25	33.....2
BUENOS AIRES	1....1122331	31.1.2243553	6423.3344676	8755.3233588	998611..1269	8863.....37	6631.....15	43.....2
LIMA	111	2...1.121233	531232232346	863442222247	997531....16	8863.....3	6631.....1	33.....
BOGOTA	11	2....1.11122	52.122222245	752333221237	886531....16	7863.....3	5631.....	23.....
** N. AMERICA								
BARBADOS	11	2...11111133	531133222256	863443211157	997531....27	8863.....4	6631.....1	33.....
JAMAICA	1	1.....22	41..12111135	7412221211 26	885531.....4	6863.....1	3631.....	.3.....
BERMUDA	.....	1.....22	41...2111135	7412221111 46	885421....16	6863.....3	4631.....	.3.....
NEW YORK	.....	1	3....1.1.124	521..1111125	774311....14	5863.....1	2631.....	.3.....
MEXICO	.....	11	2.....1.122	52.1..111113	56432.....1	3663.....	.431.....	.....
MONTREAL	.....	1	2.....23	52...1111125	764311....14	5763.....2	2531.....	.2.....
DENVER	.....	.....	1.....1	31.....1	4433.....1	1553.....	.23.....	.....
LOS ANGELES	.....	.....	1.....	21.....1..1	23331...1...	.353.....	.13.....	.....
VANCOUVER	.....	.....	.....	1.....	23331...1...	.253.....	..2.....	.....
FAIRBANKS	.....	.....	.....	...111.....	112321..11.1	..22.....	.....	.....

The provisional mean sunspot number for May 1992 issued by the Sunspot Data Centre, Brussels was 73.5. The maximum daily sunspot number was 118 on 23 May and the minimum was 30 on 30 May. The predicted smoothed sunspot numbers for July, August and September, are respectively: (classical method) 119, 117, 115; (SIDC adjusted values) 137, 135, 134.

QSL

RSGB QSL Bureau,
PO Box 1773, Potters Bar,
Herts, EN6 3EP

● There are new QSL Sub-Managers as follows:

G4S series - Mr JM Payne, RS93150. Address is: 1 St Huberts Drive, Skegness, Lincs PE25 2LS; GI class A series - Edward Barr, GI7FFF. Address is: 'Ed-Mar', 1 Onslow Drive, Bangor, County Down, N Ireland, BT19 2HQ; G0MAA to G0MZZ series - HC Foster, G4EZS. Address is: 23 Ghyllroyd Drive, Birkenshaw, Bradford, W Yorkshire BD11 2ET

● Mr D Roebuck, G0LJM, QSL Manager for G4AAA-G4AZZ and G4HAA-HZZ, has changed his address which is now 56/58 Main Road, Denholme, Nr Bradford, W Yorkshire BD13 4BL;

Also the Novice QSL Sub Manager is Mr MJ Shread, of 2A Seatown, Gardenstown, Banffshire, AB45 3YQ.

● The recommended Imperial size for QSL cards is 5.5 x 3.5in but Frank Harris, G4IEY, one of the Sub Managers, suggests it is high time we quoted equivalent metric sizes which I will gladly do. 140 x 80mm would seem to be the nearest, so there is now no excuse for those awkward sizes being sent and jamming up the system.

● There is no bureau in the Seychelles (S7). Amateurs are requested not to send cards for this country via the bureau. Those wishing to verify contacts should QSL direct or through a QSL manager. I am afraid we will have to return to the sender any S7 cards that do not bear routing instructions.

● John Garrett, G3RHP (ex VP8CIN), has kindly written to me about the Falklands QSL situation. He tells me that to say "all VP8C- calls are club members" is not strictly correct. Whilst many VP8C- licence holders are with the Armed Forces or civil contractors working at Mount Pleasant (MPA) base and probably club members, it is also true to say that any new licence issued for HF is likely to be VP8C- as well. John points out that his licence was just such a case.

The problem with QSLing to the Falklands is also compounded by the fact that there is no postal delivery service within Stanley so the residents have to collect their mail from the Post Office where they have a box number. John concludes by saying that there are very few VP8s active on HF except from MPA, and those that are will probably have appointed a QSL manager anyway.

The first Novice QSL card seen in the *RadCom* office.

● A little item in the April 1992 issue of *HaGAL*, the Israel Ham News, took my attention. It reads; "4 Parcels of QSL cards returned from England stamped 'Have moved away'!"

I will write to the Israeli Bureau and give them the PO Box 1773 address because my guess is that they might have sent the cards addressed to Ted Allen or even his predecessor! Anyone waiting for a card from 4X4 should not, therefore, hold their breath!

John Hall, G3KVA

HF NEWS

continued from page 15

Qatar - SP5EXA has now received the callsign A71AZ and is active mostly on CW. F6IRF/4U is located in **Cambodia** and trying to get an XU call. He is there until the end of August and according to *RSGB DX News Sheet* frequents 14.033, 14.233, 21.033, and 21.233MHz.

N0PMF/KH8, in **American Samoa**, will be there until October. Apparently he works most bands.

FW1FM is said to be very active from **Wallis & Futuna Is** and likely to be found on 18MHz between 0800 and 1000.

PROPAGATION

THIS MONTH Smithy writes: "The steady downward trend of solar indices reported last month has continued. By the middle of May the daily solar flux values were in the 120s and the 27-day average had fallen for 60 days from 236 to below 150sfu, a value not seen since the last quarter of 1988. There is therefore little doubt that the peak phase of the cycle has ended and it rather looks as though the descent may be steep, as it was in the previous cycle. "During the second half of April and early May there were no major disturbances of the geomagnetic field and HF band conditions were reasonable for the time of year and the reduced level of solar activity. In the second week of May this situation changed and a severe magnetic storm (Boulder A index 99) caused major disruption."

THANKS

TO THE *RSGB DX News Sheet* (G4DYO), the *Lynx DX Group Bulletin* (EA2KL), *DX'press* (PA3DZN), *DX-NL* (DL1HBT), and the *Long Island DX Bulletin* (W2IYX). Also to the many others who sent in news items.

Please send everything for the **September** column to reach me by **23 July**.

● THE RSGB Intruder Watch needs information on intruders in the 40m band. On 7.002MHz at 1830 GMT, an auto CW mode A1A comes up with: "Pirates ins sbon QRS", for 2 hours at a time. Information needed is beam headings, other times on, and any other frequencies in use. If you have any information, please send to the RSGB Intruder Watch Coordinator, G0OES, QTHR.

VHF NEWS

continued from page 18

and others. On the 16th Ela worked GJ4ICD, on the 17th EI2GK (WKW) and on the 18th DC6UW (JO44). John Hill, G7CLY (HBS), hopes to be QRV soon.

MICROWAVES

ON 17 MAY, GU8IRF telephoned G0CUH urging him to get on 23cm. They had a fine RS59 contact with Steve running 0.5W to a 23-ele Yagi. Succeeding QSOs were with G6LEU (CNL) and two Fs in JN18. He will be adding a 15 or 30W amplifier soon and is planning to build a transverter for 13cm.

G4FCD caught the 17 May tropo on 23cm working OZ2OE (JO45) and OZ6AQ for best DX. G6HKM operated in the contest on 3 May. Ela exchanged RS52 reports with GJ4ICD on the 16th, but next day they were RS59-plus. She is still looking for EI on the band.

GJ4ICD sent a tape recording of beacons heard on 23cm in the lift. FX3UHX (IN78) on 1296.875MHz and FX4UHY (JN06) on 1296.885MHz were copiable for long periods, the former up to S8. GB3MHL (JO02) was S2 and GB3MCB (IO70) was S6.

SIX NEWS

Neil Carr, G0JHC (LNH), sent a copy of the April issue of the UK 6m Group's journal, *Six News* which continues to maintain a high standard of editorial content and presentation. Send an SASE to Mr J P Turner, G4IIL, Flat 6, 132 Marine Parade, Brighton, BN2 1DE for membership details.

DEADLINES

QUITE A BUSY month, for a welcome change. The absolute deadlines for **September** are **30 July** and for **October**, **27 August**. The fax number is 081-668 5582, the BT Gold mailbox is 76:MSX 021 and the telex number is 9312111074(CN). I'll be joining the CompuServe network next and will let you know my ID.

RSGB SPORADIC E HOTLINE

0426-952211

(local rate call in the UK)

An RSGB Propagation Service

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

AS REPORTED in February's *Novice News*, Denby Dale and District Amateur Radio Society held their second 'Youth in Action' project in August last year.

Since then, four Guides have passed the Novice exam, coached by Paul, G0LVV, the youngest being eleven years old. Their Guide leader became a licensed Novice last year and all are, naturally, pleased that the project is to be repeated this year.

At present, the club is considering ways to help these new Novices to enjoy the hobby by providing opportunities to get on the air. I am promised a progress report, so you will hear more in time.

GB2YIA will be on the air again this year with the 'Youth in Action' project running between 13 and 17 August as Eric, G0DBU, has written to tell me. The groups involved before have been invited again - resources do not allow an open invitation, unfortunately. Enjoyment is guaranteed for youngsters and club members alike!

If you would like to collect their special QSL card - and perhaps speak to one of those Novices - look out for GB2YIA.

I wonder if any other radio clubs have considered a similar venture. It provides an opportunity to meet local youth groups and gives them an insight into amateur radio - and perhaps encourage some into the hobby. A lot of work and organisation is involved but the pleasure and satisfaction gained makes it well worth-while, ask Denby Dale and District amateurs! But don't forget to let me know.

RADIO INTERESTED SCOUTS

IF YOU LOOK back at the photograph in January's 'Novice News', you will find Andrew, 2E1ABI, in the centre of the back row. Now he is featured again.

A group of scouts in Holland, decided that a once-a-year meeting on the air at JOTA was not enough contact between radio-interested Scouts. So about six years ago 'Radio Interesse Stam' (RIS) was formed to extend contact throughout the year and it has proved very successful.

"Why not a UK equivalent?" thought Andrew, and RIS UK was born. Aimed at younger members especially - though not exclusively - the aims of the organisation are to promote amateur radio in the Scouting world, encourage technical activities throughout the country and to offer information, encouragement, ideas and much, much more. *Radio Wave* is the Newsletter of Radio Interested Scouts UK, and it contains a lot of information - Issue 1 is out now. The annual subscription is £2 and I would suggest that, if your interest is in this direction, it will be money well spent.

If you want to know more and would like an application form, write to Andrew Sampson, 2E1ABI, 47 Falcutt Way, Kingsthorpe, Northampton NN2 8NR. An SAE to him will provide some interesting reading.

HELP PLEASE!

IF YOU have ever had the job of erecting aerials for that special occasion, I am sure this will strike a sympathetic note.

Special Event Stations are planned well in advance and one of the considerations when planning the date is the weather. Everyone hopes that the sun will shine and the event will be an enormous success. Alas! In this country, we take what we get and make the best of it.

Is there anyone out there who has devised a temporary antenna which is simple to construct, and just as simple to erect, that will withstand the rigours of a typical Special Event Station day (wet and windy)?

If so, there are many blue-fingered amateurs who would like to hear about it. Please may we hear from you? Your help will make many organisations very happy.

An enormous amount of work goes into planning and organising these events which fly the flag for amateur radio and are often the introduction for youngsters. It seems such a pity that the contacts made by these stations is not a true reflection of what *can* be achieved - given a really efficient antenna system.

If you have found a solution, please let us hear from you. You could earn eternal gratitude! From me, for one.

NOTE THE NAME

BEFORE WE set off for the rally at Harrogate, I was given a shopping list. If the price was right, would I please buy fifty 8-pin IC sockets? They were for group construction at the RSGB'92 show. Of course I would.

I had a good look round and found a stand selling small components that was not too busy. Everything was laid out neatly and was clearly labelled. The sockets were priced singly and 'four for £1'.

I placed my order and as the young man was counting them, he asked if they were for a project for young people. On being told that they were, he handed the bag to me and said "I shall hate myself for this - but give me £1"

In business for about two years, the policy is to help youngsters to get started as painlessly and cheaply as possible. I am sure that he can't afford to be so generous every time, but I would like to say a public "Thank you" to John of Mainline Electronics for his sentiments and generosity - I hope he is very successful in business - he deserves to make his fortune!

WE ALL MAKE MISTAKES

I WAS TALKING the other day to a novice who was quite upset - and no wonder.

She was working through a repeater with her hand-held rig which does not have an automatic toneburst and needs to be activated manually each time. She is not very active on the air and is still very nervous.

She kept the toneburst depressed rather longer than is normal and was horrified when someone (no callsign given) took her to task rather sarcastically.

This is *not* the way to encourage Novices. Happy is the amateur who has never made a mistake - by the nature of the hobby mistakes are always made in public. May I appeal to *all* amateurs to show good manners and a little understanding to *all* newcomers, whether Novice or not. Remember you were in that position once.

TDOTA '92

ONCE AGAIN, the weather was less than kind. Cold, wet and windy conditions made antenna erection difficult, but dedicated helpers up and down the country struggled manfully with the weather outside, while inside, others set up stations, put posters on the walls and set out tables with materials for the various activities connected with the hobby. Elsewhere, the other Guide activities were prepared - and, of course, by the time Guides and Brownies arrived all was ready.

Guide Thinking Day on the Air Co-ordinator Jennifer, G8WWO, has given me a brief outline of the reports she has received for this year's TDOA so far.

Upwards of 200 stations were set up with 37 operating for the whole weekend. nearly 500 contacts were recorded between GB Guide stations.

There were some Novice operators, so if you worked a TDOA station you may have met a Novice and not known it. Last year ten licensed Guides took part; that number has doubled with twenty taking part this year.

The activities were extended with construction playing a larger role. These were enjoyed - as they always are when first attempts actually work.

Locally, there was a Raynet exercise which took some of our potential helpers away and a French contest made life a little more difficult for us and many other stations. For overseas working, night-time operating gave the best results. Unfortunately, many could not operate then and only older girls could take part.

Jennifer tells me that all reports are not yet in. If the picture changes as they arrive I shall give an update.

CARRICKFERGUS CLUB NEWS

THERE SHOULD be plenty of 2I1*** Novice callsigns in the future, thanks to the efforts of Carrickfergus Amateur Radio Group who's club callsign is GI0LIX. 2I1 did I say? I am sure that by now there are 2I0 callsigns.

Secretary Gavin, GI0GMG, sent the information and a photograph of the student group who took the NRAE in December, along with one of the instructors Joe, GI0TIJ. He and the other instructors must feel very proud of their students as the success rate was *very* high. I am not told if it was 100%, but no retakes were mentioned! The photograph shows Joe with the happy group. Congratulations to all.

Success breeds success it is said, and this is certainly the case here. So much interest was aroused by that first course that a second one has begun.

This time no fewer than five instructors are needed to lead the seventeen candidates in the same direction. All will have taken the June exam by the time this is read and the same pass rate is expected. If that is the case, there will be a good cross section of the community - male and female, with an age range between eleven and fifty years. Not only does this ensure a thriving future for the club, it also augurs well for amateur radio in general - especially in Northern Ireland.

If other clubs are running courses in this way and achieving the same success please let me know so that I can boast on your behalf. Meanwhile, is there a record coming here? Thank you Gavin for the information, I hope I can report again on the next set of results in Carrickfergus. Please write and tell me.

SCROOGES CORNER

I COULD LEAVE a large gap at this point, but I don't think that would make me very popular. To fill this space, I need your help.

I do have a few snippets concerning choice bits and pieces that can be 'rescued' from equipment that is considered otherwise dead. But I need more to make a varied batch.

I cannot believe that amateurs have become so wealthy that they can afford to be less inventive. By now, Novices too must have found ways to save money.

Any ideas?

SIX METRE ANTENNAS

A CARD from Chas, 2E1AMT, brings the comment that transceivers for the six metre band do not seem to be too popular with manufacturers at present.

He also adds a plea for advice on antennas for this band. Can anyone help? I know that many Novices are active on this band - with great success - and must have overcome any problems.

If anyone has a design or other suggestion, can you please let me know so that I can pass the information on? Possibly other Novices would be grateful too.

Joe, GI0TIJ, with his happy and successful band of novices (see 'Carrickfergus Club News').

LOWE ELECTRONICS

Upon reflection . . . the HF-225 is a great receiver!

The cynics among you will say "He would say that, wouldn't he". So, don't listen to me, read what independent users have said, such as

Larry Magne in *Passport to World Band Radio*
"Best bandwidth flexibility of any model tested.
"Another advantage of the '225 is that it is built to almost professional standards of ruggedness. You just don't expect to find this level of construction quality on a model selling for anywhere near this price."

The best endorsement comes from what HF-225 owners have written about it:
"The performance is remarkable and in particular the selectivity and the switchable filters provide a performance which is far superior to certain Oriental receivers that I have had over the years." *G6ITY CEng, MIEE.*

From a professional in the field we had the following comments:
"As a rigorous test one evening, I connected my HF-225 to the HF distribution system and compared its performance to that of a Racal RA-1772 and RA-1792 with the same aerial selected to each receiver . . . it did give them a run for their money. The strong signal performance, reciprocal mixing, sensitivity etc were not in my opinion significantly worse than in receivers costing ten times as much . . . in fact I don't think I could hear anything on the Racals which I could not hear on the HF-225."

3rd BIRTHDAY CELEBRATION OFFER:

Conceived, designed, and manufactured in the UK with a view to providing a simple to use, high performance "British" receiver, the HF-225 comes complete with a surprising range of facilities fitted. To celebrate the anniversary of its introduction **we are giving away a free D-225 Synchronous AM/narrow band FM detector unit** with every HF-225 purchased directly from Lowe Electronics before the end of July.

Do call in at your nearest Lowe branch and try one out . . . NOW!

HF-225 30kHz to 30MHz £429
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SWL NEWS

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

THIS COLUMN often tries to encourage listeners to take part in contest activity, but it seems that this is one area of the hobby where SWLs cannot be coerced.

Contest activity amongst listeners is at an extremely low ebb, with last year's 21-28MHz contest only attracting three entries from the UK. The HF Contests Committee is so concerned at this apparent lack of enthusiasm that it is considering withholding the trophies which are awarded annually to the SWL winner of the various RSGB contests.

Participation in VHF contest is also abysmal. Perhaps today's listener simply does not like competition.

One last chance to prove us all wrong comes with the Society's Listener Contest to be held over the weekend of 11/12 July.

It really would be good to see a sizeable entry (otherwise this event may disappear from the Calendar). The rules are simple enough (**Table 1**). You can either use SSB or CW, the choice is yours. Simply log what you hear, but make sure that the callsign of the station being worked (as opposed to the station you are logging for points) only appears in the log once every three contacts. However, if the station you hear is a new country for you in the contest, you can disregard that rule.

You can log stations for up to 18 hours out of the 24, but if you can only listen for two or three hours, then so be it. Send in a log for that listening stint. You may not win, but the Society can see that there is still support for the event.

You get one point for every station you log. Every country heard on each band also gets you one point. So you simply multiply one by the other to get your score.

Put a note in your diary that the contest is over the weekend of 11/12 July, it coincides with the IARU transmitting contest, so there should be enough activity to keep you interested.

MARCH CHALLENGE

THOUGH disappointed about SWL contest activity, I was pleasantly surprised to receive an above average number of logs for my challenge. This involved hearing different countries on 21MHz during March. There was some interesting DX heard, and the CQ WPX contest at the end of the month provided some useful additions for those who had been doing the challenge seriously from the first day.

There were 207 countries heard on 21MHz during the month. The surprise for me was that entrants found 37 countries on the African continent. The results are shown in **Table 2**.

Unfortunately, there was one log which I could not include as there was no covering sheet giving the entrant's details. As there was a worthwhile entry, I shall be providing the winner with a plaque.

UBA COMPETITION RESULTS

THERE WERE four entries to the UBA Challenge last year. BRS22643 was placed 10th with 139,000 points. Interestingly enough, there are actually nine entries from British listeners for the 1992 event. G1RPA submitted the best score from a British entrant. He scored 125,000 and is currently fourth. Best entrant from an RSGB SWL is the one from RS99709 with 97,000 points.

It is interesting to note that since 1983, no British listener has been in the top three of the SSB section, but BRS44395 (twice) and BRS52868 have taken the honours in the CW section. Perhaps this year may see a 'G' first?

ACTIVITY REPORTS

NOT MANY reports this time even though conditions in April held up quite well. That cannot be said for early May, but I will address that next month. The S92AA was excellent, operating from both Sao Thome Is and Principe Is. Other highlights included continued operation from Cocos-Keeling Is and a station signing 4K4BEU from Dickson Island. The Marconi Day celebrations went off well, with Philip, G1EMD, logging twelve of the special callsigns that were active. Some of the best DX included:

28MHz: A22MN, FH8CB, HF0POL, HU1FT (El Salvador), TZ6VV, VS6WV, YN/SM0OIG, VP8CKX, ZD8JIM and ZF2SD.

21MHz: AL7HG, BV3AT, HS0ZAD, TU2JL, V31LM, V85GA, XX9AS, 3D2AG, 7Q7XX and G4SMC/8RI.

14MHz: A71BP, CY0SAB, EL2PP, J47MAC, S92AA 4U1UN and 5H3DC.

On VHF, not much stirred in the period in question, but a very intense aurora provided plenty of DX on the afternoon of 10 May. David, BRS25429, heard seventeen countries on 50MHz via aurora, and caught many of the GI counties for his UK Six Metre Group 6X6 Award.

Mick, BRS31976, also concentrated on 50MHz and heard many new UK counties, including Cornwall and Devon. I did much the same, logging first stations from Northants (G7DDU) and GM0BWU (DGL).

Joan, RS62088, spent some time on 144MHz and her best DX was HG8CE (KN06) and OE3UP (JN87), plus several Frenchmen and Germans in new squares.

FINALE

THAT'S IT for another month. Please ensure that your letters reach me by **10 June** for the **August** issue.

RSGB LISTENER CONTEST 92 RULES

OBJECT OF THE CONTEST

To log as many stations in QSO as possible. Operation is over 24 hours but only 18 hours may be operational during the 24, and a continuous 6-hour rest period must be clearly marked in the log.

DATE AND TIMES

1200GMT 11 JULY TO 1200GMT 12 JULY 1991

SECTIONS AND BANDS

(a) SSB only

(b) CW only

Only one section may be entered - mixed-mode entries will not be accepted. The 28, 21, 14, 7, 3.5 and 1.8MHz bands may be used. Please note that entrants from the British Isles must be members of the RSGB.

SCORING

For scoring purposes the station logged must be in QSO with another amateur station. It does not matter whether the station is taking part in a contest or not. CQ, QRZ or similar calls cannot be counted for scoring. One point to be claimed for each station heard on each band. A multiplier may be claimed for each different country heard on each band. In the case of the USA, Canada, Australia, New Zealand and Japan, each call area numbered prefix may be claimed as a separate multiplier, for example: W1, W2, VE2, VE3, VK5, VK6 and so on. All other countries will be determined by the ARRL Countries List.

The final score is made up by the addition of the points scored on all bands multiplied by the total number of multipliers claimed on all bands.

LOGS

Logs should show in columns, time (GMT), callsign of station heard, callsign of station being worked, an RS(T) report on station heard at SWL's QTH, multiplier (if any), points claimed. If both sides of a contact are heard, they may be claimed as separate stations, and the callsigns are to appear in the station heard column. Each station heard can only appear once in the station heard column on each band. In the column for station worked, a callsign must only appear once in every three contacts logged (1 in 3) unless it is a new multiplier for the receiving station. The same 'station worked' may not be used for more than three successive multipliers.

Logs should be submitted with each band listed on separate sheets, 28MHz on one sheet, 21MHz on another and so on. A separate sheet listing all multipliers for each band should also be included.

Duplicate loggings for which points have been claimed will be penalised at 10 times the contact value.

ADDRESS FOR ENTRIES

R A Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ, England. Entrants should ensure their entries are postmarked no later than 2 August 1992.

AWARDS

Certificates will be awarded to the leading three entrants in each section in the British Isles section provided there is a minimum of 10 entrants. A certificate will be awarded to the leading station in each country in the overseas section provided that station scores at least 50% of that section winner's score.

Table 1.

Psn	SWL Callsign	Countries	Eu	Na	SA	As	Af	Oc	Points
1	BRS25429	169	51	23	18	28	34	15	1046
2	BRS8841	159	47	21	20	28	28	15	982
3	BRS52543	140	45	15	17	28	22	13	852
4	G1EMD	119	41	17	15	26	15	5	658
5	RS88709	89	36	9	9	14	17	4	492
6	BRS86552	80	40	8	7	9	12	4	394
7	BRS93790	49	28	6	3	6	5	1	208
8	ARS94378	41	20	3	6	5	5	2	202
9	BRS32525	38	15	7	6	4	5	1	188
10	BRS62088	22	10	3	3	3	2	0	94

Table 2: March 21MHz Challenge results.

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Watch this space for more news, 73's, Chris G8GKC, Gordon G3LEQ & John G8VIQ.

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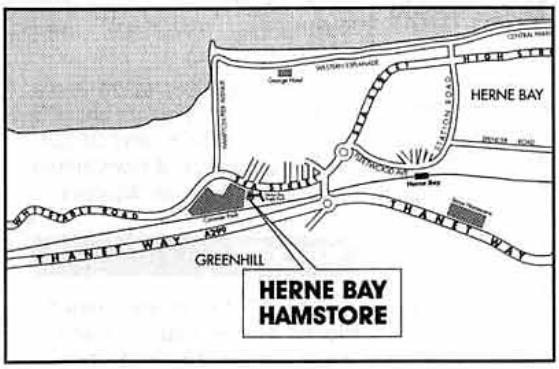

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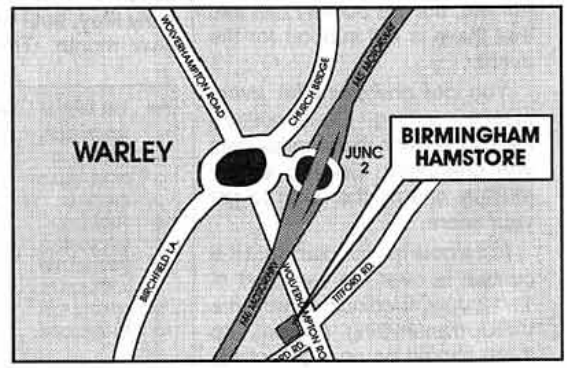

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RADCOM TECHNICAL FEATURE

The second of our major four-part series in which the UK's top HF DXers reveal the secret of their success

HF DX
The Inside Story

Part 2 – Receivers and Transmitters
by Peter Hart, G3SJX and Ian White, G3SEK

THIS ARTICLE FOCUSES on receivers and transmitters from the viewpoint of working HF DX. The previous article in this series examined the antennas and towers used by leading UK HF DXers, and contained a table which also showed what transceivers and linear amplifiers they are using [1]. Every successful DXer knows how important it is to *listen*, *listen*, *listen*, so the most important part of your station electronics is your receiver. It may be a cliché but it's still true: If you can't hear them, you can't work them!

The purpose of your receiver is to resolve *one* wanted signal out of the electromagnetic deluge that is constantly arriving down the feedline. The receiver needs to be sufficiently sensitive to receive the weakest of signals, right down to the background noise, while ignoring everything else no matter how strong. By their very nature DX signals are often bordering on the limits of readability, and on HF the limiting factor is almost always interference from other signals. The better your receiver is at resolving marginal signals, the more successful you will be at chasing DX.

The modern HF transceiver has evolved into a highly sophisticated communications machine, but there are also definite advantages in the older generation of dedicated amateur-band equipment. If you already have a transceiver that you like, then perhaps you should follow the advice of G4IUF: "Spend your money on antennas, not rigs."

RECEIVER FEATURES

MANY DXPEDITIONS NOW operate split frequency only and cannot be worked without a twin VFO capability. Fortunately this is simple to provide with frequency synthesized oscillators, and virtually all current production radios are equipped with two separate 'virtual VFOs' operated from the same tuning knob. Thus you can leave one VFO tuned to the DX station and listen to the pile-up with the other, trying to find where the DX will be listening next. One press of a button and you're ready to call. The top-of-the range transceivers also provide a second receiver so that you can continue to monitor the DX station while searching for his listening frequency.

Modern crystal filters have an excellent shape factor and ideally several different bandwidths should be provided. 2.4kHz is the optimum bandwidth for normal SSB operation, though under crowded band conditions 1.8kHz will sometimes give better readability at the expense of fidelity. Variable bandwidth is often provided, and most high-end receivers offer 'slope tuning' which gives independent adjustment of the low and high frequency edges of the IF passband. IF shift is a different facility: it moves the entire IF passband with respect to the signal, and hence shifts the audio band. These systems are good for optimising SSB signals in the presence of close adjacent interference, but for CW there is no substitute for a dedicated filter.

Many DX stations use nothing other than CW, so your receiver must have excellent performance on that mode (and so must you, the operator!). Some operators prefer a fairly wide IF filter bandwidth of about 500Hz while others prefer bandwidths down to 150Hz. With weak signals and crowded band conditions the narrower filters really help, but in contest conditions there is a danger of missing off-tune callers. Too narrow a bandwidth will also impair the readability of high-speed CW and can give rise to fatigue. The ideal situation is to have two CW filters available, one around 500Hz bandwidth and the other around 200Hz, or alternatively a 500Hz filter and an versatile outboard AF filter such as the Datong.

A notch filter is also very useful, if not indispensable, for removing in-band carriers on SSB and notching out very close-in CW. As with the main 'channel' filter it is far preferable to do the notch filtering at IF. Although AF bandpass and notch filters can give excellent shape factors they are never a total substitute for filters in the IF, because the IF filters also prevent strong unwanted signals from taking over the AGC and reducing the receiver gain.

In order to accommodate the entire range of signal strengths, some control over the front-end gain of the receiver is essential. This often takes the form of a switchable preamplifier, usually with an additional switched attenuator. Both fast and slow AGC decay time constants should be provided with a fast, clean attack (this is not normally a problem area). A noise blanker can be useful in reducing impulse noise. It should have a short time constant for car ignition or electrical noise, switchable to a long time constant for Over The Horizon Radar 'Woodpecker' interference. A noise blanker needs to be used with care to avoid strong-signal problems.

Some DX QSL cards at GW4BLE – a fine example of what it's all about.

Microprocessor control and frequency synthesis can provide many features to enhance the transceiver's operational effectiveness. Multiple memories are useful for storing the operating frequencies of a current DXpedition, the usual DX frequencies, IOTA channels etc. Most radios have 'band stores' for the last-used frequency, mode and filter bandwidth on each band, returning to these settings as you change bands. The Yaesu FT-1000 has two for each band, which can be used for CW and SSB respectively.

Interfacing to other units should also be provided, especially for control of a linear amplifier. An external receive antenna input is useful for LF-band loops or Beverages, and an antenna output connection for an external receiver is useful for spotting purposes. Many current transceivers omit these useful antenna routing functions.

TRANSMITTER FEATURES

THE TRANSMITTER SHOULD give ample power and be able to operate at a high duty cycle without overheating. This is important when operating without a linear amplifier, particularly for contests and on RTTY. The transmitter should have variable power control for use with a linear amplifier. Avoid overdrive at all costs and aim for a clean, narrow signal.

To quote G4ADD, "Do tailor your mic for punch . . . but keep it clean." A speech processor can be helpful and is built into most current transceivers, but be careful not to overdo the processing and spoil the audio quality. Also be very careful with the drive level: if you have a habit of overdriving your transmitter on occasional speech peaks, you'll be doing it all the time when the processor is switched in. Set up properly, a speech processor should make you sound louder, clearer and cleaner. Used wrongly, it will make you sound louder, nastier and wider!

On CW, full break-in between dots (full QSK) can be very useful but it is usually preferable to disable this mode if the receive channel is noisy. Whether using full or semi-break-in, changeover should be smooth and click-free or else operator fatigue can set in

very rapidly. Most modern transceivers are adequate when operated on their own, but it needs some care to interface a linear properly. Click-free keying and low transmitter noise sidebands are very important, both to other band users and to your personal reputation.

Accurate CW netting is essential, particularly if the station being called is using a narrow filter, so you need to develop the technique for doing it quickly. On most transceivers, netting is done by setting the sidetone accurately to the pitch of the incoming signal. Some radios have adjustable BFO pitch or sidetone frequency to suit operator preferences.

RECEIVER ARCHITECTURE

MOST FULLY-FEATURED receivers use a triple or quadruple conversion superhet architecture (**Fig 1**). To incorporate a general coverage receiver without gaps in the tuning range, the first IF must lie above the highest received frequency. Most receivers use a first IF around 45 or 75MHz with a so-called 'roofing filter' of about 20kHz bandwidth. The main selectivity is achieved at the second IF, typically 8-10MHz. The variable bandwidth feature requires two similar SSB filters at different frequencies, the second and third IFs. The third IF can also lie in the 8 - 10MHz region or more commonly at 455kHz. With the third LO at the correct frequency, the two filters will normally coincide exactly (**Fig 2a**). By altering the third LO, one filter will be moved with respect to the other and the net passband will be the overlap remaining between the two filters. This is illustrated in **Figs 2b and 2c**. In order to avoid a change in pitch of the signal, it is necessary to change the frequency of one of the other oscillators by an equal and opposite amount, eg LO4 in Fig 1. The IF shift facility functions by altering the frequency of the demodulator oscillator LO5, avoiding a change in pitch by moving either LO1 or LO2 by an equal and opposite amount.

The total gain in the receiver from antenna to loudspeaker needs to be around 140dB. How this gain is distributed among the various signal stages has a key bearing on the performance of the receiver. Stages between the antenna and the main IF filter see not only the wanted signal but also a host of unwanted signals, possibly up to 100dB stronger than the wanted signal. It is important that the gain in these front-end stages is kept to an absolute minimum and carefully allocated to achieve a wide dynamic range.

The channel-defining selectivity should be positioned as early in the receiver as possible. However, in the normal up-conversion architecture the roofing filter can provide only limited protection and the main selectivity comes after the second mixer. Great care must therefore be taken to achieve a wide dynamic range in every stage up to the main filters. Mixers are inherently inferior to amplifiers in this respect and require as much protection as possible ahead of them, in the form of filtering. Selectivity at the signal frequency should therefore be as sharp as possible, but with normal wideband up-conversion receivers this is normally limited to half-octave bandwidths. The second mixer is partially protected by the roofing filter, though

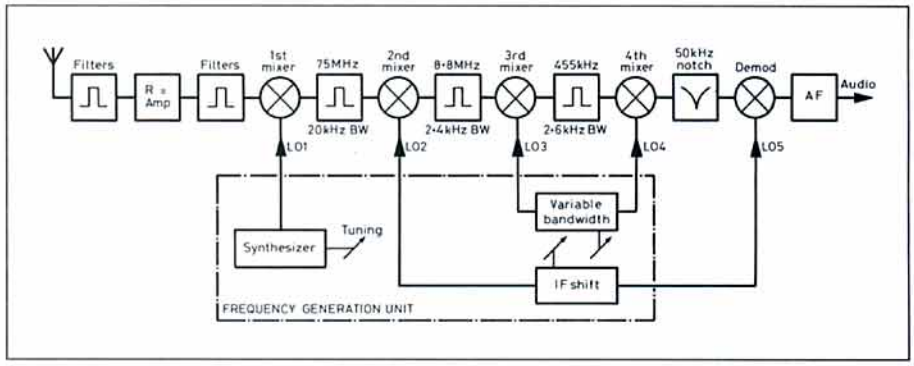

Fig 1: Frequency relationships in a typical high-performance receiver.

the typical bandwidth is wide enough to let through several extremely strong adjacent signals. Dedicated amateur-band receivers can achieve superior performance by using a sharply- tuned RF preselector with the main filters directly after the first mixer. The legendary Drake R4C is a typical example.

A key factor in the performance of any receiver is the main local oscillator, which nowadays is invariably a frequency synthesizer. To give a smooth tuning characteristic, this needs to tune in steps of 20Hz maximum (10Hz is normal) and settle quickly without transients which appear as clicks when you tune. To achieve a reasonable tuning rate of 10kHz per revolution requires a shaft encoder giving a resolution of typically 1000 steps per revolution. Larger step sizes are needed for rapid frequency setting and the synthesizer output needs to be pure without spurious sidebands or phase noise.

RECEIVER PERFORMANCE CHARACTERISTICS

AS ALREADY MENTIONED, the dynamic range of a receiver is a paramount factor in its effectiveness for HF DX. We will deal with the strong-signal end of the range first, and then return to weak signals.

A receiver's ability to ignore strong off-channel signals is determined partly by the skirt rejection of the IF filters and partly by overload effects in the front-end ahead of those filters. The skirt selectivity of modern IF filters is generally sufficiently good that front-end overload becomes the main limitation on *effective* selectivity against nearby strong signals. There are three major front-end overload mechanisms: intermodulation, blocking and reciprocal mixing [2, 3].

Intermodulation is when two or more strong

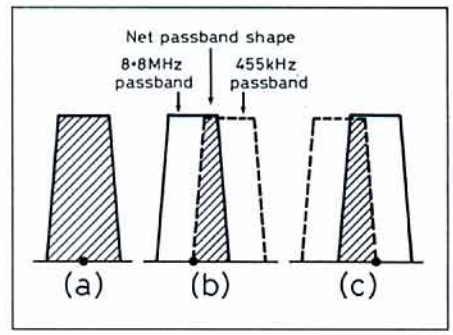

Fig 2: Operation of the variable bandwidth tuning (VBT) control. (a) Passbands coincide. (b) VBT set 'high' to attenuate signals to LF of original passband. (c) VBT set 'low' to attenuate signals to HF.

off-frequency signals mix in the front-end to create spurious signals on the wanted channel. The first and second mixers are particularly vulnerable to intermodulation. The levels of the intermodulation products increase more rapidly than the levels of the offending strong signals. For third-order intermodulation (the most troublesome kind in receivers) the rate of increase is 3dB per dB. This means that every single decibel of unnecessary front-end gain will bring up the intermodulation products by 3dB. Hence it is absolutely vital for the designer to keep the front-end gain low, and for *you* to use the receiver correctly.

Blocking is when an unwanted off-channel signal is so strong that it causes limiting somewhere in the receiver front-end. The effect is like an FM limiter: it suppresses all weaker signals including the one you wanted. Generally speaking, design for low intermodulation will also take care of blocking, but the problem can reappear inside the bandwidth of the roofing filter. Since blocking is a threshold effect, it can sometimes be cured completely by a small reduction in front-end gain.

Fred J Hall, G3NSY, the only blind UK operator on the DXCC honour roll.

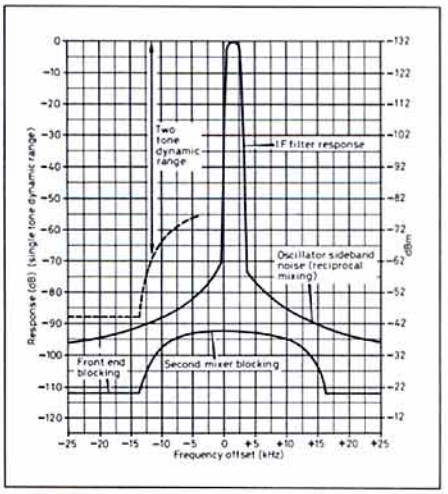

Fig 3: Effective selectivity curve of a typical receiver.

Part of G3ZBA's shack.

	Dynamic Ranges		
	Reciprocal mixing	Two-tone	Two-tone
Transceiver	@ ±10kHz	@ ±5kHz	@ ±50kHz
FT-747	85dB	80dB	97dB
FT-757	85dB	55dB	88dB
FT-767	73dB	59dB	95dB
FT-990	93dB	78dB	97dB
FT-1000	91dB	65dB	96dB
IC-725	83dB	79dB	95dB
IC-751	105dB	75dB	104dB
TS-430	82dB	62dB	96dB
TS-850	100dB	75dB	98dB
TS-930	89dB	77dB	95dB
TS-950	102dB	83dB	102dB
Corsair	98dB	90dB	90dB

Table 1: Key performance characteristics taken from reviews by G3SJX in RadCom

Reciprocal mixing has already been mentioned. It is a problem of synthesizer noise rather than the design of the signal path itself, and makes the receiver noise increase when a strong signal is present nearby. Because oscillator noise becomes worse at closer offsets from the carrier frequency, reciprocal mixing will again limit the receiver's ability to cope with strong unwanted signals at close spacings.

Fig 3 shows an effective selectivity curve of a typical receiver. This combines the overall adjacent-channel performance due to the IF filter response and reciprocal mixing. Also shown are the relative levels of intermodulation and front-end blocking. Notice how a relatively poor reciprocal mixing performance makes the IF filter's skirt selectivity irrelevant below -70dB, and how the intermodulation and blocking curves rise sharply within the bandwidth of the roofing filter, indicating some weakness in the second mixer.

Some receivers use a switchable preamplifier while others have a permanent RF stage with switchable gain; both should habitually be kept at the low-gain setting. In addition, many receivers have a switchable front-end attenuator which can be used when overload becomes a problem. Correct settings of the preamplifier, attenuator and RF gain control can do a lot to help a receiver with mediocre strong-signal performance - even the 7MHz band can 'clean itself up' amazingly!

Turning briefly to weak-signal performance, sensitivity is hardly a problem in HF receivers. The real problem is for the designer to restrain himself from providing too much sensitivity and damaging the strong-signal performance as a result. Combining the strong- and weak-signal performance gives the receiver's dynamic range. Essentially this is the range in decibels between the weakest discernible signal and the strongest off-channel unwanted signal that the receiver can tolerate without deterioration in performance. Because there is more than one strong-signal effect, and these change with frequency offset from the wanted signal, the receiver actually has several dynamic ranges. The most interesting from the performance viewpoint are the dynamic range for reciprocal mixing and the dynamic range for third-order intermodulation (also known as the two-tone dynamic range). **Table 1** shows these measurements for a variety of transceivers reviewed over the years in *RadCom*.

ERGONOMICS

IT IS NO GOOD OWNING a transceiver which has impeccable performance but is impossible to use. Ease of operation is vital for enjoyable and fatigue-free operating, particularly over long periods in contests. The equipment needs to be easy to use and the most-used functions should come quickly to hand.

The most important control on a radio is the rotary tuning control - especially for the DXer because everyone agrees that "there is no substitute for tuning the bands". The knob should have a diameter of at least 50mm, a smooth feel with no click-steps or backlash, and a convenient tuning rate of about 10kHz per revolution. This enables you to tune right through an SSB signal without having to readjust your grip, while still allowing very fine tuning for CW and data signals. The radio should be positioned on the operating table so that you can tune around for hours on end without tiring the arm muscles. Other frequency-setting controls should be simple to operate: rapid tuning from one end of a band to the other, band changes, memory preview, memory selection etc. Particularly useful are separate band buttons storing the last-used frequency, mode and filter on each band, and the 10kHz per step rotary control featured on Kenwood radios for rapidly moving around a band.

Changing of frequencies, bands, modes, filter settings, swapping VFOs and all the other basic 'radio' functions should be quick, easy and above all *obvious*. It should only be necessary to resort to the manual for special functions such as power-up settings. Modes and filters should preferably be selected by separate buttons; pushbuttons which cycle through a set of options in one direction only are particularly unfriendly.

The frequency display should be clear, bright and readable over a wide viewing angle. The fluorescent type of display is used on the majority of current radios and gives the best overall results. LCD displays tend to have a narrower viewing angle but can be clearer in direct sunlight.

LINEAR AMPLIFIERS

OUR SURVEY OF UK DXers on the DXCC Honor Roll asked the question: "Do you use a linear amplifier?" Most respondents do - but not necessarily all the time or at full power. As with antennas, if you have time to be patient you can work all the DX with a 'barefoot' transceiver at 100W. John Kay, G3AAE, is particularly notable for having worked more countries than anyone else in the UK using only modest power.

If you can only get on the bands during evenings and weekends a linear is a definite asset. And if you are also limited to modest antennas you should think twice about handicapping your power as well. Compared with transceivers, linears are relatively simple and cost-effective to build. Particular favourites are linears using a pair of 3-500Zs, which have almost instant warmup and can deliver a very clean signal at UK power limits.

Please note that we are not decrying the virtues of QRP. No-one denies that propagation will allow world-wide HF communication using low power, and no-one decries the achievements of people who have set themselves that goal. But HF DXing involves working particular stations at particular times, in competition with the rest of Europe or the rest of the world - in which case more power definitely does help.

CONCLUSIONS

THE RECEIVER IS THE MOST important part of the station electronics for working DX. This article should have given you a few pointers on what to look for in the equipment reviews - for many of the older rigs, also check in Angus McKenzie's *Buyer's Guide* (now out of print). But if you already have a transceiver that you like, then concentrate on using it correctly and spend your money on a tower and antennas instead. Finally, although you can work a lot of DX with a barefoot transceiver if you have the time and patience, there's no denying that a linear amplifier helps.

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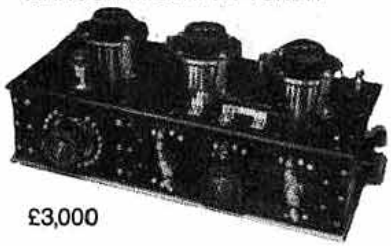

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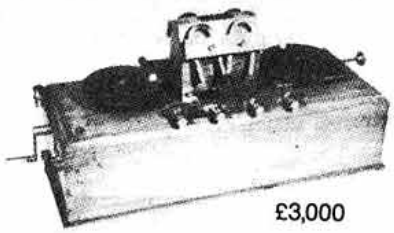

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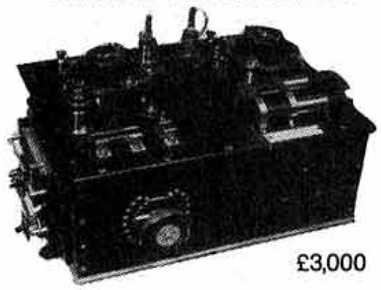

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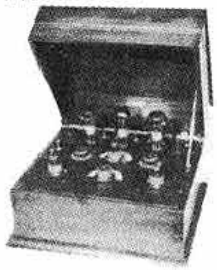

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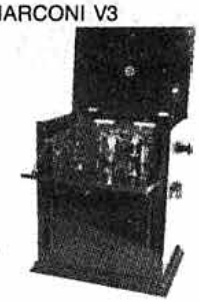

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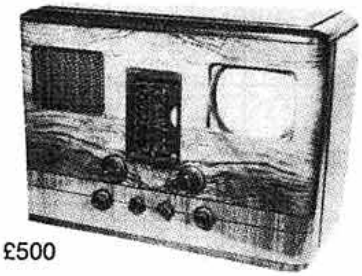

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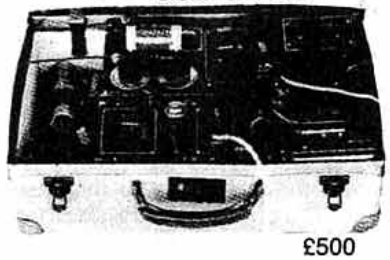

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RADCOM TECHNICAL FEATURE

A Remote Reading RF Ammeter

The second of a two part article by John Osborne, G3HMO

ALTHOUGH THIS PROJECT was developed to test the feasibility of the idea, I had no specific application in mind. As it seems to work according to predictions, I offer this description for the benefit of other antenna experimenters who might find the remote reading ammeter a useful tool.

For my own satisfaction I decided to test the performance in a typical application. At my holiday QTH I have a long-wire antenna, about 40m long and about 5m high, used on all HF bands. It is the conventional inverted-L, supported by a chimney at the house with downlead to a ground floor window, and by a guyed aluminium pole at the other end.

I lowered the antenna, threaded on the probe and moved it to the house end. Leaving the fibre dangling down I raised the antenna, loaded up the FT77 on 7MHz with an SEM Transmatch and, with key down, adjusted the drive to give 0.5A of antenna current into the downlead. A temporary extension lead for the key was contrived, passing through the window to the ground under the antenna. The meter unit was connected to the fibre and placed alongside the key.

By pressing the key I could take a current reading in two seconds without causing significant QRM. I had chosen a clear frequency when the band was quiet to avoid causing interference. A tape measure was laid out under the antenna and with the aid of two long bamboo sticks taped together I pushed the probe along at two-metre intervals, taking readings at each point. I soon discovered that the readings were going off scale, so I reset the drive to 0.15A and started again.

The readings are shown in **Fig 3**. Although the results show nothing surprising they do emphasise the possible differences between the current at the feed and the current 'up there'. I then tuned to 21MHz and repeated the experiment. These readings are shown in **Fig 7**. For precision the antenna could have been marked with a dab of white paint at two-metre intervals, but judging distance by eye from ground level seems adequate to show that the system works.

Another experiment was to investigate the distribution of the current in a counterpoise consisting of 20m of insulated wire laid on the surface under the antenna. **Fig 5** shows the result, on this occasion at 24MHz.

Continuing with other possibilities I substituted a large-diameter ferrite ring for the original, again with twelve turns, with little change in sensitivity. I then used this successfully to probe the current along the arms of a rigid aluminium tube dipole on 25MHz. This suggests that the technique might be useful in probing currents in the parasitic elements of beams, for which no simple alternative exists.

The probe is just visible on the antenna. The fibre from it hangs down to the drum, seen here in the foreground alongside the meter and amplifier.

OTHER EXPERIMENTS

VARIOUS POSSIBLE EXPERIMENTS are outlined in **Fig 6**. These have not been tried and raise the possibility of designing different probes for different jobs. If, due to lack of access, a probe cannot be threaded onto the wire, can the ring be split? I have used a broken ring with the secondary winding on one half and the other half taped into position; it seems to light the LED normally and might prove a solution to this problem. A coil on a short ferrite rod held at right-angles and close to the wire will also light an LED but in this case calibration would be meaningless as displacement of the rod would alter the reading. With the ring no change of reading occurs where-ever the ring is moved or angled provided only that the (primary) wire passes through the ring. Ferrite is not essential and my 'Admiralty Handbook of Wireless Telegraphy' (1940 pre-ferrite) shows an air-wound toroid around an antenna wire used with a hot-wire ammeter for monitoring antenna current.

It is axiomatic that one cannot measure anything without in some degree modifying the quantity measured. In the case of a ferrite-ring/LED configuration the effect on the antenna current is not easy to predict with confidence. However, it should be insignificant in practice.

When the ferrite ring transformer is driving the LED, the power for the LED is obviously provided by RF from the transmitter. As nothing gets hot the power drawn from the system is little more than that to light the LED. The LED has a forward voltage drop of 2V and a current of 20 to 40mA maximum, that is less than 0.1W. If we take a typical case of 0.5A in an antenna of 70Ω the radiated power would be around 20W, ie the ring/LED is probably absorbing less than 2% of the power. The ring will also introduce a small inductance into the circuit. A test of the effect of the meter was

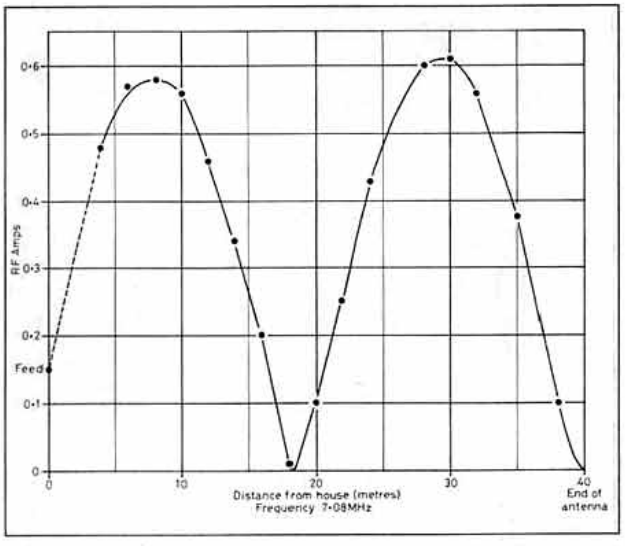

Fig 3: Variation of RF current at 7MHz along a wire antenna as measured with the remote ammeter.

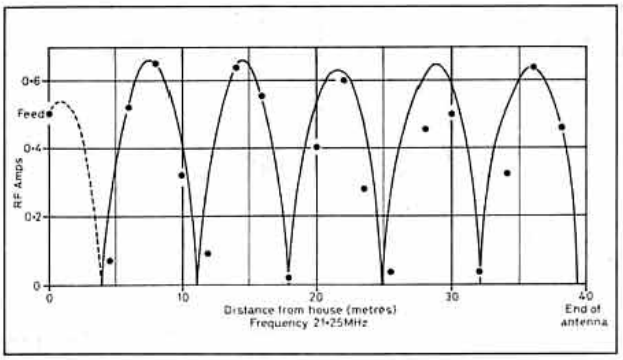

Fig 4: Variation of current as in Fig 3 but at 21MHz in the same 40m long-wire antenna.

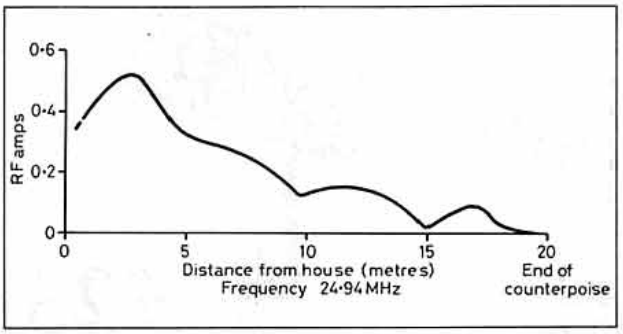

Fig 5: The decline of current in a counterpoise lying on the ground under the antenna at 25MHz. The troughs and crests are spaced approximately 5m apart. In free space at 25MHz a half-wave is 6m.

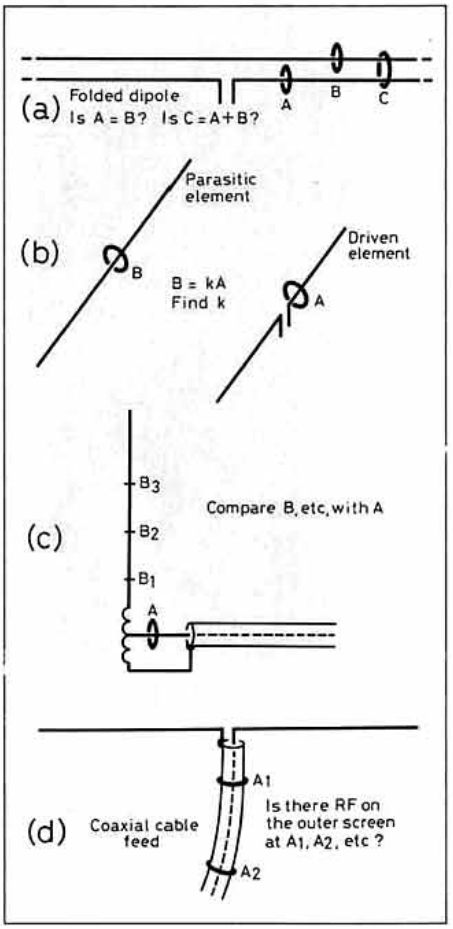

Fig 6: Some different experiments in which the Remote Reading Ammeter could be used. (a) Does a folded dipole check with theory? (b) What is the current induced in a parasitic element of a Yagi? (c) What are the currents at different points in a vertical whip, compared with the feed current? (d) Are the currents flowing on the outside of a coax feeder serious? How essential is a balun?

contrived as follows; a second ferrite ring/LED assembly (as Fig 1) was threaded over the antenna wire. This was pushed along the wire while monitoring the antenna current at a fixed point with the remote reading instrument. Fluctuations always less than 5% were observed implying that the ring/LED had a very small effect on the antenna and its radiating performance.

Another point to be remembered is that if RF current is rectified, harmonics will be generated; and although these may be weak, they are happening up there in the antenna itself. The probe is a man-made 'rusty bolt' and could cause QRN. It may be advisable to remove the probe when it is not in use as a precaution.

Optic fibres are commonly available at reasonable cost, but it is necessary that the three components, LED, fibre and photo-detector are compatible. Quite apart from terminating the fibre to interface with the solid-state devices at each end, it is vital that the wavelength of the light (or infra-red) emitted by the LED is transmitted by the fibre with acceptably low loss and is within the range to which the photodiode is sensitive. In practice this means choosing a matched set. The originals used in the above were the emitter, fibre and photodiode of the polymer system by RS Components. This matched group operated at 665nm which falls in the visible spectrum. The red glow of the emitter can be easily seen when testing before connecting up the fibre. A much cheaper alternative, the emitter, fibre and detector set from Maplin, has now been tested with a full length of fibre, and appears equally satisfactory from initial tests. The wavelength in this case is in the infra-red (820nm) so the advantage of 'seeing' the emitted radiation is lost. For test purposes a visible-light LED can be substituted when setting up, and the infra-red emitter put in when ready to go.

The connection of the fibre to the devices at each end is critical if one is to avoid big losses. The protective outer sheath has to be stripped back by half-an-inch or so to expose the fibre. It is important not to damage the inner core at this stage. The end is then cut to length for the end connector according to the maker's instructions. The cut must be made with a sharp knife (Stanley or scalpel) on a hard surface to give a clean face to the end. Press very hard vertically and do not saw. If the fibre has an uneven end from saw marks then light will be lost at the interface. It is possible to polish the end with a very fine polish such as jeweller's rouge.

CONCLUSIONS

AS I SAID AT THE START, the project is ready for further development. How sensitive can one make the system? Can one work at very low powers? Putting a 1.5V cell on the probe to forward-bias the LED gives a big increase in sensitivity; however, dependence on battery voltage would compromise accuracy and reliability. Maybe a precision Op-Amp could be integrated into the probe. What is the cheapest source of optic fibre and associated components? Could a pulley system be devised to move the probe along an antenna wire from the ground?

All sorts of experimental possibilities exist; with a little imagination you could probably come up with more new ideas. Quite routine possibilities may also crop up, such as 'How does the current vary as the antenna is raised to different heights?' I look forward to hearing from those who find new uses for the ammeter.

COMPONENTS LIST

COMPONENTS USED FOR the remote reading RF ammeter (none critical except for matched sets of fibre optic parts):

PROBE

Ferrite ring: OD 5/8" (16mm)
ID 5/16" (8mm)
Height 5/16" (8mm)

Winding: 12 turns 20SWG enamelled

Diodes (D1,D2): BAT85 (or 1N34 probably OK)

Set 1: Emitter LED (D3) RS type 301-561 GaAsP

(Peak wavelength at 50mA, 665nm)

Set 2: Sender LED (D3) Maplin FD14Q

(MFOE71 F/optc Emittr) (Wavelength 820nm)

FIBRE

Set 1: Polymer RS type 368-047

Attenuation 200 dB/km at 665nm

End termination connectors RS type 456-396

Set 2: Polymethyl methacrylate fibre Maplin XR56L

3dB from 385 to 880nm Attenuation 1.2dB/m

No connectors required; couplers integral with devices.

METER UNIT

Set 1: Detector (D4) PIN Photodiode RS type 655-032

Set 2: Detector (D4) Maplin FD12N (MFOD71 F/optc Dtctr)

Transistors (Q1,Q2) Si NPN BC108 or equivalent

Cost of optoelectronics:

RS Components (Set 1 Visible light) approx £50

Maplin (Set 2 Infra-red) approx £25

RS Components Ltd, PO Box 99, Corby, Northants NN17 9RS, UK

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RADCOM TECHNICAL FEATURE

A Practical Synthesizer

for ex-PMR VHF Transceivers

The first of a two part article by Bernie Pallett, G3VML

FOR THE NEWLY LICENSED amateur, or especially those of limited financial means, a major problem is often the ability to purchase new or second hand radio equipment within an affordable price range.

One source of cheap, but at the same time well constructed, VHF/UHF transceiver equipment is the surplus Private Mobile Radio (PMR) market. However the main drawbacks with this type of equipment is that the transceivers are usually limited to around three crystal controlled transmit/receive channels.

Another drawback is the cost of the crystals (about £5 each), and usually a pair of crystals are required for each channel. The cost of fitting crystals for all three channels can amount to around £30. Thus the use of ex-PMR equipment for amateur use can appear unattractive at first glance.

With these factors in mind I set out to establish whether it was possible to develop and construct an economical synthesizer circuit, that could derive the full 80 (25kHz spaced) channels of the two metre band, when used in conjunction with a surplus PMR VHF transceiver at a cost that roughly equates to the cost of six crystals. The circuit that I eventually developed, for use with a surplus Dymar type 882 high band FM transceiver, is based on the Motorola Synthesizer IC type MC145151P.

DYMAR VHF TRANSCEIVER TYPE 882

IT IS OUTSIDE THE SCOPE of this project to discuss in detail all the various makes and models of ex-PMR VHF Transceiver equipment being offered for sale on the surplus market, however many of these have a number of common features.

The Dymar high band type 882 VHF Transceiver, which was donated for this project, is fairly typical of this type of equipment, and therefore I will refer to it throughout this feature. The transceiver was designed to operate in the 146MHz to 174MHz frequency range. The receiver portion, which employs a 10.7MHz first IF stage, also has a 12.5kHz channel separation capability. The transmit master oscillator and the receiver first local oscillator are each derived from their respective crystal controlled oscillators, via x 12 (4 x 3) frequency multiplier circuits.

The formulae used to derive these crystal frequencies are:

(1) TX Crystal frequency = (Transmit frequency)/12

(2) RX Crystal frequency = (Receive frequency - IF frequency)/12

Whilst operating within the original design frequency band, the frequency tracking limits of the first local oscillator, will be 135.3MHz to 163.3MHz. The frequency limits of the amateur 2 metre band are from 144MHz to 146MHz, therefore the local oscillator frequency limits to cover this band will be 133.3MHz to 135.3MHz. If on the other hand the local oscillator were to track an IF (10.7MHz) difference above the received signal frequency, then the local oscillator would be required to track 154.7MHz to 156.7MHz. Because the higher local oscillator tracking frequencies fall well within the original frequency band of the x12 frequency multiplier circuits, this mode of oscillator tracking was chosen for the synthesizer project.

To replace crystal control by a frequency synthesizer circuit, will require the synthesizer to generate a range of frequencies around 12MHz (transmit), or 13.0583MHz (receive). An ultimate transceiver channel spacing of 12.5kHz, will equate to a step size of 12.5kHz/12 or 1041.6667Hz at the synthesizer output.

BASIC FREQUENCY SYNTHESIZER PRINCIPLES.

THE BASIC SYNTHESIZER block diagram is given in **Fig 1**, and it is possible to select a given number of 1041.6667Hz-spaced spot frequencies, within a frequency range of 12 to 13.058MHz. The resonant frequency of the Voltage Controlled Oscillator (VCO), is dependent upon an applied DC tuning voltage, derived from the phase detector. The higher resonant VCO frequencies coincide with the higher tuning voltages, whereas for the lower resonant VCO frequencies, the tuning voltage levels will be lower.

It is common practice to include a buffer amplifier between the VCO and any external circuit loads, thereby ensuring that the VCO is not pulled off frequency by possible external load changes. The phase detector has two inputs, the first is a 1041.6667Hz waveform, (the reference frequency) that is derived from a stable 8.5333MHz crystal oscillator via a divide-by-8,192 frequency divider.

The second waveform, referred to here as the variphase, is derived from the VCO via a programmable frequency divider circuit. If a frequency difference exists between the two inputs of the phase detector, a voltage ramp will be generated at the phase detector output, which in turn will cause the VCO to frequency sweep.

Because one VCO output is fed to the input of the divide-by-N frequency divider, depending upon the selected divider ratio, there will come a point where the two waveforms present at the input of the phase detector match. When a phase match of the two input waveforms has been reached, the tuning voltage at

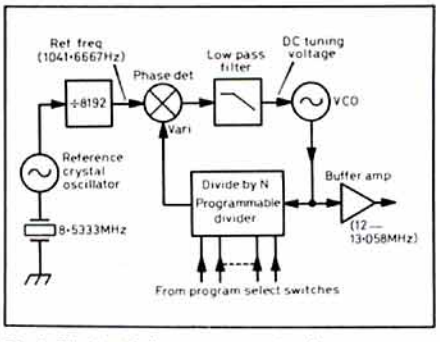


Fig 1: The basic frequency synthesizer.

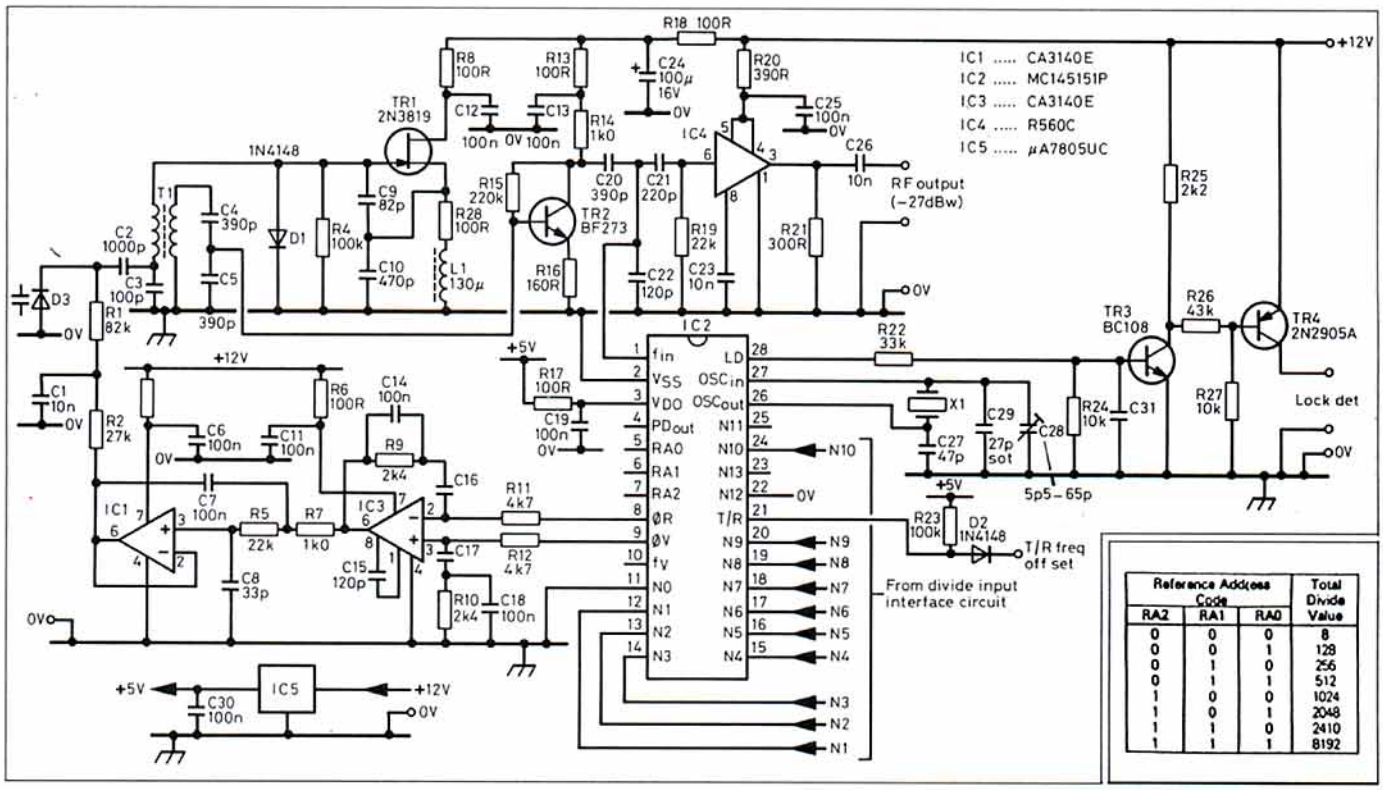


Fig 2: The synthesiser is built round an MC145151P chip controlling an FET clapp VCO.

Reference Address Code			Total Divide Value
RA2	RA1	RA0	
0	0	0	8
0	0	1	128
0	1	0	256
0	1	1	512
1	0	0	1024
1	0	1	2048
1	1	0	2410
1	1	1	8192

Table 1: Divide ratio inputs.

the phase detector output stabilises at a fixed voltage level. This in turn causes the VCO to stabilise at a fixed frequency, after which any slight drift will be compensated by corresponding small correctional tuning voltage level changes from the detector output. The channel spacing is related to the reference frequency, which for this circuit will be 1041.6667Hz per increment of the frequency divider. If, for example, a desired VCO frequency of 12MHz is required then the divide-by-N counter will need to be programmed to divide the desired 12MHz VCO frequency by the reference frequency.

N = VCO frequency required/Reference frequency

Where
N = Divide ratio

Therefore
N = 12,000,000/1041.6667 = 11520

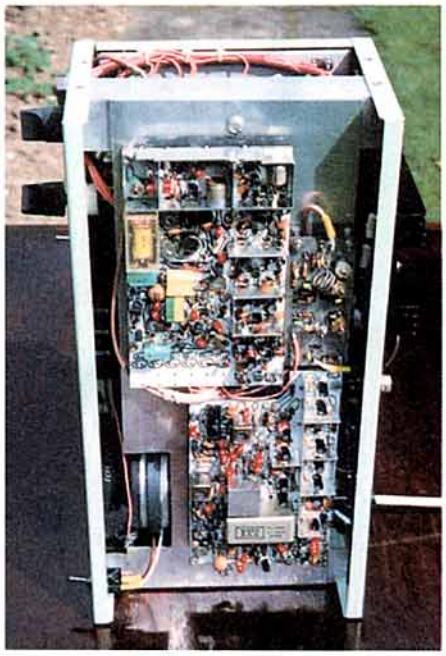
Selection of the desired ratio for the programmable divider can be achieved by manual switches. For more complex division programmes, a ROM will be necessary as a look up table, placed between the selection switches and the programmable frequency divider. The low pass filter located between the phase detector and VCO, is necessary to remove any unwanted noise that may be superimposed on the tuning voltage, and to achieve loop stability. For the circuit given, this noise will have a 1041.6667Hz component and without this filter the VCO will be frequency modulated by this noise.

MOTOROLA MC145151P INTEGRATED CIRCUIT

THE MOTOROLA MC145151P, is a parallel input, phase-locked loop (PLL) frequency synthesizer device, which employs CMOS LSI technology. This 28 pin DIL IC combines many on-chip circuit features, which only a few years ago would have occupied several additional integrated circuits. Motorola first developed and marketed the MC145151P about 12 years ago, with PMR and amateur communication equipment very much in mind.

SYNTHESIZER AND VCO CIRCUIT

THE CIRCUIT OF **FIG 2** SHOWS the dual phase ϕR and ϕV outputs, from the PLL, IC2 pins 8 and 9, which are applied to the inputs of the differential integrator IC3. This circuit has a low pass filter characteristic. The resultant DC present at the output of IC3 forms the loop-error level, or tuning voltage used to control the VCO frequency. Additional series filtering is achieved by the active low pass filter IC1 and the filter formed by resistors R1, R2 and capacitor C1, necessary to remove the remaining 1041Hz noise superimposed on the loop-error level.



View of the ex-PMR transceiver modules.

The VCO (FET TR1), is a series tuned Colpitts (Clapp) oscillator, that has a frequency range of 12MHz to 13.058MHz. However by increasing the value of C3 to 182pF, it is possible to alter the VCO frequency range to 11.108MHz - 12.1667MHz. The reason for this will become clear later on. The main frequency determining components are C3, C9, C10 and the primary winding inductance of T1, which make up a series tuned circuit. The varicap diode D3 can, for all intents and purposes, be considered to be in parallel with C3, and C2 serves as a DC blocking capacitor. The secondary winding inductance of transformer T1, and capacitors C4 and C5 make up a broadband parallel tuned circuit, centred on 12.5MHz. The VCO output appears at the junction of C4 and C5. There are two buffer amplifiers formed by transistor TR2 and IC4, that follow the VCO stage. Part of the signal output of the first buffer amplifier is fed to the F_{in} input, pin 1 of IC2. The final amplifier signal output is capable of delivering 2mW into an external 50Ω load.

Crystal X1 and associated components form the necessary external components, for the on-chip reference oscillator of IC2 (pins 26 and 27). For a final frequency resolution of 12.5kHz, a reference frequency input to the on-chip phase detector of IC2 will equal 12.5kHz/12 or 1041.6667Hz. From **Table 1**, it can be seen that by leaving the RA0, RA1 and RA2 inputs of IC2 (pins 5, 6 and 7) open circuit, the frequency of the reference crystal X1 will be:

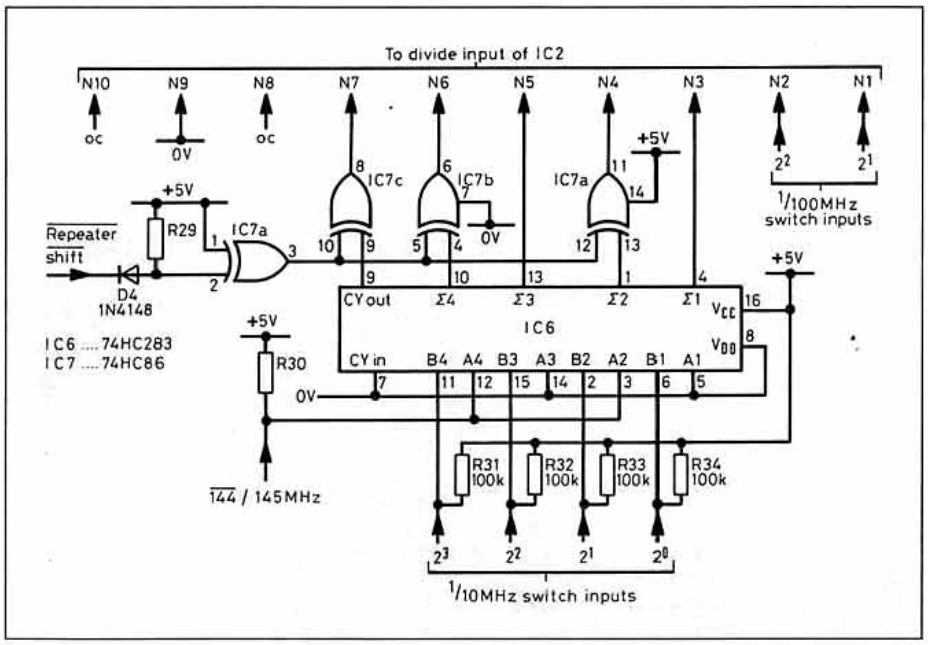


Fig 3: Divider interface. Here the receive local oscillator is *above* the signal frequency.

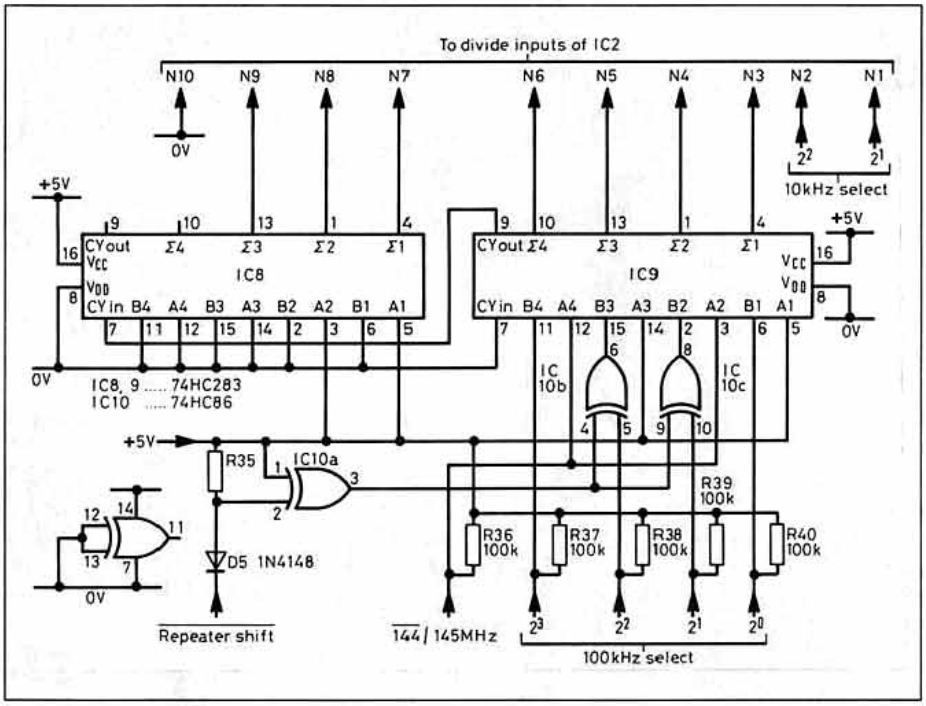


Fig 4: If the receive local oscillator is *below* the signal frequency, an additional adder is required.

$$X_{freq} = 1041.6667Hz \times 8192$$
$$= 8.53333MHz$$

The Transmit/Receive offset input (IC2 pin 21) is connected to an external pull up resistor to ensure that there is sufficient current to forward bias diode D3 fully when the cathode is grounded. When the T/R input (pin 21) is at a Logic 1 state (5V), input to D2 open circuit, the programmable divider has 856 added to the count, which causes the first receive local oscillator frequency to increase (or to be offset) by 10.7MHz. This can be shown by:

Frequency Offset = 856 x 1041.6667Hz x 12 = 10.7MHz

The Lock Detect (LD) output, pin 28 of IC2, is DC amplified by two stages, formed by TR3 and TR4. Whilst the synthesizer circuit is phase locked, 12V will be present at the output of the final amplifier stage. There is sufficient output drive to energise an external relay, which could be used to over-ride the transmitter press-to-talk line to inhibit transmissions when out of lock.

INPUT DIVIDER INTERFACE

THIS CIRCUIT IS DESIGNED to enable direct frequency selections to be made using simple BCD thumbwheel-switched combinations, and as shown in **Fig 3**, it also incorporates a -600kHz repeater shift facility.

Upper and lower VCO transmit frequency limits are 12MHz and 12.16667MHz respectively, therefore the corresponding synthesizer divide ratio limits range from hex 2D00 (divide by 11520) to hex 2DAO (divide by 11680). Thus the two most significant hex digits '2D' do not change, and IC2 divide inputs N13 to N8 inclusive, can be hard wired 101101. At the divider inputs an open circuit is logic 1, and a grounded input (0V) is logic 0.

The total number of channel select switches is limited to just three, as it is unnecessary to switch the 100MHz or 1kHz decades.

For example:

To select 144.275MHz the three thumbwheel switches can be set to xx4.27x, or 145.350MHz will correspond to xx5.35x. 'x' represents the redundant switch decade positions. Only the 21 and 22 contacts of the 10kHz decade switch are utilised, and they are connected to the synthesizer divider N1 and N2 inputs. This decade switch need only be set to '0', '2', '5' and '7'. Because the ultimate channel spacing is to be 25kHz, the N0 (IC2 pin 11) divide input, which corresponds to 12.5kHz increments, is grounded.

The 100kHz frequency select switch contacts are each connected to their respective B inputs of the full adder IC6. For frequency selections below 145MHz, normally each respective adder output is fed to the synthesizer divide programme unmodified. However, for selections above 145MHz, the adder A2 and A4 inputs will be at logic 1 (5V) level, which causes hex A (binary 1010) to be added to the 100kHz switched select frequency data. The overall effect is to add hex 50 (further divide by 80) to the synthesizer programme divide inputs, N7 to N0.

When the repeater shift input at D4 is grounded, the XOR gates of IC7 will invert the divide selection data at IC2 divide inputs N7, N6 and N4. The overall effect is to subtract hex 30, (divide by 48) from the input selection data at inputs N7 to N0, which in turn reduces the transmit frequency by 600kHz from that selected by the thumbwheel switches.

It is important that the off-board circuitry be arranged so that a selected repeater shift can only occur when a frequency of 145MHz and above is selected, and only on transmit. The receive mode (Fig 2) is activated when the T/R input at diode D2 is active low, this causes the receiver first local oscillator frequency to step up 10.7MHz.

DIVIDE INTERFACE - LOWER IF OPTION

THE CIRCUIT OF **FIG 4** IS suggested as an alternative to that of Fig 3, where the receive first local oscillator tracks 10.7MHz *below* the received signal frequency. The upper and lower tracking frequency limits of the receiver local oscillator will now be 133.3MHz and 135.3MHz. To achieve this, the channel select data present at the programme divide inputs of the synthesizer IC2, will be hex 2A48 (divide by 10824) to hex 29A8 (divide by 10664), therefore the programme divide inputs N13 to N10 should be hard wired to 1, 0, 1 and 0 respectively. An additional full adder is required, and the XOR gate circuits which form part of the repeater shift facility, are placed between the adder IC9 and the channel switches. Lastly the T/R input logic at diode D2, (**Fig 2**) will be reversed, an active low is required for transmit mode.

. . . to be concluded

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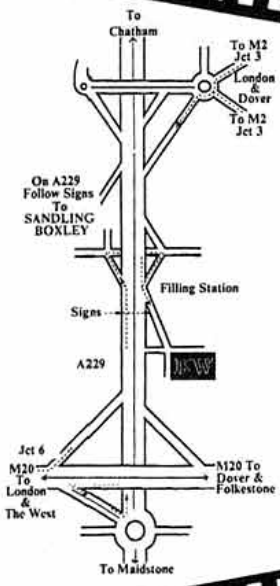

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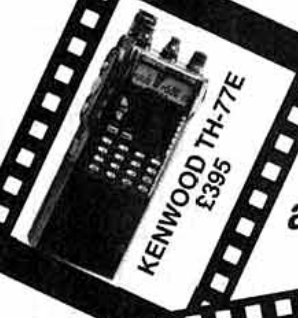
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Pat Hawker's Technical Topics

TWO-BAND QUAD-LOOP ANTENNA

LES MOXON, G6XN has shown (*HF Antennas for all Locations*) how a quad-loop element can form a multiband antenna by the use of stubs, etc. Many years ago there was included in *TT* and later *ART* a more conventional dual-band quad-loop antenna for 14 and 21MHz with a 75Ω coaxial feeder connected directly across a common feed-point of two resonant, one-wavelength loops. Originally published in *73* (Sept 1965), W6WAW claimed that this had proved effective in spite of the fact that the theoretical feed-point impedance of a loop element is approximately 125Ω.

Al Akers, ZS2U, (*Radio-ZS*, Feb 1992, pp5 and 8) uses a basically similar arrangement as a lightweight quad-loop antenna for 14 and 21MHz portable operation from the Ciskei, but with a ingenious matching network designed to provide a good match between a 50Ω cable and the 125Ω element impedance: **Figs 1 and 2.** His antenna is claimed to be easy to erect, dismantle and transport and uses garden canes for spreaders with an aluminium centre piece and aluminium mast, with no traps, etc to catch and damage among bushes and trees.

ZS2U writes: Fig 1(a) shows the antenna. L1 is the 28MHz loop and is 10.9m in length. The centre plate A is shown in Fig 1(b) with U-clamps used to fasten it to the mast (not shown are four saddles which fasten the pipes to the plate, also a centre piece which serves to hold these pipes and to block off their ends. The support arms are garden canes (2m long) and are epoxied onto lengths of 16mm outside-diameter aluminium tubing which make up the extra length needed. These pipes plug into the pipes on the mounting plate.

B is an ABS box, 15 x 8 x 5cm usually available from local electrical emporiums. It is used to house the acceptor-rejector circuits and L-match networks. The box is fastened to a 32mm PVC waterpipe about 80mm longer than the box and slotted for about 50mm. The pipe slides onto the mast and a hose clamp round the slotted section serves to clamp it to the mast.

In Fig 2, L1, C1, C2 and L2, L3, C3 form the two acceptor-rejector circuits. L4 and C4 is the L matching network for the 21MHz loop and C5 and L5 is the L matching network for the 14MHz loop. The upper acceptor-rejector circuit forms a series-resonant circuit on 21MHz (very low impedance) and a parallel-resonant circuit on 28MHz (very high impedance). The lower circuit functions similarly providing very low impedance on 28MHz and very high impedance on 21MHz.

ZS2U adds that he used silver mica capacitors, two in parallel in each case to make up the required value, and that these are standing up as well to the 50W output from his FT7B transceiver. The coils were air-wound with 14SWG copper wire, 22mm in diameter and 4mm-per-turn spacing. He used 3 turns for L2 and L3, 4 turns for L1 and L5 and 5 turns for L4. Adjustments were made by varying the coils in length, most of them requiring some spreading: "Orientate the coils so as to minimise inductive coupling between them. Start with L1 and C1 only. Resonate on 21MHz, then connect C2 and resonate on 28MHz. C3 and L3 are resonated on 28MHz, then L2 connected and adjusted to resonate on 21MHz. Wire up the whole unit and test. Probably minor adjustments will need to be made to the L matches. I used an SO239 socket at the bottom of the box for feedline attachment". ZS2U concludes his article as follows: "You may think, as I did, that this antenna will be difficult to make and adjust and, with all the coils etc, would be rather inefficient. I found that it was not difficult to adjust and it has proved itself in operation. It is a useful antenna where space is limited and has the advantage that it is directional".

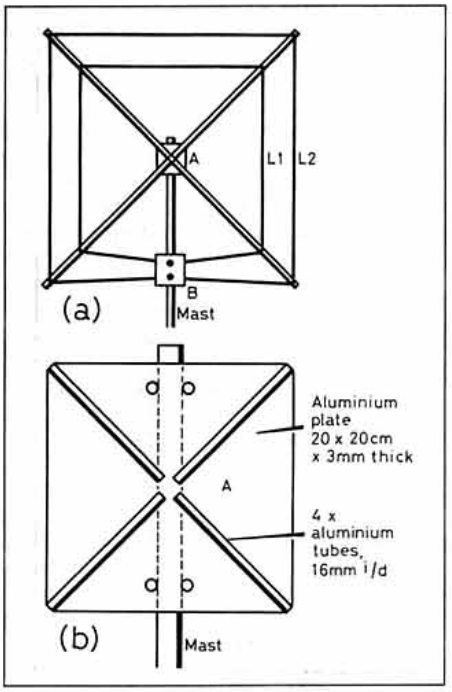

Fig 1: (a) ZS2U's two-band quad-loop antenna for portable operation on 21 and 28MHz. (b) Detail of the centre plate (see text).

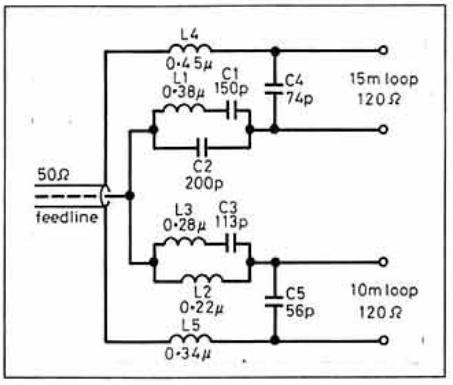

Fig 2: Acceptor-rejector matching networks providing good matching between a single 50Ω feedline and the separate 21 and 28MHz quad-loops.

VIVE LA LAMPE DE RADIO

THE MODERN WORLD OF tiny surface-mounted devices, application-specific ICs, HEMT low-noise microwave transistors and gold-bonded UHF power bipolars and FETs is gradually enveloping us all, even if, with high-power transmitting valves and the ubiquitous cathode-ray tube, we are still not quite in the all solid-state era. But it is coming inexorably. The UK's first high power solid-state UHF television transmitters have recently been installed for ITC/ITV by NTL (formerly IBA Engineering) at Stockwell Hill, Devon and Waltham (East Midlands). An IEE lecture/demonstration by Dr S Kataoka (Sharp Corporation) on 'Recent developments of black and white and colour LCDs and their applications' showed clearly the continuing developments of liquid-crystal television flat-screen TV display panels, including their use for large-screen projection displays. However, it seems pretty certain that the CRT which had its origins in the late 19th Century will still be in wide use in the early 21st Century - and I guess that there will still be some thermionic power valves in the linear amplifiers of amateur-radio transmitters. All of which means that we still need to understand how to get the best life out of devices which are of increasing rarity and cost.

Roland Martin (Z21HF) in *QUA* (Newsletter of the Mashonaland Branch of the Zimbabwe ARS) lists a number of useful hints on how to get maximum lifetimes out of power valves, especially the TV 'sweep tubes' such as 6JS6, 6KD6, 6LQ6, 6DQ5 etc. Remember that these valves were never intended for HF service as power output valves. Z21HF does not claim to be an expert on valve-based equipment but his running a station on a limited budget has given him experience that could help others in a similar position. He writes:

To get maximum life out of sweep tubes:

(1) Do not exceed the usual recommended maximum tune-up time of ten seconds, especially when the transmitter loading/plate settings are out of resonance and the anode currents are high.

(2) A quiet fan on the power-valve enclosure is a good investment, as a lower valve envelope temperature will much improve the operational life of both the valve and the surrounding components. If you don't have a fan make sure all air-vents are kept clean and clear of obstructions.

(3) Check the heater/filament voltage actually at the valve sockets. They should be within a 5% tolerance or preferably better (6.3V for the above types). If they are not within the specification check that the equipment is wired for the correct local AC mains voltage (240V UK, apparently 230V in Zimbabwe, 220V in most mainland European countries).

(4) When purchasing new power valves, matched pairs are preferable in order that the load is shared equally between them. Non-matched pairs can differ significantly.

(5) Again, when purchasing tubes, particularly sweep tubes, check that the manufacturer is compatible with your equipment. FT101 and FT200 transceivers are a case in point, as these were designed to

use Toshiba 6JS6C valves but will also work with NEC valves. On the other hand, valves from other manufactures may produce unpredictable results.

(6) Correct neutralisation of power valves is vitally important. Unless you have a 'sure fire' procedure, refer to the manufacturer's manual for the correct method.

(7) Do not run power valves for long periods with the heaters powered but with no HT on the anodes; this may result in cathode poisoning causing loss of emission and in effect destroying the valves.

(8) Efforts should be made to limit heater/filament inrush current, especially for high power linears using such valves as the Eimac 3-500z, as the magnetic field can in extreme cases warp the grid structure. It is important to note that filament transformers are often designed so as to reduce such current surges. Replacement transformers (especially if up-rated) may not provide inrush protection.

(9) Before replacing any power valves, always check the voltages on the socket(s) against those in the manual. the conditions which caused the previous set to fail may still be there! Owners of FT101 should take note!

Z21HF recognises that an increasing problem is that the correct replacement valves may no longer be available, or have become too expensive. He notes that some TV sweep tubes appear to be interchangeable. The obvious thing to do is to check that the proposed substitute has the same base, the same physical size and the same pin connections. It may be useful to obtain or borrow a manual for an equipment in which the proposed substitute is used. Check this against your equipment: (a) heater/filament; (b) anode and grid voltages; (c) values of neutralising capacitors; (d) values of loading/anode and tank coils.

He adds that it is possible to substitute commercial transmitter-type valves such as the 6146B (still usually available) for TV sweep tubes. However, (a) the chassis may have to be modified (ie bigger cut outs made to accommodate the valves; (b) for a given power output a higher anode voltage is almost always needed; and (c) grid voltage will probably have to be changed to suit the new valve.

How much work and expertise will be involved depends upon the particular transceiver. As an example, Z21HF cites the example of an FT200 transceiver with FP200 power supply modified to accommodate a pair of 6146B valves in place of a pair of 6JS6C valves; (a) The valve sockets were changed to 8-pin octal types; (b) the neutralising capacitor was changed to 500pF; (c) a stabiliser valve was installed to provide 220V to the screens, against 150V for the original 6JS6Cs; and (d) the bias was reset to give 60mA anode current.

The result was a drop in power, 180W PEP input against 240W PEP input with the original valves. However, this reduced power represents only a fraction of an S-point received signal. the plus point was a completely reliable transceiver using transmitting-type valves which are still around in reasonable numbers.

THE UK AND THE BEAM-TETRODE

IN *TT*, OCT 1986, p782 under the heading 'The valve that changed everything' it was noted how, 50 years earlier, in 1935-36, a team of RCA engineers, led by Otto Schade, developed a new metal-type power valve. This had a tetrode structure but used aligned grid and screen electrodes and beam confining plates connected to the cathode that, like the pentode, eliminated the kink in the characteristics of the earlier screen-grid tetrode valve. So came to us the 6L6 and then late in 1936 the glass 6L6G and the improved RF version, the 807 - a family of valves that truly changed everything for amateur-radio transmitters.

In my review of BREMA's *The Setmakers* (*Radcom*, June 1991, p52) I noted that the author Keith Geddes explained that the original work on beam-tetrodes could be ascribed to C S Bull and 'S Rodder' of EMI at Hayes, Middlesex who had been given the task of circumventing the Philips patent on the pentode, but with British valve-makers unwilling to tackle the mass-production of this type of valve. Ivan James, G5IJ, pointed out to me that the spelling in the book is wrong: 'S Rodder' was in fact Sidney Rodda.

Furthermore, the 6L6 was not the first type of 'beam power tetrode'. In 1935, the relatively small British valve firm of Hivac introduced the HY220 (2V battery valve) and the ACHY (4V heater), providing respectively an audio output of 580mW and 2.4W, claimed as superior to comparable pentode valves - and both featuring Harries 'critical anode distance' electrode structures with 'focussed' electron stream.

These valves were based on British Patents 328,680 (1929), 380,429 and 385,968 (1931), thus preceding the EMI Patent 423,932 in the names of (Sir) Isaac Shoenberg (EMI Director of Research), C S Bull and S Rodda. Being outside the powerful BVA 'ring' the Harries tetrodes were not taken up by British setmakers but were advertised in the constructional periodicals, including the *T & R Bulletin* (the original title of *RadCom*). For example the front cover of the July 1937 issue stated: "In 1935 Hivac introduced a series of Hivac Harries 'critical anode distance' beam power tetrodes. Since their introduction several new types have been added to the range. May we send you full particulars?" The advert showed the electrode structure: **Fig 3**.

The Harries tetrodes were described by their inventor, J H Owen Harries in *Wireless World* (2 Aug 1935) but seem to have vanished with the coming of the war in 1939 without ever reaching the popularity soon achieved even in the UK by the American beam-tetrodes. I recall that Owen Harries, a prolific inventor in the 1930s in the fields of radio and television, became disillusioned with his attempts to have his ideas taken up by major manufacturers, emigrated after the war to the United States and eventually settled in Bermuda. Whether or not his form of beam-tetrode was as good as, or even superior, to the RCA electrode structure is no longer of practical importance - my junk box contains a few 807 valves but no Hivac beam-tetrodes. *Sic transit gloria* . . . .

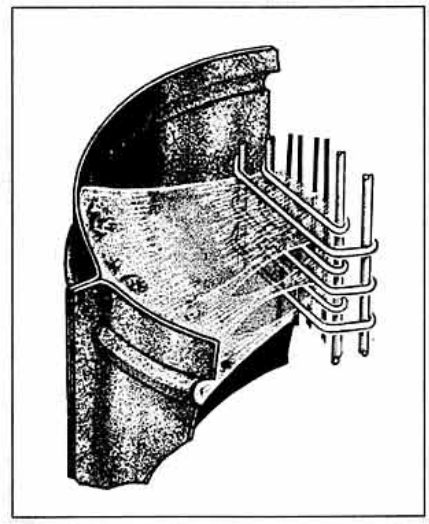

Fig 3: An illustration from the front-cover Hivac advertisement in the July 1937 *T & R Bulletin* showing the manner in which the electron stream was 'focussed' in Harries 'critical anode distance' beam power tetrodes. Unlike the RMI/RCA 6L6 beam power tetrodes there were no beam forming plates connected to the cathode. The Harries/Hivac tetrodes reached the market ahead of the 6L6 in 1935.

ANTENNA ROUND-UP

ONE OF THE MORE POWERFUL forms of broadside, vertically-polarized antennas suitable for amateur HF operation (although very little used) is the Bobtail Curtain: **Fig 4**. Its low-angle radiation provides a hefty gain on DX. The broadside horizontal directivity is only moderate, an advantage for a fixed, suspended wire array. Some relatively high-angle, horizontally polarized radiation will, in practice, result from imperfect cancellation of radiation from the top horizontal span (as with a T-antenna, most of the radiation from the two halves of this section cancel out). Perhaps the most obvious disadvantages are that it is basically a single-band array, requires a matching network at the base of the central vertical wire to provide a voltage (high impedance) feed and a site that can accommodate a full-wave span at a height of just over a quarter-wave.

In the NRRL journal *Amator Radio* (4/92), LA5UF has a short note on a simple variation which, although no longer a true Bobtail, should provide a simple DX antenna that can be fed directly from 50Ω co-axial cable, providing a mixture of horizontally and vertically polarized radiation: **Fig 5**.

Dave Plumridge, G3KMG, has some useful thoughts on feeder radiation and RF current measurement. He writes: "Recent comments on baluns and the controlled feeder radiation antenna have made me realise that nowhere have I noticed (handbooks included)

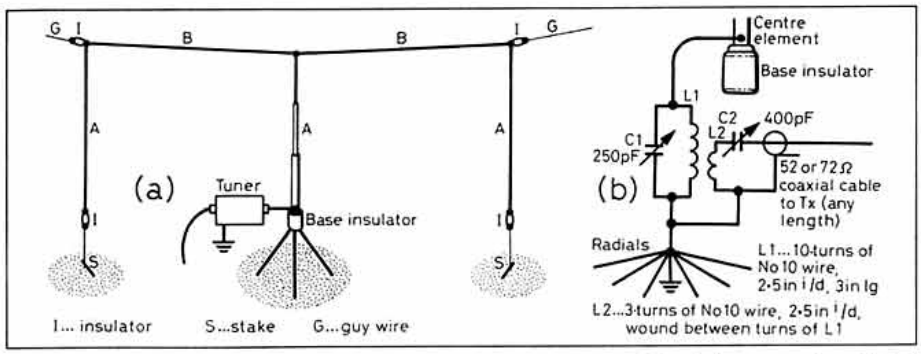

Fig 4: (a) The Bobtail-curtain antenna as described in many Handbooks. This design comes from VE1TG (*Ham Radio*, July 1969) as reproduced in *ART7*. Dimensions for 14MHz A 16.5ft, B 33ft (7MHz A 33ft, B 66ft). (b) Tuner used by VE1TG on 7MHz. For 14MHz L1 and C1 about half the values shown, C2 about the same.

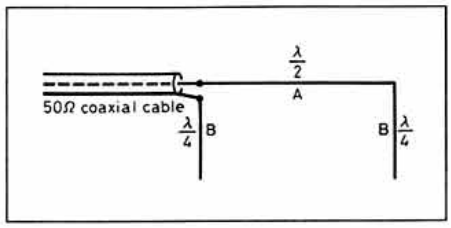

Fig 5: The simple DX-antenna described by LA5UF in *Amator Radio*. A = 75/f (MHz) in metres, B = 150/f.

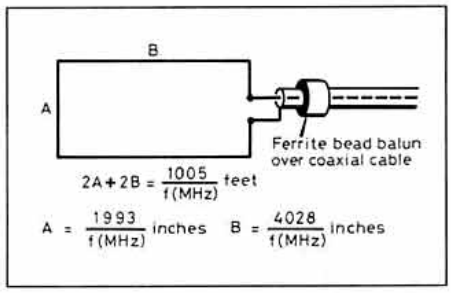

Fig 6: Elongated quad-loop antenna as implemented by G3BDQ.

any information on how to measure or even check the magnitude of current on the outer braid of a coaxial line. The last time I can recall antenna current being mentioned was many years ago in *TT* when a device involving a spring-type of clothes-peg with two half toroids which could be clipped round a coax cable to form a current transformer with diode rectifier and meter was described (Despite a lengthy search I cannot trace the issue in which this appeared - *G3VA*). (But see 'Remote Reading RF Ammeter', *RadCom* June and July 92 - *Ed.*)

"I needed to check a loaded 7MHz dipole made for a local blind amateur to use as an indoor antenna. On testing it in my attic I was plagued by RF feedback. I wanted to confirm whether it was just the close proximity of the antenna or outer braid radiation from the feeder. To check the RF on the feeder I made a current transformer with one of the large 'braid breaker' ferrite toroids of the type available from the RSGB (see *Book Case* pages - *Ed*). This consisted simply of 20 turns of wire wound on the toroid, a 47Ω load resistor with a simple diode detector (the *QST* detector shown in the April *TT* would allow accurate measurements!). The large toroid allows coax plugs to pass through without any need for disconnection or a split clothes peg toroid. The device was calibrated by coupling to the inner of the coax feeding the station power meter and dummy load and noting the voltage at various power levels. A bit of maths gave the RF current for a given detected voltage.

"Application of this meter to the dipole feeder showed the presence of a large current on the outer braid. A balun choke made by coiling the coax at the feed point into six turns at about 10in diameter reduced the current significantly and eliminated the RFI problems. Out of interest, a further 'coil balun' a few feet away from the feed point reduced the current on the outer braid to a negligible level. Such an RF current meter can thus give a quantifiable measure as to the effectiveness of a balun. On a controlled feeder radiation antenna the ratios of 'antenna' to 'feeder' currents could be quantified to check theory with practice.

"When my parallel dipoles, fed via an ATU with 75Ω twin feeder, seemed to be playing up badly on 21MHz only, a check with the current meter showed a large unbalanced current on this band with next to nothing on the other bands. Lowering the antenna showed there was a break in the 21MHz dipole near the feed point.

"A further application came with a desire to try a ground-plane antenna on 21MHz. Remembering the suggestion in *TT* that the requirement for 'four' radials is something of a modern myth with the inventor, the late George Brown, originally being satisfied with only two, I used only two radials, making the installation much less messy with fewer wires hanging about. Apart from the SWR and performance being fine, the current meter showed negligible current on the outer braid - so who needs four or even three radials?"

John Heys, G3BDQ tried the flattened-loop antenna noted in the February *TT*, p37 using the dimensions given by W6SAI but found they did not give unity SWR on the design frequency and found that on 21MHz his formula gave a loop that resonated at 20.5MHz. Much trimming eventually gave unity SWR at 21.2MHz. G3BDQ considers that the total wire length should be that used for a normal quad-loop element:

1005/f(MHz) ft with the side lengths chosen as shown in **Fig 6**. He finds that this gives a perfect match and an antenna that has worked 'really well' when with the lower side some 10ft from the ground.

It would appear that G3BDQ has his quad-loop in the vertical plane. The design is equally suitable as a horizontal loop and this may account for the lower resonant frequency found by him due to proximity of the lower element to ground.

BLOW (PIPE) UP YOUR ANTENNA

TT, NOVEMBER 1991 INCLUDED an item showing how Ron Grant, G3XPH, uses a homemade catapult-sling as a means of shooting a line across a high branch of a tree, as the first step in putting up a wire antenna. I pointed out that G3XPH had not mentioned the heights he achieves with his rather formidable weapon that shoots a metal-loaded wooden bolt. He has since written to say that the trees he uses are about 90ft high and that as he can clear these with his bolt, he guesses that it would be possible to reach 110ft or so - a truly impressive height.

He also brings to attention an alternative idea (brought to his notice by Ed Hughes, G0IOB). This, although incapable of putting a line across such high branches, combines reasonable performance with less chance of causing injury or damage to anyone else! The idea stems from an article by Ray Fry, VK2FRY, in the Australian magazine *ARA*: 'Dipole installation made easy'. The idea is to use an improvised blow-pipe formed from a piece of plastic conduit about 0.75in (20mm) in diameter and about four or five feet (1.5m) long. The projectile is a rolled-up sheet of semi-stiff paper rolled into a long narrow cone, measuring 20mm at its opening and tapering to a point at the other end. The 20mm end is formed so that it slides nicely into the pipe, a piece of sticky tape helping to keep its shape.

Next take a fishing line with a sinker attached and sticky tape it to the point of the cone. Then insert the cone into the plastic tube and shake it down until it almost comes out the other end. The paper cone forms the dart.

With an assistant standing alongside, holding the remaining line on a cork, end on, towards the tree, the person with the strongest 'puff' places the tube in his mouth and aims at the desired location in the tree. The 'blower' takes a deep breath and gives a sudden, sharp puff into the conduit. With luck the dart will shoot up and across the chosen branch, and then it is only a matter of tying a stronger cord to the line and carefully pulling this into place with the nylon line. VK2FRY and his sons have used this blowpipe several times, achieving deadly accuracy to heights of about 15m. The Australian believes it would be possible to blow harder and go further but has never needed to exceed this height. The lead sinker used was about the size of a large bean, sometimes known to (Australian) fisherman as a 'bug'. The only problem encountered was the tendency of the very light nylon line to snap while the heavier cord was being dragged through the tree.

BATTERIES AND A LEAD-ACID BATTERY CHARGER

ACCORDING TO AN ARTICLE by Andy Cogan in *New Scientist*, April 25 1992, new ranges of 'wafer-thin' disposable lithium batteries will soon be marketed by a number of Japanese (eg Yuasa) and European firms. The batteries can be made a fraction of a millimetre thick and in any shape to fit portable phones, pager devices, laptop computers and video camcorders. The developers of

solid-state lithium batteries believe they can reach a target of between 150 to 200 Watt-hours per kilogram, compared with about 35 to 40 for conventional lead-acid and nickel-cadmium batteries. All the batteries under development have solid electrolytes made of a polymer. In each cell, a sheet of the polymer is sandwiched between one electrode of lithium and one made from a mixture containing vanadium oxide, parts of the electrolyte, lithium salts and a binder to increase conductivity. The 'sandwich' is sealed to prevent leaching of lithium. In the past, a problem with lithium cells is the potential hazard of explosion if overheated. It is stated that the new batteries should be safe because the flat construction makes it easier for potentially dangerous heat generated if the battery is short-circuited to radiate away from the broad surface. Dowty Batteries of Abingdon has developed a prototype stack that fits onto a miner's belt to power the light on safety helmets: "These batteries are very safe because there is no liquid electrolyte. Lithium is a very reactive metal but the construction is such that you don't get very much lithium exposed if the battery is cut open. At the molecular level, the polymeric electrolyte flows round the lithium and shields it." according to Colin Newnham, the group project leader at Dowty.

TT has on several occasions referred to the practice of zapping away the whiskers that tend to develop in nicad cells and cause short-circuits. A rather different, and more drastic, cure is suggested in a letter in *New Scientist* (April 25 1992) by Michell Bell: "If you drop a 'tired' battery about a foot onto a concrete floor a few times it renews the battery wonderfully. The theory (folklore?) is that a layer of crystals builds up around the electrodes and dropping the battery breaks the crystals. Whatever the truth of the theory, it certainly works." An editorial note warns: "Be careful - you may cause the battery to leak, which could damage your equipment".

An item 'Low cost battery charger using regulator' by A D V N Kularatna (University of Moratuwa, Sri Lanka) in the Applied Ideas feature of *Electrical Engineering*, February 1992, p28 describes the use of a MC1723 precision regulator to configure a charger providing optimal characteristics for ordinary lead-acid batteries: **Figs 7 and 8.** The charger initially feeds the battery at a constant current until the terminal voltage reaches a value around 2.33V/cell. Then the circuit automatically configures into a constant voltage mode, and charges the battery until it reaches about 0.8 to 0.95 of its Ah capacity. When this stage is reached, the circuit once again reconfigures into a trickle charge stage (2.23/cell) minimizing gas formation. The circuit shown in Fig 8 is a design for a 6V, 1A charger for a 5.5Ah, 6V lead-acid battery. The values for constant current, constant voltage and trickle charge can be adjusted to suit individual cases with potentiometers PR1, PR2, PR3 and PR4. The author provides a detailed description of the functions of the regulator and associated components.

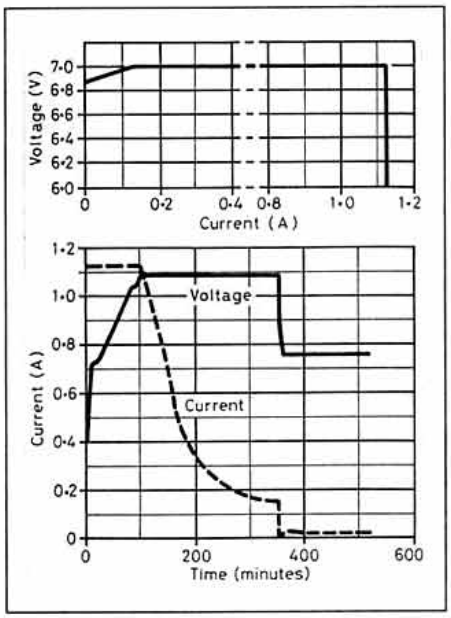

Fig 7: Characteristics of the *Electronic Engineering* low-cost battery charger (lead-acid batteries) using an MC1723 precision regulator which operates in constant-current, constant-voltage and trickle-charge modes.

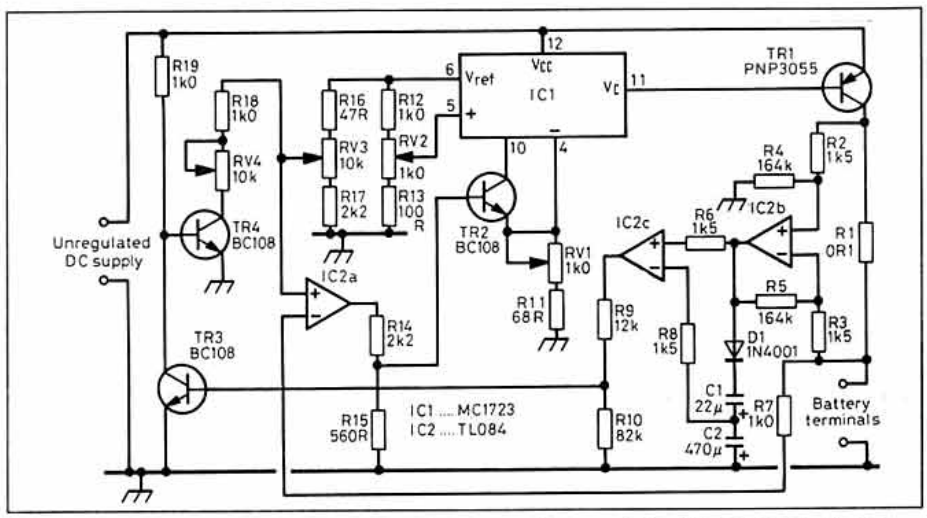

Fig 8: Circuit diagram of the battery charger as implemented for use with a 6V, 5.5Ah lead-acid battery.

TECHNICAL TOPICS

FRONT PANEL LETTERING

R C ARNOLD, G8DZU, suffered over some years from lettering falling off the front panels of his constructional projects and decided that the time had come to develop a foolproof technique that would provide a permanent non-destructible form of lettering that cannot be damaged or fall off just after the equipment has been finished. He describes as follows his technique:

(1) Panel preparation: Wire wool key the aluminium panel. Wash panel under a hot tap to remove any grease or debris, then dry the panel.

(2) Apply undercoat: Use grey undercoat spray paint. Allow it to dry for a minimum of *two* hours in a warm atmosphere.

(3) First top-coat: Apply first top-coat of spray paint. Allow to dry for minimum of *two* hours.

(4) Apply lettering: Use Lettraset or Dryprint, as required.

(5) Protective finish: Apply draughtsman Magic Tape over each piece of lettering. Do not worry about cutting into the paint surfaces already applied as they will automatically be retouched with the application of the second top-coat.

(6) Second top-coat: Spray second top-coat over the entire surface including the now protected lettering to the required final finish, and allow to dry as before. You will find the Magic Tape unaffected by the spray paint.

(7) Revealing the lettering: The lettering can now be revealed by taking a rounded-blade, sharp craft-knife and scraping the paint off the surface of the Magic Tape. The original lettering will now be seen in its permanent form.

HERE AND THERE

JOHN TAYLOR, G0AKN, poses an unusual question involving rubber bands, insects' wings and VLF radio waves (!). He writes: "I recently received a VLF receiver from Conversion Research of Descanso, California and at the beginning of March took it into the country to an area relatively free of mains hum in order to try it out. All went well, but I noticed that a rubber band that had originally secured the whip antenna in transit had been left around the case of the receiver. When I went to remove it, I distinctly heard in the receiver's headphones a strong twanging noise as I stretched the band.

"I removed the rubber band and, thinking the twanging might be due to capacitance effects from my hands, I persuaded someone else to stretch it and pluck it at a distance of two metres. I received in the headphones, a powerful sound just like an electric guitar. The Conversion Research's receiver handbook mentions that the receiver can pick up the buzz from insects' wings. They state that the cause is not known but they postulate electrostatic charges. So I wonder if vibrating rubber bands are emitters of VLF radio waves? Do other vibrating strings, for example on a violin, do this?

Mike Whitaker, G3IGW, noted the March *TT* item on the use of 7MHz dipoles on 21MHz with the problem that, because of 'end

MAGNETIC LONG-WIRE BALUN

A LETTER FROM DEREK MORLEY (ex-YB0ADW) reported that he had recently bought (from Lowe) a 'magnetic long-wire balun' made by RF Systems Inc. The associated sales leaflet made strong claims for the device as being the ultimate way of matching any long-wire antenna to 50Ω coaxial feeder. Derek wrote: "I don't know about the theory behind it but in practice it works well - about 1.5 to 3 S-points up on a traditional long-wire antenna as comparison, with greatly reduced noise."

I must admit I was misled by that YB0ADW callsign. As a long-time user of a 40m long-wire antenna at G3VA my eyes lit up. This seemed just what I and many others wanted. I could replace that part of my long wire that passes through the roof space and down to my upstairs rig with coax!

But then my scepticism about baluns and wideband toroidal cores returned, with their tendency to saturate and overheat, and their power losses. Had RF Systems really come up with the long-awaited answer to end feeding a multiband antenna with coaxial feeder?. G6XN has indicated a partial solution with a capacitor loaded end-fed Windom intended for single-band operation. (*TT*, August 1988).

It took some minutes for the penny to drop. What RF Systems have developed is a wide-band, impedance matching transformer for *reception* - useful for enthusiastic SWLs and possibly for those amateurs who are prepared to use separate antennas for reception and transmission but not, alas, a device that could make the long-wire transmitting/receiving antenna more popular than ever.

My mistake and not the manufacturers! Indeed, wideband impedance-matching transformers were, over 40 years ago, an inherent part of the 'noise-reducing aerial systems' offered by such firms as Aerialite Ltd, matching a vertical whip antenna to a screened downlead: **Fig 9**.

But to return to Derek Morley's notes on what he felt would be of interest to *TT* readers (**Fig 10**). He wrote: "However, I examined the balun before installation. I could foresee problems of weather-proofing the PL259 connector. So I hit on the modification as shown in **Fig 11**."

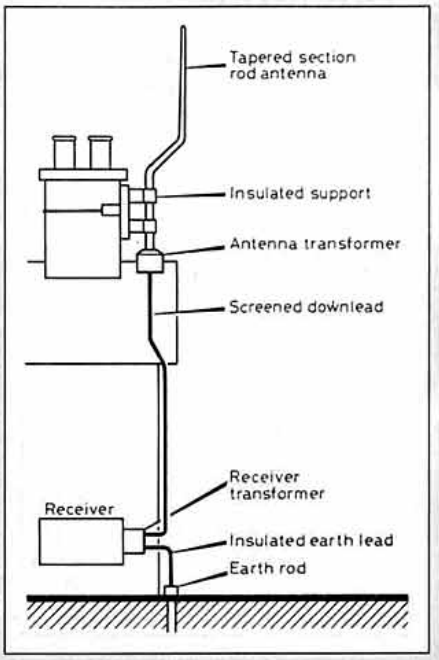

Fig 9: A wideband noise-reducing antenna installation for broadcast reception as marketed in the UK many years ago. The second receiver transformer was necessary since broadcast receivers had a relatively high input impedance of about 400Ω.

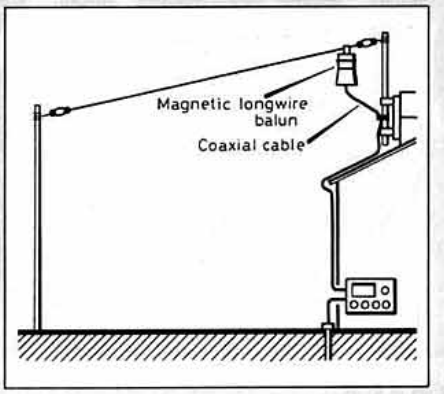

Fig 10: A receiving antenna system as suggested by RF Systems and using their magnetic long-wire balun.

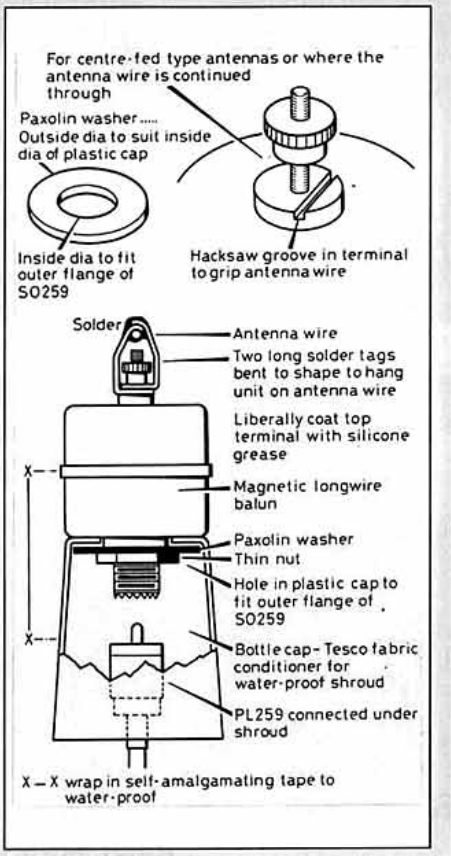

Fig 11: Modifications to improve the weather-proofing of the socket for the magnetic long-wire balun.

effect' antennas do not resonate exactly on harmonically-related frequencies. He writes: "It is probably not widely recognised that the 5th harmonic of a 3.5MHz dipole comes out roughly at 18MHz and the 7th harmonic at roughly 24MHz. After allowing for 'end effect' the dipole length for mid-band resonance on these two WARC-bands would be 134.4ft and 137.1ft respectively.

"A compromise length of 136ft would have a fundamental resonance at about 3.43MHz although if cut for 3.65MHz (the middle of the 3.5 - 3.7MHz band) would be some 8ft shorter. However, in practice, a 136ft dipole would cover much of the 3.5MHz band before there would be a cut-back of power output (due to rising SWR) when using a typical solid-state transceiver, and would thus be effective on 3.5, 18 and 24MHz bands. Furthermore, a 3.5MHz dipole is also quite effective on the 10MHz WARC-band, although on this band there is considerable reactance needing to be tuned out by means of an external ATU."

Antennas for the lower-frequency bands when used on higher-frequency bands will have multi-lobe radiation patterns. Unless some half-wavelength high, they will tend to be virtually omnidirectional on their fundamental frequency. For general use, multi-lobe patterns are seldom a disadvantage and G3IGW was pleasantly surprised to work 101 countries in 30 days on 18MHz using a 3.5MHz dipole 40ft high. He comments "18MHz is a wonderful band".

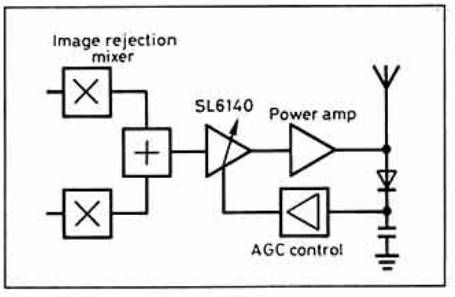

Fig 12: Use of the SL6140 AGC amplifier chip as ALC control of an SSB power amplifier.

John Greenwell, G3AEZ, sends along a clipping from one of the electronics magazines showing how the Plessey SL6140 AGC IC chip can be used as a fast-attack, slow-decay AGC system on the power stage of SSB transmitters. The SL6140 is pin-compatible with the Motorola MC1590 but has enhanced frequency performance (SL6140 up to 400MHz, MC1590 less than 100MHz) as well as mil-spec type temperature performance (-55 to +125°C).

According to the clipping: "The SL6140 has been used as shown in **Fig 12** taking an AGC input from a peak detecting diode and through an AGC control circuit to operate the ALC control pin on the SL6140. The SL6140 AGC amplifier is most suitable in this type of application as its balanced design does not 'thump' (produce a spurious output) when the AGC is activated. The input to the power amplifier in this SSB application is an image rejection mixer, but could equally well be any other input circuit requiring a power output stage with accurate control of output power." ***G3VA***

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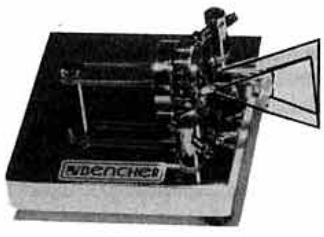

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P.S. On looking through an old 1986 price list, I noted that the price of the BY1/ST1 was £67.42 and the BY2/ST2 was £76.97.
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The Peter Hart Review

HF Vertical Antennas

G3SJX Takes a Look at The Voyager DX-IV and the Cushcraft R7

VOYAGER DX-IV

LAST AUTUMN, I had the opportunity to evaluate the GAP Challenger DX-VI 80-10 metre multiband vertical antenna and the review was published in the December 1991 *RadCom*. GAP Antenna Products also manufacture a vertical antenna specifically for the LF bands, the Voyager DX-IV. Whilst I still had the cabling in place, and with the onset of the Winter LF season, it seemed a good opportunity to review the Voyager. The principal of the antenna is very similar to the Challenger but is a scaled up version to cover the four bands 1.8, 3.5, 7 and 14MHz. Complete coverage of the entire 80m band is claimed (3.5 - 4.0MHz) as well as for the higher bands and a bandwidth of about 90kHz on 160m.

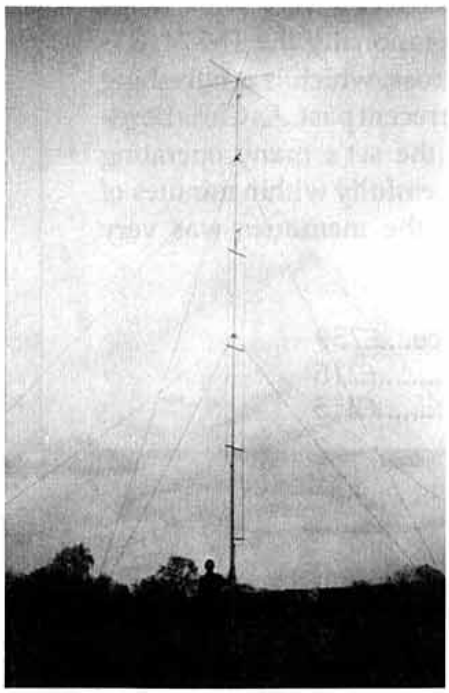
DESCRIPTION

THE VOYAGER DX-IV is very similar to the Challenger and the reader should refer to the review in the December 1991 issue of *RadCom* for a more complete description of how the antenna functions. The Voyager is 45ft (13.7m) long and uses no traps, coils or transformers to achieve a 50Ω match on all bands.

The antenna is a grounded elevated feed monopole comprising a single radiator with a gap, 29ft (8.8m) up from the base, at which point the feeder is connected. The upper section is hence 16ft in length. The feeder enters at the base and passes up the inside of the tubing. The outer of the coax is connected to the lower section of tubing while the inner feeds the upper section through a series stub. This stub is electrically one quarter wavelength long on 160m and is terminated in a capacitor (measured as 4.8nF). The feeder and stub are cleverly constructed from a single length of coax, folded and contained inside the main tubing.

In common with the Challenger, the Voyager also uses three tuning rods connected across the gap, spaced away from, and running parallel to, the main element. One rod protrudes upwards and two protrude downwards. The function is to provide capacitive loading on the LF bands and parallel transmission line stubs across the gap on the higher bands. Unlike the Challenger, the Voyager is also provided with a capacity hat at the top of the mast to lower the resonant frequency and achieve resonance on the lower bands with less loading. This raises the bandwidth. The hat is quite substantial, comprising 20ft circumference of wire attached to six aluminium tubing supports spaced around the mast.

On 1.8MHz, the series stub transforms the



4.8nF terminating capacitor into a loading inductor in series with the upper antenna section. This brings the antenna into resonance together with the additional shunt capacity provided by the tuning rods and capacity hat.

On 3.5, 7 and 14MHz, the series stub is an even multiple of half-wavelengths. The terminating capacitor is virtually a short circuit at these frequencies and is transformed to a similar short circuit at the feed end of the stub. Hence the feeder is effectively connected across the gap. On 3.5MHz, the antenna is rather shorter than λ/4 in length but is brought into resonance by the additional capacity of the tuner rods and hat. On 7MHz the radiator is about 3λ/8 and on 14MHz, the length of the top section above the gap is λ/4. On these bands, the tuner rods act as matching stubs.

The antenna is very substantially constructed using thick-walled aluminium tubing and stainless steel hardware of excellent quality. The lower section from the base to the gap comprises 2in diameter tubing and above the gap this reduces to 1.375in at the top. The tuner rods and capacity hat supports are made from 0.5in tubing and all mast joins are sleeved for added strength. Although the Voyager is only half as long again as the Challenger, it is double the weight at 30lbs (13.6kg). The Voyager is intended only for ground mounting and should be supported with two sets of guys for which supporting brackets are provided. The base of the mast is insulated directly from ground but should be connected to three counterpoise wires or radials, each 57ft in length, and evenly deployed around the antenna. The wires should be insulated but can be laid on the ground or buried.

A 24-page manual is provided which gives clear and easy to follow instructions on assembly and installation.

ASSEMBLY AND INSTALLATION

ASSEMBLY OF THE ANTENNA is very straightforward and should take around three leisurely hours. The parts were all easily identifiable and fitted together without any problems. A few spare screws and washers are provided and even a nut driver, although this gets a bit hard on the hands after inserting 60 screws. The capacity hat is best left until the antenna is ready for raising.

Raising and supporting an antenna of this size is a job which should not be undertaken lightly. The base mount comprises two lengths of angle which should be fixed into the ground, and the mast then pivots on a bolt between these set in insulated bushes. Care is needed to make sure the base mount is accurately aligned when fixing and this is best achieved by making a simple supporting jig. The antenna should be sited and protected to avoid contact when in use as some very high RF voltages are developed on the lower tuning rods which extend down almost to ground level.

The instructions cover raising the antenna in some detail although the method described is somewhat 'brute force'. After accurately tying off the side and back guys, four people heave the antenna into the vertical. My preferred method is to use a gin pole with a block and tackle. With this method, the antenna is safe, fully under control at all times, and can be easily raised single handed. Having raised the antenna, it is available for immediate use as there are no adjustments to make.

PRACTICAL RESULTS

THE ANTENNA WAS ERECTED on level ground, well away from any trees, buildings or other antennas. The VSWR measurements given in the table were made looking directly into the antenna feeder as supplied, with a battery powered rig near the base.

On 1.8MHz, the antenna was resonant at about 1880kHz. At around 1830kHz, in the DX sector, the VSWR had risen to 3:1.

On 3.5MHz, the antenna was resonant a little below 3.7MHz and the VSWR was very low across the whole of the SSB sector. The VSWR rose to 1.9 at 3.5MHz and was still only a little above 2:1 at the top of the US phone band (4MHz)

On 7MHz, the antenna was resonant in the US phone sector at about 7.17MHz. The

VSWR had risen to 1.2 at 7.1MHz and 1.6 at 7.0MHz. On 14MHz the VSWR was fairly flat across the whole band.

On-air comparisons were made back in the shack between the Voyager and a Butternut HF6V-X. The two were located 300 ft apart and fed with feeders of equal loss.

On 1.8MHz, I had no second antenna for comparison. However, the Voyager seemed to function well and plenty of contacts were made. I suspect that the stub/capacitor loading is a little lossy on this band as the bandwidth is rather wider than would be expected for a vertical of this length. This had been the case with the Challenger on 3.5MHz.

On 3.5MHz, the antenna performed very well indeed and at the Butternut resonance, the Voyager was up to half an S-point stronger. However, away from the Butternut resonance, there was up to two S-points difference between the two antennas. The wider bandwidth of the Voyager enables both the CW and SSB sectors to be covered without retuning.

On 7MHz, I could detect no difference between the two antennas on local or DX signals. On 14MHz the Voyager was rather disappointing, being consistently one to two S-points down on the Butternut.

CONCLUSIONS

THE VOYAGER DX-IV is a useful four band vertical for the LF bands. It is very ruggedly constructed and, as with the Challenger, should survive the wildest of weather conditions and give many years of reliable service, assuming it is correctly erected. The antenna is a substantial structure and needs a suitable location and a degree of space. It is certainly not an antenna for a small garden.

The 80m performance is very good and covers the whole band without retuning. 160m covers a useful bandwidth but the 20m performance is rather disappointing. The antenna will suitably complement an HF beam to give all band coverage. The current price of the antenna is £389.95 inc VAT.

ACKNOWLEDGEMENTS

I WOULD LIKE TO THANK Bredhurst Electronics Ltd of Handcross, West Sussex for the loan of the antenna.

Band	Min VSWR	Max VSWR or Bandwidth 2:1 VSWR
1.8MHz	1.1	70kHz
3.5MHz	1.0	1.9
7MHz	1.2	1.6
14MHz	1.6	1.7

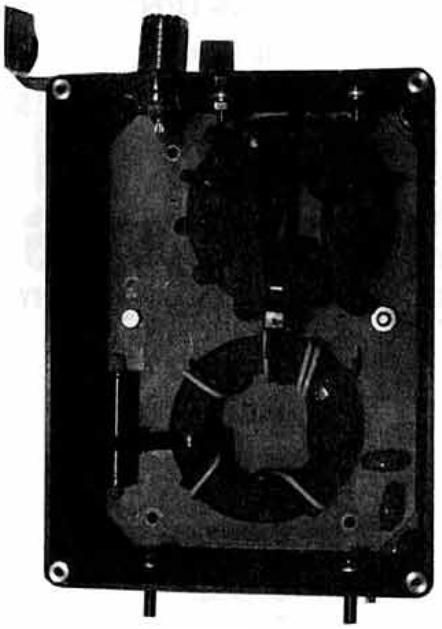
Note that for values of VSWR below about 1.5, inaccuracies in the measurement equipment probably gives an over-optimistic result.

Table 1

CUSHCRAFT R7

CONTINUING THE THEME of multiband HF verticals, this review investigates one of Cushcraft's offerings, the R7. Cushcraft Corporation of New Hampshire is one of the largest manufacturers of antennas for the amateur market. Amongst their range of antennas are three conventional trapped quarter wavelength verticals for three (AV3), five (AV5) or eight band operation (AP8).

The more recently introduced R5 and R7 verticals are particularly interesting designs, based on an electrical length of one half wave. The higher base feed impedance removes the need for an extensive radial system and allows the antenna to be located on a very small plot. The antenna may be mounted in any position from near ground to chimney mounting or on top of a tower. The R5 covers five bands - 28, 24, 21, 18 and 14MHz. The longer R7 covers 10 and 7MHz in addition to these five.



The matching box on the R7.

DESCRIPTION

THE CUSHCRAFT R7 HAS A length of about 23ft (6.9m), weighs 12lb (5.6kg) and has a power rating of 1800 watts PEP on all bands. Interestingly, Cushcraft claim a radiation angle of 16° for this antenna, 2° lower than for their quarter-wavelength verticals. I would have expected this to depend on height above ground however. If these radiation angles are correct, this implies that the half wave vertical has an improved DX performance compared to a quarter-wave vertical.

The main elements of the antenna are shown in **Fig 1**. There are six pre-tuned traps as shown separated by lengths of tubing and these tubing lengths may be adjusted to allow tuning of the resonant frequency on different bands. The 24 and 28MHz traps are combined into a single sub-assembly. Each trap comprises a series inductor shunted by a capacitor which is formed from two lengths of concentric tubing separated by a plastic sleeve dielectric. The whole assembly is sealed against the weather.

The antenna is fed at the bottom end through a matching unit. This comprises a 50Ω balun and 1:4 step-up impedance transformer, both wound on substantial ferrite toroids. The antenna is fed through a series capacitor and there is a shunt inductor to give a static discharge path to ground. The matching unit is designed to match into antennas presenting an impedance of 200Ω. An end fed half wavelength has a somewhat higher impedance than this but by a combination of shortening the antenna, reactive tuning by the series capacitor in the matching box and the effect of the traps and the 'X' hats, a compromise match can be achieved. The matching unit is housed in a water resistant plastic box which is fitted with a ventilation hole at the base and an SO239 socket for the feeder connection.

Additional capacity loading is provided by two capacity hats, the 'X' hats, mounted below the 28MHz trap and above the 10MHz trap. Each comprises two 36in rods mounted centrally and at right angles. The antenna incorporates built-in radials comprising seven 49in counterpoise rods spaced evenly around the antenna adjacent to the matching unit. No additional radial wires are needed.

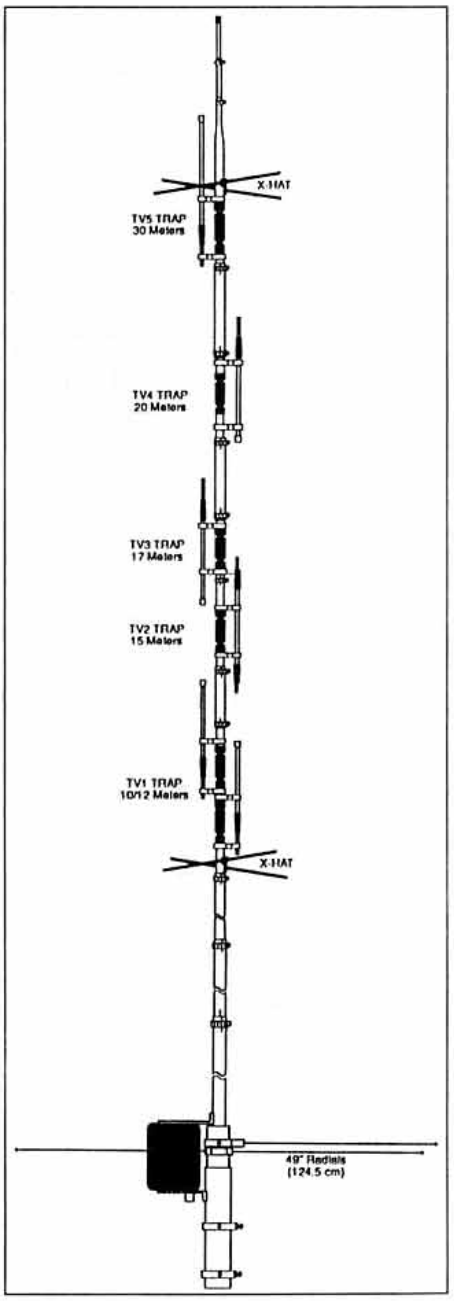


Fig 1: The R7 has six pre-tuned traps separated by adjustable lengths of tubing.

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R7

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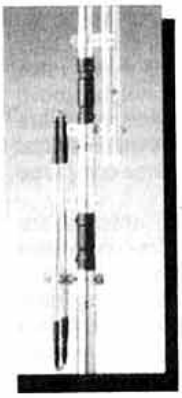

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SPECIFICATIONS

Frequency, MHz	28, 24, 21, 18, 14, 10, 7
Electrical Wavelength	Half-wave
SWR 2:1 Bandwidth	10m-2 MHz / 12m-100 KHz 15m-450 KHz / 17m-100 KHz 20m-150 KHz / 30m-25 KHz 40m-75 KHz
Power Rating, Watts PEP	1800
Radiation Angle, Deg	16
Frequency Selection	Automatic
Horizontal Radiation Pattern, Deg	360°
Height, ft (m)	22.5 (6.9)
Mast Size Range, in (cm)	1.5-1.75 (3.8-4.4)
Wind Load, ft² (m²)	2.25 (.21)
Weight, lb (kg)	12.3 (5.6)
Counterpoise Radials Supplied	7

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10-4CD .....10m 4 element Beam	**AR-6** .....6m Ringo Vertical
TEN-3.....10m 3 element Beam	**17B2**.....2m 17 element Beam
A4S ...20-15-10m 4 element Beam	**13B2**.....2m 13 element Beam
A3S ...20-15-10m 3 element Beam	**124WB**.....2m 4 element Beam
A3WS.....17-12m 3 element Beam	**A144-7**.....2m 7 element Beam
D40.....40m Rotary Dipole	**A144-11** .....2m 11 element Beam
D4 .....40-20-15-10m Dipole	**A144-20T** 2m 10 element X Oscar
D3.....20-15-10m Dipole	**AR-2** .....2m Ringo Vertical
D3W.....30-17-12m Dipole	**ARX-2B**...2m Ringo Ranger II
R7.....40-10m H/W Vertical	**AR-270** .....2m/70cm Vertical
R5.....20-10m H/W Vertical	**424-B** .....70cm 24 element Beam
AP8 .....80-10m Vertical	**A430-11**...70cm 11 element Beam
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The antenna is supplied with six pages of instructions and the assembly is described mainly by reference to diagrams.

ASSEMBLY AND INSTALLATION

THE R7 IS EXTREMELY WELL PACKED for shipment in a compact box measuring 130 x 19 x 10cm (51 x 7 x 4inches). The antenna proved easy to assemble and took about one and a half to two hours carefully following the instructions and diagrams. Exactly the right number of parts were supplied, there were no spare nuts or washers so take care not to lose any. The components are all of excellent quality with aluminium tubing and stainless steel hardware and the traps are supplied as sealed sub-assemblies. The antenna tapers from 1.375in at the base to 0.375in at the top and joins use telescoping tubing with hose-type compression clamps.

The base of the antenna is intended for mounting on masts between 1.5 and 1.75in diameter, preferably the larger. The mast slides up inside the base mount of the antenna by about 6in and is locked in place by four screws. This is a rather unsatisfactory method of mounting in my opinion and could work loose with wind and time. Even if ground mounting the antenna, a short mast should be used, for example about 6ft, otherwise the ground may detune the antenna and counterpoise.

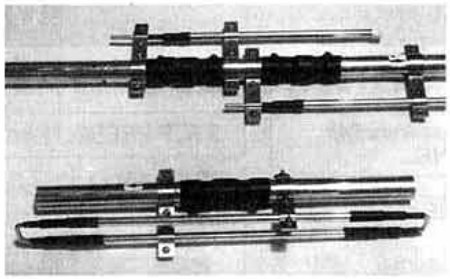
I would recommend that a single set of guys is used with the R7 to improve the overall stability in windy conditions. The antenna is fairly flexible with a fair amount of weight in the upper parts and this makes for a rather 'whippy' structure in the wind. Also the strain on the base mount is likely to be considerable. The wind loading of the R7 is specified as 2.25 sq ft (0.21 sq m) which compares with 1.5 sq ft (0.15 sq m) for the Butternut HF6V-X. The extra for the R7 is due to the trap area.

The antenna may be adjusted to set the minimum VSWR for each band at the desired frequency. This is done by adjusting the tubing lengths between the traps and the lower and upper antenna sections, starting on the highest frequency band and working down in frequency. The 24MHz band is not independently adjustable. The starting conditions given in the instructions apply to the antenna mounted 5ft above ground and at this height, the tuning was found to be fairly close to optimum. On 7MHz, the length of the top tubing element sets the resonance anywhere from the bottom of the CW sector to the top of the US phone band.

Band	Min VSWR	Max VSWR or Bandwidth 2:1 VSWR
7MHz	1.0	87kHz
10MHz	1.3	54kHz
14MHz	1.03	204kHz
18MHz	1.3	1.6
21MHz	1.2	2.0
24MHz	1.13	1.4
28MHz	1.13	1.19

Note that for values of VSWR below about 1.5, inaccuracies in the measurement equipment probably gives an over-optimistic result.

Table 1



The traps used on the R7.

PRACTICAL RESULTS

THE ANTENNA WAS MOUNTED on a five foot mast well in the clear, away from trees, buildings and other antennas. After some minor tuning adjustments, the VSWR figures given in the table were obtained. These were measured using a battery powered rig a short distance from the base.

The bandwidth on 7MHz is just wide enough to cover both the CW and SSB sectors, although the resonance can be positioned to provide a more optimum match if only one mode is needed. This also applies to 14MHz. Attempting to cover the whole 14MHz band results in the VSWR exceeding 3:1 at the band edges. The tuning was found to be particularly sharp on 10MHz and extremely flat on 28MHz.

Note that some high RF voltages can exist on the counterpoise wires which can give a nasty burn if touched, apart from the more obvious physical hazard of radials at head height. Seven warning labels are supplied for attachment to the ends of the wires.

On air comparisons were made using a ground mounted Butternut HF6V-X fitted with 12 radials and the 18/24MHz extension kit. The two antennas were mounted 300ft apart to avoid any possible interactions and fed with cables and a coax relay system, ensuring that the cable losses to the two antennas were equal.

There was no detectable difference between the two antennas on 28 or 21MHz for both DX and high angle signals. On 24MHz, the Cushcraft out-performed the Butternut by one to two S-points, although the VSWR on the Butternut on this band is nowhere near as good as it used to be and it may be off-tune. On 18MHz, the Cushcraft had a better VSWR and was generally about a quarter to a half S-point better than the Butternut. On 7 and 14MHz, the two antennas gave similar results in the centre of the band although the Butternut had a much flatter response and was just noticeably better at the band edges. On 10MHz, the Butternut was marginally better, perhaps a tenth of an S-point.

CONCLUSIONS

THE CUSHCRAFT R7 is a very compact seven band vertical and ideally suited to the very small garden. The half-wave design needs no additional radials and it is very flexible on siting from ground mounting to roof or tower top.

The antenna performs well compared with other vertical antennas although the bandwidth on 7 and 14MHz is rather restricted. This is a consequence of adopting a half-wave design which needs a greater shortening, and hence loading, of the antenna compared with a quarter-wave design.

I consider the base mounting to be a weak point and I would recommend a single set of guys to improve the overall stability.

The current price of the antenna is £369 inc VAT and it is available from a number of suppliers.

ACKNOWLEDGEMENTS

I WOULD LIKE TO THANK Specialist Antenna Systems Ltd of Oswestry, Shropshire for the loan of the antenna.

Peter Hart, G3SJX

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IDEAS FROM ABROAD

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

A 12V 20A switch-mode supply suitable for powering a 100W HF transceiver can be obtained by modifying a four-voltage PC computer supply; these are available cheaply in the surplus trade. **Udo Theinert, DL2YEO** shows how in *CQ-DL* 4/92.

I HAD ACQUIRED an unbranded working PC switched-primary power supply board, measuring 14x10x5cm and weighing 350g. Depending on the PC model, these are rated anywhere between 150 and 240W total continuous output. I had no specifications, but estimated from the size of the components that mine was designed for the usual +5V at 20A, +12V at 8A, -5V at 0.5A and -12V at 0.5A, 205W in total. At a typical efficiency of 75% this means a dissipation of only 68W. I was pleased to note that the wire of the 12V transformer secondary was of the same gauge as that of the 5V 20A winding. The switching frequency is approx. 33kHz. **Fig 1** is a block diagram of the modified PSU.

REGULATION

THE ERROR AMPLIFIER in IC1, TL494CN, **(Fig 2)** compares the actual +5V output voltage with an on-chip reference and adjusts the set-point for the pulse width modulator accordingly. The modulator sends alternate pulses to the driver transistors TR3 and TR4 **(Fig 3)**. Increased loading on the 5V output makes for wider pulses, lighter loading causes narrower pulses. As there is a finite minimum pulse width, a minimum load of 0.1A is required; it is provided by a bleeder resistor. As L4a and L4c are wound on a common core with L4b, the +/-12V outputs are also included in the regulation loop. Several protective circuits are included. Excessive primary current or short-circuiting of the -5V and -12V causes immediate power-down via the 'protection' input of IC1.

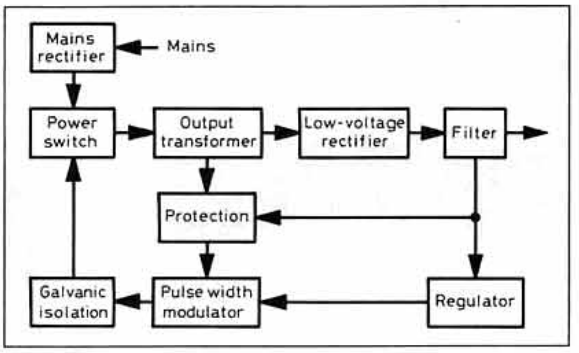

Fig 1: Block diagram of a power supply with primary switching.

THE MODIFICATIONS

THE INTENT IS FOR all of the available power at the 12V secondary of T1 to be rectified, regulated, protected and filtered to provide a single output of 12VDC at 205W, or more if possible.

- First, unsolder and remove all components on the secondary side of T1 **(Fig 4a)** which provided the rectification, filtering and regulation of the four output voltages, leaving on that part of the board only the three RC members, the Schottky rectifier SKD and the components of the auxiliary power supply V_{aux}.

Reconstruction of the output section **(Fig 4b)** is as follows:

- Break the PCB tracks between SKD and the 5V secondary of T1 and reconnect SKD to the 12V secondary.
- To modify L4 for 12V at 20A, remove windings L4a,b,c, counting turns of L4c. Rewind with a single winding, turn count as old L4c but wire thickness as old L4b. Replace L4.
- Install the forementioned 100Ω 5W bleeder and 4x2200µF 4x2200µF/25VDC electrolytic capacitors (8000µF are required but four small capacitors in parallel have less inductive impedance than one big one). Wire as in Fig 4b.
- Replace the sheet-metal heat sink on SKD with a bigger, ribbed one to ensure adequate cooling at continuous full output.
- Other changes are required in the regulator and protection circuit, see Fig 2.
- Replace D16 in the output current limiting circuit with an 8.2V Zener.
- Replace R24 with one of higher value (approx 4x), 18kΩ in the prototype, to make the voltage at the (+) input of the error amplifier (IC1 pin1) equal to 2.5V, ie half the 5V reference voltage when the output is 12V [1].
- Adapt the voltage divider in the short-circuit protection circuit. Remove D14 and R36 and connect the bottom of R42 to common. Replace R45 with one of higher value to keep the voltage across R42 below the cut-out value of 1.7V under normal operation. In the prototype, with R42=1k5, I chose R45=15kΩ.

Warning: Mains voltage appears on some of the components in Fig 3 during normal operation. Appropriate insulation and shock protection during test, adjustment and use are imperative.

- Replace the 220µF smoothing capacitors C1 and C2 in the primary rectifier by 470µF/200V units. This reduces the primary ripple, which helps output regulation at full load.
- Improved cooling of the power switching transistors TR1 and TR2 increases the continuous output capability from 205 to 240W, ie from 17 to 20A at 12VDC.

TESTING

THE FOLLOWING QUESTIONS remained to be answered:

- What regulation could I expect during load steps from 1A (receive) to 17A (transmit) and back?

I connected as a load two 95W car headlight bulbs. That did not provide a load test but it did prove the overcurrent protection: the low 'cold' resistance of the bulbs caused the supply to cycle on and off! Substitution of proper high-wattage resistors for the bulbs showed that the regulation could handle these large load steps, up or down, with output voltage excursions not exceeding 0.15V.

- Would harmonics of the switching frequency interfere with HF reception?

Yes, a 33kHz raster covered all HF bands with S-meter readings of S5 on 80m down to

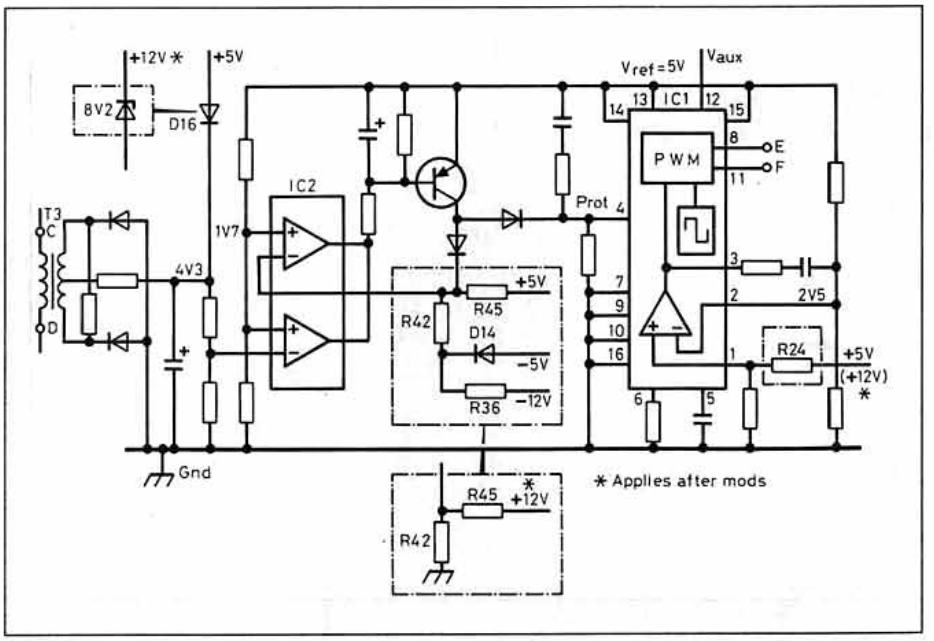

Fig 2: The regulation and protection circuitry.

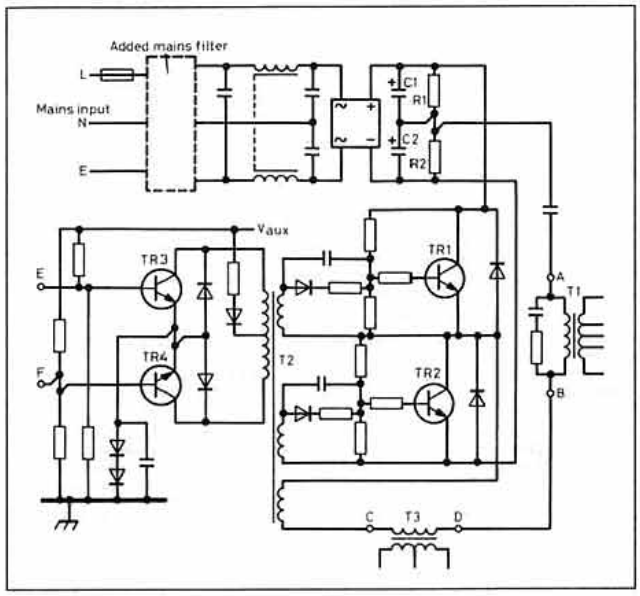

Fig 3: The primary side: mains filter, mains rectifier, power switches and drivers. *Caution - Mains Voltage Exposed*.

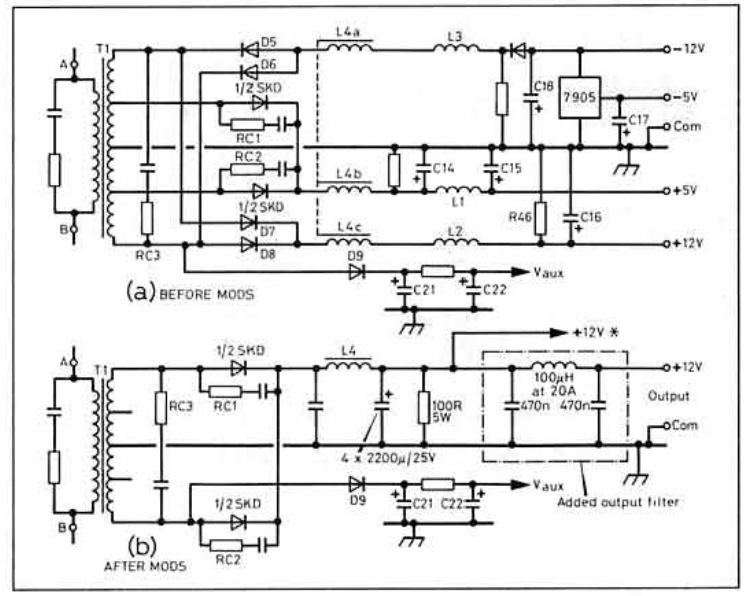

Fig 4: Secondary rectification and filtering: (a) as found in the original power supply, and (b) after modification.

S2 on 10m. As I was testing the board in a metal box, the HF radiation could only get out on the mains cable and/or output leads. The insertion of an additional standard mains filter (Fig 3) and a home-brew pi-filter in the output (Fig 4b) rendered the interference inaudible.

OPERATION

THE MODIFIED PSU WAS permanently installed in the speaker cabinet that matches my transceiver. Mains and 12V leads exit from its back, which also carries an on-off switch and the additional mains filter. A green LED power-on indicator was inserted in the front panel. I had installed a small blower just in case, but found it superfluous; at the low duty cycle of CW and SSB, none of the components is getting hot.

The power supply has been used for six months now and has given no problems. It performs as well as much heavier, more expensive supplies with a 50Hz transformer and linear regulation.

[1] Note: DL2YEO assumed 220VAC mains. Switch-mode power supplies generally will work off 220V -10% to 240V +10% mains. On UK 240VAC it should be possible to get 13.8V output by increasing R24 some more - *G4LQI*.

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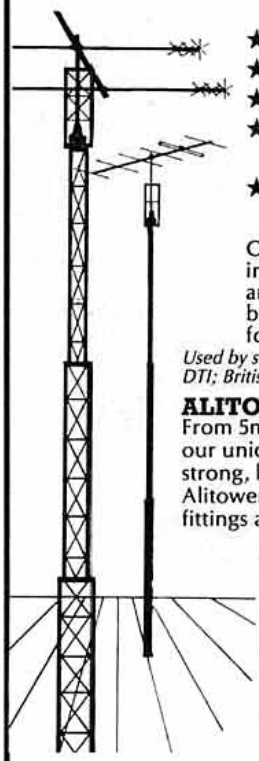

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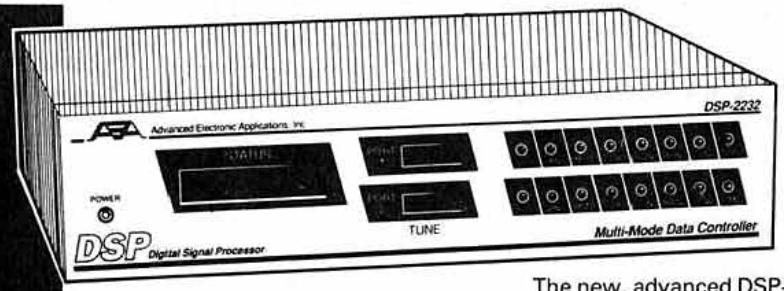

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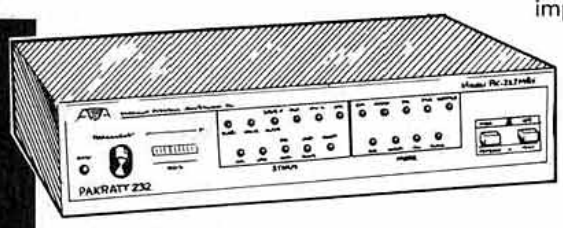

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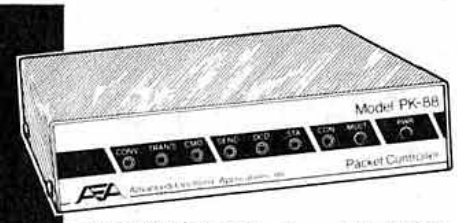

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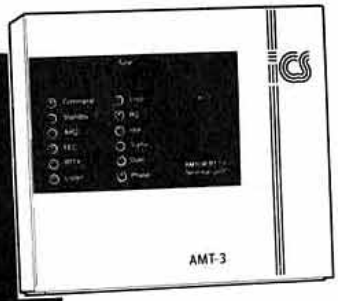

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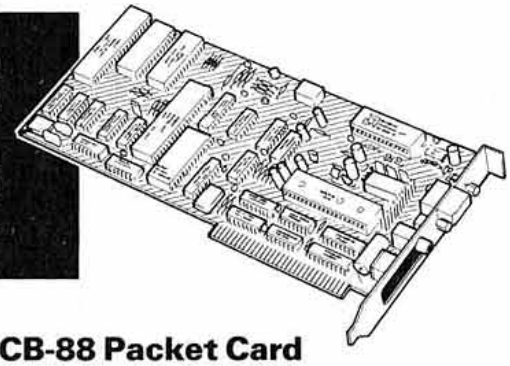

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I WOULD REMIND READERS that if they would like me to acknowledge letters, they should enclose a stamp, or IRC as appropriate. Please note also that IRCs must be franked at the post office of issue, otherwise they are not valid. I have some standard acknowledgement cards now, so an SASE is not required. I always acknowledge packet messages that reach me, so if you fail to receive a reply, either your message or my reply went astray.

The response to my appeal for first-hand opinions on PACTOR, was very disappointing. There is no doubt that it is gaining in popularity, but I am very keen to learn what it is like in practice, especially under difficult band conditions. PSE K K K !

QRP QRM

BRIAN WADDELL, GM4XQJ, is a keen QRP operator, and wishes me to pass on a plea for more consideration from data mode operators. His letter has been endorsed by Gus Taylor, G8PG, Communications Manager for the G-QRP Club. Both letters refer only to 'Packet' operation, though I suspect that both Packet and AMTOR are involved.

First, he quite rightly laments the use of 14·100MHz for HF Packet, which is the spot frequency of the world beacon chain, now rendered all but useless.

Second, he points out that the following spot frequencies are internationally agreed as being for QRP use, and asks that they be kept clear of data traffic.

CW: 1.843, 3.560, 7.030, 10.106, 14.060, 21.060, 28.060MHz. SSB: 3.690, 7.090, 14.285, 28.885MHz.

7.030MHz is often used by AMTOR stations for example. Gus states that 7.030 is a long-established international QRP frequency, and is so designated in a footnote to the IARU Region 1 band plan. He further states that it is in almost continuous use by many of the 3000+ members of the G-QRP club, as well as many more abroad in this and other such clubs.

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B	? query	NU
C	: colon	; semicolon
D	(who are you)	NU
E	3	NU
F	% percent	' reverse apostrophe
G	@ at	} closing brace
H	# hash	{ opening brace
I	8	NU
J	* asterisk	NU
K	(open bracket	[open square bracket
L	) close bracket	] close square bracket
M	. fullstop	> greater-than
N	, comma	< less-than
O	9	~ tilde
P	0	NU
Q	1	! exclamation mark
R	4	$ dollar sign
S	' apostrophe	" quotation mark
T	5	NU
U	7	& ampersand
V	= equals	¦ vertical bar
W	2	NU
X	/ slash	\ backslash
Y	6	^ caret
Z	+ plus sign	NU

Table 1: G3PLX's extended AMTOR character set. The first column is the letter-shift, the second is the conventional figure-shift, and the third is the extended character. Note that there are some unused combinations, marked NU.

SCRAMBLED SCREENS

I OFTEN HEAR OF VHF/UHF packet operators complaining that monitoring certain traffic wreaks havoc with their screens. Users of so-called 'dumb' terminals are particularly vulnerable. The finger is usually pointed at network nodes broadcasts, TCP/IP operation, 7PLUS files and compressed mail forwarding.

Typical symptoms include random bleeping, backspacing etc. of the cursor, screen clearing, incorrect scrolling, lock-ups, and so forth. The suggestion is often made that there is something anti-social about the offending transmissions, as if they have the means somehow to 'sabotage' the receiving station's terminal.

In fact, the 'fault', if fault is the right word to use, lies with the receiving apparatus. The transmissions mentioned include many characters which have an ASCII greater than 127; ie they are outside the standard range of control codes and visible alphanumeric characters.

Put another way, these characters use the full eight binary bits rather than the seven required for the standard codes and characters. Different computers and terminal use these 'extended' characters in different ways; often to display foreign accented characters, graphic symbols and so forth.

This might be sufficient to cause problems with dumb terminals, but the real trouble starts if you are using seven-bit protocol between the TNC and the terminal/computer. This causes the eighth bit to be stripped off the extended codes, thus effectively changing them into characters with ASCII 128 less than they really are.

For example, code 135 (87 hex) turns into a code 7, which just happens to be a bell (bleep) code. Other characters turn into codes which can clear the screen, alter the scrolling, and of course backspace the cursor (which is needed during normal deletion of typing errors).

A well-written TNC driver program will not allow 'dangerous' codes to filter through from the TNC, but some are not so thorough. Using eight-bit protocol on the RS232 link from the TNC may help, though possibly not if the TNC driver itself strips the eighth bit off extended characters, rather than displaying them unchanged, or ignoring them altogether. (Eight bits, no parity and one stop bit is normal practice).

On most dumb terminals, the operator has no control over which codes are filtered, with fairly chaotic results at times! Again, using eight-bit protocol may help.

OLD DOG, MORE TRICKS

IN NOVEMBER'S COLUMN, I described how Peter Martinez, G3PLX, had managed to achieve the use of lower-case alpha characters on AMTOR. Well, Peter had hinted that this would probably not be the end of the story, and indeed it wasn't. I received an AMTOR/Packet message from him recently, with the following interesting news.

"This was a joint effort between myself, W5SMM, (who is the author of APLINK), and others. By using the same NUL code as used for the lower-case system, the missing ASCII characters can now be transmitted by AMTOR. With this scheme, which is in use by all G3PLX and APLINK mailboxes, all ASCII characters between 32 and 126 can now be transmitted, in addition to codes 13 and 10 (return and linefeed). The extra characters are sent by using the NUL code as a prefix to 'escape' to the extended set. For example, a semicolon in transmitted as NUL COLON, and an underscore is transmitted as NUL HYPHEN. This scheme does not get confused by the use of the NUL as a lower-case toggle code. Indeed the lower-case toggle system was specifically designed this way to leave open the possibility for this further extension.

"However, unlike the lower-case system, the effect is not invisible to a 'normal' AMTOR receiver, which will receive the 'un-escaped' code. Like the semicolon/colon and underscore/hyphen combinations, the allocation of extended codes has, so far as possible, been designed to minimise the confusion of meaning between the escaped characters and the un-escaped equivalents. Those that cannot be treated in this way are fairly rarely used, (eg CARET is NUL SIX), so the number of occasions when incorrect characters are received will be small. The G3PLX boxes have this feature running all the time, so messages passing via packet-AMTOR-packet will now have the full character-set end-to-end, and AMTOR users can upgrade to make use of the extended-set at will. APLINK boxes use the system when forwarding between each other, (and to/from G3PLX boxes) but not when working users, unless they specifically request it.

"Note that if you implement it in your own software, you should be careful to make sure that you can handle both the sequence NUL FIGS and FIGS NUL, as you may get either sequence depending on whether the distant transmitter has implemented the system at the ASCII level or at the ITA2-code level."

Microwaves

MIKE DIXON G3PFR
'Woodstock', Gazebank, Norley, Warrington, Cheshire WA6 8LL

WARC '92 . . . AND AFTER!

YOU MAY HAVE READ David Evans', G3OUF, report on WARC '92 in the May issue of *RadCom*. On the face of it, both the Amateur and the Amateur Satellite Services appear to have lost little from the deliberations at this month-long conference.

However, there are some possible hidden pressures on the amateur allocations, particularly above 1.3GHz, but also in the VHF/UHF spectrum. At the end of March, there was an IARU Region 1 VHF Managers Conference in Vienna which also discussed the outcome of WARC '92 and raised further points relevant to future WARCs - which are expected to be held more frequently than previously. This is a sure sign that microwave technology in the 'consumer area' is developing fast!

It is perhaps timely to devote some of this month's column to review the situation at the moment and to indicate some of the likely changes which are going to be necessary to try to safeguard these valuable (and unfortunately often under-used) amateur microwave allocations.

Early in July (not long after you read this), there will be the RSGB Business Strategy Conference, two working groups of which will consider Radio Policy and Interests as represented in the UK by your Society. Frequency planning and objectives at both the UK and IARU Region 1 levels are sure to be important ingredients!

Although only the 2.3GHz and the 75.5 to 81.0GHz amateur bands were specifically mentioned in G3OUF's WARC report, there are other pressures which I believe will lead to the necessity for better amateur frequency coordination within the various regions of IARU/ITU. Our main concern, of course, is Region 1, although what is done in other regions can have a fairly drastic effect on our Region!

The long and the short of the situation is that proposals for the lower (and some of the higher) microwave bands is rapidly creating a whole lot of new 'buzz-words' for us to learn, as well as filling up the spectrum.

Some of the new services are: Wind Profiling Radar (WPR); Broadcast Satellite Service (Sound) (BSSS) using digital audio supplemented by a similar 'fill-in' terrestrial service; Mobile Satellite Service (MSS), using both geostationary and Low Earth-Orbiting Satellites (LEOS); High Definition Television (HDTV) and Future Public Land Mobile Telecommunications Services (FPLMTS).

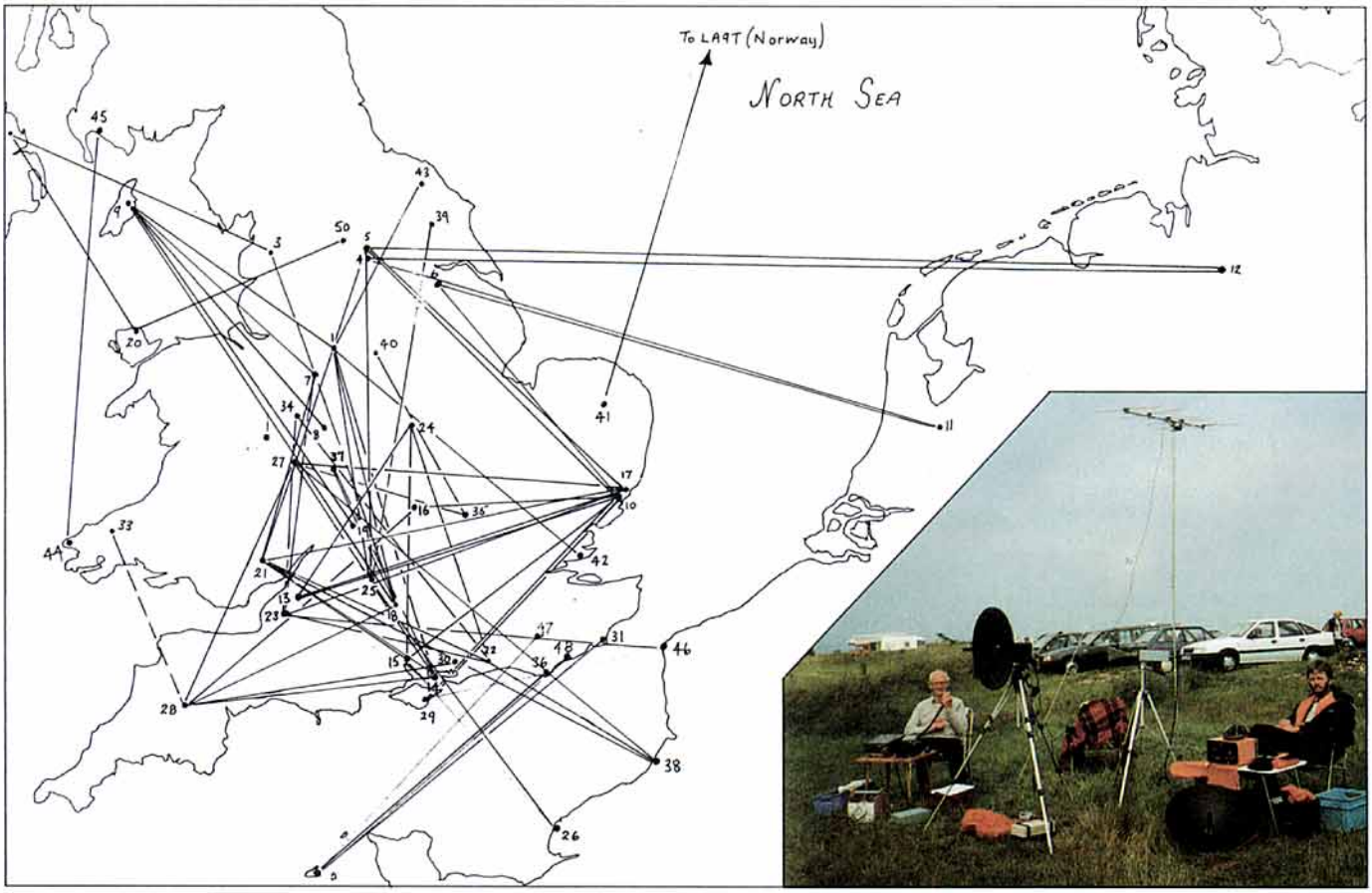
Some, indeed many, of these newly proposed uses could profoundly affect the way in which amateurs operate, particularly with respect to long distance 'weak signal' communication using a variety of propagation modes (including tropospheric and EME propagation studies). However, it is not all 'gloom and doom' as you will see if you have read the report carefully and accept the fact that there is some room for compromise. True, it is usually the amateur service which has to compromise!

To date, the worldwide 2,300 to 2,450MHz amateur secondary allocation (UK - 2,310 to 2,450MHz) is unchanged, although in a few years' time we can expect to be sharing the band with more services than at present, and whether continued sharing is feasible in some locations remains to be seen. For instance in the USA, BSSS has been given Primary status from 2.310 to 2.360GHz, in the Region 1 allocation.

One suggestion, made at the IARU Vienna conference, was to seek a fairly narrow (2 to 10MHz) amateur Primary allocation at or around 2.390GHz for weak signal DX communication while retaining the present secondary Satellite band at 2.400 to 2.450GHz plus as much as possible of the rest of the secondary allocation.

With regard to the 75GHz band, possible earth to space use by the Russian Federation (CIS) is unlikely to affect amateur development very much and there are, in any case, protection safeguards to Primary Amateur and Amateur Satellite Services use between 75.5 and 76.0GHz.

LEOS will operate in several bands near



A good indication of the long 10GHz paths achieved during 1991 is shown on this map from Peter, G3PHO. The inset shows portable 10GHz operation from Beachy Head during the July 1991 Cumulative. On the left is Jack, G3JMB, with his 160mW wideband transceiver, whilst Alan, G8LSD, is operating his 5mW narrowband transceiver. The 2m talk-back antenna is between them. Contact was made with GU0FDZ on Guernsey.

1991 OPERATING LADDER
ranked on highest multiplied score

Band (GHz)	Posn	Callsign	Best DX Stations worked km (A)	(B)	(AxB)	Multiplied score
3.4	1	G4PMK *		702	4	2802
	2	G4EQD *		175	3	525
5.7	1	G4PMK *		481	4	1924
	2	G4EQD *		61	1	61
10	1	G8KQW/P		481	43	20,683
	2	G3FYX/P		381	40	15,240
	3	G(D)3ZME/P		376	27	10,152
	4	G3PYB *		703	13	9,139
	5	G(W)4JNT/P		360	22	7,920
	6	G3PHO/P		272	24	6,528
	= 7	G3JMB/P		248	25	6,200
	= 7	G8LSD/P		248	25	6,200
	9	G4PMK *		702	8	5,616
	10	G3BNL *		246	21	5,166
	11	G4JNT *		215	22	4,730
	12	G3FYX *		281	15	4,215
	13	G3FNQ/P		260	15	3,900
	14	G3NKL/P		296	13	3,848
	15	G8AGN/P		247	15	3,705
	16	G4EQD *		418	7	2,926
	17	G8IFT *		161	16	2,576
	18	G3JMY/P		138	17	2,348
	19	G3PYB/P		297	7	2,079
	20	G8AYY/P		128	16	2,048
	21	G3JMY *		135	5	675
	22	G0DJA/P		115	4	460
	23	2E1AFH/M		40	2	80
24	1	G3FYX/P		144	3	432
	2	G3PHO/P		92	1	92
	3	G(D)3ZME/P		61	1	61

* = Fixed (home) station operation

Table 1

1992 OPERATING LADDER
ranked on highest multiplied score

Band (GHz)	Posn	Callsign	Best DX Stations worked km (A)	(B)	(AxB)	Multiplied score
10	1	G4DDK *		434	10	4,340
	2	G4JNT *		215	4	860
	3	G3PHO/P		238	3	714
	4	G3JMY *		112	3	336
	5	G3JMY/P		154	1	154

Table 2

1.5, 1.6, 2.0 and 2.5GHz and FPLMTS at 1.885 to 2.025GHz and 2.110 to 2.200GHz. HDTV has been allocated 17.3 to 17.8GHz in Region 2 and 21.4 to 22.0GHz in Regions 1 and 3. None of these allocations affect amateur operation *directly*, even though extensions of the allocations might be expected in the future.

WPRs are looking for allocations around 50, 400 and 1000MHz, although this has been referred back to CCIR for further study before technical proposals are made at a later WARC.

In the Netherlands, most of the 3.4GHz band has been 'lost' with the exception of 3,400.0 to 3,400.2MHz. However, Dutch amateurs have been assured of future operation in this remaining fragment of the band and it has been indicated that the German national society (DARC) has now recommended their operators to move to 3,400.0 to 3,402.0MHz - many are understood to have already done so.

In the UK, the position is that the RA (DTI) have approved, in principle, the licencing of a commercial subscriber telephone service ('Ionica') in the band 3.4 to 3.5GHz, requiring *at present* (my emphasis) two separate 'tranches' each 13MHz wide for its operation. This is expected to become nationwide. It seems, therefore, that we may need to fall in line with VERON and DARC (and the rest of Region 1 countries with an allocation at 3.4GHz) in order to ensure that we will have a better protected 'weak signal DX' band in which to continue meaningful experimentation. This is subject, of course, to dialogue with the RA. We would hope to retain the shared status of the rest of the band where this remains possible: again, only time will tell if continued sharing is possible.

You may recall that there was discussion, on moves in the 5.7, 10 and 24GHz bands, both at Torremolinos and elsewhere. On the basis that it is widely seen to be a sensible arrangement to have terrestrial and satellite operation adjacent to one another, certain arrangements were agreed and recommended but not implemented. These were to move narrowband 'weak signal DX' operation from 5.760GHz to 5.668GHz, 10.368 to 10.450GHz and 24.192 to 24.048GHz, ensuring that each of the new segments was adjacent to the satellite bands *and common* to the majority Region 1 users. Only the 24GHz recommendation has been formally adopted in the UK, for the reasons that many operators in the UK (and elsewhere, it must be added) chose not to follow the recommendations in the other bands - for their own reasons!

It is now felt to be vitally important that these proposals (or sensible alternatives) are given serious reconsideration in the light of developing circumstances. Both I and the Microwave Manager (G3WDG) would be very pleased to receive constructive comments, as soon as possible, in order to respond positively to IARU Region 1's call for a rational approach to the problem of obtaining common allocations for the future.

We would hope to obtain some protection of the narrowband 'weak signal DX' segments (maybe even Primary status) whilst retaining as much of the existing shared bands as possible, as well as reaping the advantages of having adjacent terrestrial and space segments.

I know I have made this appeal before - and the response has been nil to negative! Please think about it *seriously* and let us have your views: I personally believe the middle and long term advantages strongly outweigh any minor inconveniences of re-crystalling and retuning.

THE 1991 10 AND 24GHZ CUMULULATIVES

THE 1991 'SEASON ' of 10GHz Cumulatives has seen a marked swing in favour of narrowband operation, without doubt largely attributable to G3WDG's excellent home-build narrowband transmitter, receiver and transverter designs. The outcome of this swing has been a pretty remarkable increase in the average distances covered during the events. For the first time ever, the overall winner was the operator of a fixed station, Mike Walters, G3JVL. Mike won the G3RPE Memorial Cup and Plate which were presented at the VHF Convention at Sandown. G8KQW/P was runner-up in the narrowband section with F6DPH/P as the best foreign entry in the same section. The wideband section was won by G8AYY/P, runner-up G2DSP/P. There was, unfortunately, only one entry in the 24GHz Cumulative: a single 49km contact won that contest for G3FYX/P. Winners and runners-up will all receive certificates in due course.

As a matter of interest, the best DX from the entries (under what many considered as 'less than average' conditions) in the narrowband section was 380km as compared with 128km in the wideband section. The Microwave Committee would like to congratulate the winners and runners-up on their fine efforts, but at the same time really would like to see more 24GHz entries!

SQUARES WORKED AND DX BEYOND 150KM ON 10GHZ

PETER, G3PHO, ONE OF the *Microwave Newsletter* editors, produced a 1991 activity map for 10GHz (see opposite) which clearly shows some of the long paths now being worked, many of them quite regularly, with narrowband equipment. There isn't space for a full, numbered key to the paths (as there was in the *Newsletter*), but suffice it to say that the longest paths are between 700 and 900km to DL and LA. I'd like to bet that these distances will be worked more and more frequently now that there are more fixed stations in action.

It could be that we need to introduce another category of Distance Award, especially for narrowband. At one time it was very difficult, even for a portable station to work four locator squares on the 10GHz band: now I hear that Sam, G4DDK, has worked 14!

Some of you have asked for some form of bi-monthly operating ladder to appear in this column. Until readers give me some idea of how they would like to see results presented (eg Best DX, number of stations worked, multiplied score, Squares worked) I'll start with the *Newsletter* end-of- year (1991) ladder for all the bands which were reported. This is shown in **Table 1**. A particular welcome to 2E1AFH, our first Novice Licence entry! If you are prepared to wait a little time for ladder updates, then I'll use the information sent in to the Newsletter as soon as it is available. I'd dearly love to see more entries for the lower bands as well as more for the 24GHz band (and higher).

Lastly on the operating front this month, **Table 2** shows the ladder result entries between 1 January 1992 and mid-April 1992: please, please send in more entries to swell the tables. Remember you can make entries for fixed or portable operation on *any* of the UK bands.

TECHNICAL UPDATE

THE NOVICE ATU featured in the April 92 *Radcom* has generated much interest, and we have had some enquiries about the use of surplus variable capacitors. C1 and C2 should each have a value of about 150pF, and the Jackson C804A series can provide a suitable alternative to the Maplin components specified. Remember that well insulated, plastic knobs should be used for this project.

Satellites

ARTHUR GEE G2UK
21 Romany Road, Oulton Broad, Suffolk
NR32 3PJ

THIS MONTH'S NEWS AND REPORTS features the Queen's visit to the University of Surrey last March. It is good to see the work of the UoSAT team honoured in this way.

NEW SPACECRAFT LITERATURE

A NEW *Satellite Experimenter's Handbook* is just out. This splendid volume by Martin Davidoff, PhD, K2UBC, published by the ARRL, covers just about all the satellite enthusiast needs to know. It is really the satellite experimenter's 'Bible'; sixteen chapters and six appendices covering Introduction, Fundamentals, For the Advanced Enthusiast and so on. The appendices cover Amateur Satellite History, Tracking Data, Computer Programs, Conversion Factors, Constants and Derived Quantities and VC Rules and Regulations governing the Amateur Satellite Service. An absolute mine of information.

This is available from AMSAT-UK HQ, 94 Herongate Road, Wanstead Park, London E12 5EQ.

AMATEUR RADIO SATELLITE EXPERIMENTATION

ONE OF THE FUNCTIONS which amateur radio satellites provide is that of offering facilities for scientific experimentation which can provide experience for students and others in scientific observation. A very good example of this is described in the *AMSAT Education News* of Nov 91, Vol 3, Issue 9. Under the heading 'Chaminade Microsat Project' an account is given of a presentation made by four students to the national AMSAT meeting concerning the solar eclipse of 11 June 1991. The students were from the Caminade College, Los Angeles, club station WA6BYE,

They had studied the eclipse through data received from the satellite LUSAT, which passed through the umbra of the eclipse. Their presentation showed a model of the satellite LUSAT and demonstrated the rotation the satellite undergoes illustrating the path of the shadow on the earth. Former editor of the *AMSAT Journal*, Joe Kasser, G3ZLZ, met the students and talked with them about their work.

Not only did the students have fun learning about satellites and their application to science, they were also able to change their normal role as students to becoming teachers.

WINTER OLYMPIC GAMES: TWO METRE BAND INTRUSION

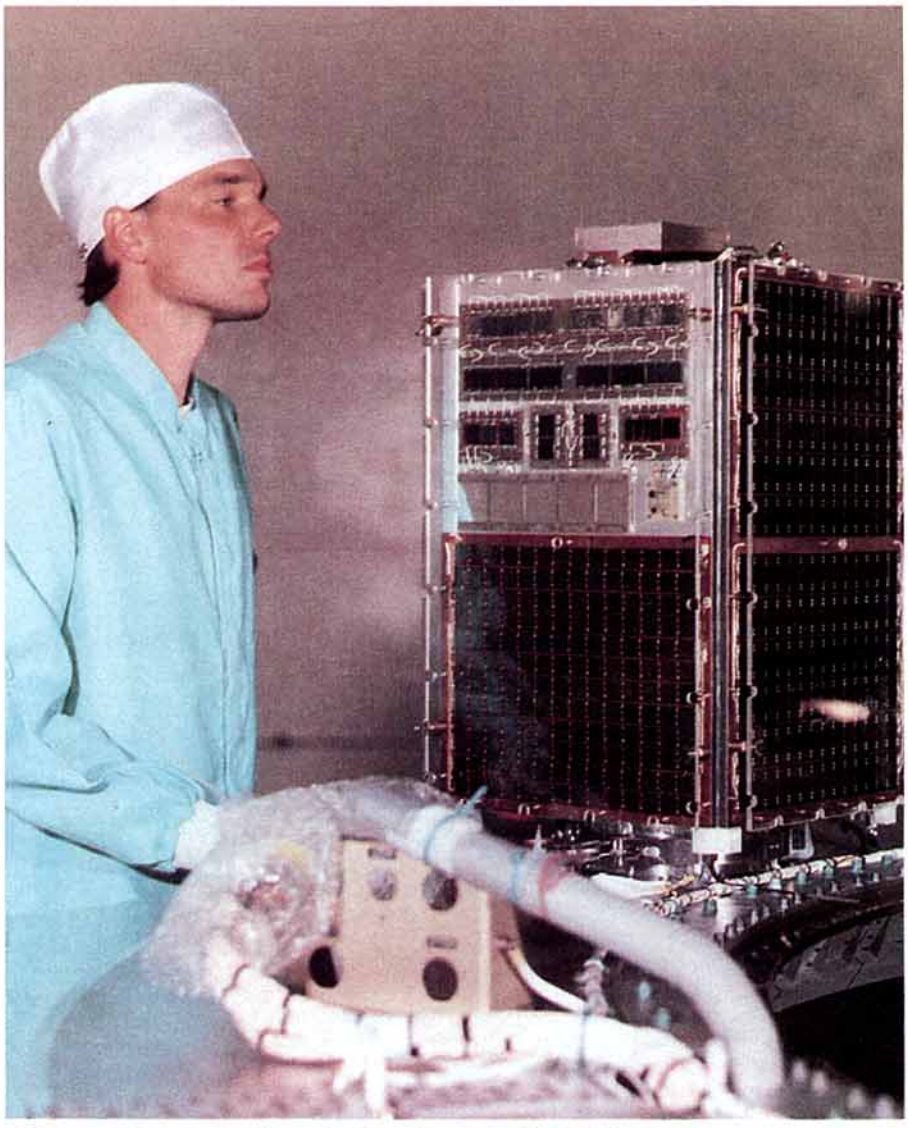
ANGER AND FRUSTRATION at the French Administration in allowing parts of the 2m band to Winter Olympic Sports teams, produced a sharp reaction from band users, particularly the satellite and EME fraternity.

The IARU were quick to take action on this intrusion into amateur bands by non-amateurs. Region 1 IARU Chairman, PA0LOU, circulated many VHF Managers, Secretariats of Regions 2 and 3 IARU and other similarly concerned authorities with details and suggested what action should be taken. He pointed out that any Administration has the right to allocate any frequency within its own jurisdiction, as it sees fit, *providing no harmful interference is caused to the normal users of those frequencies.*

The suggestion was made therefore that the Amateur Service should document any harmful interference caused to the Service by the non-amateur use of 2 metres.

The following was recommended by the IARU Monitoring System:

Non-amateur transmissions should not be deliberately interfered with; full details of the interfering transmissions should be sent to one's National Amateur Radio Society (RSGB's IARUMS Co-ordinator is G0OES). In the case of this country, send a copy to Ron Broadbent, G3AAJ, Region 1 IARU Satellite Coordinator.



UOSAT-5 awaiting launch at Kourou in July, 1991, watched by G7DKN.

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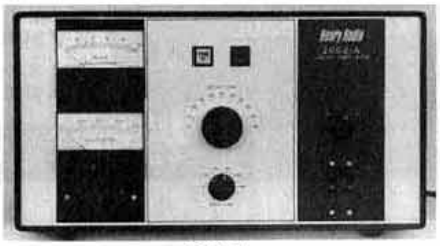

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3K Premier	HF 3CX1200 1800W out PEP (typical) 13dB gain	£3059.00	POA
5K Classic	HF pair 3CX1200 3kW out PEP (typical) 14dB gain	£3950.00	POA

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HL62VSX	2m 5½/10½/25W in 50W out pre amp	£169.00	C
HL110V	2m 2/10W in 100W out pre amp	£220.00	C
HL180V	2m 3/10/25W in 170W out pre amp	£299.00	C
SAGRA600	2m 15-25W in 600-700W PEP output 2×4CX250B	£839.00	E
HL66V	6m 10W in 50-60W out pre amp	£131.75	C
HL166V	6m 3/10W in 80/60W out pre amp	£255.00	C
HL1K/6	6m 10W in 500W PEP output 2×4CX250B	£959.00	D
HL36U	70cm 6/10W in 25-30W out pre amp	£139.00	B
HL63U	70cm 10/25W in 50W out pre amp	£220.00	C
HL130U	70cm 3/10/25W in 120W out pre amp	£397.00	C
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Carriage:

B = £5.00

C = £7.50

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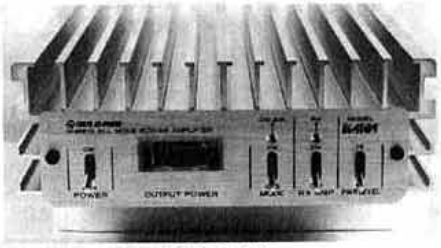
E = £16.50



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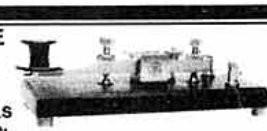
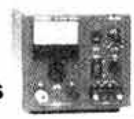


POWER SUPPLIES FROM 5 - 50A. OVER 40 MODELS STOCKED: DAIWA,BNOS,MICROSET,ALINCO,REVEX



SWR METERS OVER 20 MODELS STOCKED: DAIWA,COMET,DIAMOND,MFJ,REVEX

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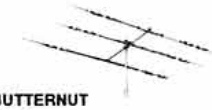

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CONTEST NEWS

All rules should be read in conjunction with the General Rules published in *Contest News* January 1992

HF RULES

SLOW CW CUMULATIVE CONTEST 1992

1. General: The aim of this new event is to provide training and encouragement for those less experienced in CW and contesting. It is intended primarily for Novices and those newly licensed or just getting their feet wet in the world of CW contesting. It is NOT intended to become a high-pressure event, as has happened to the existing LF Cumulative Contest. It is hoped, nonetheless, that experienced operators will be active during the contest and will enter fully into the spirit of the event by using a straight key and paper log. Remember the speed limit of 12WPM (HFCC members will be active and monitoring). Slow down to the speed of the other station, even if you recognise the callsign and know that he can copy fast CW . . . . he may be training someone else! If you do not wish to enter yourself, perhaps you could support or host another operator.

2: The General Rules for HF Contests and HF Receiving Contests, as published in the January 1992 issue of *Radio Communication*, will apply unless stated below. Please read them carefully!

3. Sections:

(a) Transmitting

(b) Receiving

4. Eligible Entrants:

Section (a) Individual RSGB Members, or a pair of RSGB Members may enter as a team (ie one callsign is to be used, but there may be two operators if desired). Where there is a team entry, the operators must be the same for all sessions. **Section (b)** Individual RSGB Members who do not hold a Class A Full or Novice licence.

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.

5. Dates/Times: five sessions, each from 1900 to 2000GMT on:

Mon 7 September	1992
Tue 15 September	1992
Wed 23 September	1992
Thu 1 October	1992
Fri 9 October	1992

6. Frequency/Mode: CW only between 3.550MHz and 3.575MHz

7. Exchange: RST and First Name (in full, with correct spelling). Teams 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; don't use a computer - 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 26 October 1992.

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 state on your Cover Sheet whether you wish to be considered for this last award).

Section (b) Certificate of Merit to the leading listener.

At the discretion of the HF Contests Committee, additional certificates may be awarded if there is sufficient support.

HF RESULTS

LF SSB CONTEST 1992

Around 150 different stations appeared in the overseas logs. How disappointing, therefore, to receive only 11 entries from the UK. The HFCC has decided to discontinue this contest in its present format and consideration is being given to a replacement . . . . watch this space!

G3NLY was the winner in the UK Single-operator section and, subject to ratification, takes the 1989 HFCC Trophy. His extra efforts on 80m gave him a clear lead over G3VHB in second place. G0PNW was first in a poorly-supported Multi-operator category.

In the Overseas section, UH8EA was the runaway overall leader in the single-operator section, with RB4II second overall and the European certificate winner. Again, the multi-operator section attracted only two entries with UZ9MXM emerging in front.

Both SWL sections were poorly supported; RS91477 wins the UK section with ONL383 and UA9 154 2441 taking the overseas honours. Despite considerable activity, no logs were received from the Americas or Australasia.

Logs were good with unmarked duplicates found in only two. Several of the overseas logs had to be rescored and many will see an increase in their final score as a result. Computer logging appeared frequently, and obviously has mixed blessings. One widely-used version has difficulty in recognising multipliers where it is the Call Area and not the Country that counts. The same program threw up a duplicate on one band where there obviously wasn't one, but then claimed the points! Needless to say, that log received extra attention.

EQUIPMENT USED BY LEADERS

G3NLY: TS940 + TL922, 40m - rotary dipole, 80m - loop and two λ/2 slopers.

G0PNW: Ten-Tec Omni-V + Titan Linear, 40m - 2 ele quad, 80m - dipole.

NON-EU MULTIPLIERS FOUND BY LEADERS

G3NLY: 40m: A9, CE, CO, D4, HK, HP, KP4, PY, TI, UA0, UF, UH, UL, XE, VE3, VK2, W1/2 & 5, ZP, 4S.
80m: EA8, HK, KP4, PY, TI, UA0, UH, VE1-3, VO1, W1-6 & 8-0, YV, ZF, ZL1.

G0PNW: 40m - AP, CO, EA8, HK, HP, OA, PY, TI, UA0, UH, VE2, ZL1/2, ZS, 4S, 7P.
80m - PY, UA0, UH, VE1/2.

G4IQM

UK SECTION

Posn	Call	QSOs/Mults 80m	QSOs/Mults 40m	Points
1	G3NLY @	197/43	277/50	341124
2	G3VHB *	65/25	269/50	172575
3	G0HSD *	87/31	273/41	164448
4	G0PNW +*	78/23	279/42	152165
5	G4RFR +	73/29	192/29	95584
6	G3TBK #	58/22	216/33	89505
7	G3XTT	18/12	198/43	77550
8	G4BWP	41/17	119/26	42140
9	G3FFH	41/14	126/27	40590
10	GW4HBK	31/14	92/23	26196
11	G4FVK	6/4	12/10	1372

OVERSEAS SECTION

Posn		Call		Points
1		UH8EA	*	72380
2		RB4II	*	16836
3		RB5QRW		9900
4		HA5MY		7285
5		DL0SSB		7200
6		UZ9MXM	+*	6562
7		RA3AUU		4290
8		YU4NDO		3720
9		OK1FPS		3385
10		F1NBX	#	3285
11	=	OK1FSM		3120
11	=	UZ9CYP	+	3120
13		OK3THU		2880
14		OK3YK		2180
15		PA3CLS		1488
16		EA2BUZ		1134
17		ES1CN		1120
18		LA9CO		1105
19		ON5CZ		1095
20		OK1OP	T	980
21		LZ2KRU		910
22		RB5QW		803
23		PA2CHM		780
24		YU7KM		560
25		OK3KHU		530
26		YU7SF		266
27		EA2CR		240

UK SWL

1	RS91477	*	39840
2	RS88709		34040
3	RS28198		12682

OVERSEAS SWL

1	ONL383	*	5510
2	LY R 1855		3960
3	UA9 154 2441	*	2185
4	UB4 060 090		2000
5	OK3 13095		840

Checklogs received with thanks from G3OZF, G4MET, OK1DMS, PA0COR, SM4SET, SP5MNT and Y32UE.

@ Trophy Winner
* Certificate Winner
+ Multi-operator
# Log contained unmarked duplicate(s)

APOLOGY

On page 35 last month, captions for large photographs 1 and 2 were transposed with photographs 3 and 4. Our apologies to all concerned.

HF CONTESTS CALENDAR - 1992

4/5 Jul	*Venezuela SSB*
11/12 Jul	RSGB SWL Contest (Jul 92, p23)
11/12 Jul	*IARU Championship (Jun 92, p16)*
18/19 Jul	*SEANET CW*
18/19 Jul	*HK DX CW*
19 Jul	Low Power Field Day (May 92)
25/26 Jul	*Venezuela CW*
26 Jul	RoPoCo 2 (NOTE change of date)
1/2 Aug	*YO DX (CW/SSB)*
8/9 Aug	*WAE (CW)*
5/6 Sep	SSB FIELD DAY (Jun 92)
5/6 Sep	*JARL AA SSB*
6 Sep	*LZ DX CW*
7 Sep	QRS Cumulative (Jul 92)
12/13 Sep	*WAE SSB*
15 Sep	QRS Cumulative
19/20 Sep	*SAC CW*
23 Sep	QRS Cumulative
26/27 Sep	*SAC SSB*
26/27 Sep	*CQ WW RTTY*

VHF RULES

144MHZ AFS & FIXED & SWL

6 Dec: 0900-1700GMT

General rules apply.

Sections: A AFS groups (up to 5 stations acting as a team, where total points of each individual are added to make team total). Clubs or groups must be affiliated to the RSGB (individual operators do not have to be RSGB members). Clubs or groups can submit as many teams as they wish, please mark entries team A B C etc. S Single operator. M Multi operator. L Listeners.

Scoring: radial ring.

Adjudicator: G0FCT, I Pawson, 3 Orion, Bracknell, Berks. RG12 4YX.

70, 144 AND 432MHZ FIXED STATION

26/27/28/29 Dec: 1400-1600GMT

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 14 applies (County and Country multiplier)

Scoring: use radial ring for all distances. County and Country multiplier can be be claimed for each band.

Example on day 1 you work 5 stations on 2 metres for 30 radial points, and 4 counties and 3 countries, and on the same day work 11 stations on 70cm 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 4, 2 or 70 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 county or country on each day and on each band, all will count as multipliers).

Please include check list of county/country 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

Adjudicator: G4DEZ, B Llewellyn, 110 South Avenue, Southend, Essex SS2 4HU.

Notes for All Contests:

All entries must be postmarked at the latest by the 16th day after the end of the contest ie. if contest ends on a Sunday (say October) then the entry must be postmarked on or before the 3rd Tuesday after that Sunday (17 October). For VHF Field Day an extra week is allowed, ie the 4th Tuesday.

Any late entries can only be accepted at the discretion of the adjudicator.

No recorded delivery or registered post.

Entrants can obtain a proof of posting certificate from the Post Office which we will honour if an entry has been delayed in the post.

QTH information to be exchanged on 70MHz only.

General rules: 1 through to 9, 11,12,13,15 to 23, 25, 26, apply to all contests any changes will be noted in individual contest rules.

Adjudicators will not normally enter contests which they are adjudicating, however if the adjudicator does wish to enter then his entry will be vetted by a sub-committee before final adjudicated list is published.

Every contest is open to foreign entrants who will be listed separately from UK stations, certificates will be issued to section winners (and runners-up, if enough entries).

DIRECTION FINDING

RIPON QUALIFYING EVENT

Date: 5 July

Map: 104 (Leeds and Bradford)

Assembly: 1300 for start at 1320

Location: Plantation Road Recreation Grounds, NGR 287 540

Competitors requiring tea should notify John Hall, tel: 0423 567390, no later than 28 June.

SLADE QUALIFYING EVENT

Date: 26 July

Map: 138 (Kidderminster & Wye Forest)

Assembly: 1300 for start at 1320

Location: East of Bridgenorth, NGR 740 927

Competitors requiring tea should notify John Drakely, tel: 021 770 3474 (Home) or 021 772 2278 (Work), no later than 19 July.

SALISBURY QUALIFYING EVENT

Sixteen teams assembled at Matchams View (a high point in the centre of the New Forest) on a very hot and sunny afternoon, for the start. Surprisingly, all teams headed for the 'A' station (G4KBB/P) first, probably trying to avoid the heavy holiday traffic. The station was about 10km west of the start and was hidden in partly wooded and dense undergrowth. All sixteen teams found the quarry by 15.00.

Station 'B', G4MDF/P, 15km east of the start point was a bit more formidable. Much traffic along the A31 and difficulty of knowing where to filter off, or use the underpass, caused problems for the navigators. A very long counterpoise around the forest fence also did not help 'sensing' for the operators. Thanks to G4RLF, G8PCB, G3ZNH and G6ZHJ who operated the transmitters. Also the dedicated DF'ers who came from clubs afar, and to Sir Evan Nepean, G5YN, who as usual managed the whole thing smoothly.

Pos	Name	Club	Time at TX 'A'	Time at TX 'B'
1	A Simmons	Mid Thames	14.34	15.26
2	G Foster	Mid Thames	14.19	15.34
3	C Wells	S Manchester	14.45	15.39
4	B Gray	Mid Thames	14.43	15.40
5	A Collett	Chelmsford	14.20	15.41
6	P Lisle	Mid Thames	14.49	15.45
7	D Newman	Northampton	14.49	15.50
8	B Pechey	Mid Thames	14.57	16.04
9	D Brocks	Chelmsford	14.26	16.04.5
10	D Gething	Mid Thames	14.42	16.05
11	B North	Mid Thames	14.54	16.12
12	T Gage	Mid Thames	14.44	16.14
13	P Tyler	Mid Thames	14.46	16.14.5
14	C Merry	Dartford Heath	14.41	16.15
15	G Nicholls	Banbury	14.46	16.29
16	G Whenham	Coventry	14.49	-

Alan Simmons and Chris Wells qualify for the national final.

VHF RESULTS

432 MHZ - 24GHZ RSGB/IARU CONTEST OCTOBER 1991

For a co-ordinated contest the activity from the UK was very poor. Conditions seemed to be quite good at times. IARU activity was very high even if not workable from the UK, the pile of logs in my study is about three feet (sorry 1 metre) high at the moment. Certificates, to those marked *, will be sent as soon as possible via G0FCT.

Bryn, G4DEZ

RSGB MULTI OPERATOR (OVERALL)

Normalised Scores

Pn	Group	Pts	432	1.3	2.3	3.4	5.7	10	24	
1	Havering & Hadrabs	4192	551	634	1000	307	200	1000	1000	*
2	Warrington CG	3429	700	697	417	615	1000	-	-	*
3	South Birmingham	2628	131	326	151	1000	1000	20	-	
4	Spalding Five Bells	2000	1000	1000	-	-	-	-	-	
5	South Manchester	809	377	344	88	-	-	-	-	

INDIVIDUAL BAND TABLES, ACTUAL SCORES

432 MHz

Psn	Call	Pts	QSO	Loc	Pwr	Ant	Best DX	Km	
1	G4DSP/P	2839	199	03CE	400	8X21	-	-	*
2	G3CKR/P	1988	186	93AD	350	4X21	HB9/F1FHI/P	925	*
3	G4HRC/P	1566	127	02TG	300	4X21	HB9/F1FHI/P	696	
4	G3UHF/P	1072	112	93EH	100	8X19	HB9/F1FHI/P	923	
5	G8OHM/P	373	63	92GB	100	21	HB9/F1FHI/P	817	

1296 MHz

1	G4SIV/P	389	35	03CE	25	2Md	DB1VY/P	636	*
2	G6PHJ/P	345	53	93AD	140	8X23	DL2KBB	610	*
3	G4PUB/P	247	35	02TG	250	2.5Md	Y26CI/P	664	
4	G8SMR/P	134	26	93EH	75	8X23	PA0WMX	524	
5	F1OHM/P	127	31	92GB	100	4X23	G6YXT	232	

2.3 GHz

1	G4PUB/P	79	11	02TG	40	2.5Md	PA3FPQ	286	*
2	G0CDA/P	33	9	93AD	40	2.4Md	G8OPR	219	*
3	G3OHM/P	12	4	92GB	20	66	G0CDA/P	125	
4	G3ZDM/P	7	3	93EH	4	1.2Md	G4EQD	71	

3.4 GHz

1	G3OHM/P	13	3	02TG	20	1.2Md	G4EQD	176	*
2	G8NTD/P	8	2	93AD	.8	.9Md	G3OHM/P	125	*
3	G4PUB/P	4	2	02TG	7	1.2Md	G4BYV	64	

5.7 GHz

1	G8NTD/P	5	1	93AD	.05	.9Md	G3OHM/P	125	*
1	G3OHM/P	5	1	92GB	10	.6Md	G8NTD/P	125	*
3	G4PUB/P	1	1	02TG	.3	1.2Md	G3LQR	17	

10 GHz

1	G4PUB/P	49	7	02TG	100	.7Md	PA3FPQ	286	*

24 GHz

1	G4PUB/P	1	1	02TG	.007	.4Md	G8APZ/P	7	*

RSGB SINGLE OPERATOR (OVERALL WINNERS)

Normalised Scores

Psn	Call	432	1296	2.3	3.4	5.7	10	Total	
1	G4EQD	-	42	1000	1000	750	1000	3792	*
2	G4PMK	124	35	588	307	1000	444	2495	*
3	G8OPR	227	398	764	-	-	-	1389	
4	G8FBG	1000	-	-	-	-	-	1000	
4	G3XDY	-	1000	-	-	-	-	1000	
6	G8ZQB	101	107	647	-	-	-	855	
7	G4DEZ	30	252	-	-	-	-	282	

INDIVIDUAL BAND TABLES

432 MHz

Psn	Call	Pts	QSO	Loc	Pwr	Ant	Best DX	Km	
1	G8FBG	814	96	91SG	400	4X21	DC6DY	536	*
2	G8OPR	185	23	91FE	25	17	DK5WO	532	*
3	G4PMK	101	19	93GT	70	19	TW1C/P	469	
4	G8ZQB	83	17	92JN	40	19	TW1C/P	333	
5	G4DEZ	25	5	01JN	50	18	G3CKR/P	252	

1296 MHz

1	G3XDY	567	49	02OB	250	4X23	Y46CI/P	626	*
2	G8OPR	226	32	91FE	110	55	PE0AGO	565	*
3	G4DEZ	143	25	01JN	15	4X55	DF0HS/P	375	
4	G8ZQB	61	13	92JN	50	27	G4PUB/P	194	
5	G4EQD	24	6	93QN	80	27	G1OHM/P	175	
6	G4PMK	20	8	93GT	60	23	G8ZQB	139	

2.3 GHz

1	G4EQD	17	5	93QN	10	49	G8ZQB	117	*
2	G8OPR	13	3	91FE	35	25	G0CDCA/P	219	*
3	G8ZQB	11	3	92JN	4	27	G4EQD	118	
4	G4PMK	10	4	93GT	10	.6Md	G6PHJ/P	81	

3.4 GHz

1	G4EQD	13	3	93QN	.5	.6Md	G3OHM/P	175	*
2	G4PMK	4	2	93GT	.8	.6Md	G4EQD	61	*

5.7 GHz

1	G4PMK	4	2	93GT	.1	.6Md	G4EQD	61	*
2	G4EQD	3	1	93QN	.08	.6Md	G4PMK	61	*

10 GHz

1	G4EQD	12	4	93QN	4	.6Md	G3ZTR/P	66	*
2	G4PMK	8	4	93GT	3	.6Md	G3PHO/P	68	*

IARU REGION 1 UK VHF/UHF/SHF 1991

This year, the RSGB were the adjudicators for the IARU Region 1 VHF and UHF contests. The number of entries received can only be described as overwhelming, and I am sure that Bryn's postman can testify to this. Special congratulations to the Northern Lights for achieving a magnificent 2nd place in the 144MHz Multi Operator Section for the second year running. If you were active for these events, but your callsign is not listed below, it is most likely because you did not submit your logs scored in both radial rings and 1pt/kilometre, and with a second cover sheet for IARU.

The overall UHF score is calculated on a different basis to our own '1000 point' normalised version, and does not include the 3.4GHz band, since this is not available throughout the whole of Region 1. A copy of the full results have been sent to all IARU Region 1 VHF Managers, and if you would like a copy of these, please send an SASE to G4PIQ, QTHR. *G4PIQ*

MULTI OPERATOR SECTION

144MHz (332 entries)

1	TW1C/P	470495
2	GU4APA/P	455320
3	FF1OLW/P	414039
4	FF6KNB/P	325777
5	LX/ON4AOI	317203
6	DK0BN/P	300737
7	PE0MAR/P	298998
8	G8LNC/P	276816
9	G4DSP/P	271202
10	Y35O	261618
11	G4VIX/P	260057
16	G3CKR/P	237010
59	G0KEG/P	144736
60	G4CRA/P	143224
67	G2XV/P	136046
87	G8SMR/P	117474
115	G8DMR/P	94186
120	G6WGV/P	91958

432MHz (100 entries)

1	HB9/F1FHI/P	172495
2	DK0BN/P	126184
3	DK1VD/P	125121
4	PE0MAR/P	108976
5	PA3FBP	98873
6	OZ7UHF/P	87381
7	DK0CW/P	64388
8	DL0UL/P	62405
9	PA0PLY	78664
10	G4DSP/P	70824
21	G3CKR/P	49916
30	G4HRC/P	39242
47	G3UHF/P	26926

1.3GHz (78 entries)

1	DL0UL/P	28614
2	OK1KIR/P	21735
3	DK0CW/P	20218
4	PI4GN	19382
5	PE0MAR/P	19148
6	PA0PLY	17664
7	DF0HS/P	15573
8	OZ7UHF/P	15050
9	OE5VRL/5	14284
10	PE0AGO	13991
23	G4SIV/P	9678
25	G4PUB/P	9365
27	G6PHJ/P	8717
51	G8SMR/P	3408

2.3GHz (42 entries)

1	I3NGL/3	7032
2	PI4GN	6230
3	OK1KIR/P	5728
21	G4PUB/P	2036
27	G0CDA/P	901
41	G3ZDM/P	155

3.4GHz (16 entries)

1	DK0NA	1453
2	DL0UL/P	1169
3	PE0MAR/P	1159
13	G8NTD/P	274
15	G4PUB/P	81

5.7GHz (21 entries)

1	DL0NN	1935
2	OK1KEI	1828
3	DL0UL/P	1470
17	G8NTD/P	125
21	G4PUB/P	17

10GHz (28 entries)

1	DF0OG	5847
2	DJ7FJ/P	4318
3	OE5VRL/5	3537
14	G4PUB/P	1246

24GHz (8 entries)

1	DL0NN	408
2	DK0PX	176
3	HB9MIN/P	159
7	G4PUB/P	7

47GHz (2 entries)

1	HB9MIN/P	49
2	DK0NA	4

Overall UHF (127 entries)

1	DL0NN	584533
2	DL0UL/P	578439
3	OK1KIR/P	482295
4	PE0MAR/P	442249
5	DK0NA	386931
6	OE5VRL/5	377128
7	HB9MIN/P	354543
8	DK0PX	336851
9	PA0PLY	328862
10	PI4GN	319963
23	G4PUB/P	186874
27	G3CKR/P	135710
30	G4DSP/P	129166
56	G3UHF/P	51273

SINGLE OPERATOR SECTION

144MHz (438 entries)

1	F6HPP/P	249846
2	EA2LU	240937
3	DG3FK/P	235410
4	G4PIQ	201758
5	DL2NBU/P	180447
6	DL7AJA/P	142596
7	YU3ZO	125246
8	OK1MAC/P	124816
9	DL8PC/A	114664
10	EA2AZW	111909

432MHz (271 entries)

1	DL2NBU	123085
2	DL4ZBK/P	114379
3	PA3FPS	98573
4	TW1C/P	87553
5	F6HPP/P	77683
6	DG7NBE/P	66338
7	DL4EAU/P	56582
8	DK4VW	55141
9	DL2FAG/P	54092
10	DF3BU/P	48234
182	G8FBG	4630
187	G8OPR	4558
235	G4PMK	2478
244	G8ZQB	2079
265	G4DEZ	628

1.3GHz (145 entries)

1	DK1VC	18797
2	DK2GR	18472
3	DL6NAQ/P	17960
4	DK2EG	16521
5	PA0EZ	16482
6	G3XDY	14174
7	IK5HGY/5	14078
8	IW1PZC/1	13380
9	PA0GUS	13230
10	DK2XZ/P	12784
39	G8OPR	5518
58	G4DEZ	3504
102	G8ZQB	1560
129	G4EQD	577
135	G4PMK	426

2.3GHz (45 entries)

1	IK1LUT/1	5708
2	IK3HHG	5694
3	PA0EZ	5255
4	DK1VC	4384
5	DL6NAQ/P	4211
6	DL1EBR	3828
7	IK2COJ	3650
8	DG8EAJ	3172
9	DJ6EP	3147
10	IK4GRC	2788
40	G4EQD	402
43	G8OPR	354
45	G8ZQB	258
46	G4PMK	225

3.4GHz (15 entries)

1	PA0EZ	968
2	DL1EBR	966
3	DJ6EP	925
10	G4EQD	335
14	G4PMK	88

5.7GHz (23 entries)

1	DL1RQ/P	1888
2	I4CHY/4	1136
3	PA0EZ	985
18	G4PMK	88
20	G4EQD	61

10GHz (47 entries)

1	I4BER/6	6181
2	I4CHY/4	4499
3	IW6AEG	4031
4	I3DRE/IV3	3321
5	IV3FDO/IV3	3318
6	I3OPW	3081
7	I2MUT	2716
8	IK4OMN	2403
9	DL1RQ/P	2238
10	DH6FAE/P	2179
40	G4EQD	250
42	G4PMK	183

24GHz (9 entries)

1	HB9MIO/P	228
2	DF2CA/P	42
3	HB9OMR/P	40

47GHz (2 entries)

1	HE7FML/P	13
2	DF2CA/P	4

Overall UHF (370 Entries)

1	PA0EZ	373946
2	DL6NAQ/P	250506
3	DK1VC	217620
4	HB9MIO/P	202175
5	PA0GUS	194181
6	DG8EAJ	184028
7	IK3HHG	182063
8	DL1RQ/P	167651
9	DL1EBR	165992
10	I4CHY/4	163650
29	G3XDY	92813
70	G8OPR	48324
145	G4DEZ	23573
153	G4EQD	21402
160	G4PMK	19500
169	G8ZQB	17857
291	G8FBG	4630

CORRECTION TO RULES FOR 2320MHZ TROPHY OCTOBER 1992.

The rules regarding date and time of operation for the above contest were incorrectly listed in *RadCom* June 1992.

The corrected information follows:

Saturday 3 October 1992 from 1400 to 2200GMT.

Please note that this contest runs concurrently with the 1296MHz Trophy event.

3456MHZ IN RSGB EVENTS 1992 ONWARDS.

As agreed at the IARU REGION 1 Managers' meeting 28-29 March this year, from 1993 the allocation on 9cms will be changed from 3456-3458MHz to 3400-3402MHz (narrowband section). This will then bring us into line with our Dutch and German neighbours who are already there.

The VHFCC therefore recommends that competitors change frequency as soon as is possible, even in time for the October 432MHz-24GHz event. This will save operating two sets of equipment to enable contacts to both PA/DL and inter-G (a crystal change and tweak of LO's should suffice!)

VHF CONTESTS COMMITTEE MAY 1992.

VHF CONTESTS CALENDAR

4/5 Jul	VHF Field Day (May 92)
25 Jul	144MHz LP/SWL (Apr 92)
26 Jul	432MHz LP/SWL (Apr 92)
23 Aug	432MHz Fixed/SWL (Apr 92)
1/16 Sep	144MHz CW Cumulative (Jun 92)
5/6 Sep	144MHz Trophy/SWL (Apr 92)
20 Sep	70MHz Trophy/SWL (Jun 92)
3/4 Oct	432MHz-24GHz (Jun 92)
3/4 Oct	2.3GHz and 1.3GHz Trophies
3/4 Oct	SWL Contest and IARU
1/16 Oct	144MHz CW Cumulative

For details of rules for European contests, contact G4PIQ, QTHR.

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Deluxe Dipole Centre, 259 Socket	9.35	2.00
Self-Amalgamating Tape	4.35	1.00
300 R Slotted Feeder, per metre	0.58	0.10
450 R Slotted Feeder, per metre	0.50	0.10
URM67 50R Low Loss Coax, per metre	0.95	0.25
URM76 50R Coax, per metre	0.40	0.10

SPIRO ANTENNA PRODUCTS

PB1 1:1 Balun 2kW P.E.P.	17.95	2.00
LC160 160 Mtr Antenna Shortener Pair	24.95	2.50
LC80 80 Mtr Antenna Shortener Pair	23.95	2.50
T15 21 MHz Traps 1kW (Pair)	39.90	2.50
T20 14 MHz Traps 1kW (Pair)	39.90	2.50
T40 7 MHz Traps 1kW (Pair)	41.90	2.50
T80 3.5 MHz Traps 1kW (Pair)	41.90	2.50

PALOMAR

RX-100 Noise Bridge	69.95	2.50
P-405 Receiver Pre-Amplifier	129.95	2.50
PF-300 Scaf Audio Filter	139.95	2.50
PB 350W Balun, 1:1, 1.5:1, 2:1, 3:1, 4:1, 5:1, 6:1, 7.5:1, 9:1, 12:1, 16:1	26.95	2.50

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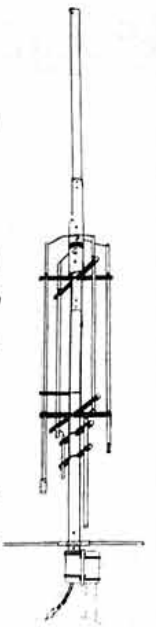

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In case you didn't already know Siskin supplies free software for just about any home computer (not just the popular ones) with every TNC purchase! This month's specials include *:

Tiny 2 - the UK's best selling TNC **£149.00** now includes free computer & radio cables ready made for YOUR computer/radio setup.

BayComm 4 Port PC card (300 baud HF, 1200 baud VHF PLUS 9600 baud!) List price £269 - this month only **£249!**

Kantronics KAM - (RRP £291) Free Smart Socket/batteyback up worth £19.95 !

AEA PK-232 MBX - (RRP **£339.95**) not only do we now include a free copy of PC Packratt II or Amiga Packratt software (worth £29.95) but we'll also make up all cables for your computer and radios at no extra charge!

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PACTOR - PacComm have recently licenced the excellent PACTOR technology from DF4KV & DL6MAA. The PacComm PACTOR modem not only includes a full featured built-in mailbox but also supports RTTY and AMTOR FEC, ARQ & L modes. Initital stocks due in around the middle of August. Phone/write for details.

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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. Ads for CB equipment will not be accepted. 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.

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

CAPCO loop AMA3 (covers 10-20 metres): £175. G4XWM QTHR. (Nr Milton Keynes). 0908 611772.

FT726R, vgc, 2m, DTMF mic, manual: £450. Pye MF5FM Europa, 6ch, 2m, ok packet, mobile, monitor etc: £35. Pye PF2 70cm FM speaker/mic, spare batteries, aerial: £50. Prism modem for BBC Micro, c/w eprom, manual, boxed: £30. PSU/stand (Weller) for 24v TCP soldering iron: £15 (available from RS, STC) - improve your soldering! Jaybeam 8ele 2m Yagi: £15. RTTY chip + circuit details for BBC micro, works with most S/W, simple to build: £5. All above ono/px. WHY? Wanted: FT290R Mk1, any cheap HF TX/RX, FT101, KW2000 etc. G8LAH Adrian, not QTHR. (Bicester) 0869 345080.

HEATHERLITE HF Explorer used 15 hrs, immaculate. 2KW PEP Two 3-500Z, nine tuned bands ALC, save £600 - asking only £650 (Grimsby) 0472 882937

ICOM 3200E dual-bander talking chip frequency readout: £300. Kenwood R600 HF/RX: £195. Spectrum Comms factory built 2M/transverter: £65. BNOS/PSU25A: £165. Pakratt 232MBX: £245. Datong Morse Tutor: £35. SEM/HF wavemeter: £25. Drae VHF wavemeter: £20. Sinclair 8 digit frequency meter: £25. Revex SWR/PWR meter/2mtr/70cm: £40. All units in very good condition and include post and packing, *but* prefer buyer collects. G0BYC QTHR. (Worthing) 0903 506289.

ICOM 970H with 50-905MHz internal receiver unit, SM8 microphone, all mans, cost £2650, first: £2100 secures. M/M 432MHz transverter: £75. Microset SR100 amplifier, brand new: £120. KAM TNC with V4 ipgrade with all manuals: £200. Call evenings John. (Aberdeen) 0224 821423.

K2RIW 432MHz KW PA, 14-70MHz 4CX250B PA. 1296MHz 100W 2C39B4 PA. KR400 rotator. Alignment bearings. Offset mounting hardware. Various lengths of Ali. scaff. Tonna 55ele 1296 yagi. 25ele 432MHz flexa yagi. Various lengths of heliax. Please phone if you are seriously interested. Prices will be remarkably low if you can convince me that you are not going to waste my time! (Holsworthy) 0409 241493.

KENWOOD TS830S CW filters, mic, VGC: £600 ono. Yaesu FT707S inc PSU 10W HF rig, VGC, boxed: £395 ono. SX200N scanner inc circuit diagrams: £90 ono. (Cardiff) 0222 892020.

SM220, mint condition: £200. Yaesu 7700 with ATU/7700 and VHF converter, mint condition: £300. Wanted VFO230. John. (London) 071 376 2338.

TONO 550 £120, Rx4 Commodore disc program £40, Commodore G4 with disc and cassette, new - still boxed £175. Datong auto notch filter £35 (Aylesbury) 0296 21694

TS850S auto ATU SP31: £1200, mint, PT135 35amp reg psu: £90. EP925 25amp reg psu: £75. Manuals, boxes, no offers or time wasters. (Sheffield) 0742 320008.

YAESU FT690R II as new, complete with charger, batteries, manual, original box: £350. Collectors Item. The Amateur Radio Handbook 1939 first edition, clean copy, Offers invited. G1POB QTHR, please write - no phone. All replies answered. (Alcester).

UNIQUE historic cottage QTH in centre of Mid Lincs Village overlooking Beck. 2 receptions, 4-5 beds, large kitchen, large garden, workshop, shack, 2 garages, store rooms, gas central heating, econ7. P/P for 60ft tower, 42ft teletilt free if sold through this advert. Contact agent Gordon Gibb 0526 833129. OIRO: £99,500. Quote ref 33/35 High Street. G3ZEG QTHR. Lee Bennett. (Ruskington) 0526 833430.

YAESU FTV901R 2M/70cm + free 4/6 mtr (modified): £350. YR901 CW/RTTY reader with YK901 keyboard: £150. FT726 2M multimode: £350. All above boxed with manuals and in good condition. Carriage extra but can deliver 100 miles. (Shrewsbury) 0743 368972.

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8874 triodes (3CX400). One pair Eimac, new, unused. 500MCs 500W rating. Ideal for QRO 2M/70cm linear: £65 each item. (Lossiemouth) 0343 814623.

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AMSTRAD 1640 mono 3 1/2 and 5 1/4 drives, packet TNC and software, Trio 2200: £360 ono. 286 PC: £90 ono. (Chesterfield) 0246 569527.

BOOKS:- RSGB 1944. Supplement 1945. AP1762 1939. Command sets. Single Sideband 1954. Sideband handbook 1958. Valves Toshiba 6KD6 TT21. 832A (2). 5B254M(2). QQYO3-20A (4) 85Kc/s IFTs. B7G 100Kc/s XTAL. Coaxial relays. Stabilised PSUs. ITT Powercard 12Vx2. Weir 12V 100m/a. 5V 1A. Microphones BM3 XTAL. Pye Tulip £5 each. TCS speaker unit. Hy-gain BN86 Balun £10 plus postage. WANTED ZETAGI BV2001 Linear Amplifier. GW3EJR QTHR (Cardigan 0239 87629.

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CAPCO loops AMA3-AMA5 plus controller: £350. BOTN realistic scanner PRO34 UHF/VHF: £100. Receiver Trio HF model 9R-59DS AM/SSB/CW: £50. G0EQR. (Worcestershire) 0386 833511.

COLLINS 75S-1 receiver with Waters model 337-S1 Q/multiplier/notch filter & 3251 transmitter, offers. Wanted 51S-1, SM-3, 516F-2, CC-2 & 637T-2. (Steyning) 0903 879526.

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DATONG filter model FL3, brand new, offers to G8BQ QTHR. (Boston) 0205 365975.

DATONG FL2 filter: £50. Shinwa SR001 scanner: £165. Katsumi EK150 keyer: £55. Star masterkey memory keyer: £50. John G4ZTR. (Colchester) 0206 860238 6-9pm.

DATONG FL3 audio filter, as new: £70. Kenwood DFC230 with up/down microphone, as new: £50. Pye varactor tripler to 70cms: £7.50. (Bury St Edmonds) 0284 754318.

DATONG Model DTO Morse tutor. £39. R A Smith, 6 Breach Lane, Enmore Green, Shaftesbury, Dorset SPY 8LE. Tel 0747 52039

DRAKE R4C S/N 16678, Good condition handbook £200. Drake R7 four accessory filters. Operators manual, servicing handbook, good condition £650. (Woodbridge) 0986 798524

DRAKE R7 updated to R7A, 2.1,1.8,.05 CW SSB Filters, 6000-4000 AM. Filters, general coverage, mint condition, first class performance, £800 (Middx) 081 571 5759

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ERA microreader MKII, pristine condition, complete with leads, instructions, demo tape: £95. G7DRG QTHR (Stevenage) 0438 312749.

FC757AT auto ATU with handbook and lead: £200. Will consider exchange for AT230 plus adjustments. GW0ESU QTHR. (Anglesey).

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FRG7 ex cond: £100. Creed teleprinter, working condition: £20. Textronic D43 'scope for spares including manual: £10. (Redditch) 0527 26041.

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FT101Z Excellent condition including ATU. £550 for quick sale. G0AXJ (Ashington) 0670 521570

FT101ZD Warc Bands Fan, CW Filter, mic, manual, recent service. FTV901R transverter fitted. 144MHz module SP980 speaker £500 ono Ken G0ORH (Newbury) 0635 866881

FT102 transceiver, 150W, new relays, realigned, recent tubes, FM/AM, superb filters, seen working, buyer collects: £485 or part/ex FT7B, FT707, etc. (Stratford on Avon) 0789 297158.

FT107M, FP107, FC107: £625, mint. FT790R Mk1 + 10W lin: £350. Lunar 2M-10-150P (10W in 150W out): £140. 12V 60A PSU (Farnell): £120. Altron 30ft tiltover + gnd post: £300. Daiwa DR7500R rotator: £80. Drae 3 way N switch: £10. Heil EQ200P mic EQ: £20. 2M 12el ZL: £10. 70cm MBM 48el: £15. All in excellent condition. Mark G4RGB QTHR. (Gillingham) 0634 230822.

FT23 R h/held. Includes spare nicad. charger, DC-CAR adaptor, two leather cases, recent service: £135. G0LNV. (Sheffield) 0742 553103 phone evenings.

FT290R with nicads and accessories: £210 ono. Complete 2m aerial system: tonna 9-ele, rotator, cable, etc: £100ono. G7HAM QTHR. (Colchester) 0206 45083.

FT747 GX, mint condition: £350. FT726R 2M, only: £325. Sentinel linear, 100 watts, 2M, as new: £80. Icom 290D 2M rn/mode: £245. Kenwood TH215E h/held: £85. Thandar PFM 200A frequency meter: £25. 6M transverter 10M IF .5/1W out: £25. 4 meter transverter 10M IF: £25. G-400 rotator: £50. (Caernarfon) 0286 830078.

FT747GX, with filters, Yaesu mic, Kent Morse key, as new, limited use from new: £550. Transistor signal injector: £9. G3FK QTHR. (Ferndown) 0202 873175

FTV107R transverter, modified to take 2M and 6M complete with modules, VGC: £225 ono. Also Icom 451E 70cms m/mode, 10W, boxed, mike, manual, VGC: £450. Mike G7AHV. (North Walsham) 0692 402479 before 9pm please.

HEATHKIT HW101 transceiver, good working order and good condition: £150, complete with PSU. (Coventry) 0203 464279.

HRO RX, immaculate condition, power supply, speaker, metal octal valve model, fourteen coils, four bandspread, handbook, spare valves: £95 ono. Buyer please collect. G4FXG QTHR. (Blackpool) 0253 883461.

I.T.C. CCTV and monitor, b/w monitor sits on top of camera, (like studio camera) zoom lens, mounts on tripod, video output, very good for indoor/outdoor work, 240V: £120. Circuit 6m transverter, instructions, blown PA, hence: £40. 30ft lattice tower, built in climbing rings: £100. AD370 active aerial: £40. Hamgear ATU: £40. Wanted - Welz meter. Ian G7HXI. (Stalham) 0692 580201 anytime.

ICOM 240 10W FM transceiver, covers all 2M, rev.rpt, listen input etc. Racal mike, manual, excellent condition: £125. (Cardiff) 0222 623974.

ICOM 275E mains base station: £650. Datong Morse tutor: £35. TenTec paragon mains PSU, 1yr old, vgc: £1200. Dave G0PQC. (Herne Bay) 0227 361255.

ICOM 505 6M multimode transceiver, excellent condition, comes with box and manual, also linear amp: £335. Postage extra. GM1XHZ. (Montrose) 0674 76503.

ICOM 725 HF All-band transceiver CW HM12 mike and manual, 2 years old, vgc: £520. (Harrogate) 0423 872997.

ICOM IC471H high-powered 70cm all mode: £650. Icom IC1271 high-powered 23cm allmode: £725. LCL10FM: £35. 29Meg 35W amp: £25. 50W: £35. Yaesu FT77 HF allmode 100W plus FM: £350. 2M AEA hot rod h/portable ant: £15. Wanted 70cm masthead pre-amp. (Norfolk) 0328 710641.

ICOM IC725, good condition, manual, boxed, microphone: £475. G3GLL QTHR. (Tollesbury) 0621 869309.

ICOM IC735, AT150, PS55, SM8, virtually new, TX unused, boxed, manuals. Complete all band HF station: £1000 ono. (Nr Bristol) 0272 864673.

ICOM R1 scanner, AM/FM 0.1 - 1300 MHZ, carrying case and external PSU. 9 months old, as new condition: £280. John G4TLS (Horsham) 0403 53051.

JAYBEAM minimax tribander VGC £300, Clark PT4 40ft pump-up telescopic field mast, legs, guys, £300. CDE rotator £30, hobby compressor as new £80. G4BKE (Poole) 0202 697338

JAYBEAM TB 3el brand new, still boxed, unwanted project, accept: £325. G3XXO QTHR. (Worksop) 0909 472316.

KENWOOD 2m multimode TR9130 complete with manual. Bracket and charger. Mobile or base station £320. After 6pm ask for Peter (Didcot, Oxfordshire) 0235 813348

KENWOOD TS530S, practically new condition, original packing and manual, buyer inspects and collects, no haggling: £475. G3YNC. (Romford) 0708 749175.

KW Viceroy SSB transceiver, 10-80M: £50. Marconi CR150 receiver 118-60MHz, handbook: £50. BC348 receiver: £45. Prefer buyers collect. G3THX QTHR. (Skegness) 0754 761306.

KW-600 linear 80 to 10m, single 572B 400w output max, handbook: £220 including carriage. GM4SID QTHR. (Aberdeen) 0224 584774.

KW108 monitorscope and two tone generator, good working order with hand book, circuit etc: £75. G0JFU. (Gloucester) 0452 862773.

MOSELEY 3ele tribander: £100. Yaesu FT690II 10W matching linear case, nicads: £325. Tonna 5ele 6M beam: £30. SMC 30A PSU: £70. Tel Ron. (Stoke on Trent) 0782 395017.

NRD 515 HF general coverage receiver with optional 600Hz CW filter, excellent condition, serviced, boxed. Rare opportunity, colectors rig: £450. Dave G1SYZ.

PRACTICAL Electronics 1974-1992, 18 vols: £45. Practical Wireless, 12 vols 1974-1985: £20. Computing today, 6 vols 1978-1984:

£15. Electronics Today International, 10 vols 1976-1985: £20. Everyday Electronics, 6 vols 1974-1979: £10. Radio + Electronics Constructor, 8 vols 1970-1977: £10. All bound volumes. (Atherton) 0942 896116.

PRINTER: electronic Brother personal EP22, will double as typewriter, mains battery, suitable all ASCII computers: £50 ono. G4TLY QTHR. (Malmesbury) 0666 822935.

PRO 34 h/held scanner. 68-88, 108-174, 380-512, 806-960MHz. AM/FM superb condition with nicads, charger, manual: £95. (Huddersfield) 0484 603963.

QQVO6/40A New makers box Mullard £15 + p&p. G5RV Type ATU. Unbalanced to unbalanced 3.5 - 30MHz 100w £25 + P&P G3JNY QTHR (Leeds) 0532 863058

RACAL LOKATA professional NAVTEX receiver with built-in printer, as described in recent SWM. Immaculate with manual and spare paper: £300, possible p/ex Icom IC-202 or Trio 7010. (Redditch) 0527 64885.

RACAL RA17L general coverage receiver in Racal cabinet, excellent condition, CW, manual, circuits and spare valves: £200. G3RDG QTHR. (NW London) 081 455 8831.

RACAL RA17L, excellent condition, cased, spare set of valves, manual: £230. G8BZN. (Nuneaton) 0530 62565.

RADCOMS Sept.84 - July 92 inc. Electronics June 87 - May 92 inc: £25 buyer transports. New and used components resistors, caps., pots, diodes, transistors ICs etc. useful for club or home brew: £25 buyer transports. G1IAJ QTHR. Lincs, (Nr Spilsby) 07903 428.

RADIO Communication bound volumes 1976-1988, no sensible offer refused. Will deliver within London. Phone Ken.(London) 081 809 1770

RARE-ISH Marconi Guardian IV Marine Receiver. Ideal supertanker/shack but apparently, not our lounge! Either it goes or wife will! Offers (Uxbridge) 0895 810826

S.E.M. VHF converter, vgc: £30. Sagent 14MC/s windom, new, wrapped: £35. Spectrum 48K upgraded keyboard complete with G1FTV RTTY/CW tapes terminal unit, instructions: £70. Mosen PC10 terminal unit, comp. with interface tape, instructions for RTTY, tx/rx with Spectrum, vgc: £75. Scarab slow scan TV/RX tape, interface, instructions, Spectrum: £15. AR88D, no case, GWO, spare valves, h/book: £45. Collected. G3OAZ QTHR. (Basingstoke) 0256 465126.

SEM transzmatch ATU 1.8 to 30MHz, very good condition: £70. Geoff G4OWH. (Bath) 0761 431198.

SG BROWN, High impedance headphones (about 4kohm). Excellent condition, some in original, plain boxes £7 each G4LUF, (QTHR) (Totnes) 054 882 442 (eves)

SILENT KEY sale - G6PUQ, Norman. Kenwood R2000 all-mode receiver £300. Scanner Realistic Pro2004 £170. Also Pro 35 £100. Contact Alan - G4REY (Blackpool) 0253 811162

SILENT KEY sale FT7B: £180. Standard C7800: £150. Clegg FM88 144MHz 25W: £100. Heathkit SB303 Rx: £100. SB400 Tx (needs attention): £40. SEM tranzmatch + ezetune: £50. BNOS 12A PSU: £45. 8A PSU £10. Oskerblock SWR300: £20. CR70A £20. Shure 444: £20. Drae Morse Tutor: £25. Heathkit RF-1U: £10. Microwave Modules 500MHz freq. counter: £35. Telereader CWR-760E, amber monitor: £100. G0EAG (Rainham) 04027 57606.

SILENT KEY sale. Yaesu FC902 ant tuner: £90. YC601B freq counter: £60. FT101ZD HF tcvr: £450. RCA AR88D: £60. FDK 700E 2M/25W mobile + PSU: £150. (Bristol) 0272 755454.

SPECTRUM 48 plus, HR5 printer, microdrive, software, hardware, RTTY, morse, word processor, many others £100 G6TPQ Not QTHR (Oldham) 061 633 3895

SPECTRUM analyzer 0-100 MHz based on G4PMK design. Constructed to prof. standard: £100. G3PTN (Leeds) 0532 654644.

STANDARD 500E dualband h/h, erc battery pack and charger, spare nicad pack charging converter, mobile bracket DC lead, excellent: £235. Panasonic 14" EGA colour monitor, high quality as new c/w controller card: £135ono. SLR camera outfit, Vivitar V2000 28-70mm, standard erc optomax 135mm, plus Tamron 7 ele 2X converter and case, Chinon superior quality, flashgun tripod pullman bag ready to go: £150. If camera is sold Weston two and Invercone also available: £30. John. (S.E. London) 081 857 8096.

STRUMECH 36ft miditower, wall mounted. Alan G8MYK. (Birmingham) 021 430 4904.

TEN TEC Corsair II PSU 250Hz, 500Hz, 1.8kHz, filters, desk mike, used daily, faultless: £700. G3JLB. (Gravesend) 0474 534694.

TRIO 820 HF Transceiver in GWO. Complete with microphone and manual. Buyer collects £340 ono. Phone evenings G4FVK QTHR (Peterborough) 0733 54331

TRIO 940S with internal automatic ATU, speaker, desk mic, all boxes, manuals, pristine: £1400. T.B3: £200. Icom 505 unused: £400. Kenwood TH25E handheld: £150. Kenwood AT230 unused: £200. Kenwood MC80 Desk mic: £40 Icom CB 29MHz FM: £40. SEM 2M transmatch: £20. 2 new boxed Tonna antennas: £60 each. Exchange any of the above for British motorcycle. G4VNG QTHR (Peterborough) 0733 231639.

TRIO CD - 10, Call sign display: £60 G4ZIP QTHR (Heathrow) Phone any time (Bedfont) 081 890 4666

TRIO TR-751E plus Tonna 9ele X-Yagi plus PSU: £425 the lot. (Livingston) 0506 414338.

TRIO TR9000 multimode, mobile bracket: £260. Kenrotor KR400 rotator: £75. Katsumi EK150 electronic keyer: £30. Datong RF speech clipper: £30. Pair RCA 8122 valves, unused: £50. Tony G4EUL. (Sandwich) 0304 611040.

TRIO TR9130 Multimode mobile mount handbook boxed £310. Makita portable generator 1100 watt, 240VAC plus 100 watt 12VDC Uses unleaded fuel £180 (Yeovil) 0935 862505

TRIO TS440S auto-ATU 1.8/2.4 filters, voice unit, matching MC60A mic, manual: £670 + carriage. G3CCX Peter Craw, 117 Sea Lane, Rustlington, West Sussex BN16 2RU. 0903 850859.

TRIO TS711E, GWO: £575. Also MC60A mic: £40. SP430 speaker: £20. SSB LT23S, GWO: £275. 13cm SLO13/SRM13/STM13 modules in box, GWO: £250. Also DX2320 OP1, mint: £100. Two HP 430C power meters with manual and asstd items, Kenwood PS30 power supply and many other items. All items above are open to reasonable offers. To collect. (Birmingham) 021 441 3641 after 6pm.

TS-820 HF rig with Daiwa active filter, ideal starters rig: £350. Evenings only. 0799 522150.

TS430S Trio vgc. box, manuals etc. FM fitted, AM/SSB, narrow: £425 ono. G7FHV. (Sussex) 0444 417509.

TS830S mint 270Hz CW filter fitted VFO120, MC35 mic, boxed with manuals, recently serviced by Lowes: £600. G3HSL QTHR. (Hartlepool) 0429 261632.

UNIDEN 2830 multimode 10m, 25w, m/bracket: £220ono. Alpine 7179L car stereo: £100ono. Pioneer car stereo (£203 receipt): £100 ono. Steve GOLRI (Cheltenham) 0242 680248.

VERSATOWER 60ft crank-up, tilt-over, needs minor attention, buyer inspects/collects: £195 or exchange for 2M mobile handheld or WHY? G4VIO QTHR. (Durham) 0388 763501.

YAESU FT 290R, all access., VGC + complete station, 13 ele yagi + mounts, rotator, drag 6amp PSU, will split: £335ono. G7GYZ QTHR. (Colchester) 0206 42717.

YAESU FT-One HF Transceiver. Excellent condition with FM and Mic. Ideal base station £850 o.n.o. Andy GMOPMW (East Riggs) 0461 40378

YAESU FT101Z, mic, fan. Daiwa CN620A power/swr meter. SEM transmatch ATU. All immaculate condition. May split: £500 ono. (SW London) 081 870 1261.

YAESU FT101ZD AM board, mic, fan, manual, pristine condition, VGWO: £360. Test before collecting. G0MZI. (Salisbury) 0722 337711.

YAESU FT102 AM/FM good condition, excellent performer, high output, fan, mike, manual £500 ono (Amlwch) 0407 832197

YAESU FT470 dual band handheld, still under guarantee with charger. 6M three element beam. G3UQZ QTHR. (Birmingham) 021 373 8806.

YAESU linear FL2100Z, mint: £458. Buyer collects, inspects. G4ZZN QTHR. (Eltham) 081 850 1440.

WANTED

ALL MODERN military radios, jammers, etc + spares, ancillaries (post 1970) especially Soviet items R112, R123, R105m etc. (Leamington Spa) 0926 651772.

AP1086 issue 1 (RAF Radio Stores Ref. Nos.) Also Air publications relating to radio radar equipment, excellent prices offered. Would purchase post-war to current magnetrons, klystrons, T/R cells, T.W.T's photo multipliers, microwave and special CV types. Required static or rotary converter, AC or DC input with output of 80/115V 1500/2000 cycles, also RX type R1355 10D/13032 unmodified. Please phone anytime. (London) 071 511 4786 or 071 790 2846.

MILITARY No 19 to complete Daimler Dingo restoration, prefer complete clean example. (Leamington Spa) 0926 651772.

BOOKS: RSGB Buyers Guide - your price paid; ARRL Handbook - pre 1980; Kahn: "The Code Breakers" (hardback edition); Hodges: "The Enigma of Intelligence". Brochures (originals preferred) for FT102, Drake TR7 and similar transceivers 1970-90 period. Crystals for Drake SPR-9. John Teague. (Somerton) 0963 24319.

COMPLETE HF base station required, preferably solid state, must be in excellent condition and realistically priced. G0IIC. (Plymouth) 0752 790557.

DG5 Digital Readout for TS520S. Junction Box No. 2 for WS38MK2. Copy of Radio Radio. Ron G3TAR (Rugeley) 0543 685694

DUAL BAND 2M/70cm mobile transceiver, must be compact type. Will consider TM701, IC3220 or 70cms TM241 etc. G0OIO QTHR anytime. (Haywards Heath) 0444 450957.

EDDYSTONE. Any mint unmodified transistorised model, particularly EB35. Will pay cash and collect reasonable distance. Please phone anytime, Peter Lepino. (Leatherhead) 037 245 4381.

FT102 SSB Filter XF.8.2HSN. Also AM filter XF.8.2 GA. Cushcraft AP8 vertical antenna. FT102 FV-102DM VFO. Ring (Neath) 0639 813431

HANDBOOK wanted for 2M transceiver. Standard type C 8900, purchase or borrow for photcopying. G3MLX QTHR. (Hull) 0482 52841.

INFORMATION on Reg Adams G2NO, to aid my research project. Can anyone who knew Reg and can provide any information, however small, please write to G3TSS QTHR

INSTRUCTION manual/leaflet for Kenpro squeeze key twins paddle model KP100. Photocopy would do. G0NVH QTHR (Doncaster) 0302 536145

JOHNSON matchbox 300W or 1KW models considered. Phone George. (W London) 081 423 2329.

M.E.L. audio squelch unit, any accessories for M.E.L. manpack radios including faulty or incomplete items. 'Folding' manpack solar cell charger, Racal RA2000 field telephone, Racal RA250 telephone handsets (especially with ch/vol controls), 6 or 7 pin military connectors/leads also wanted. (Redditch) 0527 64885.

MAST or tower, pump up type. Phone with details anything considered. G0KJF (Leicester) 0455 209661.

PHANTOM radar indicator AN/APR 25. Also WW2 radr indicators 162, 182, 184. Will exchange R1155, R1132, R600. G4EZM QTHR. (Blackpool) 0253 47176.

R210 film tuning scale army part number ZA-49511 or any information on where to get one. (Leamington Spa) 0926 425220.

RACAL Radio parts needed for my collection. Model numbers: TA99, PU99, MA79G, MA141, MA152, MA144. Decade frequency generator MA35OB. A.T.U. for the TA349E. Factory or Imhof table and rack cabinets for Racal Radio Equipment. Need Racal manuals and literature from sixties and seventies. Please write to Nigel Boyd, 2 Church Close, Lower Willingdon, Eastbourne, East Sussex, BN20 9QY

REQUIRED for Racal 1792 receiver ST80730 Micro CPU PC board A6A2 part STO8203 marked DA80771 without chips. Racal standard 9442. Any other info requested on this receiver. Rockwell Newport mech filter black 2.4 KHz LSB 526 9896 Sherwood CF4K/8 AM filter. (Shrewsbury) 0743 884858

SUPPORT bearing SL100 for use with Hirschmann 250 rotator. Bryan G3GOT QTHR. (Nr Ipswich) 0473 787779.

TEN TEC 500Hz crystal filter, model 285 for Corsair II. Also VFO module for Century, need not be working. G0FAH QTHR. (SE London) 081 693 9149.

TUBE COLLECTORS, can you help with HIVAC SG220SW and new wartime metal 6A8. G4IMT QTHR. (Chippenham) 0225 891 254 anytime.

NTED. IC AT500 ATU. Must be in good condition. G0DUD. (Bolton) 0204 77975.

YAESU FLDX400 Transmitter, must be working. Please phone Eric. (Bedford) 0860 290 460, PO Box 66, Bedford, Beds.

EXCHANGE

RICHO RP1600 letter quality daisywheel printer parallel interface with separate tractor feed, ex cond for HF mobile rig ie TS120 or WHY? For sale: transformer QRO 120+120V input 2.8-3.2kv 250mA output: £35 ono. Wanted HRO matching PSU, any condition working or not. (Whetstone) 081 368 8674.

STANDARD C5800 25w allmode 2m mobile, boxed, mobile mount, for higher power 2m FM mobile. G7IJP (Langport) 0458 250124.

TONNA 9 ele 2M portable beam, excellent condition - exchange for 4 ele 2M Tonna beam. G3NQX. (Preston) 0772 703957.

TRIO TR2300: £100. Psion Organiser: £120. For Barograph, ships clock/baro, 2M mobile, computer WHY? Paul GM4ENK. (Shetland) 0950 60649.

CLUB NEWS

DEADLINE - Items for inclusion in the September 1992 issue must be sent to HQ marked "Club News - DIARY", to be received by 17 July 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 - 2, construction; 9, PC computer workshop; 16,30, construction. Details 0272 721744.

RSGB CITY OF BRISTOL GROUP - 27, talk 'Modern Amateur Radio Equipment' by G4YCE of Lowe Electronics. Details 0275 855123.

SOUTH BRISTOL ARC - 1, Home Brew 1st evening - Terry's Trophy; 15, talk 'Antiques Radios' by Ron and Muriel; 22, voice your opinion on club matter; 29 computer evening. Details 0275 832222 on a Wednesday evening.

WESTON-SUPER-MARE RC - 6, talk 'Annual DF Hunt' by Bob McVey, G3GMC; 20, talk 'Packet Workshop' by Graham Buck, G1VSX. Details 0934 415700.

BERKSHIRE

BRACKNELL ARC - 8, talk 'Radio Control' by Dave Lemin, G4TDL - Coopers Hill at 8.15pm. Details from G4AUC.

BURNHAM BEECHES RC - 6, preparations for McMichael 92 Rally; Aug 3, Fox Hunt. Details 0628 25720.

MAIDENHEAD & DARC - 2, talk 'Radio Navigation' by Dave, G3RZF; 21, questions and answers session; Aug 6, barbecue at Max's G7DXC QTH. Details 0628 25952.

READING & DARC - 9, WAB organisation with G0HZK; 23, New Repeater Hardware; Aug 13, talk 'Standing Wave Ratios' by Peter Chadwick, G3RZP. Details 0734 722489.

BUCKINGHAMSHIRE

AYLESBURY VALE RS - ***SECRETARY*** Martyn Jones, G4XZJ, 35 Richmond Road, Aylesbury, Bucks HP20 1PN. 1, talk 'The Novice Licence' by Hilary Claytonsmith; Aug 5, Summer Social at The Crooked Billet, Kingswood. Details 044 282 6651

MILTON KEYNES & DARS - 13, talk on Howes Kits by representative from Howes Communications (provisional). Details 0908 611005.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 3, Field Day preparations & Morse training; 10, talk 'Repeaters Update' by Gerald, G0HEM; 17, talk 'Bee Keeping' by George, G0OEL; 24, talks 'Telegraphy' and 'Radio Controlled Mechanisms'. Details 0763 243570.

CHESHIRE

CHESTER & DARS - ***NEW VENUE*** Cheshire County Council Sports And Social Club, Plas Newton Lane, Chester CH2 1PR. 7, radio ideas and discussion; 14, annual grand barbecue; 21, DF Hunt 2m & 70cm; 28, general discussion. Details 051-608 3229.

CLEVELAND

STOCKTON & DARG - ***SECRETARY*** Malcolm Hotson, G0NRP, 13 Repton Avenue, Stockton-on-Tees, Cleveland TS19 9BQ, daytime tel: 0642 249067.

CLWYD

CONWAY VALLEY ARC - 2, video evening 'The Secret War' and 'The Secret Listeners'. Details 0492 530725.

DELYN RC - 14, build a kit with GW7AAV. Details 0244 819618.

WREXHAM ARS - 7, junk sale; 21, field evening; Aug 4, quiz. Details: 0978 845858.

DERBYSHIRE

BUXTON RA - 14, talk and demonstration by G3ZOM of Jandek; 28, talk 'CW Procedures'. Details 0298 25506.

EVETS COMMUNICATIONS ARC - ***NEW ADDRESS*** Enfield House, 303 Burton Road, Derby DE23 6AG.

SOUTH NORMANTON & ALFRETON DARC - 6, quiz night; 13, talk and demonstration 'Scanners' by G4NAD, AOR UK; 20, junk sale; Aug 10, talk 'Computer Virus - Plague of the 90's' by Tim, G7GFW.

DEVON

APPLEDORE & DARC - ***NEW VENUE*** Appledore Football Clubroom. Details from Trevor Brookes, G0JRE, Tel: 0237 477777.

AXE VALE ARC - ***NEW VENUE*** 'The New Commercial', Trinity Square, Axminster. First Friday each month. 3, Foxhunt meeting at Leo's Car Park, Axminster; Aug 7, visit to Sidmouth ARC and Planetarium. Details 0297 33756.

TORBAY ARS - 24, talk 'VCRs Through the Ages' Details 0803 526762.

ESSEX

CHELMSFORD ARS - 7, talk 'Satellite Weather Picture Reception' by Richard Gedge; Aug 4, shack test equipment, EG Noise Bridge. Details 0245 260831.

FIFE

DUNFERMLINE RS - 2, barbecue evening, visitors & family welcome; 30, video 'BBC World Radio Monitoring Service'. Details 031 331 4340 (evenings).

GLOUCESTERSHIRE

GLOUCESTER ARS - 1, talk 'Policing the Royals' by Cmdr B Fairbairn; 8, construction; 15, homebrew clinic; 22, Packet self help group; 29, construction. Details 0452 528533 ext 2734.

GRAMPIAN

ABERDEEN ARS - 3, junk sale. Details 0224 780519.

GREATER LONDON

ACTON, BRENTFORD & CHISWICK ARC - 21, Critique on QRP Field Day. Details 071-938 2561.

BROMLEY & DARS - 21, 2m Direction Finding evening. Details 081-462 2689.

COULSDON ATS - 13, talk '10 FM' by Jim Hicks, G4XRU. Details 081 684 0610.

CRYSTAL PALACE & DARC - 18, talk 'UFO Phenomena' by Leslie Baker, G8JIC. 'Details 081-699 6940.

EDGWARE & DRS - 23, talk 'Happy Girls and Boys' (commercial radio in the 1930's) by G0PQB. Details 081-953 2164.

HARROW RS - ***CONTACT*** J Ballard, G0AOT, 48 Elmbridge Drive, Ruislip HA4 7UT, tel: 08956 32377 (H) 071-251 2700 (W) - 3, construction contest; 17, chairman's talk. Details from G0AOT.

HAVERING & DARC - 22, talk 'Out and About on VHF' by Dave Bartlett, G4VIX and John Lemay, G4ZTR. Details 0255 821554.

KINGSTON & DARS - 15, talk 'Radio in Modern Aircraft' by Chris Volney, G0IPD. Details 081-398 1128.

SILVERTHORN RC - 3, talk by Waters & Stanton. Details 081-529 4489 (eves/wkends).

SOUTHGATE ARC - 9, talk 'Contesting and DXpedition' by Roger Western, G3SXW; 23, SSB contest simulation by G3KTZ; Aug 13, talk 'WAB Hunting' by Keith Draycott, G8UKT. Details 081-360 2453.

SURREY RCC - 6, talk 'Fooling the Enemy' by Bryan, G6ODE; Aug 3, talk 'Himalayas' by Dave Wellman. Details 081 660 7517.

SUTTON & CHEAM RS - 16, talk 'DXCC' by Roger Brown, G3LQP. Details 081 644 9945.

WIMBLEDON & DARS - 31, camp briefing. Details 081-397 0427.

GREATER MANCHESTER

ECCLES & DARS - 7, talk 'Academia & Industry - a Right Wing View' by G8ZZF; Aug 4, talk 'Radio Scouting' by G7ELA. Details 061-773 7899.

SOUTH MANCHESTER RC - 3, contest preparations; 10, talk 'Industrial Robots' by G0AOV; 17, talk 'Sight of Sound' by G4HON; 24, Summer DF and barbecue; 31, talk 'Airband Communications' by G7FQY. Details 061-969 1954.

GWYNEDD

DRAGON ARC - 6, talk and demonstration 'Raynet' by Dafydd Roberts, GW6IWY; 20, surplus equipment sale. Details 0248 600963.

HAMPSHIRE

BASINGSTOKE ARC - 6, talk 'Electronic Warfare' by Peter Chadwick, G3RZP; 26, 2m Foxhunt - OS185 - Fox: Alan Stables G8FMH; Aug 3, HF Field Day planning and junk sale. Details 0256 25517.

HORNDEAN & DARC - 2, talk 'Fast Scan TV' by Mike Sanders; Aug 6, talk 'Packet Radio' by speaker from Siskin Electronics. Details 0705 472846.

ITCHEN VALLEY RC - 10, talk 'Radio Astronomy' by Peter Werba, G7FXO; 24, open meeting. Details 0703 736784.

THREE COUNTIES ARC - 1, talk 'Novice Licence - How to get one and what it allows you to do on Radio' by Frank, G7CND; 15, talk 'Emergency Communications in Surrey' by a speaker from Surrey County Council; 29, talk 'Interfacing Computers to Amateur Radio'; Aug 12, video night. Details 0420 83091.

WINCHESTER ARC - 17, talk 'Hospital Radio' by Tony Knight. Details 0962-89 550.

HEREFORD & WORCESTER

BROMSGROVE ARS - 14, 145MHz Direction Finding Contest (G4ZWR). Details 0527 54607.

HERTFORDSHIRE

CHESHUNT & DARC - 8, talk 'A Sysop's View' by Gerrard, G0ODA/VK2DAA; 15, Portable Evening, Baas Hill, Hoddesdon; 22, junk sale; Aug 5, talk 'Beginners Teach-In' by G3WFM. Details 0992 464795.

HODDESDON RC - 23, talk 'DF Hunting' by G3ZVW. Details 081-804 5643.

STEVENAGE & DARS - 7, A10 Rally final arrangements; 14, talk 'Contesting - It's Not the Winning . . . .' by Geoff, G0HOP; 21, Round Robin discussion - Packet Experiences; 28, talk 'Equipment/Radios' by John Armstrong of AKD. Details 0438 724509.

VERULAM ARC - 23, talk 'Computerised Logging' by John Linford, G3WGV. Details 0923 262180.

WELWYN/HATFIELD ARC - 6, Foxhunt. Details 081-440 6783.

HUMBERSIDE

GRIMSBY ARS - 2, DF hunt; 9, treasure hunt; 10, Ciba Junk Sale; 23, talk 'Computers in Amateur Radio' by Joe, G4CFO; 25, open day (provisional); Aug 6, evening visit to Grimsby Telegraph Offices. Details 0472 825899.

ISLE OF MAN

ISLE OF MAN ARS - meets Mondays at The Douglas Motor Boat & Sailing Club, South Quay, Douglas and Thursdays at The British Legion Club, Peel. Details from Mrs June Wrigley, GD7DPG, 20 Fairy Hill Close, Ballafesson, Port Erin, Isle of Man, tel: 0624 834257.

KENT

DARENTH VALLEY RS - 8, Annual General Meeting; Aug 12, construction. Details 0689 876733.

NORTH KENT RS - *NEW SECRETARY* Mr D Glover, G6RMA, 56 Selbourne Road, Gillingham, Kent ME7 1QP, tel: 0634 854550.

SEVENOAKS & DARS -20, talk 'Cellular Radio' by Ray Petri, G0OAT. Details from Council Offices, Argyle Road, Sevenoaks TN13 1HG.

WEST KENT ARS - 17, Fox Hunt. Details 0892 664960.

LANCASHIRE

FYLDE ARS - 9, talk 'Radio Controlled Models' by S Barlow, G4NVF; Aug 13, DF Foxhunt. Details from R J Bourn, G7CUL.

PRESTON ARS - 9, illustrated talk 'Legging - Locking - Gongoozling' by Mr Astin; 23, discussion evening; Aug 6, outing evening - HMS Inskip - radio station. Details 0772 686708.

LEICESTERSHIRE

LOUGHBOROUGH & DARC - 7, Barbecue, Canal on Air; 14, 160m DF Hunt, 8pm start; 21, talk 'Aerial Experiments' by G7LIL. Details0509 218259.

LINCOLNSHIRE

SPALDING ARS - 10, talk 'History of Amateur Radio' by G4OO; Aug 7, DF Hunt - Fisherman's Arms, Podehole. Details 0778 425367.

MERSEYSIDE

LIVERPOOL & DARS - 7, talk 'The RAE Course' by G0MSO; 14, open night; 21, talk by G3XSN; 28, surplus sale. Details from Gordon, G4VYR.

NORFOLK

ARC OF FAKENHAM - 7, talk 'Scouting Today with Radio' by Bob, G7JTZ; Aug 4, final arrangements for GB2FSW. Details 0485 528633.

NORFOLK ARC - 1, component testing evening; 8, mobile DF hunt; 22, NARC Rally final briefing; 29, visit to BR Crown Point Depot; Aug 2, outing to Woburn Rally; 5, Town & Country Show briefing. Details 0603 747992.

NORTHAMPTONSHIRE

KETTERING ARS - 4/5, VHF Field Day at Loddington Grange Farm, Loddington. Barbecue on the Saturday evening. Details 0536 514544.

NORTH YORKSHIRE

SCARBOROUGH ARS - 6, surplus equipment sale; 20, final update on the 1992 Rally. Details 0723 514767.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM - 2, forum; 9, talk 'Foreign Language QSOs' by Walter, G0OMO; 16, Foxhunt 3; 23, construction evening; 30, practical HF aerial construction with G6ABU and G4JAE; Aug 6, forum; 13, talk 'Balun Construction' by Stewart, G3WQW. Details 0602 232604.

MANSFIELD ARS - *NEW SECRETARY* Mrs Angela Fisher, G1DZH, 33 Saddlers Close, Forest Town, Mansfield, Notts NG19 0QG, tel: 0623 652812. - 2, talk 'Radar - The Early Days' by Dennis, G0KIU. Details from G0NZA, 0623 755288.

SOUTH NOTTS ARC - 3, final planning for VHF Field Day; 10, junk sale; 17, construction evening at Fairham College; 31, SSB Field Day planning; Aug 7, open forum. Details 0602 841940.

SHROPSHIRE

SALOP ARS - 2, NFD preparations; 16, 3rd Foxhunt - 7.30pm The Oak Hotel; 30, talk 'Computers' by G3UDA. Details 0939 232090.

SOMERSET

TAUNTON & DARS - 3, visit to TV Station TBA; 17, Barbecue at G3WNI, Secretary's QTH - 7.30 for 8pm. Details 0823 680 778.

SOUTH GLAMORGAN

CARDIFF RSGBG - 13, talk 'A History of Amateur Radio' by Ron Weaver, GW3KXX; Aug 10, 'Twenty Radio Questions' chaired by John Wallis, GW4JKQ. Details 0446 773212.

SUFFOLK

FELIXSTOWE & DARS - 27, 10-pin bowling - King Pin, Martlesham; Aug 10, social visit - Newbourne Fox, Newbourne. Details 0473 642595 (daytime).

IPSWICH RC - 8, barbecue and DF Hunt; 29, ESWR post-mortem at Martlesham Radio Society. Details 0473 742072.

LEISTON ARC - 7, 'on the air' open evening - a demonstration of amateur radio to the public. Venue TBA. Details from G3DBJ, 3 Aldeburgh Road, Leiston.

SURREY

ECHELFORD ARS - 23, talk 'Technical Computing for Radio Amateurs' by Gerald Stancey, G3MCK. Details 0344 843472.

WARWICKSHIRE

STRATFORD-UPON-AVON RS - 13, annual trip (provisional); 27, construction contest. Details 060 882 495.

WEST MIDLANDS

COVENTRY ARS - 3, talk and demonstration by Castle Communications (provisional). Details 0203 311468.

WOLVERHAMPTON ARS - 28, pre planning SES for Town & Country Fayre; Aug 11, talk on Birmingham International Airport. Details 0922 475057.

WEST YORKSHIRE.

HALIFAX & DARS - 21, visit TBA. Details Halifax 202306.

KEIGHLEY ARS - 16, quiz; 30, talk and demonstration 'Using Packet Mailboxes'. Details from Kathy, tel: 0274 496222.

NORTHERN HEIGHTS AR&ES - 1, treasure hunt; 15, talk 'Novices' by Gerald, G3SDY. Details 0274 673116.

WHITE ROSE ARS - ***SECRETARY*** Mrs Betty Cappelluto, G0PVB, 7 Rycroft Place, Leeds LS13 4PF, tel: 0532 555488.

WILTSHIRE

SALISBURY R&ES - 7, guest speaker TBA; 14, 2m DF Hunt; 25, 2m LP and SWL contest; 28, contest debrief. Details 0722 329481.

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'.

29 JUNE - 12 JULY

GARDEN FESTIVAL OF WALES - Amateur Radio display and special events station GB4NGF at Churches Pavilion. Organised by WACRAL. Details from Garth Martin, G3IER, tel: 0242 583664.

5 JULY

KINGS LYNN ARC Rally - Corn Exchange, Kings Lynn Tuesday Market Place. Details from G0MQL 0553 841189.

NEWPORT ARS Junk/Boot Sale - Brynglas House, Newport. Opens 10.30am (10am for disabled visitors). Light refreshments; raffle. Talk-in on S22 by GC1NRS. Entry by ticket 25p. Details from GW7BSC, QTHR, 0633 262488 (6pm-7pm wkdays only).

YORK Radio Rally - Tattersall Building, York Racecourse. Doors open 11am (10.30 for disabled visitors). All usual favourites, bring & buy, licensed bar and cafe, arts and crafts. Morse tests, amateur radio, electronic and computers. Talk-in on S22. Ample free parking. Entrance fee £1. Details from David Moreland, G7FGA, 0904 790079.

11 JULY

CORNISH RAC Rally - Penair School, St Clement, Truro. Opens 10.30am (10 for disabled visitors). Admission: £1, accompanied children under 16 free, otherwise 50p. Usual amateur radio/electronic/computer traders; bring & buy; ample free parking; refreshments; vintage wireless display; RNARS; RAFARS; repeater groups etc. 2m talk-in - GX4CRC on S22. Details from Barrie Thomas, G0NNR, tel: 0872 862046.

12 JULY

HORNCASTLE AR Electronics and Computer Fair - Queen Elizabeth's Grammar School, Horncastle. Car boot sale facility for small fee (electronics/radio only please). Talk-in on 2m. Free parking. Details from Tony Nightingale, G6CZV, 0507 522482.

SUSSEX AR & Computer Fair - Brighton Racecourse. Opens 10.30am. All usual facilities. Details from Ron Bray, G8VEH, QTHR, 0903 763978 or 0273 415654 office hours.

19 JULY

COLCHESTER RA Radio & Computer Rally - Highwoods Sport and Leisure Centre, Brinkley Lane, Colchester, sign-posted from A12-A120 jnct Crown interchange on north side of Colchester. Doors open 10am. Trade stands, bring & buy, RSGB Morse Test, licensed bar, snacks, drinks. Talk-in on S22. Ample free car parking on site. Admission £1. Details from G3FIJ, QTHR, 0206 851189.

9TH McMICHAEL Rally & Car Boot Sale - Haymill Youth & Community Centre, Burnham Lane, Slough (near Burnham Railway Station). Starts 10.30am. Admission £1.50. Car boots (no advance bookings) £6 per pitch on the day. Free parking on site. Talk-in on S22 (145.550MHz). Details from G8XYN, 0628 25952.

2ND WIRRAL Radio Rally - Masonic Hall, Manor Road, Liscard, Wallasey, Merseyside. Doors open 11am (10.30 for disabled visitors). Details Dave Clifford, G0NVF, 051-639 5922 and Darren Roberts 061-476 3076.

25/26 JULY

Norfolk ARC & Hewett School First Radio Electronics Rally - Hewett School, Norwich. Details Sheila, G0KWP 0603 618810.

26 JULY

ROMSEY RAIBC Annual Picnic - Broadlands, Romsey, Hants. Super junk sale and bring & buy; refreshments; grand draw. All RAIBC members, families and friends welcome. Talk-in on S22. Details from John Compton, G4COM, 0703 693017.

RUGBY ATS 4th Annual AR Car Boot Sale - BP Truckstop on A5, 3 miles east of Rugby, 2.5 miles NW from Jct 18 M1. Open from 10am. Admission £1 per car. Cafeteria and toilets. Talk-in on S22 by GB6CBS. Pitches £7 prebooked, £9 on the day. Details from Peter 0455 552449 or Kevin (for bookings) 0203 441590.

SCARBOROUGH ARS Radio Electronics & Computer Rally - The Spa, South Foreshore, Scarborough. Doors open 11am. Many traders, bring & buy, refreshments and bar. Details from Ian Hunter, G4UQP 0723 376847.

30 JULY-2 AUG

AMSAT-UK Colloquium - University of Surrey. Details from G3AAJ, tel: 081 989 6741.

2 AUGUST

RSGB NATIONAL MOBILE RALLY - Woburn Abbey. Details from N Miller, G3MVV, QTHR, 0277 225563.

9 AUGUST

DERBY & DARS Mobile Rally - Littleover Community School, Rykneld Road, Littleover, Derby. National Grid Ref SK319336. Usual attractions; monster junk sale; flea market; refreshments. More room this time. Contact for traders and general enquiries - Martin Shardlow, G3SZJ, QTHR tel: 0332 556875.

FLIGHT REFUELLING Hamfest 92 - Flight Refuelling Sports & Social Club Grounds, Merley, Wimborne, Dorset. Opens 10am. Trade stands; bring & buy; radio and elecronics car boot sale; craft fair; field displays. Parking for disabled visitors available in the grounds. Overnight camping on the Saturday night available. Details from John Fell, G0API, 0202 691649.

16 AUGUST

SOUTHEND & DARS Rally and Radio Car Boot Sale - Rocheway Centre, Rochford, Nr Southend-on-Sea, Essex. Starts 10am. Bring & Buy; bar; ample parking. Tables inside £10; car boot pitch £5. Details from G0DFE, 0702 202216.

23 AUGUST

WEST MANCHESTER RC "Red Rose" Rally - Bolton Sports & Exhibition Centre. Doors open 11am (10.30am for disabled visitors). Admission £1, children free. Usual trade stands; societies, bring & buy etc. All at pavement level, with facilities for disabled visitors. Refreshments and bar. Details from Dave, G1IOO, 0204 24104 (evenings).

30 AUGUST

GALASHIELS & DARS Open Day - Focus Centre, Livingstone Place, Galashiels. Doors open 11am - 4.30pm. Usual activities; bring & buy; traders; club stalls etc; refreshments. Details from John G Campbell, GM0AMB, 9 Brunton Park, Bowden, Melrose TD6 0SZ, 0835 22686.

TORBAY ARS Mobile Rally - STC Social Club, Brixham Rd, Paignton. Details from G3HTX, QTHR, 0803 526762.

31 AUGUST

HUNTINGDON ARS Annual Rally and Junk Sale - The Medway Centre, Coneygeare Road, Huntingdon. Doors open 10am, rally closes 4pm. Trade stands; bring & buy; components; junk; refreshment bar. Car Boot pitches available. Talk-in on S22 and GB3OV (433.125). Details from David Leach, G7DIU, 0480 431333.

6 SEPTEMBER

BRISTOL Radio Rally - Brunel's Great Train Shed, Bristol Old Station, Temple Mead. 5 minutes from M32. Opens 10.30am. Admission £1, concessionaries 50p, free for young persons under 14 accompanied by adult. Traders; club stands; computer supplies; bring & buy, ATV demonstration, Packet Radio demonstration. Refreshments. Talk-in on S22. Details from G4WUB, QTHR, 0275 839855.

MILTON KEYNES & DARS Car Boot Rally - Cranfield Airfield (South Side), Cranfield, Bedfordshire MK43 0AL. Off J13 or J14 of M1. Talk-in on S22 G8MKC. Details from Ray, G1LRU 0908 660798.

PRESTON ARS Mobile Rally - University of Lancaster. Opens 11am (10.30 for disabled visitors). Trade stands; Club/Repeater groups; bring & buy. Free prize draw. Free parking on campus. Details from G Earnshaw, 0772 718175.

VANGE ARS Rally - The Laindon Community Centre, Laindon High Road/Aston Road, Laindon, Basildon, Essex. (Short walk from Laindon Station (BR) on the Fenchurch/Shoeburyness line. Doors open from 10.30am to 4.30pm. Admission 75p. Traders, bring & buy, refreshments, free raffle. Talk-in on S22. Approach roads will be signposted. Details from G4NVT, 0268 543025 or Doris Thompson, 0268 552606.

12 SEPTEMBER

WIGHT WIRELESS Rally - National Wireless Museum, Arreton Manor, Newport, Isle of Wight. 11am to 5pm. Details from G3KPO, QTHR, 0983 67665.

13 SEPTEMBER

BARTG Rally - Sandown Park Exhibition Centre, Esher, Surrey. Well signposted; 10 min drive from jnct 10 of M25. Over 250 tables including top companies; special interest groups. Free parking. On-site catering; licensed bar. Details from Peter Nicol, G8VXY, tel: 021 453 2676.

LINCOLN SWC Hamfest - Lincolnshire Showground and Exhibition Centre, 4 miles north of Lincoln on A15 Lincoln/Scunthorpe Road. Open 10.30am. All usual trade stands; large bring & buy stand. Refreshments inside and outside; real ale bar. Lots of attractions for the whole family. Admission £1 by lucky programme. Free parking; caravans welcome by arrangements. Talk-in by West Lincs Raynet Group on 2m. Details from Sue Middleton, 0522 531788 or QTH G8VGF.

15 SEPTEMBER

RSGB SCOTTISH NATIONAL ARC Convention - Fife Institute of Physical and Recreational Education, Viewfield Industrial Estate, Glenrothes, Fife. Opens 11am (10.30am early entry) - 5pm. Details from John Hardwick, GM4ALA, 0506 410677 (day) 0592 742763 (eves/wkends).

20 SEPTEMBER

CENTRE OF ENGLAND Autumn Radio Computer & Electronics Rally - National Motorcycle Museum, Bickenhill, near NEC, Jnct 6 M42. Opens 10.30am (10am for disabled visitors). Admission £1 (reduction for RAIBC members). Over 60 traders; free parking; bar & restaurant facilities. Concessionary rates for those wishing to visit the museum. Talk-in on S22. Details F Martin, G4UMF, 0952 598173.

EAST OF ENGLAND Radio Rally (Peterborough R&ES) - ICI Building, East of England Showground, Peterborough. Opens 10.30am (10am for disabled visitors - toilet facilities available). Admission £1. Traders Main Hall with bar and catering. Traders Marquee with Bring & Buy, separate outside area with flea market plus radio and electronic car boot. Details Mike Bowthorpe, G0CVZ, tel: 0733 222588.

27 SEPTEMBER

34TH HARLOW AR Rally - Harlow Town Sports Centre, off Fifth Avenue, Harlow. Easy access off M11 jnct 7 A414. Signposted. Opens 10.30am. Admission £1; children/concessionaries 50p. Traders; Special Interest Groups in a room solely for their use. Free car park; on-site parking with full facilities for disabled visitors. Talk-in on 2m S22 and 70cm SU22 by G6UT. Catering and licensed longe bar facilities. Details 0279 432306 (day) 0279 722569 (eve).

NORTH WAKEFIELD RC Radio Rally - Outwood Grange School, Outwood, Wakefield. Details from John, G4RCG, 0924 362144.

4 OCTOBER

GREAT LUMLEY Radio Rally. Details from Barry, G1JDP, 091 388 5936.

WINCANTON Rally. Details from Norman, G4YXX, 8 Fair View, North Brewham, Bruton, Somerset BA10 0JT or tel: 074985 432.

9-11 OCTOBER

WACRAL CONFERENCE - High Leigh Conference Centre, Hoddesdon, Herts. Details from G4EZU, QTHR, 0474 533686.

11 OCTOBER

HORNSEA ARC Rally (ELHOEK). Details from G4IGY, 0964 533331.

SOUTH DEVON RC Computercations 92 Computer & Radio Rally. Details from W T Trezise, G6ZRM, 0803 522216.

23/24 OCTOBER

LEICESTER ARS Show - Details from F Elliott, G4PDZ, 0533 871086.

31 OCT/1 NOV

6TH NORTH WALES Radio & Electronics Show. Details from GW7EXH, 0745 591704.

8 NOVEMBER

BARNSLEY & DARC 2nd AR Rally. Details from Ernie, G4LUE, 0226 716339 (6pm-7pm please).

MARS/STOCKLAND Mobile Radio Rally. Details from Norman, G8BHE, 021 422 9787.

15 NOVEMBER

BRIDGEND & DARC Rally. Details from GW3RVG, 0656 860434.

22 NOVEMBER

BISHOP AUCKLAND RAC Radio & Computer Rally - The Spennymoor Leisure Centre, Spennymoor, Co Durham. Details from Mike, G0PRQ, 0388 766264.

WEST MANCHESTER RC Winter Rally - Bolton Sports & Exhibition Centre, Silverwell St, Bolton. Details from Dave, G1IOO 0204 24104.

28 NOVEMBER

GREATER LONDON AR & Computer Show - Harrow Leisure Centre, Christchurch Ave, Harrow. This Rally has been cancelled.

7 FEBRUARY 1993

SOUTH ESSEX ARS Radio Rally - Paddocks Long Road, Canvey Island. Details from Ken Hendry, G0BBN, 0268 755350.

14 FEBRUARY 1993

CAMBRIDGE & DARC Computer Rally. Details from G6UGI, 0763 243570.

29 MARCH 1993

PONTEFRACT & DARS 13th Annual Components Fair & Spring Rally. Details from Colin Wilkinson, 0977 677066.

9 MAY 1993

MARS/DRAYTON Mobile Rally. Details from Peter, G6DRN, 021-443 1189. Traders bookings Norman G8BHE, 021-422 9787 (eves).

15/16 MAY 1993

RSGB National Convention - NEC Birmingham. Details from Norman Miller, G3MVV, 0277 225563.

22 AUGUST 1993

WEST MANCHESTER RC Summer Rally. Details from G1IOO, 0204 24104 (evenings).

GB CALLS

The list below shows all special event stations licensed for operation during this month and up to 8 August. It was taken from the HQ computer on 6 June. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

1 JULY

GB0BBG	Burnham Beeches Guides
GB0CDN	Coastal Defence Needles
GB0SMS	St Mark's School
GB2DTS	Dagenham Town Show
GB2OCC	2nd Odiham Cub Camp
GB2PSC	Pelsall Summer Carnival
GB2SMR	Sussex Mobile Rally
GB4LPS	Langley Primary School
GB4RPS	Ryles Park School
GB4SAG	Scouts and Guides
GB4SOU	Southampton
GB50RAR	RAF Regiment

2 JULY

GB2RCC	Radio Caravan Club

3 JULY

GB2RAF	Royal Air Force
GB4SRC	Swindon Radio Club
GB4WCF	Wolverley Church Fete
GB6SIX	UK Six Metre Group

4 JULY

GB0USA	USA Independence
GB1BSG	British Steel Gala
GB2BST	British Steel Teeside
GB2SRH	Sue Ryder Fete
GB4CMB	Canaud Metal Box
GB4WAS	Winterton Agricultural Show

5 JULY

GB2CHG	Cupar Highland Games
GB4ATC	Air Training Corps
GB8RT	Royal Tournament

6 JULY

GB4RC	Red Cross

8 JULY

GB0CSS	Croydon Scouts Spectacular

9 JULY

GB0PSF	Portway School Fete

10 JULY

GB0MKS	Milton Keynes Scouts
GB1CDC	Cromwell District Cubs
GB2ATC	Air Training Corps
GB2USA	Great Britain to USA
GB5FDC	Forest of Dean Cubs
GB6SIX	UK Six Metre Group

11 JULY

GB0GH	Grace Home
GB0HCS	Harry Cheshire School
GB0LS	Langley School
GB2CSS	Croydon Scouting Spectacular
GB2GSB	Guernsey Scout Bonspiel
GB2STT	Spirit Two Thousand
GB4DX	"DX"

12 JULY

GB2SPF	Suffolk Police Force
GB8OEB	Operation Euro-Baby
GB2JWS	John Warner School

13 JULY

GB2AG	Richard Taylor Operated C/S
GB2HFD	Hatfield Festival Day
GB2MR	Minquiers Reef 1992 Operation
GB2PMS	Preston Manor School

15 JULY

GB4CDA	Camp Discovery Auchengillen

16 JULY

GB2RCC	Radio Caravan Club

GB CALLS

17 JULY
GB0FTS Fleetwood Tram Sunday
GB1LFS Lee Flower Show
GB2SMC Scottish Museum of Comm.
GB4DVF Dartington Village Fete
GB4PCP Pembrey Country Park

18 JULY
GB2ISR International Steam Rally
GB2JPJ John Paul Jones
GB2RVT Ribble Valley Telethon
GB4MF Maritime Fair
GB4SMM Swansea Maritime Museum

19 JULY
GB2NBF North Baddesley Fete
GB2WMS West Moors School
GB400CU 400TH Anniversary Royal Burgh
GB1EPG Essex Packet Group
GB2HI Hilbre Island

20 JULY
GB4LCC Lincolnshire County Council
GB2OOY 200 Years Wyrley & Essington

21 JULY
GB2PC Project Countryside
GB500RGC Grand Regatta Columbus

23 JULY
GB50SCC Sea Cadet Corps

24 JULY
GB4LCC Lincolnshire County Council
GB100BMC Bowes Museum Centenary
GB1BMC Bowes Museum Centenary
GB2CDU Coastal Defence "U"
GB2CPC Castell Penrhyn Castle

25 JULY
GB6CBS Car Boot Sale

26 JULY
GB4NED Norwich East District
GB6SIX UK Six Metre Group

27 JULY
GB0YMR Yorkshire Moors Railway
GB4RIS Radio Interest Scouts

29 JULY
GB2PNT Poacher Ninety Two

30 JULY
GB2SAT Satelite
GB4CDI Camp Downe International

31 JULY
GB8PP Polfok Park

SILENT KEYS

WE HAVE BEEN advised of the deaths of the following radio amateurs:

G0AMA	Mr MK Toseland	Sep 91
G0HPY	Mr E Carr	05.2.92
G0KPX	Mr LH Doubleday	May 92
G1AEO	Mr HG Lester	
G1BUG	Mr NJ Attwood	06.4.92
G3ABB	Mr CL Fenton	29.01.92
G3AVH	Mr GJ Lewis	
G3GRJ	Mr RS Johnson	28.4.82
G3HBU	Mr FA Hall	24.4.92
G3ISV	Mr FH Lindsay	Jul 91
G3SAX	Mr JR Robinson	14.5.92
G3TBS	Mr R Wilson	Dec 91
G4KLP	Mr WG Mott	Jul 91
G4NPP	Mr EE James	28.3.92
G4SIY	Mr C Smith	
G5IK	Mr EW Hunt	Feb 92
G5WL	Mr F Rhodes	
G7JBH	Mr DC Smith	Mar 92
G8IMO	Mr W Darlington	02.2.92
G8MTH	Mr M Day	
GM0MYF	Mr JG Frew	28.4.92
GM3GPK	Mr S Crate	27.4.92
GM3LIB	Mr JTA Armstrong	
GM4AQM	Mr J Kelly	15.2.92
GM4DJS	Mr DJ Smillie	
GW0GHC	Mr K Rawnsley, CBE	1.4.92
GW3ASW	Capt CR Mountjoy	
GW3LII	Mr D Clayton	29.4.92
GW4BMN	Dr BJ Shaw	
RS33326	Mr BM Hopkinson	12.4.92
VE6YK	Mr W Potts	21.4.92

CORRECTIONS

We would apologise for any distress caused by the following errors in June RadCom.

G8TN Mr L Sanderson
G0PBD Mr E Melling

NEWS & REPORTS

Raynet

continued from page 8

it is necessary only for Groups who wish to be independent to send membership cards to Clive Trotman. All the current insurance policies will continue unchanged.

The Emergency Communications Officer (ECO) will be an RSGB Honorary Officer appointed by the Chairman of the RSGB Membership Liaison Committee. The job is to be clerical, not operational and until the ECO is appointed, Clive Trotman will carry out this work.

There is no intention on the Society's part to set up a rival emergency communications organisation so it will not be issuing any form of ID card. Raynet will always be Raynet; it is merely changing from one management structure to another.

The National Raynet Committee has expressed its gratitude to RSGB Council for their clear statement of the position. In particular, they are grateful for the insurance arrangements which will considerably ease the immediate financial burden. The Committee recognises that some Groups may wish to leave Raynet and become independent and wishes them well.

The NRC has also made it clear that Raynet will work operationally with these Groups as if they were still part of the organisation. Commonly accepted Group boundaries will still be recognised and there will be no attempt to divide Groups. The NRC expects this approach to be reciprocated.

RSGB HF and IOTA Convention

will be held this year at Old Windsor, 26 and 27 September 1992. Details: G3PJT (0223 263137); Accomodation: G3KMA (0276 858224).

practical Wireless

M·O·R·S·E – W·E·E·K·E·N·D

Worried about the Morse test? Are you all 'keyed up' about Morse? Does the prospect of getting an 'A' licence 'bug' you? Do you want to put that final 'polish' on your Morse? And do you then want to have the opportunity to take your test, while you're enjoying a 'short break' weekend holiday?

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The Last Word

A WORTHWHILE CAUSE

We are pleased to enclose a cheque for £25 towards the G2DQU/MENCAP Albania Appeal Fund. Our response is as a result of reading the most interesting and moving article in the April issue of *RadCom*. We sincerely hope the desired target is reached and hopefully exceeded for such a worthwhile cause.

Alan and Nina Balmforth G3RKQ + XYL

TOP BAND QRO SSB

When the new power limit in the 160m DX window was introduced, many were worried about what would happen to the 'Best Band'. In the event, there have been very few problems. Most of the 'big gun' signals are as loud as ever, and as clean. The Band Plan is generally adhered to, except that many new UK ops seem to have misunderstood the guidelines.

The IARU Region 1 CW allocation runs up to 1840kHz, so when a QRO SSB operator transmits on 1840.00kHz the sidebands of even a clean signal splatter into the top third of the CW allocation allowed to many Europeans. With DLs ragchewing on 1835 LSB, the effect is to make all but a couple of kilohertz of the CW DX window unusable.

LSB should not be used below 1843kHz, except in SSB contests. After all, the other 150kHz above 1850 is there for us all to use. We are lucky not to be in the position of the DLs with their 1832-1835 SSB band. Please think before switching the linear on as 10W will cover most of Europe, and it is easy enough to work across the pond, or into Asia or North Africa with QRP. Full smoke is only needed for difficult DX or contesting.

We are getting a seriously bad name with our neighbours because of this misuse, so if you want an inter-G ragchew, please don't use the DX window. I realise of course that no *RadCom* reader is guilty, but please educate any of your friends who are transgressors!

Neil Smith G4DBN

REPEATER CTCSS PROPOSAL

May I suggest that we have an explanatory article in *RadCom* on the proposal of the Repeater Management Group to introduce CTCSS on a national basis on VHF and UHF repeaters. I am sure that many repeater users do not know what it is all about. I am a founder member of the original GB3PI repeater group and have only recently heard about this from the excellent news letter of the Cambridgeshire Repeater Group.

First I must say that I am in favour of CTCSS, and I am sure that had it been generally and cheaply available when we put in the first repeater, GB3PI, we may well have used it instead of the 1750Hz tone burst. What does concern me is that it may not be introduced in a manner which is satisfactory to all. I know one repeater which uses CTCSS for threshhold squelch and has raised the level of the tone burst squelch such that most low powered hand portable can no longer access.

I believe that when installed at the repeater, CTCSS should be used so that full receiver sensitivity can be utilised where possible, and the tone burst squelch level should be left at the current sensitivity.

I note that the RMG have said that "Nearly all modern rigs, ie those less than seven years old have provision for installing CTCSS". I would challenge that statement, having within the last two years bought two rigs neither of which have the facility, nor have the provision for retrofit. It may be fairly simple to fit a CTCSS single tone generator to the average mobile rig, but this is of no use if one travels away from the local area. In my family we have between us six rigs, none of which has provision for CTCSS and it is impractical to add a nine position switch for multiple tone facility.

I am led to understand that it is up to individual repeater organisations to decide whether or not to fit CTCSS. If they decide to do this to sort out interference problems, I think they should be instructed to maintain the tone burst facility at existing sensitivity levels for a minimum of ten years so that we can save up (if I last that long!) and buy a suitable rig for the future. I may be wrong, but there seems to have been no consultation by the RMG with the membership in general, nor with the manufacturers.

Finally, if few people understand what this letter is all about, it merely proves the necessity for an article as mentioned in the first sentence of this letter.

Brian Armstrong G3EDD

[An article is already in hand and will be published just as soon as space permits - Ed]

RADIO-LESS RALLIES

Rallies are not the great bargain-hunting venues that they once were; at least that is my perception on returning to this country after an absence of a few years.

There seems to be a marked lack of 'amateur radio' gear for sale compared to a few years ago. I remember the excitement and the hustle and bustle at the bring and buy stall. People would scramble to get the multitude of bargain radios on display, but nowadays there is hardly anything that can be recognised as a 'radio'. The more rallies I go to the more I think I am at a general car-boot sale. Much as I enjoy getting a bargain, I can attend car-boot sales any weekend - amateur radio rallies are not always so easy to come by.

I notice that there are fewer dealers attending the provincial rallies than was the case a few years ago. Have so many gone out of business? Where does the newly licensed amateur get his (second-hand) gear?

Brian Burke G4HIY/KM4MV

[Do other readers think rallies are not what they used to be? Do organisers have a hard time attracting radio dealers. Do the dealers find rallies a chore? Let's have your views - Ed]

FROM AN OLDER NOVICE

I have followed with interest the views expressed by *RadCom* readers concerning the Novice licence from the day it was first announced. May I now comment from a novice point of view?

Since receiving my Novice licence at the end of January 1992, I feel that the experience of operating under Novice Licence conditions has been invaluable in preparing for the full RAE, which I have recently taken. The result is that I feel completely confident to operate under full RAE conditions when it transpires.

I feel that those concerned with launching the Novice Licence got it right from the very beginning, and that the sceptics, of whom I was one myself, prejudged wrongly. It has pleased me to hear the praise and encouragement offered on the air by fellow amateurs, at home and abroad, to both young and older novices.

I believe that the sheer frustration of working the 20kHz allowed on 80m which can be crowded and/or noisy, not only provides excellent training for CW transmissions but also inspires motivation to spread the wings to the full licence.

Besides introducing young amateurs, the Novice licence has enabled older members such as myself to take up a hobby which has, for various reasons (lack of time etc) eluded us for many years. Good luck to all Novices who have either taken or are to take the NRAE, you will be well received from my experience without any doubt.

I would like to express my gratitude to those involved in the setting up of the Novice licence and to the members of the Forest of Dean ARS for their interest and time involved in the course, which included Morse lessons.

Chris James 2E0ABH

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.

NOVICE AND QRP

The Nelson and District ARS is presently running a Novice Licence course. We have had a good response so far, with many others considering joining the next course.

I must say that the Novice Licence is, in my opinion as a 100% QRP operator, the best thing to happen to amateur radio in years; in particular, the emphasis on low power operation will help I think, to impress on new licensees the effectiveness of QRP, and that one doesn't need huge linear amplifiers to work long distances. Previously, the general belief among new operators was that only high power would suffice, which of course is not the case.

Leighton Smart GW0LBI, Secretary NDARS

EFFORT BRINGS ITS REWARDS

I took the RAE in 1985. With a little work it was a breeze. I then looked at the solid wall which was the Morse code and sighed hopelessly "if only". But I knew that VHF-and-up was not the way I wanted to go, so I gave up hope of ever getting a licence.

I took until 1989 for me to be persuaded by George Dobbs, G3RJV, that the Morse was attainable. It was two years of effort, with Morse classes, an electronic tutor and a computer program, as well as listening 'on air'. But in the end I got there. And having arrived at an 'A' licence through Morse I decided I was not going to let go what had cost me so dear. I went on 40m homebrew, QRP and CW only, with an RA17L and *PW* Irwell. It was fun and very exciting. And it still is, now I've added a commercial QRP transceiver and other homebrew gear.

My Morse certainly isn't fast but it is almost the only mode I use now. If I'd been allowed onto the bands without CW, by now I would be QRT through SSB boredom and Packet bankruptcy!

I'm sure that a 'code-free' licence would only give a short term gain in numbers and band usage, and would bring with it chaos, ill-discipline and ultimately the loss of the bands, for what costs you no effort is worth no care. By all means include new tests relating to other modes, perhaps even make licences mode-specific, but don't work for the end of the Morse Test. CW is great!

Les Austin GONMD

DIFFERENT ATTRIBUTES

The 'debate' about Morse rumbles on with the same tired old prejudices being trotted out from all sides. It seems that many of the arguments are really about much wider attitudes within the Society, and I fear that matters can only get worse.

Currently, there is an international requirement that shortwave operators must have proficiency in Morse. I believe that this dates from the time when CW was the predominant mode of maritime communication and operators had to be able to understand messages from ship or shore. These days, satellite communication is becoming common on ships and I guess the real reason behind the Morse test may soon no longer apply. Please, let us strive for some reasoned argument. If we are going to discuss the role of Morse, let us do so separately from the wider issues.

Morse is a valuable form of communication. It is neither better nor worse than speech, RTTY/data or video; it simply has a different set of attributes. Why can't we all accept it for what it is; an interesting and enjoyable alternative. I am pleased that a long overdue change in the rules allows me to use Morse on those bands available to me. I don't yet have the skills to try it out, but I much prefer hearing CW to the 'racket on packet'.

Steve Thompson GW8GSQ

MORSE FOR PLEASURE

Pat Hawker's reference to 'soul-less' Morse (*Technical Topics*, June) draws attention to a facet ignored by the anti-CW brigade, the sheer aesthetic pleasure of listening to 'good' Morse. I find that quite a proportion of my air time is spent just listening on the CW bands, quite as much for pleasure of hearing good Morse as for the content. I always make a point of thanking contacts on QSL cards if their Morse has been particularly pleasing and note it also in the log. I find I can almost take this for granted in G contacts, so someone is doing a good teaching job and/or most CW operators have a musical ear.

John Allison G0LYY

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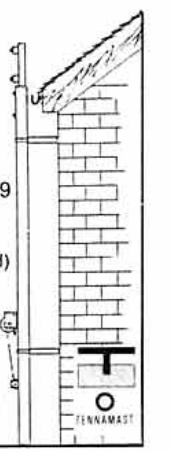

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SILVER MICA CAPACITORS. 200v.w. 100pf, 350v.w. 30pf, 36pf, 180pf, 200pf. All at 10 for £1.00.
SCREW TERMINAL ELECTROLYTICS. 10,000uf 25v.w. @ 50p, 15,000uf 40v.w. @ 75p.
25 AMP BRIDGE RECTIFIERS @ £1.30, 400 PIV 1 Amp BRIDGES @ 30p.
FETS. 2N3819 @ 25p, J304 @ 20p, J230 @ 20p, 2N3823 @ 30p, 2N3824 @ 30p, BFW11 @ 30p, BFW12 @ 30p. DUAL GATE MOS FETS 3N201 @ 80p, 3SK88 @ 60p.
AIR SPACED VARIABLE CAPACITORS. 10+10+20pf @ £1.50, 15+15pf @ £2.95, 100+200pf @ £2.50, 200+350pf @ £2.50, 400+350+30+30pf @ £2.50, 500+500pf @ £3.50, 310+310+310pf @ £3.50.
SURPLUS R.F. TRANSISTORS. 10 Watt 175 MHz 12 Volt @ £3.95, 25 Watt 175 MHz 12 Volt @ £6.50.
VERNITRON CRYSTAL FILTERS. 100 KHz Upper and Lower Side-Band Mounted on Panel with some components @ £14.95 a pair. (Few only)
PHILLIPS HIGH POWER 1.6 GHz TRANSISTOR with Data Type PZB1604OU with data @ £16.95. BLW90 UHF POWER with Data @ £4.95, 2N5590 @ £5.95.
HYBRID VHF-UHF WIDE BAND POWER AMPLIFIER. OM322 with data @ £9.95.
ACCESS and BARCLAY CARDS. Accepted P&P 60p under £5. Over Free. Unless otherwise stated.
C.M. HOWES KITS. Available by post and for callers.

ADVERTISERS INDEX

NEXT COPY DATE

The display advertisement copy date for our September 1992 issue will be **20th July 1992.** New advertisers should contact **Victor Brand, G3JNB** on **0953 788473** for assistance and information

BETTER BASE STATIONS

IC-575H
28/50MHz all mode transceiver

- 100W output power.
- Wide receive coverage 26~56 MHz.
- Built in preamp.
- 99 memory channels.
- Compact size for convenient portable operations.
- 241(w)x95(H)x239(D) mm.

Photograph shows U.S.A. version

IC-275E/H
144MHz all mode transceiver
IC-475E/H
430MHz all mode transceiver

- Sophisticated DDS system.
- Versatile scan functions.
- Data switch for packet radio operation.
- CI-V system for computer control.
- 241(w)x95(H)x239(D) mm.

IC-1275E
1200MHz all mode transceiver

- Superior sensitivity and stable 10W output power.
- Suitable for satellite communications, EME, packet radio, ATV and propagation tests.
- 99 memory channels.
- Optional weatherproof preamp.
- 241(w)x95(H)x239(D) mm.

IC-970E/H
Multi band all mode transceiver

- All mode operation on 144, 430, 1200 and 2400MHz bands.
- Optional 50~905MHz receiver unit.
- Satellite operation mode.
- Sophisticated DDS system.
- Dual band watch.
- 425(w)x149(H)x406(D) mm.

For further information about ICOM products and your nearest authorised dealer please contact:
Icom (UK) Ltd. Dept RC Sea Street Herne Bay Kent CT6 8LD
Telephone: 0227 741741 (24hr). Facsimile: 0227 741742

ICOM

Yaesu's Pair of Aces

YAESU

UK Sole Distributor
South Midlands Communications Ltd, S.M. House,
School Close, Chandlers Ford Industrial Estate,
Eastleigh, Hants S05 3BY.
Tel: (0703) 255111.

The FT-26/76 hand-helds make your life simple with all the features you will ever need. They're easy to use and designed to fit comfortably in your hand, and weighing in at just one pound each, the FT-26/76 lets you travel light.
For complete details on these handhelds call your nearest Yaesu dealer now!

FT-26/FT-76

Hand-helds that make your life simple

- ✔ **FT-26: 144-146MHz, FT-76: 430-440MHz.**
- ✔ **Supplied as standard with FNB25 and NC28C.**
- ✔ **53 Memory Channels.**
- ✔ **5 Watt Output, 12V DC NiCad Batteries Available.**
- ✔ **Four User-Programmable Power Levels (with FNB-27).**
- ✔ **Built-In Vox.**
- ✔ **Built-In DTMF calling For Selective Or Group Calling.**
- ✔ **Backlit Display and Front Buttons.**
- ✔ **Direct 12-Volt Operation With E-DC-5 Adaptor.**
- ✔ **Key, PTT and Dial Locking.**
- ✔ **Automatic Repeater Shift (ARS) Built-In For 2 Meters.**
- ✔ **Automatic Power Off.**
- ✔ **Selectable Channel Steps.**
- ✔ **Automatic Battery Saver.**
- ✔ **User Selectable Channel-Only Display, Simple Operation For New Hams.**
- ✔ **Accessories Options:**

A selection of batteries and leather cases. Desktop quick charger (NC-42 1 hour). CTCSS encode/decode unit (FTS-17A). DC adaptor with noise filter (E-DC-5). Mobile mounting bracket (MMB-49).

Performance without compromise