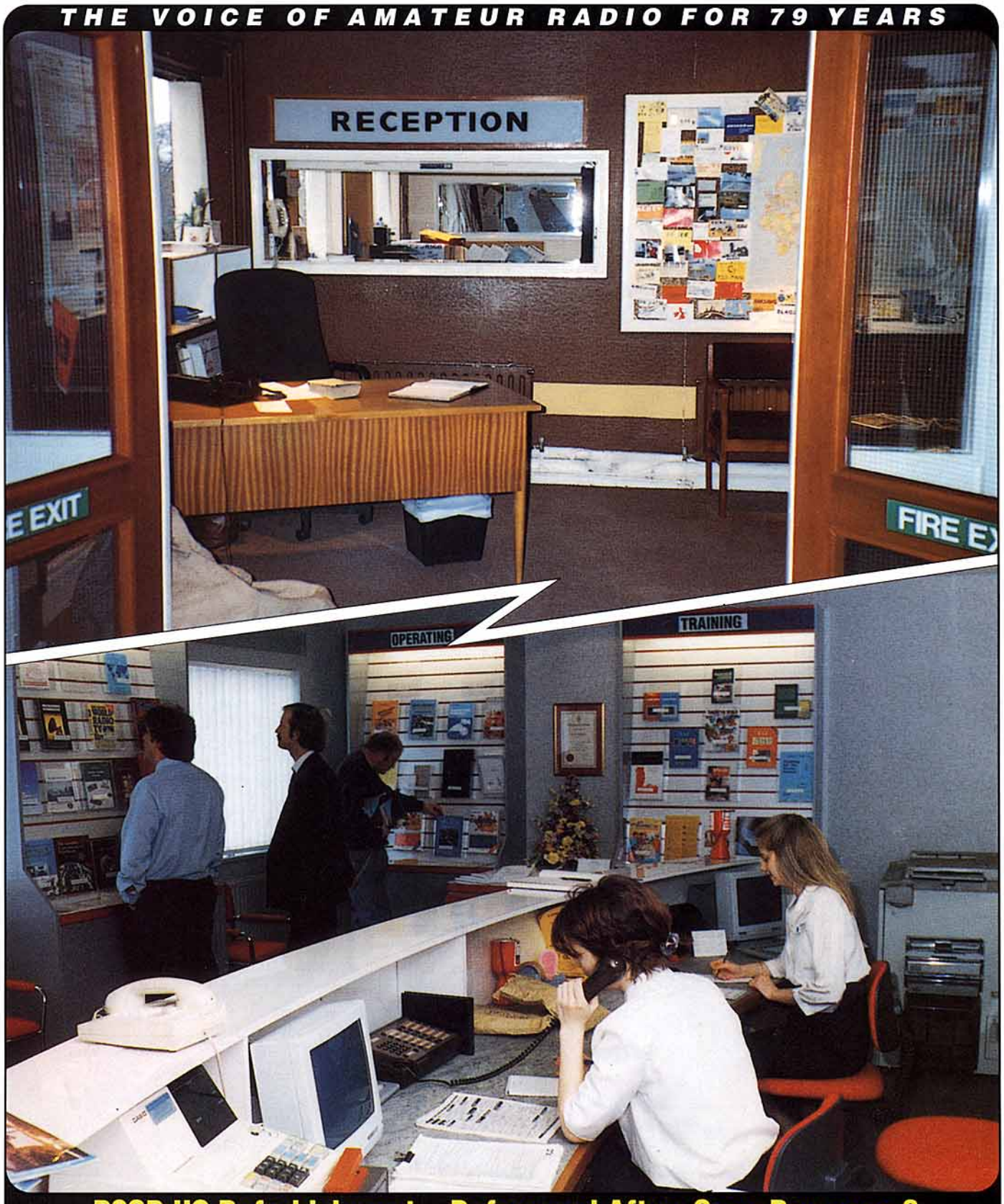
Radio Communication

The Journal of the Radio Society of Great Britain

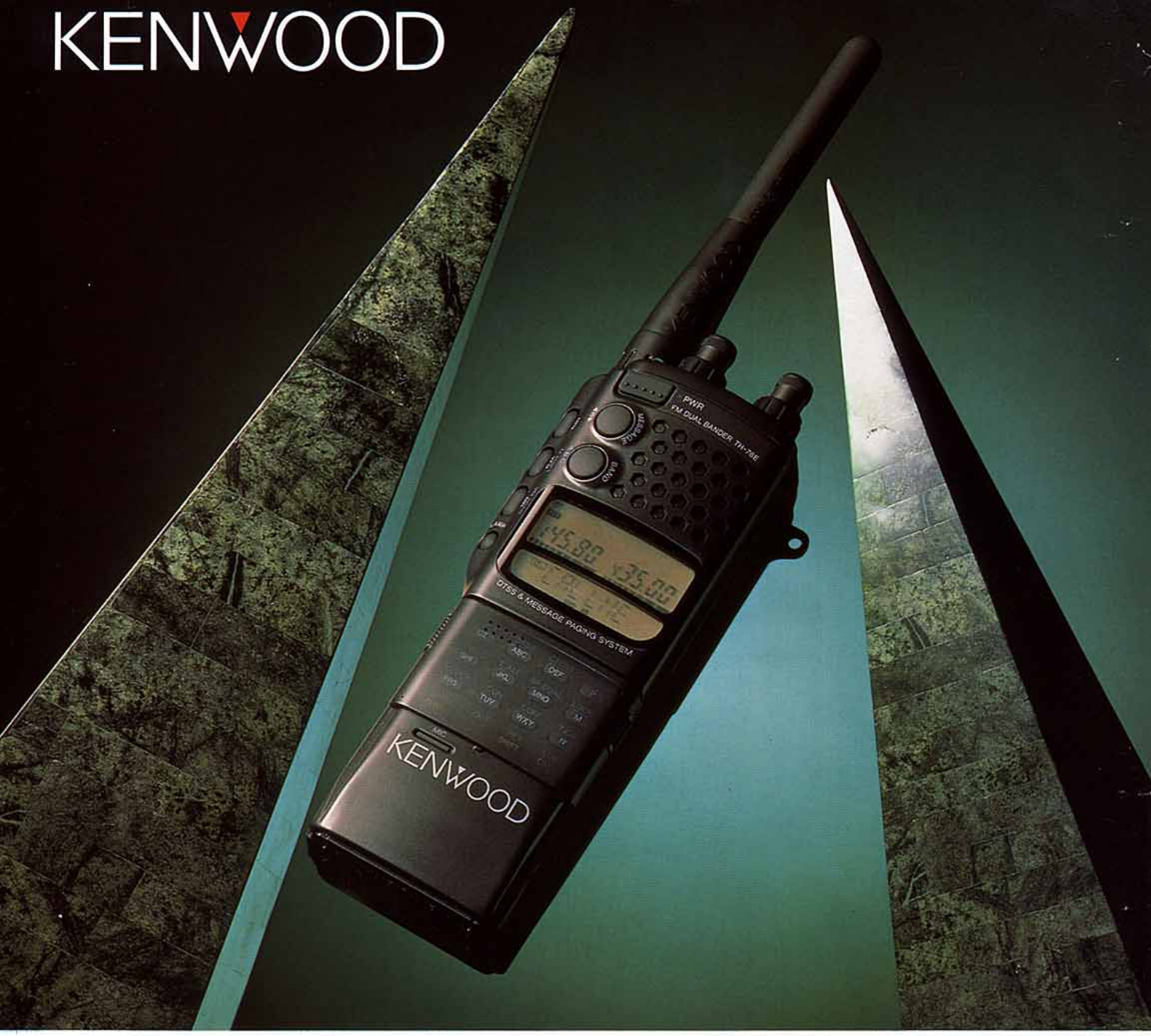
June 1992

Volume 68 No 6

THE VOICE OF AMATEUR RADIO FOR 79 YEARS



RSGB HQ Refurbishment – Before and After: Open Day page 6



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Tel: 0629 580800 Fax: 0629 580020

Managing Editor
Mike Dennison, G3XDV

Assistant Editor
Marcia Brimson

Production Editor
Sid Clark

Technical Editor
Paul Lovell, G3YMP

Draughtsman
Derek Cole

Editorial Secretary
Erica Fry

Typist
Belinda Gannon

All contributions and correspondence concerning the content of *Radio Communication* should be posted to:

The Editor
Radio Communication
Lambda House, Cranborne Road
Potters Bar, Herts EN6 3JE

Tel: (Editorial *only*): 0707 59260
Fax: (Editorial *only*): 0707 49503
E-mail (Telecom Gold) 87:CQQ083

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

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RSGB membership at 30 June 1991: 34,581

Radio Communication

All you wanted to know about HF DX . . .

In the best tradition of amateur radio, the UK's top HF DXers have passed on the secrets of their success in our major four-part series starting this month on page 42, plus:

You Too Can Work HF DX ● IOTA Award Honour Roll ● Multi-Ratio HF Baluns ● Remote Reading HF Ammeter ● The RSGB Stands

NEWS AND REPORTS

TECHNICAL FEATURES

COVER PICTURE:
Over the last six months, the RSGB HQ building at Potters Bar has undergone a face-lift. In particular the members' reception area and book shop has been completely rebuilt. This month's cover shows the remarkable difference. See pages 6 and 7 for more colour pictures.

PHOTOGRAPHS: Justine Coles (before); Gordon Allis (after).

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.

Headquarters and registered office:
Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE
Telephone: 0707 49855 - Members Hotline and book orders
Fax: 0707 45105. Telex 9312 130923 (RSGB)
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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

The Radcom Leader

HQ NEWS

OUR OPEN DAY on 11 April was most successful with over 250 members and their families visiting Headquarters. The main improvements have been made to the ground floor, and visitors had an opportunity to circulate freely and inspect the Radio Shack, Museum, QSL Bureau and Library.

Council Member Hilary Claytonsmith, G4JKS, held conducted tours to see the departments and facilities upstairs. My staff and I were able to meet members in a relaxed environment, and members had the chance of chatting to the President and Members of Council who were here for the day. If you couldn't visit, this month's photo-spread on pages 6 and 7 shows you how things looked.

As you will have seen in last month's *RadCom* our National Convention and Amateur Radio Exhibition, RSGB'92, is being held at the end of May. Despite the recession, stand space has sold well this year, and traders and various organisations will be there in force. It is vital that their undoubted confidence is matched by a similar level of interest from members and the general public. The entrance fee has been held down to last year's figure and I hope this will help us to top last year's attendance figures. Make sure that you and your friends go to the NEC this year. There will be plenty to interest visitors and by popular request the lecture programme is on both Saturday and Sunday this year. There will even be a flight simulator to keep youngsters amused.

The Society's financial year draws to a close on 30 June and judging by results so far it promises to have been a very good year. We are ahead of budget on our income, and expenditure has been held below budgeted levels. However, the final result will depend on the success of RSGB'92, and this will not be known until early in June.

At the Show there will be a 'chat' area as part of the RSGB stand to give members an opportunity to talk to Council, Committee members, Staff and RLOs. I look forward to seeing you there.

Philip Smith
General Manager

NEWS & REPORTS

● THE EXETER ARS celebrates its 72nd birthday by operating the special event station GB2EWS on 20-21 June on 40, 20 and 10m plus packet radio.

Originally the Exeter and District Wireless Society, the club has had many famous members, including Sir Ambrose Fleming the inventor of the valve diode.

Former members are invited to join in the celebrations at the home of Dr John Theobalds, G3EQM, at 39 Barnfield Rd, Exeter.

● THERE IS still time to nominate someone for the presitigious Young Amateur of the Year Award this year. See page 4 of May's *RadCom* for full details.

An application form was enclosed with the magazine but if you have lost yours, a replacement form can be obtained by contacting the *RadCom* office.

● THE AIR Training Corps is again providing an amateur radio and ATC communications stand at the Royal Tournament which takes place 8-25 July.

All radio amateurs or SWLs are invited to join the rota of operators or log keepers by applying to Ray Degg, G0JOD, QTHR (tel: 0522 750316).

● SWINDON and Dist ARC will operate GB4SRC for the 48 hours 29-31 May to raise money for ITV's Telethon. GB4SRC will also be active 5-7 June from the Lydiard Park Nostalgia Weekend amongst steam engines, classic vehicles and artifacts of bye-gone days. Details G0DMZ, QTHR.

● FROM THE Licensing Section, Radiocommunications Agency, Waterloo Bridge House, Waterloo Road, London SE1 8UA, you can obtain Form RA 169 which answers some basic questions about using Scanners, and Form RA 178 about the use of transverters and transverter drivers.

● STOLEN: From a midlands car park over Easter, a container load of Microset equipment from Waters and Stanton Electronics. Any info to 22 Main Road, Hockley, Essex (tel: 0702 206835).

● NEW RSGB QSL Sub-Manager for the G0MAA - MZZ series is: H C Foster, G4EZS, 23 Ghyllroyd Drive, Birkenshaw, Bradford, W Yorks BD11 2ET.

● OF 1777 EI licences issued, only five are for Co Laois, six for Leitrim and ten for Offaly. Dublin has over one-third at 626.

G5RP Award encourages new HF DXers

You Too Can Work HF DX

THE ANNUAL G5RP Award is designed to encourage newcomers to HF DXing. Unlike most DX awards, this one is given for making rapid progress in the recent past, which only relative newcomers have the scope to do. However, you don't have to be young or newly-licensed in order to qualify - the HF DX bug can bite at any age!

Well-established HF DXers have a particular role to play in the G5RP Award scheme. It's up to you to nominate up-and-coming DXers for the award - and your nominations for 1991-92 are needed *now*.

Nominations Due Now

IF YOU have someone in mind to nominate for the 1992 G5RP Award, contact HF Committee Chairman Bob Whelan, G3PJT, for details *now* at 36 Green End, Comberton, Cambridge CB3 7DY; tel 0223 263137.

Now turn to page 42 to read how the experts do it

PHOTOGRAPH: G4DXW

Bob Barrett, G4WJB won the 1991 G5RP Award by working 7MHz DX from this small garden, using a 33ft vertical end earth system.

Bob Barrett, G4WJB –1991 Winner

G4WJB IS typical of many would-be HF DXers who have only a small garden, 30ft by 40ft in Bob's case. He started his amateur career using a 20m dipole which produced very disappointing results. After the initial burst of enthusiasm he soon began to doubt whether he could ever work any real DX, and could only listen with envy to fellow-members of the Greater Peterborough Radio Club talking about their own DX conquests. For a lot of amateurs, that would have been the end of the story - but not for Bob.

With encouragement from other club members, Bob decided to try a 33ft vertical on 7MHz. He duly set to work, and after a few weeks of burying radials, testing and careful impedance matching the vertical was ready for action. For the first few nights on a new band, Bob still didn't believe he would be able to work any DX; but then the QSOs started to come .... 9V1, HL, HR, V31, FM and more!

Bob was delighted, especially when he realised he could work stations that the local DX gang couldn't even hear. Confidence boosted, Bob went on to add such exotica as ZL9, XQ0, CE0Z and ST0 to his collection. If you're wondering where these places are, check the prefix list in the RSGB *Call Book*: you'll find that they represent DX by anyone's standards.

G4WJB has made the 7MHz band his own, and with over 170 countries worked he has become an accomplished operator. He believes in getting in before the pileup, so his operating philosophy is to listen and pounce, rather than to call "CQ DX" aimlessly. Also he now connects to the PacketCluster network, which links DXers across western Europe and gives him another useful edge over the competition.

If you have similar antenna constraints to G4WJB, the message is clear. Don't give up. Get advice from local DXers. You can work HF DX from any location! And if you need any further encouragement to get started, just remember: the G5RP Award could be yours next year.

RSGB'92 Exhibition Update

THIS EDITION should thud onto your mat immediately before the premier amateur radio event of the year, the RSGB National Convention and Amateur Radio Exhibition - RSGB'92. Remember to take with you the Official 16-page programme enclosed with last month's *RadCom*.

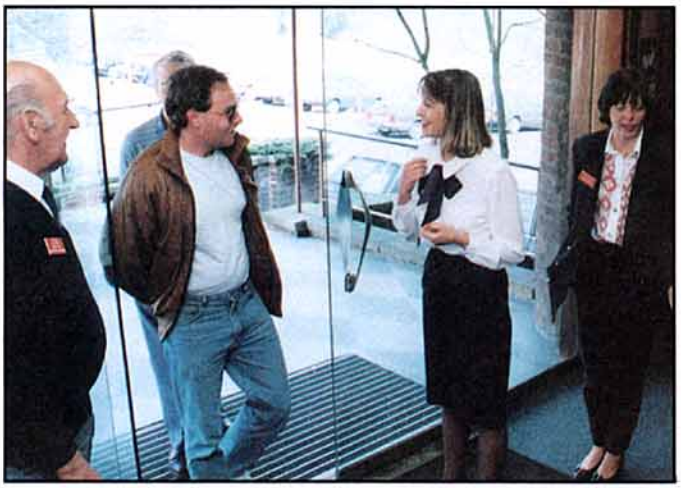
In addition to those listed in the programme, the following have confirmed their stand bookings:

Canberra Communications	Y14
C M Howes	Z11, 16
Coltec Electronics	W11
Direct Computer Supplies	W7, 8
G4ZPY Paddle Keys International	W1
Ham Videotronics	W9, 10
Mainline Electronics	C2
N T Microsoft	N7, 8
Peter Goddard & Co	TBA
Peter Rodmell Communications	X7, 8, 9, 10
Practical Wireless and Shortwave Magazine	A12
RF Engineering	W4, 5
Satellite Surplus	Z1, 2, 3, 4
Tennamast Scotland	D7
The Girl Guides Association	C18
W H Westlake	J7, 8, 9, 10

MORE NEWS AND REPORTS ON PAGE 8

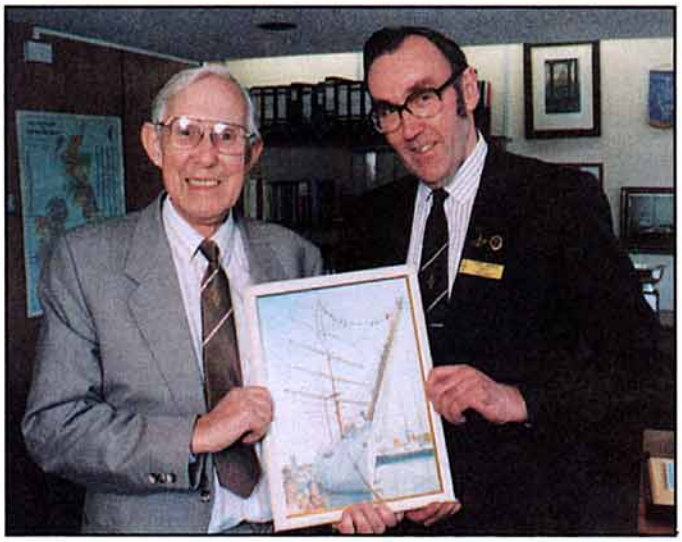
Welcome to Your Headquarters

ON SATURDAY, 11 APRIL, members were invited to have a look round the re-furbished Headquarters building. Over 250 members responded, many bringing their friends, spouses and children. Just in case you couldn't come along, here's what you missed: *Photographs: Gordon Allis, G0LRS*



General Manager's Personal Assistant, Justine Coles, opens the door to the first visitors, watched by Despatch Manager Bert Mair and Accounts Assistant Jane Hanson.

SWL Scott Edney listens to one of the HF rigs in the GB3RS shack whilst Dad, G7IDW, operates the two metre station.

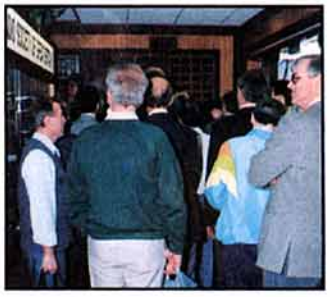


1991 President John Case, GW4HWR (left), presented 1992 President Terry Barnes, G13USS, with a picture of the *Dar Miodziezy* painted from the front cover of last December's *RadCom* by his wife Joan.

Brisk trade at the completely rebuilt Members' Reception and Book Shop.

GB3RS Chief Operator John Crabbe, G3WFM, gives visitor Howard Drury, G4HMD, a tour of the Museum. John is a regular volunteer worker at HQ.

The money side of HQ's work was explained by Accounts Manager Janet Cragg (top) and her Assistant Sue Rose.

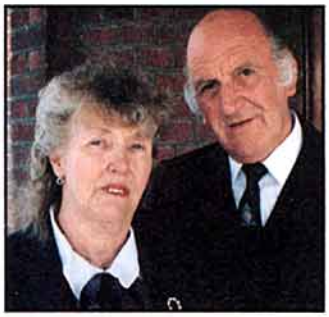


A log jam of members await their guided tours.

David (8), Caroline (5) and Steven (10) take a look at some *D-i-Y Radio* subscribers' packs whilst waiting for Mum (G8IYA) and Dad (G4HCL).

"This is how the cover for May *RadCom* was put together" reveals Managing Editor Mike Dennison, G3XDV.

Barry Maxwell, Director of the RA Radio Investigation Service joined in the fun.



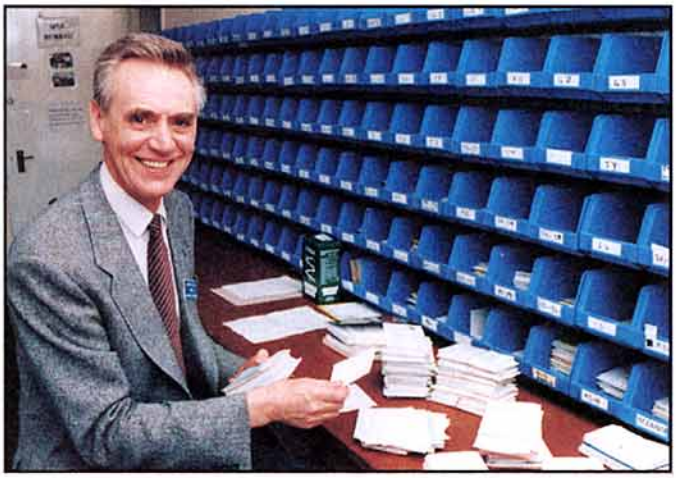
Husband and wife Bert and Margaret Mair head the Despatch Department team.

Council Member Hilary Claytonsmith, G4JKS, ran most of the day's conducted tours. She is seen here describing some of the machinery in the Despatch Dept.

RadCom meets *Ham Radio Today*: (l to r) *RadCom* Technical Editor Paul Lovell, G3YMP; *HRT* Consultant Technical Editor Chris Lorek, G4HCL; *RadCom* Managing Editor Mike Dennison, G3XDV; *HRT* Editor Shiela Lorek, G8IYA; and *RadCom* Assistant Editor and *D-i-Y Radio* Editor Marcia Brimson.

"This way for the next guided tour", invites Telephonist and Receptionist Lynette Crawshaw.

Darren Elliott takes a look at *D-i-Y Radio* with Project YEAR Coordinator Hilary Claytonsmith, G4JKS.



John Hall, G3KVA, the QSL Bureau Liaison Officer (an honorary post), welcomes visitors to the sorting room.

A group of members reach the inner sanctum – the office of the General Manager, Philip Smith (far right).

Novice Licence Administrator Sylvia Manco represented the Amateur Radio Department and . . . .

. . . . Brett Rider, G4FLQ demonstrated one of his responsibilities, the AS400 computer.

Garden Festival

WITH THE spectacular five-month Garden Festival Wales now well under way, you are invited to look out for the special event callsign GB4NGF, on the air from 29 June to 12 July.

Operating from the custom-built Churches Pavilion the station is expected to be visited by many thousands of people, many of whom will be seeing amateur radio for the first time. A full display and information service is being organised and presented by WACRAL - the World Association of Christian Radio Amateurs and Listeners, whose members will be manning the shack and assisting the public.

WACRAL Secretary Garth Martin, G3IFR, (0242 583664) says: "It will be interesting to see just how GB4NGF gets out on HF as the location is deep in Ebbw Vale!" Icom have kindly promised their support for this major event and will be providing their IC765 HF transceiver. Special commemorative cards are to be available. WACRAL invite all amateurs to visit this station and to bring their QSL card with them!

The southern end of the Garden Festival Wales' site includes a 'journey into the future' theme area with theme rides, exhibitions and spectacular gardens surrounding a five million gallon lake.

Volunteer Vacancy

THE HF COMMITTEE urgently needs new members to join as either corresponding or full members. The work of the committee involves all aspects of HF amateur radio. Members of the committee organise the annual HF Convention, produce papers for the IARU, advise on band-planning, administer the Society's HF Award programmes and generally promote HF amateur radio nationally and internationally.

Committee meetings are held 3-4 times per year and will in future be at weekends. Most committee work is undertaken using telecommunications! If you are an active HF radio amateur and would like to help us, please call Bob Whelan, G3PJT, on 0223 263137; Fax 0223 263940.

"Electric Signalling Without Wires"

President Terry Barnes, GI3USS, and Peter Turall of GEC-Marconi, unveiling a plaque which commemorates some of Marconi's earliest experiments.

THE ROVING Kennels on Three Mile Hill near Salisbury was the site of some of Marconi's earliest experiments 95 years ago. To commemorate this historic fact, a plaque was presented on behalf of the Salisbury Radio and Electronics Society (SRES) by its President Sir Evan Nepean Bt. The plaque was conceived and donated by John Hart, G4POF, helped by other SRES members.

Amongst those making speeches at the unveiling on Saturday 28 March were Peter Turrall of GEC-Marconi, Terry Barnes, GI3USS, RSGB President and Col Philip Whitemore representing the Royal Signals at Blandford.

In a letter to the SRES, Marconi's widow Maria wrote that her husband had told her "about the experiments he carried out on Salisbury Plain to dignitaries, military and naval personnel. He was always telling me how moving had been that great event."

Extracts from a letter from Marconi to the GPO in London:

THE OBJECT of the experiments, which I with the assistance of Mr Kempe and of the Royal Engineers, carried out near Salisbury; was to more completely investigate a fact of both theoretical and practical interest that I had noticed in part some time before, during experiments on electric signalling without wires, which I had carried out in Italy. The phenomenon I had noticed was the following:-

When using a modified form of Hertzian radiator, i.e. a Righs radiator, having one of its external spheres connected to earth and the other connected to an insulated conductor as transmitter, and employing one of my receivers having also one end of its sensitive contact grounded and the other end connected to an insulated conductor I noticed that the distance from the transmitter at which the receiver would work increased very rapidly by increasing the height from earth of one or both of the insulated conductors in communication with the instruments.

I had noticed also an increase of the distance to which perceptible effects travel if a metallic body of large surface was placed at the top of the conductors.

With heights up to about 30 feet, I had found that the distance at which signals could be obtained (at parity of other conditions) increased almost exactly in direct proportion with the square of the height of the said metallic body or capacity from earth.

I had also noticed that by this arrangement signals could be transmitted to the other side of the hills and metallic objects which might intervene between the transmitting and receiving instruments.

One of the most important facts which I have learned from these experiments is that the signals can be transmitted to considerable distances in all directions without employing bulky conductors or capacities in the air, it being apparently sufficient to have a wire leading to the top of a pole or mast to as great a height as possible. A capacity (plate or sphere) at the top of the pole or line certainly increases the effect but is not indispensable as I previously thought.

G Marconi
London, 31 March 1897

RSGB On Show at NEPCON'92

THANKS TO the generous sponsorship of David Topham, GM3WKB, the RSGB was represented at one of largest electronics exhibitions in the country, NEPCON, held in Hall 2 of the NEC last March.

The stand was designed by Council Member Hilary Claytonsmith, G4JKS, on the theme of 'The RSGB: Yesterday, Today, Tomorrow'. Hilary was ably assisted by a team of stalwarts from the Birmingham area: G3OOQ, G4AAL, G4EYD, G4IVF, G4LQF and G8ACR. The team was headed by Warwick Hall, G4WMH, who also erected the antenna system for the special event station GB2NEI. Icom UK kindly loaned the HF equipment and contacts were made all over the world, with 99% of the contacts being made on CW. The Morse signals acted like a beacon to the knowledgeable and the inquisitive alike.

Over the three days of the show more than 1000 people were introduced to amateur radio, three hundred callsigns appeared in the visitors book and several lapsed members promised to return to the fold.

Watched by a small crowd of visitors, John Layton, G4AAL, talks to Japan while John Harvey, G4IVY, extols the virtue of *RadCom*.

Ilford RSGB Group

FOR THE last twenty three years, a group of RSGB members has met in the workshop of J R Hooper, G3PCA, for four hours every Friday.

Although there are no formal lectures, members use the workshop and test gear and learn from each other; home construction is actively encouraged. Prior to G3PCA's involvement, the group was run by Fred Ruth, G2BRH.

New Beacon

A NEW microwave beacon, GB3SCX, is operational on 10368.250MHz. Co-sited with VHF/UHF repeaters GB3SC/SZ in Bournemouth, it is 60m ASL at IO90BR63, NGR SZ098914.

Construction of the 275mW Tx and seven-slot waveguide antenna was by Dorset 2m Repeater Group members G0API and G4JNT who would be grateful for reception reports.

Scottish Century

DURING THE First Annual Scottish Activity Weekend on 18-19 April over 10,000 contacts were made from Scotland. Unfortunately two of the regional stations did not appear, so the Scottish Tourist Board (Radio Amateur) Expedition Group has announced that anyone who had a contact with GB2STB can now claim twenty points towards the Scottish Century Award.

Any comments on this event and the points system would be appreciated by the coordinator Paddy, GM3MTH, QTHR or telephone 0236 440495.

RAE Report

THE CITY and Guilds official report on the May 1991 (not 1992) RAE is available by sending an SAE to Radio Communication, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

So this is where the inhabitants of Turriff, Grampian, take the exam. Graham Davis, G4MFX, couldn't resist taking this photograph on a recent trip to Aberdeen.

Intruders removed

RSGB INTRUDER Watch Coordinator, David Owen, G0OES, reports a terrific response to his appeal for information (*RadCom*, December 91).

Some recent good news is that the fixed aeronautical station STK has been removed from the exclusive 17m (18MHz) band. Also, as the result of a great number of reports received regarding Radio Espana (Exterior) on the 40m band, the RA is now assisting the Spanish to solve the transmitter problem which is causing an intrusion into our band.

Using high-tech means, information is being gained about the many data intruders spread across our spectrum.

● THE NEW ARRL President is George Wilson, W4OYI, who succeeds Larry Price, W4RA.

The Talking Book Service of the Royal National Institute for the Blind requires technicians urgently.

The Blind Need Your Help

MANY BLIND people have tape-reading cassette-type playback units and are supplied from a large library in London. Help is needed to install and maintain these, initially by giving some guidance to the blind, the average age of whom is over 74.

Originating with an appeal in the *RSGB Bulletin* (*RadCom's* old name) 43 years ago, there are now over 3,500 technical helpers looking after 'Talking Books' throughout Britain. However, there are over 70,000 blind readers needing help; 4,200 of them are over ninety and we have as many as 130 who are over 100 years old.

Would you be prepared to give up some of your time for this rewarding and interesting work? There is an urgent need at present. Volunteers should have technical abilities in electrical or electronic engineering, they are generally able to look after up to twenty blind people: to visit them when required and to assist in repairing defects in their sets. The time required generally does not exceed two evenings per month. Circuit diagrams and full technical details are sent out to each helper. If required, technical support is always available by telephone from London.

Anyone prepared to assist or needing further details, should write to the address below. If you feel that you cannot help personally then perhaps you would help by passing on this appeal to a friend with technical knowledge. Your assistance will be very greatly appreciated.

David Finlay-Maxwell, Hon Recruiting Organiser of Servicing Volunteers, D F Maxwell & Co, Prospect House, Prospect Street, Huddersfield HD1 2NU. Telephone 0484 450982, 0484 604546 (night).

● THE RA HAS informed us that there is now a reciprocal licensing agreement between the UK and Malaysia. The single class of Malaysian licence is reciprocal with the UK Class A.

● From this year, the Japanese Amateur Radio League's call book will include only JARL members.

Station X

RECENTLY THE key role of Bletchley Park (Station X) in ensuring victory in WWII has become apparent. The Park was the hub of code-breaking activity and used the world's first electronic computer Colossus.

Most of the original buildings are still on site but could be demolished after September. The Bletchley Park Trust has been formed to make the site into a museum to the work of the code-breakers, and an interest has been shown by the Science Museum.

There is a chance to visit the site over the weekend 5 - 7 June when there will be exhibitions on airborne radio and the history of the Park by the Royal Signals, Scouts, and Bletchley Park Trust.

Milton Keynes Scout Amateur Radio Group will be operating on all HF bands using GB4BPX. An award is available to those working the station on two bands, modes or days (overseas stations need only have one contact). Send a log extract and a A4 SAE (overseas 3 IRCs) to G0EYZ, QTHR.

Members of the North Ferriby United ARS have regular challenges to compete for in an attempt to win the G3YCC Trophy. The latest competition was aimed at increasing activity on 144MHz and 430MHz, all modes. This year's winner is Bernard, G6EBH.

Scottish Trophies – Nominations?

TWO TROPHIES are awarded annually in Scotland: the Jack Wylie Trophy to the Scottish club, society or RSGB member thought to have done most for amateur radio in Scotland in general terms in the past year; and the Jock Kyle trophy to the Scottish club, society, group or RSGB member thought to have done most in Scotland in the field of VHF in the past year. In the case of an award being made to an individual, that person must have been resident in Scotland during the period the award refers to.

In 1991 the Jack Wylie trophy was awarded to Tom Hughes, GM3EDZ, for his work in organising the successful Scottish Amateur Radio Convention in 1990. No award was made for the Jock Kyle Trophy. Nominations and citations for each of the trophies in respect of the 1992 awards are required from at least five RSGB members resident in Scotland who should send them to the Zonal Council Member, Ian Suart GM4AUP, by **14 August 1992.** In the event of more than one nomination being received for either trophy the final decision on the award will be placed in the hands of the Scottish RLOs. In the event of no nominations being received, the trophies will pass to the safe keeping of the Zone G Council Member until nominations are called for in 1993.

1992 WARC

A Postscript

FREQUENCY management is a very complex business involving a mixture of technical, political and other skills. As more countries develop, their citizens will obviously look to greater technology in their lives. This will place increasing requirements on the majority of the radio spectrum and this in turn will lead to additional pressures on the amateur bands, especially above 30MHz.

It often comes as a surprise to radio amateurs that most amateur bands above 146MHz are shared with other services and are only allocated to the Amateur Service on a Secondary basis. To date our sharing partners, with notable exceptions, have not always been too obvious. However, this will change, in part because of what has been referred to as the 'peace-dividend'. We will discover in the future that while in some cases we will be able to continue to share - as has already been demonstrated on some of the HF, VHF/UHF and microwave bands for many decades - in other cases sharing will just not be possible.

With the increasing complexity involved in frequency management there is a view that the Amateur Service should in the future involve full-time professional people, probably on an IARU Regional basis, to co-ordinate frequency management issues with the professional IARU Secretariat. With the prospect of more WARCs every few years, it may well be increasingly difficult to rely on the work of dedicated volunteers.

While the elected volunteer leaders of the amateur community give up many weeks of their free time every year, it is perhaps unreasonable to expect them to devote any more effort to the frequency management task. If full-time staff is an answer, it begs the question as to how such work can be funded. At National Society level the members themselves will have to decide on the importance that they attach to the protection of the most valuable assets of the Amateur Service - the amateur bands.

David Evans, G3OUF (UK delegate)

A report by RSGB VHF Manager David Butler, G4ASR, on this meeting which took place in Vienna on 28 - 29 March.

IARU Region One VHF, UHF and Microwaves Committee Meeting

THE FOLLOWING recommendations and points of interest arose from the VHF/UHF/Microwave Working Group formed by VHF or Microwave Managers from fifteen IARU Region 1 Societies:

50MHz

IT WAS agreed that the recommended frequency for **AFSK SSTV** working be 50.510MHz.

The RSGB will prepare a paper for the next IARU Region 1 Conference (Antwerp, Sep 93) proposing that the recommended frequency for **facsimile** working should be 50.550MHz.

A proposal by the Danish Society (EDR) for **FM repeaters** was not approved by the meeting. However, it is likely that this will be discussed at the next Conference.

The meeting recommended that all IARU Region 1 member Societies, who do not currently have a normal allocation at 50MHz, shall endeavour to obtain such an allocation, preferably permanent, in the 50-54MHz band. In order to obtain a **common IARU Region 1 band**, this allocation should at least contain the frequency segment 50.00 - 50.50MHz.

70MHz

THE MEETING agreed to the RSGB proposal to include the **UK 70MHz band plan** in the IARU Region 1 *VHF Managers' Handbook*.

The aim of this is to promote interest in cross-band working and, as a long term aim, to encourage other Societies to obtain permits for the band.

144MHz

BECAUSE OF harmonics caused by computer clocks operating at 8MHz and 16MHz causing interference to the weak signal Earth-Moon-Earth sub-band, 144.000 - 144.025MHz, it was recommended that publicity be given to the use of 144.140 - 144.160MHz as an alternative for **EME** operation.

Note that this sub-band is currently allocated for weak signal FAI working. The results of the recommendation will be monitored with the aim of incorporation into the usage part of the band plan if successful.

The meeting was convinced that the **beacon sub-band**, 144.845 - 144.990MHz, could be reduced in bandwidth but this will only be entertained if usage is identified for the space created. It is very likely that this matter will be discussed at Antwerp.

Call for papers

PAPERS FOR the Region 1 Conference, Antwerp, September 1993, should be ready for forwarding to IARU by the end of November 1992. This time scale is to enable all Societies in Region 1 to receive each other's papers and have time to discuss them at committee meetings before September 93.

If you have any proposals regarding band plans, procedures or policy relating to the VHF bands you are invited to forward them either to the VHF Manager, David Butler, G4ASR, or the Chairman of the VHF Committee, Peter Burden, G3UBX.

Have a say in the way your bands are managed!

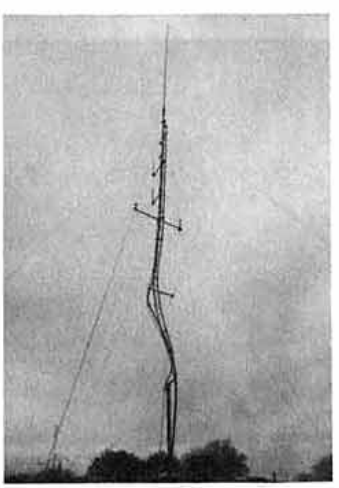
● IN THE USA, people unable to speak or move their limbs can use side to side head movements to send Morse to control a microcomputer.

Seventh AMSAT-UK Colloquium

THIS YEAR's annual get-together for those interested in satellites, or those who want to find out about them, takes place at the University of Surrey. Thursday 30 July is reserved for "AMSAT/IARU space politics" with lectures taking place on Saturday and Sunday 1-2 August. The Colloquium comprises talks, lectures and demonstrations, right across the range of amateur satellite activity. It is arranged to provide delegates (from the beginner to the expert) with a complete educational and fun weekend with an oportunity to talk to those who design, build, command and launch the satellites.

This year's lecture programme includes an update on Phase 3D, information on KITSAT which is due to launch at the same time as the Colloquium, tours of the UOSAT Command Stations, a brief on WARC '92, packet satellite operation etc. Prospective lecturers should contact AMSAT-UK *urgently* to be included. This is a most enjoyable event and, in the words of AMSAT-UK supremo Ron Broadbent: "Nobody goes away from the Colloquium without having gained a lot of knowledge."

For further information and full details of the price package (available with or without accomodation), write to AMSAT-UK, 94 Herongate Road, Wanstead Park, London E12 5EQ; tel 081 989 6741; fax 081 989 3430.



The mast used by the Leicester Repeater Group for GB3s CF, GV, LE, LEX and LES was damaged by fatigue, or possibly over-tensioned guys, in December 1991.

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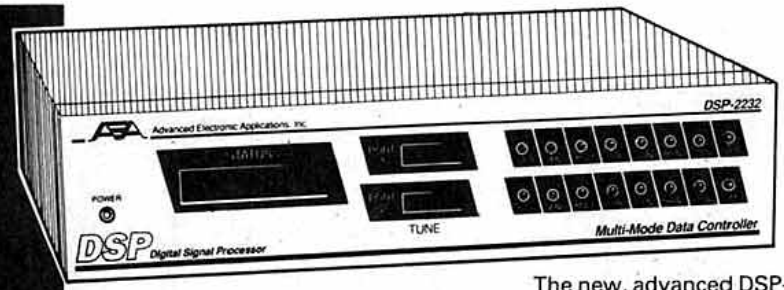

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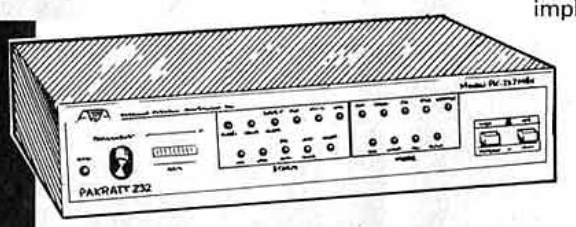

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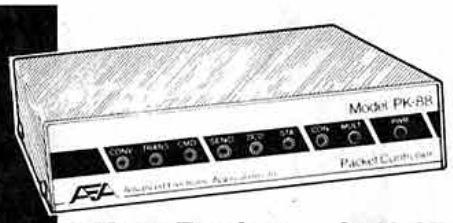

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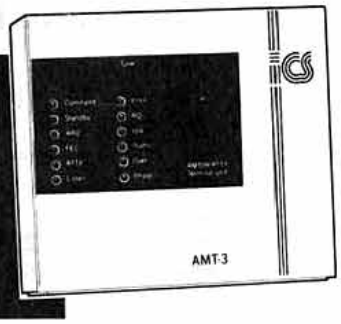

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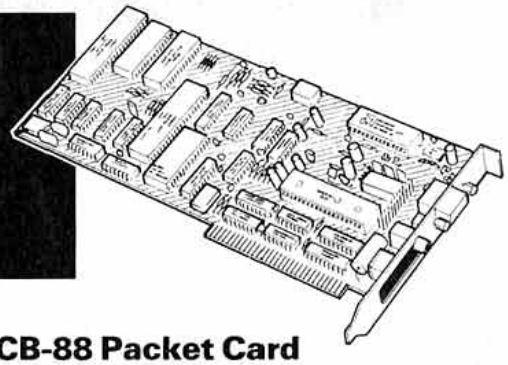

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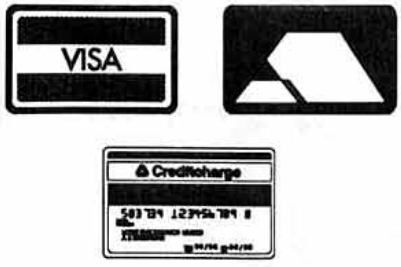

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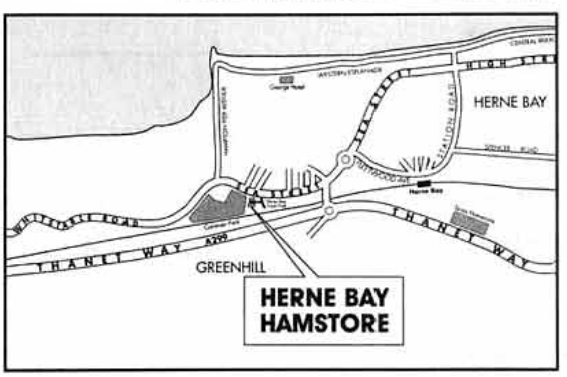

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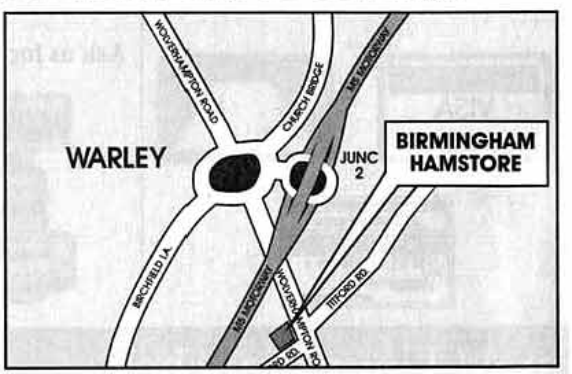

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HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham
B17 8QB

MARTIN, OY7ML, has written to tell me that 'TF3C' is being operated by a pirate and that the signals seem to be coming from the UK. Martin himself had the same problem a little while ago and a British amateur in the area west of London was found to be the guilty party. The phoney operator is abusive and uses a bug key. Another callsign being pirated - mostly on 3.5 and 7MHz CW belongs to G0HGA. This one also uses the callsign GW0HGA and his (or her) behaviour also leaves a lot to be desired.

VIETNAM AND KAMPUCHEA

G3NOM HAS sent me a report on his recent visits to Vietnam and Kampuchea. In Vietnam he visited the station of the Post and Telecommunications Training Centre, XV2A. There he met JA3UB and JE3MAS who were working on repairing and replacing antennas. A lot of work is also needed on the other equipment which has unfortunately been maltreated by some of the amateurs who have visited there previously. A new 2-element beam for 14, 21, and 28MHz was being put up, as was an inverted vee trap dipole so that the Vietnamese operators undergoing training could get practice communicating with the other training centre in Ho Chi Minh City (3W8AA). The PTT was currently drafting new amateur regulations. Some problems have occurred in the past with operations by visiting amateurs and the new regulations should help to prevent a recurrence of these. It is interesting to note that the use of HF bands for training purposes has been abandoned because of the interference from DX pile-ups.

Previous to going to Vietnam Ray visited Malay Mak Heun in north west Kampuchea and operated for about 12 hours as XU1NOM. During this time he made about 600 QSOs on six bands, both CW and SSB, using a TS757GX and a TS680S and dipoles as well as a three element rotatable tribander. Again JA1UT and JA3UB had been working to improve the station facilities and continuing the goodwill programme established by Japanese amateurs. Ray hopes to return there.

DX NEWS

RSGB DX News Sheet reports a confusing development concerning the issue of callsigns for special event stations in France and in the French overseas territories and departments. The prefix TM will be used for France, TO for French Overseas Territories (FK, FO, FW), and TX for French Departments Overseas (FG, FM, FY). There will be no other indication of country so that a station using the TO prefix could be in either FK, FO, or FW !

LA5NM is now in **Svalbard** as JW5NW and will be there for a couple of years. QSLs for JW5NM and other stations for which Math acts as QSL manager may be sent to the address in *QTH Corner*. JX3P is on **Jan Mayen Is** and has been found near 21.275MHz around 1700. 4J1FS in **Malyj Vysotskij** is likely to come on the air again between 21 May and 16 June. This time the operators will include UT4UZ.

FD1PYM will be in **New Caledonia** until 10 June but his FK callsign was not known at the time of writing. Brian, C21BR, reports from **Nauru** that he is making regular contacts with UK stations between 1900 and 1930 via the long path around 14.240MHz. He has no luck on the short path - he can hear but apparently his signals do not get through and he suggests trying 14MHz at the 'greyline' times around 0700 and 1900. He also gets on 21.203MHz (short path) between 0430-0530 for the UK and Europe.

As mentioned previously G3ZSS is in **Brunei** for two years and on the air as V85PB. He has been worked at weekends on 14.240MHz at 1800. A71AA, in **Qatar**, keeps daily schedules from about 1230 near or on 28.535MHz. *RSGB DX News Sheet* says that JA1NUT has reported that XU8DX in **Kampuchea** was closed down in early April and that the equipment was confiscated.

DL3PI is presently in **Antigua** and on the air as V29PI. He will be there for several years and has been worked on Sundays on 21.155MHz after 1330. The VP8SSI team left **S Sandwich Is** on 3 April, having made nearly 40,000 contacts. The weather during their stay was atrocious and unfortunately most of the equipment had to be left behind. The team suffered greatly and the DX world owes them a great debt for their fantastic performance in the face of adversity.

There will be a special event station on the air from 29 June to 12 July celebrating the bicentennial of John Graves Simcoe (the first Lieutenant Governor of Canada). It will have the callsign XJ3S and will be located near Lake Ontario. Special QSLs will be available - send an SAE and return postage to VE3VM, PO Box 692, St Catherines, Ontario, L2R 6Y3, Canada.

PA3CXC made 12,700 QSOs from **Southern Sudan** recently. These were mostly with JA and the USA because he had a high mountain in the direction of Europe.

DXPEDITIONS

FOUR AMATEURS from the Whitton Amateur Radio Group will be operating from Sri Lanka for a period of three weeks starting on 12 June. Operation will be on all bands 3.5 to 50MHz. Each operator has been given an individual callsign - G0MRF is 4S7DBG, G0LUH - 4S7DGG, G0ONA - 4S7PNG, and G0OHW - 4S7JVG. A group callsign 4S0UK has also been applied for. They will have beam antennas and linear amplifiers so should have good sigals.

Lloyd and Iris Colvin completed a six month YASME expedition to the Far East at the end of March. They operated as HS0ZAP (120 countries), XU8KG (105), XW1QL (115), V85KGP (130), and XX9TQL (112). They had been told that a Macao licence would be very difficult to obtain but in fact the administration was very efficient and XX9AS was most helpful.

PHOTOGRAPH: G4NOO

Niklaus Schweitzer, GB9VP/KH6, who lives near Diamond Head, Waikiki. Nick often contacts HB9HM on 14.344MHz at 0700.

MOUNT ATHOS

THERE HAS been a great deal of confusion concerning what constitutes proper permission to operate from Mount Athos and ARRL has just issued a bulletin which clarifies the situation. In essence it says that the first requirement is to have a valid licence for operation from Greece. In addition all visitors must have written permission to enter the region and DXpeditioners must have written permission to transmit from Mount Athos. Both entry and amateur radio permission comes from the Holy Community of Mount Athos and authority lies with the Superiors of the Common Congregation of the Twenty Holy Monasteries of Mount Athos. DXCC accreditation will be given only to those who have satisfied all these conditions.

ARRL DXAC NEWS

A NEWS release dated 30 March by ARRL under the above title has been circulated so that radio amateurs everywhere may have the opportunity to comment on matters being considered by the ARRL DX Advisory Committee. The first item mentioned is that DXCC status for **Vatican Enclave of the Holy House** (HV0HH) was rejected unanimously. The following are still under consideration for DXCC status: (1) **Pratas Is** (21N 117E) - "waiting further information and a formal application". (2) Making **Ceuta** and **Melilla** (EA9) two separate countries - based on Rule 3 (separation by another DXCC country). **Spratly Is** (1S) and **South Sudan** are being considered for deletion based on "no longer meeting criteria". In addition the following questions are under consideration: (1) Should elec-

tronic confirmations be acceptable for DXCC credit? (2) Should separate DXCC status for the **Vienna International Centre** (4U1VIC) be reconsidered? (3) What are appropriate quidelines and and procedures for DX operations - particularly dxpeditions to rare countries? (4) Should contacts with stations located on docked ships count for DXCC credit? (5) What does the future hold for DX and DXCC? I feel sure that comments from this side of the Atlantic would be welcomed so if you have any please write to ARRL, 225 Main St, Newington, Conn 06111, USA.

PROPAGATION

THE NEWS from G8KG is not quite as good as it has been for quite a while and he says: "The signs are that we have at last seen the end of the peak of Cycle 22. Throughout the second half of March and the first weeks of April the general trend of solar indices has been steadily downward. By the end of the period the 27-day average solar flux had fallen below 164 sfu, a value last seen late in 1988 as values began to climb toward the peak. Since 1 March the daily flux values have been below 200 sfu with a low of 140 on 9 April and a slow rise thereafter: but values above 200 could well have been seen again since this report was written.

The general level of solar activity was, however, still comparable with that at the peak of some earlier cycles and, with the geomagnetic field being free of major disturbances on most days, HF band conditions were generally quite good, MUFs, though, were substantially lower than in the early part of the year, partly because of the decline in solar activity and partly through the seasonal reduction in northern hemisphere MUFs after the spring equinox".

CONTESTS

IARU HF WORLD CHAMPIONSHIP

1200 11 July - 1200 12 July

All bands except WARC. Single-operator single- and multi-band, CW only, phone only, and mixed-mode. Multi-operator single transmitter, mixed mode only. Object is to work as many others (including IARU Member Society HQ stations) as possible. Exchange RS/T and ITU zone (UK is 27). Society HQ stations send signal report and official abbreviation (eg 'RSGB'). A station may be worked on each mode on each band. QSOs with own ITU zone and with Society HQ stations count one point, with different zone in own continent three, and outside own continent five. Multipliers consist of ITU zones and society HQ stations worked on each band - but note that the latter do *not* also count as zone multipliers.

Official entry forms are available from ARRL HQ, 225 Main St, Newington, CT 06111, USA, in exchange for an SAE and two IRCs. Logs may also be submitted on IBM compatible disks. Entries must be postmarked no later than 12 August 1992 and sent to IARU HQ, Box 310905, Newington, CT 06131-0905, USA. I can supply photocopies of the full rules in exchange for an SASE.

There are no UK stations to be seen in the results of the **1991 ARRL 160 Metre Contest** and in fact there are only five Europeans listed. Maybe next time things will be a little more interesting from this side of the Atlantic now that the permissible power on part of the band has been increased?

BARCELONA-92 OLYMPIC GAMES HF CONTEST

0000 18 July - 2400 19 July

All bands 1.8 to 30MHz except WARC. Work anyone. Mixed, SSB, and CW sections. Single-operator single and multi-band. Multi-operator single and multi-transmitter, QRP (up to 5W output), and listener sections. Exchange RS/T and CQ zone (UK is 14). The official rules are rather lengthy and I can supply copies if needed (SASE please).

ALL ASIA DX CONTEST

0000 20 June - 2400 21 June (CW section)

1.8 to 28MHz (no WARC). Single-operator single or multi-band and multi-operator multi-band. Exchange RST plus age (ladies give '00'). QSOs with Asian stations on 1.8MHz count three points, on 3.5MHz two, and on all other bands one. The multiplier is the number of Asian prefixes (as defined by the WPX rules) worked on each band added together. The score is the total of QSO points on each band multiplied by the multipliers on that band (added together in multi-band entries). Entries must be postmarked no later than 30 July 1992 and sent to JARL All Asia Contest, PO Box 377, Tokyo Central, Japan. I can supply copies of the rules for *the 1991 contest* but unfortunately the 1992 rules had not arrived when this was being written.

BAND REPORTS

Thank you this time to: G2HKU, GM3CSM, G3s GVV, KKJ, G4s DJG, NXG/M, OBK, SFU, XRV, and G0AEV, GM0KMJ, and G0KDS. Stations listed in italics were on CW:

10MHz

0600	*EA9/DK7ZB, N6AV/VP9, ZP6CW, 6W6JX*
0700	*PJ4/DK9FN, SU1HV*
1800	*VK9CL*
2000	*JW0GB, RJ8JM*
2100	*C30CAG, HI8AX, VK3MR, VK6RZ, ZD8OK, 9K2WR*

14MHz

0900	*KH4/N7TKL*
1600	VP8SSI
1800	*S2/HA5BUS*
2000	C9RTC

18MHz

0700	YA5MM
0900	*3D2BQ*
1600	*FO0PT*
1700	A45ZZ, *JM1GLZ/JD1* (Ogasawara), *SU1HV, JJ1VKL/4S7, 7Q7XX*
1800	JAs, *V85KX, 9V1OK*
1900	*PJ5/N4XO, VQ9RS, 8Q7CW*
2000	*FJ/N0IMH, VK6AJ, VP8SSI*
2200	VP8CKH, *ZD8LII*, 6W6JX
2300	*HC5AI, PJ4/DK9FN*, V21AM, VK5VN, *5H3RA*

21MHz

1600	BV4ASA, HS0AC, *VU2TE*
1800	BV2CD, *S2/HA5BUS, 4S7CW*
1900	PJ4/DK9FN, PJ7/K2TW, S2/HA5BUS, *VP2CBA*

24MHz

1100	JP1KDC/JD1 (Minami Torishima), *W1XP/VP9*, VS6CT
1200	PJ8AD, PY0FZ, YA5MM, ZF2WM, 9Q5TE
1500	A71BS, JY5FA, *PJ7/K1XM*, VK9CL
1600	VE7s, *VS6UW, VP8SSI*, W7's, *ZF2NM, 9M2AX*
1700	J8/G0GIX, *VU2PTT*, ZD7CW, *ZD8OK*, 7Q7XX
1800	FR5GG, P40MR, *7P8RQ*
1900	OX3CS, ZL1ACW

28MHz

0800	JH1MAO/JD1 (Minami Torishima)
0900	BZ4RBC, VS6CM, YA5MM, 5U7M, 9M2CW
1000	*VK9CL*, 3D2AG
1100	H44MS, XX9AS
1200	P49V, PY0FZ, S9AGD, TL8NG, V73DO, *WL7E*, YI1BGD, 5V7JG
1300	A71BR, KH2EV, *VP8GAV*, XX9MD, *OK1IAI/YA*, 8R1JV
1500	FH8CB, HS0ZAD, *VP5P*, VP8SSI
1600	HC8A, TZ6VV, V51/DL3ECK
2000	*AH6IP*, CE0FFD, KH6JEB/KH7
2100	FO0CI

QTH CORNER

HS0ZAP	(see XX9TQL).
JW5NW	Mathias Bjerrang, PO Box 498, 9170 Longyear City, Norway.
S2/HA5BUS	The Globex Foundation, Box 49, 1311 Budapest, Hungary.
VK9CK/ VK9CW	Fritz Szoncso, 53 Chemins des 2 Hameaux, Thoiry, F-06130 St Genis Pouilly, France.
VP8CBA	Terry Dubson, W6MKB, 1880 Summit Dr, Escondido, CA 92027, USA.
XU1NOM	via G0CMM, 28 Stiles Av, Marple, nr Stockport, Cheshire, SK6 6LR.
XX9TQL	Yasme Foundation, PO Box 2025, Castro Valley, CA 94546, USA.
4S7s DBG, DGG, PNG, JVG	D Bowman, 31 Benson Close, Hounslow, Middx, TW3 3QX.

AWARDS

BARCELONA 92 OLYMPIC AWARD

For contacts made between 0000 on 20 June and 2400 on 17 July 1992. Available to licensed amateurs and listeners. QSOs must be made on 1.8 - 30MHz (excluding WARC bands) and also in the correct segment of these bands according to the IARU band plans. Contact can be on phone, CW, RTTY, AMTOR, SSTV, and packet radio, and reports must be exchanged. (QTR must be noted in the log but not passed.)

continued on page 19 ▶

1992 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G4OBK	48	**89**	**123**	260
G2VJ	41	74	85	200
G3KKJ	33	57	52	142
G3ING	34	30	28	92
G4NXG/M	-	41	27	68
GM0KMJ	-	-	59	59
GW4RGT	13	21	16	50
G4XRV	**50**	-	-	50
G4MUW	-	-	35	35

VHF/UHF NEWS

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

NOTHING VERY significant seems to have occurred on the VHF and UHF bands lately. Contributors mentioned a weak aurora, and some E-layer propagation into Slovenia around deadline time. Moonbounce activity seems to be attracting growing numbers of experimenters.

REPEATER NEWS

ED HARLAND, G3VPF (DOR), sent a copy of an undated and unnumbered newsletter covering recent activity of the 70-strong South Dorset Repeater Group. GB3SD, near Weymouth, is the callsign of the UHF voice repeater on RB14. It has been operating since July 1976 and covers the Weymouth and Dorchester areas, eastwards to the New Forest and northwards towards Yeovil.

The SDRG has decided against fitting Continuous Tone-Coded Squelch System (CTCSS) circuitry to GB3SD as there is no problem with interference from adjacent repeaters. The group also operates simplex packet systems GB7SD on 144.650MHz and GB7SD-1 on 1.3GHz from the same site.

A combined PSU for all this equipment and a new Tx antenna are planned, to be financed from the satisfactory reserves. The AGM was scheduled for 12 May. The current annual dues are £4 for the voice relay and £4 for the packet units. For full details of the group contact G3VPF, who is QTHR.

CONTESTS

IF YOU ARE a QRP enthusiast make a note of 21 June, the date of the tenth *Practical Wireless* 144MHz QRP Contest. GMT times are 0900-1700 and the maximum permissible power output is three watts. The adjudicator is Neill Taylor, G4HLX, and full rules are in the June issue of *PW*.

On 7 June, during HF NFD weekend, there are a couple of RSGB VHF CW contests. On 70MHz, 0800-1100 and on 50MHz 1300-1600. See March *RadCom* for the rules. On 432MHz on 21 June, 1300-1700 there is the FM Fixed and Open event, followed by the CW Single/Multi-op contest, 1800-2200. See the March and April *RadComs* respectively for details.

The UK Six Metre Group has organized a 50MHz contest for 6 June, 00-24GMT, which is now open to all. Crossband QSOs with countries which do not have 50MHz are valid. Exchanges should comprise call, RST, membership number, if appropriate, and square, eg IO91 or JO02. Send a large SASE to Mrs M Wright, GW8ZCP, 6 Cwm Eithin, Wrexham, Clwyd LL12 8JY, for a supply of official log sheets. Entries, postmarked no later than 8 July, should go to the same QTH.

QUALITY

A PERENNIAL topic in VHF/UHF circles is the quality of transmissions. The relevant licence requirements are covered in Section 4 of the RA *Terms and Limitations Booklet BR68* under the heading, 'Apparatus'. Clause 4(2) states that: ". . . . the Licensee shall ensure that the apparatus . . . . does not cause any undue interference to any wireless telegraphy." Clause 4(4) states: "The Licensee shall conduct tests from time to time to ensure that the requirements of this clause 4 are met."Under the 'Log' section, clause 6(1)(h) requires the Licensee to log: "details of tests carried out in accordance with sub-clause 4(4)."

PROBLEMS

Some operators always transmit clean, narrow SSB signals and click-free CW ones. Others habitually radiate distorted SSB, while their key clicks can be heard over tens of kilohertz. The only certain way to comply with clause 4(2) is to monitor your signal in a separate receiver since meters can't tell you anything about quality or bandwidth. An oscilloscope monitor is more useful, provided you understand how to interpret the patterns.

Over the years there have been a few notorious transceivers that proved incapable of operating in a linear mode on SSB. Some could be improved by competent people with the necessary test gear and, not least, the patience. On CW, others defied all attempts to clean up the key clicks. Some of the early synthesized rigs suffered from excessive phase noise which invariably resulted in a broad signal.

A low power transceiver driving an amplifier which is turned on by sensing the presence of a few milliwatts of RF, often produces nasty transients. If the delay is too short when in CW mode, clicks on make and/or break can occur on each word, or even each character in bad cases. This is bad news for anyone engaged in weak signal working, such as MS and EME.

REMEDIES

Many stations comprise several separate items; the basic transceiver, perhaps a transverter, plus some or all the following; a power amplifier, an Rx preamplifier and a speech processor. Audio and RF drive levels, and all the switching sequences, must be properly set up. This is essential when assembling a station for a contest, using a friend's PA with your transceiver and someone else's masthead preamp, for example.

To their credit, some of the more responsible contest groups do carry out the required tests with knowledgeable colleagues, well before kick-off time. Even so, problems may arise later if there are several operators. Some may talk in a normal manner but others might shout into the microphone, so gain re-adjustments are essential to accommodate the latter if distortion is to be avoided.

For linear operation the PA must be correctly loaded. In home built valve amplifiers a loading control is usually provided. If the plate current meter seems a bit lively, it is likely that the loading is too light. Increasing it to a point where the peak power output starts to decrease, can dramatically improve the linearity, hence the quality, and reduce the bandwidth of the signal.

Tetrodes in the 4CX-series can provide reliable and excellent linear amplification if properly set up and if the power supply is adequate. Such amplifiers are usually operated in class AB1 so should never be driven into grid current. Don't forget that the screen supply has to sink current as well as supply it.

Whatever the circumstances, if you suffer from 'undue interference' from another station, *and you are quite certain it is not due to deficiencies in your receiver*, you ought politely to tell the offending station. An offer to assist in tests should be made and, if taken up, the results can be logged - licence clause 6(1)(h), remember?

I hope these few comments will encourage operators not to turn a deaf ear to those who cause such nuisance. There is no need to suffer in silence or take the easy option by switching off. In contests, if a genuinely offending station refuses to clean up their signal, you should tell him/her you will note this fact in your log when you submit it, reminding them about General Rule 20.

METEOR SCATTER

JUNE IS quite a good month for MS practioners offering three of the most active daylight streams of the year. The following data are taken from the International Meteor Organization's (IMO) *1992 Meteor Shower Calendar* which mentions that they were discovered by radio detectors at Jodrell Bank in 1947.

The Arietids is predicted to peak on 7 June at solar longitude (LS) 76.7°. The zenithal hourly rate (ZHR) is 60, right ascension (RA) 44° and declination (DEC) +24°. My MSD1 program indicates reflection efficiences exceeding 50% at the following GMT times: NE/SW 0430-0930 and 1300-1530; E/W 0700-1200; NW/SE 0300-0530 and 0900-1430; N/S 0300-0800 and 1100-1600.

Next, the Zeta Perseids, 9 June, LS 78.6°, ZHR 40, RA 62°, DEC +23°. Best times: NE/SW 0600-1100 and 1430-1730; E/W 0830-1330; NW/SE 0400-0700 and 1100-1600; N/S 0430-0930 and 1200-1730. Last the Beta Taurids, 28 June, LS 96.7°, ZHR 25, RA 86°, DEC +19°. The efficiency patterns are virtually the same as for the Arietids, but you must add two hours to all the times.

MOONBOUNCE

AS RAY SOIFER, W2RS, pointed out in his excellent article in the May 1992 *RadCom*, 144MHz EME is becoming very popular in the UK. The standard licence now permits us to deliver 400W of CW to the antenna system, so we have an extra 6dBW towards overcoming the 251.5dB path loss at perigee.

ACTIVITY

John Regnault, G4SWX (SFK), concluded that April was a good month: ". . . . but with a lot of of very strange Faraday rotation and one-way propagation." He worked another eight initials and heard at least six other new stations. On 8 April, W6JKV/HK0 was copied for 15min from 1610 with a very large pile-up in tow.

New initials on the 10th, the start of a sked weekend, were

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50MHz	70MHz	144MHz	430MHz	1.3GHz	Total
GJ4ICD	509	-	264	121	59	953
G4IJE	415	-	338	5	2	760
G0JHC	405	-	48	-	-	453
GM0EWX	404	-	211	18	-	633
GW4LXO	395	2	261	108	48	814
G3IMV	364	-	467	125	52	1008
G6HCV	355	-	241	-	-	596
G6HKM	339	-	234	117	54	744
GW6VZW	287	-	143	6	-	436
G4TIF	280	28	204	112	-	624
GU7DHI	269	-	94	1	-	364
G1SWH	245	33	179	63	9	529
G0HVQ	235	-	71	-	-	306
G8PYP	228	1	122	35	-	386
G1SMD	206	-	112	-	-	318
G0EVT	187	-	222	60	-	469
G8LHT	169	?	192	93	17	471
GM1XOG	169	-	-	-	-	169
G4MUT	167	25	155	94	34	475
G6YIN	163	-	158	72	-	393
GJ6TMM	162	-	151	52	-	365
G0FYD	162	-	191	6	-	359
G4RGK	142	-	314	166	55	677
G4DEZ	141	-	251	62	56	510
G0NFH	136	27	92	28	12	295
G1UGH	131	-	117	-	-	248
G8XTJ	130	-	121	-	-	251
G6MXL	87	23	104	55	24	293
G1LSB	73	-	177	144	-	394
GM1ZVJ	72	-	48	-	-	120
G7BXB	18	-	66	5	-	89
G7EWL	14	2	59	-	-	75
G3FIJ	1	24	80	22	3	130
G0CUZ	-	-	367	75	-	442
G4SWX	-	-	404	-	-	404
G4PIQ	-	-	289	108	-	397
G4RRA	-	-	299	80	-	379
G4SSO	-	-	267	99	-	366
G4DHF	-	-	342	-	-	342
G0GMB	-	-	202	103	-	305
GW8JLY	-	-	269	36	-	305
G0EHV	-	35	175	81	-	291
GW4VEQ	-	-	267	-	-	267
G3FPK	-	-	246	-	-	246
GW4FRX	-	-	235	-	-	235
G4DOL	-	-	223	-	-	223
G4XBF	-	-	176	-	-	176
G7CLY	-	-	149	2	-	151
GM0CLN	-	-	116	-	-	116
G6ODT	-	-	33	49	-	82
GW0PZT	-	-	69	-	-	69
GM0GDL	-	-	55	-	-	55
G7JAF	-	-	49	2	-	51
G6AJE	-	-	25	-	7	32
GW7EVG	-	-	28	-	-	28

No satellite, repeater or packet radio QSOs. If no updates are received for a year, entries will be deleted. Next deadline is **25 June**. Band of the month 50MHz.

LA8KV, a 4-Yagi 1kW station, and W9OEH. Next day, C53GS was number 180 and a fantastic signal at 1826. The 12th, between 1330 and 2120, brought the other five initials which were: JA4KLX, 4N2EZA, IK4DCX, K1GVM and VE6TA.

Stuart Jones, GW3XYW (GNW), is now QRV on 2.3GHz, thanks to help from Charles Suckling, G3WDG. This is the result of two years' construction and testing culminating in his hearing his own echoes on 4 April. That's not bad for a new Moon/Sun noise period. His first sked with OE9ERC on the 9th failed but that on the following day succeeded bringing a 'first' GW/OE EME QSO on 13cm.

Other completions were with OE9XXI on the 10th, IN3HER on the 11th (for the first GW/I on the mode/band) and SM0PYP on the 12th, a first GW/SM. The 13cm situation is awkward as some countries are allocated 2.304GHz, while the UK, Germany and others have 2.320GHz. Hence the IN and SM contacts were crossband.

Stuart runs an estimated 70W to a 6.7m dish. His partners' stations were: OE9ERC 100W 8m; OE9XXI 30W 9m; IN3HER 100W 5m; SM0PYP 100W 7.6m and WB5LVA, which sked was incomplete on 12 April, 400W 7.5m. He reckons the main problem at this frequency is generating enough power at the feed. 6/7 June is a sked weekend and 27/28 June looks favourable, too.

50MHZ

PROPAGATION

The March report from Ray Cracknell, G2AHU (HWR), includes the three-hourly K-indices recorded at Eskdalemuir for the complete month. Only for a few hours on the 17th did they reach 5. He states that: "March 1992 was distinguished by an almost complete absence of magnetic disturbances and consequently auroras."

By contrast, in the period 24-26 March 1991 there were storm conditions resulting in the second largest event this solar cycle. Although solar and geomagnetic activity have markedly declined, we should not write off the band. As Ray comments: "Sporadic-E does not decline with the sunspot cycle and if we have geomagnetic conditions like March 1992 in June/July, transatlantic Es will be very good."

He reminds us that: "TEP will continue, albeit on a reduced scale, right through sunspot minimum as will aurora. Tropo and meteor scatter are unaffected by sunspots and 50MHz is the best band for working all these modes." He warns against deserting the band if F-layer DX declines, adding ominously: "It could be fatal if you do."

The first major Es opening of the summer season was on 24 April. Ted Collins, G4UPS (DVN), reported that 4X1IF worked into 9H at 1040, while at 1220 Ted heard Russian in-band FM traffic. G3ZYY (CNL) copied the 4N3SIX beacon at 1230, then the band opened up to I, YU, OE, DL and OK. Some YUs in Osiek, Croatia, were operating while under bombardment; how dedicated can you get?

NEWS

David Bowman, G0MRF (LDN), plans to operate from Sri Lanka from 12 June to 4 July. He has been issued with the call 4S7DBG. Three other members of the Whitton ARG are going; Doug Goodison, G0LUH/4S7DGG; Paul Nicholls, G0ONA/4S7PNG and Jan Vassek, G0OHW/4S7JVG. A considerable amount of gear has already been shipped out.

TEP and Es propagation should provide opportunities to work into Europe so listen for 4S7 on 50.110MHz SSB and 50.095MHz CW. Beacon or keyer modes are proposed when propagation seems possible. All QSLs should go via G0MRF, who was G8PDW, at 31 Benson Close, Hounslow, Middx TW3 3QX.

G4UPS reported that VQ9JY in Diego Garcia was believed to have made his first 50MHz QSOs on 24 March, working 9H. From the RSGB world map the square is probably MI62. QSL to Jason's home QTH, KB7CDA. According to JA1BK, EK0JA has been worked. He is UW0MF, newly licensed for the band, but can only come on very rarely when the TV station goes QRT. He runs 100W to a 6-ele Yagi.

J37AE is QRV again from Grenada. QSL to James Langdon, Philatelic Dept, Post Office, Sauters, Grenada. ZD7CRC should be on from St Helena; he is Chuck Chalmers, PO Box 126, St Helena. P29CW can be QSLed via PO Box 461, Ukarumpa via Lae, Papua New Guinea. F1JKK is now QRV from Turkey as TA9/F1JKK and may be QSLed via F6FNU. HI8A has returned to Japan so QSLs for him should be sent to Akito Nagi, PO Box 73, Ishii Tokushima, 779-32 Japan.

From Kuwait, 9K2ZR and 9K2WR have been active from 30 March and by 20 April had worked over 25 countries. QSLs should go via K8EFS for 'ZR and via N6UXB for 'WR. VK8RH is reportedly building a beacon for Kuwait; proposed parameters are 50.0415MHz, 9K2SIX, continuous CW operation. Further details when a licence materializes.

Commenting on GJ4ICD's 28min WAC, Peter Halpin, PE1MHO/G7ECN, wrote that his took three years. But he repeated it in four weeks in January, all on QRP with small antennas. He has 72 legal countries in the log and is quite satisfied bearing in mind his non-exotic call.

ACTIVITY

During the last week of March, the only DX from the British Isles consisted of afternoon openings to central and southern Africa. The first three weeks in April saw predominantly mediocre conditions with nil reported on most days. ZS6s were heard/worked from about 1300 on the 4th and an aurora was noted, 1645-1800 with G, GI, GM and SM worked.

ZSs were coming through on 5, 9 and 12 April. At 1210 on the 17th, G4UPS noted very strong Russian traffic on FM consisting of several simplex nets. DF7QY was heard at 1246 on CW. At 1137 on the 18th, Ted worked CN8ST on CW but no other DX was heard. Things were better on the 20th with an opening between Italy and Brazil from 1315. PP5WL, G4SMC/8R1, LU3EX and beacon CX1CCC were heard till fade-out at 1415.

QSL

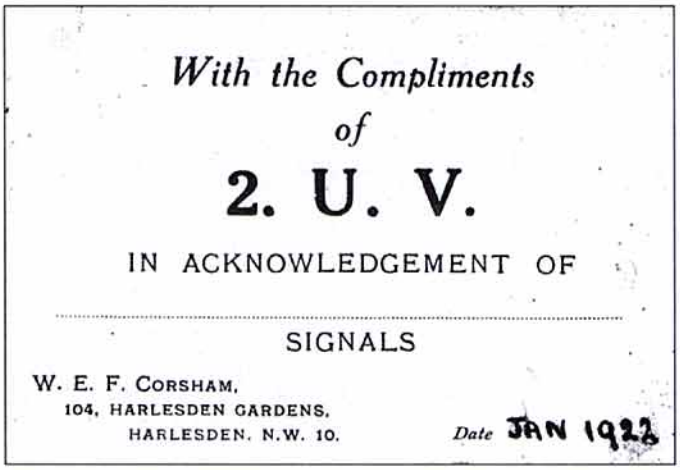
RSGB QSL Bureau,
PO Box 1773, Potters Bar,
Herts, EN6 3EP

● I wonder if many members know that the first British and, very probably, the world's first QSL manager was Cecil Jamblin G6BT of Bury St Edmund's in Suffolk. Coincidentally, I am a member of the Bury St Edmunds club. G6BT started his activities in 1926 and the Society has provided the service ever since. One of the selling points for the fledgling service was that a member could very soon save the cost of his subscription by using it instead of the postal service and, I suppose, that is still true today.

● I am grateful to Hartmut Gumpert, 9X5HG, for writing to let me know that there is no QSL bureau in Rwanda. Apparently it is pointless sending cards to PO Box 663 Kigali, Rwanda, because nobody is collecting them! Now I am not sure where this PO Box number originates from because Rwanda is not shown as having an official bureau in the definitive list issued by IARU. Obviously some time in the past this was given as a destination address for cards to that part of Africa but it has long ceased to be functional. So be warned!

● For those of you concerned about the situation at PO Box 88 Moscow I can tell you that it is working quite normally and will even accept and forward cards for the Baltic republics although our understanding is that they levy a charge for doing this service.

A D-I-Y QSL card. To quote G3EAY: "Select suitable photo, mark callsign and RSGB logo. Take photo close up with SLR camera, using close-up lens. Take to shop for developing with extra prints - cost approx 6p each".


With the Compliments
of
2. U. V.
IN ACKNOWLEDGEMENT OF
SIGNALS
W. E. F. CORSHAM,
104, HARLESDEN GARDENS,
HARLESDEN. N.W. 10.
Date JAN 1922

The world's first QSL card reproduced here actual size. The original is in the RSGB HQ museum.

In fact the RSGB central bureau has, for some months now, been forwarding cards direct to the Baltic republic bureaux.

I am most grateful to John Allaway, G3FKM, for this information obtained at first hand from within the CIS.

● One of the constant worries that beset QSL sub managers is the number of uncollected cards. It's the same throughout the bureaux of the world and a great deal of trouble could be avoided if only operators would say quite clearly at the time of a QSO whether they do, or do not, intend sending a QSL card - and then sticking to what they say.

You know, the principle behind SQUALL (I will only QSL if you do) is a good one. If it were adopted universally it would reduce the number of cards that sub managers have to destroy every year. They don't like doing that; think of the enormous waste involved. ***John Hall, G3KVA***

During the aforementioned Es opening on the 24th, there was also propagation to South America. At 1212 PY5CC was copying Greek beacon SV1SIX, and worked into Malta. PY5CC and ZP6CW were coming in, probably by enhanced TEP mode, till about 1500, but by 1515 it all faded out.

70MHZ

ANYONE NEEDING Kent is invited to contact Phil Boorman, G0JBA, either QTHR or @ GB7SEK. He runs an RN Electronics transverter, driven by an Icom IC-735, with BNOS 100W amplifier. The antenna is a 5-ele NBS Yagi. Ian Cornes, G4OUT (SFD), operated in the 29 March Fixed contest. New ones for the table were G4WDL (CHS), GW7ATG/P (CWD), G0JBA, G1SWH (MCH), G8APB (SFD) and G4LDR (WLT).

144MHZ

IT SEEMS that this band was devoid of any DX tropo propagation in April. Colin Morris, G0CUZ (WMD), mentioned an aurora on the 3rd in which the only DX worked was OZ1FGP (JO46). From Fife, Arlen Pardoe, GM0HUO, who usually hears/works auroras inaudible in the south, had nothing to report. He had a tropo QSO with GB2XS (IO78) during Clive Hennessey's, GW4VVX, annual pilgrimage to XS square.

430MHZ AND UP

G0JBA IS QRV on 430MHz with a Kenwood TS-790E, 25W to a 21-ele F9FT Yagi at 17.5m AGL with a 13dB masthead preamp. He also operates on 1296MHz with 10W, 4 times 23-ele Yagis at 16m and a 20dB masthead preamp. Phil wishes more people would try 1296MHz on which he has worked LA6LCA (JO59FE) at 1067km.

DEADLINES

SORRY THERE was so little to report this time but there ought to be some Es to gloat about next month, at least on 50MHz. If the current low geomagnetic activity continues, we probably won't enjoy any good auroras but hopefully the tropo scene will liven up.

The deadline for **July** is **28 May**, for **August, 25 June** and for **September, 30 July** - all Thursdays. My fax machine is QRV 24 hours a day, so call it on 081-668 5582. If you use BT Gold, the mailbox is 76:MSX021, while the telex number is 9312111074(CN).

HF NEWS

continued from page 16

Each QSO with AM25 or AO25 stations will count one point and QSOs with official Olympic centre and sub-centre stations five. To get the award, you need 100 points and to have worked at least five Olympic centre or sub-centre stations including Barcelona. Repeat QSOs with the same station count provided that these are on different bands or modes and that they are at least 24 hours apart. Rules are the same for listeners. The callsigns of the official stations and sub-centres are as follows: EH92B (Barcelona), EH92A (Banyoles), EH92C (Castelldefels), EH92D (Badalona), EH92G (Granollers), EH92H (L'Hospitalet de Llobregat), EH92I (Viladecans), EH92L (Sabadell), EH92M (Sollet), EH92N (Valencia), EH92R (Reus), EH92S (Sant Sadurni D'Anoia), EH92T (Terrassa), EH92U (Seu D'Urgell), EH92V (Vic), and EH92Z (Zaragoza). It seems that this is a contest although listed as an award - and awards will be given to continental and country leaders. Submit full details of QSOs in log form and include the usual declarations. Send to Comite Organizador Actividades Radioamateurs Barcelona-92, (HF Award), PO Box 1461, 08080 Barcelona, Spain, to arrive before 1 September 1992.

SEMENIC MOUNTAIN AWARD

Issued by the YO2KJI club station of FRR. Single and multiband versions (in the latter case the same station may be worked on different bands for credit). Europeans need 35 points. QSOs since 1 January 1986 with YO2s KJI, LDE, DFA, and DHN count ten points, with YO2s BBT, BK, BKL, BLP, BVC. CCE, CRX, FV, GZ, KCB, KJA, LAU, LAV, LBN, LFT. LYL, and QQ count five. Contacts made during the YO DX Contest count double. Send certified list plus five IRCs or £1 to Dany Vussou, YO2DLE, PO Box 26, R-1700 Reita 4, Romania.

THANKS

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

Please send everything for the **August** issue to reach me no later than **18 June**.

Novice NEWS

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

FAIRHAM Community College now offers the chance to take the NRAE exam for those living in the Nottinghamshire area, and it is accessible for entrants from South Yorkshire, West Lincolnshire and North Leicestershire.

The cost of the examination is £9.65 with an additional charge of £5 for external candidates. With the closing date for the September exam looming (1 July) this information may be useful to anyone wanting to take it at a venue closer to home.

HATS OPTIONAL

THE UK 6 Metre Group holds its Six metre UK Summer Sporadic E Contest on 16 June, from 0000 to 2400GMT. The Group has 700 members world-wide.

The Keighley Amateur Radio Society Contest Group enters this contest, mounting a station on Ilkley Moor. They hope to do even better than last year when they worked 208 stations in five countries. Apart from the fact that you may wish to enter on your own behalf, there is another option if you live within striking distance.

Graham, G7BUR, is organising the event on behalf of the Keighley club and sends an invitation to you through this column. As this is a band open to Novices, Graham hopes that many will be trying to make contact, and that many Novices will visit the station to join in the fun. This invitation does not apply exclusively to Novices of course, but to anyone who is interested.

Furthermore, he said that if there is enough interest, he would like to use a special rig within the bounds of Novice conditions to be run *by* Novices *for* Novices. A nice idea.

The station will be housed in a caravan, which does not allow a multitude to enter at any one time, so if you are interested please get in touch beforehand and let them know you are visiting. It would also give him an idea of how many gallons of water to take up there for the coffee that will surely be needed. He did murmur something about possible light refreshments too.

For those who cannot make it but would like to know more about the contest, the rules are simple. Two-way communication on six metres or cross band working if in contact with a country which does not have this option. Exchange calls giving RS(T), membership number, Maidenhead locator (only four digits). Serial number is not required.

If you would like to know more about visiting the station or how to contact it, get in touch with Graham, G7BUR, (QTHR) or ring 0535 669002. For Novices who would like to look at what this band has to offer and do not have the gear, this seems an excellent chance.

Best of luck to all who take part. Enjoy yourselves.

ANOTHER OFFER

APART FROM the invitation to visit Ilkley Moor, if you look back to the March *Novice News* you will find two other offers which are on-going.

Alex, G0DHZ, invited any amateurs to go along to the Coastal Defence special events stations and join in there. He also suggested to me that if any Novices in the areas of Petersfield, Portsmouth, Southampton or the Isle of Wight were interested, there was an amateur in each area who would welcome them and give all information needed. Should you wish to know more, I can put you in touch.

Del, G0DLN, having offered Novices the chance to work from his location in the Croydon area, suggested that a list of amateurs willing to offer the same facility could be compiled so that Novices could find a friendly shack where they could get more on-air experience.

In beautiful copperplate script Brian, G0IFX, makes a similar offer. He remarks that it may be the only way that he ever gets to speak to a Novice! Brian lives in Fallowfield, Manchester, and looks forward to hearing from anyone interested in taking up his offer.

Any more for my growing list?

MEET THE BERRYS

FOUR AMATEURS in one family under the same roof is going to be a fact of life in other households perhaps, but the Berry family will be able to give advice on how to cope with it!

David, G4DDW, has been interested in radio for some time - seventy years or so. He built the family a three-valve battery receiver in his early construction days.

Semaphore flags (which had seen service in the Boer war) were his means of communication in Norway in 1940, where he was 'left behind', but managed to escape into Sweden, and met Vic, a young civilian. The rest of the war years were full of action too, including being wounded.

In 1970, he visited Vic in Stockholm, now holding the callsign SM5KP, and was bitten by the bug. The A licence was essential to hold regular skeds with Vic and one was gained in 1973. Weekly contacts have continued for 19 years. David has now retired from farming, and grandson Edward was the first to find another interest for him. The former egg-grading station was converted into a classroom to accommodate the family and he has led his trainees through the Novice course. Now five more Novices can look forward to a life of making new friends in the hobby, with another four under instruction. Kate, 2E1AGG (13) and Edward, 2E1AGF (11) took part in the 2m contest along with David, so they have already sampled another aspect of amateur radio.

Edward is building a 50MHz QRP transceiver and all the family will be tackling the Morse in the New Year. Does this make it a 'radio-active' household?

JOTA '91

I WAS DISAPPOINTED at the lack of information regarding the success or otherwise of this event from individual Jamboree on the Air stations. I have now received the UK Report on the 34th JOTA, thanks to Public Relations Officer, John Fogg.

In 1961, some fifty stations took part. In 1991, 340 stations took part involving 11100 Scouts, 2368 Guides and 7400 others, with 1640 licensed amateurs helping the Scout stations. This makes 4.8 amateurs helping per station! RTTY, Packet, Satellites and SSTV were used as well as speech, with an average JOTA station speaking to 26 similar UK stations, 11 overseas JOTA stations and sending 28 greetings messages around the world.

That means that 9486 greetings messages were sent. At two minutes per message the time for those alone amounts to just over 316 hours. JOTA station contacts within the UK account for 730 hours and outside the UK another 303 hours. Gosh! I'm tired!

HIGH FLYING NOVICE?

PETER, G0GTE, wrote and asked for information on 'Kidlink' and added a very interesting postscript.

His daughter, Emily, took the March NRAE and is hoping to do a sponsored parachute jump on behalf of the RSGB's MENCAP Albania Appeal shortly. Emily is seventeen and is studying for her A levels. Her first-time parachute jump should take place in early June and GB2RS should give final details regarding date, time, callsign, etc. Please help to make Emily's venture worthwhile - perhaps by pledging your support as is done for the Children in Need Appeal.

A Novice in the air is a novel idea which should raise interest. I hope she raises a lot of money too. Emily asks that sponsorship money be sent to her father, Peter Daly, at 48 London Road, Stevenage, Herts SG1 4PJ. Cheques should be made out to the RSGB Albania Appeal.

Lord Rix works extremely hard

Four amateurs in one family: (l to r) Edward, 2E1AGF, David, G4DDW, John, G7LCK and Kate, 2E1AGG, busy in their classroom. Of added interest perhaps, is the old wave-meter and plug-in coils, circa 1920, on the shelf.

David is twelve, holds the callsign 2E1ABH and is a member of the Wollaston Baptist Scout Group. He was one of the first Novice trainees to take the NRAE. There were fifteen candidates from Northamptonshire but only David from that immediate area. I am sure he won't feel lonely! Thanks to G6FJF for this snippet.

to raise funds and Emily is trying to help - what say we support them both and raise a very respectable sum. I will report after the event.

We all wish you luck Emily. Please tell us all about it when you come down to Earth. You are braver than I am!

FRIENDLY DRAGONS

DEWI, GW0ABL, has written again, and sent the Dragon Amateur Radio Club newsletter and his promised progress report on Novice training on the Isle of Anglesey. Distances between the potential Novices and Instructors in rural areas caused problems, as reported last August.

Obviously, some gentle arm-twisting has taken place, and a course involving three sets of four students, two instructors and three assistant instructors has begun at the local technical college in a large classroom, with the added advantage of use of the electronics workshop. Best of luck from us all. May there be a dozen 2Ws later this year, with an age-range of ten to seventy-plus.

Dewi, who organised this, hopes that after this first course, the assistant instructors will feel confident enough to apply for Instructorship in their own right. This has happened in many other cases where, having been involved without full responsibility, amateurs have decided that they too can lead and, perhaps, enrol more assistants in turn!

This course will go a little further than the average too. During the time the course is running, a 'Castles on the Air' station will be operating at Penrhyn Castle. This station, of course, will require aerials to be set up and loggers will be needed. No marks for guessing who will get hands-on experience in both fields plus, of course, the opportunity to pass greetings messages and maybe start their collection of QSL cards.

It is a great pity that I could not tell you of this *before* the event, (23 May) as then you could have looked for GB2CPC, and had the chance to offer budding Novices a word of encouragement - or perhaps you found them anyway!

There could be a second chance on 24 July when there is a Summer Fayre at the castle with GB2CPC again in operation.

ARE YOU BREAKING THE LAW?

IT IS illegal to transmit using more power than your Novice licence allows. If your equipment is *capable* of giving forth more than the three watt output permitted, you must ensure that it has been modified to see it *does* not.

If you possess the equipment but are not yet licensed, it is illegal to keep it in a state ready to transmit.

If you are caught in either of these positions, you could be fined heavily - with costs and have your equipment confiscated. You could even have your licence revoked or fail to have one issued to you. So, what do you do?

In the first instance, make sure that the modification is done by someone qualified to do it, with the appropriate test equipment. If you contact your local amateur radio club, someone will advise you, possibly putting you in touch with an experienced amateur who will do the job for you. When you get the full licence, it is easy to return things to the original state.

In the second instance, it is even easier. Disconnect the microphone and remove it from the scene. Keep that packed away until you are licensed to use it. Temptation cannot then raise its ugly head.

You have worked - or are working - very hard for that licence - do not put it at risk before you have had the chance to enjoy using it - or we will never meet on the bands!

NOVICE OFFICIALS

ANOTHER NOVICE who is already involved in more than just making contacts, is Stuart, 2E1AGH. Having joined the South Dorset Radio Society, he has been elected on to the Committee. I would like to think that Clubs not only welcome Novices, but include them in this way. Are there any other Clubs involving Novices - and any Novices willing to be involved - out there? Please let me know and I will spread the word. The newsletter is called *Catswhisker*!

NOW MEET 'Y'

AFTER READING "Morse Not Spoken Here", I have heard from another amateur who feels slightly fraudulent as a 'G0'. Again, I will not give a name or callsign.

After one year using a Morse tutor, there was no positive result. After another year, spending an hour a day, there was some progress. This was improved by listening to a local CW group who were practising plain text and five figure number groups (as in the amateur test), and the test was taken - and passed.

End of story? Oh no! Just before the test, 'Y' noticed that the front panel switch was set at 'mixed', for how long he didn't know, but in spite of coping with the group practice, (separate words and numbers remember) he could not read from the tutor at anything more than five words a fortnight. Yet he could copy *separate* words and numbers at a very respectable speed.

The advice that 'Y' gives is "Throw away the tutor as soon as possible and *listen* to *real* CW", with the mixture of words, numbers, punctuation marks and procedures you will hear, and use, in the future.

Like many amateurs, 'Y' was not prepared for this and after eight or nine attempts which he found very hard going, and certainly not pleasurable, he abandoned the effort.

His final comment is that he wishes all Novices well and hopes that they don't waste their time as he did.

ENCOURAGING NEWS

FROM ROY, G4SSH, Chief Morse Examiner, comes the breakdown of the first six months of the Novice successes in the Morse test.

The number taking the test was not given, but with Emma being number 24, you can work it out for yourself - given the rest of the information - which is a 78% pass rate and that 80% of all candidates followed on from a Novice course with the other 20% being Class B licence holders.

The youngest Novice 'A' is ten and the oldest is seventy which just shows that age is no barrier - at either end!

PHOTOS PLEASE

IT CAN'T have escaped your notice that this column is now in glorious technicolour. While all news stories are welcome, along with *all* photographs, colour pictures are especially welcome. I know that some come from press reports and these are always black and white.

It would be nice to have a Novices' Gallery, consisting of head-and-shoulder portraits. Send all photos to the address above.

SWL NEWS

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

DAVE BORNE, G4CYW, the Society's SWL QSL Bureau Manager, enclosed a note for publication with a recent batch of cards. The current situation is that he receives cards on a regular basis about once every two months from HQ. This has been the case for about a year. I am pleased to report that the size of the box which gets the cards to Dave has been reduced from an 'apple' box to a 'shoe' box. This does mean that Dave gets cards more regularly to send on to his clients. Dave wishes to remind SWLs that the preferred envelope size is about 20 x 12cm, and that Jiffy bags are definitely not welcome!

With this good news about SWL QSL cards I do not expect to hear any more moans about the service. If you are not receiving cards regularly it is probable that there are not many arriving at the Bureau for you, or your envelope instructions need amending. Those sending envelopes with high value stamps will obviously wait longer for the envelope to be filled up.

As a guide, a first class stamp will probably net you about 15 cards. If you want them more regularly, ask Dave to amend your instruction to, say, "wait 10". Dave will be only too happy to oblige.

WHERE'S THE DX?

EACH OF THE three main DX bands have spot frequencies which the major DXpeditions favour. These are, on 28MHz, either 28.395, .495 or .595. In the past, 28.595MHz was the usual choice, but in recent times this has changed, so that most big expeditions choose 28.495. On 21MHz, there is either 21.295 or .245. While on 14MHz, the choice is between 14.195 or .145. If you monitor these frequencies you will, doubtless, bag all the big DXpeditions.

As well as these spot frequencies, another source of hearing the DX is to tune into a 'net'. Our licensed colleagues either love or hate them, but for the SWL, there is no doubt that they are a useful source of finding exotic locations. Some of the most well known nets, along with their frequencies and times, are given in Table 1 (I have to thank David Whitaker, BRS25429, for helping me to compile this list).

These appear to be the most attractive of the DX nets. If anyone can confirm the times we are unsure of, I can note any amendments in a later issue. I hope that these frequencies will make listening more interesting and will lead to some of the Society's less established SWLs collecting some better DX. Next month I shall look at the DX contests occurring during the year, which always seem to attract activity from exotic parts.

FREQ	NET	OPERATING TIMES
14.143	The South American Net	2130 daily
14.150	The Arctic Net	0800 Sat/Sun
14.160	The ET Net	2100 daily
14.222	The VK9NS "222" Net	0600 daily
14.226	The Butterfly Net	various
14.243	The European DX Net	1500Mon-Thurs, 0700Sat/Sun
14.250	The Arabian Nights Net	0500 daily?
14.256	DX Net	1600 daily
14.260	IOTA Net	1300 Sat/Sun
21.157	The DK9KE Net	1000 daily
21.170	The French DX Net	1500 Sat
21.335	Snookys Net	1600? daily
21.345	The Family Hour	1700? daily
21.355	The Afrikana Net	1800? daily
28.530	The Brazilian DX Net	1300 Sat/Sun

Table 1: Some well-known DX nets.

HF NEWS

I SHALL kick-off our usual look at the HF Bands with the news that four British amateurs (G0LUH, G0MRF, G0OHW and G0ONA) are mounting a big DXpedition to Sri Lanka (4S7) and will be operating all bands, all modes from 12 June to 3 July, taking in the All Asia DX Contest. I understand that they will use the special callsign 4S0UK. I shall be handling the QSL cards for all SWL reports (other cards will be handled by G8PBM). Cards with return postage will be returned direct, others will be answered via the Bureau. Look for the group on 14.146, 14.186 or 14.260MHz, and between 28.400 to 28.500MHz. They will also be active on 7 and 3.5MHz, the WARC Bands and 50MHz.

VE7HBL has advised me that he will be holidaying in the Lake District in May and June and will be active as G0/VE7HBL. He will be pleased to QSL all listener reports. His QSL details are Bill Leyland, 2130 Patricia Avenue, Port Coquitlam, British Columbia, Canada V3B 2H1.

A letter from G0NKZ failed to beat last month's deadline, but he wrote to advise SWLs that 4L6CH would be active from 25 April to 3 May, to draw attention to the continuing problems resulting from the Chernobyl disaster. If any SWL heard the station, a safe bet for QSLs is via G0NKZ (Glebe Cottage, Glebe Close, Southwick, Sussex BN42 4TF) who was to have been one of the operators.

Moving on to conditions over the second half of March and early April, several major DXpeditions dominated the news. The two big ones, of course, were FO0CI (Clipperton Island) and VP8SSI (South Sandwich Island). During the WPX contest, 21MHz was still open to Africa, North and South America and the Near East at 0300. As well as the FO0 and the VP8, YX0AI (Aves Is), YA5MM (Afghanistan), VK9CK and CL (Cocos-Keeling Is), PY0FZ (Fernando de Noronha Is), KP5/N1DX (Desecheo Is), N0PMF/KH8 (American Samoa), S92SM (Sao Tome) and WZ6C/S2 (Bangladesh) were active. There is a good deal of doubt about the last one as, although operating permission was expected, it had not at the time of writing, been received.

28MHz: HC8A, HT1T (YN), HU1FT (YS), J68AX (Via OH3VV), J8/W8KKF, TU4SR, TZ6FIC, V31DX, V4ITU, 5Z4BI, 8A2DX (YB) and 8R1JV.

21MHz: A47RS, AH0K, HF0POL, HK0/HK5JPS, HL9AA, HS0XPO, JH1MAO/JD1, TL8NG, T26NU, T30A, V63OM, V73DH, V85HG, XX9AS, ZF2NE/ZF8, 3D2AG, 9V1YC, 4U1WB (World Bank), 5H3RA, 5R8GW, 6D2X (XE) and 7Q7XX. Indeed looking at this selection, 21MHz was probably the 'star' band over the period.

14MHz: A61AD, C6A/G4AML, F05IV, H44MS, JT7AA, TG9QQ, VP5/KN4UG, 5U7M.

7MHz: K2NG/PJ4, VP2EC, 5V7JG, 9K2WR and 9M2AB.

3.5MHz: PJ0B, PY0FF, V44KAQ, 7P8DX, 7Q7WB, 9K2ZZ, 9Q5TE, 9V1XQ and 9X5NH.

Philip Davies, G1EMD, mentioned that during the IRTS Diamond Jubilee in conjunction with St Patrick's Day, he heard 22 of the 26 Irish Counties on 7MHz.

VHF NEWS

THINGS ON VHF have been relatively quiet, but a surprise Tropo opening to EA1 and EA2 on 19 March was useful for square collectors. On 50MHz, 21 March provided a number of ZSs and A22BW. 5 April gave Dave Whitaker his first ZS4 in KG41. Brian, BRS93818, received his callsign (G7LIJ) and worked 41 squares in his first month on 144MHz.

FINALE

DEADLINE FOR **August** is **10 June**.

Doug, G0LUH, will operate as 4S0UK this month. He is seen here on a previous visit with best-selling science fiction writer Arthur C Clarke.

HF F-LAYER PROPAGATION PREDICTIONS FOR JUNE 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.	..1232212442	223455445675	766666556788	865333334578	642111.11257	3.....24
MALTA	.....	....1...111.	1.1332323443	423555555776	867766667899	987543344689	875211112368	+42.....35
GIBRALTAR	.....	.....	...111111221	2..343333453	744676566788	987654445689	886422112468	+53.....35
ICELAND	.....	.....	.....	....11..1121	422344334566	876554444567	665322112245	332.....2
** ASIA								
OSAKA	.....	.....	...111112231	1..132113453	....2...2573	251	.....2.	.....
HONGKONG	.....	...111..122.	1.1122223452	211122224675	2.....2686	354	32	.....
BANGKOK	...111..111.	..1222112331	112233224664	311123224786	5.....2688	3.....367	34	2
SINGAPORE	...111..111.	..1222112331	212233234664	421123224787	51.....2688	3.....367	1.....35	2
NEW DELHI	...111..111.	..1222112331	222333334664	532112224787	73.....2689	51.....367	2.....35	2
TEHERAN	..1222112221	1.2333223442	335433335776	655212225788	873.....2689	84.....367	52.....35	2.....2
COLOMBO	..122211222.	1.2333223441	323334335775	642113235787	84.....2689	61.....367	4.....35	2
BAHRAIN	..1222212331	113333334553	435433446787	766211235798	973.....2689	851.....368	62.....35	3.....2
CYPRUS	..1222212321	1.2444434553	435666667887	767766667899	987533345789	87421..12478	752.....256	42.....23
ADEN	1.1223333442	213434445665	646433446888	877311235899	985.....2689	862.....368	63.....36	3.....3
** OCEANIA								
SUVA/S	.....	.....	.....111.	..1221112331	..342...155.	..12.....22.	.....	.....
SUVA/L	21.1.....42	3223.....64	4356.....85	23671.....74	..552....251	..22.....22.	.....	.....
WELLINGTON/S	.....	.....	..1111....21	112221....52	12542.....63	..32.....241	.....2.	.....
WELLINGTON/L	21.....2	4221.....4	6554.....37	66761.....57	34651....175	1142.....252	..1.....2.	.....
SYDNEY/S	.....	..11111.....	1124322....2	213542211..5	2.241...1326	...1.....353	31	.....
SYDNEY/L	1.....2	3111.....4	53341.....17	53462.....27	21352.....66	..13.....153	21	.....
PERTH	..12221.....	1.23332.....	32445431....	53344321....	63111...112.	4.....251	1.....34	2
HONOLULU	.....	.....	.....111.	..1111111211	..332...12..	..22.....	.....	.....
** AFRICA								
SEYCHELLES	..1222333111	213434445332	536434446666	866312235788	985.....2689	862.....368	63.....36	3.....3
MAURITIUS	..1223334443	1.3434556666	4.6534446888	717323235899	9551....2689	862.....368	64.....36	3.....3
NAIROBI	2.1223445533	423434556755	756634456888	987522235899	9972....2689	874.....368	651.....36	32.....3
HARARE	2..222455643	411434567766	844744456898	976732225899	9974....2689	8851.....368	652.....36	32.....3
CAPETOWN	...22245562.	...444567841	...754456873	2..753224886	73.52...1689	8712.....368	662.....36	33.....3
LAGOS	1..122455642	421343567875	753653346898	986742124899	99751...1589	8852.....268	662.....36	33.....3
ASCENSION Is	....3134554.	11..53456762	441164446885	774352224798	99742...1589	8852.....268	663.....35	33.....2
DAKAR	21.131244542	422353455764	765664344887	987752122799	99852....489	8862.....167	663.....35	33.....2
LAS PALMAS	1...21121221	21.242343453	633565566786	866776677898	998765455689	987532122478	77521....156	542.....24
** S. AMERICA								
Sth SHETLAND	......34452.	......45574.	......44587.	1224782	1.....1586	623.....267	653.....35	33.....2
FALKLAND Is	243442	1....1355664	3....2345887	6....2224789	94411...1579	8752.....257	663.....25	33.....2
R DE JANEIRO	21...1243442	421..3354664	754114444787	987223223589	99742....379	8852.....57	663.....25	33.....2
BUENOS AIRES	2....1233332	4211.3354564	7544.4345687	9876.3223589	99751...1269	8853.....37	663.....15	33.....2
LIMA	1...1.111122	31.121232244	642342333356	875552222247	99752.....16	8863.....3	663.....1	33.....
BOGOTA	1....1.1.111	31..12121133	632233232246	864443221137	98753.....6	7853.....3	553.....	22.....
** N. AMERICA								
BARBADOS	1...11.11121	31.122222243	642343332357	875553221158	99752.....27	8863.....4	663.....1	33.....
JAMAICA	11	2....1111123	521112222235	753332221126	88652.....4	6853.....1	353.....	.2.....
BERMUDA	11	2....1111122	521112221145	753222211137	88652.....16	7753.....3	453.....	.2.....
NEW YORK	.....	1.....12	41...1111124	642112111126	786321.....4	5752.....1	252.....	.2.....
MEXICO	.....	1.....11	31....111123	542211121113	57642.....1	3753.....	.42.....	.2.....
MONTREAL	.....	1.....11	31...1111124	632111111125	775321....14	5752.....1	252.....	.2.....
DENVER	.....	.....	2.....1	4211.....2	4653.....	1552.....	.22.....	.....
LOS ANGELES	.....	.....	1.....1	2211....1.11	25531...1...	.352.....	.12.....	.....
VANCOUVER	.....	.....	1.....	2111.....1	14431...1...	.252.....	..2.....	.....
FAIRBANKS	.....	.....	.....	111111..11.1	11332...111.	..22.....	.....	.....

The provisional mean sunspot number for April 1992 issued by the Sunspot Data Centre, Brussels was 102.2. The maximum daily sunspot number was 185 on 21 April and the minimum was 54 on 10 April. The predicted smoothed sunspot numbers for June, July and August, are respectively: (classical method) 122, 119, 117; (SIDC adjusted values) 138, 137, 135.

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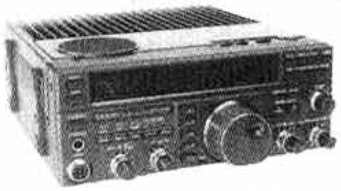

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★ JRC
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★ STANDARD
★ COMET
★ HOKUSHIN
★ CREATE
★ DIAMOND
★ OSCAR
★ HIMOUND
★ HENRY RADIO
★ STRUMECH
★ DRAKE

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ICOM IC2410
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RSGB Albania Mencap Appeal

Mike, G3YPP, raised over £300.

PRIZES!

CLUB RAISING THE MOST MONEY
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CLUB'S MOST UNUSUAL EFFORT
2 metre handheld

UNDER 18 RAISING THE MOST MONEY
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INDIVIDUAL MOST UNUSUAL EFFORT
2m/Marine Scanner

LARGEST DONATION FROM OUTSIDE THE UK
'Mini-Pack' packet radio system

Plus these prizes for runners up in all categories.

Barker & Williamson VS300A matching unit; Pump Action Morse key; Rugby Time Clock; Supa-Tuta Plus Morse Tutor; MP7/14/21/28L medium power capacitor dipole; Digital thermometer; 2m indoor Preamplifier; Microreader MkII.

We would like to thank the following companies for their support in this appeal:

Strumech Versatower, AKD, Waters & Stanton, Nevada, Martin Lynch, Hately Antennas, Siskin, Bredhurst, ICS, Datong, RN Electronics, G4ZPY Paddle Keys, Dewsbury, AMDAT, ERA and Mark Furness Ltd.

THE RSGB Albania Mencap Appeal aims to raise runds for much-needed better conditions for mentally and physically handicapped people in Albania. This is being actively supported by many members (see April and May *RadComs*).

The trade have also taken up the gauntlet to help us in this venture. They have come up with a fantastic selection of prizes for us to award in individual categories, and there are still opportunities to win some excellent prizes. Several thousand pounds have been raised already, but there is still a long way to go!

Several members have sent us information on sponsored activities, including:

* Mike Costello, G3YPP, who completed the ADT London Marathon on 12 April in 4 hours 31 minutes, and raised over £300 for the appeal.
* Amanda Baird, G7JVH, is raising sponsorship for a parachute jump in June.
* Emily Daly, daughter of Peter, G0GTE, is also planning a sponsored parachute jump in early June (see *Novice News*, page 20).
* Hilary Claytonsmith, G4JKS, has raised over £280 with a sponsored slim.
* RSGB HQ staff are raising over £300 from sponsored slims.

If you would like to sponsor either of the two parachute jumpers named above, get in touch with Marcia Brimson on 0707 59260 and we will pass details on.

For those organising sponsored events, official sponsor forms are available from Marcia at the above number.

Several thousand pounds have already been banked, but think how much could be raised if every member sent in just 50p. Let us prove to the outside world that we are a generous bunch at heart. Who knows, you may be lucky enough to win one of our super prizes.

N.B. Appeal closes 14 August.

***The press have already picked up our appeal and this appeared in the* Hull Daily Mail.**

Peer tunes in to hams' generosity

LORD RIX has launched an appeal for amateur radio enthusiasts to aid the country's mentally handicapped.

The Cottingham born former' king of farce, who is an enthusiast himself, is backing a £50,000 appeal to help MENCAP's endeavours in Albania.

Lord Rix of Whitehall in Westminster and Hornsea in Yorkshire - Sir Brian Rix until his recent peerage - has devoted much of his life to the charity's work.

And MENCAP, which supports more than 150,000 people with a mental handicap or learning disability, is now working on a major programme in Albania boosted by the Radio Society of Great Britain.

The Society, of which Lord Rix is a lifelong member and vice-president, represents the interests of about 50,000 "hams" nationwide.

Lord Rix, who was first licensed at the age of 13 in 1937, is known worldwide by other radio amateurs through his callsign G2DQU. His older brother, Malcolm (G5GX), who lives in Hull, is also licensed.

MENCAP is hoping to raise the money for people living in hospitals and institutions in Albania, where amateur radio was only recently re-authorised after a lengthy ban.

Lord Rix has urged all RSGB members to support the appeal. Through its worldwide membership and friends, the society hopes to raise a substantial part of the £50,000 target figure.

"We are appealing to you for as large a gift as you can spare," he has told RSGB members in a personal message.

"Join us, please, and make an investment in a nation's future care."

Many amateur radio traders in Britain are also backing the initiative by offering prizes to individuals or clubs who raise the most money.

Donations can be sent to the RSGB at its headquarters, Lambda House, Cranborne Road, Potters Bar, Hertfordshire, EN6 3JE.

RADIO PLEA: Lord Rix asking hams for help.

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 HF National Field Day?**
* **Holding an amateur radio junk sale?**
* **Organising a raffle at the next club meeting?**

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- Convert an ASCII file to Morse, and display if required
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Simply send an IBM-formatted disk with your donation to the RSGB Albania Mencap Appeal at the address below.

HOW TO MAKE YOUR DONATION

- ***Cheques/Postal Orders:*** **payable to the 'RSGB Albania Appeal', and sent to:**

  RSGB Albania Appeal, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts, EN6 3JE.

- ***Credit card:*** **just call 0707 59260**
- ***Cash:*** **over the counter at RSGB Headquarters**

RADCOM NEWS FEATURE

In March, *RadCom* was invited to take a look at the Radiocommunications Agency's monitoring station. Here's what we found.

The Ears of the RA

IN THE HEART of rural Hertfordshire, some 60km north of London, lies the market town of Baldock, apparently named after Baghdad during the crusades. Several large aerials can easily be seen from the A505 a few kilometers east of Baldock; this is the RA's monitoring station which was built on this electrically quiet site in 1929 originally to provide the UK end of the world's first HF overseas public radio telephony service.

The station, the only one of its type in Britain, has three parts: the Terrestrial Monitoring Station (TMS), the mobiles and the Satellite Station. Work is divided between supporting the other radio services within the RA, such as the RIS, and providing data on contract for commercial concerns. One facility is identifying underused frequencies within a permitted allocation (users of shared amateur bands please note).

Graham Cheaney is the Radio Station Manager at Baldock.

Terrestrial Monitoring

WITH THREE consoles capable of monitoring 9kHz to 30MHz (exceptionally to 1GHz), the TMS can deal with urgent jobs such as keeping emergency channels clear to enable the tracking of a beacon when an aircraft goes down. Also long term jobs such as plotting the drift of a broadcast station, and the more common work of identifying stations which intrude by accident, ignorance or design, into the spectrum allocated to others.

Two or three operators man the receiving consoles 24 hours a day, supplemented by computer-controlled equipment producing 'waterfall plots' of band occupancy. Potentially the computerised gear could carry out most of the station's work, checking frequency, bearing and field strength, but it still takes a human being to identify an emission type.

Baldock has no interest in message content, it concerns itself solely with the origin of the transmission. As part of the International Monitoring Service of the ITU the station works on behalf of licence payers to ensure they get a good deal. In order for a formal complaint to be made to a government, interference must be persistent and harmful.

Three of these consoles allow Baldock's Terrestrial Monitoring Station to check the frequency, mode, field strength and bearing of any HF signal.

If an intruder or malfunctioning station can be identified, a telex is sent to the operator concerned, and usually this is enough. A tiny minority of cases need subsequently to be referred to the International Frequency Registration Board (IFRB) for stronger action. Out of some 3,500 reports a year, only a handful need to go to the IFRB. A copy of the International Frequency List is always to hand on CD-ROM, as is the amateur *Call Book*. Surprisingly, the station's work has actually increased post-cold-war. The Soviet Union, like most large countries, had shown the cooperation on which all international regulation relies.

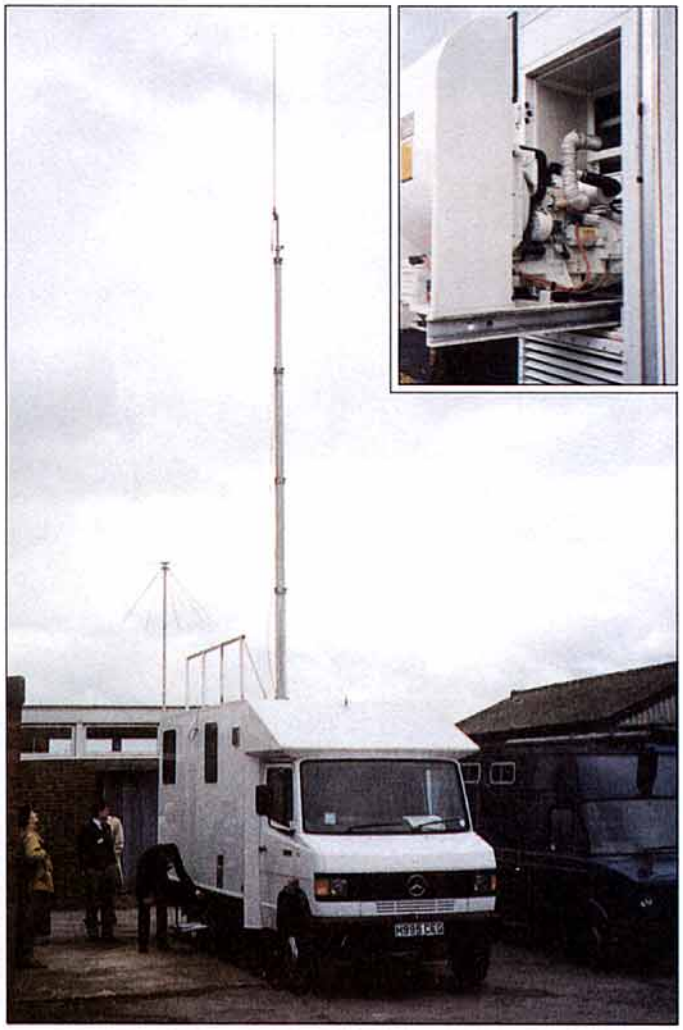
Most reports concern European stations, often military - armies are usually remarkably cooperative in moving frequency when requested. Other reports may, for example, be about interference from a visiting oil rig support vessel from the Gulf of Mexico (in ITU Region II) which has not switched to the frequencies allocated for Region I.

Bearings are taken using rings of 24 monopoles giving accuracies down to 1° in conjunction with similar stations around the North Sea. Receivers in use include Racal, Watkins-Johnson and Rhode and Schwarz, though it is becoming increasingly difficult to find a receiver tuned by knob rather than by keypad.

This impressive log periodic broadband antenna can be seen from the main road half-a-mile away.

Most types of data transmission can be demodulated and identified on this impressive console which also has long term audio recording facilities.

Two large dishes (12m and 10m) cover the satellite broadcast and communications bands. The one at the rear rotates at 3° per second.



The ideal field day station? An air-conditioned van complete with 10m hydraulic mast and (inset) almost silent built-in diesel generator.

The Mobiles

THERE ARE three mobile monitoring stations based at Baldock, including a four-wheel-drive Land Rover. The mobiles supplement the work of the TMS, particularly in the VHF to Microwave region, as well as carrying out survey and channel occupancy work for the RA's licensing sections.

The largest vehicle, a Mercedes van, has air suspension to prevent damage to the spectrum surveillance gear which covers from 9kHz to 1.5GHz. Also fitted are manually-tuned receivers with up to 40GHz capability and a VHF/UHF DF set. A computer driven receiver scans up to 300 channels per second, storing each day's data on a 20 Megabyte tape for later analysis on Baldock's Hewlett-Packard mainframe. Aerials are mounted on a 10m hydraulically-operated mast.

The van regularly tours the UK, operating from the same site in each city to ensure historical consistency. The equipment is powered from a local mains supply via an armoured cable, though an almost silent diesel-powered generator is available on board.

Altogether more compact is the travelling laboratory which carries £0.5M-worth of very accurate measuring equipment which goes up to 40GHz, with uncalibrated performance up to 75GHz. Two portable masts are carried, the largest able to go to 30m unguyed on a calm day!

Unlike the long-term routine jobs carried out in the Mercedes van, this lab is for short-term but highly accurate jobs such as assisting a local RIS District when measurements are required using equipment more complex than is available locally, when several days' intense monitoring is needed, or for accurate measurements prior to a court case.

The work is diverse, from investigating whether a radio station is interfering with a computer (or vice-versa) to doing field strength surveys, even checking an amateur station's field strength if a dispute arises with a neighbour.

Satellite Station

HIGHER ON the hill than the TMS, the satellite monitoring station has three dishes, the biggest being 12m (40ft) and the smallest a 3m trailer-mounted dish. The big dishes, which cost around £1M each, are mounted on concrete bases measuring 2 x 10 x 10m and can withstand a 65kph wind without needing to be parked.

Built in 1978 for communications satellites, the station has more recently taken on the role of checking on broadcasters. Measurements made on a monthly basis include frequency, bandwidth, occupancy and position in the sky.

Power flux density measurements can be made to an accuracy of 1dB. During our visit, the Astra satellite was being checked (it conformed with its allocation). As with terrestrial measurements, there is no concern with the message content of a signal.

There are very few similar stations in the world and although much of the work is commercial, around 10% is the collection of scientific data.

In charge of the Travelling Team, Eddie Bull operates some of the highly accurate measuring gear packed into the smaller van.

Amateur Radio

ALTHOUGH NOT a major part of Baldock's work, there are links with amateur radio, particularly with the work of the RSGB's Monitoring System (see *RadCom*, Dec 1991) and the RSGB Amateur Radio Observation Service (AROS) whose pre-selection work is greatly valued by the hard-pressed staff at Baldock. And, of course, several of the station's staff and managers are radio amateurs.

Whilst hesitating to use the term Big Brother, the awesome capabilities of this station are reassuring in a world where commercial and government self-interest threatens the delicate balance on which rest the International Radio Regulations, and our own future in an ever-busier spectrum.

Further information about the Baldock Radio Monitoring Station can be obtained from the Radiocommunications Agency, Room 209, Waterloo Bridge House, Waterloo Road, London SE1 8UA; tel 071 215 2326 (Alan Betts).

RADCOM NEWS FEATURE

IOTA is one of the RSGB's most prestigious HF certificates, much sought-after world-wide

Islands on the Air Award

THE IOTA AWARD programme was created in the mid-1960s by Geoff Watts, a leading British short wave listener. By March 1985 it had become well established and highly regarded among amateurs worldwide and at Geoff's request the award scheme taken over by the RSGB.

In all, the IOTA award programme consists of fifteen separate awards. They may be claimed by any licensed radio amateur eligible under the General Rules who can produce evidence of having effected two-way communication, since 1 December 1964, with the requisite number of amateur radio stations located on islands both worldwide and regional. Many of the islands are DXCC countries in their own right; others are not but by meeting particular eligibility criteria these also count for credit. One of the great merits of IOTA is that it is an evolving programme with new islands being added to the list when they are activated for the first time.

The following awards are available:

IOTA AFRICA
IOTA ARCTIC ISLANDS
IOTA ANTARCTICA
IOTA ASIA
IOTA BRITISH ISLES
IOTA EUROPE
IOTA NORTH AMERICA
IOTA OCEANIA
IOTA SOUTH AMERICA
IOTA WEST INDIES
IOTA WORLD DIPLOMA
IOTA CENTURY CLUB 100
IOTA CENTURY CLUB 200
IOTA CENTURY CLUB 300
IOTA CENTURY CLUB 400

A feature of the IOTA programme is the yearly Honour Roll appearing in the *RSGB DX News Sheet* (and now *RadCom*) which encourages continual updating of claims. The *Directory of Islands* lists all islands which count for IOTA and gives full information of the awards. Requests for *Directories* should be addressed to: The IOTA Awards Manager, Roger Balister, G3KMA, La Quinta, Mimbridge, Chobham, Surrey GU24 8AR, England (not to the HF Awards Manager). Addresses for IOTA award claims, which in all cases must be accompanied by QSL cards, are given in the directory.

The Honour Roll

THE IOTA Honour Roll and Annual Listing appear here for the first time. The Honour Roll lists the callsigns of stations who have a checked score in excess of 50% of the islands/groups which have been activated post-war and who have updated during the last two years. The Annual Listing lists the callsigns of stations who have a checked score of 100 or more islands, but less than the qualifying threshold for entry into the Honour Roll, and who have secured the IOTA 100 Islands or other award or who have updated during the last year.

Exceptionally this year, a second Honour Roll and Annual Listing will be published in late September to coincide with the RSGB's International HF and IOTA Convention to be held at Windsor from 25 to 27 September (see below). All stations wishing to participate should mail their updates/applications on or before 31 July to their usual checkpoints. UK stations should note that their new checkpoint is Philip Marsh, G4WFZ, 28 Orcheston Road, Charminster, Bournemouth, Dorset BH8 8SR. The previous checkpoint, John Kay, G3AAE, remains an active member of the IOTA Committee.

SWL Listing March 1992

M Stippschild DE0MST	600
C Gibbs BRS 47426	473
R Small BRS 8841	471
M Rustige DL-9286	441
H Nilsson SM3-5384	439
R Haszprunar OK1-1198	431
K Corson W0-6437	408
B Woodcock BRS 44266	393
F Parkhurst BRS 10663	380
G Szucs W0-20276	302
J Holterman WDX3JFH	282
P v z Gathen DL-P42/1647130	205
G Szucs W8/Michigan	180
D Burt EI-982/G	149
P Destoop ONL.5923	137
C Hodas OK3-28013	129
H Weidmann DL-20064	122
D Tanswell BRS 30493	116
E Blazicek OK3-21951	107

Honour Roll – Spring 1992

F9RM	647	DK6NP	560	CT4NH	496	IK1GPG	417
I1ZL	639	K9PPY	559	F9MD	494	WT2O	415
VE3XN	622	YU2TW	556	KD7SO	492	SK6PJ	408
G3KMA	620	FE6CYV	555	DL7CW	490	IK8GCS	407
G3AAE	617	OZ4RT	550	F2BS	488	I8ACB	405
EA4MY	608	F6AXP	548	G3ZAY	485	N6BOI	405
DL8FL	606	G4RFV	542	G3TOK	484	IV3YRN	401
DL8NU	606	K2VV	542	IK1EDC	483	G3VJP	391
YU2AA	606	ON4FU	533	9H4G	478	I2YDX	391
I8YRK	603	ON4AAC	530	G3YAA	477	K5MK	388
I1SNW	602	EI7CC	525	GW3ARS	474	I2JSB	387
W9DWQ	602	ON4XL	523	I8YZP	472	K6DT	386
VE7IG	601	ON7EM	523	I1CAW	468	IN3ANE	384
W9DC	601	F6DZU	517	IK1AIG	467	W1ENE	376
GM3ITN	600	G3XTT	515	I1POR	465	ON7FK	374
W4BAA	600	F6DLM	514	I2MWZ	464	DJ4XA	373
ON5KL	599	I8KNT	511	KE4I	459	G4IJW	373
OH2QQ	597	I1HYW	507	G3MLX	457	HB9CZW	371
ON6HE	586	EA5AT	506	HB9AFI	457	N3CWP	371
G3ALI	585	YU3TE	505	CT1ZW	454	IX1BGJ	364
G3GIQ	584	CT1UE	502	I1KFB	452	F6BFH	363
I0OLK	582	HB9RG	502	HB9BVV	446	I2FUG	358
I1JQJ	578	I8XTX	502	Y37XJ	442	IK1AOD	356
IT9GAI	573	ON5NT	502	OE3WWB	436	K8DYZ	348
F6AJA	570	I2PHN	501	F6CUK	435	DK6NJ	346
G4WFZ	569	OK3JW	500	IK1JJB	434	G3EZZ	345
DK1RV	561	K2EYJ	499	KC8PG	427	K5FNR	341
G8JM	561	SM6CAS	498	SM0DJZ	422		

Annual Listing

IK2MLY	339	CE7ZK	234	IN3PEE	154	IK8FUN	119
F6EXV	334	OE6MKG	232	NL7BY	150	K3ZPG	119
I2VDX	331	CT1AHU	230	OK3YEB	148	N3CYD	119
VE6PW	330	DL1BS	230	W9ZGP	146	PS7AB	119
DF2NS	327	SM4DDS	230	LU1JDL	144	SM2BQE	119
YT7DX	327	G4BWP	228	G0GRK	143	AA6ZG	118
VE6VK	325	N4UH	227	IK2HSW	141	KW0U	118
KM4RX	324	G2FFO	226	DL3ECK	140	ON4ACB	118
CT1CQK	322	HB9CSA	225	NJ1T	140	AA9F	117
G3ZQQ	318	HB9DLU	224	F1HNQ	139	IT9JKY	117
SM5HV/CT1DIZ	314	KD7EC	224	G3SWH	135	LA3GI	117
I8ZTE	311	JF1SEK	222	KA1NCN	134	N4SZE	117
KN1I	311	W0BBT	221	FE1LMJ	133	HA1AG	116
DL3RK	308	IK2IGX	220	G4XTA	132	UW3RR	116
HA8XX	308	W4BKP	219	RA6YJ	132	VE3IMO	116
N6JM	308	FE6EDW	216	DK7BY	132	WB4UHN	115
ON4ADN	308	CT1YH	214	DL6SDB	132	CT1UD	114
IK5EXV	307	IV3EAD	214	SM6TEU	131	IC8JAH	113
IK2EUY	306	DL1ZN	213	JA1CKE	130	I1WNB	112
PY2DBU	306	JH3AIU	213	K2YOF	130	KY1W	112
W3KH	301	SM5BMB	211	DL1NP	128	P29VMS	112
EA7OH	300	W0GLG	211	F6IVY	128	I2GGJ	111
FE6ACV	296	EA7CIW	210	G3WCY	128	W1KKG	111
G3KYF	287	SM1CNS	210	IK2ECP	128	AL7HS	110
G3ZBA	287	G4NXG/M	208	SM6CED	128	G0NXJ	110
VE3JGC	284	IK8JWA	208	WA4WTG	127	ON4ACG	110
WA2UZB	282	KD9HT	207	KL7UR	125	DL9MFH	109
I2YWR	281	LY2BZ	205	IT9JPK	124	IK1CJO	109
I1ZXT	279	IK2ECN	204	NT1I	124	IK8IPD	109
SM0DRB	271	IK8CNT	204	IK2ILH	123	N3HHE	109
G4GIR	271	N6PYN	202	IK7BDN	123	EA9PY	108
ON4QP	268	KZ4V	201	I8KUT	121	GU4WQP	108
F9GL	259	OZ1LRT	201	K4BBF	121	HK7	108
G3VOF	259	DK7XX	200	KA2ANF	121	VE7GKH	108
I1UKM	255	G4OBK	194	WB2RQX	120	DL5XAS	107
SM6DHU	255	3A2LF	191	FR5ZN	120	I1BRB	107
ON7LX	254	G3TLG	190	G0MFO	120	KA1DIG	107
G3SJX	253	KD6GC	189	G4VZQ	120	PA3EXX	107
OH3MIG	252	PP2ZDD	186	HK3JJH	120	VY2YT	106
I4CSP	251	EA7ABW	185	IN3QCI	120	Y37OJ	106
G3XON	250	G0DVT	185	JA4CTL	120	DL1FU	105
W1OPB	249	G4SDJ	184	KB4HBH	120	DL2GAC	104
I2PQW	245	GM4KHE	183	KK6ZO	120	K6GCF	104
IK7DBB	243	I8LEL	183	LZ1XL	120	K8VKI	104
WF1N2	242	G4MVA	175	NC6A	120	UW9SG	104
G4HJA	242	F1HWB	172	VE7IU	120	W4ZPO	104
G2ATM	240	OE3RE	171	EA5AN	119	WA3ELE	104
UA6AF	239	WD5KBB	165	G3PMR	119	DF4SA	103
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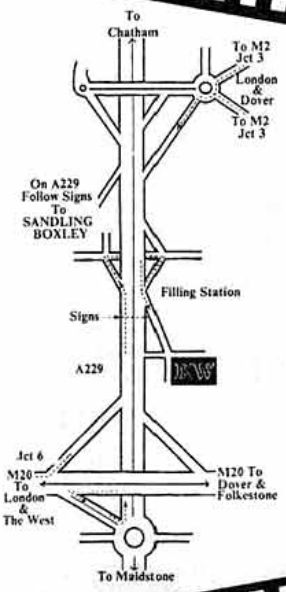

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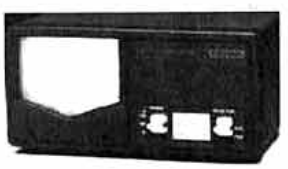

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RADCOM CONSTRUCTION FEATURE

Multi-Ratio Baluns For HF

by Graham Spinney, G0IFF

LAST YEAR I erected a W3DZZ trap dipole, after losing my HF antenna in the previous winter's storms. After erecting the new antenna, I once again found that on the 80 metre band my antenna had a radiation resistance at resonance considerably lower than 50Ω.

Using a noise bridge at the foot of the 72W feeder the antenna measured 16W (at resonance). The main reason for this low impedance is probably the close proximity of the antenna to the ground, as a proportion of a wavelength on 80m.

Most amateurs who encounter these low impedance problems overcome them by tuning the antenna to a point at which the radiation resistance is nearer to 50Ω in the area of the band they most frequently use. This action can have several disadvantages, the most annoying of which is that the antenna may only have a low VSWR over a narrow bandwidth.

Looking through many books on the impedance matching of antennas, I found that the only balun designs published were either 200Ω (balanced winding) to 50Ω (unbalanced winding), or 50Ω to 50Ω. So I set out to design and build a new type of balun that would match a low balanced impedance of around 16Ω to a 50Ω unbalanced impedance (normal rig impedance) for power levels up to 100W PEP of SSB.

CALCULATING IMPEDANCE RATIOS OF BALUNS

THE THEORETICAL IMPEDANCE ratio of any transformer is the square of the turns ratio. Therefore in this case:

$$\frac{Z}{50} = \left(\frac{Na}{Nt}\right)^2$$

where:

Z = impedance of antenna

Na = number of turns feeding antenna

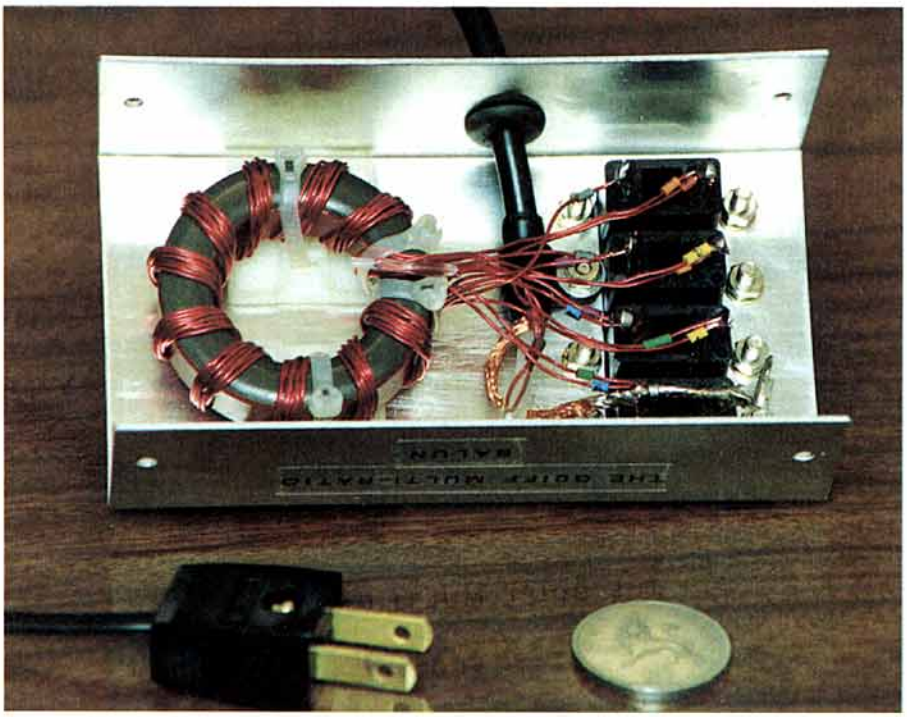
Nt = number of turns from rig output

MY FIRST ATTEMPTS

AS A RESULT OF MY previous balun building experience, I had already decided to standardise the raw materials as a single T200-2 red toroidal ring and 0.71mm diameter (22SWG) enamelled copper wire.

My initial experiments were aimed at a two ratio balun, which could convert 22Ω or 78Ω to 50Ω. This design used five or six identical windings of seven turns. The main deficiency of this design was that I still needed to use my 1:1 ratio balun with the W3DZZ antenna when transmitting on 40m. Therefore two ATU inputs were required for one antenna.

Most of my successful designs used a number of identical windings all joined in phase and in series.



Graham Spinney's HF balun is based around a T200-2 red toroidal powdered iron core. Four American chassis mounted mains sockets provide the antenna outputs.

FINAL OUTCOME OF EXPERIMENTS

AFTER A FEW QUICK calculations, I set to work on a three ratio balun, which included a 1:1 ratio. I had now established from the previous experiments that the rig (unbalanced) side of the balun was likely to have in the region of 30 to 40 turns in total in order to give maximum bandwidth across the HF spectrum.

The balun consists of 8 coils, each of 10 turns. One of the coils is used to provide some reactance to flatten the frequency response of the device.

A socket provides an antenna earthing facility which bypasses the balun windings. This facility should only be used if the station earth is isolated from mains earth (as it should be).

CONSTRUCTION OF THE G0IFF BALUN

a) Remove any sharp edges on the T200-2 red core using very fine abrasive paper or emery cloth.

b) Cut eight lengths of the 0.71mm wire about 80cm (32in) long. Twist the wires together using a vice to hold one end of the wires and a hand drill to hold and twist the other. The wires are twisted 12 full turns over their length.

c) Leaving 10cm (4in) of wire free, wind 10 turns of the twisted wire assembly tightly around the core. The windings should be equally spaced. Secure the ends of the windings to the core using cable ties, tape or string (see photograph).

d) Strip a short length of enamel off both ends of each winding. Using an ohmmeter or continuity tester, find the two ends of each coil and identify them with the same number (1 to 8) by writing on a piece of self-adhesive tape and sticking it on the two ends. Alternatively coloured identification sleeves can be used.

e) Cut all the required holes in the lid of the aluminium box: One hole for the coax

grommet, and another long rectangular hole to fit all four American mains sockets. Eight holes are needed for the socket securing screws.

f) Secure the wound balun core into the box using self adhesive cable tie bases and cable ties.

g) Fit the sockets and grommet into the box. Strip about 40mm of coax and push through the grommet into the box. Secure it using a 'P' clip.

h) Insulate one end (the beginning) of coil 1 using heat shrink sleeving or insulation tape. Solder the other end of coil 1 (the end) to the beginning of coil 2 and the inner core of the coax, then insulate the joint with heat shrink sleeving or insulating tape.

i) Connect the end of coil 2 to the beginning of coil 3 on the back of the relevant socket terminal. All the remaining connections are made on the back of the sockets, with the end of one coil going to the beginning of the next and so on.

j) Connect the two earth socket terminals to the box lid using wire and a solder tag under one of the screws and nuts that retain the sockets. The outer braid of the coax must also be soldered to these terminals.

k) Fit the PL259 to the end of the coax.

l) Label the sockets on the front of the box.

TESTING THE FINISHED BALUN

NOW THAT THE BALUN IS complete it is advisable to test it. The easiest way to do this is to connect non-inductive resistors (such as carbon film resistors) across the output terminals and measure the VSWR with the rig on 3.7MHz. A low power level must be used to avoid burning out the resistors. A higher power rating may be obtained by using a number of resistors in series and/or parallel. For example five 10Ω 1 Watt resistors could be used in series to give a 50Ω, 5W load.

Typical results are as follows:

- With a load resistance of 12Ω across Tap A the VSWR should be approx. 1.6:1
- With a load resistance of 50Ω across Tap B the VSWR should be approx. 1:1
- With a load resistance of 112Ω across Tap C the VSWR should be approx. 1:1

The balun has a fairly flat frequency response on the 50Ω tap (tap B).

Note that if the previous measurements are made on bands other than 3.7MHz, the VSWRs are unlikely to agree with the above values. At 14MHz and above, VSWRs of 3.5:1 or worse are likely to be measured on Tap A.

ADVANTAGES OF THE G0IFF BALUN

THE ADVANTAGE OF this design, when used in conjunction with most types of commercially manufactured unbalanced ATUs, is that it creates a more flexible matching system which will increase the efficiency of a station. Also it may allow operation on more bands without using an ATU at all. The G0IFF balun will not take much longer to build than a conventional 1:1 balun, and the cost should be similar.

Using the balun with a W3DZZ dipole and approximately 7m of 72Ω twin feeder between them, advantages over a conventional 1:1 balun became evident. Firstly 10m, 15m, and 17m were now usable (if we define usable as one that presents an VSWR of less than 3:1 to the ATU). Also a lower VSWR was achieved on 80m.

FINAL COMMENTS

ALTHOUGH THE FREQUENCY response on two of the taps (A and C) are not ideal, I have achieved the aims I set out to pursue. I have tried a variety of methods to see if further improvement could be made, such as adding capacitors across various coils, but so far I have not improved the original design.

When using a dipole with a bad VSWR (impedance not near 50Ω), a multiple tap - balanced output ATU or a balun with the appropriate ratio tap (such as the G0IFF balun) will reduce the high RF voltages that can be developed inside the ATU. These high voltages can often lead to the variable capacitor breaking down (sparks jumping between the capacitors plates).

COMPONENTS LIST

1) A T200-2 red toroidal powdered iron core, available from TMP.
2) Aluminium box size 133 x 70 x 38mm. Available from Maplin, Part No LF08J.
3) Seven metres of 0.71mm (22SWG) enamelled copper wire.
4) Four American chassis-mount mains outlet sockets, Maplin part No HL18U.
5) One American mains plug for each antenna used with the balun, Maplin Part No HL17T.
6) Eight 4BA 0.5in round headed screws with washers and nuts.
7) 'P' clip to retain coax in the box.
8) Grommet for coax input.
9) PL259 connector.
10) Four self-adhesive rubber feet.
11) Two self-adhesive cable tie bases with cable ties to retain the toroidal core within the box.
12) 0.5 metres of good quality RG58 50Ω coax.

One advantage of situating a dipole antenna's balun in the shack is that the dipole can be used in the Marconi T mode on the lower frequency HF bands. If the dipole's balanced feeder is terminated in an American mains plug, then it is simply a case of connecting both terminals of an American mains socket to the long wire output of the ATU (if available), then plugging in the dipole.

TECHNICAL UPDATE

QRP+QSK Transceiver

May 92 *Radcom*, pp33-35. The author, Peter Asquith, G4ENA, can supply the PCB for this project featured last month. The price is £5.50 incl. postage, and his address is: Well Cottage, Selsley Hill, Stroud, Glos. GL5 5LN

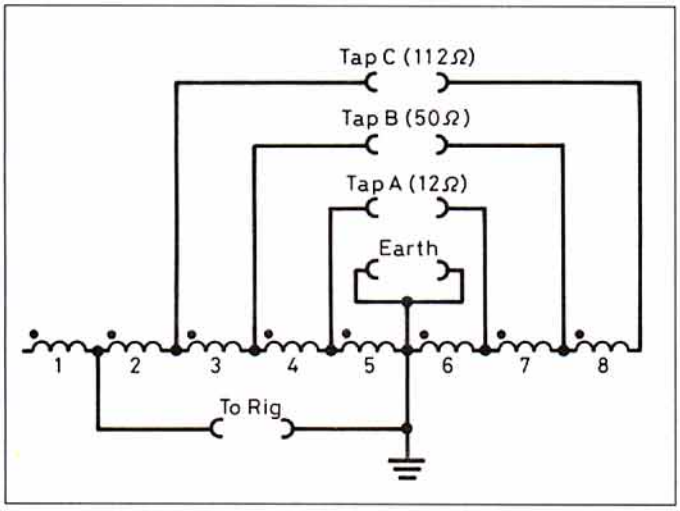


Fig 1: The G0IFF HF Multi-ratio balun is connected between the ATU and the balanced feeder attached to the antenna. One end of coil 1 is left unconnected.

The G0IFF multi-ratio balun provides three taps for efficient antenna matching over a wide bandwidth.

VHF Trophy Presentations

The Society's VHF Trophies were presented by RSGB President Terry Barnes, GI3USS, at its VHF Convention at Sandown Park in March. Here are some of the best photographs.

The Northern Lights won The Telford Trophy; Mitchele Milling Trophy; 1951 Council Cup; VHF Contest Committee Trophy and the Surrey Trophy.

Martlesham Radio Society were awarded the Martlesham Trophy as winners of the Restricted Section of VHF National Field Day. G4PIQ (far right) won the Thorogood Trophy.

G3RPE Memorial Trophy winner Mike Walters, G3JVL. (10GHz Cumulatives).

The VHF Manager's Trophy was won by the Sheppey Exiles. (70MHz).

The G6ZR Memorial Trophy: The Three Spires Contest Group, overall winners of the 2.3GHz Trophy Contest.

Arthur Watts Trophy went to the Westmorland VHF Group, winners of the Low Power section of VHF NFD.

1962 VHF Committee Cup awarded to Tim Forester, G4WIM. (50/70MHz rig).

Pat Hawker's Technical Topics

THE EXTENDED DOUBLE ZEPP ANTENNA

THE UNEXPECTEDLY RAPID decline in solar activity during March would seem to foreshadow some years during which 14, 18 and 21MHz rather than 24, 28 and 50MHz will be of major interest for long-distance daytime working, with 1.8, 3.5, 7 and 10MHz increasingly useful during the hours of twilight and darkness - though it is much to be hoped that 28 and 50MHz will continue to be well occupied for medium-distance Sporadic E, extended local operation etc.

Recent *TT* items have underlined the usefulness of such multiband wire antennas as the large horizontal loop, but there are many locations where loops tend to be difficult if not impossible to fit into narrow gardens, even where these are long enough to accommodate a single span of say 70 to 100ft. In such circumstances, as past *TT* items have frequently emphasised, a centre-fed dipole fed with open-wire feeders and a flexible ATU with balanced output will work well on any band, whether or not the top span is resonant. Admittedly, the horizontal radiation pattern will differ on the various bands, splitting into multi-lobe patterns on the higher frequencies.

A well-established, but seldom used, configuration of this general type is a centre-fed antenna designed as an extended double-zepp antenna for a favourite band (providing a broadside gain of an extra 3dB over a half-wave dipole) but eminently usable on other bands with various radiation patterns and gains.

A timely reminder of the usefulness of the EDZ appears in *QST* (Feb 1992) as a *Hints & Kinks* item from Bob Baird, W7CSD, supported by editorial addenda. W7CSD writes: "Although the extended double zepp (EDZ) antenna (**Fig 1**) has been in just every antenna handbook since the year one, hams seldom use it. Its overall length is 1.28λ and it is bidirectional broadside. Fed with open-wire line and a balanced antenna tuner, an EDZ also makes a fine multiband antenna. Let's look at an EDZ for 18MHz. We can calculate the overall length in feet as (984 x 1.28)/f(MHz) from which an 18.15MHz EDZ works out to be 69.4ft long. At this frequency the EDZ exhibits 3dBd gain in a figure-of-eight pattern with two major and four minor lobes. It still performs usefully when operated on several bands lower in frequency. At 14MHz, an 18MHz EDZ acts as two slightly long half-waves in phase, exhibiting between 1.6 and 2dBd gain. At 7MHz, it is a slightly long half-wave dipole. All these modes are directional broadside if the EDZ is positioned at least a half-wave high at 7MHz. At 21MHz, it exhibits a four-leaf-clover pattern, with minor lobes broadside; at 28 and 24MHz, it is close to two full waves in phase and produces a pattern similar to that at 21MHz. It can even be used as a short 3.5MHz dipole - not bad for a 70ft piece of wire! . . . . There's nothing magic about the EDZ. It's a tried-and-true dipole that offers useful gain at its design frequency and good multiband performance."

W7CSD does not mention the 10.1MHz band but a good performance could be expected from an 18MHz EDZ. On 1.8MHz it could be used either as a very short dipole or with the open-wire feeder strapped together as a T-antenna fed against earth (or a counterpoise), with a high T-antenna providing vertically-polarized radiation.

TRIP SWITCH (ELCB) TROUBLES

ON A NUMBER OF OCCASIONS in the past, *TT* has referred to the use of 30mA and 15mA earth-leakage circuit-breakers (ELCBs) as a safety measure to protect against severe electric shock from mains supplies. In *TT*, July 1981 (pp628-9) it was pointed out by G3HWR that a problem can arise with these devices where mains filters having capacitors of the order of 10.1μF or more are fitted to equipment. Modern filters should have much lower value capacitors (of the order of 0.01μF) but older filters and indeed capacitors in older equipment may result in continuous leakage currents large enough to trip the more sensitive 15mA ELCBs. G3HWR provided information on a modified filter configuration that overcomes this problem: **Fig 2**.

'Dud' Charman, G6CJ, has encountered the related but rather different problem of ELCBs affected by switch-on surges. His notes on this topic, originally written for the FOC *Focus* newsletter are as follows:

"I don't know what happens in other countries, but in G-land we have a protective system in which the electricity-mains wiring comprises three wires: Phase (Line); Neutral; and Earth. A trip switch is provided which will fire if there is any substantial potential difference (causing a leakage current to flow) between Neutral and Earth.

"So far so good. I have had some alterations made to bring my ancient house wiring up-to-date and this has involved a new set of the Company's input switchboard instruments. In the past the potential difference between N and E was reasonable, but the legal PD has now been reduced to 30mV!

"The result with the new switchboard instruments was that every time I tried to switch-on my rig, the trip fired. After some considerable work, it was realised that the charging (in-rush) current of any capacitor across the line would cause a trip. The only way to get the station on the air was to reset the switch by hand (in an awkward place of course). It would then hold-in past the surge.

"Virtually any piece of radio gear has a capacitor connected from Line to Earth and for a time it seemed I was condemned to manually re-setting the trip, a pretty hopeless situation. Then I discovered that the Electricity Supply company could provide an ELCB with its own built-in 'shock-absorber' that does not trip on a surge but still provides protection against continuous leakage. Joy at last!

"So if you move into a new house fitted with one of these 30mV switches, or have been obliged to have one fitted, make sure that the Company fits one with a shock absorber. It will still be the property of the company, so you will not have to pay for it, though there may be a charge for the work of installing it."

1.8MHZ TO THE SOUTH ATLANTIC

IN COMMENTING ON THE reliable 1.8MHz chordal-hop path during the months of May to August between the West Coast of North America and parts of Australia (*TT*, April and March, 1992) I suggested that there could be a good possibility that a similar 1.8MHz path could exist between the UK (or at least the South-Western areas) and parts of South America around the Tropic of Capricorn (Brazil, Paraguay, Peru). This would make use of the dawn ionospheric tilts and the tilts that appear to exist during Spread-F conditions in the tropics as well as the now recognised tilts of the Grey Line paths.

These comments have brought forth a most interesting letter from Peter Hobbs (G3LET/VP8GQ/RS84049). He writes:

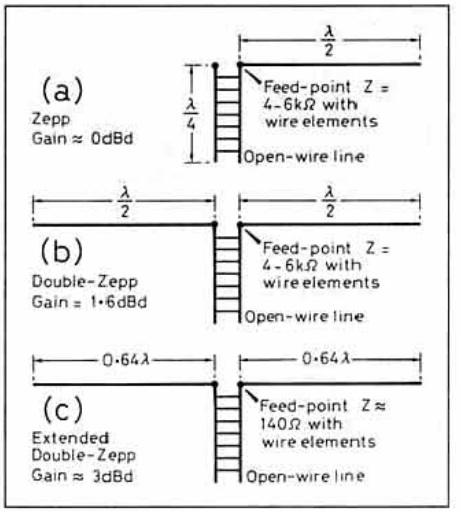


Fig 1: Evolution of the extended double zepp antenna. (a) Classic zepp antenna, originally developed for use in the Zeppelin airships but now considered uncertain in behaviour due to the unbalanced connection of the element to the resonant balanced transmission line. (b) Double zepp (two half-waves in phase) provides a broadside gain of 1.6dBd. (c) By extending the dipole element lengths to 0.64-wave, the gain is raised to 3dBd with two major and four minor lobes. It is termed an extended double zepp (EDZ) antenna.

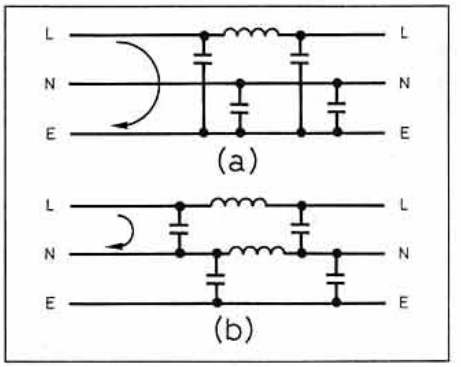


Fig 2: (a) Unbalanced currents flowing with the capacitor values used in some mains filters can present problems when a sensitive earth leakage circuit breaker (ELCB) is fitted. (b) Modified filter configuration suggested by G3HWR in 1981 overcomes this problem.

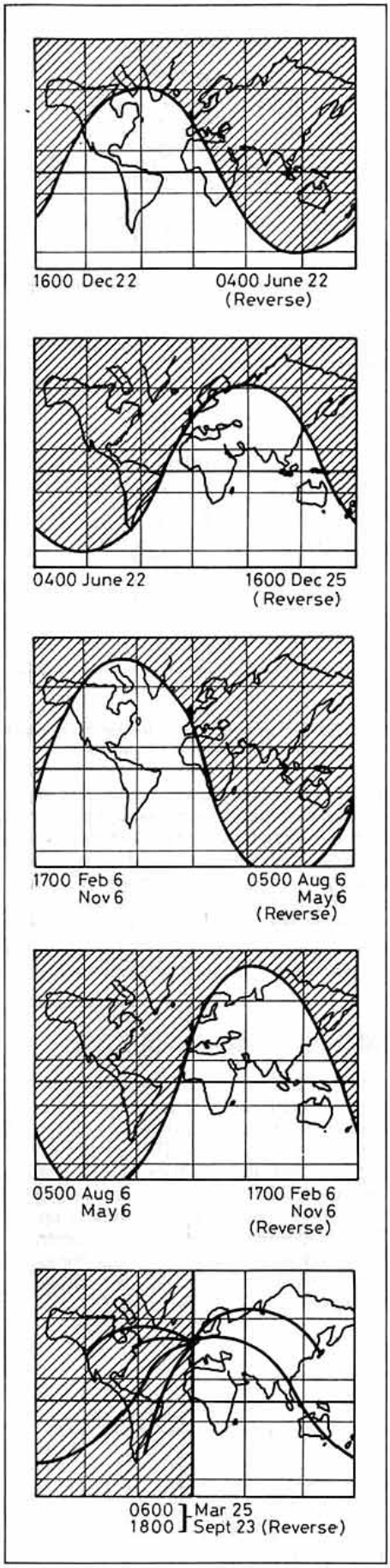


Fig 3: How the twilight boundary (grey-line path) varies at different seasons of the year. Times are GMT for the UK. Computer software for determining time of sunrise and sunset grey-line paths from the UK to locations throughout the world has been published.

"Your April piece on 1.8MHz propagation stirred a distinct chord (no pun intended!). I came to very similar conclusions on the reliability of trans-equatorial solstice propagation on the band back in the early 1960s when, as VP8GQ in the South Orkneys (latitude 60° South), I spent many hours investigating the possibility of Top Band contacts with the UK.

"The antenna in use was a rhombic with 250ft per leg on 40ft masts, built for the BERU contest and fed, on Top Band, with strapped feeders against ground. At that time, the German coastal station DHJ was a well-known occupant of the lower end of the band, available virtually continuously as a 1.8MHz beacon signal - forming one of the first beacons that I had come across. At the appropriate times, his signal strength in the South Orkneys was roughly equivalent to that of DL1FF and G3GRL when they were around.

"As suggested in *TT*, 50° or 60° of latitude, North or South, should, by rights, be rather high for classical trans-equatorial propagation but my VP8GQ logs show that DHJ was at least audible virtually every day during June and July and again in December and January. Between five and ten days in each of those months, the path would be so good that local contacts between G-stations around dusk would be of good strength for an hour at a time, although raising them from VP8 was another matter. I often wondered about the then accepted wisdom of multi-hop propagation with signals of such strength and always felt that there must be some other mechanism at work.

"My motivation at the time, of course, was to achieve that elusive first 1.8MHz VP8-G contact. Eventually, I persuaded Paddy, EI9J with whom I kept a daily sked at midnight on 3.5MHz to spend a couple of days off the air reorganising his station for Top Band and give it a try. We succeeded in making contact at the very first call. After that, the word spread and I had quite a busy time making QSOs on 1.8MHz.

"So, for what it is worth, another anecdotal confirmation from 30 years ago that chordal hop propagation does work on 1.8MHz (MF) and can extend, with reasonable reliability, to quite high latitudes. The main, and possibly only, reason that this was and is not more widely recognised is lack of amateur activity along the open paths. In all the time I listened on 1.8MHz from VP8, a period of five solstices between 1961 and 1964, I only heard one South American station, ZP9AY. I believe he worked W1BB (who did so much to encourage 1.8MHz DX in the post-war period - *G3VA*) and a few others one night and that was it".

Old-timer Ted Cook, ZS6BT, (a long-time HF enthusiast but now at 88 years restricted to VHF/UHF operation) in commenting on the March item, appears to have gained the impression that the 1.8MHz VK/W6 trans-equatorial contacts were thought to have been made via 'long-path' - an impression possibly fostered by my inclusion of Fig 5 (page 37) intended only to illustrate the difference between multi-hop and chordal-hop propagation (my use of Figs 4 and 5 was in fact strongly criticised by John Branegan, GM4IHJ, on the grounds that they distorted the height of the ionosphere in relation to the scale of the Earth and thus wildly distorted the actual signal path geometry, but I am sure that this would have been obvious to readers and make no apologies for including them).

Long-path propagation, almost invariably by chordal-hop, is indeed a most valuable mode, much exploited in morning G-VK and afternoon G-W6 contacts, as a feature of 'grey-line' propagation along dawn/dusk and dusk/dawn boundaries. But chordal hop paths also occur along dawn/dawn and dusk/dusk boundaries or indeed, as in the 'sweet-spot' 1.8MHz contacts, where there are suitably located ionospheric tilts to put signals into and out of the chordal-hop mode: **Fig 3** shows the twilight (grey) boundary at various seasons.

ZS6BT points out that long-path grey-line propagation from Johannesburg to the West Coast of North America via Australia is possible (usually on 14MHz), with an alternative path via the South Pole on 21MHz during the summer solstice. He also points to the useful signal enhancements brought about by the focussing of signals at or near the antipode of the transmitting location.

This topic was touched upon in *TT* (Jan 1973) in an item 'Thoughts and facts on chordal hop' with reference to a paper by Gary Bold of the Radio Research Centre, University of Auckland, New Zealand (*IEEE Trans on Ant & Prop*, Nov 1972, pp741-6). The antipodes are the two locations precisely opposite one another on the surface of the Earth so that times and seasons are exactly reversed. All radio paths along Great Circle routes, no matter in which direction they take off, all come together again at the antipodal point, in other words a broad-lobe antenna can be every bit as effective as a narrow, highly-directional beam; there is no long-path or short-path since all paths are approximately the same length.

Gary Bold showed that 15MHz transmissions from a Voice of America relay at Tangiers built up rapidly in signal strength (by up to 30dB) over a half-an-hour period at its antipode in New Zealand during local dawn (around 2000GMT) at times when the critical frequencies were too low to support multi-hop propagation at 15MHz.

The exact antipode of the UK is unfortunately a virtually blank stretch of the South Pacific south of New Zealand, although, as ZS6BT points out, France is a near exact antipode to New Zealand and the UK is near enough often to benefit from antipodal focussing. Johannesburg is a near antipode to Hawaii. He writes: "We here are fortunate enough to be almost exactly antipodal to WWVH and we are able to hear all four frequencies simultaneously *and*, at the same time, make contact on 21 and 28MHz". ZS6BT believes that it is time that more attention was paid by amateurs to basic propagation.

G3IPV'S SELF-NEUTRALIZED FET AMPLIFIERS

TT, JULY 1991, pp28-29 GAVE information on the problem of avoiding instability in small-signal FET amplifiers based on a review by VK6KRO in *Amateur Radio*, May 1991. The problem arises from the combination of a high-gain device, large internal capacitances and the vulnerability of FET devices to destructive self-oscillation in RF amplifiers.

VK6KRO showed that one solution is to operate the device itself with low gain but to achieve a reasonable overall gain by achieving high voltage gain with a step-up resonant input transformer.

A British amateur who over a number of years has experimented with FET pre-amplifiers primarily as a means of providing very sharp signal-frequency selectivity (using crystals or LC circuits) ahead of the first mixer stage is P W Hallett, G3IPV. A number of his radical ideas have been described over the years in *TT*. (For example February 1986, pp109-110 and July 1985, pp541-2) illustrating his search for unconditional stability while using high-Q resonant circuits.

Last year, before the appearance of the VK6KRO article, G3IPV sent along a further contribution to this topic in the form of a new version of his self-neutralized internal-feedback amplifier which he believes makes it easier to vary output power from radio transmitters, provide low-noise gain for radio receivers and which could also find application in other types of RF equipment. He writes:

"**Fig 4** shows the first self-neutralized controlled internal feedback amplifier developed at G3IPV. The selectivity, gain and internal feedback of this amplifier are controlled by two pairs of coupling capacitors, C1-C2 and C3-C4. Tuning is varied (over a small range) by capacitors C5-C6 and C7-C8. Once the four coupling capacitors, C1-C2 and C3-C4 are set below a critical value the amplifier becomes unconditionally stable. This to some extent is variable with different input and output load impedances. A key feature of this amplifier is that if the input and output inductances are placed in series with its input and output, the internal feedback drops to a low value. It has been found that if the tuning capacitors are also in series with input and output of the amplifier then a much improved amplifier is produced especially at VHF where the earlier amplifier did not have satisfactory gain and selectivity.

"This new version (**Fig 5**) has been tested for small-signal purposes at HF and VHF in receiver front ends and also using high-power MOSFETS in linear amplifiers. It is my belief that this version represents possibly the finest high-selectivity amplifier so far developed. In Fig 5, C1-C2 and C3-C4 are coupling capacitors which control internal feedback, gain and selectivity of the amplifier. When they are below a critical value they ensure that the amplifier is unconditionally stable and also that input/output tuned circuits act as peaking bandpass filters and not as notch filters. This is an unusual feature of this amplifier and was not foreseen. The input and output L/C tuning circuits can be replaced by quartz crystals when very high selectivity is required, for example in the front end of receivers intended primarily for operation at or around fixed frequencies (see *TT*, July 1985).

"Another feature of this amplifier is that its gain can be controlled by varying supply voltage with little distortion to the output signals. This makes it easier to vary power output from radio transmitters and the gain of radio receivers etc. Note that the gain of this type of amplifier is lower than for conventional amplifiers so that additional stages may be needed to achieve as much gain; however since they contribute very little noise this is not a significant problem and does not affect those applications where the primary purpose is to obtain good pre-mixer selectivity."

READABLE MANUAL MORSE

F L U RITSON, G5RI, was interested to note the comment by Gordon Brown, VK1AD (*TT*, Apr 1992, p40), reprinted from *Morsum Magnificat* No 22, that 'perfect' machine Morse is not necessarily the most readable Morse, particularly at higher speeds. I also expressed my liking for the 'old-fashioned' up-and-down manual Morse-key, even though at times I have spent many hours practising and/or using semi-automatic ('bug') keys, electronic keyers and iambic squeeze keyers.

G5RI found support for the views of VK1AD in a 50-year-old letter from an L J Voss in *Wireless World* ('Thoughts on Morse Operating', Sept 1940, p393). In considering the question of telegraph operators who initially learned to use sounders or the single-needle railway telegraph system, he wrote:

"Operators with much experience of wireless all agree that it is most important to get the dashes clear and distinct, if necessary spinning them out beyond their precise three-dot length. *Never* clip the dashes; when interference or atmospherics are bad, the good operator instinctively sits on his dashes a little more, and is grateful if the other fellow reciprocates . . . 'Machine' sending is only really suitable for machine reception. Personally, I dislike the 'bug' for this reason; as a multitude of ordinary Post Office operators used to have no difficulty in working at a steady 30 (WPM) without fatigue or cramp, with a burst up to 40 if required, one fails to see any reason for using a bug at all, when the normal key will take anything one gives it."

L J Voss suggested that anyone who has copied much press (ie machine telegraphy in those days), as distinct from scrappy messages with breaks between them, has experienced that maddening feeling that comes from the monotony of the machine - or the soulless, machine-like hand telegraphist, adding: "Holding the key is ruled by the size and shape of the knob and by the set and length of the operator's fingers. My own handwriting was ruined in early life by a schoolmaster who insisted (with a stick) on

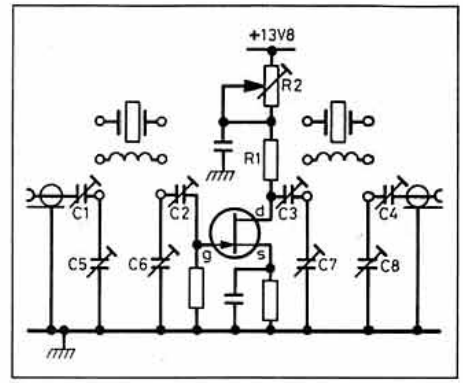


Fig 4: G3IPV's first form of controlled internal feedback FET RF amplifier.

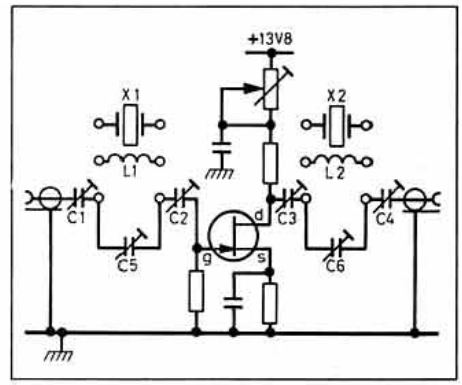


Fig 5: G3IPV's new version of the self-neutralized controlled internal feedback FET amplifier.

REPRODUCIBLE TONE-BURST OSCILLATOR

B WALTERS, GW3XHD, writes: "With ex-commercial equipment still coming on the market, there is a continued need for small projects to modify the equipment for amateur-radio use, including the fitting of 1750Hz tone-burst generators. I have found CMOS devices are sometimes unpredictable in this application and often need obscure component values. I consider the generator shown in **Fig 6** using two discrete bipolar transistors, one PNP and one NPN, is repeatable however built. Using modern components I have managed to build it on a PCB the size of two postage stamps. Diode D1 isolates the key line from the microphone key line, TR1 switches the voltage to the oscillator and a 0V on the tone-key line starts it up. The variable resistor fine tunes to 1750Hz. Feeding the tone output into the microphone line is quite effective, or it can be fed straight into an op-amp input."

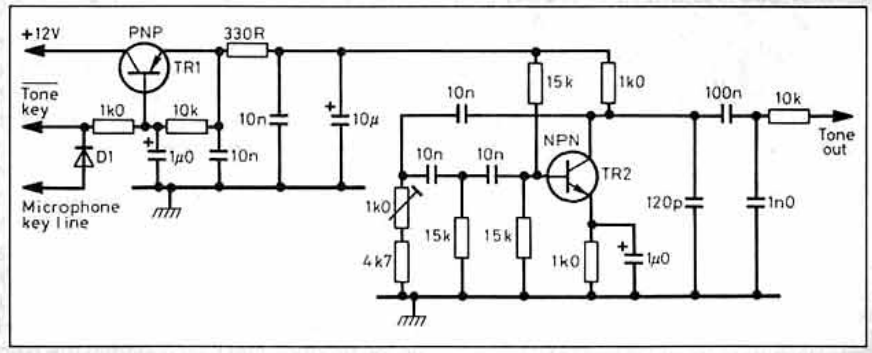


Fig 6: GW3XHD's 1750Hz tone-burst generator using small signal transistors NPN and PNP.

SOLAR POWER AND THE LEMON-DROP KIDS

I AM NOT SURE WHETHER children today still read a book that I recall from my own early days - *The Swiss Family Robinson* - in which a shipwrecked family sets about providing themselves with many of the amenities of civilisation by utilising the local materials, plants, flotsam and jetsam. Today, of course, it would be advisable to take along a well-stocked survival pack including *inter alia* some electronic components and a solar array to provide a modest supply of electricity, if only to play those eight *Desert Island Discs*!

Even in Wales, R W Mander, GW4DYY, has for several years used a solar charger incorporating a DC-DC converter along the lines of the *Electronics Australia* low-cost solar battery charger outlined in the April *TT*. He uses an ex-equipment DC-DC converter from a Pye radio (believed to be from a hand-held car amplifier/charger type AT27148) which, with a 12in by 12in solar panel, is used to top up his caravan battery. He finds it a very useful piece of equipment.

Across the Atlantic, Bob Culter, N7FKI and Wes Hayward, W7ZOI, nursing an ambition to do something in amateur radio for the very first time - and believing that solar-powered transmitters are now relatively 'old-hat' - have succeeded in making a 29MHz CW contact over a span of some two miles using a battery in which the electrolyte comprises the juice of a lemon!

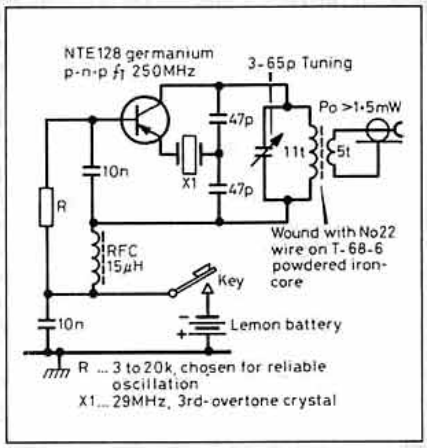


Fig 7: The micro-power transmitter used by W7ZOI and N7FKI to make the first contact using a lemon-juice battery.

As described in *QST* (March 1992, pp18-19) a primitive cell was made first by piercing the lemon with a zinc-coated nail (negative terminal) and a 3/16in-diameter copper tube (positive). This gave an open-circuit output of 0.93V dropping to 0.6V with a 2KΩ load with depolarization effects soon reducing this further.

A more practical battery was then constructed by layering a 5 x 7in zinc-coated shingle, a similar-sized paper towel separator soaked in lemon juice and a slightly smaller rectangle of copper-clad circuit-board. Two of these in series gave an open-circuit voltage of 1.9V (initial short-circuit current of 64mA) dropping to 1.35V when delivering 4.7mA output to the micro-QRP transmitter (**Fig 7**) giving an RF output of rather over 1.5mW. Contact was made over a distance of some two miles, ending when depolarization effects began to result in a poor-quality signal.

Since fruits other than lemons also contain citric acid, one might see a rush to gain a 'Worked All Fruits' certificate were it not for an unfortunate connotation in North America!

our resting two fingers on the pen; that suited his own hand all right, but he could not see that most of us had a middle finger appreciably longer than the index, and so needed to rest it at the side of the pen for comfort, the essential factor for good writing as for good telegraphy. And writing is an important matter to the telegraphist whether or not a typewriter is normally used."

His remarks on 'bug' keys reflects well the controversy that, in those years, raged among both professional and amateur operators on this side of the Atlantic and the then official dislike of any form of semi-automatic or side-swiper type of key. I recall a friendly contest held at Hanslope Park in early 1942 between a Post Office telegraphist (Bill Windle, G8VG) and Des Dowing, GI3ZX, one using a manual key, the other a bug. I fancy the decision was a draw. While experienced telegraphists could certainly reach a steady 30 or so, I cannot help feeling that bursts of 40WPM on an up-and-down manual key is a bit of a fisherman's tale - though certainly some of the operators at the Coast Stations and those on the large trans-Atlantic passenger liners of the 'thirties, sending masses of telegrams on the old 2100-metre shipping band, could certainly lick along! And their Morse was far from 'Soul-less'.

TOROIDAL CORES DEFENDED

THE ITEM 'Toroidal cores, baluns and ATUs' (*TT*, Feb 1992, p37) noted that the balun-type broadband impedance transformers with toroidal ferrite or powdered-iron cores of the type still found in many transmatches (ATUs) are not suitable for use at high or reactive impedances: at high power cores are prone to saturate while at high impedance the RF voltage can cause arcs between the turns or between the windings and the core material. GW3DIX also noted the decision of the ARRL actively to discourage use of these components for such applications.

This has resulted in several letters pointing out that it is wrong to condemn outright the use at relatively high powers of toroidal cores. Used correctly such components still have a useful role to play, several correspondents suggest.

For example, Bob Pearson, G4FHU, writes: "While I agree with much of this item, it would be a pity if it were to cause unnecessary dismay among those who could nevertheless use ferrite or iron-dust cored baluns and transformers successfully.

"It is often quite practicable to connect a balun on the transmitter side of an ATU, so that the balun drives a resistive impedance of a suitable magnitude. The ATU need not then be a balanced configuration even though it feeds a balanced line. But it does need to be fully insulated. For output powers up to about 100W PEP the ATU components can be physically small enough to fit into a plastic box of reasonable size, and shaft-insulation can consist of substantial control knobs with recessed and plugged grub-screw holes.

"For example, a single variable capacitor and a tapped inductor can cope with a wide variety of matching requirements. The simplest arrangement uses terminals or wander plugs and sockets to permit a variety of configurations (see **Fig 8**). It is remarkable how small a suitable toroidal core can be, even for quite high power transfer, as long as the balun load impedance is correctly adjusted by the ATU before full power is applied.

"The minimum core size can be estimated as follows: Most suitable ferrites have a saturation flux density of about 0.2 tesla to 0.5 tesla (2000 to 5000 gauss). Suppose we permit a peak flux density of no more than a tenth of the lower figure (ie 0.02 tesla or 200 gauss) and assume a winding of no less than about ten turns across a 50Ω load.

Peak envelope power $P = V^2rms/R = Vpk/2R$

Peak flux $\Phi pk = Vpk/Nw$ where N=number of turns and $w = 2\Pi f$

Therefore $\Phi = BA$ where B=flux density and A = core cross sectional area.

Then finally $A = (1/2\Pi f N B_{pk}) \times \sqrt{(2RP)}$

More familiar as $A=\sqrt{(RP)}/4\text{-}(4f N B_{pk})$

Compatible units are in mm², MHz, tesla, Ohm, watt.

Results on this basis are shown in **Table 1**. Commonly available toroids need be no longer

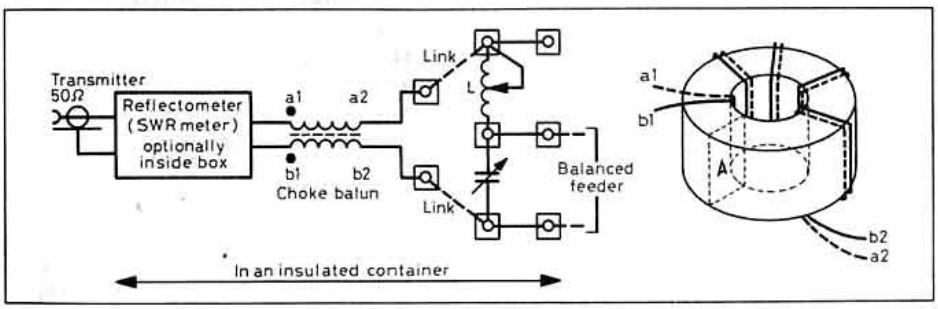


Fig 8: G4FHU's method of using toroid balun transformer with unbalanced ATU to feed a balanced transmission line without contravening the guidelines for using toroid cores

than about 2-inch diameter to satisfy the highest figures shown. A 1-inch diameter core easily meets the 100W PEP 3.5MHz requirement, though one could select a slightly larger core to minimise the number of turns of wire needed and to give a comfortable winding space".

Power (W PEP)	Lowest frequency of operation (MHz) 1.8	3.5	7	14	28
1	4.42	2.27	1.14	0.57	0.28
2	6.25	3.22	1.61	0.80	0.40
5	9.89	5.08	2.54	1.27	0.64
10	13.98	7.19	3.60	1.80	0.90
20	19.77	10.17	5.08	2.54	1.27
50	31.26	16.08	8.04	4.02	2.01
100	44.21	22.74	11.37	5.68	2.84
500	98.86	50.84	25.42	12.71	6.36
1000	139.81	71.90	35.95	17.98	8.99

TABLE 1: Minimum cross sectional area (mm²) for magnetic core with peak flux density of 0.02T (200 gauss) and 10-turn coil effectively in parallel with 50Ω resistive load. For higher flux or more turns, core area proportionately less. But required area increases as the square root of load resistance.

HANDHELDS AND YOUR EYES

IN DIGESTING THE guidelines suggested by WC2S ('Health Hazards: Tougher Guidelines', *TT*, January 1990), I noted that a worrying aspect of the WC2S survey is that "he suggests there is a growing body of opinion that not all handheld transceivers with less than the usually accepted figure (endorsed in the ANSI-C95.1 safety standard of 1982) of 7W RF output are safe if held near the operator's head, and that more stringent guidelines may be introduced in this area."

The WC2S guidelines, as originally published in *QST*, Oct 89, include: (9) Handheld radios should be used on the lowest power setting needed to carry out communications. (10) Handhelds should be kept as far from the head as possible when operating. (11) The use of a separate microphone or similar device is recommended. (12) Transmissions using a handheld radio should be kept as short as possible". *TT* has in the past noted that some transceivers marketed for amateurs are specified as having an RF output of up to 5W, approaching the 7W exclusion clause of the ANSI safety standard.

The rationale for stringent guidelines is that in most cases the 'rubber duck' antenna during transmission is only a few inches from the operator's eyes. These are known to be particularly vulnerable to proven thermal effects of RF radiation. A rise of temperature of a few degrees Centigrade (from the normal 37°C to about 42°C) can result in irreversible effects leading to cataracts. The lens is particularly vulnerable because it has no blood supply and hence only poor thermal conduction paths; it also has a high water content.

A further warning that the 7W exclusion clause of the ANSI standard for low-power communications equipment needs to be revised downwards is given in a paper 'Energy Absorption Mechanism by Biological Bodies in the Near Field of Dipole Antennas Above 300MHz' by Niels Kuster (Swiss Federal Institute of Technology) and Quirino Balzano (Motorola) which appears in *IEEE Trans on Vehicular Technology*, Feb 92, pp17-23. This detailed study shows that the 7W exclusion clause is not always consistent with the ANSI safety limits for the spatial local peak SAR (specific absorption rate) recommended for the controlled environment (8mW/g).

For the uncontrolled environment (1.6mW/g) the exclusion directly contradicts with the peak SAR limits. The authors provide a telling example. They state: "Assume that the feedpoint current of a 7W 1.5GHz transceiver 2.5cm from the eye tissue is increased to about 350mA due to feedpoint changes, this would result in a spatial peak SAR averaged over 1g of tissue of over 40mW/g. Further note that in the close near field, the SAT is not directly related to the input power but to the antenna current distribution.

DIY FINGER MORSE KEY

CHARLES SMITH, G0ICA passes along a suggestion for a novel 'twin-paddle-type' Morse key which he finds comfortable to operate and easy to make. Also, importantly, it costs very little since all the main components come from an ex-BT relay of the type which, in recent years, have been pulled out of Strowger step-by-step telephone exchanges now largely superseded by solid-state digital systems. These relays have reliable flexible members with excellent contact points at their tips of high-quality material which may prove to be platinum.

The original electromechanical relay and the way this is converted into a finger-operated Morse-key are shown in **Fig 9**. G0ICA writes:

"In use the entire hand can rest on the operating table, with only the index-finger and the fore-finger used to operate the keys, in a manner rather similar to playing a piano or using a typewriter: in other words to consider the action similar to drumming your fingers on a table whilst resting the palm on the table. This avoids the tendency with conventional keys of experiencing wrist ache due to keeping the lower arm, wrist and fingers locked in one position, arched above the key."

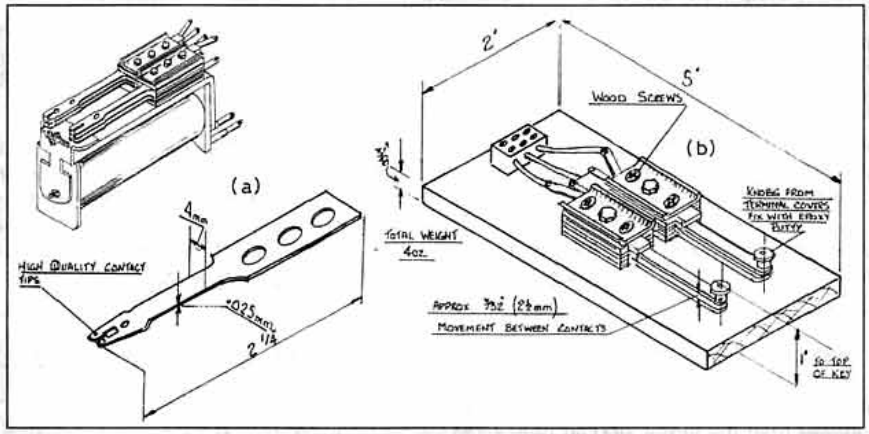


Fig 9: (a) Standard GPO/BT electromagnetic relay as now discarded in large numbers from old Strowger-type telephone exchanges, with well proven reliability. (b) Finger-type (dual paddle) Morse key based on parts from the BT relay as built by G0ICA. It has no bearings and movement depends on flexing of the upper steel member (4mm wide by 0.25mm). Approximate pressure 0.5oz.

HERE AND THERE

PETER CHADWICK, G3RZP, recently observed two 'locals' (about ten miles distant) putting in good S5 signals on 28MHz when in fact they were operating on 14MHz with home-brew linears and trapped multi-band beams. A reminder that with a multiband or broadband antenna that retains a good match to harmonics any that are generated will get radiated - and this is likely to arise in factory-made amplifiers as well as the home-brew variety. G3RZP points out that a simple filter such as that of **Fig 10** inserted in the feeder when transmitting on 14MHz (be sure to remove it when using higher bands!) will give about 25-30dB of rejection on 28MHz. Although an ATU is an alternative, G3RZP considers that unless it is designed for a working Q of 10 (which an L-network would not be) this would not help much. ***G3VA***

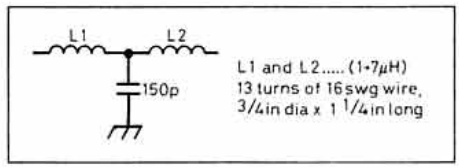


Fig 10: G3RZP's simple filter for reducing the 28MHz harmonics generated by a 14MHz amplifier fed to a multiband antenna

CORRECTION: 'SWEET SPOT' 1.8MHZ PROPAGATION

Unfortunately an error appeared in the first paragraph of this item (*TT*, April 92). The line '. . .horizontally-polarized antennas having relatively high-angle radiation usually considered. . .' should have read '. . .horizontally-polarized antennas having relatively high-angle radiation, often outperform antennas designed to provide the low-angle radiation usually considered. . .'. We apologise for any confusion this may have caused.

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20-3CD	20m 3 element Beam
15-3CD	15m 3 element Beam
10-4CD	10m 4 element Beam
TEN-3	10m 3 element Beam
A4S	20-15-10m 4 element Beam
A3S	20-15-10m 3 element Beam
A3WS	17-12m 3 element Beam
D40	40m Rotary Dipole
D4	40-20-15-10m Dipole
D3	20-15-10m Dipole
D3W	30-17-12m Dipole
R7	40-10m H/W Vertical
R5	20-10m H/W Vertical
AP8	80-10m Vertical
AV5	5 Band HF Vertical
AV3	20-15-10m Vertical
A50-6S	6m 6 element Beam
A50-5S	6m 5 element Beam
A50-3S	6m 3 element Beam
AR-6	6m Ringo Vertical
17B2	2m 17 element Beam
13B2	2m 13 element Beam
124WB	2m 4 element Beam
A144-7	2m 7 element Beam
A144-11	2m 11 element Beam
A144-20T	2m 10 element X Oscar
AR-2	2m Ringo Vertical
ARX-2B	2m Ringo Ranger II
AR-270	2m/70cm Vertical
424-B	70cm 24 element Beam
A430-11	70cm 11 element Beam
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KT34-XA	20-15-10m 6 element Beam
6M-7LD	6m 7 element Beam
6M-5	6m 5 element Beam
2M-20LBX	2m 20 element Beam
2M-16LBX	2m 16 element Beam
2M-13LBA	2m 13 element Beam
2M-22C	2m 11 element X Oscar
2M-14C	2m 7 element X Oscar
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103BAS	10m 3 element Beam
TH7DXS	20-15-10m 7 element Beam
TH5MK2S	20-15-10m 5 element Beam
EXP14	20-15-10m 4 element Beam
TH3JRS	20-15-10m 3 element Beam
TH2MK3S	20-15-10m 2 element Beam
DX88	8 Band HF Vertical
12AVQS	20-15-10m Vertical
14AVQ	40-10m Vertical
18VS	80-10m Vertical
66DX	6m 6 element Beam
64DX	6m 4 element Beam
215DX	2m 15 element Beam
216SAT	2m 8 element X Oscar
7031DX	70cm 31 element Beam
7030SAT	70cm 15 element X Oscar

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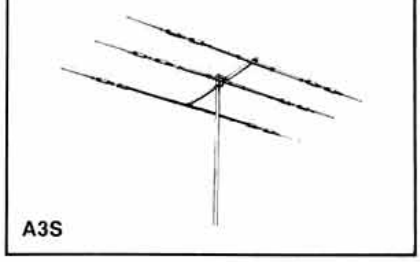
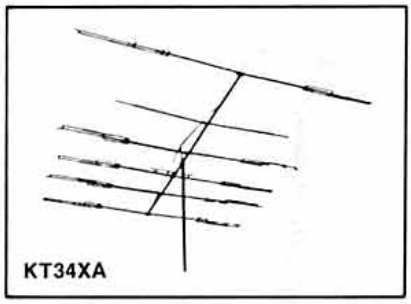
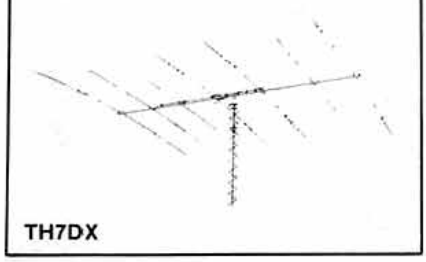


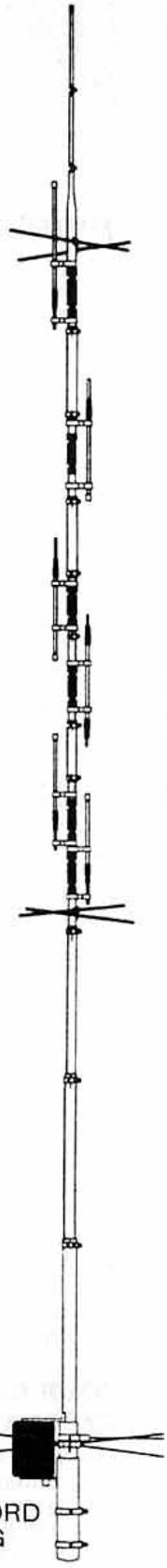
A3S



KT34XA



TH7DX



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RADCOM TECHNICAL FEATURE

In the first of a major four-part series, the UK's top HF DXers reveal their secrets

HF DX
The Inside Story

Part 1 is by Ian Buffham, G3TMA, and Bob Whelan, G3PJT

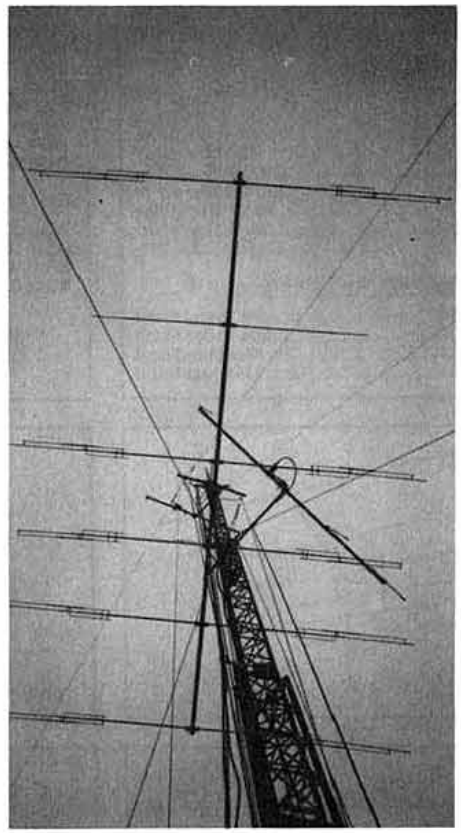
THE DESIRE TO WORK DX has been one of the main driving forces for progress and improvement within amateur radio. Yet surprisingly little has been written about how today's top HF DXers actually set about it, and how you can do it too.

This series of four articles will show you how to develop your HF station into a world-class system for working DX. The articles are based on a survey of all the UK stations on the ARRL DX Century Club (DXCC) Honor Roll, which currently requires proof of contact with 314 countries. Most people responded, and the HF Committee is grateful to everyone for so generously sharing their expertise. This series will also form four lectures at the HF Convention on Sunday 27 September, where you will have the opportunity to question the authors and many of the survey participants in person.

This month's part will deal with antennas, rotators and towers, Part 2 will consider transceivers and station equipment, Part 3 will deal with software and information systems, and Part 4 will cover operating and propagation.

The idea of a survey came from a classic series of articles in *QST* back in 1966, in which W3AFM analysed the reasons for the outstanding performance of some of the best US stations [1]. The four parts covered not only the hardware side but also the operator's side - knowledge of propagation, operating techniques and information networks. A lot has changed over the last 25 years: the HF bands have become more congested, and much of the hardware has changed beyond recognition. Yet many of the principles described in the original articles still hold.

One of the most interesting facets of DXing is that superior operating skills can offset a disadvantage in signal strength, especially if those skills are complemented by a good information network and knowledge of propagation.



GW4BLE makes good use of his 60ft tower with fixed antennas for 1.8, 3.5 and 7MHz plus a KT34XA for the higher bands.

Once in the 'big league' like Steve, GW4BLE, you could be spending time polishing trophies, as well as chasing (the) DX!

YOUR STATION SYSTEM

YOUR HF STATION IS more than just a radio and an antenna. It is a system of units - including yourself, the operator - which all have to work together. Equally important parts of your system for working DX are your information networks, such as a subscription to the *RSGB DX News Sheet* (see page 79) or making use of the DX PacketCluster, and your own knowledge of propagation and operating techniques. These articles will look at all aspects of your station in a structured way, considering the various aspects in turn.

Most rare DX stations will have many stations calling them for a QSO. The question is how to present your signal in such a way that, on average, the DX station will come back to you rather than the others calling. This is not just a question of signal strength, but rather a measure of the performance of your station system as a whole. Knowing when to go into the shack, and then knowing precisely when, where and how to call, is just as important as having a loud signal.

SMALL GARDEN? DON'T DESPAIR!

LEW McCOY, W1ICP, DESCRIBED the ideal location for HF DX as "an island in the middle of a salt marsh atop a high plateau" - but fortunately we can manage without that! In particular, we can all work HF DX without needing a large garden:

"Making the most of your particular location .... I have only a small plot yet I have a total of nine HF antennas to choose from .... Everyone can get up a reasonably efficient Butternut or similar." - Dennis, G3MXJ

"Available space for antennas is 35ft x 35ft" - Tom, GW3AHN

"Rear garden 60ft x 80ft .... all countries worked" - Roger, G3NLY

"Garden only 40ft x 40ft" - Bill, G4ADD

"Simple antennas in a reasonable location" - Laurie, G3UML

There is no doubt that over a period of time a superior station system will have more DX contacts than an inferior one, and will tend to get through the pileups sooner. Fortunately, if you are disadvantaged in one area (such as space for antennas) you still have scope to try extra-hard in other areas, to bring your station system up to a higher level overall.

START NOW!

THE TOP HF DXERS HAVE BEEN at it for some while, often 20 years or more. And even if you don't have all the facilities at present, you can still make a good start on your countries total. If and when you move house, hopefully to a better location, you can take your existing HF DX totals with you (provided you don't cross a country border) and carry straight on. So get started now!

Part 1 - Antennas, Rotators and Towers

TABLE 1 SUMMARIZES THE SURVEY of station hardware, with a particular focus on antenna systems. The most obvious feature is that almost every one of the leading UK DXers uses a beam for 14, 21 and 28MHz. You might have imagined that they would all be using large arrays on very high towers, but in fact the reverse is true - a very encouraging sign for up-and-coming young DXers. Over 50% of respondents use simple commercial three-element tri-band beams (**Fig 1**).

Although a beam seems to be almost indispensable if you want to play in the First Division, don't forget our earlier remarks about small gardens. You can often fit an HF beam in if you really try; and even if you can't, you can still work a lot of DX. Many beam owners also use a multiband vertical such as the Butternut HF6V, primarily for the LF bands but also as a standby antenna for 14 - 28MHz. If the beam is not available they would fully expect to work the DX on the vertical instead, given enough time - and so could you.

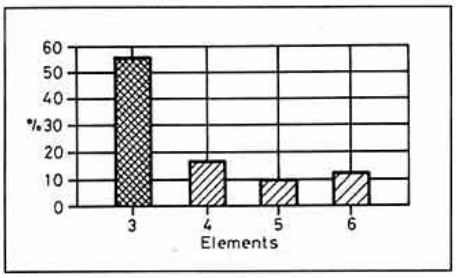


Fig 1: A three element beam is popular and can give excellent results.

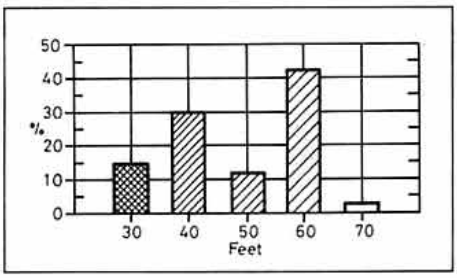


Fig 2: The most popular antenna heights make an interesting comparison.

HOW HIGH?

FIG 2 SHOWS THE PERCENTAGES of 14 - 28MHz beam antenna heights from the survey, grouped into the ranges 0 - 35 feet, 35 - 45ft and so on. The majority of antennas are at either 40+ feet or 60+ feet, simply reflecting the heights of commercial crank-up towers. Very few UK members of the DXCC Honor Roll have antennas at 70ft or higher, though almost all have made the effort to get significantly above roof height.

The antenna textbooks give the reason why: antenna height affects the angle of radiation, and hence the strength of your DX signal. A horizontal antenna located a half-wave above ground will give an angle of radiation of approximately 30°, with much lower signal strengths at lower angles. If the antenna height is doubled its low-angle radiation will become much stronger. It is generally reckoned that an antenna at 60ft will put a 6dB stronger signal into a DX location on 14MHz than the same antenna at half that height. In practical terms a 14MHz antenna at 33ft will give a good signal into the eastern USA, but the same antenna at 66ft will be noticeably better for contacts into California.

For instance, with a low dipole you are very unlikely to work a DXpedition to a rare location such as Bouvet or South Sandwich on the first day of activity, when it sounds like the whole world is calling. However, after a week of activity the DXpedition will have worked all the big guns with high towers and linears, and the more modestly-equipped stations should have no problem in getting a prized QSO, especially on CW.

So you can work DX with even a relatively poor antenna. The difference when using a high tower and a yagi is that you can get through the pileups earlier, just in case the DXpedition's antennas blow down. Contest working is a quite different game - your signal needs to be 'top of the pile' from the word go - but that isn't what we're talking about here.

CALL	HF ANTENNA	TOWER HEIGHT	LF ANTENNAS	TRANSCEIVER	LINEAR
G2FSP	KT34XA			TS830+TR4	
G3JEC	HB43SP	65ft		TS950S	
G3COJ	HB33SP	34ft	Dipoles	IC751	Heatherlite
G3SJH	KT34A	60ft	Inverted V	TS180S	FL2100
G3PJT	TH5	40ft	Butternut	IC735	Heatherlite
G3RCA	TH3 MK3	38ft	Inverted V	TS180+VFO	Homebrew
G3LQP	TB3			TS950	
GM3WIL	3EL Beam	40ft		IC765	
G3MXJ	TH6DX	60ft	3.5/7 Slopers. 1.8 Vertical	TS830	
G4GIR	TH3	40ft	60ft Vert + Loading Wire	IC781	Alpha 76A
GW3AHN	2EL X Yagi (14)	35ft		TS530	
	G4ZU (28,24,21,18)	25ft	35ft Top Loaded Vertical		
G3KMA	FBDX706	60ft	7 Sloper, 3.5 Delta Loop 1.8 Inverted L	TS940S	TL922
G3XTT	TH5DX	56ft	7 Vert, 3.5 Inverted V 1.8 Inverted L	TS940S	TL922
G3NLY	TH3	55ft	Sloping Long Wire	TS830S	SB220
G3HCT	2EL QUAD	70ft		TS940S	SB200
G3IOR	TA33	60ft	Shunt Fed Tower, Dipole	IC720A	
G4ADD	TB3000	40ft	Slopers	IC735	Hammarlund
G3UML	Dipoles, Delta Loop			IC735	SB200
	Wire Vertical	45ft			
G4DYO	2EL Quad	60ft	"Bits Of Wire"	TS930S	MLA2500
G3HTA	TB3	60ft	Phased Verticals (3.5/7) Dipole (1.8)	FT101ZD+VFO	G2DAF
G4FEU	4EL Yagi	45ft		FT101ZD	FL2100B
G3WPF	2EL Quad	65ft	Inverted V	TS930S	TL922
G3VIE	TA33	40ft	Dipoles	FT101ZD	MLA2500
GW3ARS	2EL X (14) ZEPP Vertical (21,28)	45ft	100ft Wire Tuned Against Counterpoise	TS930S	Homebrew
G3VOF	KT34XA	40ft	Butternut (3.5/7)	TS940S	TL922
G3YJI	TH3	38ft		TS830S	FT1000
G3AAE	DX33	42ft	Dipoles	TR7+TS850S	
GW4BLE	KT34XA	60ft	Shunt Fed Tower (1.8) 1/4 Wave Sloper (3.5) 1/2 Wave Sloper (3.5) Sloping Dipoles (7)	TS930S	SB220
G3ZBA	TH3	60ft	2EL Beam (7) Delta Loop (3.5)	IC740	FL2100Z
G3GIQ	Fritzel 5EL	60ft	Inverted V (3.5) Dipole (7)	TS950	TL922
G3FXB	3EL Quad (14)	65ft	Wire Beam (7)	TS930+C LINE	
	4EL Quad (21,28)	65ft	Inverted V (3.5/1.8)		
G3NSY	TH3	60ft	Inverted V	TS930S	KW1000
GW3CDP	TH3	50ft		TS830S	FL2100Z
G4IUF	FB53	50ft	Dipole(1.8) Sloper(3.5)	TS830S	TL922

ARE IMPROVEMENTS WORTHWHILE?

ARE A FEW DECIBELS EXTRA in signal strength worth all the trouble and expense of raising your antenna to 60ft or more? In the absence of other stations trying to work the same DX, one or even two S-points would be almost irrelevant; but in the real world of DXing it can make all the difference. There is a trade-off between the strength of signal radiated and the time it takes to get through to the station you want, and wide experience shows that as little as 1dB extra can tip the long-term odds in your favour. The leading DXers have paid a lot of attention to small details such as a better grade of feedline or adding extra ground radials; none of these improvements would make a huge difference on its own, but together they add up to something significant.

It is interesting to look at the cost of various options to gain an extra 6dB, starting from a dipole at 30ft and 100W output. Doubling the antenna height will make you about 6dB louder with the DX, as mentioned earlier, and a 60ft tower will cost more than £1000 with its base foundation and a suitable rotator. Since a tower is hopefully a once-off investment, it is worthwhile to go for the maximum possible height, though few people go much higher than 60 - 70ft. For the antenna, a three-element tribander will give very roughly 6dB increase in gain over a dipole, and at rather less expense than the tower. A few people use larger beams and there is always scope for experimentation, but the increase in gain with size is subject to rapidly diminishing returns and escalating costs. To complete the list of options, a 6dB linear amplifier (100W input, 400W legal-limit output) can be purchased new for somewhat over £1000, or built for considerably less.

So the feasible steps towards improving your DX signal are a normal-sized tower, a reasonable-sized beam and a legal-limit lin-

ear - but don't forget that many people have reached the DXCC Honor Roll using much smaller systems than that.

QUAD OR YAGI?

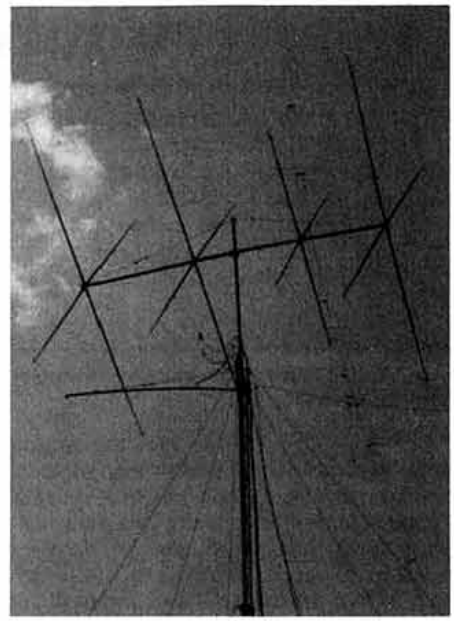
ARGUMENTS CONTINUE TO RAGE within the DX community about the merits of quad antennas versus yagis. Our survey of the leading UK DXers gives a new perspective on that argument: only four respondents to the survey use quads, the remaining thirty generally using yagis. So although quads are highly respected, it seems that you can manage to achieve a high countries score without one.

Quads are generally regarded as being susceptible to damage in winter storms, and as being much more visually obtrusive than yagis, but it would be very unwise to write them off as practical DX antennas. For example, one of the questionnaire respondents who uses a quad is Al Slater, G3FXB. As well as being a leading DXer, Al is also famous as a contester and has one of the strongest HF signals from the United Kingdom. Al's quad is a real monster with a 23ft boom, carrying three elements for 14MHz and four elements each for 21MHz and 28MHz, yet by guying his 65ft tower he seems to have no trouble in keeping it in the air.

Another quad enthusiast is the *RSGB DX News Sheet* editor Brendan McCartney, G4DYO. "My first 'serious' amateur antenna was a TA33 triband yagi which I erected around 1974 for SWL use and later for transmitting. In 1978 I acquired a 60ft tower and shortly after the tower was erected I changed to my present cubical quad antenna. The change was like switching from a dummy load! Despite the odd broken wire from strong winds, I would not consider changing back to a yagi - of any size! Experience in numerous pileups on all bands from 10-20m has convinced me beyond any doubt that the 2-element quad is in a class of its own." Also, a 2-element quad has a very small turning circle and is unlikely to overhang the property line of even the narrowest garden.

G4DYO is one of the few who have worked all the countries on the ARRL Countries list, and is also very keen on chasing countries on the WARC bands. He has made a very potent WARC band antenna simply by adding extra wire loops to his existing 14/21/28MHz two-element quad. It is clearly much easier to modify a quad in this way than to add extra elements to a yagi. Bren comments as follows: "The framework is the Gem Quad but the electrics are home-brew. The 14/21/28MHz quads are fed with coax-type gamma matches. However, when I added the 18MHz elements sheer laziness prompted me simply to connect the driven element to 50ohm coax and feed it without any matching. The result is stupendous and next summer I shall probably replace all the gamma matches with straight coax feed.

"All those hours spent cranking the tower up and down, tuning gamma matches, were a total waste of time. The 18MHz 'chuck up a couple of loops and see what happens' quad is the best yet, with excellent forward gain and superb side/back rejection. Incidentally I do not employ ATUs. My Quads are all tuned outside and my various wires are always



A 65ft tower supports Al Slater's, G3FXB, huge Quad antennas. These comprise a three element for 14MHz and a four element for 21 and 28MHz.

pruned to produce "an appropriate match to the transceiver."

Yet another quad devotee with a big signal is John Bazley, G3HCT. His quad is a 2-element on an 8.5ft boom, carefully optimized by a combination of measurement and computer modelling. Like G4DYO, John has taken advantage of the fact that it is easy to add wire loops for the WARC bands.

In summary, the vast majority of successful HF DXers are satisfied with their yagis, though they have not found a lot to say about them. The quad devotees, on the other hand, are positively lyrical!

LF BAND ANTENNAS

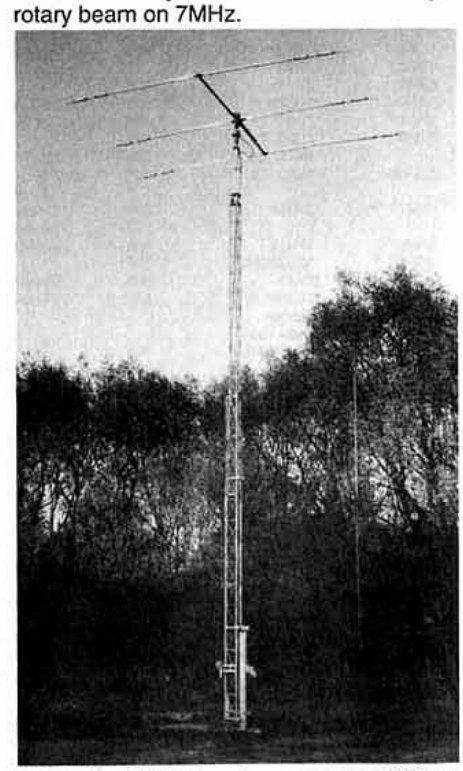
IF YOU DON'T HAVE ROOM for a 14 - 28MHz beam, the best way to work the DX may be to use the LF bands, especially 7MHz. G3HTA explains why the longer wavelength is no disadvantage when space is limited: "If you can't get a dipole up more than 65 feet on those bands, it is a waste of time. Verticals will do a really good job and I have used them continuously for 20 years."

A simple vertical needs very little space, and will be a much more competitive DX antenna on 7MHz than on 14MHz. All the major DXpeditions visit 7MHz, so your chances of catching them on that band are very good indeed. A good example is G4WJB, who was the winner of the G5RP trophy in 1991 - awarded for progress in DX working during the year (see page 5). Bob uses a 7MHz vertical in a small garden but nevertheless has accounted for over 170 countries in a very short space of time, including such exotic DX as ZL9, VP8 (South Sandwich), ST0 etc.

To emphasise the fact that LF-band verticals need very little space, here is G3HTA again, recalling when he used to live in a bungalow with only a 16ft garden: "For 3.5/7MHz I had verticals. One was a 33ft whippy job for 7MHz at one corner of the bungalow. A quarter-wave away was a 3.8/7MHz trapped (wire) vertical going to a guy ring under the TA33 at an angle of about 50°, then horizontally to the chimney. These antennas were phased on 7MHz or selected separately, and the arrangement worked well. The textbooks will suggest that you need a minimum of 120 buried radials equally spaced around the base of a vertical - OK for the drawing board but rarely practical. A good 6ft stake at the base plus one either side about 3 feet away and a few square feet of wire netting under the base will perform like a miracle! I did a 1.8MHz contest once with base loading and had a lot of fun."

So there you have it from one of the experts: don't despair if you have a small garden - you can still work LF-band DX. These days G3HTA has rather more real estate to play with, but continues to use phased verticals for 7MHz and 3.5MHz.Further evidence of good results on the LF bands with simple antennas comes from Brian, G3COJ: "Probably the most effective aerial I have ever had was a sloping dipole put up in 1985 at G4DYO's suggestion to work FO8XX, my only contact with Clipperton as it turned out. One end was 46ft high, attached to a portable mast, and the other about 6ft. Much other DX was worked without difficulty. Conversely, I tried a delta loop on the other side of the mast and fed it as recommended for low-angle DX.... it proved to be completely useless (I never knew why)." But don't let Brian's experience put you off trying delta loops for the LF bands; loops are very easy to experiment with, and Laurie, G3UML, works a lot of DX using simple wire antennas such as carefully resonated monoband loops.

The survey reveals that almost all of the top UK DXers use relatively modest LF-band antennas: dipoles, slopers, inverted-Vs, verticals, shunt-fed towers etc. Only G3FXB, G3ZBA and G3HTA use directional antennas on the LF bands. G3FXB has a wire beam for 7MHz, and G3HTA has phased verticals on 7/3.5MHz. Only G3ZBA admits to using a rotary beam on 7MHz.



Mr S Sefton, G3ZBA's, antenna system in 1971. He currently uses a TH3 antenna, and a rotary beam on 7MHz.

ROTATORS

THE SURVEY REVEALS MANY different types of rotator in use. Some people have had years of trouble-free service from their rotator whilst others regard the rotator as the most troublesome piece of equipment in the whole station. Rotator faults can almost always be guaranteed to occur in the middle of winter and it is certainly no fun working on a rotator in sub-zero temperatures. In choosing a rotator it is important to consider the following:

(a) The proposed rotator must be easily able to cope with the antenna to be used. Antenna manufacturers and rotator manufacturers generally specify their products in terms of square feet of antenna wind loading, and also in terms of dead-weight loading. Although stresses on the rotator can be greatly reduced by a rotator cage with a load-carrying top bearing, it is certainly unwise to choose a rotator which according to the manufacturers' literature will only just cope with a particular antenna.

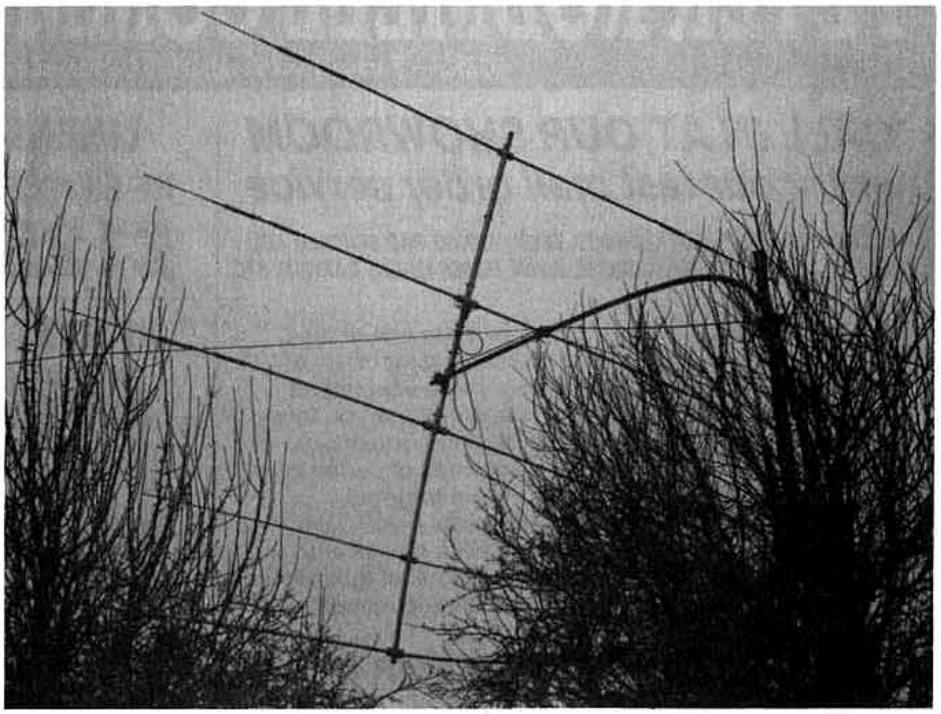
(b) Some rotator types seem much more troublesome than others, even though they are being operated well within their published ratings. Since the survey was relatively small and did not request engineering details of individual installations, it would not be justifiable to name names. If you are contemplating buying a new rotator, have a word with your friendly local DXers to see what they think.

TOWERS

ANOTHER IMPORTANT ELEMENT in the design of an antenna system is the choice of a tower to support the beam. This aspect is often neglected and left to chance. It is not surprising therefore that stories abound of towers being flattened in gales, and worse still, stories of accidents and near-accidents.

Most amateurs have heard of the old saying "If your tower didn't blow down during the winter, it just goes to prove that it wasn't high enough". Unfortunately this kind of attitude can lead to accidents which at best are very expensive and at worst result in severe injuries or fatalities. A much more healthy attitude is expressed by Bob Locher, W9KNI, in his indispensable book *The Complete DXer*. Bob makes the important point that a good DX antenna is one that is always available, even in the harshest months of winter. It is no use having a huge stacked array on a 200ft tower if it blows down a couple of days before the much-wanted XZ expedition comes on the air.

The well equipped station of G3GIQ. Successful DXers pay attention to small details, which together add up to a significant improvement.



Gone with the wind! The mast and guys should be capable of supporting the antenna and its rotator in a severe gale. If not . . . .

There are two main parameters to be considered in the choice of a tower: the maximum allowable wind speed when used with the proposed size of antenna, and the total weight to be carried by the tower (weight of antenna plus rotator plus additional support hardware). In the British Isles wind conditions can be very severe and wind speeds of 90 - 100mph are not unusual at times; average wind speeds for your location may be lower than that, but it's the one strongest gust that does the damage. If you read the literature for commonly used crank-up towers, you will find that many of them will not survive 90 - 100mph winds when carrying a triband beam without either being guyed or cranked right down. This does not mean that these towers should not be used, but that it is very important to know the limitations of your system. If the antenna system is to be left unattended, even for a few days, it should be wound down to a safe height. Also, in the event of any weather forecasts of severe gales it is better to play safe and wind the tower down or even tilt it right over.

The important thing is to find out the limitations of your system - don't guess. Ask the tower suppliers: they will be able to advise whether your proposed tower and antenna combination is safe at the wind speeds it is likely to encounter. Also check that the tower can support the dead-weight load of your antenna and rotator. Even a moderate-sized yagi plus rotator and fittings will easily weigh in excess of a hundredweight. If a crank-up tower is overloaded with too much weight there is always the danger of catastrophic failure of the winch cables, resulting in a serious accident. Finally, look after your tower and maintain it well.

CONCLUSIONS

- A large beam on a high tower will help you to work through the pileups more quickly, but you can still be a successful DXer if you're prepared to be patient.
- Height is more important than the size of the beam.
- Simple vertical antennas are very competitive on the LF bands.
- You can manage without a big garden!

Antennas are generally regarded to be the key to successful DXing, but other articles in this series will show that you can partly make up for a poor antenna by trying harder in all the other departments of your station system.

REFERENCE

[1] 'Station Design for DX' by Paul Rockwell, W3AFM; *QST* September - December 1966.

FURTHER READING

ALL ARE AVAILABLE FROM RSGB - see Bookcase pages

HF Antenna Collection (RSGB) contains edited highlights of all relevant *RadCom* items for the past 20 years.

Low Band DXing, John Devoldere, ON4UN (ARRL).

ARRL Antenna Book, (ARRL).

The ARRL Antenna Anthology, (ARRL).

The Complete DXer, Bob Locher, W9KNI.

All About Beam Antennas, Bill Orr, W6SAI, and Stu Cowan, W2LX, (RPI).

All About Cubical Quad Antennas, Bill Orr, W6SAI, and Stu Cowan, W2LX, (RPI).

Bob Locher, W9KNI, in his indispensable book *The Complete DXer*

To be continued

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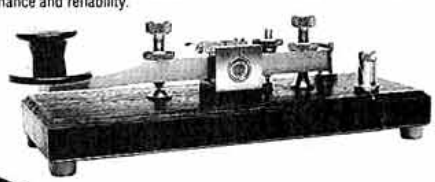

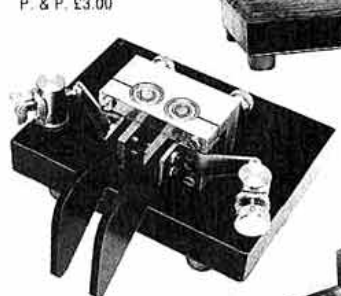

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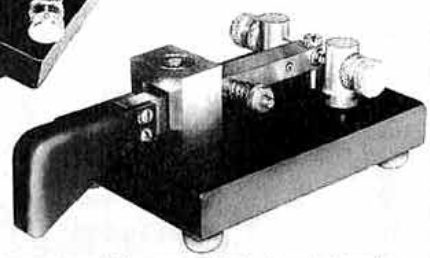

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RADCOM TECHNICAL FEATURE

A Remote Reading RF Ammeter

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

THE ELECTROMAGNETIC radiation at a distant point from an antenna depends on several factors; such as the RF current flowing in each element multiplied by the length of that element. But the current usually varies along the length, as normally we have standing waves (as well as resistive losses).

To get an idea of the power radiated we need to know what the current is over each section of the antenna.

Traditionally the best that can be done to check the antenna current is to put an ammeter in series with the antenna as it leaves the shack. The bigger the reading, the bigger should be all the components up there in the air though we still have no indication of the current at some fixed point along the antenna.

It is theoretically possible to calculate the current at one point knowing it at another, but this usually involves assumptions and approximations, ignoring local conditions such as trees and buildings and capacitance to ground. Likewise we seldom know if the currents in the two arms of a dipole are really equal; nor do we know how much current flows on, and radiates from, the outside of a coax feeder and whether a balun has reduced it to zero. Unfortunately it is not practical to put our RF ammeter up there to see what the current really is; nor can we use an ammeter shunt or current transformer and run a lead down to the meter - the meter lead would become part of the antenna system and invalidate the reading. But maybe we can . . . .

A RAY OF LIGHT

WHEN DEMONSTRATING optic fibres to students I had an idea that here might be a solution. Light from an LED is coupled into an optic fibre which conducts the light to a detecting photo-diode. The diode is connected through a meter to a battery; the brighter the LED, the greater the meter reading. If the LED could be driven by a current transformer energised by the antenna current, then the meter reading could be related to RF in the antenna. The optic fibre of glass or plastic contains no conducting metal and so does not influence the antenna. If the idea works, we have the makings of the ideal antenna ammeter.

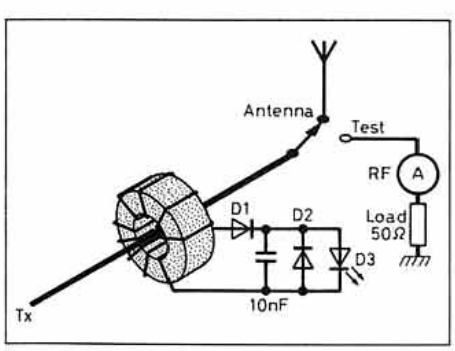
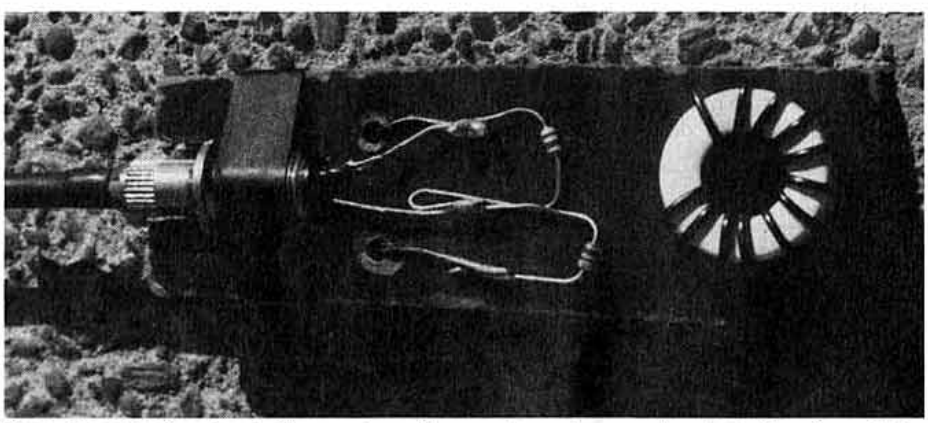


Fig 1: The test setup of the Remote Reading Ammeter. The light output from the LED D3 is approximately proportional to the RF current through the ferrite ring.



The probe or 'business' end of the remote reading ammeter on the ground ready for threading onto the antenna wire. The fibre is coupled onto the LED emitter.

To explore the possibility I took the standard design of a current transformer as used in VSWR meters and shown in **Fig 1**. A ferrite ring has a secondary of typically ten or twelve turns. The primary is formed by taking the wire carrying the antenna current straight through the ring forming a twelve-to-one ratio transformer. An RF detector and an LED replace the usual resistor.

A low-capacitance signal diode in series is used to rectify the RF; the LED lights convincingly with half an amp of RF in the antenna. In fact the transformer ratio does not predict the LED current accurately owing to flux leakage and losses. These are not serious, however, and the LED current is typically around 20mA with half an amp of RF in the primary.

This ferrite ring and LED assembly can be used alone as a current indicator just as a neon lamp can be used to indicate RF volts. The protective diode across the LED may not be necessary but it is cheap enough not to omit as LEDs have a low reverse rating. A small capacitor, say 10nF, acts as an RF bypass.

Having confirmed that the theory thus far worked, I took the plunge and spent around £50 on fibre optic components. It is possible to economise with cheap DIY alternatives, but to test this new venture I wished to remove as many unknowns as possible. The components had full-performance specifications. It was clear that a meter amplifier would be required so a bread-board was set up to establish a suitable, very simple, design. I was now ready to construct the prototype.

PROTOTYPE SYSTEM

THE SYSTEM CONSISTS of three components; the probe, the fibre and the meter unit.

The probe is shown in Fig 1 and photograph. The ferrite ring is attached to a small piece of insulating board and is located over a hole through which the current-carrying wire will be threaded. Twelve turns of 20SWG enamelled copper wire are wound on the ring and the ends threaded through holes in the board to retain them. The high-output LED is taped to the board with its threaded front conveniently exposed for coupling to the optic fibre. The diodes used in the original were BAT85 silicon Schottky barrier type, but the earlier germanium types would probably do equally well. The circuit is soldered together using the wire ended diodes for connections.

The optic fibre is of the relatively inexpensive polymer variety, supplied on a cardboard drum in a twenty-metre length. The fibre is carefully unwound, a procedure best done out of doors in a straight line. A small hole is made in the cardboard flank of the drum and one end of the fibre threaded through the hole before winding the fibre carefully back on the drum. Both ends are now accessible and special ferrules are fitted following the supplier's instructions to terminate the fibre.

The meter unit is based on an educational (classroom) meter. Optional shunts for different ranges in standard boxes plug into the

side of a large-scale 100µA movement. The photo-diode which matches the LED is mounted on the outer side of a box with the threaded part protruding for connection to the optic fibre. The box should be large enough to contain a small (PP9) 9V battery and the two transistors for the amplifier. The circuit is shown in **Fig 2** and the general layout in the photograph. Two transistors such as BC108 in a Darlington configuration make a suitable high-gain amplifier. They are soldered to a small piece of Veroboard which is supported on stiff wire leads. No switch is needed; plugging the box into the meter serves that function. The meter reads over full scale in daylight until the fibre is connected and cuts out stray light.

When connected up, a current of half an amp RF results in a meter reading of about 80µA. Note that the meter can be up to 20m from the probe. The drum of fibre being unwound as required. It matters not if the fibre is wound on the drum as there is no inductance in a coil of fibre!

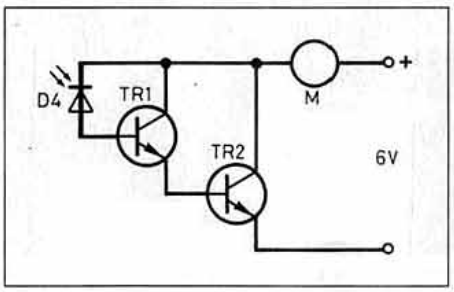
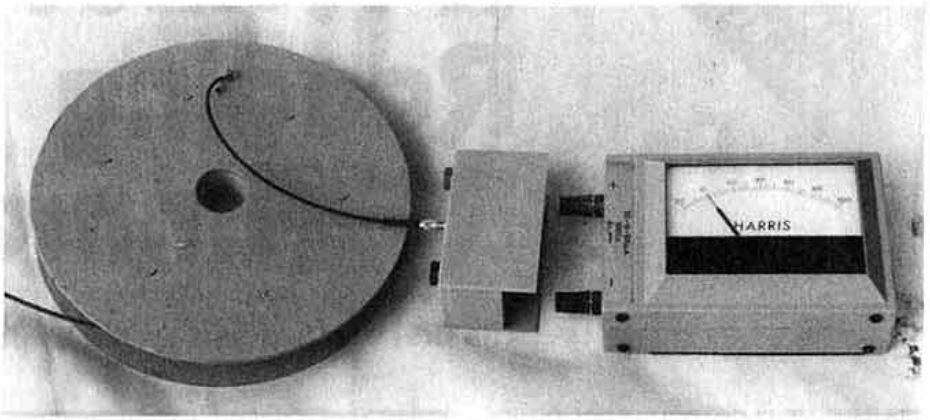


Fig 2: Circuit of the photodiode and simple amplifier to measure the light coming down an optic fibre from D3 in Fig 1.



The reel of optic fibre, amplifier and meter. The fibre is coupled to the photodiode which protrudes from the amplifier. The amplifier box plugs into the side of the meter.

RF Current A (Amps) Meter Reading M (microamps)							
A	0	0.2	0.3	0.4	0.5	0.6	0.7
M	0	20	35	50	65	80	100

Table 1: Calibration

For calibration I used my FT77 transceiver which has a variable drive, and an old RCA thermocouple ammeter, reading to 1A, set up with a dummy load as in Fig 1. The thermocouple ammeter had a non-linear scale and only currents over 0.2A gave a useful deflection. **Table 1** shows the calibration of the prototype for the 7MHz band. Other HF bands gave similar but not identical results.

It is convenient to store the unused fibre on the drum for several reasons; it protects the fibre which might otherwise be tripped over and damaged, it avoids having to cut lengths and provide new terminations, it avoids the need to join fibre which can introduce serious losses and, most important, only one calibration table need be made.

. . . to be continued

LOWE ELECTRONICS

With recent advances in transceiver performance, it's all too easy to concentrate on single aspects of a complex unit and lose sight of the package as a whole. I am as guilty as anyone in this respect, because I have been simply staggered by the improvements in receiver performance achieved by Kenwood in the TS-950S, TS- 850S and TS-450S, and have therefore tended to labour the point. It is nevertheless a fact that the receivers in all three transceivers have taken a significant step forwards relative to any other unit on the market, from whatever manufacturer you care to choose, from whatever country you care to name. There is just no comparison.

However, there is more to Kenwood engineering than just the receiver, and more to user satisfaction than knowing that you have the best receiver in the world. What counts is the knowledge that when you buy a Kenwood unit, that unit is the result of careful and detailed assessment of your needs; has been the subject of intensive research and design; and has been matched in every aspect to ease of use by a human being, i.e. you. It has always been commented by reviewers and users alike that anyone can sit in front of a Kenwood transceiver and operate it without reference to a handbook. Whatever you want to do, it is easy to do; whichever control you need to use falls easily to hand. You are never faced with the situation so often encountered with other makes when you say to yourself "Why on earth did it do that?"

Further satisfaction comes from the comments you receive on the air when the station you are working tells you that you have the best sounding signal on the band. This is not the result of an accident; it's due to the care which Kenwood take in pursuing their care and attention as much to the transmitted signal as the ultimate receiver performance.

That's the situation in general, but as far as the TS-850S is concerned, it has been remarkable how many people have looked at it, used it, and then said that it has everything that they ever wanted in a transceiver. So whatever your needs in amateur radio, the TS-850S is probably the rig to satisfy you. It's all down to small but significant details such as the fact that the user can select high tone or low tone pairs for RTTY (and it's true FSK rather than AFSK), the fact that you can operate "Reverse CW" which in effect gives you selectable sideband convenience in CW, and allows you to toss interfering stations to one side, the fact that the main display can be set to show VHF and UHF frequencies when using a transverter (yes, there are transvert facilities), the fact that an advanced keyer with full BK is provided within the rig; so many details which add up to the whole truth that as a total station, the TS-850S brings Kenwood uncompromising performance and ability within the reach of many more people.

Don't take my word for it, try and see a TS-850S for yourself at your nearest Lowe Electronics branch. If you don't know your nearest branch, just ring Matlock and we will give you the address. The TS-850S is always in great demand, so do make sure that there is one for you to see before heading off on a long journey. I can assure you that when you see the TS-850S you cannot fail to be impressed.

The amateurs who really know their equipment are of the opinion that Kenwood at the moment make the best HF transceivers in the world: I have to agree.

John Wilson \
G3PCY

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RADCOM EQUIPMENT REVIEW

Alinco DJ-F1E 2m FM Handheld

A user review by the RadCom team.

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The radio itself is very small indeed and it is hard to believe how much wizardry is packed into the 110(H) x 53(W) x 23(D)mm (4.3 x 2.1 x 1.1in) case. The battery pack clips easily onto the back, increasing the thickness to 37mm (1.5in). The weight with standard battery pack is 375gm (13.2oz).

TECHNICAL SPECIFICATION

ACCORDING TO THE handbook, the F1E covers 144.000 - 145.995MHz (F4E: 430.000 - 440.000MHz) but the model supplied had a modification to allow coverage of the range 130 - 174MHz; transmit is inhibited when outside the UK 2m band. Channels can be tuned in user-selectable 5, 10, 12.5, 20 or 25kHz steps and there are 40 programmable memories (plus a rapidly selectable Call channel for your favourite repeater or club net) which can store frequency, repeater offset and details of sub-audible tones if fitted.

The standard 600kHz repeater shift can be reset by the user for any shift between 5kHz and 16MHz in either direction; this is essential for the F4E when a 1.6MHz shift must be substituted for the factory-set 7.6MHz. A 'reverse repeater' button allows listen-on-input. Tuning is achieved by rotating a knob on the top panel, direct frequency entry from the keypad or by up/down buttons.

Transmitter power output is 2.0W (F4E: 1.5W) in the 'high' position, 1W 'mid' and 0.1W 'low'. With the optional 12V battery the 'high' power increases to 5W.

The receiver is a double conversion superhet (IFs at 23.05MHz and 455kHz) and sensitivity is quoted as 12dB SINAD for <-15dBu.

DESCRIPTION

A BNC CONNECTOR is used for attaching the 'rubber duck' or external aerial. Next to the aerial is the volume control with on-off switch. Concentric with the volume is the squelch control which proved a little fiddly to adjust without accidentally altering the volume at the same time. The only other knob on top of the radio is for continuous tuning. Although necessarily small, the tuning knob was quite comfortable to use. It has twenty 'click' positions, representing from 100kHz to 500kHz per turn depending on the channel spacing selected.

On the back is a belt clip and the charger connections. Although slightly recessed, the connections seemed rather exposed and safety conscious users may want to tape them over when not charging. An internal diode would have made this unnecessary.

The left side contains a three-part switch. This includes the Function ('F') button through which most programmable facilities are accessed. The other parts are 'Transmit' and 'Transmit with tone'. Sockets for external speaker, microphone and power are under protective flaps on the right hand side.

The main functions of the radio including direct frequency entry are carried out by 22 very small buttons on the front panel, either on their own or in combination with the 'F' button. All buttons emit a reassuring bleep when pressed, though this can be disabled.

Frequencies can be directly keyed into the memory channels, the contents of the VFO transferred into memory (and vice versa), or the contents of any memory written into any other. A priority watch function allows one frequency to be checked automatically every five seconds whilst listening on another; this is available for the VFO or any memory.

All 40 memories can be scanned and any can be simply excluded from the scan. Scanning is also available over all or part of the full tuning range. Two scanning modes are available: one resumes five seconds after it stopped even if the channel is still occupied, and the other resumes two seconds after the channel clears.

The dial (and, usefully, all push buttons) may be illuminated, either for a few seconds or until switched off. Another handy function for night-time use are bleeps to indicate when multiples of 500kHz (one bleep) or 1MHz (two bleeps) have been tuned to.

There is a battery saver which switches on for 300mS and off for 700mS whilst monitoring, and a very handy Automatic Power Off turns off the radio after a period of no activity, programmable from 5 to 60 minutes; it even plays a tune to warn you it is going off!

The 60-page instruction manual covers the VHF and UHF variants and describes all of the accessories and functions. Initially daunting, the comprehensive instructions quickly become clear once the user becomes familiar with the rig. In addition, an A3 size circuit diagram is included plus a very handy A5 Pocket Guide which describes in straightforward terms how to drive the radio.

IN OPERATION

THE DJ-F1E FEELS very comfortable and is well balanced and light. Despite the buttons being so tiny, they were not difficult to use. Apart from the squelch, the controls were well enough spaced to avoid two being activated at the same time. The squelch could be set to open on unreadably weak signals and the scanner also stopped reliably on this sort of signal. Receive audio quality was good but in a moderately noisy car the volume was inadequate without an external speaker. The batteries lasted about three hours on receive.

In conclusion, this is a very handy and flexible radio. Though somewhat complex for the newly licensed, it is ideal for anyone needing the full range of 'bells and whistles' in a tiny package. It is available at £239 + £4.50 p&p from Waters and Stanton, 22 Main Road, Hockley, Essex SS5 4QS; thanks to them for the loan of the review model.

RADCOM EQUIPMENT REVIEW

Very few short wave transistor radios feature SSB reception; the Sangean is one of these – we put one through its paces.

Sangean Model ATS-803A

READERS WHO ARE looking for a moderately priced, portable shortwave receiver, might like to consider the Sangean ATS-803A. The set covers the entire HF spectrum including all nine Amateur bands and, unusually, has a BFO for SSB/CW reception. In addition it offers VHF/FM Stereo reception, and coverage of the Short, Medium and Long Wave broadcast bands. There's even an alarm clock and sleep timer!

The ATS-803A, though portable, is fairly large, measuring 29.2 x 16.0 x 6.0 cm, and weighs 1.75 kg less batteries. As battery power consumption is quite high (approx.90mA), an external 9V mains adaptor seems a good idea. The full complement of batteries comprises 6 x D (U2), plus 2 x AA type for clock and memory back-up. There is a 3.5mm headphone socket on the side panel together with a 5-pin DIN socket for tape recorder or stereo amplifier.

As a broadcast set for LW/MW/SW and VHF/FM reception the sound quality and general performance are excellent. But for the remainder of this review we will concentrate on the receiver's suitability for amateur use.

OPERATION

HF COVERAGE IS continuous from 150kHz to 29.999MHz in 1kHz steps, either using up/down keys or rotary tuning. In addition a particular frequency may be directly entered from the front panel. Channels, once selected, may be locked by a switch on the front panel. The stepped nature of the frequency synthesizer gives the receiver excellent frequency stability, although it means that all fine tuning must be accomplished on the small BFO pitch control. The BFO range was found to be approx. +/-3kHz. A scan function is also available which tunes upwards in 1kHz steps at a fixed rate, though this facility is not available on the memory.

The Sangean has two IF filters for the HF band, which gave adequate selectivity for SSB and CW. Best results were obtained by tuning across the band with the wide filter, then switching to the narrow (2.4kHz) position once a station had been located. This results in a useful reduction in QRM while ensuring that stations are not missed between tuning increments. It is perhaps worth mentioning that the bass and treble controls were found useful to compensate for a slight ripple in the IF response, and produce good audio quality.

Other features include the ability to store up to nine frequencies in non-volatile memory, which provides a very effective means of switching between amateur bands. Rotary tuning may also be used, with the tuning rate being dependent on how fast the knob is turned.

Sensitivity below 10MHz was very good, but above this frequency a good antenna matched to the receiver's low impedance input would be beneficial. This input provides a switched alternative to the large (140cm) built-in telescopic antenna. There is also an RF gain control, and a five-LED signal strength indicator. The AGC characteristics are really more suited to AM broadcast reception than SSB, so it was helpful to be able to reduce the RF gain on stronger stations.

The instruction manual proved helpful and informative, with an entertaining English translation. It includes a number of tips on how to obtain the best performance, together with a circuit diagram.

CONCLUSIONS

ALTHOUGH THERE MAY be better amateur receivers, the majority of these are in a much higher price bracket. Also although most are quite small in size, they are more suitable for car-mobile than portable operation due to their relatively high power consumption.

The Sangean ATS-803A on the other hand, provides a very good introduction to Short Wave listening and would be a nice set to take away on holiday.

The receiver is obtainable from SRP Trading, Unit 20, Nash Works, Forge Lane, Belbroughton, Nr Stourbridge, Worcestershire. Price £109.95 + £5.00 p&p.

MANUFACTURER'S SPECIFICATION

Wavebands

LW:	150kHz to 281kHz
MW:	520kHz to 1620kHz
AM:	150kHz to 29.999MHz
FM:	87.5MHz to 108MHz

IF Bandwidth (SW)

Wide:	6.5kHz
Narrow:	2.4kHz

IF suppression

AM: 50dB

Output Power

1200mW (DIN standard) at 10% distortion.

Tape output

1mV into 1kOhm.

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SANGEAN

ATS-803A

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AS SEEN 'RSGB'92'

SPECIFICATION

General Details	
Frequency of Operation	Channel A 144.650MHz Channel B 144.675MHz
Frequency Coverage	144-146MHz via internal options
Frequency Stability	± 10ppm
Supply Voltage	12V to 14V
Supply Current	transmit — 1.5A Receive — 250mA
RF Output Connector	BNC
User Interface	7 Pin DIN (Cairo Compatible)
PSU Input	1 Metre long flying lead
Size	190 x 115 x 44mm
Transmit	
RF Output	8W
Turnaround Time	<25mS
Modulation Type	FM, 3KHz deviation
Spurious Outputs	>-60dBc
Receive	
Sensitivity	<0.25uV for 12dB SINAD
Image & Spurious Responses	>70dB
Spurious Emissions	<2nW (-56dBm)
Squelch Type	Noise operated
Recovered Audio	1 Watt into 8 ohms

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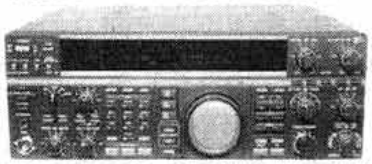

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FM Marine 130-174MHz

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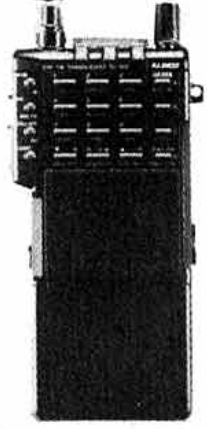

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IDEAS FROM ABROAD

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

Erich Zimmerman, HB9MIN, writing in the Swiss *Old Man* 2/92, described a **dB-linear S-meter** for a transceiver used behind microwave transverters. It seems equally useful for all who are dissatisfied with the almost useless signal level displays in some modern VHF and UHF FM transceivers.

ICs DEVELOPED FOR cell-phone IFs can be used to provide dB-linear indication of received-signal level. Motorola's MC3356P is simple and easy to apply: **Fig 1**. Its dynamic range is 70dB at 10.7MHz and 58dB at 21.4MHz, both with an approx ±1dB error. Signetics-Philips' NE604AN/NE605AN **(Fig 2)** can even cope with 85dB (±2dB) but require more external circuitry, including an additional tuned circuit, and demand more care in their layout.

The IF signal is taken from the output of the IF crystal filter and applied to a discrete-component pre-amp using a VHF MOSFET with low input capacity. This provides gain without unduly loading the filter. The pre-amp drain circuit is coupled to input pin 7 of the MC3356P IC via a standard IF transformer of the same frequency as the crystal filter. The IC itself is wide-band, from 5 - 22MHz. The RMS signal level, as measured at pin 20, should be between 30µV and 80mV for a dB-linear DC output from pin 14. The metering circuit is designed to read a range of 50dB on a 0 - 100µA DC meter, ie 2µA/dB.

CONSTRUCTION HINTS

THE S-METER SIGNAL input is bridged across the output of the IF crystal filter. The MOSFET pre-amp must be mounted adjacent to that filter. Coax is used between the pre-amp and the IC, which may be placed in a far corner of the cabinet or with the moving-coil instrument proper.

None of the stages between antenna and crystal filter must be connected to the AGC bus. If MOSFET, move G1 from AGC to 0VDC and G2 to a fixed potential approx 4V above that of the source (all measured against earth).

ADJUSTMENT AND CALIBRATION

TEST THE S-METER with a signal generator and a built-in or separate step attenuator before installing it in the receiver.

Apply -70dBm (71µV[1]) at the IF to pin 7. With RV2, set the meter current to zero.

Raise the signal level to -20dBm (22mV[1]). With RV1, set the meter current to full scale (100µA). Repeat these two steps. Check linearity by reducing the input level in 10dB steps. If no calibrated signal generator or step attenuator is available, RV1 may be replaced by a fixed 8.2kΩ resistor.

Install the pre-amp, IC board and meter in the receiver. Apply RF at the operating frequency to the antenna input at approx. -80dBm (22.4µV). Tune the IF transformer for maximum S-meter reading. Set the RF input level to the 10dBm multiple which produces nearest to 100µA S-meter reading, then adjust RV2 for exactly 100µA. Check linearity by reducing the input level in 10dB steps. Done!

S-UNITS ANYONE? by G4LQI

CW OPERATORS of old gave signal strength reports by ear. S1 was when you had to strain to hear anything, S9 blew your head phones off. There was no standard. In the mid-thirties AM with its steady carriers became popular. Increasing signal and thus AVC voltage 'pinched' the plate current (and gain) of the RF and IF valves. This current reduction drove a meter conveniently marked in the familiar but arbitrary S-units from S1 to S9.

A standard was proposed: S9 was to be 50µV at the antenna input, and each S-point below that was half the voltage, ie 6dB down; that placed S1 below 0.2µV, far below the threshold where the AVC and with it the S-meter started working. The 50µV = S9 caught on, the 6dB per S-point did not. Some recent receivers do meet this standard but at least one current top-class HF transceiver comes nowhere near. My VHF FM receiver goes from no indication to endstop on a signal range of 10dB!

Having a dB-linear S-meter you can at least give meaningful comparative reports in which each S-unit represents the same known voltage ratio. With a meter scale of 0 - 100µA, it is convenient to call 0 = S1, 10µA = S2, ... 80µA = S9 and 100µA = S9+10dB, ie 5dB per S-point.

REFERENCES

[1] The author only gives signal levels in dBm, ie units of power. They can be converted to units of voltage, µV and mV, only at some nominal impedance. The conversion given here is valid if the signal generator is calibrated, and the impedance presented at pin 7 of the IC is 50Ω. However, **Fig 3** shows that this is not critical as there is plenty of linear range left below 71µV and above 22mV (G4LQI)

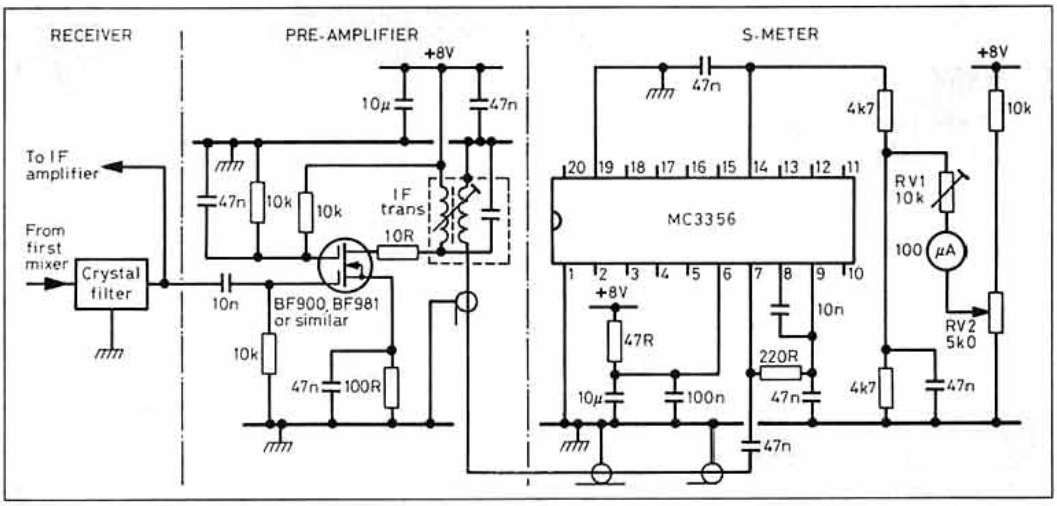

Fig 1: Circuit diagram of the dB-linear S-meter

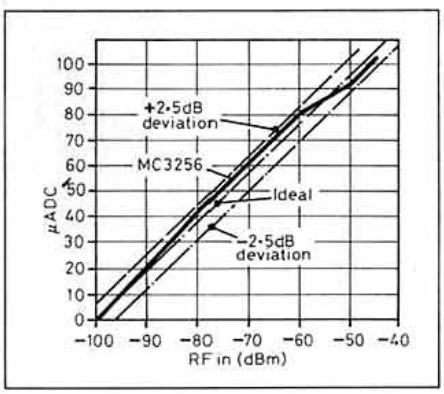

Fig 2: Measured deviation from linearity of the MC3356P in the circuit of Fig 1

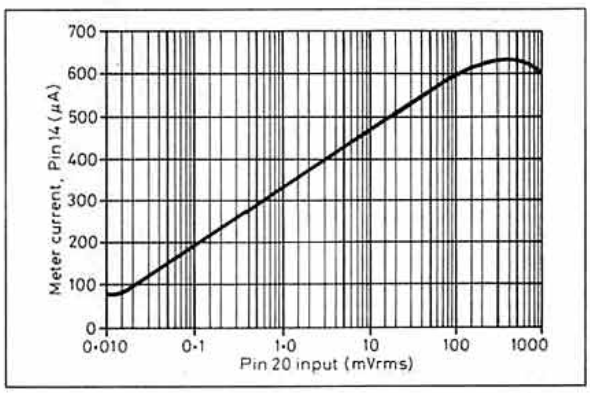

Fig 3: Meter current vs signal input. ***(From the Motorola MC3356 data sheet).***

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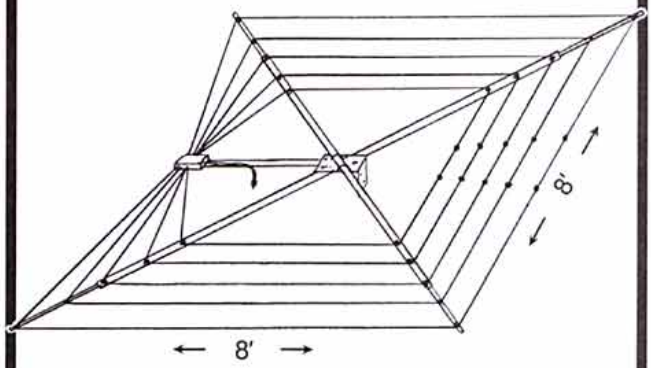

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EMC

MEGAN SMITH, G0MEG
EMC Committee Secretary

THIS MONTH FEATURES more on alarm systems and PIR's (passive infra-red sensors). The subject has encouraged a fair bit of correspondence, so I will probably mention some of that in future columns. My thanks go to EMC Committee member G1OSC for doing the research.

STANDARDS FOR ALARM SYSTEMS

BS4737 PART I: 1986 covers installation requirements for intruder alarm systems. Clause 3.2.3 refers to 'environmental' conditions, thus; "The system shall comply with this part of BS4737 in the environmental conditions to which it is likely to be exposed at the protected premises, including mechanical damage, weather, dampness, corrosion, heat, oil, electrical interference and adverse industrial atmospheres." One interpretation of this is that amateur and other radio transmissions are part of the 'environment' in which the alarm system operates, and if this results in false alarms it could be argued that the system does not comply with BS4737.

An organisation called NACOSS, the National Approval Council for Security Systems (Tel: 0628 37512) has a list of recognised alarm installers. The parent body of NACOSS is the Loss Prevention Council, LPC, an organisation supported by the Association of British Insurers and Lloyds. The LPC deals with standards and approvals of a wide range of fire prevention and security products. The Technical Centre of the LPC has produced three specifications for intruder detectors: ultrasonic (LPS 1167), microwave (LPS 1168) and passive infra-red (LPS 1169). Specifications for alarm control panels and combined sensors are in draft form, and a CENELEC European standard for intruder alarm systems is expected in about two years' time.

The LPS 1167 to 1169 specifications include RF immunity tests at field strengths of 10V/m over the range 1-1000MHz, modulated at 1kHz with 50% AM, although this test is likely to be brought in line with a CENELEC specification which specifies pulse modulation. The LPC Technical Centre has its own EMC test facilities for RF susceptibility testing using a GTEM cell. The Loss Prevention Certification Board (Tel: 081 207 2345) publishes a 160 page book listing approved products and services. The March 1991 edition lists only the following approved PIR sensors: IR210C and IR212C from Alarmcom Ltd, PA 7012E and PA 7030E from Pulnix Europe Ltd and Apollo D/10 and S/10 from Racal-Guardall (Scotland) Ltd. As of Dec 1991, NACOSS approved installers did not have to use PIR sensors from the approved list. More approved types are expected to appear in future editions of the list.

It will be interesting to see whether the immunity level of 10V/m proves to be adequate in practice near amateur stations. In theory, an amateur station transmitting 100W ERP (Effective Radiated Power) produces a free space field strength of 10V/m at a distance of seven metres from the antenna, ignoring 'near field' effects. In practice, these effects can result in considerably higher electric field strengths at HF if the distance from the antenna is a small fraction of a wavelength. In the 'far field', the free space field strength is inversely proportional to the distance in metres so doubling the distance halves the field strength in V/m. Field strength is proportional to the square root of the power, so at a given distance, 400W produces twice as much E field strength as 100W.

PIR OPERATED SECURITY LIGHTING

ANOTHER APPLICATION OF the dreaded PIR sensors is automatic security lighting. Triggering of these lights by RF appears to be a much more common problem than triggering of alarm system PIRs. Although less serious than an alarm going off, it can cause problems for radio amateurs if neighbours object to their outside light being on whenever the amateur is on the air! Alan Pudsey, G4DXH, reports that he has a Maplin outdoor PIR sensor (order code YP29G) which switches on mains-operated security lighting but does not have a light built in. His amateur antenna is nine metres away from the sensor and the mains electricity feed to the sensor runs parallel to the HF antenna for a distance of 21 metres. G4DXH has found that this type of Maplin sensor is immune to the output of his IC 730 on all bands.

AND NOW FOR SOMETHING COMPLETELY DIFFERENT

I HAVE HAD SOME 'fan mail' from G0NEZ, who is the Novice Services Manager for the G QRP Club. He enclosed a lovely full-colour advertisement for Radio Rentals from a local magazine with the words "Don't worry, we'll replace your set even if it suffers a breakthrough." I wonder what they intended us to make of that!

Talking about fan mail, the EMC Chairman, G8SOZ, has had a letter from the New Zealand Amateur Radio Society which is trying to set up an EMC Committee similar to ours. It will be interesting to see what sort of EMC problems they have. I am sure that in the towns and cities it will be very similar to the UK, but maybe in country areas there will be some unusual ones - emissions from electric sheep-shears perhaps!

Peter Wood, G0HWQ, might be interested in help from 'down under' too, as he wrote to me with a cautionary tale about how he pacified his neighbour who was wound up to hurricane force by a misbehaving TV which she was sure was caused by him. Fundamentally he stayed calm and polite, made sure his station was OK by getting a friend to help check it, made enquiries to see if any others in the area had been affected and discovered that unusual propagation conditions had been occurring. Then he checked his log for times of transmission and wrote to her with the facts of the case. He was able to show that the disturbed picture was nothing to do with him and has heard no more. As he says "Be prepared for the knock on the door. Expect venom like you've never had it before. Expect to feel like it's all your fault even if it isn't. Don't hit back, but admit nothing and try to sound

FROM *RADIO FREQUENCY INTERFERENCE* (ARRL)

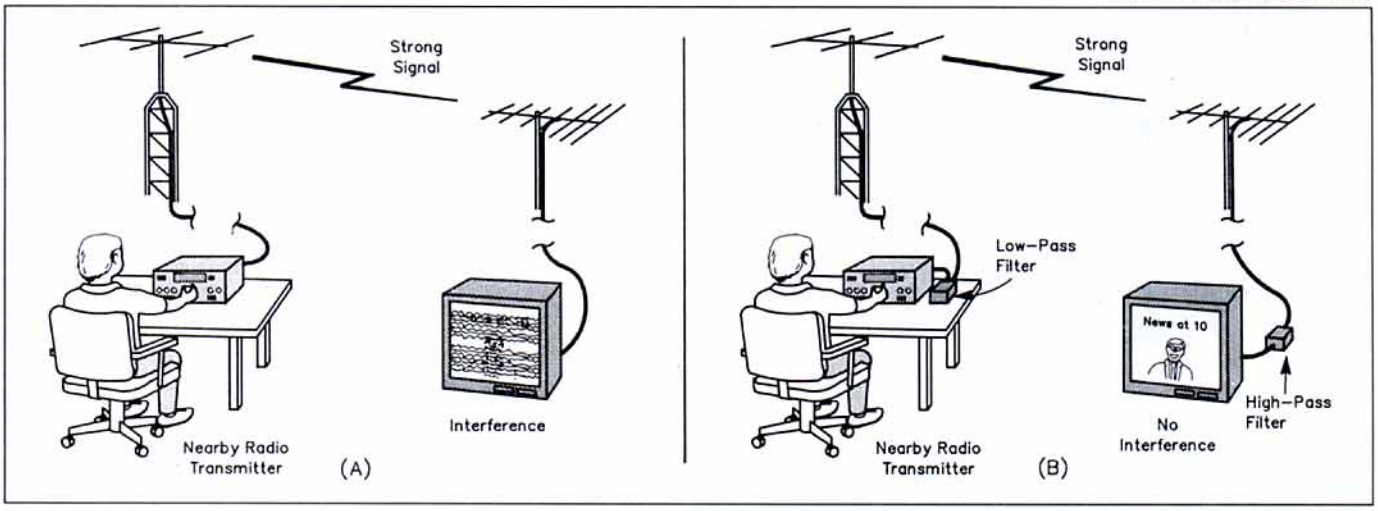


Fig 1: (A) This TV doesn't have enough rejection to keep out an amateur fundamental signal: The TV set is rather unhappy about the whole thing. (B) The appropriate cures have been installed: Everyone is happy again.

NAME	CALLSIGN	AREA	PHONE No	
L J Parry	G8AMK	Bracknell	0344 423704	
C G Barry	GW3BUT	Cardiff	0222 628430	
R P Harrison	G4UJS	Nantwich	0270 627620	
R P Smith	G3SVW	Sale	061 9693999	
A Armstrong	G0FBW	Peterlee	091 5864500	
G Halse	G3GRV	Hemel Hempstead	0442 214972	
A D Maish	G4ADM	Worcester Park	081 3372123	
R M Allsopp	G1YFT	Leicester	0533 833714	
D A Hopkins	G0MXI	Hull	0482 210763	
P Daly	G0GTE	Stevenage	0438 724991	
L K Ayre	G3DPR	New Milton	0425 615676	
K Hendry	G0BBN	S. Benfleet	0268 755350	
R Sykes	G3NFV	Leatherhead	0372 372587	
M Goodfellow	G4KUQ	Bristol	0272 716093	
K N Watkins	G3AIK	Martock	0935 825266	
S O'Sullivan	G8VPG	Bristol	0225 873098	
Mrs S Morley	G0MCV	Loughborough	0533 374999	
S M Wood	G4OWI	Newark	0636 72625	
G Brooks	GM4NHX	Caithness	084 783570	
Rev S Bennie	GM4PTQ	Stornoway	0851 703609	
D W Smith	G3LIS	Ormskirk	0695 77960	
R Adam	GM4ILS	Elgin	0343 545842	
N Carr	G0JHC	Preston	0772 742710	
C Barnes	GW4BZD	Bangor	0248 351151	ext 2750
D Morris	GM3YEW	Perth	073 885533	
J Lawrence	GW3JGA	Prestatyn	0745 853255	

TABLE 1: EMC Co-ordinators

helpful. Check the gear and give factual and polite feedback. Above all do not mention the word 'interference'". That pretty well sums up the right approach so why would Peter need help fom down under? Well, the neighbour in question has a very noisy Minah Bird who interrupts his QSOs - I'm sure they would have an answer for that one!

TELEPHONE IMMUNITY IN SWEDEN

A CONFERENCE CALLED 'EMC 92 - Designing EMC into your product' was organised by ERA Technology and took place in London on 12 and 13 Feb 1992.

One paper which was of particular interest to radio amateurs was presented by Mr R Storrs of Telia Research of Sweden (formerly Swedish Telecom). The title was 'RF detection in telecom terminal equipment'. In simple terms this means telephones acting as radio receivers when they shouldn't. Mr Stores presented a comprehensive list of calculated field strengths produced by various types of radio transmitters including amateur radio transmitters. He was critical of what he called the 'crude' HF antennas used by Swedish radio amateurs, saying that these often resulted in RF currents in mains wiring. He claimed that wherever there was a radio amateur in Sweden there was a telephone problem!

In late 1988, Swedish Telecom tested 65 different types of telephone available on the Swedish market. The tests involved injecting a modulated RF voltage of 1 Volt across the line and measuring the sound pressure level (SPL) of the interference at the telephone earpiece. With the best telephone, this interference would be undetectable to the telephone user, while with the worst it would be about 40dB louder! Many of the poorer models were also known to be extremely susceptible to RF disturbances in practice. This was not only due to amateur radio transmitters, but also broadcast transmitters including the former 198kHz long wave transmitter at Motala.

One type of telephone which wasn't mentioned in the tests was the old non-electronic type, but the introduction to the paper mentioned that modern telephones were more susceptible to breakthrough than the older type. Fortunately for radio amateurs in future, new standards will require all telephones to have better immunity than the best type tested by Swedish Telecom. At the end of the presentation it was pointed out that BT also does RF immunity tests on telephones.

BIOLOGICAL EMC

KEEN MICROWAVERS MIGHT be aware of some of the correspondence and articles in various publications about the effect of these frequencies on humans. The National Radiological Protection Board (NRPB) has recently published a new report covering RF and microwave radiation which is the third part of a study called 'Biological Effects of Exposure to Non-ionising Electromagnetic Fields and Radiation'. The report highlights possible problems which can arise if microwaves are allowed to heat parts of the body. As the eye has no blood supply to cool it down, it is particularly susceptible, and the heating effects of microwave radiation can produce cataracts on the lens of the eye. However, by the time the lens had been affected, the rest of the surrounding facial tissue would be at 40°C which is very much too hot to be comfortable. *Electronics Weekly*, in an article on 8 Jan, estimated that you would need to transmit continuously on a cellular telephone for two hours to get to this point. The introduction to the NRPB report noted that most occupational and all domestic exposures to microwaves are considerably below levels associated with significant heating effects. Amateurs using microwave frequencies are not normally that close to the antenna, but it may be something to bear in mind next time you slip into 'waffle mode'. [See also page 40 - Ed].

MORE TESTING

ICL HAS NOW SET UP a subsidiary company CF Eurôpe Ltd, to provide services using the EMC test facility featured on the cover of Dec 1991 *Radcom*. The company aims to provide a range of testing and consultancy services to help other manufacturers get to grips with the new EC Regulations. One company not likely to need this service is GEC Ferranti which is opening a new commercial test site near Dunfirmline in Scotland, at a cost of around one million pounds. Apparently the company has been carrying out EMC testing at Donbristle, near Dunfirmline since 1969 and they think they are the first Scottish EMC test facility to be granted NAMAS (National Measurement Accreditation Service) approval.

"WHATS AN EARTH LOOP?"

THIS IS A QUOTE FROM the editorial page of *Electronics Product Design*, December last year. It is part of a 1991/n item about the lack of available analogue design engineers in the electronics industry, and the changing background of the new recuits. Many digital design engineers have not got the kind of analogue design background that is needed. The editorial referred to discussions on the experiences of some of the consultancies in EMC work. It appears that many of the problems presented are due to poor practice in matters such as earthing. Even sophisticated digital equipment can be let down by details which would never escape someone who had ever built a high-gain audio amplifier, hence the above quotation. The article noted that this may be due to a 'cultural change' of young recruits entering electronics. Whereas the young recruit used to be fired with enthusiasm by audio projects or amateur radio, it is quite likely that they would now spend hours hunched over a personal computer. The editor ends with a challenge to anyone to give this unloved branch of the subject a better image. Well, there's something to fire up the novices on their next construction project!

RSGB'92

THE COMMITTEE WILL BE having a small stand at the NEC for the RSGB Convention at the end of May and hope to be able to give advice, and sell the RSGB's range of filters. It will also be nice to meet some of the corresponding members and local co-ordinators. See you there!

NEW CORRESPONDING MEMBER

WELCOME TO NEW Corresponding Committee member R.J.Halls, G4MJZ, based in Leicester.

This reminds me that we haven't produced a list of EMC Co-ordinators recently. These are the hard-working volunteers round the country who are your contacts with the EMC Committee for help and advice on EMC problems. See **Table 1** above.

Q R P

GEORGE DOBBS G3RJV
St. Aidan's Vicarage, 498 Manchester Road, Rochdale OL11 3HE

WHAT ANTENNAS DO QRP OPERATORS USE?

THE DX EXPLOITS of QRP operators are well documented in this column. Sometimes it amazes even me what some operators achieve with low powered, often home built, equipment. One reaction is that 'they must use good antennas'. In this case 'good antennas' usually infer expensive high gain commercial ones. My general impression is that the reverse is the truth. Most QRP operators I know use simple, home made antennas, usually cunning arrangements of cheap wire distributed around the available space. Whenever QRP operators exchange information, there is much talk about antennas, antenna tuning arrangements and effective use of their limited power.

The only documented evidence I recall on this subject was a report from the German AGCW-DL Group produced some three years ago which included some data on antennas used by members for QRO operation. Amongst the chief types used were: dipoles (single, multiband or indoor) 30%, simple wires (end fed with tuner) 21%, verticals (groundplanes, rods and telescopic) 16%, Windom and FD4 combinations 8%, delta loops, inverted V and slopers 7%. Commercial multi-element directional beams account for only 6%, interestingly equal with the use of indoor magnetic loops! This seems to confirm that most QRP operators use simple, inexpensive antennas, often in restricted sites.

THE G QRP CLUB ANTENNA HANDBOOK

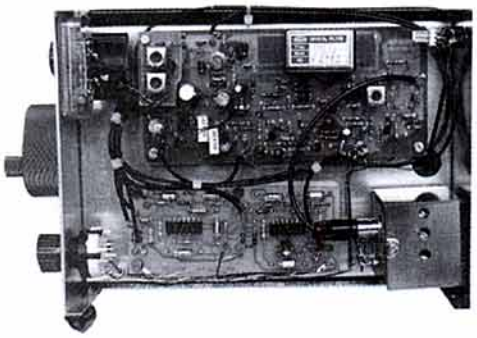
THE *G QRP CLUB Antenna Handbook* is a compilation of articles on antennas, matching units and associated items from *SPRAT* Issue 1 to the end of 1991. The contents were compiled and edited by Peter Linsley, G3PDL, and Ty Nicholson, KA9WRI/GM0LNQ, and the book was published by the G QRP Club in May of this year. The book is a unique collection of antenna ideas by the users of the smallest signals on the bands. As G3PDL puts it:

"Antennas and their accessories are always of immense interest. Once the signal has been produced, the one transmitter is much the same as any other. The difference between the loud and weak signals depends basically on how the signal has been launched - the antenna. Arguably it is the most important equipment in any station".

The book is divided into seven sections: Antenna Matching Units and Test Equipment, HF Beam Antennas, HF Wire Antennas, HF Vertical Antennas, HF Loop and Restricted Site Antennas, Antennas for the VHF Bands and two Appendices.

The range of articles is amazing, from simple antennas, like my favourite 'Skeleton Cone', to ambitious wire beams. Where else would you find eight magnetic loop designs for restricted spaces along with the remarkable short series of articles by G8PG on very small antennas? There is full information on the G3CCB tuned balun tuner, claimed by some to be *the* antenna tuner circuit and the GM4ZNQ bi-directional in-line wattmeter, already a classic amongst many operators. The book contains 100 articles crammed into 160 pages and is worth a place on any radio amateur's bookshelf whatever power they use. What the QRP operator uses is worthy of note by the QRO operator.

The *G QRP CLUB Antenna Handbook* is available by mail order from Shoreham Copy Centre, 3 John Street, Shoreham-by-Sea, Sussex, BN4 5DL. The cost is £4.50 (plus 93p postage) for G QRP Club Members and £5.00 (plus 93p postage) for Non-Members. Cheques to: 'G QRP CLUB'.



Inside view of this typical QRP home construction project, built by G3RJV.

HOW ABOUT THAT . . .

G4BUE, IS A WELL KNOWN DXer who also runs QRP. Although he does use antennas a cut above most of the ones described in the book above, his exploits in QRP Contests and DXing are impressive. During the 'QRP Winter Sports' which ran from Boxing Day to New Years Day, Chris obtained a special callsign: GB0QRP. Part of the exercise was to test out the new Ten Tec Argonaut II Transceiver. All of his contacts over the week were made using no more than 5W RF output.

GB0QRP had a total of 645 QSOs between Dec 25 1991 and Jan 1 1992. Of these, 476 were with other QRP stations. 231 members of the G QRP Club were contacted on QRP.

A total of 62 DXCC Countries were worked including 8P, BV, HI, J7, JW (7MHz), KL7 (10MHz), KP4, SU (10MHz), VP5, VS6, VU and ZA. Individual DXCC band scores were 13 on 1.8MHz, 19 on 3.5MHz, 19 on 7MHz, 14 on 10MHz, 17 on 14MHz, 13 on 19MHz, 19 on 21MHz, 2 on 24MHz and 20 on 28MHz.

Four stations were worked on 8 bands (3.5 through 28MHz) on QRP. These were AA2U, NG1G, W3TS and N4AR in Kentucky. In a five hour period on 1.8MHz, RA9CT, K1KI, EA8QO and OY9JD (four continents) were worked with 5W. Some limited contacts were also made on 50MHz and 144MHz.

Most QRO operators would have been proud of such a list of stations worked in such a limited time. Chris promises to activate GB0QRP again next year. Will you be on the bands, with less than 5W, to work him?

QRP IN EASTERN EUROPE

HOME BUILT EQUIPMENT and low power operation has always been popular in eastern Europe. Many radio amateurs in some of the former 'iron curtain' countries have had no other option. With the more recent lifting of restrictions in these countries a number of new clubs are emerging.

The OK QRP CLUB is one of the older and well established of such clubs. Under the guidance of Petr Doudera, OK1CZ, there have been links for many years between QRP operators in the Czech lands and western Europe. Details of the 'Europe for QRP' weekend, a joint venture between the OK QRP Club and the G QRP Club, to be held between 2 Oct and 4 Oct 1992, appeared in the last issue of this column. The club produces a fine journal called *OK QRP INFO*, with sections in English. Information about the club can be had from Petr Doudera, OK1CZ, U 1.baterie 1, 16200 Praha 6, Czechoslovakia.

'Universal Superhet' from the new *W1FB's QRP Notebook* by Doug DeMaw (see page 79).

The U QRP Club, based in Russia, has been completely re-organised. The club now has over 170 members in 5 countries: I am member 178! The club publishes a journal called the *U QRP CLUB NOTEBOOK*. Although it is in Russian, it does contain some fine circuits and technical ideas which stand well even without an understanding of the text. Membership is open to radio amateurs from any country and costs $8 or 15 IRCs. Applications or enquiries can be made to the president Sergej Pichurichkin, U QRP Club, PO Box 100, Saransk - 31, 430031, Russia.

YO-QRP 'The Club of Romanian Radioamateurs Using Low Power' was founded on 1 June 1991 and affiliated to the Romanian Radioamateur Federation and the Central Radio Club in Bucharest. Membership is open to all radio amateurs worldwide who wish to develop radio communication using low power. The limits are CW: 5W RF output or less, SSB : 10W PEP or less. The subscription is 20 IRCs for the first year and 15 IRCs thereafter. The club issues several awards and a magazine. Co-ordination of the club's activities is by YO3CR, YO3RT and YO3CDN. Application Forms and details can be obtained for a self addressed envelope with 1 IRC from YO QRP, c/o PO Box 22-50, 71100 Bucuresti 22, Romania.

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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

ROPOCO-2 1992 - RULES

1. The General Rules for RSGB HF Contests, published in the January 1992 issue of *Radio Communication*, will apply.

2. Date & Time. 0700 - 0900GMT, Sunday 26 July 1992.

3. Band & Mode. 3520kHz - 3570kHz, CW only.

4. Exchange. RST only, do NOT send Serial Number. **Other Data:** For the first QSO, the entrant's own postcode. For each subsequent QSO, the postcode received from the previous contact.

5. Scoring. Ten points per QSO. Contacts with stations outside UK will not score.

6. Address and Closing Date for logs as per General Rules.

7. Awards. Certificates to the leading three entrants. The G3XTJ Memorial Trophy to the highest-scoring entrant with a perfect (or the most accurate) log. The G5MY Trophy to the entrant with the highest aggregate score in this event and ROPOCO-1 1992.

RSGB SSB FIELD DAY 1992 RULES

1. The General Rules for RSGB HF Contests, published in the January 1992 issue of *Radio Communication* will apply. This event is open only to 'Portable' stations operated by members or groups of members; intending entrants are urged to read the General Rules carefully.

2. When: 1500GMT 5 September to 1500GMT 6 September 1992.

3. Sections: Both sections are multi-operator. Single-operator entries are welcomed, but will compete on equal terms with the Multis.

(1) Open: Maximum licensed power. Equipment: one transmitter and one receiver or one transceiver, PLUS an additional receiver if desired. No antenna restrictions.

(2) Restricted: Maximum of 200W PEP *input power*. Equipment: one transmitter and one receiver, or one transceiver . . . . no additional receiver. Antenna: Only one antenna may be used, which must be a single element (eg dipole, longwire, W3DZZ, trapped vertical) having not more than two elevated support points. No part of the antenna may be more than 15m above ground level.

Entrants in both sections may keep standby equipment on site, but it may not be connected to a power source or antenna at the same time as the main equipment.

4. Contacts: Telephony only in the 3.5, 7, 14, 21 and 28MHz bands. **NB - QSY Rule:** A station making a scoring contact on a new band may not return to the previous band until ten minutes have elapsed since the previous scoring contact on that band, eg G9ZZZ works W1AAA at 1555 on 14MHz, then QSYs to 28MHz and works PY2BBB for points. G9ZZZ may not make another scoring QSO on 14MHz until 1605.

5. Contest exchange: RS plus serial number starting from 001.

6. Scoring: For each complete QSO with

(a) a fixed station in IARU Region 1: 2 points

(b) any station outside IARU Region 1: 3 points

(c) a portable/mobile station in IARU Region 1: 5 points.

IARU Region 1 countries include those in Europe, Africa, USSR, ITU Zone 39 and Mongolia. For a more precise definition refer to the RSGB *Amateur Radio Operating Manual*.

7. Multiplier: ONE for each DXCC Country worked on each band.

8. Final Score: The final score is given by the total number of QSO points earned on all bands added together, multiplied by the total number of multipliers worked on all bands added together.

9. Logs must be addressed as per General Rules, and postmarked not later than the Monday **22 days** after the end of the contest. Please don't forget (i) Separate logs for each band, (ii) the list of Multipliers worked for each band and (iii) a Dupe Sheet or checklist for each band if you possibly can.

10. Awards: The leading station in the open section will receive the Northumbria Trophy. The leading station in the restricted section and the second- and third-placed entrants in both sections will receive certificates of merit. A certificate will also be awarded to the station in each continent submitting the highest-scoring checklog.

VHF RESULTS

432MHZ CUMULATIVE (OCT-NOV 1991)

This contest was spoilt for most by the two December sessions having to be cancelled in favour of the prime user of the band. Normalisation was introduced as promised last year but as would be expected it made no difference to the overall results in the absence of two of the five sessions. Insufficient notice was given to reschedule the sessions so it was out of the hands of the VHFCC. Apart from regrets about the cancelled sessions, stations which reported conditions only found them poor to average. PE1EWR reported that he heard no stations at all during the first November session. Congratulations to Richard Gardner, G4WKN, who experienced severe gales on each session but nevertheless came second in the fixed station section behind worthy winner Peter Tribe, G8FBG. Certificates also go to the winner of the overseas section Frank Laanen, PE1EWR, and to Spalding and District who won the 'Others' section. Let us hope that next years sessions will not be upset, and will be better supported. *G4OUT*

SINGLE OPERATOR FIXED

Pos	Callsign	Pts	QSO	Loc	Ant	Pwr	1	2	3	Best DX	Km
1	G8FBG	3000	104	IO91	4X21	400	1000	1000	1000	DK5WO	458
2	G4WKN	2005	87	IO92	21	100	644	650	711	DK5WO	501
3	G4FCD	1865	76	IO91	88	25	649	593	623	DJ5WO	519
4	G7AZP	1534	48	IO90	2X18	100	448	537	549	G1GEY	475
5	G8JXV	800	33	IO91	48	50	294	192	314	G1NXS	296
6	G0PHV	662	35	IO93	88	10	139	356	167	G8FBG	271
7	G6GAU	518	22	JO02	21	10	253	147	118	DK5WO	375
8	G7BZD	311	16	IO92	2X28	50	113	198	-	G7AZP	181

OTHERS SECTION

1	G4DSP	2820	117	IO92	88	400	846	1000	974	DL9YBJ	596
2	GW0MGR/P	2691	117	IO83	21	45	1000	691	1000	G3FIJ	303

OVERSEAS SECTION

1	PE1EWR	2000	15	JO11	21	10	1000	-	1000	G3ZYC	383

HF RESULTS

CLUB CALLS CONTEST 1992

"My first real contest and we both had great fun" commented G4OFR aged 16 and G0LRJ aged 62 operating G3PRC/P. Likewise G0LBP, one of the members of G0OCE, had "a most enjoyable competition" and looked forward to more contests of a restricted nature where a low budget can produce a good place. Several more commented on the fun and enjoyment obtained from this event. What is most encouraging is that of the 77 operators listed in the entries received, there were 28 G0 and six Class B licence holders.

Competitiveness at the top is always keen and this year's event proved no exception with five stations in the first ten using dipoles at greater than 90 feet. Lichfield ARS is the overall winner for the third successive year and G4DBN used his extensive LF antenna/earth system to good effect to head the individual members' entry. A special mention to G0PWA with a creditable performance from a newly licensed operator. GB5HQ was operated from my own location and those stations who didn't 'search and pounce' missed out on the bonus since my strategy was to stay on one frequency for the full length of the contest.

Log presentation was fairly good with just two entrants submitting unrewritten logs. A number of entrants included a band cover sheet, HFC9, which is intended for use in Field Day events only. Most errors centred on /P being omitted from callsigns; this does, of course, result in the loss of all points including any bonus. G3LRS would have been much higher up the list had they scored their entry correctly and G3RAL lost over 30% with extremely inaccurate logging.

Posn	Call	Club	Stn	QSOs	Points
1	G3WAS *	Lichfield	C	175	1722
2	G0JBX	Evets	C	163	1571
3	G5BK	Cheltenham	C	125	1409
4	G3PRC/P	Plymouth	C	131	1405
5	G0OCE/P	Charnwood	C	128	1400
6	G4DBN *	Goole	M	117	1380
7	G4RFR	Flight Refuelling	C	112	1367
8	G3WOI/P	Newbury	C	100	1336
9 =	G2BBC	Ariel RG	C	128	1317
9 =	G0IVZ	Plymouth	M	95	1317
11	G2LO	Ariel RG	C	125	1284
12	G6RC	Crawley	C	104	1209
13	G6UQ/P	Stockport	C	93	1204
14	G4ERW	Sutton & Cheam	M	77	1113
15	G4ADV	Newquay	C	87	1089
16	G3NKS	Cheltenham	M	77	1078
17	G4OGB	Scunthorpe	M	67	1059
18	G3HYH	Leicester	M	80	1033
19	G4DDC/P	Dunstable	C	74	1008
20	G4WKS	Warwick School	C	68	984
21	G0PWA	Stockport	M	60	976
22	G4LSF/P	Fakenham	C	78	931
23	G3LRS	Leicester	C	106	929
24	G3ZBU	Horsham	M	55	919
25	G0JKD/P	Bideford	C	66	865
26	G3SJE	Edgware	M	54	855
27	G0ALE	Addiscombe	C	55	836
28	G4OYY	Axe Vale	M	56	832
29	G3VNG	Plymouth	M	39	738
30	G3ASR/P	Edgware	C	44	731
31	GW4CC	Swansea	C	43	729
32	G0JYC	Stevenage	M	36	715
33	G0BRC/P	Bredhurst	C	38	703
34	G3JJZ	Bromley	M	35	692
35	G3JRM	Lowestoft	C	29	646
36	G3SAD/P	Stevenage	C	30	595
37	G3RAL	Loughborough	C	40	579
38	G3GMM	Stockport	M	32	500
39	GM3UM	Lothians	M	25	491
40	G4ISO	Stevenage	M	14	368
41	G0GDN	Stockport	M	13	251
42	G3WRR	Addiscombe	M	10	207

SWL SECTION

1	G1EMD *	59	979
2	BRS 20249	60	902

* Certificate of Merit.

Checklogs gratefully received from G3EIZ & GB5HQ

VHF RESULTS

432 MHZ FM CONTEST JUNE 1991

Compared to the number of participants, poor support by way of entries received jeopardises the continuance of this contest, poor UHF conditions did not help this mode of activity either.

Congratulations to winners and runners-up of the Open and Fixed station sections. Interesting to note that the winning station of the Open section was not in a densly populated area of the UK, nor on the East Coast! *G8HHI*

OPEN SECTION

Psn	Call	Pts	QSO's	Loc	Pwr	Best DX	Km
1	GW1ATZ/P	118	35	82KX	45	G1OGY	285
2	G4WKN/P	61	24	91NV	40	G6FPX/P	225
3	G6FPX/P	42	22	83ON	15	G4WKN/P	225

FIXED SECTION

Psn	Call	Pts	QSO's	Loc	Pwr	Best DX	Km
1	G4WYJ	47	24	91VL	80	G0ORC	208
2	G1OGY	44	18	01GR	50	GW1ATZ/P	285
3	G6HKM	39	9	01FT	100	GW1ATZ/P	276
4	G3ZPB	36	16	91WH	100	GW1ATZ/P	276
5	G0NVZ	22	12	91UR	25	G6YLW	104
6	G0MLY	20	12	92AP	25	G4WKN/P	120
7	G1KEA	7	7	92CK	25	G0MLY	26

HF CONTESTS CALENDAR - 1992.

6/7 Jun	NFD (+ IARU R1 FD) (Feb 92)
20/21 Jun	*AA (CW)*
27/28 Jun	Summer 1.8MHz (May 92)
4/5 Jul	*Venezuela SSB*
11/12 Jul	RSGB SWL Contest
11/12 Jul	*IARU Championship*
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 (June 92)

VHF RULES

RSGB VHF/UHF/ SHF CONTESTS 1992

144MHZ CW CUMULATIVES

1 Sep, 16 Sep, 1 Oct, 16 Oct, 2 Nov: 2030-2300 Local

General rules apply

Please use 4422 summary sheet to show scores for each day. Best three days will be totalled, please send all logs. Single 427 cover sheet for entry.

Rule 10 applies

Sections: F Single operator fixed or portable. L Listeners.

Adjudicator: GI4KIS, B J Sheepwash 204 Donore Cresent, Antrim, Northern Ireland.

70MHZ TROPHY/SWL

20 Sep: 0900-1600GMT

General rules apply.

Rule 14 applies (County/Country multipliers)

QRA information including county code or county name to be exchanged.

Sections: F Single operator fixed. O All other. L Listeners.

The overall winner will receive the VHF Managers Trophy

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

432MHZ - 24GHZ, RSGB 2.3GHZ AND 1.3GHZ TROPHIES, SWL CONTEST AND IARU

432MHz - 24GHz Contest

3/4 Oct: 1400-1400GMT

General rules apply.

IARU and RSGB

Sections: S Single operator. M Multi operator. L Listeners

Scoring: RSGB radial ring on 432 MHz, 1 pt per kilometre all other bands. IARU 1pt per kilometre (logs will be forwarded)

Entrants who are not RSGB members will be entered into IARU contest only (please score 1pt per kilometre). No high power licenses to be used. Only one transmitter to be used on each band at a time. Separate cover sheets for RSGB and IARU (if you want to enter both contests that means 2 (TWO) 427s and 4422s).

A single copy of the log sheets is sufficient.

1296MHz Trophy: This will run between 1400 and 2200GMT on the Saturday.

2.3GHz Trophy: This will run between 0800 and 1400GMT on the Sunday. Stations can enter all contests (IARU or RSGB 24h or 1.3 and/or 2.3GHz Trophies) but please separate logs and cover sheets for each contest.

Adjudicator: A Cook, Fishers Farm, Tendring, Clacton-on-Sea, Essex CO16 9AA

1.3 & 2.3GHZ CUM.

6 Oct, 21 Oct, 6 Nov, 19 Nov, 7 Dec: 2030-2300 Local

General rules apply, including rule 10.

Sections: S Single operator fixed. O All others. L Listeners.

One summary sheet including all entries, plus a cover sheet.

Best three logs of maximum 5 days, please send all logs for checking purposes.

Adjudicator: G4PIQ, Andy Cook, Fishers Farm,Tendring. Clacton-on-Sea, Essex CO16 9AA.

432MHZ CUM.

14 Oct, 29 Oct, 13 Nov, 30 Nov, 15 Dec: 2030-2300 Local

General rules apply, including rule 10.

Sections: S Single operator fixed. O All others. L Listeners.

One summary sheet including all entries, plus a cover sheet.

Best three logs of maximum 5 days, please send all logs for checking purposes.

Adjudicator: G4OUT, 6 Haywood Heights, Little Haywood, Stafford ST18 0UR

2ND 1296MHZ FIXED/ SWL

1 Nov: 1600-2000GMT

General rules apply.

Sections: S Single operator fixed. M Multi operator fixed. L Listeners.

Adjudicator: GW8GSQ, S Thompson, 8 Nant Lais, Corntown, Bridgend CF35 5SA.

144 MHZ RSGB CW 6 HOUR

8 Nov: 0800-1400GMT

General rules apply

1 pt per Kilometre.

Sections: S Single operator fixed. O All others. L Listeners.

144 MHZ CW MARCONI/ RSGB 24 HOUR

7/8 Nov: 1400-1400GMT

Sections: S Single operator fixed. O All others. L Listeners

Logs for Marconi contest will be forwarded.

Please two cover sheets and two copies of the log if you are entering both RSGB 6 hour and Marconi 24 hour contest.

Adjudicator: For 6h and 24h contests, G8HHI, J Pilags, 43 Bartons Drive, Dungells Lane, Yateley, Camberley GU17 7DW

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 the 1st of October) then the entry must be postmarked on or before the 3rd Tuesday after that Sunday (17th 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).

VHF RESULTS

MARCH 1991 70 MHZ FIXED CONTEST

The general comment regarding this contest was that activity was very low. The number of entries supports this view, with only one more than last year when the rules didn't even make it into *RadCom*! In fact, there were more stations active than this level of entries may suggest, and there were several stations who, if they had taken the short time needed to write up their QSOs, would not have been at the bottom of the table!. It only takes a few minutes for a contest like this, so why not send an entry in next time - you can always have a position certificate for your efforts! Many thanks to G3UAX/M for his 200mW check-log, and as usual congratulations and certificates go to the winners and runners-up in all sections. G4PIQ

SINGLE OPERATOR SECTION

Pos	Callsign	Score	QSOs	Loc	Pwr	Ant	DX Call	km
1	G3UKV	246	45	82RR	100	5Y	GM4ZUK/P	467
2	G4FOH	164	33	83QC	25	5Y	G8MFV	318
3	G0EHV	105	16	94FW	50	3Y	G4SSD	522
4	G3BPM	71	11	80OW	50	4Y	G4KUX	410

MULTI OPERATOR SECTION

Pos	Callsign	Score	QSOs	Loc	Pwr	Ant	DX Call	km
1	G4KUX	575	60	94BO	150	2 x 8Y	G3YJX	496
2	G4SSD	336	43	80FJ	25	6Y	G0EHV	523
3	G3WSC	241	36	91VC	150	6Y	G0EHV	435

SWL SECTION

Pos	Callsign	Score	QSOs	Loc	Pwr	Ant	DX Call	km
1	BRS 52543	59	11	83LT		HB9CV	G3RSI	325

1991 70MHZ CW CONTEST

Very low activity during the contest. Only one entry to All Others section, maybe this section will have to be removed. Certificates and congratulations to G0FRR winner of All Others, and G3TCU winner of Single Operator section, runner-up certificate to G4ASR. *G4DEZ*

ALL OTHERS SECTION

Psn	Call	Pts	QSO's	Pwr	Loc	Best DX	Km
1	G0FRR	126	20	40	90AS	G3APY	269

SINGLE OPERATOR SECTION

Psn	Call	Pts	QSO's	Pwr	Loc	Best DX	Km
1	G3TCU	102	16	40	91QE	G4FOH	253
2	G4ASR	93	17	50	81MX	G3FIJ	262
3	G4FOH	92	16	25	83QC	G0FRR	264
4	G3HYH	89	19	130	92JO	G0FRR	211
5	G4OUT	49	11	10	92AT	G0FRR	227

Thanks for checklog from G3BPM.

JULY 1991 70CM LOW POWER CONTEST

SINGLE OPERATOR PORTABLE

Psn	Call	Pts	QSO's	QTH	Pwr	Ant	Best DX	Km
1	G6WVG/P	658	78	IO84	25	4X19	-	-
2	G0LNC/P	487	59	IO90	10	4X15	DA4RG	518

SINGLE OPERATOR FIXED

1	G8HHI	443	71	IO91	25	2X21	DA4RG	482
2	G10GY	435	69	JO01	10	18	GD8EXI	439

OTHERS

1	G3UAX/P	615	99	IO91	25	-	DA4RG	527

Once again congratulations to the winnners and runners up!
Commiserations to those whose logs failed to arrive.

JULY 1991 LOW POWER 144MHZ CONTEST

SINGLE OPERATOR FIXED

Psn	Callsign	Pts	QSO,s	Mult	QTH	Pwr	Ant	Best DX	Km
1	G0NYL	58550	155	50	IO93	25	8	G0MYE	500
2	G8HHI	48960	126	60	IO91	25	2X21	GI4KSO/P	485
3	G1OGY	48840	140	55	JO01	20	2X14	GI4SJB/P	529

SINGLE OPERATOR PORTABLE

1	GM0CLN/P	165255	211	69	IO84	25	2X14	GJ6CSY/P	627
2	GW4KVI/P	88004	201	49	IO81	10	9	FC1NLG	677
3	GW8ZRE/P	41181	123	53	IO83	25	HB9CV	PA3FTE	570

OTHERS

1	G8LNC/P	252507	379	73	IO90	10	4X19	GM4AFF	719
2	G3UAX/P	189570	334	71	IO91	25	2X17	DL0WAE	687
3	GW1VDF/P	144384	256	64	IO81	25	19	GM4BAP/P	668
4	GI4KSO/P	121044	139	44	IO74	25	16	GJ6CSY/P	623
5	G6QM	51324	124	47	IO94	—	4Q	GJ6CSY/P	533
6	G6GAU	15903	68	31	JO02	25	14	DL2WP	511

Congratulations to the winners and runners up in each section, again apologies to those whose logs failed to appear.

DECEMBER FIXED AND AFS 144 MHZ

Well at least the conditions were good, even though inter-G activity was reckoned to be poor. Some very good DX was worked and I noticed that some logs showed pages where only continental QSOs figured. However now we come to the gripes. It would help if contestants could read the rules, and if in any doubt ask me or VHFCC committee members for advice.

There were instances of logs not scored! No summary sheets to let me know who was entering. No declarations from AFS entries that the entrants were in fact club members. Even one case of no claimed score (I sorted that one out, and scored the unscored ones). Two cases of entries submitted on altered HF Contest summary sheets and logs! If those of you who sent in unscored logs have access to an IBM compatible system, then get in touch, I can help you. I will not be able to score your logs for you next time, it took me an hour or more to do them. If you do send the log in on computer printed paper, please cut the edges off! One club could not make up its mind if it was multi or AFS, nor could I! One AFS group claimed that they were /P. This was a Fixed station contest, they were disqualified.

Many stations failed to put their zone on the cover sheet (or anywhere else), they will *not* receive zonal certificates, that includes the winners of Multi-op, AFS and high placed single operator stations. The certificates will go to the highest placed stations in the zones, where the station took the trouble to write in the zone letter.

Congratulations to Spalding and District for winning AFS, to G4ANT for winning Multi Operator section, and to G4HUP (who gets a zone cert as well). Congratulations also to the runners up in each section, all zone winners (where claimed), to SWLs and to our foreign entrants who are slowly growing in number; certificate this time to PA3FJY.

Bryn G4DEZ.

AFS SECTION

Psn	Group	Callsigns					Zn	Total
1	Spalding & District	G4DSP	G4DHF	G4NBR	G4NPH	G1LSB	-	13265
2	Martlesham DX & CG	G4HUP	G3XDY				C	*6823
3	Sutton & Cheam	G4ERW	G3OLX	G4OWM	G3WHK	G4CMU	C	5309
4	Rugby A T S "A"	G4DDW	G6KKK	G7ATB	G8ZOB	G7GAB	-	4643
5	Scunthorpe ARS	G4JRY	G0NYL	G8XFY	G4EQD	G4FUH	-	4615
6	Colchester R A "A"	G4TZM	G1OGY	G3FIJ	G0EGX	G0HKG	C	4604
7	Harwell ARS	G3PIA	G4HLX	G0MCN	G0ADH	G3NAQ	D	*4386
8	Chesham & District	G0KZP	G4TBR	G1GSU	G8AHS	G8FMS	D	4226
9	Crawley ARC	G3GRO	G3YVR	G3WSC	G4MKW	G7KMM	C	3235
10	Chippenham & Dist.	G0HAS	G3VRE	G0HFX	G0GRI		-	3225
11	Lowestoft RC	G0JSG	G1XUV	G3JRM	G4YFQ		C	2870
12	Aylesbury Vale RS	G0MHZ	G0ODQ	G3MEH	G3XTQ		-	1738
13	Vale of Evesham RC	G4UXC					B	*1651
14	BBC Wenvow ARC	GW4WVO					-	1052
15	Mid Sussex ARS	G3JMB	G0APZ				-	1042
16	Clifton ARS "A"	G0HUZ	G0PPO	G7BKH	G4TJE	G3JJZ	-	1031
17	Porthmadog & Dist	GW7LAG					-	910
18	Ariel Radio Group	G8BBC	G3NTS				-	838
19	STC Paignton ARS	G0OSH					-	797
20	Poole Radio Amateur	G7AZP	G6MXL				D	784
21	Telford & District	G6ZWP	G4ZJY	G1JNZ			-	709
22	West Kent ARS	G8GCI					C	705
23	Reigate ATS "A"	G8JXV	G1LNT				C	665
24	Rugby ATS "B"	G0OLS	G7APD				B	621
25	Bromsgrove & Dist	G4IVJ	G3VGG				-	255
26	Colchester RA "B"	G0OLM					C	153

* Denotes zonal certificate winner.

MULTI OPERATOR SECTION

Psn	Callsign	Pts	QSO	Loc	Zn	Pwr	Ant	Best DX	Km
1	G4ANT	5585	437	02QQ	-	400	2X17	DG7MHR/P	840
2	G4KUX	5400	368	94BO	A	400	4X19	DH9FAH	*855
3	G4DSP	3573	321	92WS	-	400	2X9	DJ5JK	721
4	G0LIP	3372	328	92JW	B	400	17	DJ2JA	*733
5	GD4IOM	3223	251	74QD	-	400	4X9	FC1MKG	758
6	G4NPH	2435	289	02BI	-	400	17	DL8SDE	759
7	G0KZP	2061	334	91NP	D	400	2X9	DK2AM	*635
8	G4RFR	2035	261	90AS	D	400	2X19	GM4ZUK/P	699
9	G3OLX	1742	264	91VH	C	120	15	GM0GMD	595
10	G4DDW	1463	245	92KK	B	400	17	DK2AM	623
11	G3WHK	1462	239	91VJ	C	150	16	GM4FKD	524
12	G8KMI	1087	165	90HW	-	200	4X17	DJ5BV	593
13	G4CMU	1066	201	91VH	C	180	10	GM0GMD	595
14	GW4WVO	1052	139	81IL	-	80	2X8	ON7EH	868
15	G6KKK	1034	192	92JL	B	80	8	FIJKK	539
16	G3GRO	1010	168	91VC	C	150	13	DL4YBZ	506
17	G4FUH	984	142	93QN	-	60	13	G0OSH	400
18	G3PIA	926	179	91IN	D	400	17	GM4AFF	609
19	G1GSU	876	191	91PS	D	180	9	GM0GMD	535
20	G7ATB	849	157	92JI	B	400	14	DK2AM	631
21	G4OWM	838	167	91WI	C	90	17	PA3FJY	459
22	G0OSH	797	99	80FK	-	150	17	ON1KVA	525
23	G3NTS	706	154	91UM	C	250	17	GM4ZUK/P	628
24	G7GAB	587	119	92IJ	B	60	14	PA3FJY	520
25	G3WSC	565	123	91VC	C	400	18	GD4IOM	450
26	G7ABU	435	85	81UJ	-	30	9	ON7EH	474

* Denotes zonal winner

FIXED STATION SECTION

Psn	Callsign	Pts	QSO	Loc	Zn	Pwr	Ant	Best DX	Km
1	G4HUP	369	355	02PD	C	400	2X18	DB2RR	*783
2	G4DHF	580	242	92TS	-	250	4X9	DJ2JA	688
3	G3XDY	454	265	02OB	C	200	14	DH9FAC	580
4	G1LSB	370	238	02CT		400	19	DB4ES	633
5	G4NBR	307	191	92VU	-	200	4X9	DL6YEK	733
6	G4TZM	223	283	01NW	C	200	2X14	DJ5JK	601
7	G3NAQ	908	248	91HL	D	400	16	DJ2JA	*714
8	G4ZTR	695	181	01LV	C	300	16	DL9OBD	598
9	G4UXC	651	263	92BC	B	250	2X14	DG7EAI/P	*612
10	G4WKN	478	254	92OG	-	300	17	F1CYB	600
11	G3JRM	442	152	02UC	C	100	17	DL9OBD	572
12	G0NYL	385	192	93QN	-	100	6	G0MYE	500
13	G8XFY	167	135	93RN	-	25	2X17	DG7EAI/P	566
14	G0HFX	164	180	81VH	-	200	14	GM8FFX	635
15	G4EQD	068	100	93QN	-	100	8	DL9KCE	575
16	G1OGY	026	172	01GR	C	80	14	GD4IOM	438
17	G0HAS	022	160	91BN	-	150	13	F1CYB	654
18	G3YDY	990	147	01FQ	-	60	8	DL0WAE	560
19	G8FBG	915	141	91SG	-	400	2X16	DG5YEZ	554
20	GW7LAG	910	92	72PT		100	2X9	——	—
21	G1WAC	853	131	92BJ	-	25	18	DB4ES	602
22	G3YVR	829	153	91VC	C	100	13	GD4IOM	450
23	G4LDR	772	122	91CD	D	150	14	GM4ZUK/P	658
24	G8ZRE	740	116	83NE	A	100	8XY	GU3EJL	*379
25	G4TBR	715	167	91QQ	D	100	9	DL5BBL	608
26	G0GRI	713	125	81WG	-	200	HBAR	GM4ZUK/P	644
27	G8ZQB	710	138	92JN	B	100	10	PA3FJY	512
28	G0GCI	705	96	01ED	C	80	13	DJ2JA	589
29	G0APZ	675	100	90WW	-	25	8Q	DJ0PQ	500
30	G4HLX	644	130	91FP	D	100	9	DL5BBL	670

31	G4JLG	635	97	83TM	A	250	10	G3NPB	426
32	G3MEH	629	161	91QS	-	400	2X9	PA3FJY	482
33	G0JDL	621	87	02UL	C	100	9	GD4IOM	460
34	G0ODQ	596	122	91NQ	-	50	9	PA3FJY	501
35	G4MKW	562	110	91UB	C	80	9	GD4IOM	450
36	G0ADH	559	109	91KO	D	50	6Q	PA0GHB	519
37	G3FIJ	536	84	01KV	C	10	9	GD4IOM	448
38	G0MYE	531	44	70GE	-	350	10	G4ANT	548
39	G6MXL	514	82	80XR	D	180	9	G4KUX	431
40	G0EGX	502	90	01IT	C	10	8	GD4IOM	441
41	G8JXV	461	103	91VE	C	100	9	GD4IOM	444
42	G1NRM	433	115	91UO	-	75	10	GD4IOM	-
43	G0OLS	380	88	92IK	B	40	8	GD4IOM	291
44	G3JMB	368	74	91WA	-	8	7	GD4IOM	462
45	G0PPO	366	96	91XL	-	50	10	GD4IOM	427
46	G0MCN	349	77	91IO	D	85	2X5	ON2AGC	393
47	G3JJZ	340	93	01AJ	-	25	8	PA3FJY	447
48	G3VRE	326	66	81WL	-	25	8	G4KUX	347
49	G0HKG	317	53	01IV	C	400	9	DB8KJ	450
50	G4ZJY	309	50	82SQ	-	10	8	G7KTE	265
41	G8AHS	309	89	91RR	D	25	13	GD4IOM	383
52	G0PHV	301	51	93MQ	-	10	10	G4RFR	339
53	G4YFQ	295	44	02UL	C	10	9	DC8VJ	416
54	G0HUZ	285	80	91XM	-	25	5	GD4IOM	424
55	G0MHZ	283	70	91NT	-	90	8Q	GD4IOM	361
56	G1XUV	282	50	02TN	C	100	10	G4KUX	324
57	G7AZP	270	36	90AS	D	100	9	G4KUX	426
58	G7KMM	269	71	91SD	-	25	5	GD4IOM	436
59	G6ZWP	266	58	82SQ	-	35	18	GM4ZUK/P	486
60	G8FMC	265	68	91PT	D	25	++	PA3FJY	487
61	G7APD	241	56	92JI	B	10	17	GD4IOM	302
62	G3VGG	234	54	82XH	-	10	4Q	———	—
63	G0JSG	230	37	02UL	-	10	8	G4KUX	334
64	G3XTQ	230	58	91OW	-	18	4	GD4IOM	354
65	G1LNT	204	62	91WG	C	25	9	G4KUX	389
66	G4XPE	202	39	92GU	-	10	10	———	—
67	G4ERW	201	63	91UJ	C	25	5	G4FUH	242
68	G0CDY	169	27	90BT	-	10	-	GD4IOM	**414
69	G0OLM	153	33	01KX	C	10	8	G4RFR	287
70	G1JNZ	134	25	82SP	-	25	2X6	G3WSC	230
71	G8BBC	132	40	91VM	-	25	8	G0NYL	229
72	G7BKH	38	24	01AK	-	10	VERT	G8KMI	113
73	G4IVJ	21	11	92AJ	-	10	5	———	—
74	G4JRY	11	7	93QN	-	10	XDI	G3VIP	66
75	G4TJE	2	2	01AL	-	3	SJM	G0HUZ	—

* Denotes zonal certificate.

++ 6-ele at 20' leaning on roof, vert dipole with TV coax @ 28', 7-ele quad resting in loft fixed NW, HB9CV hand held in bedroom!

* Congratulations to Melissa, 2E1AET, on her first contest. Special certificate for this one. I look forward to more entries from you.

FOREIGN ENTRIES

Pos	Callsign	Pts	QSO	Loc	Pwr	Ant	Best DX	Km
1	PA3FJY	1178	62	JO32EH	150	2X17	GW4WVO	671
2	PA0GHB	980	94	JO11WH	200	10	GW7LAG	609
3	PE1EWR	647	65	JO11SL	10	10	G4NXO	457

SWL

Pos	BRS	Pts	QSO	Loc	Ant	Best DX	Km
1	25429	953	99	93FX	8	DB4ET/P	665
2	28198	321	51	00HX	10	GD4IOM	490

Disqualified

G0JKD/P This was a fixed station contest! Rules 6 & 13 (HF Log sheets).
G4NXO Cover sheet inaccurate as to operators. Station not operated within spirit of contest.

Checklogs

Thanks to those stations who supplied checklogs, this is much appreciated.
GM4ZUK/P, Allan Duncan
G8IUB/P, Birmingham University Radio Society
G0CLP/P
G2AFV
G0JKD/P

144MHZ CW CONTEST 1992

Conditions for this contest ranged from 'rather poor' to 'average with low activity'. However this did not stop some stations from working some very decent DX. Congratulations to G4DSP, Spalding & District, for winning the open section, to Andy G4PIQ, the fixed station section and to BRS37796. All will receive certificates as will the runners-up. It is just pure coincidence that the winners of both Tx sections have committee members operating. This causes me great embarassment, please, oh please, will someone else win a contest from time to time. Seriously though, they both won fair and square; in fact committee members are more rigorously checked than anybody else to ensure complete fairness to all. *Bryn Llewellyn, G4DEZ*

OPEN SECTION

Pos	Callsign	Pts	QSO	Loc	Ant	Pwr	Best DX	Km
1	G4DSP	24586	63	IO92	2X9	400	F8OP	787
2	G4FKA/P	22596	65	IO91	16	100	GM4AFF	639
3	GM4ZUK/P	11088	31	IO87	19	400	G0AFH	656

FIXED SECTION

1	G4PIQ	2000	90	JO01	4X15	400	F1DUO	707
2	G4ASR	8152	68	IO81	*	300	DL2OM	746
3	G4WKN	2489	74	IO92	17	300	DK5DQ	569
4	G0AFH	7518	60	JO01	2X17	200	GM4ZUK/P	656
5	G4HUP	5164	46	JO02	2X18	400	GM4ZUK/P	591
6	G4OUT	2210	46	IO92	12	400	PA3FJY	565
7	G4ZTR	6580	35	JO01	16	300	GM4ZUK/P	609
8	G0ADH	4026	31	IO91	6Q	50	ON4KFM	542
9	G3FPK	3120	20	IO91	16	100	GM4ZUK/P	654
10	G3FIJ	2652	17	JO01	9	10	GM4PPT	563
11	G2AFV	2144	20	IO93	16	10	GM4ZUK/P	385
12	G1YIY	1376	20	IO92	10	10	GU4HUY	363
13	G5UM	1200	14	IO92	10	12	GM4JJJ	-
14	G0DJA	948	13	IO93	9	**3	GM4ZUK/P	386

SWL SECTION

1	BRS37798	16	2	IO91	5	-	G4DSP	-

* G4ASR 421BXL Boomer (Whatever that might be!)
** Nice DX Dave with just 3W!

DIRECTION FINDING

DARTFORD HEATH QUALIFYING EVENT

Date: 14 June

Map: 188 (Maidstone and the Weald of Kent)

Assembly: 1.00pm for start at 1.20pm

Location: Shipbourne Common, NGR 594 522

Competitors requiring tea should notify Peter Sharman, tel: 0689 854089, no later than 8 June.

160 METRE DIRECTION FINDING CONTESTS

1. EVENTS

(a) Qualifying events will be open to members of the RSGB or affiliated societies and will be held on Sunday afternoons, commencing at 1320 and concluding at 1630.

(b) The National Final will be held after the Qualifying Events have been decided and only the following will be allowed to compete:

(i) The winner of the National Final in the previous year.

(ii) Competitors qualifying in the Qualifying Events.

(iii) One or more competitors specifically invited by the contest committee.

Only entries under (i) and (ii) will be entitled to win the trophy.

The National Final will be held on Sunday afternoons commencing at 1250 and concluding at 1630.

Note: all times are local

2. TRANSMITTERS

In the Qualifying Events, competitors will be required to locate two hidden transmitters and on the National Final only, will be required to locate three. All transmitters will operate, using CW and amplitude modulation, in the 1.8MHz band, each with a maximum carrier level of 9dBW and the power output will remain constant throughout the event.

3. IDENTIFICATION

For identification purposes, the call signs and frequencies (which will be separated by at least 10kHz) will be announced at the start of each event. Identification signals will be given in CW for the first four minutes of the first transmission, immediately followed by two minutes of telephony.

4. SIGNALS

(a) After 1326 (1256 on the National Final) competitors who are satisfied with their bearings may leave the start at their own discretion.

(b) If any of the competitors fail to detect signals from any of the transmitters they will, at 1335 (1305 on the National Final), be given a bearing(s) which, when drawn on the appropriate 1:50,000 OS map, will pass within 4km (8cm) of the transmitter(s) they have not detected.

(c) If none of the competitors detect a signal from any one or more of the transmitters, the starter, in addition to providing the information under Rule 4(b), will state whether the transmitter is less than 10km, more than 10km but less than 20km or more than 20km from the start location.

TRANSMISSION TIMES

Qualifying Events

1320 - 1324 CW
1324 - 1326 Telephony
1400 - 1402 CW
1402 - 1404 Telephony
1404 - 1600 Random
1600 - 1602 Telephony
1602 - 1615 Random
1615 - 1630 Continuous

National Final

1250 - 1254 CW
1254 - 1256 Telephony
1330 - 1332 CW
1332 - 1334 Telephony
1334 - 1600 Random
1600 - 1602 Telephony
1602 - 1615 Random
1615 - 1630 Continuous

After 1404 (1334 on the National Final) transmissions will continue on telephony for not less than two minute periods at irregular intervals, such periods to be not more than 15 minutes apart. Each transmission will be preceded by a short identification signal in CW of the form 'TEST, TEST, TEST DF DE G . . . . . /P' After 1600, transmissions will continue on telephony only. Transmitters will operate on the same fixed schedule of transmissions (ie operating simultaneously) until 1404 (1334 on the National Final) subsequently operating independently, except for the 1600 transmission. Where severe interference is known to exist, slow CW may be used in place of telephony.

Contests will terminate at 1630 and in the event of no one finding all the transmitters in the time allowed, the contest will be declared a one or two station contest, as the case may be, and the winner declared on that basis.

6. LOCATING HIDDEN STATIONS

Competitors may locate stations in any order and upon arrival at each station the competitor must hand his numbered entry form directly to a member of the transmitter crew who will initial the form, mark on it the time of arrival and hand it back to the competitor. The transmitter operator, or his assistant, must if challenged by a competitor holding a DF receiver admit that his is one of the hidden DF stations.

7. QUALIFIERS AND WINNERS

(a) If seven or more Qualifying Events are held in any one year the first two competitors, not having previously qualified to locate their second transmitter, will go forward to the National Final. If there are six or less Qualifying Events the first three competitors, as defined above, go forward to the National Final.

(b) In the National Final the first competitor to locate his third transmitter (or second transmitter if no one has located three) will be declared the winner.

8. GENERAL

(a) Competitors searching likely transmitter sites prior to the commencement of a competition will, at the discretion of the umpire, be disqualified from the competition.

(b) The hidden stations will be located at least 50 yards from any inhabited building and will be directly accessible to competitors without them entering, crossing or trespassing upon property in private occupation.

(c) The hidden stations will be located at least 50 feet from any public highway.

(d) Transmitter locations and starting point shall be covered by one sheet of the Ordnance Survey map (1:50,000 series) and the sheet number must be published prior to the event.

(e) Each competitor must sign on at the starting point and must receive an entry form numbered to confirm with the entry on the starters sheet.

(f) A team shall consist of a competitor plus not more than three others.

(g) Tampering with the transmitter aerial by the competitor or his team is strictly forbidden and may entail disqualification of the competitor. Competitors and their teams must leave the vicinity of each transmitter immediately the signed form has been handed back to the competitor.

(h) Only one portable receiver, capable of being tuned to the 1.8MHz band, shall be carried by any team during the event, and the competitor, at the time of his arrival at each hidden transmitter must have his receiver with him and, if required, must demonstrate that it is in working order. However, there is no objection to having a second portable receiver as a reserve for use in the event of failure of the first receiver. Simultaneous use of two receivers may result in disqualification from the contest. The use of any transmitting equipment by the competitor or his team is expressly forbidden. Any aerial connected to a fixed monitoring receiver in a competitors car must be of a non-directional type.

(i) The aerial, in each case will be directly connected to the transmitter without the use of non-radiating feeders. The transmitter will not be operated by remote control.

9. NATIONAL ORGANISER

The National Organiser, before the start of any event, shall appoint an umpire whose main function shall be to ensure that the rules are compiled with at the start of the contest.

In the event of any dispute(s) occurring during the contest the organiser may, at his discretion, refer the matter to the national referee and/or RSGB HF Contests Committee whose decision shall be final. Nevertheless the competition results, in which the dispute(s) occur(s), shall be determined by the referee's ruling(s) until or unless the RSGB HF Contests Committee decides otherwise.

BERT SIMMONS MEMORIAL TROPHY

This year the Rose Bowl was won by Brian Bristow of Mid-Thames.

B Bristow	Mid-Thames	24
P Lisle	Mid-Thames	18
D Brocks	Chelmsford	15
T Gage	Mid-Thames	15
A Collett	Colchester	14
C Plummer	S Manchester	12
B Gray	S Manchester	10
P Cunningham	Colchester	9
G Whenham	Coventry	9
M Hawkins	Colchester	9
A Mead	Chelmsford	9
A Simmons	Mid-Thames	9
P Tyler	Mid-Thames	9
G Foster	Mid-Thames	7
D Newman	SLADE	7
C Metcalfe	S Manchester	6
M Standen	Mid-Thames	6
C Wells	S Manchester	4
D Holland	S Manchester	4
W Pechey	Mid-Thames	2
P Larbelestier	Devizes	1
K Howell	Mid-Thames	1

VHF CONTESTS CALENDAR

7 Jun	70MHz CW (Mar 92)
7 Jun	50MHz CW (Mar 92)
21 Jun	432MHz FM Fixed/Open (Mar 92)
21 Jun	432MHz CW Single/Multi-Op (Apr 92)
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
6/21 Oct	1.3 & 2.3GHz Cumulative
14/29 Oct	432MHz Cumulative
1 Nov	2nd 1296MHz Fixed/SWL
2 Nov	144MHz CW Cumulative
6/19 Nov	1.3 & 2.3GHz Cumulative
7/8 Nov	144MHz CW Marconi/RSGB 24-hour
8 Nov	144MHz RSGB CW 6-hour
13/30 Nov	432MHz Cumulative
6 Dec	144MHz AFS/Fixed/SWL
7 Dec	1.3 & 2.3Ghz Cumulative
15 Dec	432MHz Cumulative
26/29 Dec	70 MHz Fixed Station
26/29 Dec	144MHz Fixed Station
26/29 Dec	432MHz Fixed Station

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

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?

If so, why don't you put your name down for the *Practical Wireless* Morse Weekend? For around the £160 mark, we're planning to provide meals and accommodation in a good quality, comfortable Hotel. The weekend will start on the Friday evening, and finish after lunch on the Sunday. You will have the opportunity to have some Morse tuition, before you take the Morse test itself. You'll also have the chance to see and try all the latest aids for c.w. working in amateur radio, meet the experts, other 'key' enthusiasts and have fun at the same time.

OTHER ATTRACTIONS

Originally planned for the late spring, we're now looking at a weekend in September. There will be other attractions for friends and family members not joining in with the amateur radio events. Don't forget that we're very close to the delights of the New Forest, the Hampshire and Dorset sea-side resorts and some delightful 'Stately Home' attractions. With that in mind, we plan to organise some coach trips so that the weekend will have something for everyone.

EXCELLENT COMMUNICATIONS

Communications to this part of the UK are excellent. We've got superb train services from the north and Scotland and even abroad if need be! If you're interested, please send a fully refundable deposit of £25 per person to:

PW Morse Weekend, Enefco House, The Quay, Poole, Dorset BH15 1PP. Tel: (0202) 678558.

Alternatively, if you want to hear more about the Morse Weekend, why not call Rob Mannion G3XFD to talk about it? (Between 3 and 4pm please!)

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VC300
300 Watt antenna tuner with precision cross pointer metering for FWD/REV/SWR readings. Switch between two coax antennas plus wire or balanced line (a 4:1 balun is included). Switching allows both tuned and direct antenna selection. Uses same high quality case and front panel as the HT-1500 ...£129

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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

4CX250 BM valves, new, original boxes. Cooling fins slightly discoloured on some examples, hence bargain price. Normally: £90 each. My price: £50. 8 available. Will post for £2 extra. Several large wooden packing crates. Ideal for storage in shack/garage or for moving house, shipping abroad your delicate/expensive equipment: £3-£15 each, delivery possible. Shack heater (2 kw): £15. 405 TV: £15. (Birmingham) 021 472 3688.

5 BEDROOM detatched family home in rural Cheshire near Nantwich. Granny or teenage flat, 2 bath, 3 WC, fitted kitchen, laundry, workshop, radio room. Good take off, central heating, double glazing. Peaceful village for retirement. Snip at: £80K. Brochure, photographs. G3ADV. (Nantwich) 0270 627149.

A1 - "The Classic" linear amplifier. Full licence output, 80-10M, 2x813's, professionally built, superb condition: £265. Eddystone 880/2 communications receiver, 0.5-30.5MHz, 30 ranges, excellent condition with cct/info: £250. Cossor TF-1331 dual trace oscilloscope with handbook, needs attention, hence: £30. Hitachi VK-C600E colour video camera, 6xzoom, ideal CATV, cost: £650, offered excond, /info: £125 - Scope/camera, carriage extra. Amp/RX test/collect only. No offers. (Cheltenham) 0242 524217.

COMPUTER 386 DX 25MHz, 8meg RAM, 140meg hard disk, 387 co-processor, VGA card, mono (VGA) monitor, and all software installed on the hard disk about 100 megs. 5 1/4 floppy disk 2xserial ports 1xparallel port, mouse, excellent condition: £1000 ono. Ring David. (Halifax) 0422 842243.

DRAKE R7 receiver, excellent condition. 4 accessory filters fitted. Operators handbook and service manual, boxed: £750. SEM VHF tranzmatch: £30. (Woodbridge) 0986 798524.

EDDYSTONE 990 transistor radio 29.6 - 240MHz: £295. FT690R radio all mode TX/RX 6M: £265. Labgear bamboo quad 10-15-20 unused, boxed: £125. J beam 10XY 2M beam: £25. 70cm 6 over 6: £15. MFJ noise bridge M202: £36. 1155 radio wkg. (Nr Matlock) 0773 832943.

ICOM R71E general coverage receiver, excellent condition: £450. ICS FAX-1 FAX/RTTY terminal unit: £150. Datong RFA RF-switched wideband pre-amplifier: £10. Microwave modules 70cm ATV converter: £10. Pair 4CX250B valves, ex equipment: £15. QQV06-40A valve: £5. Watford Electronics IEEE-488 interface for BBC micro: £25. 13.8V 3A regulated PSU: £10. Homebrew CCTV camera: £10. 0-270V 3A variable voltage transformer: £15. (Guildford) 0483 575870.

ISOLATING transformer 240/240 KVA: £30. Two 19" rack cabinets, 64" ht, 32" depth: £25. Plug in ELCB's (RCD's), new, 5 for: £25. Giant boxful, new components - R's, C's, semi's etc, over 30,000 items: £55. A trailer full of junk (useful stuff), free delivery locally: £39. Large fridge/freezer, upright, perfect, very large American style (but 240V of course!) Offers. Yellow colour, urgent. (Birmingham) 021 472 3688.

KENWOOD R820 communications receiver. Variable bandwidth, notch filters fitted, CW.250/500Hz AM6kHz. Amateur bands 1.8-29.7MHz. Short wave bands (extended coverage by Lowes). Immaculate condition, boxed, instructions. New SP430 included. Sale: £450. Rarely advertised. G2FZU QTHR. (Notts) 0636 813847.

ICOM 575H 10M and 6M all moes, 50W or 100W, direct digital synthesiser 2VFO and 99 memories. Duplex and cross band duplex. Includes antenna C/O relay, lots of extra and rather confusing facilities. Handbook and boxed as new: £800 ono. (Sussex) 0825 740310 after 6pm.

KENWOOD TS520 with matching speaker, external VFO, mic, manual, excellent unmarked condition, spare valves: £450 ono. GM4FIB QTHR. (Edinburgh) 031 663 7895.

KENWOOD TS680S HF with 6M band: £680. Might PX 2M mobile or base station. Malcolm G0HOG. (Ruislip) 0895 676919.

KW202 amateur bands RX: £100. Hammalund HQ180 general coverage RX: £100. R1155 RX: £25. AVO model 7 meter: £20. AVO minor meter: £15. AVO all wave oscillator: £25. Taylor Universal multimeter 83A: £25. Microvac valve voltmeter CT54: £30. Eddystone 640 manual: £5. Quantity LDF4-50 and LDF550 with connectors ring and ask various lengths available BC221 with charts: £45. (London) 071 732 8319.

LAPTOP LT1400 2X720K d/drives, 2X key boards, IBM DOS5, b/lit LCD, manuals, IBM S/W: £400 ono. Swap WHY? Topward 8115 digital sweep function, boxed, new: £150pp. Kikusui AVM23, 2 channels, bench type, no manual: £50pp. Lab bench multi dig meter, tests everything, boxed: £50pp. Adret Marconi 740A 0.1/550MHz digital sig-gen, programmable memories: £1250pp. Dual trygon DL400 lab power supply 2X0-40V metered, give away: £35pp. All above modern, not chunky. (Ipswich) 0473 785203.

MATHS CO-PRO. 2C 87 ITT, brand new on mother board with 80286 processor, AMI, BIOS, etc. Multi I/O card and HDD/FDD card: £55. G3VNI not QTHR. (Middlesborough) 0642 711855.

MOSLEY TA33JR three element triband beam. Heavy duty high power version with balun: £150. GW0GDK. (Nr Chester) 0244 541303.

MUTEK TVVF 144a, 2M transverter, CW leads and manual: £195. Samson ETM - sq paddles, boxed like new: £20. Diamond SX-200: £35. Heatherlite headset: £8. Morse key: £10. Dummy load, 60W max: £5. National NC 'sixty special', 500kHz - 30MHz RX, very poor condition but good working order. (Some very rare valves). Offers! (Bolton) 0204 852410.

OFFERS INVITED. BC221 with PSU. CT471 multimeter with all test leads. HRO with 9 coils and PSU. Kenwood MC55 mobile microphone. VLF converter. PL259 coax switches. Collection of valves. KW1000 linear VGC: £300. KW204 TX: £100. Sale due to illness, so regret that buyers must inspect and collect, as no packing available. Contact G3ADZ QTHR. 11am - 9pm. (Rugby) 0788 815222.

PK88 boxed, manual, June 1990 firmware: £80. Mike G8RCG QTHR. (Knutsford) 0565 722262.

RECESSION biting need cash. FT290 Mk1 nicads charger case: £185. 25W amp: £15. Jaybeam 8XY2M: £25. 5/8 whip G/mount: £15. FT690 (Sommerkamp): £195. 15W Nevada amp: £10. 3ele beam: £20. All GWO. Buyer collects/pays carriage, no offers. Phil GM1NZD. (Newtonmore) 0540 673475.

SILENT KEY sale: HF5B Butternut 2ele beam CW rotator: £150. (Purchaser dismantles). SEM QRM eliminator Mk2: £45. Yaesu MDIB8 desk mic: £45. Super Scaf switcher capacity audio filter: £35. Atari 520ST computer, CW, SM124, hi-res monitor: £175. Contact Peter G3HEE. (Stamford) 0780 55001.

SONY receiver, ICF7600D paper back book size, LW/MW/SW, AM/CW/SSB, plus Sony quality HI-FI FM, VGC ideal holiday/P SWLing: £100 ono. G4FAS QTHR. (S Manchester) 061 437 7784.

SPECTRUM analyser 10MHz to 40GHz. H-P 851B/8551B clean and in good working order. Includes spare BWO (plenty of urge 40mW+ in installed one!) used as spare in professional workshop. Ideal for school, repeater group, club etc. Bargain price: £995 neg. Also Tek 222 digital storage scope, recently calibrated: £2100 list - excellent buy at £795. Ray. (Pinner) 081 866 3300.

STORNO 600's bases, repeaters, mobiles, transportables, low/b, high/b, UHF, 25/12.5kHz, spares, accessories, manuals, mounting hardware, 10/25 Watts. Ideal packet or replacement repeater. Storno 800 handportables, high/b, low/b, UHF, 1-3 Watts, 25/12.5kHz, spares, accessories, chargers, batteries, manuals, etc. Willing to haggle! FT221R 2 multimode, VGC Mutek: £275. MM432/144 transverter: £75. MM432/30 linear: £50. RA17: £150. G2DAF HFSSB, transmitter, well made W/PSU: £40. G8PMQ QTHR. (Nr Camberley) 0344 761791.

TRANSFER files between the BBC Micro and your PC via the serial port. BBC to basic to plain text conversion program included. Supplied complete with cable: £50. Other PC utilities available. For details send SAE to GW4ZQY QTHR. (Swansea) 0792 791207.

TRIO TR9130 2m multimode TX/RX fist mike, leads and m/bracket: £320. Yaesu FTV250b 2m transverter for FT101,: £70. Also 20MHz double beam scope Telequipment D67A, dual timebase. slight fault so only: £60, manual included G0OPL. (Ludlow) 0584 872522 or 876675 evenings.

YAESU FT-209R TX/RX, handheld 2 nicads, charger, soft case, original packing and manual, one owner, in good clean condition plus MH-12 microphone: £175. Also Trio R600 receiver with pro-fitted FM mod, squelch in good clean condition and includes service manual: £200. G4OTC. (Huddersfield) 0484 642901.

100 WATT solid state HF transceiver IC701 PSU: £395. FT290R: £200. Racal RA17 working but well used, needs collection from Bolton: £140. Call Mike Willis G0MJW office hours. (Guildford) 0483 300 800 x2310.

2M converter 144/28 Spectrum, brand new, little used, very good condition: £35. G3HKH QTHR. (Weybridge) 0932 847112.

3 BEDROOM end terraced house, 2 receptions, large kitchen & garden, dbg, gch, second WC and attached radioshack/workshop, rear access & parking, permanent antenna planning permission, (W3, 2E1 HF beam & 6M Yagi; 2M & 70 cm possible) - could be purchased fully furnished inc. all elect. appliances, also 1.8M motorized 11/12GHz dish. Maintained to a very high standard, fully rewired & insulated. Contact Karl Barth, G0KSW, 30 Bedhampton Way, Havant, Hants, PO9 2DP - will vacate Aug/Sept 92 - no chain: £55,000. 0705 471432(home), 0705 674551(office).

35FT Tiltover tennamast, wall mounted, brand new complete with head unit, DL800 autobrake winch not being used, genuine reason for sale. Tiltover angle between 45/50 degree angle complete with wall bolts: £490. No silly offers. G0LUU QTHR. Buyer collects. (Huddersfield) 0484 865125.

60 FOOT wind up three section tower, winch missing, lattice non tiltover. Buyer inspects and collects: £250. (Gillingham) 0747 823574.

70CMS linear HL-63U 10W/25W autoselect input, output 50W, variable gain preamp, boxed, as new condition, instruction manual: £110. G7FZB QTHR. (Alsager) 0270 875507.

ALINCO DJ160 extended coverage, nicads, charger, case, speaker mic, boxed, mint, manual: £150. Microreader Mk2 as new: £120. Westminster packet crystals 70cms: £6. NEC 9A battery pack, never used: £25. Amstrad 1512, IBM, mono monitor, 20mB H/D, 5.25 floppy disk, mouse, software and manual. As new: £295. Or exchange for HF linear, must be mint. Please contact Patrick. (Dereham) 0362 821125.

ALTRON AQ6-20 3ele minibeam, new not erected: £120. Trio JR310 Hybrid 1.8-30MHz, superb double IF - RX, as new: £175. Canon AE1 SLR 35mm camera plus 177A flash unit: £75. Wanted FL2001Z linear amp. G3FCV QTHR. (Gillingham) 0634 854682.

AMIGA software, less than half price. ICS Amiga fax: £45. ICS Amiga SSTV: £25. Maxiplan spread sheet with database and business graphics plus manual: £35. Superbase personal data business system plus manual: £30. Dr T's music software plus manual: £25. GW0IQP. (Newtown) 0686 626551.

AMSTRAD 2086, 32MB,HD VGA colour display. Light home use. CW mouse, software, excellent condition: £495. Peter G0OJX QTHR. (Exeter) 0392 432675.

AMTECH 300 HF ATU: £25. New boxed 6146B valves, pair: £25. Driver 12BY7A: £5. Welz SWR/power meter, SP220 1.8-200MHz 2/20/200W ranges reads AVG and PEP: £50. UHF starphone no xtals CCT diagram included: £10. Datong broadband preamp 5-200MHz RF switched: £25. (Ammanford) 0269 826357.

ATARI portfolio pocket PC, MS.DOS compatible with serial and parallel interfaces and mains PSU, mint condition: £155 ono. Steve G4UHM (24 hours). (Ingatestone) 0277 355731.

B2 SPY radio in suitcase with accessories: £500. A13 on carrier, A40, A41, A14HP, lots of 19 set accessories, ZC1 Mk1. Phone (New Malden) 081 949 2317.

BATTERY pack 6V, 7AH (5x"F" nicads) new sealed case, shaped to fit HIP+2 belt loops. Integral fuse +200mm output lead: £12 each. (Stockport) 0663 762707.

BBC-B 64K DDFS, 5.25" disk drive 40/80T, Aries B32 fitted, inter-word WP, RX-4 and scarab RTTY tapes, miscellaneous software discs, manuals: £200. SEM Tranzmatch with ezitune: £60. All VGC. Tim GD0EOT. (Douglas) 0624 626794.

BBC-B series 7 computer, ROM/RAM, twin 40/80T disk, software, VGC: £190. WW2 army VHF RX type 62H with PSU 234: £25. Sweep oscillator Dinosaur electronic SS: £30. Sig gens TF801D, TF144HS, offers. AMP EL38X2 free but collect. (Wokingham) 0734 791488.

BBC-B series 7, twin 40/80 drives, plynth, mouse, Philips monitor, sideways RAM, speech module, ROMS - Enigma, view, superart etc. Masses software tapes/disks, books magazines: £250. Philips CM8833 colour monitor: £130. PSION organiser, spellcheck, datapack, PSU: £50. Carriage extra. G3OHC QTHR. (York) 0904 87779.

BEST sensible offer secures two 813s (RCA/GEC) unused, US forces spec. WW2. G4RHI QTHR. (Axminster) 0297 32572.

BUTTERNUT HF6V vertical used: £75. HQ-1 4 band mini beam, as new: £80. Datong D70 Morse Tutor, little used: £40. GW4PRP. (Port Talbot) 0639 890260.

CAPCO 300D ATU, mint: £160. Icom PS55 PSU: £105. Diamond SX100 1.6MHz-60MHz PWR?SWR meter: £60. Phone Paul G4XHF QTHR. (Crawley) 0293 515201.

CASIO FX850P personal computer, fitted additional RAM pack (see Maplins Page 52) very versatile, fully programmable. Absolute mint: £90 only. Ring G3HNP. (Great Yarmouth) 0493 393560.

CLEAROUT. FT23R: £140. CTE1600: £80. Both CW nicads and chargers. IC240 2M mobile CW mobile mount: £100. Standard C78 70cm handheld + 10W PA + mobile mounts: £100. Realistic PRO34: £125. PRO32: £80. Dyson 60Mb tape streamer + interface card: £50. 2X BBC computers + packet software, both GWO: £80 each. Johnathon G4FMG. (Peterborough) 0733 66471 after 6pm.

CODAR TX AT5 with PSU: £35 plus postage ono. Or exchange WHY? GD0IFU. Mr W Corkish, 17 Ballachrink Drive, Onchan, Isle of Man.

COLLECTORS ITEMS: Eddystone R770U: £75. Marconi Atlanta mains PSU speaker: £100. CR100 re-sprayed with S-meter: £40. Kay Sonagraph (to record sound spectra of birdsong): £175. GEC communications receiver 5820 - 99 - 916 - 4679. Superb valve receiver 2-30MHz in 8 bands. Separate IFs and speakers for USB and LSB simultaneously fantastic performance: £175. All above good working order with manuals. Nascom I: £20. Beme ships DF/RX: £15. Universal Bridges: test set 373: £10. Wayne Kerr: £5. Wanted cheap Collins valve transceiver. G3MFW QTHR. (St Austell) 0726 73608.

COMMODORE 8032 computer with 8050 disk drive: £75. Buyer collects. G4PTP QTHR. (Corby) 0536 745425.

COMPUTER Laptop, Toshiba T1000LE 20MB hard disk, 3.5 floppy drive, battery plus mains adaptor, leather case: £700 ono. Buyer inspection preferred. (Nr Huntingdon) 0487 841558.

COMPUTER. Goldtar GT212, VGA, 40MB hard disk, 2MB RAM, amateur programs already loaded. MS.DOS 5.0, windows 3 plus many others. Purchased 25 Feb 92, still under guarantee. has 3.5" and 5.25" floppy drives. Cash: £700. G3ENB QTHR. (Scarborough) 0723 365093.

CP-6 diamond 6-10-15-20-40-80M vertical with radials, as new with box, 6 months old, used twice before radios were stolen from shack, thus no need for antenna. Telephone Steve G6ELD after 18.30GMT. Buyer collects, is advertised at £219, accept offers around: £130. (S Manchester) 0831 875 245.

CUSHCRAFT A3S 3-ele HF tribander: £250. Yaesu G1000SDX rotator: £300. Both brand new, planning permission refused. G0RGO. (Havant) 0705 475168.

CX 540D relays, little used, will handle 300W at 1GHz: £15 each. G0DYW. (St Albans) 0727 872753.

DIGICOM packet modem for C64: £30. RTTY modem: £10. 4x19ele 70cm beams (new boxed). Tonna with N type plugs: £35 each. 4 way splitter for 70cm: £35. 4 way splitter for 2m: £30. Both new with N types, buyer collects. (Yateley) 0252 874033.

DIGITAL freq-mtr by Global Corporation, 5Hz-650MHz with manual: £75. FT401DX with manual and spare valves: £125. G8FXG. (Holsworthy) 0409 241548.

DRAGON 32 computer, hardly used, complete with all bits for RTTY and CW plus small printer, offers please. Also ERA microreader, perfect with latest update firmware for AMTOR SITOR and NAVTEX as well as RTTY and CW: £120. G3FAU QTHR. (Stevenage) 0438 352932.

DRAKE TR-4CW, PSU, mic + spare valves: £375. Drake W4 wattmeter: £30. ICL dumb terminal: £15. Hi-Mound lambic paddle with marble base: £12. Matched pair 6146B valves, new: £15. J Beam 2m 5el yagi + coax: £15. Buyers inspect and collect large items. G3GGK. (Cambridge) 0954 210374.

DRESSLLER D200 VHF linear (350W) working but repaired: £250. Wells RF/SWR meter: £20. RadComs 1974 onwards: £20. Buyer collects. G4CZZ. (Stevenage) 0438 748865.

EDDYSTONE 1830 marine general purpose HF/MF receiver solid state, VGC, manual, 120kHz-31MHz: £250. Swap small receiver possible. (Middx) 081 571 5759.

ERA Microreader Mk2 Morse/RTTY decoder, LCD display, cost £160 - mint: £75. Trio TR2400 fast chargers mobile BCS: £10. Base sti: £14. (Chatham) 0634 849112.

ERA Mk2 tutor/decoder (Morse RTTY) complete: £105. Datong Morse Tutor D70: £35. 1kv dummy load: £20. 1kv auto-trans (to collect): £20. Sony M8EK 8mm handicam plus VTR, the simplest, no zoom, no monitor, cost £1200 - snip at: £300 ono. (Gillingham) 0634 379140.

F290R 2M transceiver including nicads case, charger: £220 ono. SX200 scanning receiver AM/FM 26-58, 58-88, 108-180, 380-517MHz including charger. (Lichfield) 0543 263608.

FOR SALE: Drake R4V receiver, Drake MS45 speaker, Drake MN4 ATU: £250. FT101 plus ext VFO, boxed with manuals, excellent condition: £220. Collins 51J4 receiver cabinet manual: £220. Creed 444 teleprinter, exc, Brooks RTTY decoder, both VGC: £65. RS85441 Nelson. (Brandon) 0842 810879.

FRG7700 SW RX, FRT7700 ant tuner, FRC7700 VHF conv: £300. 40ft lattice tower, 2 sections: £60. Roband scope, 10MHz: £30. BT Merlin dumb term, boxed: £30. (Stevenage) 0438 724991.

FT ONE, one owner: £825. FT707 TX/RX: £325. FT207 PSU: £90. FC707 ATU: £90. FV707 DM: £90. Or all four: £500. Standard C58, one owner: £220. AEA tuning meter, model T1-1: £25. PSU fine for HF xcver: £25. Roband 5 & PSU: £10. Daystrom scope: £10. Daiwa automatic antenna tuner: £90. Yaesu Musen speaker: £15. 2 Dragon 32^ with ST5 and 5 program cartridge BMK: £75. (Towcester) 0327 52309.

FT101/E MK2 ono, as new condition with manual. 2 spare sets of valves, fuses and battery leads + spare slow motion drive & lead for Siskin Kam all mode with Vic 20 computer: £350. Trio R2000 used 11/2 mts new, with leads for KAM. Manual, spare, fuses and batt leads: £350 + carriage. FC301 ATU, as new: £50. Mr GT Eustace, The Old Westlyan Chapel, The Entry, Wickham Skieth, Eye, Suffolk IP23 8LY.

FT101ZD 9 band (WARC) FM, CW filter, fan, DC/DC converter: FC902, FV101Z: £550 no offers, no split. (Ruchterarder) 0764 64647.

FT101ZD/FM mic fan: £400. FC902 ATU: £120. Weston P?meter DM2000A: £40. Welz CT530 d/load: £50. All boxes, mint, manuals. (Newark) 0636 71324.

FT102, VGC, manual, box: £475 ono. RICOH RP1600 (ICL HITYPE interface) daisywheel printer: £15 ono. Delivery by arrangement. G4CCN QTHR. (Woodbridge) 0394 386529.

FT290R mint nicads, case, rubber whip, M/whip, home base antenna, coaxial cable, 30ft pole wall brackets, only: £250. Quick sale. (Croydon) 0689 849600.

FT290R Mk 2 matching linear, battery pack, nicads, charger, carrying case: £375 ono. 2M-6M R L transverter, 3ele beam and dipole, 6M bandpass filter: £125 ono. All in very good condition with manuals. For details phone Graham G1WXU QTHR. (Gosport) 0705 582496.

FT290R Mk1, perfect condition with batteries, soft case and 30W linear: £220. Will PX for 2M mobile. (Blackburn) 0254 830557.

FT707, good condition: £350 ono. 10-160M HF linear, approx 2kw output, uses 3x4-400. Mounted in 2x19" racks, Offers!. Tel Dave. (Sheffield) 465145.

FT726R 50MHz module: £175 plus postage. TH3 JNR 3ele HF beam with BN86 balun, unused: £180. Buyer collects. (Motherwell) 0698 53394.

FT736 multimode 2M and 70cms: £900. Icom 726 HF and 6M: £750. Yaesu monitor scope YO100: £80. PEP meter: £35. (Stroud) 0453 824853.

FT775, 20W, compact HF mobile rig: £300 (with CW filter and mic). Mizuho KX3 antenna tuner: £30. Icom electronic keyer module for IC735, IC745 etc: £25. Kenwood YK88S SSB filter: £25. (Glasgow) 041 776 6098.

FT902 DM, very good condition, all filters, keyer etc: £475 ono. PX for Tono 9000E considered. Harold G3ZIF. (Huddersfield) 0484 863936.

FT902DM 250Hz CW filter fitted: £525. Racal RA17 receiver: £120. SRX30 receiver: £60. Ring Colin G4OTN QTHR. (Blackburn) 0254 852420.

FT902DM, FC902, FV901DM, SP901, bencher paddle, all with boxes and manuals: £850. FT107M with manual, no box: £400. (Bristol) 0272 642867.

GLASSFIBRE flagpole 50ft with hinged base. One year old but must sell due to overseas move, ideal for HF and low band loops etc. Buyer collects: £75 ono. Also 4 bed house on 300ft plot with planning permission: £139,950 no TVI. G0OLQ. (Crowthorne) 0344 779851.

GOING QRT TS.830S: £695. Leader SWR/Wattmeter LMP.885: £45. Transmatch: £40. Yaesu LP filter: £30. Yaesu YD148 mic: £35. Would accept: £800 for all 5. Altron 3el HF beam AQ6-20/3E £110. SMC 2m triple colinear (new): £40. AR40 rotator coupled to great circle map (dial the world): £75. 13el ZL special (new): £40. Two 'Magnum' industrial bench magnifiers lens size 6.5 x 4": £45 each. WELZ dummy load CT150: £38. (High Wycombe) 0494 439611.

HEATHKIT HW101 transceiver with power supply. GWO spares and manual: £160 ono. Rene G0LHJ QTHR. (Stroud) 0423 731640.

HEATHKIT HW9 QRP xcvr, WARC bands, unmodified, mint: £200 ono. FT290R11, nicads, case, charger: £310. Palm four 70cm handy, nicads, toneburst, charger, eight xtals: £55. Unbuilt kits: Howes CVF20 VFO: £6. ST2 sidetone: £5. AA4 scanner antenna: £10. G0DIW QTHR. (Reading) 0734 483593.

HEATHKIT RxRA1 Q-Multiplier: £25. Heathkit OS2 scope: £15. RadCom frequency counter: £15. Type D wavemeter: £15. Raymart 0-30 bandchecker: £7. Commercial 0-35 LPF: £5. Above carriage extra. Below prefer collected. (XG2BBC) not WARC offers. minimitter TX 80-10M 150W: £20. (Darkin) 0905 774624.

IC781 HF transceiver CRT Icoms top of the range model: £2950. Might consider PX. G0HOG. (Ruislip) 0895 676919.

ICOM 251E CW Mutek F/E base microphone SM5: £450. FT790R CW nicads, carrying case: £230. BNOS 50W amplifier 1 watt input, 70cms: £130. All in good condition. MBM 48 70cms beam: £25, unused. MET 5ele 6mtrs beam: £40, unused. Contact after 6pm please. Barry G4MMV QTHR. (Nr Hull) 0964 622396.

ICOM 280E 2M FM 10W transceiver, digital readout. Scanning complete with remote cable kit (unused): £150. G4GBB QTHR. (Deal) 0304 361085.

ICOM 3210E extended RX, mint boxed: £370. Icom 228H 45W, boxed: £255. Alinco 120E H/H, mint, boxed: £155. Icom HS15+SBT mobile mike, complete: £35. Drae 12amp PSU: £75. Hansen FS7 VHF/UHF SWR meter: £35. Mobile speakers, Yaesu SP55, Kenwood SP50: £7.50 each. Comet CA2x4MAX 2+70 base antenna: £75. Hembro S/S discone: £45. Oscar 7/8 F mobile aerial, new: £15. G1GQL QTHR. (Hants) 0425 654946.

ICOM 735 9 band general coverage HF TX/RX, 100W CW filter, very good condition. Original box and manual: £650. 18 AVT vertical antenna: £30. (Farnham) 025 713851.

ICOM 751, good rig inc PSU: £695. TS120V: £250. Excellent mobile/portable rig with manuals: (Princes Risborough) 0844 275255.

ICOM IC-720A HF transceiver with general coverage receive, matching Icom IC-PS15 PSU and Icom hand microphone, narrow filter fitted, hardly used, approx 30 QSOs. Mainly CW, second rig, manuals, boxed. Purchased from new: £599. Might consider exchange WHY? Radio/HIFI. GW4WBT. (Llandudno) 0492 878107.

ICOM IC-AT500 auto antenna tuner 500W: £340 ono. (Canterbury) 0227 766586.

ICOM IC-AT500 auto antenna tuner, 500W: £340 ono. (Kent) 0227 766586.

ICOM IC25E 2M FM mobile bracket 5-25W, mic, handbook, box, VGC: £180. G4MWP QTHR. (Coventry) 0203 462035.

ICOM IC25E 2M FM transceiver 2.5/25W with mike and manual, good condition: £100. Datong D70 Morse Tutor, hardly used: £40. Please contact Ron GM4VBE QTHR. (Glasgow) 041 638 4814.

ICOM IC2KL auto linear amplifier, little used: £835. Yaesu FT101E, WARC bands, G3LLL double balanced mixer: £250. G4RBO QTHR. (Taunton) 0823 322812.

ICOM IC725 including FM board, mint condition with original packing: £625 or part exchange for IC A20 or similar airband handheld. (Flitwick) 0525 714566.

ICS MET1 SHF two channel RX (Meteosat etc) plus dish and preamp: £375 ono. Two 100W 2M linears - enquire. Belcom LS102L 10M multimode: £150. Seikosha VC100 printer (Commodore): £40. Yaesu FP80 5APSU, near new: £30. G0PWU. (Teignmouth) 0626 773301.

JAYBEAM 26/2M antenna with 15M westflex 103 coax: £40. Light VHF type rotator with 15M cable: £25. Both used inside loft only. Datong D70 Morse tutor, new January: £42. Kenwood HMC-2 VOX headset for TH26E etc: £15. G7IJP. (Langport) 0458 250124 anytime.

JAYBEAM minimax tribander, model MM3: £285. Very good condition. G0KOG QTHR. (Northampton) 0604 751928.

KATSUMI EK150 keyer: £55. Star masterkey memory keyer: £50. Shinwa SR001 scanner 25-1000MHz AM/FMN/FMW: £170. Phone John G4ZTR 6-9pm. (Colchester) 0206 860238.

KENT solid brass straight Morse key: £18. Also Kent single paddle key, as new: £20. Buyer to collect please. G0KPC. (Barnsley) 0226 764545.

KENWOOD ATU 200, VGC. KENWOOD SP 520, VGC. Yaesu 2M trans m/mode 480R, VGC. G0LHM QTHR. (Doncaster) 0302 859451.

KENWOOD R1000 RX in very good condition: £195 ono. G3JAU QTHR. (Bournemouth) 0202 514078.

KENWOOD R600 HF receiver, 150KHz to 30MHz, AM, SSB, CW, manual, boxed: £170. Len G0RDV (QTHR as G7EHM). (Kettering) 0536 514544.

KENWOOD TR 9130 2 metre all mode transceiver in good condition complete with manual and mobile bracket, any trial: £350. (Redditch) 0527 543598.

KENWOOD TS530 HF transceiver: £475. John Fragola. 0604 410822.

KENWOOD TS770 dual band 70cms/8mtrs all mode FM/CW/SSB. Dual VFO not stepped. Buyer inspects and collects: £500. (Chichester) 0243 771691.

KENWOOD TW4000 25W dual band with synth service manuals, mic, boxed: £310. BBC B Computer RAMboard 80/40T drive, monitor, manuals: £150. (Watford) 0923 241461.

KW1000 linear amplifier: £325. Eddystone 888 amateur bands receiver. Excellent condition. Offers! Wanted multi tracking tape recorder. G4EUK QTHR. (Lancing) 0903 753139.

KW2000E, C/With KW PSU?SPR and Shure mic in GWO: £130. G0RHM. (Heckington) 0529 61537.

KW200B HF transceiver, mic, manual, 180W PEP, excellent condition, in regular use: £110 ono. G3YYG QTHR. (Leighton Buzzard) 0525 376289.

LOWE HF225 with keypad. Datong active antenna AD270: £325 ono. Buyer collects. G7DRG QTHR. (Stevenage) 0438 312749.

MAGS, unbound, very good condition. Amateur radio 1983/88: £5 per vol. Jan 89 to Oct 89: £4. £25 the lot. Ham Radio 1983/90: £5 per vol. Jan 91 to Oct 91: £4. £35 the lot. Practical Wireless 1983/90: £5 per vol. Jan 91 to Oct 91: £4. £35 the lot. Short Wave 1983/90: £5 per vol. Jan 91 to Oct 91: £4. £35 the lot. RadCom 1983/90: £5 per vol. Jan 91 to Sept 91: £4. £35 the lot. Buyer collects. Silent Key Sale, all monies to British Cancer Research. (Coventry) 0203 459750.

MAST (hi-lo pump up model NK9; 30ft extended 7.5ft retracted; aluminium construction) with diamond CP6 trapped vertical antenna, complete with rigid trapped radials. Covers 80M to 6M, 5 months old: £500. Split possible or exchange for Tennamast tiltover or WHY? G1EBH. (Basildon) 0268 545573.

MFJ 949D 300W versa tuner II VSWR power meter, dummy load, balun, antenna, switch, new October 1991: £120 surplus to requirement. (Corbridge) 0434 632837.

MICRO reader, new, unwanted gift: £95. HF5R radial kit, new: £15. Plus carriage. (Suffolk) 0449 767717.

MICROWAVE modules, 50W linear, 2 metres: £70. Transverter 10-2mtrs: £50. Lattice tower: £30. Amiga A500 1.3 full set up includes A590HD 20meg 2 meg on board expansion half meg external drive, modem, Philips CM8852 monitor loads software. Offers. Phone Keith for more info G0MPN. (Washington) 091 415 1550.

MIRACLE technology modem WS4000 plus power unit and software. Fits to RS232 port: £75. Amstrad PCW interface centronics/RS232: £20. (Derbys) 0332 834228.

NORDMENDE Galaxy 25 portable mini - standard colour TV AC/DC operation. remote control pal/secam VHF/UHF, mint condition: £300 ono. Carriage arranged extra. G4RWD. (Burton-on Trent) 0283 33161.

NRD535, extra filters, NVA319 matching loudspeaker: £925. Icom ICR7100 VHF/UHF receiver: £875. Both mint condition and under guarantee. G7JAI. (Kenilworth) 0926 54556.

PACKET Kantronics KAM. TNC multimode HF/VHF with latest Eprom and Yapp software (PC): £100. G3PJT QTHR. (Cambridge) 0223 263137.

PROFESSIONAL receivers R&S type USU2 EMC RX covering 30-1000MHz in one range, all solid state, excellent: £350. Nems-Clarke VHF/UHF surveillance RX type R1302B/REU300C, VGC with handbooks: £250. Collins 75A3 with cabinet and H/B, VGC: £200. 6F33: £5 each. E180F: £5 each. E810F: £5 each. E88CC: £5 each. All new. BNC 50 ohm terminations: £2 each. AF sine oscillator by Grayshaw insts: £20. Marconi TM6221 AF balun: £5. Chris. (Portsmouth) 0705 596836.

RACAL RA17, VGC, manual: £200. Amstrad PC1512SD 30M6HD, mono, mouse, books: £250. Trio TS510/PSU HF TX/RX, OK but needs attention: £100. Spectrum+, interface, microdrives, software, books: £50. G4DWP. (Reading) 0734 483486.

RACAL Syncal 30 synthesizer gen coverage transmitter 1982 model. Portable w ater proof. 28400 channels spacing one-kc. LSB/USB AM 1.6-29.999MHz very sensitive speak mic, manual: £350 Eddystone 1830 solid state ex performance: £350 Redifon 145-SSB 26-valves ex performance condition: £250. (Middx) 081 571 5759.

RCA AR77E communication receiver, good working order. Some spare valves with manual. Offers. Mike G1RNP. (Rye) 0797 222011.

REALISTIC PRO-2005 scanner, boxed as new: £225. BNOS LPM50 -10 -100 50MHz amp, hardly used, boxed: £150 ono. Cushcraft AV3 10-15-20 vertical, new in box: £50. Kenwood hand mic, up/down buttons, new: £12. Jaybeam model 4Y/6M 50-52MHz beam: £30. (Gravesend) 0474 357795.

RN 2M to 4M and 2M to 6M transverters: £150 each. AKD wavemeter: £15. Dressler ARA30 HF active antenna: £60. Various antennas, books, kits and accessories. Phone for details. Nick G7IYG, Lindsay G7IYH. (Uxbridge) 0895 236397.

SILENT KEY sale - G7GBT. TR9000 2M m/mode tcvr, car/dash brkt, manual, case, VGC: £300. TR2500 FM h/held tcvr, manual: £130. Datong Morse Tutor D70: £35. G7ADE QTH evenings. (Princes Risborough) 084 44 5755.

SILENT KEY sale. Icom R-71E, KW Atlanta with external VFO, KW 1000 linear, BNOS 144MHz 100 watt linear, MM 28MHz 100 watt linear, MM 144/28MHz transverter, Belcom liner two and liner ten with PSU, Shure 444 desk microphone. Offers to G3FET QTHR. (Crowborough) 0892 654156.

SOTA 1296 to 144MHz transverter plus Tonna 23ele 1296MHz antenna: £100 the pair. G4FOH QTHR. (Cheshire) 0829 260860.

SPECTRUM PLUS. Microdrive, printer, Mirage microdriver, 25 cartridges, interface with manuals, software including bsquares program, distance, Morse and many more: £100. (Barnsley) 0226 296108.

STANDARD C500 dual band handheld, dual nicads charger, soft case, boxed, mint: £260. AOR 2002 scanning receiver, boxed as new: £270. (Haywards Heath) 0444 458390 after 6pm.

STRUMECH BP30 telescopic/tiltover tower, complete with top bearing, good condition, sensible offers invited. Chris G0BHX. (Cannock) 0543 574564.

T1154/8D R1155L both in good working condition: £140. Labgear LG300 TX: £40. FLDX400 Yeasu SSB TX: £80. G4HVK. (St Ives) 0736 795948.

TEN TEC 561 corsair II, matching 260 PSU/speaker, 500Hz CW filter. Ten Tec keyer model 670, hand mic, model 1140 circuit breaker for mobile use. 1.8/30MHz including WARC band: £600. G0CBJ QTHR. (Manchester) 061 904 0434. after 6pm.

TEN TEC Argonaut II: £800. Drake 6m transceiver CW MS4 1/s & AC4 PSU: £400. SPR4 receiver: £150. RV4 VFO: £50. AC4 PSU: £50. KW Vespa transceiver: £50. Will p/x for mint Drake R4C and/or R7/R7A RX. Stuart G4MIB QTHR. (S London) 081 674 6452.

TENTEC Argosy II tcvr, 5-50W RF 3.5-30MHz, model 525D 225 PSU fixed mobile NB 22B CB 1125, 2 years, mint condition: £495. G3JNY QTHR. (Ledds) 0532 863058.

TENTEC filter 500Hz (Model 285) to fit Omni 5, Paragon, Corsair 1 and 2, new: £165. Surplus to requirement. Therefore: £120 or straight swop for similar condition 250Hz Tentec filter (model 282). Check this price with TT Agents. Bernard G0PMN. (Cornwall) 0736 753676.

TENTEC Paragon 1.8kHz filter power supply, excellent condition: £1100. Bronco 310 3ele 10M Yagi, unused: £88. (Leicester) 0533 674112.

TENTEC Paragon HF transceiver, as new, boxed, 500Hz filter: £850 or P/X for TL922 linear. G4OBK not QTHR. (Stoke or Chorley) 0782 201001 or 0257 272561.

TEXSCAN AL60 spectrum analyser 0-3GHz: £1200. Tel G4AIR. (Nr Aylesbury) 0844 238172.

TH3 antenna and 30' lattice tower, 10 sections, tiltover, faulty rotator. Buyer dismantles: £135. KDK 2M FM: £75. G3XMA QTHR. (Coventry) 0203 410208.

TINY TWO TNC, boxed with manual and leads. John G1WSN. (Ringwood) 0860 709306.

TRANSVERTERS. Both 2 meter input, 10W output. Howes 80M in metered box. Microwave module 10M. Ideal Novice QRP, mobile: £70 each. (Birmingham) 021 3516285.

TRIO 830S, as new, boxed, MC35 noise cancelling microphone, immaculate; a superb receiver: £625 ono. (Swansea) 0831 444450.

TRIO 9130 2M multimode transceiver, boxed, immaculate: £350. (Swansea) 0831 444450.

TRIO R1000 HF receiver with Codar PR40 ATU and mains PSU: £230. BNOS 12/10E power supply: £75. All as new. (Hitchin) 0462 814827.

TRIO TR9130 2M multimode transceiver, power unit, fist mic, manual. Good condition: £350 ono. Carriage extra at cost. G3JHL QTHR. (Romsey) 0794 512283.

TRIO TS-130V all internal filters fitted, MC30s microphone boxed with handbook: £350. MC50 base station microphone for TS130V: £30. Kenwood external VFO-120 to match 130V: £55. All in good condn. Welz SP200 PKP 1kW SWR meter: £40. G0AQL. (Chippenham) 0249 655379.

TRIO TS530 S with de-luxe VFO knob plus CW SSB filters, MC35S mic, Kenwood AT230 antenna tuner, SP230 speaker, with filters, spare set new RCA 6146 B's + 12BY 7A. An immaculate matched station, prefer not split: £645 ono. Phone any time. (Doncaster) 0302 884338.

TRIO TS530S with CW filter fitted, mic, vgc: £450. G4JGL. (Bedford) 02302 4000.

TRIO TS530SP narrow CW SSB filters fitted, little used: £400. Yaesu FC757AT auto ATU, as new: £175. LAR VHF omni match 144-174MHz, 750W: £15. Above carriage extra. Eddystone EA12, good condition and performance: £150. Buyer collects. G4IOT QTHR. (Folkstone) 0303 276063.

TRIO TS780 2/70 base station: £625. FT77 HF mobile, inc, FM and CW filter: £350. Trio SP31 speaker: £50. Switchable transverter 4mtr and 6mtr 28MHz IF: £115. Various computer power supplies. New multimeter surplus to requirements: £45. (East Northants) 0933 318493.

TS440S HF transceiver, little used with automatic ATU, CW 500Hz and SSB 1.8kHz filters. Deluxe desktop microphone MC85, boxed: £800. (Plymouth) 0364 72479.

TS530S transceiver with Datong RF speech processor and mic: £425 plus carriage. G4DBE QTHR. (Wirral) 051 342 7545.

TS830S: £550. YG455CN 250Hz CW filter: £60. YK88CN 270Hz CW filter: £20. YD844A desk mic: £20. everything ono or £600 the lot - superb HF setup - MFJ484 Grandmaster memory keyer - 12 memories: £50 ono. Wanted Tiny Iambic keyer, WHY?. (York) 0430 861488 eves.

TS940S excellent condition fitted ATU, CW filters. Going QRP hence sale: £1100. Alan G0KMC. (Aylesbury) 0296 658037 eves/weekends.

UNIDEN HR2510 10M multimode transceiver 25W, scanning mic, only 1 years use: £215. G4WXT. (Braintree) 0376 326577.

WIDEBAND solid state linear amplifier 1.5-30MHz, 25W in 500W benchtop, built in PSU data available: £350. Pye Westminster W15U, cables, remote control, no microphone: £40. 30' aerial mast 2inch dia, lightweight CW carrying case Guys: £40. 1.5 to 30MHz multi mode manpack tcvr, 20W PEP integral auto ATU, complete not working, data available: £75. Bird 50W load DC-3GHz: £25. Buyers collect or pay carriage. (Horsham) 0403 864222.

WS19 RCA Mk2, mount variometer, key, headset, control box, full spare valve box, original handbook, spare generator and control box, wavemeter type D. All very nice condition. Best offer olny. Hallicrafter 520R: £55. Murphy B40D mount and plugs: £55. Again all good condition. Enquiries SAE. Mr D Parsonage, 52 Bramble Lane, Mansfield, Notts.

YAESU FL110 linear, 10W in 100W out, solid state, all safety circuits employed: £70. Redifon GR377 transceiver 100W: £30. (Nr Aylesbury) 0296 614128.

YAESU FL2100B HF linear in good condition: £425. (Milton Keynes) 0908 667250.

YAESU FR101DD RX 2M, 6M converters: £150. Matching speaker: £20. Yaesu FL101 TX, matches FR101 RX: £150. Icom IC202S 2M SSB/CW with 25W linear: £130. FT301 realy box: £15. Datong UC1 general coverage receive converter: £60. HW7 QRP rig: £50. (Bristol) 0454 615793.

YAESU FRDX400 receiver and FLDX40 transmitter 80-10 metres. All valves in good condition. G4IDL QTHR. (Rotherham) 0709 874100.

YAESU FRG7000: £140. FRG7: £120. Sony air-7: £120. Sony 2001D: £190. All excellent with original boxes and manuals. G4JYB QTHR. (Orpington) 0689 876805.

YAESU FT-767GX complete with 70cm, 2M, 6M modules, manual and MD-1 desk mic. All unused and absolute mint condition: £1500. Also AR2002 with power supply and new discone aerial: £200. GW4SII not QTHR. (Nr Chester) 0244 534886.

YAESU FT101: £220. 3 sets spare valves: £20 per set. Mic: £10. Trio 7200G 2M tcvr: £175. PSU: £25. Raytheon SPE34 60W SSB tcvr: £140. Mic: £10. Tektronix 321 3inch oscilloscope: £90. Sansei 2inch oscilloscope: £40. Heathkit SWR meter: £12. Yaesu 500W ATU FC301 built in SWR/PWR meters: £90. MFJ CW active filter: £20. All GWO. (Marlborough) 0672 516498.

YAESU FT101Z, mint complete with fan and mic, offers around: £350. G0FVH QTHR. (St Albans) 0727 868439.

YAESU FT480R 2M multi mode. 10/1W output. Clean and in good condition. CW mike, leads, mobile mount, base stand, boxed: £240 ono plus carriage. Ask for Nick or leave a message. (Yeovil) 0935 706102.

YAESU FT726R and modules, as new. See full description, page 87 March issue. Price reduced to £795. MMC 50/28 converter for 6 meters. New, boxed, instructions: £10. Oscar news, June 83 - Feb 91 inclusive. All mint condition: £10. G2FZU QTHR. (Notts) 0636 81384.

YAESU FT757GX: £545. FC757SU auto ATU: £260. FP757GX power unit: £150. All pristine, boxed with service manuals. G4IJS. (Cheshire) 0925 264075.

YAESU FT767 GX current spec. inc. 2M module, excellent condition: £1025. Solid state HF professional receiver. (Warrington) 0925 728253.

YAESU FT767GX all mode HF transceiver. Integral PSU, ATU etc: £975. AMstrad PPC512 portable PC: £150. No offers. G3XZO QTHR. (Stratford-On-Avon) 0789 740073.

YAESU FT767GX with 2 metre module, matching SP102 speaker mic, handbook, mint: £1350. KW1000 linear new 572Bs handbook: £325. (Ashford) 0233 732277.

YAESU FT77 HF mobile/base station transceiver with WARC bands. FM board fitted: £375 ono. May keep if offered a CW filter kit for it at the right price. Looking for G4BWE 'Versafilter' PCB layout too. (Stockport) 061 485 5036.

YAESU FT902DM + FL902 ATU. Boxes, manauls, can be tested, working: £500. (Maidstone) 0622 744659.

YAESU FV107R transverter with 70cms module, (unused since new) plus 6m module (TX fault): £300. Will split. Icom IC290A 10W 2M all mode, VGC: £250. Graphtec A3-8pen plotter, HP7574 emultion, only 6 months old: £350 ono. Contact Dave G3ZOI. (Reading) 0734 332777.

YAESU FTDX 401 with spare 6KD6's and instruction manual: £195. Buyer collects. G3WMO QTHR. (Enfield) 081 363 5814.

WANTED

AP1086 issue 1 1938-52 (RAF Radio S Ref Nos) Also air publications relating to radio, radar equipment, excellent prices offered. Would purchase post war to current. Magnetrons, klystrons, T/R cells, TWTs, photo multipliers, microwave and CV special types. Required static or rotary converter, AC or DC input with output of 80/115V 1500/2000 cycles, also RX type R1355 unmodified. Please phone any time. (London) 071 511 4786 or 071 790 2846.

HEATHKIT linear also SEM trans-match, KW E-Z match, KW107, KW109, any condition considered. Cash paid, phone anytime. G2DYM. (Tiverton) 0398 6215.

PRC320 army radio wanted, any condition, any accessories and other Clansman radios, good price paid. Please phone G4OFO. (New Malden) 081 949 2317.

RACAL TA349E amplifier unit or parts thereof, including; RF unit, power unit, blower unit, ATU, cabinets, any manuals, technical, or sales information would be nice. Would also like to make contact with anyone who has an operating unit or is getting one working. Please write, all letters answered: Nigel Boyd, 2 Church Close, Lower Willingdon, Eastbourne, East Sussex, BN20 9QY.

60FT STRUMECH versatower on mobile trailer, must be in good condition. G3YJH. (Tamworth) 0827 284211.

BOOKS WANTED. "Wireless - The Modern Magic Carpet". "Tuning In and Tuning Out" or any other books written by Ralph Stranger. RA Smith, 6 Breach Lane, Enmore Green, Shaftsbury, Dorset, SP7 8LE.

CIRCUIT diagrams and/or maintenance manual for B40/B41 set, single sideband converter (solid state Marconi radio manufactured) G1KWF QTHR. (Melton Mowbray) 0664 67116.

CODE MASTER, CW/RTTY model CWR-610E data decoder. Service and/or operation manual or any information on. All costs repaid. Please contact Brook G7HJA QTHR. (London) 081 882 4110.

CODEMASTER model CWR-610E CW and RTTY data decoder. Circuit diagram or instruction manual wanted, photocopy acceptable. G7HJA QTHR. (London) 081 882 4110.

COLLINS 136C1 blanker for 75A4, B&W notch for KWM2, 516F2 PSU for KWM2. Drake NB4, NB5 blankers. CW filters for R4C. Sherwood filters WHY? Collins mech filters WHY? Drake 7-line speaker, VFO (RV7 or RV75). Valves 3BA6, 3BE6, 3BZ6, 3CB6, 5U8, 3AL5, 7AU7, 12CU5 (for AR8516L. Scrap chassis equally useful!) Broken FT221R nag linears, KWM2, Drake 7-line purchased. TNX Chris. (Portsmouth) 0705 596836.

COMPACT HF beam and rotator like G4MH or AQ6-20. Cash waiting. Bill G4WUS. (Guisborough) 0287 642596.

CUSHCRAFT R7 multiband vertical antenna, SWR, power, PEP meter 1.8-200MHz range, both GWO only please. Distance no object. (Wilmslow) 0625 531154.

DATONG ASP, also Odhams Master Language courses in French, Spanish or Italian. All letters answered. Williams, 7 Thornhill Road, Croydon, Surrey CR0 2XZ.

DRAKE TR7, PSU7, VF7, MS7. Must be in good working condition. Serial number above 5000. G3GMY QTHR. (Barnet) 081 449 7203.

DRAKE. Still looking for solid state rack mount, Drake receivers RR1, RR3 etc. Also CW75 and Collins 851S1 and 75A4. (Shrewsbury) 0743 884858.

EDDYSTONE 750, 870, 880/2/3/4 in good condition. Also Eddystone speaker, accessories, especially S-mater and defective 730 for spares. (Barnsley) 0226 288718.

EDDYSTONE EC10 465kcs IF transformer or suitable 13.5mm square, 38mm high, for restoration. Sale 13cms 2C39 cavity: £30. G3VVB QTHR. (St Austell) 0726 842368.

FT726R 70cm and satellite modules, must be in good working condition. Geoff G1EGB QTHR. (Battersea) 071 223 2331 anytime.

GOLD RING Lenco turntable type GL78 repair manual with exploded illustrations, showing location of assembly parts. (Haverfordwest) 0437 721769.

HF linear KW 1000 or similar, about £200. G0HET QTHR. (Charmouth) 0297 60556.

ICOM IC-3PS power supply, BC-20 or BC-15 nicad power units, SM-2 base microphone. Accessories for Icom IC-2025 or IC-4025 SSB/CW transceivers. G8ITB Richard. (Bromley) 0689 852177.

ICOM IC-7000E must be recent model in first class order. G3MPN QTHR. (Wymondham) 0953 603382.

KENWOOD TS120V or similar small transceiver. Leeves G2LV, 19 Tower Park, South Molton, EX36 4EP. 0769 572495.

KENWOOD TS690S HF transceiver in good condition. Any reasonable price paid. Terry G4OXD. (Hitchin) 0462 435248.

MILITARY communications. Needed for completion of ferret armoured car restoration. C12, C42, B48, working sets preferred. G0FGS. (Gloucester) 0452 528758.

MORSUM Magnificat magazines wanted. Nos 3+4 or complete sets, WHY also "RAEM is my callsign" Ernst Krenkel. (West Midlands) 0543 360372.

PILOT U385 broadcast receiver, any condition. Also case for wartime civilian receiver or non-working example of same. Call Martin. (Carshalton) 081 773 2983.

RACAL MA79 SSB drive unit and MA150 synthesizer, both units must be unmodified and in good working order. (Buxton) 0298 83286.

RACAL RA121A SSB adaptor, GWO. Also QRP-rig, HW8, FT7, TS120. Any condition. G0BBL QTHR. (Trowbridge) 0225 754542.

SPECTRAL writer word processor for rotronics wafer drive. Copy of program urgently required to re-establish my wafer which has gone down. All your expenses paid. Please phone to discuss arrangements. Help please!! G4EAB not QTHR. (Shrewsbury) 0743 355870.

STEPS for telegraph pole. transistor FT31983. Audio module STK459. Circuits for Airmec analyser 248A. Also Marconi voltmeter TF2604. G8BEH QTHR. (Boston) 0205 750724.

TENTEC Corsair 2 with 263 VFO and PSU. Must be good condition and GWO. Alan G0IUD. (Nr Bristol) 0454 318539.

TRIO KENWOOD handheld TH25E, TH45E, TH205E, TH405E or dual bander CW charger or WHY? Contact David G0IBW QTHR. (Guisborough) 0287 633816.

WANTED Kenwood RZ1 wide band receiver in good condition, 500kHz extended to 990MHz with manual, mobile mount, boxed. G4KPT QTHR. (Taunton) 0984 23762.

WANTED, Welch CW Brass Morse key on slate base. Will pay in sterling. W1DMD QTHR. (Mass, USA) 508 824 5453.

WANTED: Cushcraft R7 vertical antenna. Call Len. (Chesterfield) 0246 234885.

WANTED: GPO Morse key with glass cover or GPO 56 key. Will pay in pounds money order. NF5B Dave Johnson. (Houston, Texas) (713) 498 8945.

EXCHANGE

YAESU 736R 1 year old, exchange for 767GX. Straight swap, as new, hardly been used, box, manuals, mic, mint condition. (Burnley) 0282 50563.

35mm SLR camera outfit - Yashica TL-Electra CW 50mm lens - Vivitar 70-210 CW Hood + filters - Vivitar 67mm w/angle - 283 electronic flash - other parts + c/case. Swop for 2M M/Mode or Kenwood S/monitor or telescopic mast or HF gear or WHY. Cash adjustment. Wnated 1980s ARRL handbook. Keith Ritson G0PKR. (Tyne and Wear) 091 237 1963.

BBC MASTER in viglen case with double disk drives. Microvitec colour monitor. BBC hand scanner, many extras, manuals. Exchange for 2M multimode rig, cash adjust either way. New knitmaster option 4 knitting machine with table and demo video, WHY. G3ZYQ. (Enfield) 081 363 3363.

ELECTRIC typewriter Smith Corona, type C640, first class condition. Exchange for single or dual bander 2+70 handheld or FL2100Z linear amplifier. (Poole) 0202 666299.

EXCHANGE racal R1218 receiver in excellent condition with service manual for Astronomical Newtonian telescope or: £380. Tony G0KUL. (Bognor Regis) 865468.

WOULD YOU like to swap your equipment and save from a trade in loss! I have a TS440S, AT250, PS430, SP430. I would like a HF base set TS940, FT767, FT980, IC751A, etc. All my equipment is excellent and payed for and so should yours! Depending on the deal I could split and sell. Wanted FT726-70cm modual. Contact G0HYR QTHR. (Tamworth) 0827 57742.

CLUB NEWS

DEADLINE - Items for inclusion in the August 1992 issue must be sent to HQ marked "Club News - DIARY", to be received by 19 June 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 - 18, Longleat Rally preparations; 25, VHF NFD preparation progress report and Longleat Rally preparations. Details 0272 721744.

SOUTH BRISTOL ARC - 10, talk 'Astro Photography'; 17, 'Bullseye' contest with NBARC; 24, briefing for Longleat Rally and Fox Hunt. How to make the aerial. Details 0275 832222 on a Wednesday evening.

WESTON-SUPER-MARE RC - talk 'My Radio Holiday in Uzbekistan' by Barry Steel, G4LZK. Details 0934 415700.

BEDFORDSHIRE

SHEFFORD & DARS - 4, talk by the Senior Engineer for BBC Radio. Details G1GSN QTHR.

BERKSHIRE

BRACKNELL ARC - 13, Barbecue. Details from G4AUC.

BURNHAM BEECHES RC - 1, talk '10 Metres'; 15, talk 'Packet Clusters' by G3WGV; Jul 6, McMichael Rally preparations. Details 0628 25720.

READING & DARC - 11, VHF NFD planning; 25, talk 'G5RV and Other Antennas' by John Crabbe. Details 0734 722489.

BUCKINGHAMSHIRE

MILTON KEYNES & DARS - 8, construction contest and judging night; Jul 13, Howes Kits (provisional). Details 0908 611005.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 5, talk 'The RIS Service' and question & answer session; 12, talk ;Current Radio Astronomy Projects at Cambridge' by Mike, G4DYW; 19, talk 'Lightning Protection; by Ian, G4AKD; 26, evening Fox Hunt. Details 0763 243570.

CHESHIRE

CHESTER & DARS - 2, radio ideas and discussion; 9, talk 'Broadcast Bands' by G3EWZ; 16, visit to Liverpool Coastguard Station; 23, operational planning; 30, Nassa video. Details 051-608 3229.

CLEVELAND

STOCKTON & DARG - 10, talk and slides 'History of Wireless 1900-1945' by Mr Fred Hey. Details 0642 249067.

CLWYD

CONWAY VALLEY ARC - 4, Annual General Meeting followed by construction competition. Details 0492 530725.

DELYN RC - 16, open night; 30, Barbeque at Steve and Helen's. Details 0244 819618.

WREXHAM ARS - ***NEW SECRETARY*** Ian Wright, GW1MVL, 28 Maes-y-Gornel, Rhos, Wrexham, Clwyd LL14 2LP. 2, annual constructors contest; 18, field night HF + VHF. tel: 0978 845858.

DERBYSHIRE

BUXTON RA - 9, new members' invitation night; 23, Field Day discussion; Jul 14, talk & demo by G3ZOM of Jandek. Details 0298 25506.

DEVON

TORBAY ARS - 19, talk 'History of Amateur Radio'. Details 0803 526762.

DYFED

LLANELLI ARS - ***NEW SECRETARY*** Mr S Jones, GW0RHE, 12 Danybanc, Felinfoel, Llanelli, Dyfed SA15 4NS.

ESSEX

CHELMSFORD ARS - 2, constructors' competition; Jul 7, talk 'Satellite Weather Picture Reception' by Richard Gedge. Details 0245 260831.

FIFE

DUNFERMLINE RS - 4, visit by Ian Suart, GM4AUP, RSGB Zonal Rep for Scotland. Details 031 331 4340 (evenings).

GRAMPIAN

ABERDEEN ARS - 5, NDF site preparation; 12, junk sale, 19, second round of 1992 'On-the-Air' contest; 26, 4 stage VHF DF foxhunt; Jul 3, junk sale. Details 0224 780519.

GREATER LONDON

ACTON, BRENTFORD & CHISWICK ARC - 16, talk 'ERA Morse Decoder' by G3IGM Details 071-938 2561.

BROMELY & DARS - 16, talk 'Introduction to Family History' by Gill Valentine. Details 081-462 2689.

COULSDON ATS - Jun 8, team quiz night. Details 081 684 0610.

CRYSTAL PALACE & DARC - 20, talk 'I Followed Rommel' by Joan Nicholls. Details 081-699 6940.

EDGWARE & DRS - 25, talk 'Audiometry' by Rob Mahmud, G4GKA. Details 081-953 2164.

HAVERING & DARC - 10, talk by Dave Bull, G8YSK; 24, talk 'The 16 Bus' by Steve Fairweather, G6BEL. Details 0255 821554.

SOUTHGATE ARC - 11, talk 'Surface Mount Technology' by A J Fisher, G8TAU; 25, barbecue; Jul 9, talk 'Contesting and DX-Pedition' by Roger Western. Details 081 360 2453.

SURREY RCC - 1, talk 'Reminiscences' by Gav, G2OS; Jul 6, talk 'Cross Mod' by Peter, G3ZPB. Details 081 660 7517.

SUTTON & CHEAM RS - 18, inter-club quiz. Details 081 644 9945.

WIMBLEDON & DARS - 26, talk 'DX Chasing on Top Band' by Dave Hayes, G4AKY. Details 081-397 0427.

GREATER MANCHESTER

ECCLES & DARS - 2, talk and demonstration 'Circuit Simulation Using CAD' by G8KRG; Jul 7, talk 'Academia & Industry - a Right Wing View' by G8ZZF. Details 061-773 7899.

SOUTH MANCHESTER RC - 5, contest preparation; 12, talk 'Frequency Measurement' by G3SVW; 19, visit to Holme Moss; 26, talk 'Packet Clusters' by G0CMM. Details 061-969 1964.

GUERNSEY & DEPENDENCIES

GUERNSEY ARS - 26, Mid-Summer Radio Society Dinner. Details from GU4YOX who is QTHR.

GWYNEDD

DRAGON ARC - 1, talk 'Pre-Radio Communications in Anglesey' by Tomos Roberts; 15, quiz night; Jul 6, talk 'Raynet' by Dafydd Roberts, GW6IWY. Details 0248 600963.

MEIRION ARS - meets at the Royal Ship Hotel, Dolgellau 1st Thursday each month, at 8pm. Contact: M D Fowler, GW3GKZ, tel: 0341 422447.

HAMPSHIRE

BASINGSTOKE ARC - 1, planning for VHF NFD; 28, 2m Foxhunt - OS175 - Fox: Eddie Thompson, G4SQZ; Jul 6, talk 'Electronic Warfare' by G3RZP. Details 0256 25517.

HORNDEAN & DARC - 4, brains trust; Jul 2, talk 'Fast Scan TV' by Mike Sanders. Details 0705 472846.

ITCHEN VALLEY RC - 12, talk 'Frequency Synthesisers' by Peter Chadwick, G3RZP; 26, talk 'Talking Books' by a speaker from the RNIB. Details 0703 736784.

THREE COUNTIES ARC - Jun 3, talk 'The Falkland Islands and the British Antarctic Survey' by Richard Fletcher-Cook (ex-Deputy Governor Falkland Islands); 17, construction night and competition; Jul 1, talk 'Novice Licence - How to Get One, and What it Allows You to do on Radio' by Frank, G7CND. Details 0420 83091.

HEREFORD & WORCESTER

BROMSGROVE & DARC - 12, demonstration by Castle Electronics. Details 0562 710010.

BROMSGROVE ARS - 9, technical topics; 23, talk 'RSGB Topics' by RLO Dave Gourley; Jul 14, 145MHz Direction Finding Contest (G4ZWR). Details 0527 54607.

HEREFORD ARS - 5, talk 'Planning Permission' by John McFall, G4HFX. Details 0432 355297.

VALE OF EVESHAM RAC - 7, car treasure hunt - start at Evesham Post Office, High Street, Evesham - 2.15pm - o/d map 150 required. Details 0386 41508.

HERTFORDSHIRE

CHESHUNT & DARC - 3, NFD briefing; 10, talk by RSGB President Terry Barnes, GI3USS. Details 0992 464795.

HODDESDON RC - 16, visit to RSGB HQ (meet there 7.45pm); 25, talk 'Visit to Morokulien' by Peter, G0KLU. Details 081-804 5643.

STEVENAGE & DARS - ***NEW SECRETARY*** Peter Good, G7HCL, 80 Meredith Road, Stevenage SG1 5QS, tel: 0438 724509.

VERULAM ARC - 23, talk 'Computerised Logging' by John Linford, G3WGV. Details 0923 262180.

WELWYN/HATFIELD ARC - 1, barbecue; 15, talk 'DF Antennas' by Dave Lauder, G1OSC; Jul 6, Foxhunt - Lemsford Village Hall. Details 081-440 6783.

HUMBERSIDE

GRIMSBY ARS - 11, evening visit to SCM Chemicals; 18, DF Hunt; 25, talk 'Dayton Hamfest' by Peter, G3PDL; Jul 2, DF hunt; 9, treasure hunt. Details 0472 825899.

HORNSEA ARC - 3, NFD preparation. Details 0964 533331.

JERSEY

JERSEY ARS - ***NEW VENUE*** La Moye Signal Station, St Brelade. Club meets every Friday 8pm-10pm. Details from Ken, 0534 483722.

KENT

DARENTH VALLEY RS - 10, talk by Chris Wortham, G4AGC; 24, Annual General Meeting. Details 0689 876733.

WEST KENT ARS -19, junk sale. Details 0892 664960.

LANCASHIRE

BURY RS - 9, talk 'Contest Operations' by Keith Khan, G3RTU. Details 0204 883212.

FYLDE ARS - 11, visit to Police Headquarters Communication Centre, Hutton; Jul 9, talk 'Radio Controlled Models' by S Barlow, G4NVF. Details from R J Bourn, G7CUL.

PRESTON ARS - 11, illustrated talk 'Vanoise National Park' by Mr Ruthven; 25, outing evening 'Whitbread's Brewery', Salmesbury; Jul 9, illustrated talk 'Legging - Locking - Gongoozling' by Mr Astin. Details 0772 686708.

ROSSENDALE ARS - 8, members' Foxhunt contest - book in by 6.30pm for 7pm start. Details 0706 227182.

THORNTON CLEVELEYS ARS - 15, talk on Nuclear Power Generation; 22, talk by Arthur, G3IWP; 29, VHF NFD preparation. Details from G4BFH, QTHR.

LEICESTERSHIRE

CHARNWOOD ARCC - 21, VHF QRP contest. Details from M S Mather, Station Manager.

LEICESTER RS - 1, open meeting & NFD final arrangements; 15, HF NFD post mortem; 22, third annual junk sale/auction; 29, VHF NFD final arrangements. Details Leicester 762241.

LOUGHBOROUGH & DARC - 2, 'visit' to Chris, G4AMN QTH; 9, 2m DF; 23, G3RAL Reunion at The Belfry Hotel, Oaks in Charnwood, near Shepshed, starting 7.30pm; 30, talk 'Aerial Experiments' from Wymswold. Details 0509 218259.

LINCOLNSHIRE

SPALDING ARS - 12, test equipment evening - align your radios and home brew equipment; Jul 10, talk 'History of Amateur Radio' by G4OO. Details 0778 425367.

MERSEYSIDE

LIVERPOOL & DARS - 2, pre-NFD discussion; 9, talk 'LADARS Between Wars' by G4CVZ; 16, talk 'RAE Course' by Albert; 23, DF Hunt; 30, surplus sale. Details from Gordon, G4VYR.

WARRINGTON ARC - 2, cheese & wine social evening; 9, talk and demonstration 'Microwaves' by Jim Leviston, G3NFB; 16, open forum; 23, talk and demonstration 'Satellites, Packet and Paksat Node' by Mike Mansfield, G6AWD; 30, Rig clinic conducted by George Fare, G3OGQ. Details 051 487 8076.

NORFOLK

ARC OF FAKENHAM - 2, EGM (details by post) and members to display 6 of their favourite QSL's. Details 0485 528633.

NORFOLK ARC - 3, talk 'The American Radio Scene' by Tony Barton, G3JQI; 10, NARC Rally briefing; 17, talk 'Development of the Receiver' by Mike Lemin, G4UUB; 24, debate 'Do we need the RSGB?'; Jul 1, component testing evening; 8, mobile DF hunt. Details 0603 747992.

YARMOUTH RC - 4, NFD Contest preparations; Details Yarmouth 721173.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM - ***NEW PRESIDENT*** **Ian M G Miller, G4JAE**, 93 Boxley Drive, West Bridgford, Nottingham NG2 7GN, tel: 0602 232604. - 4, forum; 11, junk sale; 18, Foxhunt; 25, talk 'Contest Techniques' by Colin, G0FOG; Jul 2, forum; 9, talk 'Foreign Languages QSOs' by Walter, G0OMO. Details 0602 232604.

MANSFIELD ARS - 4, junk sale. Details 0623 755288.

SOUTH NOTTS ARC - 5, open forum; 12, preparation for Elvaston; Jul 3, final planning for VHF Field Day, 10, junk sale. Details 0602 841940.

OXFORDSHIRE

BANBURY ARS - ***NEW SECRETARY*** Mr G R Pearson, G4EBF, 37 Park End, Croughton, Brackley, Northants NN13 5LX.

OXFORD & DARS - ***NEW SECRETARY*** Terry J Hastings, G0CFN, 1 Pottle Close, Eynsham Road, Botley, Oxford OX2 9SN, tel: 0865 863526. Club meets 2nd & 4th Thursday at British Legion Club, Haddow Road, Crotch Crescent, Marston Road, Oxford, at 7.45pm.

SHROPSHIRE

TELFORD & DARS - 10, club purchase proposals; 17, DF hunt 144MHz; 24, VHF NFD preparations. Details Bridgnorth 761203.

SOMERSET

TAUNTON & DARS - 5, preparation for NFD with Peter Robinson, G0EYR; 19, visit to 'Orchard FM' Studios 6.30pm. Details 0823 680 778.

SOUTH GLAMORGAN

CARDIFF RSGBG - 8, slide show by Don Green, GW3MRI on his latest trip to South Africa; Jul 13, talk 'A History of Amateur Radio' by Ron Weaver, GW3KXX. Details 0446 773212.

SOUTH YORKSHIRE

BARNSLEY & DARC - 1, talk 'Breakthrough and Interference' by Tony, G4DXA; 8, junk sale. Details from E Bailey, G4LUE, QTHR.

DRONFIELD & DARC - 1, talk and demonstration 'The Magnetic Loop Aerial - Construction and Operaion' by Wesley Mitchell-Watson, G0LUM. Details 0246 290444.

SUFFOLK

FELIXSTOWE & DARS - 15, visit to Tacolneston; 29, talk 'HF DXing' (provisional). Details 0473 642595 (daytime).

IPSWICH RC - ***NEW VENUE*** 24th Scout Headquarters, Bramfod Road, Ipswich. 10, visit to Harwich Harbour Board; 24, DF Hunt; Jul 8, barbecue and DF Hunt. Details 0473 742072.

LEISTON ARC - 2, talk 'The Art of Self Preservation' by Bob Simmons, G0HSI; 21, annual Foxhunt & barbecue - start from 3 Aldeburgh Road - 6pm & 8pm - bring your own provisions, condiments on the house. Details 0728 832924.

SURREY

DORKING & DARS - 23, talk 'Bulletin Boards' by Robin Bye, G6XVW and Ian Weller, G1GUB. Details 0306 77 236.

ECHELFORD ARS - 11, talk 'Can You Really Re-charge a Dry-Cell?' by Ed Gowler, SWL. Details 0344 843472.

WARWICKSHIRE

STRATFORD-UPON-AVON RS - 8, talk 'Cables and Feeders' by Glen Ross, G8MWR; 22, talk 'Electronic Warfare' by Peter Chadwick, G3RZP; Jul 13, annual trip (provisional). Details 060 882 495.

WEST GLAMORGAN

SWANSEA ARS - 18, car treasure hunt. Starts 6pm Swansea University. Finishes Swn-y-Mor, Penclawdd, North Gower for results and light meal. Details from GW3SIY, 0792 403527.

WEST MIDLANDS

COVENTRY ARS - 6, RA Rig test and talk (provisional); 20, Diamond Jubilee Anniversary Dinner at The Crypt, St Mary's Guidhall. Details from Mark, G4RUN; Jul 3, talk and demonstration by Castle Communications (provisional). Details 0203 311468.

MIDLAND ARS - 16, treasure hunt. Details 021 628 7632.

WOLVERHAMPTON ARS - 9, talk 'Air Traffic Control' by Mr A Armstrong, SWL; 23, talk (provisional). Details 0922 475057.

WEST SUSSEX

MID SUSSEX ARC - 18, Windmills evening. Meet at the Jack & Jill Windmills car-park, Clayton at 7.30pm. Presentation by Louis, G5RV of the club award shield.

WEST YORKSHIRE.

DENBY DALE & DARS - 3, talk 'HD Repeater' by John, G0PRF. Details 0484 532371.

HALIFAX & DARS - 16, talk 'Parachute Mobile' by R C Andreang, G4CMT. Details Halifax 202306.

KEIGHLEY ARS - 4, talk 'Stoneage Man PHD' by Mr Dougherty; 25, visit to Leeds Weather Centre, Jul 16, quiz. Details from Kathy, tel: 0274 496222.

NORTHERN HEIGHTS AR&ES - 3, computer (demonstration) night; 17, Field Day preparations. Details 0274 673116.

PONTEFRACT & DARS - 16, 2m Open DF Hunt - £10 for the winner - OS 105 or 111. Details 0977 677006.

SPEN VALLEY ARC - 4, Fox Hunt. Details 0274 875066.

WAKEFIELD & DARS - ***NEW SECRETARY*** Dave Ackrill, G0DJA, 104 Durkar Lane, Crigglestone, Wakefield WF4 3HY, tel: 0924 240577. 2, talk 'VHF 20 Years Ago' by Tony, Galey, G0JZZ. Details 0924 240577.

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 call-sign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

7 JUNE

BURY ST EDMUNDS ARS Car Boot Sale - Scout Pavilion, Stanton, nr Bury St Edmunds. 10am-4 pm. Admission free. Light refreshments. £3 per car boot. Talk-in on S22. Send SAE for free map. Details from G0MEV, QTHR, 0359 50271.

NORTHAMPTON RC Radio Computer & Electronics Rally - rear of Red Lion public house (500 yds from Jct 16, M1). Starts 10am. Refreshments. Talk-in on S22 and GB3NH (RB3) and top band 1.933. Much more space for stalls this year - extra field for parking. Pitches first come first served. To book early contact Paul Young, G0HWC, 0327 41267.

SPALDING ARS 24th Annual Mobile Rally - Springfields Exhibition Centre, Spalding. Doors open 10.30am. All under cover; 3 times more exhibition space than previously; full catering facilities; indoor flea market; bring & buy; 5 acres car parking; entry to gardens available. Talk-in on S22 G1DSP/P. Details G4TWR, 0775 722940.

14 JUNE

ELVASTON CASTLE Mobile Rally - Elvaston Castle Country Park nr Derby. Over 150 trade stands, technical bookstall, grand bring & buy marquee, flea market (for private vendors) from 9am. Craft marquee, RSGB, band performances, children's entertainments and stalls, laser sport, full on-site catering. Talk-in on 144 and 432MHz. Car parking £2, coaches £10. Adjacent caravan/camp site - for bookings telephone 0332 751938. Trade enquiries Peter, G3WFU, tel: 0332 700265 (evenings). Details John, G4PZY, tel: 0332 767994.

RNARS Annual Mobile Rally - HMS Mercury, nr Petersfield, Hants. 10am-5pm. Trade stands, RSGB, RAIBC, BARTG, Raynet, RAFARS, RSARS, SUNPAC, RNLI. Bring & buy; flea market; radio-controlled power boats & trains; children's amusements; ices and refreshments; arts & crafts exhibition; two raffles; arena displays; free parking & picnicking; admission £1.50 (free for children). Talk-in 2m and 70cm. Details from Cliff Harper, G4UJR, 0703 557469. *This year's event is the last to be held in HMS Mercury; from next year the venue will be HMS Collingwood, Fareham, Hants*.

20-28 JUNE

FAREHAM & DARC 1992 SECOND WIRELESS EXHIBITION - HMS Warrior 1860, Naval Heritage Area, HM Naval Base, Portsmouth. Exhibits on display will represent the advance of wireless communication from Marconi/Jackson days up to 1942. Exhibits on loan from individuals, HMS Collingwood Wireless Museum and Mr Len Newman, G6NZ. Details Ray Mclean, G0JVE 0329 238642.

21 JUNE

DENBY DALE & DARS Annual Mobile Rally - Salendine Nook High School, Huddersfield (easy access from M62, jnct 23 eastbound 24 westbound). Doors open 11am. Usual traders; craft stalls; bar; catering; car boot sale; bring & buy. Ample car parking. Talk-in on S22 and SU22. Details from Philip, G4FSQ, 0484 644827.

MID-LANARK ARS Annual Rally - Newarthill CE Centre, High Street, Newarthill. Morse tests, trade stands, bring & buy, raffle, plus much more. Free parking. Details from Bill Findlay, GM0LEG, QTHR.

NEWBURY & DARS Annual Car Boot Sale - Cold Ash Playing Field. Less than 10 mins from A34 jnct 13 M4. 10am-3pm. Refreshments and children's play area. Free parking & entrance for buyers. £7 per pitch for sellers, no pre-booking. Talk-in on S22. No entrance to field before 8am. Details from N Jaques, G0HFU, 0635 63310.

NORFOLK RAYNET Rally & Car Boot Sale - Barford, Norfolk (B1108) OS Map 144, Ref TG113078. Starts 10am. Trade stands, refreshments. Car boot sale. Talk-in on S22. Details from G0IYD QTHR 0692 404593 (eves).

RAF COSFORD ARC Annual Station Open Day and Flying Display - RAF Cosford, Wolverhampton. Jnct 3 of M54, 500 yds along the A41 towards Wolverhampton. S22 (GX4CES). Details G0KTH, tel: 0902 373133 (eves).

27 JUNE

BRENTWOOD INTERNATIONAL AR & Computer Rally - this Rally has been cancelled.

28 JUNE

BROMSGROVE ARS Mobile Radio Ham Rally & Boot Sale - Lower Wick Country Fair on Worcester to Malvern Road, rear of Bennetts Dairy. Opens 9am-6pm. Tables for boot sale £4. Details Dave Edwards, G4ZWR, 0527 546075.

HAMBLETON ARS Family Radio Picnic - Allertonshire School, Brompton Road, Northallerton, N Yorkshire. Starts 11am, finishes 4pm. Club station will operate HF and 2m and some activities will be laid on for the children. As it is a Radio Picnic, please bring your lunch!. Details from G0NHM, 0609 776608.

35TH LONGLEAT AR Rally - Longleat, nr Warminster. Follow the brown signs for 'Longleat House' from Warminster. Extensive trade exhibition; craft fair; RSGB bookstall & membership services stand; over 20 amateur radio clubs; bring & buy; catering; free car parking. Camping & caravanning facilities nearby. Details from Shaun, G8VPG, QTHR, tel: 0225 873 098.

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. Details from Mr B Thomas, 'Creekside', Greenbank Road, Devoran, near Truro. 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). 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 M J Cooke, 4 Geddes Way, Mattishall, Norfolk NT20 3RE.

26 JULY

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. 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.

dh>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.

30 AUGUST

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. Details from G4WUB, QTHR, 0275 839855.

MILTON KEYNES & DARS Car Boot Rally. Details from Ray, G1LRU 0908 660798.

PRESTON ARS Mobile Rally. Details from G Earnshaw, 0772 718175.

VANGE ARS Rally. 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. Details from Peter Nicol, G8VXY, tel: 021 453 2676.

LINCOLN SWC Hamfest. Details from Sue Middleton, 0522 531788 or QTH G8VGF.

20 SEPTEMBER

CENTRE OF ENGLAND Autumn Radio Computer & Electronics Rally - National Motorcycle Museum, Bickenhill, near NEC, Jnct 6 M42. Details F Martin, G4UMF, 0952 598173.

EAST OF ENGLAND Radio Rally (Peterborough R&ES) - ICI Building, East of England Showground, Peterborough. Details Mike Bowthorpe, G0CVZ, tel: 0733pp 222588.

27 SEPTEMBER

34TH HARLOW AR Rally. Details 0279 432306 (day) 0279 722569 (eve).

NORTH WAKEFIELD RC Radio Rally. 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.

22 NOVEMBER

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.

14 FEBRUARY 1993

CAMBRIDGE & DARC Computer Rally. Details from G6UGI, 0763 243570.

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 28 June. It was taken from the HQ computer on 7 May. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

30 MAY

GB8NEC	National Exhibition Centre

31 MAY

GB2LBI	Life Boat Institution

1 JUNE

GB0BAC	Brynamman Air Cadet
GB2CDX	Coastal Defence X
GB2MAM	Mosquito Aircraft Museum
GB50SCC	50 Years Of Sea Cadets Corps

2 JUNE

GB2CQH	Conquest Hospital

5 JUNE

GB0LCF	Leyland Carnival + Festival
GB4BPX	Bletchley Park (Station) X
GB4SRC	Swindon Radio Club
GB5CB	Chesham Bois - Scouts

6 JUNE

GB0MKF	Midland Kite Flyers
GB2CCG	Cupar Childrens Gala
GB2CDW	Fort Wallington
GB2CWG	Cherry Willingham Gala

8 JUNE

GB2ECR	Elvaston Castle Rally

10 JUNE

GB0JKC	John Kitto College

11 JUNE

GB0HCF	Horncastle Country Fair
GB6HYC	Horncastle Youth Club
GB8BN	Ben Nevis

12 JUNE

GB4HAF	High Ash Fair
GB4PSF	Parham Steam Fair

13 JUNE

GB0FMR	Final Mercury Rally
GB2CPD	Collette Park Day
GB5PT	Pastimes
GB8SG	Scottish Games

14 JUNE

GB0ATC	Air Training Corps
GB0CMF	Cumbria Motor Fair
GB0WVG	Washingborough Village Gala
GB8OEB	Operation Euro-Baby

15 JUNE

GB2HC	Harrogate College
GB2WCF	Wick Country Fair
GB4REE	Redbridge European Enterprise

18 JUNE

GB2BSF	Bicnacre School Fete
GB2RCC	Royal Caravan Club

19 JUNE

GB2EWS	Exeter Wireless Society
GB4RVS	Rettendon Village Show
GB4SEC	St Elizabeths Church
GB50SCC	50 Years Of Sea Cadets Corps
GB8GC	Glamis Castle

20 JUNE

GB0TPR	Three Peaks Race
GB2BHH	Burton Hill House
GB2BRC	Belfast Radio Convention
GB4QRP	QRP 'Low Power' Operation
GB4RHA	Rainbow House Appeal

21 JUNE

GB4EKG	Essex Kite Group

23 JUNE

GB2CHE	Chester Historic Event
GB4LMR	Longpleat Mobile Rally
GB4RAF	Royal Air Force
GB50SCC	50 Years Of Sea Cadets Corps

24 JUNE

GB1EPG	Essex Packet Radio Group
GB2GTO	Glasgow Taxi Outing (am)
GB2GTO	Glasgow Taxi Outing (pm)

26 JUNE

GB0BC	Bromsgrove Carnival
GB0DAS	Dollar Academy Sports
GB100BMC	Bowes Museum Centenary
GB1BMC	Bowes Museum Centenary
GB1SBS	1st Southoe & Buckden Scouts
GB4EWE	Euro Wheels Extraganza

27 JUNE

GB0ESP	Esperanto
GB0SCS	Second Cadoxton Scouts
GB1BIR	Brentwood International Rally
GB2HAS	Halton Air Show
GB2RAF	Royal Air Force
GB4BPM	Bromley Peagent Of Motoring
GB50SCC	50 Years Of Sea Cadets Corps

28 JUNE

GB4NGF	National Garden Festival

HELP LINES

COLLINS RADIO CO

Information on the Collins Radio Company is sought by Roy Reed, G3ZIG. He is compiling a history of the company, and information such as technical write-ups, advertising material etc, would be appreciated. Also, is there a Collins Owners club? If you can help Roy, his address is Oak Cottage, Dereham Road, Bawdeswell, Dereham, Norfolk NR20 4AA

CIRCUIT DIAGRAMS

Hewlett Packard Time Domain Reflectometer type 1415A. Does anyone have info on this unit? If so, then P Beehlar, G3ZCT, would like to hear from you. He also requires technical details of a C.Itoh 8510 printer, and says that he has thousands of circuit diagrams for various items of equipment (domestic, commercial and amateur). Write to 12 Dulverton Road, Leicester, LE3 0SA, tel 0533 557654 (eves).

Anthony Langton, GM4HTU, has acquired some Storno CQF 643 base stations and would appreciate any information, especially input levels and connections. Contact him on 0224 592104.

Redifon RT106 - Tom Ross, GM4YWI, requires winding info for 'Safari' drive panel type B and E inductors and has spare C type for rewinding. Any information appreciated. Write to 16 Hayfield, Edinburgh EH12 8UH. Tel 031 339 3250

Hitachi V-302F 30MHz Oscilloscope. G3MNV would like to borrow or acquire a copy of the instruction/service manual for this unit. Reply to P W F Darragh, 48 Goodwood Park Rd.,Northam, Bideford, N Devon EX39 2RR, tel Bideford 474564.

Microwave Modules 144MHz Transverter MMT144/28-R: Manual and instructions required by Mr W J Balsdon, 3 Kempley Road, Okehampton, Devon, EX20 1DS, tel 0837 52331. Expenses reimbursed, or anything loaned will be returned.

G3ICB is seeking a manual and circuit for a "MASTR" 'Royal Executive' Base Station (34 MHz FM?) made by General Electric (USA). Also data on a Texttell Sealinc VHF radio Telex, possibly made by West-tec Ltd. Please contact Mr A P Bull, 91 Lower Way, Thatcham, Berks RG13 4RS (tel 0635 64345).

John Walton, G4LAV, has a Codar CR45 receiver, and is seeking a manual and circuit diagram for copying. All expenses reimbursed. John's address is 40 Murrayfield Drive, Willaston, Nr Nantwich, Cheshire CW5 6QF

Phil Stevens, G3SES, requires a manual or any information on a 'Safari' 11 channel SSB transceiver. Write to him at 20 Abbots Park, Chester CH1 4AN, tel 0244 383954.

Telequipment Oscilloscope type S51. If you have a circuit diagram for this unit then R A Parrott, G3HAL, would like to hear from you. His address is 270 Glynswood, Chard, Somerset TA20 1BX.

PYE CAMBRIDGE AM10

Doug Hotchkiss, G4BEQ, would like to hear from anyone who has converted the Pye Cambridge AM10 for 4m FM operation. A circuit diagram would also be useful. Replies to 4 Erica Close, Locks Heath, Hants SO3 6SD.

SILENT KEYS

WE HAVE BEEN advised of the deaths of the following radio amateurs:

9H4G	Mr E Rogers	18.3.92
G0BBM	Mr AR Hunt	01.4.92
G0EDX	Mr B Cunningham	June 91
G0NFM	Mr CR Holbourn	01.4.92
G0REX	Mr R Beastall	05.4.92
G1YPV	Mr E Blackburn	01.02.92
G2BCX	Mr F Judd	10.4.92
G2BYM	Mr CH Williams	09.3.92
G2DF	Mr FA Vost	05.8.91
G3EVP	Mr HJ Grayson	March 92
G3EZZ	Mr E Melling	05.1.92
G3FPJ	Mr A Littlewood	18.3.92
G3FQN	Mr RF Gilding	10.2.92
G3FRO	Mr M Hudson	05.12.91
G3GEY	Mr S Preston	29.2.92
G3HZS	Mr PWA Baker	14.3.92
G3IPQ	Mr RF Lloyd	12.12.91
G3IVT	Mr WK Dodgson	Dec 91
G3JKW	Mr J Warrington	05.02.92
G3JMW	Mr J Whittlestone	06.02.92
G3KSR	Mr RE Edwards	06.3.92
G3MDO	Mr DNT Williams	
G3MSK	Mr V Davis	29.3.92
G3QM	Mr J Roy	24.01.92
G3UHH	Mr J E Price	19.11.91
G4DNY	Mr H Oxley	17.2.92
G4ECI	Mr J Verity	17.4.92
G4HXR	Mr D Baker	Jan 92
G4PY	Mr HD Ashworth	23.3.92
G4ZNV	Mr GM Draper	Sept 91
G6DKU	Mr D Appleyard	Feb 92
G6SQ	Mr JW Nuttall	19.3.92
G6ZT	Mr H Turner	09.3.92
G7GBT	Mr B E Turner	11.01.92
G8ABD	Mr BN Wade	
G8IO	Mr K North	Jan 92
G8PF	Mr HE Bennett MBE	27.3.92
G8TH	Mr L Sanderson	10.4.92
G8ZWZ	Mr R Gray	22.08.91
GI1BIW	Mr S E White	28.9.91
GI3WFA	Mr Johnny Babes	04.02.92
GM3BMZ	Mr BL Browne	14.3.92
GM8MBP	Mr RN Suttar	15.2.92
GW0HPP	Mr GT Finn	06.02.92
GW3ANU	Mr J L Reid	
GW3ZFG	Mr L E C Brown	
GW4ZUO	Mr W Evans	22.3.92
GW8ACG	Mr L W Barnes	26.01.92
OH6JW	Mr A Kiviluoma	19.2.92
RS49715	Mr J H J South	21.01.92
RS839	Mr RCG Lodge	22.4.92
RS90991	Mr HM Rankin	20.3.92
RS94085	Mr P Jolly	13.4.92

CORRECTIONS

We would apologise for any distress caused by the following errors in March RadCom.

GW0KRO Mr SP Webster
GW3DGZ Mr TC Carpenter

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TRANSVERTERS for <1mW 10 metre drive. Buffered versions of above types TRC2-10B, TRC4-10B, TRC6-10B. PCB KIT £64.25, PCB BUILT £94, BOXED KIT £85.75, BUILT £127.

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The Last Word

PREHISTORIC OR PREPOTENT?

RadCom arrived on Saturday and two thoughts crossed my mind. (a) "I'll have a good read this afternoon" and (b) "I wonder who will be having a dig at the Morse Code this month". On both counts I was right and thoroughly enjoyed my Saturday afternoon's read. I noted that out of eight letters published some two were on the Morse code bandwagon.

One letter writer was making a correlation between reducing the code requirement to 5WPM and of increasing power levels allowed to 30dBW. I cannot see any connection between these proposed changes. A CW operator certainly doesn't require 1kW for success. Neither is it difficult to appreciate that high power creates for its operator a superiority in signal level over the average station influenced more by the bank balance than by technical merit.

The letters from GM0IRZ suggested that an "atavistic drive" (I had to reach for the dictionary) is keeping amateur radio exactly as ever and we must learn to "tolerate lesser breeds"! The first of these statements is absolute assumption and as for the second, who are these lesser breeds?

Returning to my good read, the feature *An Introduction to Moonbounce*, by W2RS, was first-rate reading, a fascinating aspect of amateur radio. The accompanying photographs showing the high-tech antenna systems in use, together with technical background were excellent. To quote the paragraph sub-titled *CW v SSB*: "owing to the weak signals involved, *more than 99% of all* current Earth-Moon-Earth activity *utilises CW* rather than SSB" (my italics).

This success of CW is hardly that of a prehistoric dinosaur. W2RS's article highlights only one of the many and continuing reasons why the 19th century code is being successfully employed almost into the 21st century and bolsters yet again the importance of retaining CW as part of the Class A licence. The codes prepotency in Moonbounce undoubtedly highlights the dangers of pensioning off a tried and efficient mode. In the end we'll either use it or lose it.

Over the years I've noted how operators have been more thrilled on passing the Morse test than perhaps any other aspect of the Amateur exam. And next time you visit a rally look how many people have a tap on the Morse keys. Let's not be complacent but let us preserve that which is good within our hobby including the requirement for a reasonable standard of Morse code.

Fred Reid G3VMD

2M CW DEFUNCT?

My Morse code was learnt by listening to the HF bands where the knowledge and use of procedures, abbreviations, Q codes and punctuation was part and parcel of the learning process. Consequently, I found no real problem in using my new-found skill on air once I had passed the Morse test.

Let us now consider the plight of the 'B' licensee who in the process of learning Morse develops a keen interest in the mode. In this area, and I suspect in most other areas, there is no shortage of willing and capable 'A' licensees to teach the code up to passing the test. The problem now arises of where to exercise this new-found skill. It is logical to suppose that as the code was learnt through the use of 2m, the most obvious place to start is the lower end of the 2m band, in that hitherto unused CW section.

After a great deal of 'plucking up courage', a tentative and faltering CQ call is sent, and greeted by deathly silence, so another CQ is ventured, and met with the same indifference and so it goes on. It is not uncommon in this area (West London) and so I am led to believe, in most other areas, to call CQ all evening with no response.

It is my experience that the 2m CW section only becomes active in the event of an aurora (not easy to work for a newly licensed station), or when good lift conditions prevail when we hear stations calling CQ DX at speeds far too great for the Morse beginner to work, if indeed he/she gets answered at all.

At this stage the new 'A' licensee, in all probability, does not have access to the HF bands, so as far as CW is concerned, that is the end of the story. The prospective CW operator is then forced to return to phone, and another CW operator is lost to the microphone because by the time the new 'A' licensee has found a rig for the HF bands the interest in CW has diminished, if not gone forever.

If we are to retain CW on the amateur bands, bearing in mind the old adage 'use it or lose it', then perhaps each 'A' licensee with access to 2m could devote a little time, if only an hour or so each week, to help and encourage newcomers with a spot of QRS. In any event QRS is good for the soul and no better practice for anyone.

Nigel Ackland, G0IIL

CURFEW?

We hear a lot about the effort made to keep the repeaters free of the foul-mouths. Down here in Lancing they have cured the problem; at 8pm both the two-metre and seventy-centimetre repeaters are switched off.

The group has been switching them off for some time, and the appeal to the 'squeakies' has become less. In fact, during the day very little abuse is heard at all.

Chris Reynolds G1LDV

EVANGELIZE

Although I admire the concern of GM0IRZ (*The Last Word*, May) for the Society and the hobby in general, I am concerned at some of the comments he made.

Firstly I do not feel that a more liberal approach to obtaining a licence is the answer to swelling the ranks. One has only to tune the empty channels on 27MHz FM to realise that easy entry to radio does not work. In my work I meet many young engineers who would be a great asset to our hobby. Yet these people have a very low opinion of amateur radio and this is not surprising. They see us as appliance operators using our cheque books far more frequently than our soldering irons. If they pick up my copy of *RadCom* they see very little technical content and soon put the magazine down.

Secondly, GM0IRZ sees the Morse Test as a barrier to HF operation. In my 29 years on the air I have never met anyone who, with a little effort, has not been able to pass the test. Many of us now are able to operate at speeds in excess of 25WPM and the thrill of this is something we would recommend to the phone operators. Morse has enabled many of us to communicate world-wide with very simple equipment and with very low power.

This brings me to comment on one definite growth area in our hobby, QRP operation and membership of the G QRP Club. Nearly all QSOs take place on CW and much of the equipment is home-made. Many newly licensed amateurs are discovering that you don't have to support the Japanese economy to work the world.

I do not believe that a change of licensing requirements will save the hobby. What is needed is an evangelistic enthusiasm among its members. Special Event stations should contain some home-made equipment, preferably in use. Operation on modes other than telephony should be demonstrated (including CW). This will help to remove the rich man's CB image. Radio Clubs must do everything possible to make newcomers welcome, with no sign of cliques. They must be prepared to help the SWL through the RAE and Morse Test. Old-timers must be prepared to pass on their skills and knowledge to newcomers. Members should give talks and demonstrations in schools and colleges.

It is quality not quantity that is the answer to amateur radio. When this is achieved, we will be looked on once more with respect by the public.

This country needs a strong engineering base if it is to compete in world markets. Unlike GM0IRZ, I believe that no-one is too young to be started on the fascinating road of Science and Technology. For many youngsters, like myself, it was amateur radio that decided our careers. It is up to us as individuals whether our hobby survives.

Phil Stevens G3SES

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.

DISBELIEF

I read through the letter from Mr D F Elkington, G0PAN, headed 'NO CHARITY' (*The Last Word, May*), with increasing disbelief. Then I read it through twice more. Then I checked the cover to see whether I was reading the April issue by mistake, thinking that this was perhaps your *genuine* April Fool spoof. But no, it seemed that the letter was genuine and I don't think I have ever seen anything so full of pomposity and self-importance.

I have enjoyed amateur radio, on and off, since 1950. I take it very seriously and have great respect for it. Almost as much respect as I have for those people who offer their lives and reputations to help others with handicaps, of whatever kind, who are unable to enjoy the things I enjoy. The article about G2DQU was very interesting. It indicated good editorial policy and a high level of editorial competence. In my opinion, it enhanced the quality of *RadCom* and gave an extra shine to amateur radio. Keep it up!

A D Wake G3GIB

CHARITY SES

In reply to Mr Elkington's letter, all power to the RSGB for supporting such a well-deserved cause. Amateur radio supports many charities with special event stations with sponsored contacts, such as Children In Need. I have just spent a week operating GB2RN aboard HMS Belfast supporting the ITV Telethon.

So why not do the same, dear friend; it costs nothing for a special callsign, it just entails a lot of hard work, especially on the publicity side. Raising money for charity is something you must do yourself.

My pet one is the King George's Fund for Sailors and everyone has his own to support - all you have to do is get out there and do something.

Don Walmsley G3HZL/EI4HM

See page 25 for details on how you can help some of the poorest people in Europe.

MIKE OR NOVEMBER?

Do you know your Q codes? If so, what is the difference between QRM and QRN? This question, in a slightly different form, cropped up in a recent Novice licence examination paper!

The WW2 edition of the *Amateur Radio Handbook* gives:-

"QRM - I am being interfered with; QRN - I am troubled by atmospherics"

Clearly the poor chap trying to read your signals through a tropical thunderstorm is suffering QRN, whilst you, trying to read his reply despite blocking by a 400W linear just down the road, are enduring QRM. But when he stops, how do you categorise the hash from your DIY neighbour using his ancient drill with a sparking commutator?

Some experts I consulted said QRN was Natural interference whilst QRM was Man-made stuff. But is this correct, or logical? A more useful distinction might be between interfering signals which you could QSY to avoid, and wide-band stuff which you can't escape in this way. What do readers think?

Whilst on the subject of codes, can any archivist at HQ dig out the full two-digit code of which only 73 and 88 have survived? Some items, eg "Rising damp is affecting my spark coil" may no longer be appropriate, but these could be given new meanings. There must be a lot of routine stuff in the average QSO which could be abbreviated in this way. Any suggestions?

Phil Mayer G0KKL

AUDIO NOTCH FILTER

There has been considerable interest in my design (*RadCom*, Jan 91) and to my knowledge over two hundred have been constructed. In view of the popularity of this circuit and the fact that there appears to be a problem in locating some of the chips, I thought that it would be helpful to members to know the names of suppliers currently known to stock the components:

Jandek - which advertises in *RadCom* - offers a complete kit but does not sell the individual chips; Maplin - with branches country-wide - sell all the chips except the LMF90; Farnell, Canal Road, Leeds, West Yorkshire LS12 2TU, currently stock the LMF90 and many of the other chips used.

Paul Stewart G7EAH

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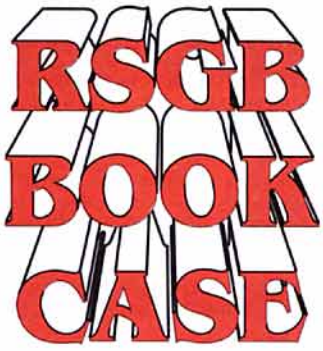

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- ✔ **Automatic Mode- Dependant AGC Selection.**
- ✔ **Full and Semi-Break In CW Operation:** With built-in iambic memory keyer with BFO offset and CW spot. Key jacks on both front and rear panels.
- ✔ **6 Function Multimeter.**
- ✔ **Adjustable RF Power Output:** With internal heatsink and whisper-quiet temperature switched squirrel cage blower.
- ✔ **Adjustable Level Noise Blanker:** For a wide variety of noises and woodpecker.
- ✔ **CPU Controlled RF FSP (RF Frequency Shifted Speech Processor):** For better intelligibility and pile-up "PUNCH" for competitive situations.
- ✔ **High Speed Automatic Antenna Tuner:** With 39 memories.
- ✔ **50 Memories:** Independant ATU and mode/IF filter memory.
- ✔ **Multimode Selection on Packet/RTTY:** Switchable FSK tone, RTTY shift and CW pitch.
- ✔ **Front Panel RX Antenna Selection:** Allows quick switching.
- ✔ **Digital Voice Storage (DVS-2):** Option provides instant playback of 16-second receive memory, plus two 8-second or 4-second "CQ contest" messages on transmit.
- ✔ **Built In Switching AC Power Supply:** Reliable performance with significantly reduced size and weight.
- ✔ **Band Stacking VFO System:** Each VFO register memorises your most recent operating frequency, mode, bandwidth and clarifier information for instant return to your favourite frequency and mode.
- ✔ **Accessories/Options:** TCXO-2 (Temperature Compensated Crystal Oscillator), XF-10.9M-202-01 (2nd IF SSB Narrow 2.0kHz), XF-445C-251-01 (3rd IF CW Narrow 250Hz), SP-6 (External Speaker), MD-1C8 (Desk Microphone), YH-77ST (Headphones).

Performance without compromise