

Radio Communication



The Journal of the Radio Society of Great Britain

October 1992

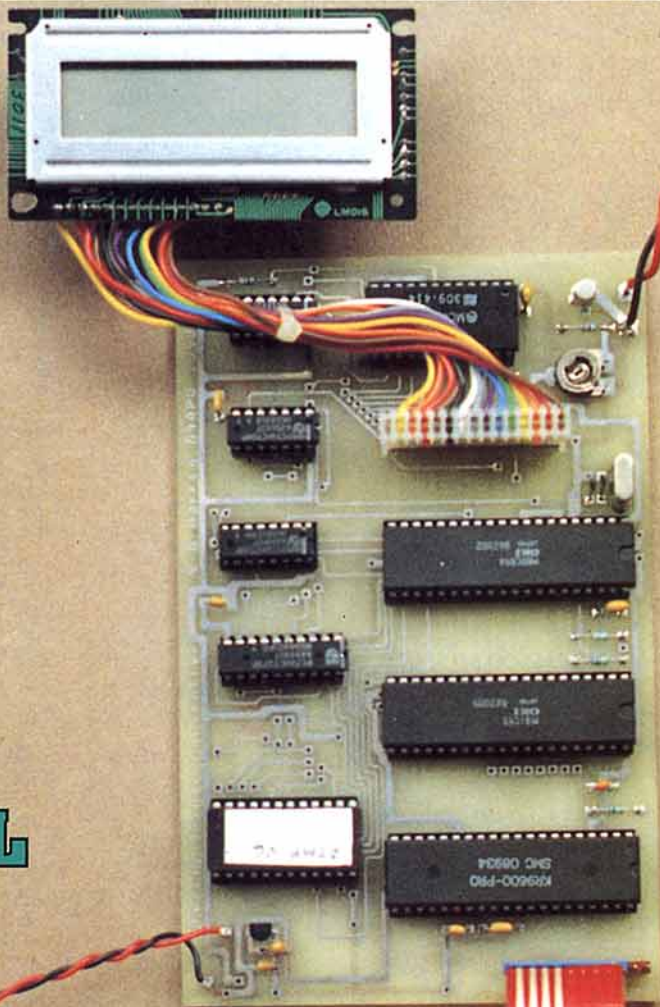
Volume 68 No 10

THE VOICE OF AMATEUR RADIO FOR 79 YEARS

THE
LEICESTER
SHOW EDITION

**Project:
REMOTE
CONTROL
FOR
ICOM
HF
RIGS**

**by
Bob Harris,
G4APV**



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Radio Communication

Licensing: Informing and Involving Members

The RSGB was formed to represent radio amateurs to the Government, and has continued to do this for nearly 80 years. There are few privileges in the amateur licence which have not come about as a result of proposals originated by the Society, and subsequent direct negotiation between the RSGB and the licensing authority of the day. *RadCom* plays a major part in the Society informing members of changes and consulting members prior to proposals being made, and this month's edition is no exception. Turn to pages 6 and 8 for:

- Possible licence changes to permit aeronautical mobile
- Members' data needed for RA Spectrum Review
- Guidance on scanner use
- The latest on repeater licensing procedures

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In this month's edited translation, Erwin David, G4LQI, brings us a technical review of the DSP-100 Digital Signal Processing Unit from Kenwood, abridged from an article by DL1BU in DARC's house-magazine *cq-DL*. In colour.



COVER PICTURE:

This month's main construction project is a remote controller for the Icom HF series of rigs. Our photo shows Bob Harris's prototype. Feature page 27.

PHOTOGRAPH: G4APV.

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RADIO SOCIETY OF GREAT BRITAIN

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

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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Corporate Members: UK and Overseas (*Radio Communication* sent by surface post): **£30.00**. Airmail rates on request.
UK associate member under 18: £15.00. Family member: £12.00
Corporate (Concessionary): £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 Communication*). (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

The Image of the 'Radio Ham'

THE SERIES OF ARTICLES that appeared in the press at the end of August, under the heading of the 'Diana Tapes', caused widespread condemnation, and a strong protest amongst our members and within the Licensed Amateur Radio Community over the use of the term "Radio Ham" in connection with the articles.

I have received a large number of letters condemning the articles and asking what steps were taken to protect the good name of amateur radio. I acted swiftly to point out to the press and TV that the 'gentleman' in question had never held an Amateur Radio Licence, nor was he a member of the RSGB.

Further Press Statements were issued pointing out the differences between the hobbies of CB, scanning, and licensed amateur radio. The Press was further informed of the qualifications and skills required to be a licensed amateur radio operator. I also had the opportunity to state our case on BBC Radio West Midlands.

The Society is restricted in what action can be taken when inaccurate reports appear in the Press using the term 'Radio Ham'. However, I am confident that by acting swiftly to put the record straight a successful damage limitation exercise was achieved. You have my assurance that I will continue to inform and support the hobby of amateur radio and the position of the licensed radio amateur in the press and other media at every opportunity.

On a further serious note, I have to inform you that on Friday 14 August a Royal Mail vehicle was stolen in Potters Bar. A certain amount of RSGB mail failed to be delivered to HQ. If you posted orders or subscriptions, or wrote to HQ between 12 and 14 August and have not received a reply please contact HQ at your earliest convenience. A large amount of the mail was recovered, including the daily delivery of QSL cards, so I am hopeful that not too many members have been inconvenienced by this theft.

Not so Quiet Here

AUGUST IS TRADITIONALLY a quiet month. The holiday season is in full swing and a general air of *mañana* normally prevails. The script this year has somehow gone by the board. Life at HQ has been anything but quiet: The annual audit has gone on throughout the month, the staff have been undertaking training on the new computer system, work has been undertaken to refurbish office spaces and Lambda House is undergoing external painting for the first time since the RSGB took up residence in 1982.

I am pleased to announce further changes in the administration in support of the membership. The HQ QSL Bureau, which has in the past operated on a part time basis (mornings only), will be going full time from 5 October. The Bureau will be open Monday to Friday, 9.15 - 5.15. If you have any queries concerning the QSL operation the staff will be happy to answer your calls. Along with the shack, museum and library, the Bureau will be open so that visiting members can see it in action and can see how cards are sorted and despatched.

Further encouraging news is that in the past three months the number of complaints about the services we provide has reduced. We are turning round orders on the day they are received. All letters received are being acknowledged and on most occasions are being answered within three working days. Membership of the Society also continues to be on the increase. My staff and I are certainly not complacent but I feel we are making progress in improving our administration and the services we provide.

Peter Kirby
General Manager

Zone C News

FOLLOWING THE resignation of **Zone C Council Member** Richard Horton, G4AOJ, election runner-up Neil Lasher, G6HIU, has been invited by Council to be a co-opted member for Zone C under Article 27 of the Articles of Association. A formal decision on this will be made at the September Council Meeting held just after we went to press.

The new **RLO for Kent** is Fred Stewart, G0CSF, 'Shingles', Ingleborough Lane, St Mary's Platt, Sevenoaks, TN15 8JU; tel 0732 780721.

The new **RLO for Essex** is Malcolm Salmon, G3XVV, 54 Church Road, Rivenhall, Witham CM8 3PH; tel 0376 514377.

Resuming his duties as **RLO for Norfolk and Suffolk** is Bill Higgins, G3PNR, 65 Hayden Court, Eleanor Road, Norwich NR1 2RG.

Vacancy

A VACANCY exists on the Training and Education Committee for an RSGB member involved in, or interested in, the training and educational aspects of amateur radio. The committee meets five or six times a year, mainly in Cardiff. Interested parties should contact the Chairman John Case, GW4HWR, QTHR.

HQ in Post Raid

A POTTERS BAR mail van robbery in August affected post destined for our HQ. Part of the consignment was recovered by the Post Office but some, unfortunately, is still missing.

● UNTIL 10 October, Vestry House Museum in Walthamstow, London E17, has an exhibition 'Making Waves - the Story of Radio', which includes broadcast and amateur radio exhibits. Admission is free; details from Rosy Hayward on 081 509 1917.

● STOLEN from a car on the Isle of Sheppey, Kent: Kenwood TS430S S/N 3090109, property of Martin Ouwehand, PA3EHW. Any information to Sheerness police on 0795 584140, quoting crime no: BD803992.

● IN SEPTEMBER we published the incorrect number for Trio-Kenwood UK. The correct number is 0923 816444.

Computers, scouting and amateur radio combine to help seventeen-year-old Martin win top youth award.

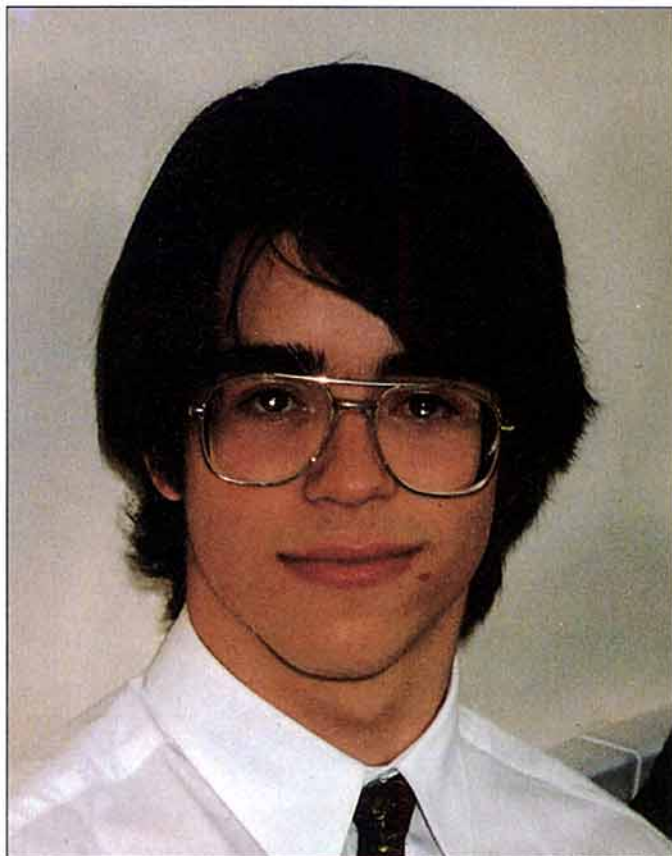
Young Amateur of the Year '92

THIS YEAR'S holder of the prestigious title Young Amateur of the Year is seventeen-year-old A-level student Martin Saunders, G7JCJ, from Broadstone in Dorset. A computer enthusiast, he enjoys combining this with radio by running a Packet Cluster node (GB7JCJ) to serve the local HF DX community. He has recently been elected Secretary of the Southern Users' Network Packet Group and has written 'beginners guides' to sell in support of the group.

Martin is a member of the Flight refuelling ARS with a brief to liaise with the younger members of the club. He has built most of his packet radio station himself, including the computer. He has also written articles on amateur radio with a view to encouraging youngsters into the hobby. As a Scout, Martin's job is to be in charge of food and radio at camps and he will be providing potentially life-saving radio gear for a future Scout trip to the Brecon Beacons. He has passed on his amateur radio experience to his fellow Scouts and Leaders during Jamboree On The Air.

The school physics group project is a weather satellite station and Martin has used his radio experience to help solve a number of problems, impressing his tutor at the same time. He aims to go on to Southampton University.

The Young Amateur of the Year will receive many prizes, including £250 and a tour round the Baldock Monitoring Station from the RA, a general coverage receiver from the RSGB, a week's training at Wray castle College from the Mobile Radio Users' Association and many others from the amateur radio trade.



1992's Young Amateur of the Year is Martin Saunders, G7JCJ, from Dorset.

Runner Up

SECOND WAS Neil Mothew (16), G7NGM. He is a very keen constructor, having built a 20m CW transceiver, an 80m receiver, a digital weather station, and a Morse practice oscillator.

A member of the Loughton and District ARS, Neil has helped at field days and DF hunts. He persuaded the club to introduce a student membership rate in order to encourage youngsters to join. He also helped to form a radio club at his School in Chigwell, built a loop aerial for the club and used the school CAD program to design a QSL card.

The Young Amateur of the Year award is part of the RSGB's initiative Project YEAR (Youth into Electronics via Amateur Radio) which in-

cludes the Novice Licence scheme. This is the fifth year of the award which has been generously supported by the Radiocommunications Agency and the professional and amateur radio industry. The prizes will be awarded at the RSGB HF Convention on 27 September.



Runner-up Neil Mothew, G7NGM.

Want to operate Stroke AM?

FOLLOWING AN initial approach made by the Society about three years ago to the RA, there is now a possibility that Aeronautical Mobile may come within the terms of the Amateur Radio Licence. The Civil Aviation Authority has been consulted and has requested a meeting to agree standards, limitations and procedures, adding a preference that "approval applications, fees and technical submissions come from a single coordinating body".

In order fully to represent the views of UK amateurs, the Society would like comments from anyone with an interest in it. Would you find the facility useful? Can you provide facts and figures on the safety implications? Are you a flier yourself? Please send your comments as soon as possible to the Chairman of the Licensing Advisory Committee, John Bazley, Brooklands, Ullenhall, nr Henley in Arden B95 5NW.

It's all (wrong) in the Sun

ON TUESDAY 25 August, the *Sun* newspaper ran a story claiming that "a radio ham" was responsible for passing it the taped contents of a cellular telephone conversation allegedly involving the Princess of Wales. Over the next few days, RSGB HQ was contacted by many daily and weekly newspapers who were all told that the interceptor of the call, Mr Reenan, was not a member of the Society nor, as far as we could establish, was he a licensed radio amateur. A Press Release was then issued to the national press explaining the difference between amateur radio and the 'hobby' of eavesdropping using scanners.

Recently a scanner user was fined £100 plus costs and had two radios confiscated when he was found to have police and fire brigade frequencies in the rig's memory. It is an offence to "use any wireless telegraphy apparatus with intent to obtain information as to the contents, sender or addressee of any message . . . which neither the person using the apparatus nor any person on whose behalf he is acting is authorized by the Secretary of State to receive."

Advice on scanner use can be obtained by telephoning the RA's Library Service on 071 215 2352, and asking for a copy of Information Sheet RA169 *Receive Only - Scanners, etc.*

RA Spectrum Review

THE RSGB VHF Committee is engaged in preparing the Society's submission to the RA Spectrum Review (see p6, September). It is important that we show that we are using our VHF allocations to meet the objectives of the amateur service. To help in this, the VHF committee is looking for detailed information from members on the numbers of amateurs using the various VHF bands and modes.

The following would be particularly appreciated, in computer readable form: Lists of UK stations . . .

- (1) using repeaters
- (2) taking part in local nets
- (3) chasing VHF DX
- (4) participating in VHF Contests

(5) using amateur satellites

'Flat ASCII' files are strongly preferred on 3.5-inch MSDOS disks. Please send to the committee Chairman: **Peter Burden, G3UBX, 2 Links Road, Penn, Wolverhampton WV4 5RF**, with return postage if you want the disk back. *Short* lists can be sent via the packet radio network to G3UBX @GB7MAX.

All information will be treated as confidential and will not be used for any purpose other than preparing the Society's submission. The bad news is that the RA want the completed submission by 31 October so if you have any information which might be useful please send it as soon as possible.

GB17USA Commemorates Rescue



The GB17USA HF shack: (l to r) Ernie Bradbury, G1UJR; Terry Owen, G4PSH; Stuart Gray, G0RDK; Mike Goodwin, G0NJI and Jim Adams, G4MXG.

THIS AUGUST, contact was finally made between Bovingdon Airfield and one of six P38F Lockheed aircraft which had left the USA for the Hertfordshire RAF station exactly 50 years earlier! Whilst on its wartime mission accompanying two B17 bombers, the flight ran into difficulties and all eight planes had to be abandoned over Greenland. A distress message was picked up by a radio amateur in Maine and nine days later the surviving airmen were rescued.

This year American archaeologists brought the P38F up from

its resting place more than 250ft below the ice cap. To celebrate this a contact was arranged between XP1AX at the Greenland site and GB17USA at Bovingdon. GB17USA was operated by members of the Dacorum ARS, RAF Halton ARS and visiting amateurs, including G3XFE who arrived by light aircraft.

W1BFA, an RAFARS member and Controller of the International Air Traffic Control Net, provided a QSP as conditions were poor. Listening to the contact was the pilot of the P38F, Lt McManus who is now aged 73.

Forger Caught

SOME TIME ago, a suspected forged RAE pass slip was forwarded to the Radiocommunications Agency by the RALU. On 12 August the case was heard at Cardiff Magistrates Court where the defendant pleaded guilty to Sections One and Three of the Forgery and Counterfeiting Act 1981. The defendant was given a conditional discharge of twelve months and was ordered to pay £50 costs.

£1000 Reward

REG WARD & Co has recently been a victim of a break-in. SMC are offering a £1000 reward for information leading to the recovery of the stolen goods and the apprehension of the offenders. The stolen items are: FT1000 S/N 0H070257, IC735 S/N 10030039259 and an HX240. If you have any information on any of these, please contact Reg Ward & Co on 0297 34918, or Axminster Police on 0927 32231.

RSGB VHF/UHF AWARDS NEWS

A NEW RSGB award is the 50MHz Transmitting (Listening) Award and qualifying levels are as follows:- Standard Award 40 counties / 12 countries and Senior 60 counties / 20 countries. Start date is 1 June 1987 with the same county rules as the other VHF/UHF awards. Application forms may be obtained from G4OUT, QTHR, on receipt of an SASE. The Senior certificate counts as credit towards the RSGB Supreme Award. Congratulations to all RSGB VHF/UHF award recipients who include:-

50MHz: 10 Countries (2way) - Civil Service ARS, G1CSR; G Atkinson, GD7HEJ. 20c (2w) - W M J C Moest, PE1AED. 30c (2w) - Terry Chaplin, G1UGH. 40c (2w) - S E Ashdown, G1SDO. 50 Countries (2way) - Alec Trusler G0FIG. 100c (2w) - Paul Simons, G4CCZ and Ted Collins G4UPS. 110 Countries - Chris Gare, G3WOS. 25 squares to Civil Service ARS G3CSR and GD7HEJ. 50 sq - Max Ollerton, G7GMD. 100sq - Al Harvey, GU7DHI. 150sq - G0FIG. 250sq - Ela Martyr, G6HKM. DX 50 Countries Award - G0FIG. DX 100 countries - G0CCZ, G3WOS and G4UPS.

144MHz: 60 squares / 15 countries - Roger Muggleton, G0HZK. 100sq/20c - G0FIG. Standard Transmitting - Dennis Jones, G7HCC. Senior Transmitting - G0FIG and Gerard Elliott, G14OWA.

432MHz: 30 squares / 6 countries - G0HZK. 100sq/15c - J Arnold, G4MPH.

Ian L Cornes, G4OUT,
VHF/UHF Awards Manager.

GAM1 Testing

SEPTEMBER SAW test transmissions of the RSGB's Propagation Service Beacon, GAM1, on 3.8123MHz, just above the UK 80m band. The purpose of the tests was to ascertain the service catchment area and the quality of signal. Anyone who has heard GAM1 is requested to send reports containing: Date and Time, Location, Signal Strength and Signal Purity.

Reports should be sent to Gwyn Williams, G4FKH, QTHR, from whom more information can be obtained by sending an SASE. Further details of this RSGB service can be found on page 7, *RadCom*, June 1991.

GB4ATC on the air from the Royal Tournament



The Air Training Corps stand formed a prominent part of the Royal Air Force display at the 1992 Royal Tournament.

FOR THE second year, GB4ATC and GB8RT were in use by the Air Training Corps at the Royal Tournament which took place at Earls Court in July. The ATC 'Comms Cabin' was as usual located on the Royal Air Force stand and this year the Exhibition Production Flight of the RAF did them proud with the size and design of the stand. It had a perspex screen all round the front with the operators and radios facing the general public. The operators felt a little like they were in a glass cage but this year people stopped to see them at work and they found that most of the time the stand was packed with budding radio enthusiasts and short wave listeners.

The HF radio, an FT990, was

used mostly on 40m logging about 1900 contacts. Most QSOs were within the UK with quite a number of amateur friends from last year calling in for a chat, but several hundred were with Europe plus Cyprus and Africa. A few State-side contacts were made on 20m.

Working at the same time was the FT726 on 2m and 70cm, resulting in a further 400 contacts. The QSL cards were made out immediately - a lesson learned from last year. A great many amateurs visited to say hello and to leave their QSL card. Most notable were a VK from Perth; a VE from Nova Scotia and a WNS from California.

Distinguished

A NUMBER of very distinguished visitors viewed the stand and were most impressed, especially the Air Vice Marshals from the RAF and ATC (both were given QSL cards to mark their visit). Another visitor to the stand was Jeff Kenyon from the Information and Publicity office of the RA. Interviews were given about amateur radio to the British Forces Broadcasting Services.

Amateur radio information leaflets, giveaway booklets and flysheets were produced in record time by both the RSGB and the RA. These proved so popular that stocks had to be replenished three times. We even robbed our local London ATC Squadrons of

all their stickers and publicity booklets, especially the ones on the Novice Licence, a subject they are now cultivating most successfully in the ATC. (See photograph p21, *RadCom*, August).

Stand organiser Ray Degg, G0JOD, wishes to thank the 21 operators who gave up their time to operate and log on the ATC's special event station. Without their unstinting co-operation the station would not have been on the air. Most put in more time in the 'shack' by staying on to distribute leaflets and talk to the public about amateur radio. Special thanks go to Alan Butcher, G3FSN, who acted as second in command and to Peter, G0LMG, for lending his FT726 2m/70cm gear, his dual band co-linear and his son Danny.

The ATC would also like to thank the sponsors especially SMC who kindly lent the superb FT990 and the FT747 which they kindly altered to suit one of the ATC HF frequencies. Also to Lowes and Dee Comm for the gift of the aerials. Finally thanks to the RA who kindly donated the special event QSL cards.

Next year is already in the planning stage. The ATC would like for the first time to produce satellite weather charts for the public to take away with them. If anyone has information, software or hardware which would help (including a large screen VDU) contact Ray, G0JOD, QTHR.



The GB4ATC/GB8RT operators, situated behind a specially built perspex screen, attracted a great deal of interest from passers by. The stand opposite was for the St John Ambulance Brigade.



A few of the 21 operators: (l to r) Peter Burchett, G0LMG; Nigel Robertshaw, G0NHM and Alan Butcher, G3FSN.



The ATC also had their own HF and VHF radio equipment alongside the amateur radio display.



Amongst the overseas visitors were Dieter, DK2PU, and his XYL. Dieter contacted the station last year and was visiting the tournament for the first time. Stand organiser Ray Degg, G0JOD, is pictured centre.

RSGB Repeater CTCSS System

FOLLOWING DISCUSSION during 1991, pressure from some repeater groups and indications that the licensing authority would have no objections, a request for comments on CTCSS (Continuous Tone-Coded Squelch System) was sent to groups in the RSGB's occasional newsletter *Repeater Report*. Working from these returns the RSGB Repeater Management Group has settled on a country-wide allocation of CTCSS frequencies for both 70cm and 2m repeaters.

The plan is based broadly on existing county boundaries and thus resembles the RSGB Zone boundaries. However some minor variations have been, and will continue to be, made to accommodate individual situations. If a repeater group has a clear technical reason for wishing to use a tone frequency different from that indicated on the map the RMG is happy to discuss it.

It was decided to use the nine lowest tones on the standard CTCSS scale, 67.1 - 118.8Hz and to try to ensure that each 70cm repeater unit is 'protected' from all those within *normal* range on the same radio frequency by ensuring they each have different allocations, hence the need to fudge county boundaries a little!

Use of the CTCSS tones is strictly defined by the conditions agreed with the RA. In summary,

A	=	67.1
B	=	71.9
C	=	77.0
D	=	82.5
E	=	88.5
F	=	94.8
G	=	103.5
H	=	110.9
J	=	118.8

TABLE 1: Allocation of tone frequencies (Hz) as shown on the map.

such tones may *not* be used to create 'private' repeaters nor to restrict facilities to those without CTCSS. However it has been agreed that when a repeater user is equipped with CTCSS this can act in place of the normal 1750Hz tone burst in opening the talk-through facility at the repeater. However, once CTCSS is fitted those with 1750Hz tone bursts must be able to continue to operate exactly as before.

Finally the encoding of the repeater output with the specified tone will allow users with CTCSS encoded squelch to listen only to speech and to ignore the periodic ident signals from the repeater, a facility long requested by many repeater users.

Any problems or difficulties still experienced by repeater groups should be referred to their Zonal RMG member or to the RMG Chairman, G4AFJ.



The UK is divided into 23 areas, sharing nine sub-audible tones. Map supplied by the RSGB Repeater Management Group.

Repeater Franchise Update

A FURTHER meeting on Repeater Licensing was held with the RA on 20 August, following a three-month extension of the deadline for renewals. The background to this has been fully explained in *RadCom* (July and other issues this year).

The position at the time of the meeting was:

- 219 groups had completed the documentation and paid the franchise charge.
- 24 groups had completed the documentation but not paid the franchise, namely: GB3s BW CR DC DS GH GT LL LW MA MB MC MF MH MN MP MR MT NW SE SL SM ST VT and WP.
- Two groups have failed to respond at all: GB3s BM and GC.

This situation was discussed with the RA in detail and various options were reviewed, finally agreeing that up to 31 March 1993 the RSGB:

- will include on the Licence Schedule those that have completed the documentation and paid the franchise.
- will not include those who have failed to complete the documentation.
- does not wish to include on the schedule those who have not paid their dues, but have reluctantly agreed to do so in order not to jeopardise the position of the groups that have fully complied with the procedures.

The RSGB will be paying a licence fee for these non-payers and authority to operate will be issued valid to 31 March 1993. The RSGB recognises that this is unfair to the groups that have complied but it became clear when discussing the situation with the RA that there was no alternative if the small minority will not cooperate.

Groups on the schedule will shortly possess a letter of authority to operate. Any not in possession of such authority will therefore be unlicensed.

The Future

THE CURRENT position of some groups refusing to pay the franchise is untenable in the long term, and so it has been agreed reluctantly with the RA that, with effect from 1 April 1993, each group will be licensed directly by the RA. Each group will be directly responsible to the RA for the correct operation of the station, and deal directly with the RA on matters of close-down operators, other essential licensing records and abuse.

The RA want the RSGB to perform the technical management and coordinating of the network, covering the vetting of site clearance forms, frequency planning, coordinating of coverage areas, linking technical standards and special licence conditions and facilities. This will be done under a sub-contract to the RA. The RSGB will be submitting proposals to the RA for this work.

Groups wishing to start a new repeater will initially contact the RSGB for advice and guidance with their

applications. The group will then submit the application to the RA. The RA will consult with the RSGB on the technical and management aspects, and when this has been agreed the group will obtain a licence direct from the RA.

The RSGB will continue its site sharing agreements with bodies such as Philips, BBC and NTL. Groups will be able to continue to take advantage of these so long as the charges raised by the RSGB are paid promptly, which will include insurance cover for the site. The RSGB intends to continue to provide Public Liability insurance for repeater groups at other sites but, in view of the changes stated above, groups wishing to continue to use this facility after 31 March 1993 are advised to make written application to the General Manager at Potters Bar, marking the letter - 'Repeater Insurance 1993', before 31 December 1992 to enable a new policy to be negotiated.

Geoff Dover, G4AFJ,
Chairman Repeater Management Group

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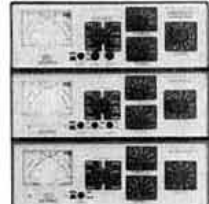
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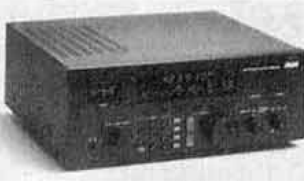
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Alinco break the price barrier again! Forget the cheap old-fashioned technology, this is brand new designed stock that will rock the market. Ideal as second rig or for those who only occasionally use 2 metres.

NEW! ALINCO ELECTRONICS GmbH

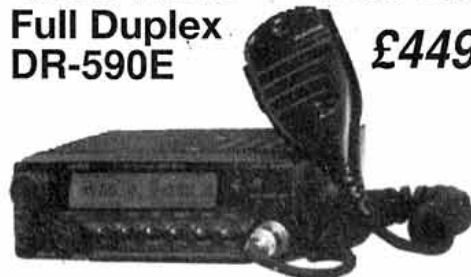
DR-119E 2m Mobile 50 Watts £289 RX: 135-174MHz



The latest 2 metre mobile from ALINCO now offers superb value. No larger than a car radio it boasts 50 Watts output and extended receiver coverage. Completely re-styled it offers all the usual features including memories, scanning etc, and comes with microphone, mounting kit and full warranty. For more details send or phone for brochure.

ALINCO Clearance!!

2m/70cm Mobile 45/35 Watts £100 off! Full Duplex DR-590E £449



Brand new stock with 12 month's warranty. No catches. Just check prices with our adverts last year and you'll see the price saving is really genuine. Nobody can beat this price. Our bulk purchase has cleared the factory of this model. Act now and save £100 into the bargain. Send for colour brochure. (please note illustration shows DR-599 which is almost identical)

NEW! ALINCO ELECTRONICS GmbH

70cm 2 Watts £239

The new exciting DJ-F4E has arrived. ALINCO engineering at its best, a superbly clean transmitter and the usual "no nonsense" warranty that takes the worry away from purchasing ham gear.

Ideal for the new NOVICE license, this is a really tough little rig. Use it mobile with external 12V DC, use it for Packet radio, or just pop it in your pocket knowing you have the most advanced and reliable transceiver on the market!



DJ-F4E in stock

- ★ Tx: 430MHz - 40MHz
- ★ Rx: 410MHz - 470MHz
- ★ 5 Watts output (12V DC)
- ★ 40 Memories
- ★ 3 way Power Setting
- ★ Illuminated Key Pad
- ★ 6 Programmable steps
- ★ Programmable Shift
- ★ 1750Hz tone
- ★ Frequency Lock
- ★ PTT Lock
- ★ Beep on/off
- ★ Automatic Lamp
- ★ DTMF Tones
- ★ Reverse Repeater
- ★ 8 Scan modes
- ★ Battery Saver
- ★ S meter
- ★ Priority Channel
- ★ Fast tune function
- ★ Rotary Dial
- ★ Illuminated LCD
- ★ Quick touch Squelch
- ★ Protected Output
- ★ BNC socket
- ★ Ni-Cad Pack 700mAh
- ★ AC Hod Charger
- ★ Many Accessories

FREE! Mail Order Price List. From UK's LEADING HAM RADIO STORE
Kenwood Yaesu Icom Alinco etc. We can ship same day! No quibble 12 Month Warranty!

NEW Packet Radio Kit £49.95 Ramsey — USA p&p £2.00 P-IBM

- ★ Powered directly from RS-232 port.
- ★ Includes free software for IBM



Other Kits

- AR-1 Airband VHF Rx£23.95
- FR-1 FM broadcast Rx£17.95
- HR-20 20m DC Rx£26.95
- HR-40 40m DC Rx£26.95
- HR-80 80m DC Rx£26.95
- QRP-20 20m QRP Tx£26.95
- QRP-40 40m QRP Tx£26.95
- QRP-80 80m QRP Tx£26.95

This is a truly amazing kit for all those who want to get into packet radio without committing themselves to a large outlay. The complete kit of parts is provided with circuit, board layout and comprehensive manual. It can be put together in an evening. All you need is an RS-232 lead to your computer and cable connection to your transceiver mic socket. You'll be receiving and sending Packet signals in no time at all. If you haven't tried Packet radio, here's your chance to do so with minimum outlay and guaranteed results.

Dual 24 hour/12 hour Station Clock £19.95 p&p £2.00

Ideal for all ham stations, this large LCD clock gives both local and distant times. Completely self-contained and battery powered it has a smart satin finish.



Digital HF Antenna Analyzer MFJ-247 £189.95 Post Free 1.8 to 30MHz



This amazing instrument enables you to tune your antenna system in minutes. It has built-in rf generator, frequency counter and meter. All self contained, simply connect to antenna system and watch the effect as you make adjustments in the garden. Amazing!

VISA & ACCESS MAIL ORDER, 24 Hour Answerphone. Open 6 Days a Week 9am-5.30pm.
Rail: Liverpool St/Hockley or District Line/Hornchurch

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ASK FOR
YOUR USED
EQUIPMENT LIST
AT THE
LEICESTER
SHOW!

YAESU FT890

After Peter Harts review in September Radcom, it's a small wonder I've sold any other H.F. transceiver under £1,300!! Available from stock, list price is £1,075 without auto & £1,250 with.

My price £..... Phone now!!

THE BIGGEST AMATEUR LEICESTER SHOW AND

This is the one you've all been waiting for - a sales extravaganza at the Leicester Show, Granby Halls and throughout the whole of October at the Ealing Shop.

I've purchased extra large quantities of stock, both new and used, to give you unrepeatable bargains. This year I'm in the main hall at the famous Leicester Show - my stand last year was too small!!



YAESU FT1000

Confirmed the world's No. 1 H.F. transceiver. In stock and backed by a company who understands the requirements of the discerning H.F. operator. Very special deals for October. If you've waited this long, wait no more - if you're genuinely interested, ring me and tell me. If you are serious, you'll buy one.

List £2,995. My price £7



YAESU FT747GX

It's small, it's simple to use. It comes complete with AM/CW filters fitted, covers all H.F. bands and has a general coverage receiver. Microphone included? Not usually but I'll throw one in!

List £710. Lynch's price? Much lower!!



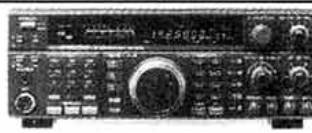
YAESU FT290R MKII

Not just a "New B licence" 2M multimode, but consider the remarkable FT290R with the clip on 25 watt linear and you have a totally unique concept in 2 metre operation. Without the linear you have a true portable, capable of all modes - no other manufacturer can offer you this. Only £409 or £519 with matching FL2025 25W linear amp.



KENWOOD TS850S

Now the initial surge is over, (two years of it!!!), the TS850 sells at a steady pace. However, for October I've given you a financial advantage. Ring me and find out how £1,475? Nope!



TS450S / 690S

With or without the 6M option, they sell well. Offered as a mid-sized H.F. transceiver with 100W O/P, general coverage RX and optional auto tuner, they work well too! £ Special October price!



TR751E

Remember G3OSS reviewing this super 2M 25W multimode awhile back? For Angus to say it's good, it must be good. The TR751E - the only dedicated 2M 25W multi mobile available. Newly licensed? Phone for my super deal on this one!



Kenwood's handheld range:

TH28E TH48E TH78E

They all look like they've been styled in the year 2000. All beautifully shaped and offering features the others are still dreaming about. Try them out at Leicester or at the shop. From £249

ELITE : Setting new standards in used Equipment.

"I have always been pretty choosy about the used amateur radio equipment I supply my customers. This is a great hobby, and for maximum enjoyment, it is vital that equipment is working up to specification. I want you to get the best ... and let's face it ... MY reputation is at stake otherwise!

Any equipment I am not completely happy with gets immediate attention from our engineers ... IF IT'S NOT GOOD ENOUGH FOR ME IT WILL BE DISPOSED OF ELSEWHERE IN THE TRADE. That's no reflection on the previous owner of course, simply that the equipment isn't right for me to sell; and will not be good enough for you either. It either leaves here in clean and immaculate condition, or not at all!

Recently we have felt that the time is right to take things a little further, so we are promoting our used equipment under the name 'ELITE' ... from MARTIN LYNCH. Any piece of used equipment you purchase from me will be the very next thing to brand new. Quality standards will continue to be uncompromising ... and all equipment will be offered with a meaningful warranty, handbook and leads. WE WILL ALSO OFFER A FULL MONEY BACK GUARANTEE - if the equipment is not as described ... Who else can offer a

service like that?"
CALL NOW AND DISCOVER THIS MONTH'S BARGAINS - AMONG THE 'ELITE' from MARTIN LYNCH - and enjoy true PEACE OF MIND!

73 MARTIN G4HKS

MARTIN LYNCH

G4HKS

THE AMATEUR RADIO EXCHANGE CENTRE

286 Northfield Avenue, Ealing, London W5 4UB. Tel: 081 566 1120. Fax: 081 566 1207

cushcraft

I've been selling CUSHCRAFT for donkeys years - the range is now available either MAIL ORDER or by visiting the shop.

PRODUCT LIST

40-2CD 40m 2 element Beam	617B	6m 6 element Boomer
20-4CD 20m 4 element Beam	A50-6S	6m 6 element Beam
20-3CD 20m 3 element Beam	A50-5S	6m 5 element Beam
15-3CD 15m 3 element Beam	A50-3S	6m 3 element Beam
10-4CD 10m 4 element Beam	AR-6	6m Ringo Vertical
TEN-3 10m 3 element Beam	17B2	2m 17 element Beam
A45 20-15-10m 4 element Beam	13B2	2m 13 element Beam
A35 20-15-10m 3 element Beam	124WB	2m 4 element Beam
A3WS 17-12m 3 element Beam	A144-7	2m 7 element Beam
D40 40m Rotary Dipole	A144-11	2m 11 element Beam
D4 40-20-15-10m Dipole	A144-20T	2m 10 element X Oscar
D3 20-15-10m Dipole	AR-2	2m Ringo Vertical
D3W 30-17-12m Dipole	ARX-2B	2m Ringo Ranger II
R7 40-10m H/W Vertical	AR-270	2m / 70 cm Vertical
RS 20-10m H/W Vertical	424-B	70cm 24 element Beam
AP8 80-10m Vertical	A430-11	70cm 11 element Beam
AV5 5 Band HF Vertical	416TB	70cm 8 element X Oscar
AV3 20-15-10m Vertical	ARX450B	70cm Ringo Ranger II

SHOP OPENING HOURS:

Monday - Saturday 10am-6pm.

Tel: 081

MARTIN LYNCH MARTIN LYNCH



SUPPORT ✓ YOUR INDEPENDENT RETAILER
- It's the right thing to do !!

**FT990/DC £1,599 or with PSU and filters
FT990 £1,799.**

For those of you that liked the FT990 but didn't want to pay the price to

include a power supply — well eerritz! Yaesu have announced the FT990DC. Identical in spec. to the FT990, but minus the internal mains PSU and CW filter. Auto tuner, digital filters etc. are all retained, but just look at the saving

RADIO SALE AT THE THROUGHOUT OCTOBER

Do come along and visit us at the show, we are already taking orders and deposits for equipment to be collected there. Just phone your requirements through. If you cannot make it on the 23rd / 24th, the bargains will still be available direct from Ealing. This year the shop will be open a full six days a week, 10 a.m. to 6 p.m. including the Leicester days — so there's no excuse!



YAESU FT736R

I sold nine, last month alone. Another nine customers now have the only VHF/UHF base station to offer 25W on 2 & 70, together with 6 metres and 23CM operation as an option. Built in PSU, full duplex operation, the list goes on and on.... So you want to be the first new owner in October? Usually £1395, with 2/70.

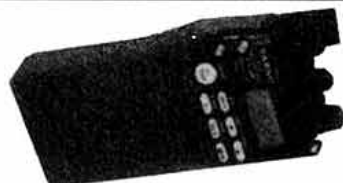
Big savings this month . . . £ phone.



YAESU FT530R *NEW*

The latest dual band handle from Yaesu. It's been delayed in coming but it has been worth waiting for. All internal options fitted, lots of mind boggling features and built to the same robustness as the FT26/76 series. In stock October.

£379, with NICADS and charger included.



YAESU FT26/FT76

My personal favourite handles, easy to use and very well built. Very special prices on these award winning 2M and 70CM handles.

FT26 only £239 or FT76 £259
both with NICADS / charger.



The Alinco Range:

DJ580E: In a nut shell? W&S can retire on this one alone! The best dual band handle available. Full stop. **£369** with free case!

DJF1E: The other manufacturers are getting worried — this neat little 2M handle comes complete at only .. **£239**.



DJF4E: *NEW* Identical to DJF1E with all the same features but on 70cms. Ideal for novice. Comes complete **only £239**.

DJ51E: As with the DJF1, but minus keyboard, (who wants to imitate Russ Conway anyway?) NICADS & charger, but less Wonga. Ideal 2M starter rig **£179**.



A Selection from the Icom range.

IC728 & IC729

Easy to use H.F. base or mobile, the new twins from Icom really fit the bill. My mate Dennis Branson at ICOM said they were good and he's right — they are! With PBT and speech processor fitted, they offer outstanding value and reliability. 100W out on all the H.F. bands and 10W on 6M with the IC729, you should have one!

From only £799.



ICW2E

Icom's dual band handle, others have copied, but none can quite match the feel of the W2E. Supplied with NICADS & charger, etc. **£375**

IC275H

The only company to offer you a competition grade 100 watt 2 metre multimode in one neat package. If you are keen on 2M operation, (as keen as I was years ago — remember GBJNV7 — do you really want to?) Wave goodbye to the Liner 2 and become a man over night. **£995 — October only!**



MICROKEY ELECTRONIC KEYS

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

- High speed facility 70 - 990 WPM
- Adjustable sidetone 500Hz - 990Hz
- Analogue or digitally controlled speeds 6 - 60 WPM
- Internal 9V battery or external 9-15V DC supply

Available now, only **£99.00** inc. VAT



OPTOELECTRONICS 2300 HANDHELD FREQUENCY COUNTER/SNIFFER

It's like having a wideband receiver in your hand, displaying transmissions going on around you, but giving you the actual TX frequency they're operating on in BIG CLEAR digits! Ideal for checking your own transmitter frequency and lots of others. Can detect R.F. at over 200 meters depending on power output. Ideal for the D.F.er. See the frequency, then tune in on your scanner.



MLV THE MARTIN LYNCH GIFT VOUCHERS SCHEME

For those of you who are just dying to give me your money, but can't quite make up your mind on what you want — your problem is solved! October '92 sees the introduction of The Martin Lynch Gift Voucher Scheme that not only has no time limit on spending them, but you can top it up with part-exchanges, cash, H.P., credit cards or anything else. (Legal, that is).

Available now in £5, £10 & £50 vouchers, these make the ideal way of saving for your new rig or accessory for Christmas, the retirement present, birthday and any other occasion throughout the year.

So! All those out there who would like their loved one to get them something they actually want for Xmas '92, just leave this advert in a discrete place. (Copies glued to the inside of all the windows, front of the washing machine, dash board of the car, etc).

Martin Lynch Gift Vouchers — also available mail order, payment by credit card welcome.

24 HOURS SALES HOT LINE:

TEL: 0860 339339

566 1120 NOW!

- 4 x 48 character memories
- Adjustable weighting 25-75%
- Contest serial number 0-9999
- Auto beacon mode-message loop
- Keyer status enquiry mode



SOMETHING FROM Bill Ricalton, G4ADD, RSGB HF Awards Manager, which should be read by everyone who intends to apply for an award! He says: "The position of Awards Manager is a voluntary one. The manager generally is an active awards hunter himself, who likes to get on the air and work a few stations towards whatever objective is on his current wanted list.

"He might have to earn his living, and tend to the usual household and gardening chores. If he is unlucky his XYL might even insist on the occasional holiday (well - you never know what you might miss whilst you are away!).

The Awards Manager therefore appreciates having an application sent to him that is legible, and with the application listed and QSLs sorted and in the correct order, with an SASE of adequate size for the return of any QSL cards. The most important task for the applicant is to follow the particular award requirements. It will then be processed and adorning the shack wall in a fairly short time. What he does not welcome is a scribbled application on a scrap of paper, signed "Joe Amateur-QTHR" which takes hours to decipher! Whilst he might well enjoy corresponding with you he hasn't the time to answer long queries about awards - particularly if they are not sponsored by the Society or organisation that he represents. Remember - the Awards Manager enjoys issuing awards to you and will try very hard to furnish you with them. Some may take several years of careful operation before the necessary requirements are met. He is not being pedantic in insisting that the rules are fully complied with, he is only trying to preserve the integrity of the award and not devalue the achievement of those who - through dedication and skill - are already proud recipients.

So please read the rules and requirements carefully and if you intend to become an award hunter - a very satisfying activity - consider buying a good Awards Manual such as that published by

the RSGB. However, if all else fails, do drop a line to the Awards Manager - but please make it easy for him. That way you will get a prompt reply and you will not be contributing to the delay in the issuing of awards to the deserving"

AWARDS

CHRISTOPHER COLUMBUS AWARD

This celebrates the 500th anniversary of the discovery of America and requires QSOs to be made between 1 September and 31 December 1992. Available to listeners and licensed amateurs who gain 30 points (15 for those outside Europe) by contacting stations in Italy (one point) or Genoa (three points) on any band or mode. QSOs with special stations IQ1CC or IQ2CC count five points and a contact with one of these and also with a station in Genoa is mandatory. Send log details plus 10 IRCs (or £3.50) to: ARI Award Manager, Via Scarlatti 31, 20124 Milano.

DX NEWS

THE BAHAMAS Amateur Radio Society will be on the air for the whole of October as C6A500 to commemorate the 500th Anniversary of the landfall of Christopher Columbus in the New World. Authorised members of BARS may use the /500 suffix during the same period. On Monday 12 October C6A500 will operate 24 hours from the island of San Salvador. Frequencies to be monitored are 3.590, 3.740, 7.030, 7.090, 14.070, 14.135, 14.290, 18.150, 21.140, 21.204, 21.390, 24.950, 28.190, 28.350, and 28.990MHz. Awards will be issued to those working (1) three different /500 contacts and (2) ten different /500 contacts one of which must be C6A500. Send copy of log and three IRCs to BARS, PO Box SS.6004, Nassau, Bahamas, within one year. RSGB DX News Sheet reports that VP8CDJ has now left S Georgia but that VP8CGK is still there and appears on Saturdays at 1500 on 21.340MHz and will give CW contacts on request. There is a new operator on S Orkney. This is VP8CKC who uses the equipment used by VP8CFM.

Brian Rous, C21BR, in Nauru has written to remind readers of the forthcoming autumn/winter openings and also of the fact that he will be returning to ZL early in 1993. This will leave only C21JM, C21JH, and C21RK on the island and possibly only C21JM as re-

ally active (he is a good CW operator). Brian offers skeds - these can be arranged by writing to him at Box 359, Nauru Is, but allow thirty days for airmail delivery of your letter! C21BR times/frequencies are 0430-0530 21.203MHz, 0530-0630 14.222MHz, 0600-0700 14.236MHz (for N America only), and 1100-1400 (Fridays and Saturdays) 14.240MHz. Other QRGs as requested and he will be in the VK/ZL contest this year. C21NI is currently dismantled and I have a long list of details of QSL managers responsible for various periods since 1986. If you still need a C21NI card send the date of your QSO and a SAE and I will tell you who to contact! FK8GJ, in New Caledonia is to be found regularly at 0600 on 10.105MHz, and he expects to be on other WARC bands soon.

Bob Parkes, G3REP, is now in the Sultanate of Oman and on the air as A45XF. He still has his 4S7/G3REP logs if anyone requires a QSL (see QTH Corner). Mike, V85KX, is temporarily off the air from Brunei and V85AA has his TS690S for the time being.

According to RSGB DX News Sheet WA4WKY is now with the US Embassy in Maputo in Mozambique and is on the air as C9RJJ. He likes CW and is specially active at weekends. FD1PJK is in Ethiopia for three years. He has been worked as ET3JR on 21MHz SSB and has said he has been promised written documentation. The Long Island DX Bulletin says that SU2MT, in Egypt keeps daily skeds in the 21.280MHz area from 1800. TN1AT, in Congo, is reported to join in the French net on 14.256MHz at 2100 on the first and third Saturdays of each month, and S79KMB in Seychelles appears very often near 21.335MHz around 1700.

Terry Langdon, W6/G3MHV, with his wife KA6ZYF, recently visited Tirana and took along a transceiver and were permitted to operate as ZA/G3MHV and ZA/KA6ZYF. They were mostly active on 7 and 14MHz CW.

ARRL has announced the acceptance of FOOCI cards for DXCC credit. The DXAC was due to vote on the issue of DXCC status for Bosnia-Herzegovina, Croatia, Macedonia, and Slovenia at the end of last month. The deletion of Abu Ail was also on the agenda.

EXPEDITIONS

David Dutton, G6QQ, will be in Antigua again this year arriving on 14 October, and he hopes to be V2/G6QQ in time for the RSGB 21MHz CW and CQ WW SSB contests. He has an ICOM 735 and Cushcraft R3 vertical which will be mounted on a clothes pole - and he will be on 14, 21, and 28MHz. For a direct QSL please send \$US1 or an IRC.

A recent news release reports that the expected IARU training session in North Korea has been postponed because of several open issues requiring clarification. More details at a later date. A note in Lynx DX Bulletin says that OK1DTG has now returned home following his OK1DTG/P5 activity between 12 and 24 April this year on 7MHz CW and that he did not operate on 21MHz.

A large group of Dutch amateurs will be in Luxembourg between 4 and 11 November. They will be located at Bech and will work all bands from 1.8 to 144MHz (except 50MHz). They will use their own PA3 callsigns preceded by LX/. A free award will be sent to listeners or amateurs who hear/work three members - the same one on three bands, three different on the same band, or three



Teddy Barczyk, DL4DBR, (Pappelstr. 34, D-5800 Hagen 1, Germany) offers to act as QSL Manager for DX stations.

BAND REPORTS

Thank you this time to G2HKU, G2VJ, G3GVV, G4s DBN, DJC, GW4KGR, G4s MUW, OBK, XRV, G0HGA, and the UK DX Packet Cluster courtesy of G4PDQ. Stations using CW are listed in italics:

1.8MHz

- 0300 *CX4CR, D2CW, HF0POL, LU2DKT, ZC4SXW*
- 2000 *S21ZC*
- 2200 *VQ9RM, ZC4SXW, ZS1JX, 5N0MVE, 9D0RR*
- 2300 *A22MN, UD6D/Y42DA, ZD8Z, 4S7RO*

7MHz

- 2000 *BY1PK, VK5BUS*
- 2100 *D2CW, ZA1KAB, 5H0ROA, 5U7M, 9D0RR, 9V1OK*
- 2200 *PY0TUP, S2/G3NOM, V5100SWP, Y11MH, 4S7RO*
- 2300 *C9RKL, VK6HD, VP8GAV, VQ9FX, VY6QST*

10MHz

- 0300 *3B8CF*
- 1900 *VS6WV, ZD8Z, ZS6QU.*
- 2000 *KH0JA1HGN, 5N0ZKJ, 7P8SR, 7Q7XX, 9D0RR*
- 2200 *D2CW, D2FGC, D44BS, FY5FO, S21ZA, YV6AZC*

14MHz

- 0600 *ZK1AR, 5W1KH, 9D0RR*
- 0700 *FO4LJ, FO5BVP, H44/M4LCK, KH8/DF6MS, V73DO, VK9ND, ZK1XBM, ZK1XR*
- 0800 *A35KB, AH6NM, NH6NG, VR6TC, ZK1JR, 3D2XV, 5W1AU.*
- 0900 *FW1FM, KH3AE.*
- 1500 *JT1BV, XU2UN, 9M2HB.*
- 1600 *JT1AS, 9M8FC*
- 1700 *D2CW, S21A, S21ZA.*
- 1900 *A71BV, W0WVB/KH0, V73DO, VP8GAV.*
- 2000 *HS1SJ, S2/G3NOM, S79SGA, V63OM.*
- 2100 *D2FGC, KL7GU, ZD8MS.*

18MHz

- 0800 *AH6IP, SV9/DL3MFZ/P, ZK1RS.*
- 0900 *KH8/G4ZVJ, TK/G3OZP/P.*
- 1600 *D2CW, VQ9QM, ZB2JI, 3C1EA, 3X0HNU, 9D0RR*
- 1800 *BV2FA, S21ZC, TZ6VV, XU8CW, 5H0ROA/A, 5V7DP*

21MHz

- 0700 *FW1FM, JW5NM, ZK1AR.*
- 0800 *BY3AE, BY4RB, FR5DD, S21A, 9D0RR.*
- 1000 *A35s KB, NP, H44/M4LCK, T20AA, T30IL, 3D2IM, 3D2XV.*
- 1300 *A71BV, C9s RDM, TDM, H10GBL, S92IJ, ZS9A*
- 1500 *FE1NTW/FH, V85CJ, VQ9WM, VY6QST, XU7VK, XV7TH, XX9GD.*
- 1700 *S21A, 5H0ROA, 5H0ROA/A, 5R8GW, 8Q7AA.*
- 1900 *F6BLQ/D2, D2FGC, J5UAI, T53UN.*
- 2000 *FY5FX, ZF2NE, 9V1YC*

24MHz

- 1300 *D2FGC, XU2CW*
- 1500 *D2CW, J5UAI, HZ1HZ, S92IJ.*
- 1700 *C9RJJ, VQ9RB, 9D0RR.*

28MHz

- 1000 *D2FGC, TR8XX, 9D0RR*
- 1200 *D2CW, ZD8LI*
- 1600 *F6BLQ/D2, ZC4TXF, 5H0ROA.*
- 1800 *VP8ADY/92HY, 3X0HNU, 5U7M.*

There has been some confusion about the correct routing for QSLs following recent changes in the CIS. However - a notice from the Krenkel Central Radio Club of the Russian Federation in Moscow says that Box 88 is still operating exactly as before - dealing with awards and contest logs as well as QSLs.

QTH CORNER

- A45XF** Bob Parkes, PO Box 6628, Ruwi, Sultanate of Oman.
- C21BR** B Rous, 56 Tamahere Drive, Glenfield, Auckland 10, New Zealand.
- C21JM** J Motiti, Box 359, Nauru, Central Pacific.
- C9RJJ** W8GIO, Paul Vest, Rt 1 Box 140-42, Bunker Hill, WV 25413, USA.
- D2FGC** OK1AJN, Ivan Matejicek, PO Box 127, CS-46601 Jablonec nad Nisou, Czechoslovakia.
- S2/G3NOM** G0CMM, J.Bell, 28 Stiles Av, Marple, Stockport, SK6 6LR.
- S21ZA** Jim Smith, VK9NS, PO Box 90, Norfolk Is, Australia 2899.
- V2/G6QQ** David Dutton, 55 Stalham Rd, Hoveton, Norwich, NR12 8DU.
- V85KX** M Street, PO Box 243, BSB 1902, Brunei, Darussalam.
- ZA/G3MHV and ZA/KA6ZYF** via bureau or the PO Box 1489, Santa Monica, CA 90406-1489, USA.
- ZF1WD** K Cheetham, Callingwood Hall, Tatenhill, Burton-on-Trent, Staffs, DE13 9SH.
- 9D0RR** Romeo Stepanenko, P.O.Box 766, Brooklyn, NY 11230, USA.



Festus Havelock, 9M8FH, at his operating position in Kuching, Sarawak.

different on different bands. QSLs must be exchanged and logs sent to DAGOE Foundation, PO Box 356, Dordrecht, Netherlands.

Ken Cheetham, G4RWD, wrote to tell me that he would be in **Cayman Is** at the end of September and on the air as ZF1WD. He may still be there when you read this.

FR5ZU was expecting to be in **Juan de Nova Is** as FR5ZU/J from 21 Sept to 4 Oct and then on **Europa Is** until 16 Oct - if you are an RTTY enthusiast listen around 14.080, and 21.080MHz between 1100 and 1500 and call between 14.085 and 14.099 or 21.085 and 21.099MHz.

PROPAGATION

THE LATEST from G8KG goes as follows : "The movements of the solar indices up to the middle of August have continued to reflect a halt in the steep decline which occurred in the first half of the year but have not yet given any promise of a major recovery. There were no major magnetic disturbances during the period and the 27-day average of the 2800MHz solar flux which had risen gently to 140 sfu was back below 120 at the time of writing though perhaps about to rise again. As a result there was little dx above 21MHz as compared with a year ago but conditions on the higher bands should improve by October, even if solar activity continues it's downward trend.

As warned last month, readers who make their own forecasts

1992 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G4OBK	74	119	127	320
G3KKJ	77	149	90	316
G2VJ	79	109	111	299
G3KKJ	65	109	82	256
G3ING	62	89	42	193
G2AFV	39	45	11	95
G4NXG/M	-	58	28	86
G4MUW	-	49	36	85
G4XRV	80	-	-	80
G3IAR	27	28	11	76
GMOKMJ	-	-	59	59
GW4RGT	13	21	16	50

should bear in mind that the smoothed sunspot number could well be getting down towards 50 by the turn of the year, a possibility confirmed in the August *SIDC News* from Brussels".

CONTESTS

IN THE first **Annual Scottish Activity Weekend** the following won trophies:- GM - GM0OPS, UK/Ireland - G4OAT, Overseas - LY3BH, Listener - G 20297, Regions - GB0DGL (Dumfries & Galloway). The GS, 144MHz, UK Novice, overseas listener, and Scottish listener awards were not claimed. These will be carried over to next year's event on 17/18 April 1993. 190 GMs took part and over 11,700 QSOs were made from Scotland during the weekend.

In the **1991 VK-ZL-Oceania DX Contest** (phone) G3SNN scored 3036 points and G5MY 192. In the CW section G3GLL was top UK entry with 2800 points, followed by G3ESF (2028), G5MY (1152) and GW4HBK (168).

WORKED ALL GERMANY CONTEST

1500 17 OCTOBER - 1500 18 OCTOBER

CW and SSB on 3.5 - 28MHz (no WARC bands), and following IARU contest band segments. Classes are (a) single operator all-bands CW only, (b) single operator all bands CW and SSB, (c) single operator all bands CW and SSB QRP (max 5W output), (d) multi-op single transmitter, and (e) listener. Work German stations and give RS/T plus serial number from 001. German stations will give their DOK number and may be worked once per band per mode. QSOs count three points and the multiplier is the sum of different DOKs worked on each band. Logs may be submit-

continued on page 19 ►

HF F-LAYER PROPAGATION PREDICTIONS FOR OCTOBER 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	24MHz	21MHz	18MHz	14MHz	10MHz	7MHz	3.5MHz
	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802	000001111122 024680246802
** EUROPE								
MOSCOW	....788761..	...2899982..	...5999996..	...78888982..	322877778975	876644446899	875321124788	+52.....4++
MALTA	....776552..	...1888774..	...49999972..	1..688899951	542877778996	9987544457899	998521124789	++52.....4++
GIBRALTAR	....354331..	...576564..	...8988872..	...19988995..	221587778994	886865556899	999742223689	+++4.....4++
ICELAND	....2432..	....46652..	....278885..	....5889983..	11..88788972	763465557898	998743234678	+++4.....35+
** ASIA								
OSAKA	....64.....	...2861.....	...48731.....	...5864211.1	1..363335543	....31.14774	.....1551	.....22.
HONGKONG	....388841...	...489862...	...4787753...	...266677631	2...33347875	2....1.14796	.....1574	.....24.
BANGKOK	....5898861..	...5898983..	...36778961..	...136678831	3...13347986	4.....14798	1.....1576	.....243
SINGAPORE	....5888871..	...6788983..	...45778961..	1..136578842	3...3247986	3.....14797	.....1575	.....242
NEW DELHI	....588871..	...678883..	...45778611..	1.1225578432	521..2247887	73.....14799	51.....1578	2.....245
TEHERAN	....7+88861..	...8888983..	...1756789621	213534568853	7452.1247998	973.....14799	851.....1578	52.....245
COLOMBO	....6+88872..	...6788984..	...1446789721	2.1124568953	63...1247998	72.....14799	5.....1578	2.....345
BAHRAIN	....7+88861..	...77789841..	1.1655789732	313423568964	8551..237998	973.....14799	851.....1578	52.....245
ICELAND	....6+98984..	...89999961..	1.1888899942	423877789975	877654567999	97421235899	8841...12688	+5.....3+
ADEN	....7+888841..	...777889621	211644689963	533422468987	9751..137999	983.....14789	851.....1578	52.....245
** OCEANIA								
SUVA/S	....13551...	...267721..	...577754..	...17667761..	...46434771..	...531.144..	...21...11..	.....
SUVA/L	1..1221..262	21.2542..474	331576421763	222775433852	..375322572.	...52...34..	...2...11..	.....
WELLINGTON/S	....4663.....	...687521..	...2887754..	...48666761..	...66434772..	...331.1451..	...1...12..	.....
WELLINGTON/L	....1.....	11.1.....22	231341...144	2335631..453	..13652113631	...33...34..	...1...11..	.....
SYDNEY/S	....487773...	...6988852..	...78878851..	...58667872..	...353347951	...21.1474..	.....151..	.....2..
SYDNEY/L	....1.....11	...31.....32	111.631...64	12117521.274	..1263223662	...131..363..	...1...141..	.....
PERTH	....688753...	...7888762..	...57778521..	1.1356568853	3...23247986	1.....14785	.....1572	.....24.
HONOLULU	....2.....	...14.....	...21...362..	..1..421.672..	..2225322651..	..15531.142..	...341...1...	.....
** AFRICA								
SEYCHELLES	....66687441..	...766886721	211544778964	533222568987	963...237999	951...14789	83.....1568	5.....235
MAURITIUS	....6888851..	1..777899731	311545789974	632322568997	963...236999	85.....14799	72.....1578	4.....245
NAIROBI	....687898621	1..777789852	421644579986	743421268998	9861...36999	984...4799	861...1577	53.....244
HARARE	....567789741	2..667789964	531644479997	863522268999	9962...36999	984...4799	862...1578	54.....245
CAPETOWN	1..377789852	21.577789975	641755569998	873732248999	9964...16899	9861...3789	873...1478	54.....245
LAGOS	1..1+889862	21.487779985	651774458998	883852237999	99872...5899	8994...2789	7872...478	454.....45
ASCENSION Is	....88768762	22.197667884	552385446998	884672123899	99885...1699	89862...389	7874...168	454.....35
DAKAR	....8+888862	11..98778984	452296446997	775484224899	999761..1699	88963...389	7774...168	445.....35
LAS PALMAS	....7998883..	...99999961	12.199889994	453488778997	897876556899	999853223699	888521..1378	+++2.....4+
** S. AMERICA								
Sth SHETLAND	....26888862	11..47888884	452267776787	775576554578	898863221256	68863....24	4564.....1	.23.....
FALKLAND Is	....38988861	11..58877873	442177755687	775476532478	9997632..157	89963....25	6874.....2	355.....
R DE JANEIRO	....18766761	11..38766883	342167544687	675376222488	999763...169	99963....38	8874.....15	555.....2
BUENOS AIRES	....28878861	1..48877773	332177644576	665376422368	9997631...47	89963....15	7874.....2	454.....
LIMA	....98875..	....1877762	121.13754465	454124521147	8985531...16	899631....15	68841.....1	355.....
BOGOTA	....98775..	....2876662	111..4753365	443..5521147	8884342...17	898631....4	78741.....1	454.....
** N. AMERICA								
BARBADOS	....798885..	....8876772	121.18743585	444126521278	8885532...58	998631....27	87741.....4	554.....
JAMAICA	....98774..	....1887661	11...4764464	332.15531146	88734421..16	898631....4	68741.....1	454.....
BERMUDA	....498885..	....6877871	11...7755684	332.26532477	8873542..158	998631....26	77741.....3	444.....
NEW YORK	....78873..	....2888861	11...4776773	331..5654576	776234321257	898531....25	67741.....2	355.....
MEXICO	....18763..	....287641	11...1.575443	331.2.563224	67615233...3	598531....1	27741.....	.55.....
MONTREAL	....78773..	....2888851	1...4777773	321..5665676	775134332357	898531....25	67741.....2	345.....
DENVER	....3652..	....5773..	....77652..	22...166444	67412.233114	588531.1...1	26741.....	.35.....
LOS ANGELES	....651..	....1863..	....48641..	22...57432..	564131.341.2	378531.11...1	15741.....	.24.....
VANCOUVER	....13..	....352..	....16741..	21...27642..	45312..36323	367531.131.1	14741.....	.4.....
FAIRBANKS	....12..	....1352..	....11135742	11...11135742	442243236654	346531.14333	12431...11..	.....

The provisional mean sunspot number for August 1992 issued by the Sunspot Data Centre, Brussels was 64.4. The maximum daily sunspot number was 103 on 3 August and the minimum was 20 on 25 August. The predicted smoothed sunspot numbers for October, November and December, are respectively: (classical method) 97, 95, 93; (SIDC adjusted values) 121, 117, 113.

VHF/UHF NEWS

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

SOME MEMBERS of the Canadian Contest Club and the Square Bashers Group operated from YS square (IO88CB) between 8/15 August using GB5YS. The operators were G4VXE, GM4AFF, GM4ZUK and GW4LXO and they were QRV (commonly used to mean active) on five bands, 50MHz to 1.3GHz.

They concentrated on 144MHz MS (meteor scatter) using CW, and found the best reflections occurred around 2100 on the 11th and 12th. 66 QSOs were completed, 20 on random. Contacts included EA6VQ, HA4XT - completed in 'real time' in a long burst - HG1YA, HG8CE, OH5LK, UW2F and 9A1CCY. UV1AS was heard programming his keyer on 144.100MHz. The 144MHz station comprised a TS-940 transceiver, transverter, big PA and a 17-ele Cushcraft Yagi at 16m AGL with masthead preamp. Tropo conditions were poor and there was a very weak 30 minute aurora on the last day.

On 50MHz they made about 200 QSOs enjoying several Es openings to central, eastern and southern Europe; best DX was SV1OG with a 9H3 heard. SSB MS operation was quite successful but random activity seemed down on previous years. Tim Kirby, G4VXE, wrote: "When will people learn to use the tuning dial on six, though? Unless one called within 5kHz of 50.110MHz, the results were hopeless!" Results on 70MHz were disappointing with mainly 'old faithfuls' being worked - a dozen QSOs in total, including MS. PA2TAB was worked MS crossband, 70/50MHz. A few semi-local contacts were made on 70cm and 23cm, mostly as a result of WAB (Worked All Britain) activity. The total number of QSOs was about 500 and QSLs should be sent via G4CAN. Thanks to Jon, GW4LXO, and Tim for their reports.

PROPAGATION

HELD OVER from last month were some interesting notes on

Es from Ray Cracknell's, G2AHU (HWR), June report. Using rockets on the Woomera range in Australia, Whitehead proposed his windshear 'theory' of the formation of Es. He "... postulated that the ionosphere winds, which blow at velocities in excess of 250km/h in contrary directions, produce a wind shear zone between them at approx 105km altitude which sucks in ionized matter, like nature's vacuum cleaner, thus forming an ionized layer only a kilometre or so thick.

"Like the winds near Earth's surface, ionosphere winds are influenced by Coriolis, which is a force resulting from the difference in rotational velocity of Earth's surface at the equator (1670km/h) and the poles (nil). The rate of change with change in latitude is ... maximum at 45°, at which latitude the tendency to form eddies and cyclones is greatest. "Thus the nice smooth layer of the tropical Es is anything but smooth at 45° latitude. Gradients and irregularities are the means by which much higher frequencies are propagated from the ionosphere (cf the 'grey' line, FAI and the mechanism of TEP).

Another force working on an area of free electrons is Earth's magnetic field ... even a mild magnetic storm (K-index of 5) disrupts Es propagation by speeding the transport of free electrons to the magnetic poles, bringing aurora ... but it takes several days for the Es region to recover fully." Ray concludes: "Of course, all this energy originates from the sun, but the formation of Es is by no means a simple or direct process. Take heart, sporadic-E will improve, not fade away, as we approach the period of the quiet sun once more."

BEACONS

THE DERBYSHIRE beacons GB3BUX (IO93BF) became operational on 21 August on 50.000 and 70.000MHz. For propagation evaluation purposes they share the same keying cycle. For more information on these transmissions contact Tony Whitaker, G3RKL, QTHR. Rogan Clements, SM0KJD (JO99CE), told me that SK1VHF on 144.950MHz sends its locator as JO97CJ, as per the *Dubus* list, not JO97BG as in the RSGB database and published lists.

REPEATER NOTES

IN A RECENT *Press Release* the RSGB's Repeater Management Group (RMG) airs: "... additional thoughts ... for future

study." These are; linking repeaters to the telephone network, approval of repeater linking beyond the experimental stage, digital speech via repeaters, more GB2RS broadcasts on repeaters, HF gateways via 28MHz repeaters, repeaters on 50MHz, increase of repeater ERP on 23cm and above and a possible allocation on 220MHz. Your constructive comments on any of these topics are invited and will be passed onto the RMG.

A proposed site and frequency change for GB3AN on RB8 in Anglesey has reached the frequency planning stage, as has new application GB3CL on RB9 in Clacton (ESX). GB3TL on RB9 in Spalding (LCN) is a new application being vetted by the primary user. Other recent new applications are for TV relays, GB3TM, in Anglesey and GB3MV on RT2R in Northampton. GB3LR (SXE) on RB11 has been relocated in Newhaven. Anyone wishing to assist the Lewes Repeater Group in the maintenance of GB3LR is invited to contact Mark Abbott, G6RZA, on Newhaven (0273) 512247. GB3SG on RB15 in Cardiff went back into service on 9 August following a site change; reports to GW0JER (QTHR). GB3WB on RB5 in Weston-super-Mare became operational on 1 August. Ted Collins, G4UPS (DVN), reports that the first European 50MHz repeater was due to come on stream in Norway for an experimental one year period in September. The callsign is LA5UR and the QRGs (frequencies) 51.200/51.800MHz using FM.

METEOR SCATTER

THE PERSEIDS stream this year provided some of the best results for years. In 1991 an initial peak was reported on 12 August, 1500-1700, so it was possible that a

similar peak would occur this year about six hours later, but on the 11th as this is a leap year, ie around 2100. From reports so far received, it appears that the period 1800-2100 produced exceptional reflections.

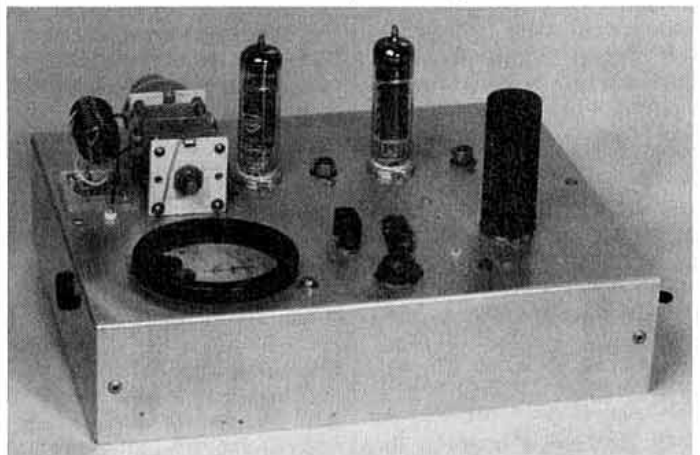
70MHZ

Steve Wright, EI5DD, VHF Manager, reported that the DXpedition group EJ6O on Clare Island (IO43) found this period like an Es opening as the reflections were so frequent and loud on the 11th. David Warr, G4RQI (YSW), completed with both EJ6O and EI4MTR between 2020 and 2030. He wrote: "... both peaked S8. It's hard to say how long the bursts were with EJ6O especially, as he never really disappeared over a 30 min period."

144MHZ

Colin Morris, G0CUZ (WMD), missed the peak between 1900 and 2000, getting on 30 min later. During Perseids week he completed about 30 stations, most on random, the only new square being OK/DL5YET (KN09). Countries worked were DL, EA, EA6, HA, HB9, I, OE, OK, SM, SP, TK, YU and 9A (Croatia).

Alec Trusler, G0FIG (SXW), found best reflections 1800-2100 on the 11th. In the period 10-13 August he completed with SM6EAN (JO57), SM4POB (JP70), SP3EPX (JO83), SP2NJI (JO92), SK3SN (JP80), HG7PL (JN97), IN3TWX (JN56), HG9RC (KN08), GB5YS, SP3UCA (JO92), SM0KAK/0 (JO99) and YU3ES (JN65). At the end of July he completed with IC8FAX (JN70), UZ2FWA (KO04) and IK1PAG (JN35). John Regnault, G4SWX (SFK), somewhat tongue-in-cheek, thought he could claim a world record of 1923km for MS using FM mode when he completed with Peter Sundburg, SM2CEW (KP15CR),



Part of a collection of fourteen pieces of VHF equipment designed and built by Bill Scarr, G2WS, during the sixties. The collection was donated to the RSGB Museum by Mrs Scarr and was presented by Eric Palmer, G3FVC.

at 1820 on the 11th. He wrote: "However, all was not well. G4PIQ near Colchester (ESX) 'tail-ended' the QSO and completed at 1824, increasing the record to 1952km." In a subsequent contact on the 20m VHF net, Peter reckoned FM MS was so much better as "... you can squelch out all of that nasty noise in between bursts!" Brian Underdown, G7LIJ (KNT), spent the past year monitoring the main showers and familiarizing himself with the correct procedures. He made his first MS QSOs on the 11th completing with IC8FAX and HG1YA (JN87) with 37 and 39 reports respectively.

Other Perseids SSB QSOs were with IK2DDR (JN55), HA4XT (JN97) and 9A1CCY (JN85). Arlen Pardoe, GM0HUO (FFE), installed an extra PA to give 160W but then blew up his masthead preamp. Not only did he lose 12dB gain, but the dead device acted as a 15dB attenuator in the RX path. So his Perseids activity was virtually ruined but he may have completed with SM3RLJ on the 8th and DG6MGP on the 11th if they got his final 'Rogers.' Edward Allely, GW0PZT (GDD), also tried the mode for the first time completing with IW2BME, DB3VE, DL5MAE, I2PY, DL7ARM, IK4GNG, DH8NAA and OE3NFC. He exchanged reports with IG3W on the 12th but wonders if he got the call right? Lyn Leach, GW8JLY (GNS), found the QRM from the DX end unbelievable. He completed random SSB contacts with F1YR, HG1YA, I3LLH, IC8FAX, IK1EGC, IK1SLI, IK5JWQ, IW5AVM, OE3OBC, YU3ES and 9A1CCY on the 11th. Next day brought LA1JU (locator required), OK1FVP, SK6HD and TK5EP.

AND NEXT

The next significant meteor stream is the Orionids group. The International Meteor Organization's *Meteor Shower Calendar* predicts a peak on 21 October. At maximum the solar longitude (LS), right ascension (RA) and declination (DEC) are 208.4, 95 and +16° respectively. Best times are: NE/SW 2300-0500; E/W 0130-0730; NW/SE 0400-0930 and N/S 2300-0100 and 0600-1030. The radiants are below a mid-UK horizon between 1200 and 2100.

50MHZ

THE MAY issue of *QUA*, the newsletter of one of the amateur radio groups in Zimbabwe, includes a contribution from Mal

Geddes, Z23JO. He gives a resume of results from Christmas 1989, since when he has worked 60 countries in five continents with 189 squares confirmed. He runs an IC-505, 10W CW/SSB, with a 4-ele Yagi at 20ft AGL, rotated by the 'armstrong method.' His QTH is 3600ft ASL. For many years the sole Z2 on the band, he mentions that Z21AF/R is now QRV.

NEWS

G4UPS gives I2ADN's QTH as Via Ortigara 19, I-22070 Casnate Con Bernate (CO), Italy. Angelo was QRV from various islands and squares June-August. QSLs for the July operation by ES5MC/0 can go to Arvo's QTH at PO Box 301, EE-2400 Tartu, Estonia. 9K2AZ is K1OK and can be QSLed via Kuwait ARS at PO Box 5240, 13053 Safat, Kuwait.

PA0FM will be QRV from November to March as P43FM in Aruba. QSLs may be sent either to his home QTH or to an Aruba address which George will give when he arrives. QSLs for Polish stations worked in July and August may be sent as follows: SO5PAR via SP5EFO; SR5PAR via SP5TAW; SN5PAR and SN5PAR/8 via SP5CCC and HF7PAR via SP7HT.

ACTIVITY

Jon Acton, G0NFH (AVN), reported satisfaction with this year's results. DX worked includes OD5SK, 5B4/G3KOX, HB9MIG, OY6A, UA2F/DJ2ZF, 4U1ITU, UZ2FWA, LY2WR and UX1A. Terry Chaplin, G1UGH (SFK), worked several of the EHs on 30 July and 6 August, YL/ES9C (KO27) on the 8th and EH, EH6, I, OK, SP and YU stations in a good Es opening on the 10th, 1730-2230.

G4UPS was away from home in the first part of August. Ted records "nil heard or reported" on 28, 29, 31 July, 3-5, 12-14, 17, 18 and 22 August. He records a good Es opening to EH3 and EH6 in the evening of 30 July, some Es activity to SM1, OK2, YU, SP, EH2/3 and CT from 1650 on 10 August and more to OH, LA, OK and YU from 1830 on the 19th. Al Harvey's, GU7DHI (GUR), new countries since his last report are: 7Q7CM, OH7YD, 5B4/G3KOX, TA5ZA, OH0BBF, 3Z4PAR, UZ2FWA, ZA1A, UX1A, EH4CGM, EH6VQ, 4X4IF and EH9IB, bringing his band tally to 58. GW4LXO has been spending a fair amount of time on the band lately and now has 116 countries worked with 108 confirmed. Jon runs a home built transverter and home made 5-ele NBS Yagi at

**LOCATOR SQUARES TABLE
STARTING DATE: 1-1-1979**

Call sign	50MHz	70MHz	144MHz	430MHz	1.3GHz	Total
G3IMV	386	-	483	125	52	1046
G4SWX	-	-	404	-	-	404
G0CUZ	-	-	374	78	-	452
G4DHF	-	-	342	-	-	342
G4RGK	167	-	319	182	58	726
G4RRA	-	-	299	80	-	379
G4YTL	-	38	279	37	-	354
GW8JLY	-	-	271	36	-	307
G4SSO	80	-	269	99	-	448
GW4VEQ	-	-	267	-	-	267
GJ4ICD	555	-	264	121	65	1005
GW4LXO	440	23	261	108	48	880
G4DEZ	141	-	251	62	56	510
G3FPK	-	-	246	-	-	246
G6HCV	355	-	241	-	-	596
G6HKM	407	-	236	117	57	817
GW4FRX	-	-	235	-	-	235
G0EVT	217	2	233	65	1	518
G4DOL	-	-	223	-	-	223
G0MGA	249	-	216	-	-	465
G4TIF	280	28	204	112	-	624
G8LHT	196	20	202	93	17	528
G0FYD	162	-	191	6	-	359
G0EHV	-	35	187	81	-	303
G1SWH	245	33	179	63	-	529
G0FIG	200	-	171	42	-	413
G4MUT	167	25	155	94	34	475
GW6VZW	323	-	143	6	-	472
G7LIJ	-	-	132	-	-	132
G8PYP	228	1	122	35	-	386
G1UGH	187	-	118	-	-	305
GW0PZT	-	-	115	-	-	115
GM0GDL	-	-	114	-	-	114
G1SMD	206	-	112	-	-	318
GU7DHI	329	-	106	5	-	440
G6MXL	87	23	104	55	24	293
G0NFH	133	26	101	51	18	329
G3FIJ	1	24	80	22	3	130
G7EWL	54	2	78	-	-	134
G0HVQ	235	-	71	-	-	306
G0HDZ	11	-	67	-	-	78
G7CLY	70	-	60	2	-	132
G7JAF	-	-	53	3	-	56
G0JHC	439	-	48	-	-	487
G6ODT	-	3	48	52	-	103
G4OBK	21	1	45	-	-	67
GW7EVG	-	-	28	-	-	28
G6AJE	-	-	25	-	7	32
GM1XOG	181	-	-	-	-	181

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Next deadline is 29 October. Band of the month 144MHz.

7m AGL. Recent new countries include: 5B4/G3KOX, TA5ZA, OD5SK, 3Z4PAR, UZ2FWA, ZA1A, EH6VQ, YL/ES9C, EH9IB and LY2WR.

70MHZ

G0NFH HAS made some cross-band QSOs recently with stations on 6m. These include DL7YS (JO62QL) and a 'first' with UA2F/DJ2ZF. Jon is pleased with these results. G4RQI has increased his power from 8W to 60W, replaced 60ft of UR43 feeder by UR67 and installed a 5-ele MET Yagi. These improvements have resulted in contacts with 42 different stations, excluding contests, and David usually manages three QSOs per evening.

GW4LXO commenced operation in June using a home built transverter running just 3W output and a 5-ele NBS Yagi at 5m AGL. This modest station has netted ZB0T and CT1WW! Jon only needs GU to have worked all active countries. He made cross-band contacts to 6m with SM6PU and DL7YS. He is building a 100W

power MOSFET PA and would welcome skeds via the packet DX-cluster node GB7WDX.

144MHZ

GERARD ELLIOTT, G14OWA (LDR), sent copies of four log pages covering this year's best Es opening on 22 June. At 1828 his CQ call was answered by SU3UAR but he faded before exchanging reports. On the tape, the DX definitely says: "Sierra Uniform Three Uniform Alpha Radio" in a rather guttural, middle-European accent. At the time, the opening was to HG, OK, SP and YU and five minutes later, Gerard worked YT3ET. My suggestion is the station was in Slovenia and substituted an S for the old Y. Did anyone else hear or work this station or any other SUs?

G0CUZ reported that the only tropo worthy of note was on 2 August with good propagation to northern Spain to the "usual squares" - IN52, 53, 63 and 73. Colin's best DX were EA2AZW/P (IN82) and EA1DKV/P (IN62). G0FIG contacted EA1YV and

QSL

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

● Nigel Roberts, G4KZZ, who is Sub Manager for the G0G series has written to say that although he moved house some time ago his new address has not appeared in *RadCom*. Nigel now lives at 6 Park End, Forsbrook, Staffordshire ST11 9DR. My apologies for the omission.

● Many will have heard of the RAEM award which commemorates services to communications by Ernst Krenkel. Krenkel was the chief radio operator aboard the SS Cheluskin (not Chelyuskin as sometimes spelt) which was crushed by ice in February 1934 95 miles off the Siberian coast. The ship sank and the crew had to take to the pack ice for survival. Krenkel managed to communicate with the shore base for some two months using a one-watt

transmitter and improvised antennas on pack ice in temperatures often as low as -40°C until a rescue could be mounted. RAEM was the callsign of the SS Cheluskin and because of his superb skill and determination as a radio operator Krenkel was allowed to use that call as his own personal call until his death in 1971. He was also made a Hero of the Soviet Union for his work. Briefly, that's Krenkel's story and reproduced in this column is his own QSL card, signed personally by him, for a CW QSO on 20 metres in June 1947 with John Kay, G3AAE. The reverse of the card states "RAEM was the call of the SS Cheluskin smashed by ice in the Polar Sea in 1934. I was there the Chief Operator. Since then RAEM is my personal amateur call". I am most grateful to John for supplying and allowing me to print this piece of communications history.

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

sender any S7 cards that do not bear routing instructions.

● On that subject, can I make a plea for routing instructions to be put on the front of cards as well as the back. It is very easy when sorting cards to read just the face of the card and send it to the wrong destination. To read both sides of every card just to check whether there was any route on it would virtually double the workload of the sorters. With two million cards to get through every year, you could help them considerably in this way.

● Readers will have seen the letter from Steve Hodgson ZXD8LII in The Last Word page of April *RadCom*. In an effort to assist Steve I wrote him asking if the RSGB Central QSL Bureau could be of any help to him. He replied saying that he will despatch cards through the bureau as and when he comes to the UK and there is nothing really the Bureau can do to further assist him. So anyone awaiting a card - don't worry.

● It is not always appreciated by amateurs operating in foreign countries and using their own callsign/foreign prefix, that QSL cards relevant to their operation

will go to their home call bureau. For instance cards for VP6/G3KVA will be sent to the RSGB Bureau whereas G/VP6KVA will be dealt with by the VP6 bureau.

● Continuing the theme of 'never give up hope' when it comes to QSL cards I have a card in front of me from a W5 to a G4 for a SSB QSO in 1982. The card bears the message "sorry to take so long to QSL". That must rank as the understatement of the year!

John Hall, G3KVA



QSL card signed by Ernst Krenkel confirming a contact with John Kay, G3AAE in June 1947.

EB1EFC (IN52) for a new square and EA1BLA, EA1WZ/P and EA1FCX all in IN53. G1UGH also contacted EA1WZ/P in this opening. G7LJ reported strong signals from northern Holland on 30 July and Brian worked many PAs with just 5W. At 1814 he was called by DL0DWD (JO34). From 2200 he contacted DL0PE/P (JO52), OZ1BNN (JO55), OZ1GEH (JO65) and SM7SPG (JO66). Conditions in the EA/F contest on 1/2 Aug were patchy, best DX being FC1FNY/P (JN36), EA1YV, EB1EFC, EA2AZW/P, EA1BLA and EA1DDV. On 5 August he worked F9OE/P (IN78), I2FHW (JN44) and HB9MIG and HB9SNR (JN36).

GM0HUO mentions the excellent propagation reports transmitted from beacon DK0WCY on 10.144MHz in the 30m band. Arlen wrote: "Daily Boulder Ak readings give indicators to possible auroras but DK0WCY seems better set now to warn when one is actually in progress." He suggests the operator(s) "... deserve some congratulations on their contribution to the good of amateur radio." GU7DHI asks if the 2m calling frequency has been changed? Al complains that there is more DX being worked on 144.300MHz during any opening than anywhere else in the band. He cites 2 August when several

stations continued working DX on the frequency with no attempt to shift elsewhere. He wrote: "Come on lads; move up or down a little. Not all of us run 400W and big beam arrays." My apologies to GW0PZT for moving him to Anglesey; Edward is in Pwllheli (GDD) on the Lleyn peninsula. He worked into EA1 on 18 and 30 July during good openings. Best DX on the 31st were F6CKZ (JN09) and F6CBH (JN19) in the morning and EA1TA and EA1DAV (IN63) in the evening. Beacon EA1VHF was S9-plus-40dB, so strong that he could hear it plus/minus 20kHz of 144.867MHz. GW8JLY heard HB9IAB/P at good strength on 9 August while the UK and near continent was surrounded by low pressure weather systems. The HB was working lots of Fs and ONs and Lyn couldn't get through the pile-up but he did work EJ6O (IO43XT) on SSB on the 13th.

DEADLINES

THE ABSOLUTE deadline for December is 29 October and for January, 26 November. The two E-mail routes are BT Gold at 76:MSX021 or CompuServe ID 70630.603. The fax machine is on 081-668 5582 and the telex number is 9312111074(CN). And there's always the Royal Mail.

HF NEWS

continued from page 15

ted on disk if preferred. They must be posted within 30 days to: Klaus Voigt, DL1DTL, PO Box 427, O-8072 Dresden, Germany. I can supply photocopies of rules (SASE please).

GI0KOW has sent the UK results of the 1991 ARI Contest which are: (CW section) G3ESF - 250,452 points; (Mixed) GU4YOX - 225,888; (SSB) G3UFI - 139,590, GI0KOW - 121,176, G0OIM - 71,361, G3PRI - 55,334, and G4DFI - 39,520.

CQ WW DX CONTEST

0000 24 October - 2400 25 October (Phone)

0000 28 November - 2400 29 November (CW)


All bands (other than WARC) 1.8 - 28MHz. Single-operator single and multi-band, multi-operator single and multi-transmitter, and QRP (up to 5W output) sections. Exchange RS/T plus CQ zone (UK is in zone 14). QSOs with own continent count one point, with others three. Own country

may only be worked for country/zone credit. The multipliers are the total of DXCC and WAE countries plus CQ zones worked on each band added together. Use separate logs for each band and if you make more than 200 contacts on any band you must send in a 'dupe' sheet. List date, UTC, station worked, numbers in and out, and points claimed. Clearly mark new multipliers and carefully check for duplicate QSOs - the presence of these can result in disqualification. QRP entrants must mark this fact on their cover sheet and give the actual power used. All entries for the SSB contest must be postmarked no later than 1 December 1992 and sent to *CQ Magazine*, 76 North Broadway, Hicksville, NY 11801, USA. Sample log and summary sheets are obtainable from that address in exchange for a large SAE and some IRCs. (Sorry but I have no supply of either.)

THANKS

TO ALL who wrote and to DX-NL (DL1HBT), *Long Island DX Bulletin* (W2IYX), *RSGB DX News Sheet* (G4DYO), *Lynx DX Group Bulletin* (EA2KLL), and *DXpress* (PA3DZN).

Please let me have everything for the December column no later than 20 October.



Novice NEWS

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

IT HAS BEEN mentioned before that *running* Novice courses is fun, and here is the proof, if it were needed. Chris, G7BIG, and two fellow amateurs arranged to start a course at Norden Community School, Shawfield Lane, Norden, Rochdale, last September.

Fifteen students enrolled making a tutorial staff of three essential. The class settled to eleven with ten taking the actual exam. Of the ten who did take the exam eight passed, including the oldest and the youngest. They were seventy-two and twelve years old respectively.

This is the first course that Chris has run, and he is eagerly awaiting the start of the next course on 7 September. The course will have already started when you read this but if you know anyone who is interested contact Chris on 0706 46295, there will possibly be other courses.

It is intended that the Rochdale Observer will report the occasion of the Grand Presentation and, hopefully, Sir Cyril Smith will present the certificates.

MORE DRAGON NEWS

THIRTEEN CANDIDATES sat the Novice RAE and ten were successful. This news comes from the Dragon Amateur Radio Club in Anglesey, sent by the Chairman Dewi, G0ABL.

In this, their pilot course, three classes were combined. I believe the original sorting into groups was done by age and previous experience. Again, the proportion of older class members was higher. Only two of the successful candidates were in their teens, the others older. There are perhaps reasons for this which may apply in many areas.

In his letter Dewi details the travelling involved; round trips for each attendance are listed and, in total, about 3,600 miles were travelled by instructors and students! Individual round distances of 32, 24, and 20 miles were undertaken for each session with the rest travelling between one and twenty miles. This would be

difficult for younger people at any time of year, but darker nights and poor weather would make life even more difficult for everyone. Throughout most of the course the weather was kind and, even the night the roads were flooded, it was business as usual.

The photograph shows Clive, GW4YKL, the Zonal Council Member with his class members. His interest, help and enthusiasm for the Novice Training scheme was much appreciated.

Dewi makes a final comment that has been repeated to me many times. While on his holiday in the Matlock area he became involved with a net of three Novices on 70cm and throughout the contact their courtesy and operating procedure was immaculate. Congratulations to those Novices - and to their Instructors. I too have now found Novices on the air and endorse all those complimentary comments. It is nice to hear perfect manners and procedures and anyone listening, at special event stations or at friends' shacks, must surely be very favourably impressed.

COST CUTTING

PONTYPOOL Amateur Radio Society is concerned about the cost of Novice training, bearing in mind that many are youngsters with limited wealth - and many parents are feeling the pinch at present. Strenuous efforts are made to keep costs down, but it is a losing battle. They have found an answer which may help others with this problem and offer it to you.

Members of the Club agreed to buy four sets of everything which could be issued on a loan basis to students. The student keeps them until *after* the exam then returns the items that can be re-issued. As they produce their own PCB, and a generous local employer provides supplies of some amplifier components, the only *essential* costs to students is for the amplifier speaker and volume control.

While this is less than ideal, it is felt that this saving will perhaps encourage more young people to join the courses. However the option is there for students to buy their own components if they wish.

Con, GW0FJH, sent us news of twelve-year-old Mark who passed the June exam.

The Club headquarters at Pontypool Community Education Centre is now registered as an exam centre with City and Guilds - perhaps other clubs might like to consider this idea.

YOUTH IN ACTION

I WONDER if you managed to contact GB2YIA between 13 and 17 August? Eric, G0DBU, had given the information and, although he would not be present due to pressure of holidays, he invited me to the site if I would like to meet the amateurs and the youngsters.

I had heard the station calling from home but was unable to answer and warn them of our arrival, so we took pot-luck and set off. We found the site with no difficulty.

The weather was warm and the welcome warmer. ATC members were manning the gate and we had to explain ourselves before proceeding, then the chairman of Denby Dale and District ARS, Tony, G0DDB, appeared and escorted us around the site, introducing us to everyone and explaining the activities. For the most part, the youngsters were far too busy to show any interest in us, though all were courteous and friendly when approached.

Some ATC members had volunteered for guard duty that day as they were not as interested in the activities, but all the rest - some thirty to forty - were engaged in receiving Morse, logging the stations, answering quizzes, and constructing, ie soldering - a working crystal set to take home plus small projects and badges. There was a practical demonstration of computer controlled radio and computers generally.

Guide ingenuity had built a stove from a drum filled with sawdust which kept the pot boiling continuously - a welcome amenity.

I had chance to talk to all the helpers - some for the first time - and their enthusiasm and commitment to the project was most impressive. Too numerous to mention individually, I would say "Thanks" to all.

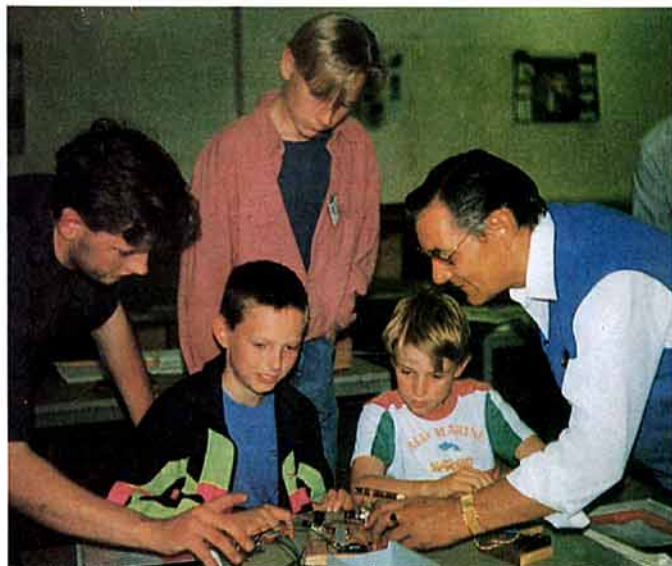
Novices were there too, busily helping in the radio rooms, getting the chance to use their ability to operate, under supervision, on frequencies normally denied to them. An incentive to further their capabilities later on. Each group worked round all the activities so the experience was made as wide as possible.

One important amenity for the youngsters was a 'shop' for those who could not survive between meals which, incidentally, were provided free of charge.

There was a barbecue on the Saturday evening along with music and the last event on Sunday was to be a prize giving. Tony told me that there would be a certificate for everyone, who had taken part, and many small prizes - a very nice gesture.

An immense amount of organisation and work had gone into making this, the third, Youth in Action venture such a success. The weather was kind throughout, though I doubt if the youngsters would have noticed had it been otherwise. Tony paid tribute to the dedicated team of helpers, and I am pleased to make this public. Once again, thanks go to Goodalls Caravans who own the field. It is in an ideal spot, and without the site there would have been no GB2YIA on the air.

I am promised a full report after the event, which I shall share when I can. My only regret is that I never did work the station so I do not qualify for their QSL card.



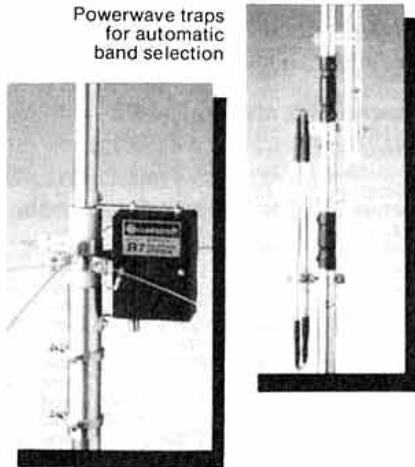
RSGB Training and Education Committee member Clive Trotman, GW4YKL, helping Novice trainees at the Dragon Amateur Radio Club.

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R7 will make ham radio more fun!

SPECIFICATIONS

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

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- no ground radials —
- high performance —

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40-2CD40m 2 element Beam	617B6m 6 element Boomer
20-4CD20m 4 element Beam	A50-6S6m 6 element Beam
20-3CD .....20m 3 element Beam	A50-5S .....6m 5 element Beam
15-3CD .....15m 3 element Beam	A50-3S .....6m 3 element Beam
10-4CD .....10m 4 element Beam	AR-6 .....6m Ringo Vertical
TEN-3 .....10m 3 element Beam	17B2 .....2m 17 element Beam
A4S ...20-15-10m 4 element Beam	13B2 .....2m 13 element Beam
A3S ...20-15-10m 3 element Beam	124WB .....2m 4 element Beam
A3WS .....17-12m 3 element Beam	A144-7 .....2m 7 element Beam
D40 .....40m Rotary Dipole	A144-11 .....2m 11 element Beam
D4 .....40-20-15-10m Dipole	A144-20T 2m 10 element X Oscar
D3 .....20-15-10m Dipole	AR-2 .....2m Ringo Vertical
D3W .....30-17-12m Dipole	ARX-2B ...2m Ringo Ranger II
R7 .....40-10m H/W Vertical	AR-270 .....2m/70cm Vertical
R5 .....20-10m H/W Vertical	424-B .....70cm 24 element Beam
AP8 .....80-10m Vertical	A430-11 ...70cm 11 element Beam
AV55 Band HF Vertical	416TB70cm 8 element X Oscar
AV320-15-10m Vertical	ARX450B ...70cm Ringo Ranger II

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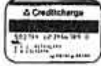
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RSGB



Below are listed just a few of the items from the list.



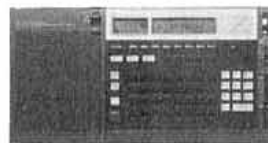
FT1000

HF TRANSCEIVERS/AMPLIFIERS

Model	Brand	Features	£ inc. Vat
SX FT 1000	Yaesu	HF 200w dual VFO	2650
SX FTONE	Yaesu	HF 100w	895
CX FTONE	Yaesu	HF 100w	895
RX FTONE	Yaesu	HF 100w	975
RX FT757GX	Yaesu	HF 100w	525
RX FC757AT	Yaesu	ATU Automatic	225
SX FT980	Yaesu	HF 100w	895
RX FT980	Yaesu	HF 100w	795
AX FT980	Yaesu	HF 100w	625
BX TS-940S	Trio	HF 100w	1595
LX TS690S (inc. ATU)	Trio	HF TX/RX (inc. 6 mtrs)	1095
CX TS-530SP	Trio	HF 100w	475
AX TS-530SP	Trio	HF 100w	475
RX TS-530S	Trio	HF 100w	550
AX FT107 (12v)	Yaesu	HF 100w	425
SX FL7000	Yaesu	HF 500w L/amp	1295
AX FL7000	Yaesu	HF 500w L/amp	1185
RX FT902DM	Yaesu	HF 100w	550
AX FT901DE	Yaesu	HF 100w	439
SX FT101Z	Yaesu	HF 100w	485
RX FT101Z	Yaesu	HF 100w	449
RX FT102 (inc. FM)	Yaesu	HF 100w	550
LX FL2100Z	Yaesu	HF 500w L/amp	450
AX FL2100Z	Yaesu	HF 500w L/amp	549
AX FV101Z	Yaesu	2nd External VFO	135
AX IC-735	Icom	HF 100w	749
AX IC-725	Icom	HF 100w	675
CX IC-730	Icom	HF 100w	425
AX AT-500	Icom	Auto ATU 500w	345
AX AT-100	Icom	Auto ATU	239
AX PS-55	Icom	PSU 20 amps	145
AX FT 102	Yaesu	HF 100w	495
AX YO-100	Yaesu	HF Monitor scope	129
AX FL2100B	Yaesu	HF 500w amp	449
SX FT767GX	Yaesu	HF 100w	1095
CX FT767GX	Yaesu	HF 100w	975
AX FT767GX	Yaesu	HF 100w	1195
CX 430/767	Yaesu	Module 70cm	175
LX HX240 (10-80)	Tokyo	HF 40w. Transvert. 2mtr IF	200
SX HC-2000	Tokyo	HF ATU 2kw	275
AX Corsair	TEN-TEK	HF 100w	825
AX Century 22	TEN-TEK	HF 80-10 MTRS 25w	285
AX MX145	Mizuho	HF 20mtr 2w.ssb handle	169
SX FC-70P	Yaesu	HF ATU 200w	79
SX SPC-300D	CapCo	HF ATU 1kw	169
AX MT3000A	Dentron	HF ATU 3kw	199
AX TM1000	Nevada	HF ATU 1kw	99
SX AL-84	Ameritron	HF 400w amp	349
AX AL-84	Ameritron	HF 400w amp	349
AX PC-1	Datong	HF Converter (2mtr IF)	89

RECEIVERS/SCANNERS

Model	Brand	Features	£ inc. Vat
SX FRG8800	Yaesu	RX. 150khz-30mhz	525
CX FRG8800	Yaesu	RX. 150khz-30mhz	449
AX FRG8800	Yaesu	RX. 150khz-30mhz	499
CX FRG7700M	Yaesu	RX. 150khz-30mhz	299
AX FRG7700	Yaesu	RX. 150khz-30mhz	295
RX FR101	Yaesu	HF RX. 10-160m	225
SX NRD 525	JRC	RX. 150khz-30mhz	699
SX PRO-2004	Tandy	Scanner 25-1300 mhz	249
SX PRO-9200	Tandy	Scanner 66-512mhz	89
SX FRG9600M	Yaesu	RX. 60-950mhz	395
RX FRG9600M	Yaesu	RX. 60-950mhz	475
AX FRG9600	Yaesu	RX. 60-905mhz	395
SX IC-R70	Icom	RX. 150khz-30mhz	425
AX IC-R72	Icom	RX. 150khz-30mhz	489
AX IC-R71	Icom	RX. 150khz-30mhz	499
AX R2000	Trio	RX. 150khz-30mhz	429
AX IC-R70	Icom	RX. 150khz-30mhz	449
MS1000	Nevada	RX. 500khz-30mhz	199
AX 108	Win	RX. VHF airband	119
AX R532	Pro	RX. VHF airband	149
AX ICF-SW77	Sony	Portable RX. htl/vhf	299
AX ICF-AIR7	Sony	RX. HF + VHF airband	149
SX ICF-AIR7	Sony	RX. HF + VHF airband	179
SX ICF-PRO80	Sony	Portable RX. htl/vhf	219
BX ICF-PRO80	Sony	Portable RX. htl/vhf	219
AX ICF-PRO80	Sony	Portable RX. htl/vhf	149
RX ICF-PRO80	Sony	Portable RX. htl/vhf	220
AX ICF-2001D	Sony	Portable RX. htl/vhf	189
AX MX7000	Regency	Scanner 25-1300mhz	249
AX AR2002	AOR	Scanner 25-1300mhz	249
AX AR1000	AOR	Scanner 8-1300mhz	189
SX DX-440	Tandy	Portable RX. htl/vhf	109
SX PRO-34	Tandy	Scanner vhf/uhf	129
AX 200XLT	Bearcat	Scanner vhf/uhf	125
AX BJ-200	Jaguar	Scanner vhf/uhf	139

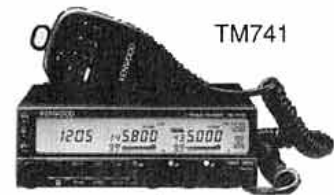


ICF2001D

DATA/COMPUTER

Model	Brand	Features	£ inc. Vat
SX AMT-1	I.C.S.	Amtor/rtty terminal	135
SX PK-87	I.C.S.	Packet TNC (88 software)	90
SX FIF80	Yaesu	RS232 interface	25
SX MMT4001	M/Modules	TU RTty, CW c/w keyboard	159
SX MM1000	M/Modules	Ascii to morse conv.	49
AX Microreader	ERA	LCD 16 char. rty/cw	115
AX IF232C	Kenwood	Computer interface	115
SX 5000E	Tono	Multimode TU inc. KB/VDU	499
AX CD660	Telereader	TU - AMTOR/RTTY/CW	165

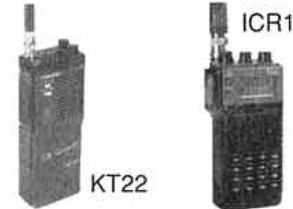
*Subject to status



TM741

VHF/UHF TRANSCEIVERS

Model	Brand	Features	£ inc. Vat
SX IC-251E	Icom	2mtr multimode 10w	385
SX IC-575A	Icom	6mtr/10 mtr 10w	795
RX IC-25E	Icom	2mtr FM handle	155
RX TH215E	Trio	2mtr FM Handle	175
AX TR751E	Trio	2mtr multimode 25w	495
AX TR851E	Trio	70cm multimode 25w	525
LX TS790E	Trio	2mtr/70cm multimode	1250
RX FT650	Yaesu	6mtr/10mtr 100w	825
AX FT690R2	Yaesu	6mtr 3w. multimode	350
LX FT290R2 (FL2025)	Yaesu	2mtr 3w (25w) multimode	460
AX FL2025 (+MMB31)	Yaesu	2mtr 25w L/amp (290R2)	110
AX FT290R	Yaesu	2mtr 3w. multimode	250
AX FT480R	Yaesu	2mtr 10w multimode	325
AX FT780R	Yaesu	70cm 10w multimode	375
SX FT230R	Yaesu	VHF 25w FM mobile	139
AX FT227R	Yaesu	2mtr 10w FM mobile	139
RX FT203R	Yaesu	2mtr Thumbwheel handle	145
AX FT703R	Yaesu	70cm Thumbwheel handle	149
SX FT73R	Yaesu	70cm 3/5w FM handle	189
LX FT470	Yaesu	2mtr/70cm FM handle	220
RX FT727R	Yaesu	2mtr/70cm FM handle	275
RX FTV107R	Yaesu	Transverter 2mtrs 10w	175
RX FTV107R	Yaesu	Transverter 2mtr/70cm	275
RX FTV901	Yaesu	Transverter 2mtr	175
SX HT106	Tokyo	6mtr 10w sss/cw	249
AX C120	Standard	2mtr 5w handle	139
AX C5800	Standard	2mtr 25w multimode	279
AX D520	Standard	2mtr/70cm handle + bits	379
BX Palm-4	Dunno	70cm 6ch. Handle	99
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AX KT22E	Kenpro	As above + loadsa bits!	149
AX ALM203E	Ainco	2mtr LCD + memory handle	145
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AX MR150V	Tono	2mtr 100w L/amp 10w in	139
AX LPM144/10/100	Bnos	2mtr 100w L/amp 10w in	189
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RW MR750E	Daiwa	Rotator (no guarantee)	185



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SWL NEWS

BOB TREACHER BRS 32525
93 Ellbank Road, Eltham, London
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WITH THE closing date for the RSGB's 1992 SWL Contest still a few days away as I write this, I am most encouraged at the response this year. The results will appear in due course, but there are listeners out there who are quite proficient at the art of contesting and there are others who still have much to learn. However, the entries show a good mix and it will be interesting to adjudicate the entries.

While on the subject of contest activity, it is time to remind listeners that my October Challenge comes up again on 24/25 October to coincide with the SSB leg of the biggest contest event in the calendar - CQ WW.

WHERE ARE THEY NOW?

THIS IDEA seems to have been well received, as five of the SWLs whose receiving numbers were mentioned in the August issue have provided details of their amateur radio 'career' since 1983. I will start the series with Andy Smith who was ARS50134.

Andy was licensed as GU1DWO in 1984 and lives in Guernsey. He still listens on HF, but his main interest is 50MHz. He still keeps an All Time Countries list: 293 countries heard, 226 on 28MHz, 235 on 21, 257 on 14, 203 on 7, 189 on 3.5 and 103 on 1.8MHz. On 50MHz, Andy has heard 79 countries and has worked 48. His equipment is an IC-551 with about 15W to a 2-element Yagi. His best contacts on 50MHz have been this year with I2ADN/IG9, 7Q7JL, UZ2FWA, ZA1A, TA5ZA, 4U1ITU and EH9IB.

Although GU is listed as 'rare', several stations are active, mainly GU7DHI. Apart from himself, GUS 1HTY, 1JDN, 2HML, 6RWD and 8IRF are occasionally active. A group of GUs were hoping to activate Sark this summer, but they now hope to arrange the trip for next year. Andy is also active on 144MHz and caught some Sporadic E to HA, OK, OZ and

SM on 22 June. There he uses an FT290R Mk 1 plus a MUTEK board and a MM 30 Watt linear into an 8-element Yagi.

If any SWL hears Andy on 50 or 144MHz and can provide a proper report (stations worked, reports passed, etc) he will be pleased to provide the necessary confirmation. If QSLing direct, please remember that English postage stamps are not valid in the Channel Islands.

David, G4CYW, our QSL Manager, says that from his records ARS8808 is now G4PVM, BRS30493 is G6LAU, BRS35509 is G6TEP, ARS44984 is G6CSY, BRS45033 is G6NBO and BRS45466 is GW6MHV. I hope to hear from these in due course, but if your old BRS number appeared on p23 of the August issue and you have not already written, please drop me a line.

RARE WAB SQUARES

ED, G3DDK, wrote to say that of the 'difficult to activate' WAB areas mentioned in August, G3VCA/M activated TR08 on 23 April 1992. There were obviously no SWLs listening at the time!

While on the subject of WAB, G4HPU wrote with details of special event stations to be established in coastal towns where lifeboats are stationed. A certificate is available for hearing 10 on HF or 5 on VHF (unfortunately, I have no list of the active stations). Claims should go to A C Keeble, G4HPU at Heather Field, Colchester Road, Ardleigh, Colchester, Essex CO7 7PA giving details of date, time, band, station being worked and reports exchanged. The cost of the Award is £3, which will go towards the WAB 25th Anniversary Appeal to provide a Class 'D' Lifeboat.

OCTOBER SSB CHALLENGE

HAVING ATTRACTED a number of listeners to contests for perhaps the first time, I hope that interest can be retained to produce a bumper entry to this Challenge. The few rules are produced here, and it is hoped that as there are so few, it might attract a few more listeners to join in. The idea of the Challenge is to log as many countries as possible during the 48 hours from 0000 on 24 October to 2359 on 25 October. You can therefore listen when it suits you. As you will be trying to find as many countries as possible, you can only log *one* station from each

DXCC country on each of the six main amateur bands. Points can be claimed as follows - countries in the SWL's own continent count 1 point on each band, and countries outside the SWL's own continent count 5 points on each band. Your final score will be the number of points scored from each station you have heard on each of the six bands multiplied by the total number of DXCC countries heard. Entries *must* show date, time, callsign of station heard (the callsign of the station being worked does *not* have to be shown), and the RS of the station heard at your QTH. To avoid 'dubious' loggings, the minimum acceptable report *must* be 4x4. Logs should be sent to me at the above address post-marked no later than 23 November. A prize will be awarded, but only if there are at least 20 logs.

80 METRE DXING

AS PROMISED here's a look at the sort of propagation that can be expected on 80m during winter months so that listeners who may be new to the Society or the hobby can take advantage of the DX that can be found there. 80m DXing used to be the main pastime here - my current score on the band is 278 countries heard.

To be successful on LF requires some patience (because conditions are not always right for DX), a good receiver (because the band can be noisy) and a good aerial (because DX signals arrive at a lower angle and something like a sloping dipole cut for the DX portion of the band will be needed). Assuming you have all three, you are ready to have a go at some LF DXing.

The first thing you need to know is that most of the SSB DX (stations outside Europe) will usually be found in the top 10kHz of the band (from 3.790 to 3.800MHz). Stations in the USA and its possessions can also use frequencies higher than 3.8MHz and you will hear some stations listening higher up the band (eg transmitting on 3.790 and listening on 3.804MHz). A receiver that allows you to switch between two preset frequencies will be an advantage here.

The best months for LF DX are from October through to March, with the best conditions during December and January. What you will hear depends on conditions, but it is worth remembering that the best conditions will always be found around sunrise or sunset. At the shortest day, you will find DX audible on the band until 1000 and from about 1530

on days when conditions are especially good you may hear East Coast Ws or VEs after 0900 and stations from JA or the Pacific before 1530. Indeed, during one very good DX opening a few years ago, a ZL was copied at 1415.

I do not intend to go into the band's propagation characteristics here. Anyone who thinks they will get serious on the band should purchase ON4UN's book *Low Band DXing* (see Book Case pages 78 and 79).

To give a flavour of the DX you can expect to hear, stations in the States, the Caribbean and South America will normally be at their best from midnight, with a peak at our sunrise. The Pacific can be heard between about 0600-0830, but conditions dictate when this is possible. Once darkness has fallen (or is about to fall), you can expect to hear JA, HL and YB stations. Africa is also possible, but openings will more than likely be from around 1900. Stations in the Near East will also be heard. VKs will be heard from around 1900, with VK6s audible around 2130. Openings to JA have been known to continue from 1600 through to 2200, and there is a 'window' to VS6 during December/January at about 2200. State-side and Canada are possible from early evening.

Let me know how you get on. I will provide a similar guide to 7MHz next month.

REPORTED LOGGINGS

THE PERSEIDS Meteor Shower provided some good 144MHz reflections on 12 August. Best SWL report was UZ2FWA. 50MHz continued to provide plenty of Europeans to work via Sporadic E. Again, the best loggings to hand at the time of writing were YL/ES9C, EH6VQ, EH9IB, SN5PAR/8, UA2F/DK2ZF and I2ADN/IH9. DX traffic had all but dried up, but CN8ST, EA8/DJ3OS and 7Q7RM were reported.

On HF, the number of reports have increased, but the poor conditions (sunspot numbers for the end of July were as low as 096) meant that not much real DX was heard. The best on offer were: BV2BT, DU7AF, EK3DA/MM, KC6OO, VP8CKA, VQ9GY, VU2JJQ, ZA1TAG, ZD7VC, ZD8SA, 4S7AVR, 5Z4FM and 9K2YA.

FINALE

THE DEADLINE for the December issue is 11 November.

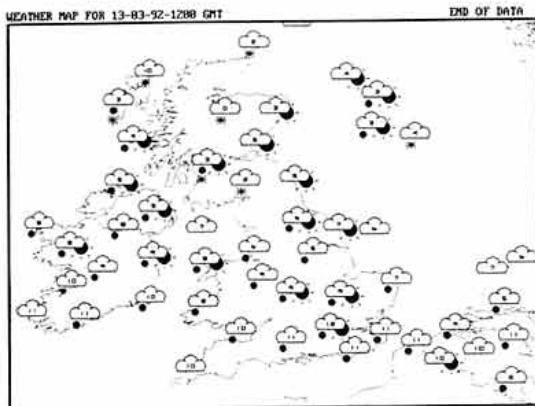
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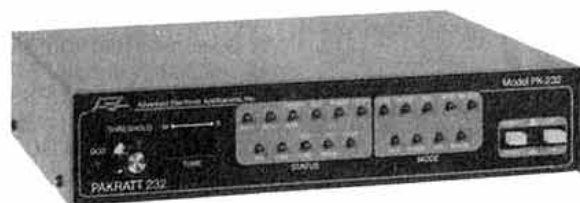
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How to Build a Simple RF Sniffer

by Steve Ortmyer, G4RAW

THINKS MR BIG: "A spy must have hidden a secret transmitter in my office". Some of his industrial secrets are in the hands of a rival company, and Mr Big is very concerned. He is the boss of Megga Tec PLC, makers of virtual reality computers. "I know!", he thinks, "I will ask my two young friends Norman and Nancy Novice to check out my office - they are radio enthusiasts and will know exactly what to do".

SIMPLE SOLUTION

IF YOU WERE NORMAN or Nancy would you know what to do? Well, luckily they were both RSGB members and reached for their latest *RadCom*. What they needed, of course, was a sensitive field strength meter to detect energy from the secret transmitter.

The RF Sniffer described here is a field strength meter and has many uses besides finding secret transmitters. It has been found invaluable both inside and outside the shack for checking various functions on transmitters, antennas and ATUs. No doubt there are also occasions where it could help out with the odd EMC problem, too.

CONSTRUCTION

THE CIRCUIT DIAGRAM is shown in Fig 1. RF is received on the short wire antenna and detected (rectified) by the diode, D1. The relatively small voltage is then amplified by the FET to give an indication on the meter.

The RF sniffer is constructed on plain perforated board with wires from the components bent underneath, thus avoiding the

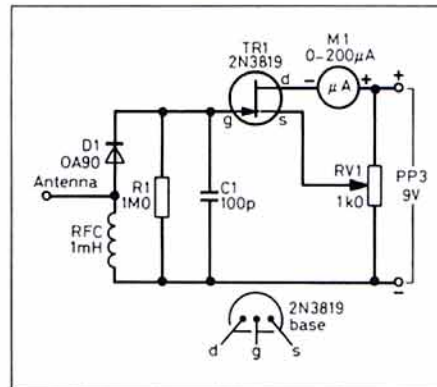
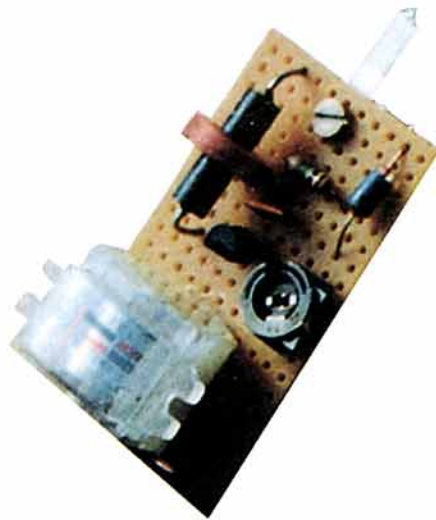


Fig 1: The simple sniffer uses a Field Effect Transistor (FET) to amplify the signal received by diode D1.

need for a PCB (see photograph). The antenna is about 30cm of stiff wire - bending the end into a small loop helps avoid the possibility of eye damage! The meter can be any surplus type of less than 1mA full scale deflection - not so common as they used to be but often available at rallies. I used a tape recorder level meter which was quite small. The antenna is soldered to a solder tag bolted to the board with a 6BA nut and bolt.

FINAL ADJUSTMENTS

WHEN COMPLETE CHECK the connections carefully. I didn't use an on/off switch but just pulled off the battery connector when the RF sniffer was not in use. Connect the battery and adjust VR1 until the meter needle is just coming off the zero stop (with no RF present). Testing is best carried out with a low power transmitter which should give a reliable indication on the meter. I tested it for operation between 1.8MHz and 145MHz but it should also work at higher frequencies.

CONCLUSION

PERHAPS YOU WILL NOT be asked to catch any industrial spies with your RF Sniffer but it should still prove useful and as they say in the Scouts "Be Prepared!"

COMPONENTS LIST

C1	100p	D1	OA90
R1	1M0	RFC	1mH choke
RV1	1k0	M1	200mA FSD Meter
TR1	2N3819		

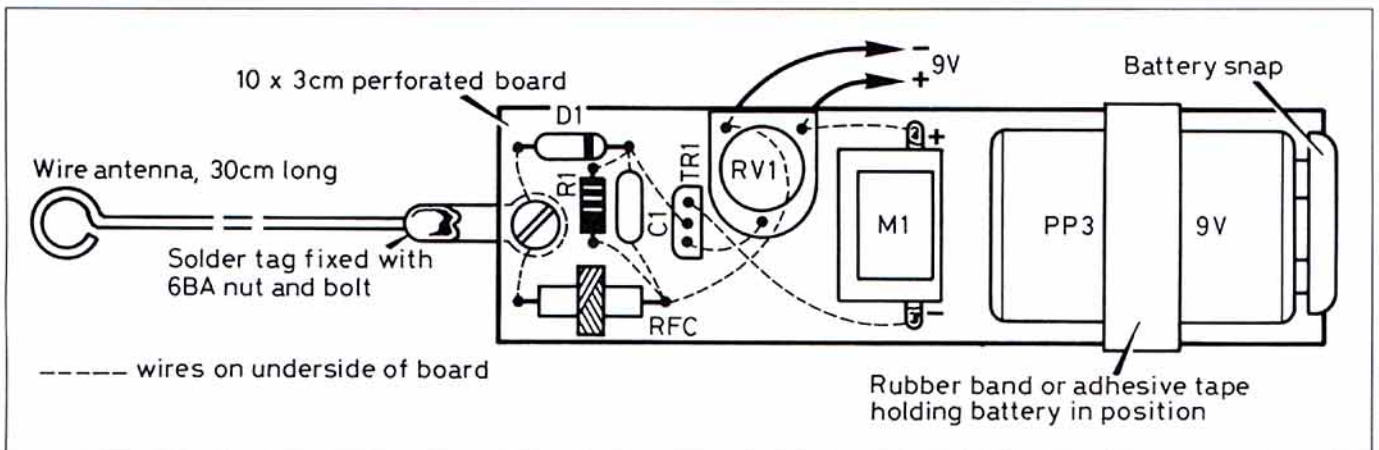


Fig 2: The RF sniffer is easily built in an evening using readily obtainable components. The 1mA meter is the sort of surplus component which can often be bought at mobile rallies. At the end of the wire antenna is a loop to protect against eye damage.

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A Remote Controller for the IC725/726/735

by Bob Harris, G4APV MSc CEng MIEE

THIS CONTROLLER provides remote operation of the main functions for the ICOM IC725, IC726 and IC735 HF transceivers over a distance of at least 30 metres. It can be built to mimic the front panel of the transceiver, in much the way some of the modern VHF rigs do (for example the Icom IC901).

The controller is microprocessor based and uses CMOS technology. This allows adequate operating current to be drawn via the +8V supply on the microphone socket of the transceiver, and the low power levels mean reduced spurious radiation.

Even at retail prices the unit should not be too expensive to build although rallies and junk box bits can reduce the cost dramatically. It is mainly used in the shack to provide a quick QSY using the keypad, but is also very useful in the car to allow remote control of my boot mounted IC725 (no expensive rig taking space under the dash, whilst in view of thieves!). See photo of the installation.

A 4 x 4 keypad provides 0 to 9, decimal point and an enter key. The remaining four keys control mode, memory channel selected, selection of VFO A, VFO B or memory and the last key is a memory write control.

Separate up and down tuning buttons are provided. These can be mounted on the gear lever to allow tuning safely while driving. They are inputs to the microprocessor and are not the same as the conventional up/down buttons on the microphone. The display will follow the frequency and mode if they are changed by using the transceiver's front panel. Also the display will update as the transceiver is remotely controlled via the keypad and up/down tuning buttons.



ICOM CONTROL PROTOCOL

TO APPRECIATE THE HARDWARE design it is useful to understand how the Icom C-IV bus system works. The bus is a CSMA/CD system (carrier sense multiple access with collision detection) as used in packet systems. All this means in practice is that several radios and controllers share the same two wire bus and that if two try to send a message at the same time then the error is detected.

The connection system is as shown in Fig 1. Two controllers and three rigs are shown in this example. They are all on the same bus, and it should be noted that in this case the bus switches between 0 and 5V and not RS232C levels. Whilst the design could operate with multiple rigs and controllers, the present software only allows one controller and one rig to be used.

To understand the operation of the bus assume the controller wishes to change the rig's frequency to 14.0900MHz. The data is sent to the rig in 8-bit bytes (plus one start and one stop bit), and ten of these bytes are used to form the complete packet of data sent to the rig as shown in Fig 2a.

The transceiver will reply in one of two ways, either as in Fig 2b (if successful), or as shown in Fig 2c (if unsuccessful).

Although the latter should never happen, it is only likely if you ask the rig to go to a frequency it does not cover, for example 145MHz. In this case the software in the controller will not let you enter 145MHz in the first place. Other control codes allow changing of mode, memory channel, selection of VFO A, VFO B or memory and memory writing. The other control codes and their functions will be outlined in part 2 of this article.

If the rig itself is operated, changes in mode and frequency are output as packets of data by the rig to the controller so that it always displays them correctly.

The default baud rate for the IC725/726/735 is 1200 baud. This must be increased to 9600 baud to get usable results. In the IC735 this is done by changing a jumper, in the IC725 and IC726 diodes must be changed. The IC725's address is 28H, the IC726 is 30H and the IC735 is 04H. The controller expects that the rig it is controlling will have an address of 04 (ie the IC735's default address). If you have an IC725 or IC726 then you will have to set its address to 04. The various link and jumper changes needed to do these changes are detailed in Table 1. To get access to the links it is necessary to remove the bottom cover and in the case of the IC725 and 726, lift the circuit board to get access to

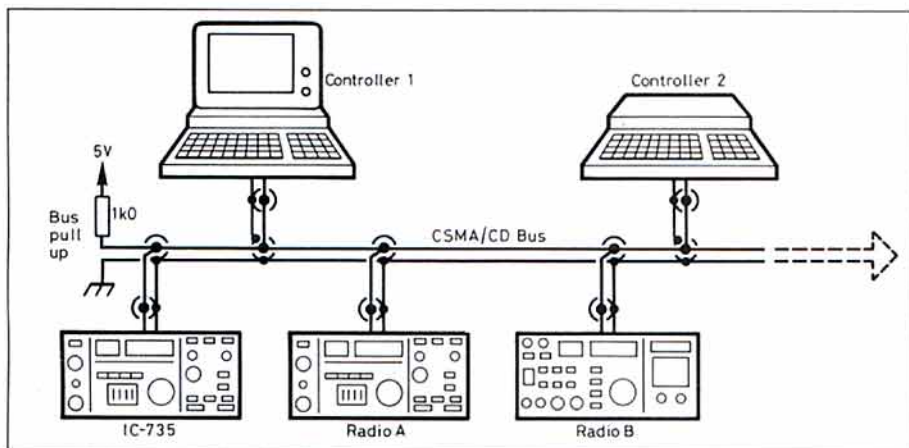


Fig 1: Several different transceivers and/or controllers can be connected as shown. Links in each transceiver set the address and baud rate for each unit.

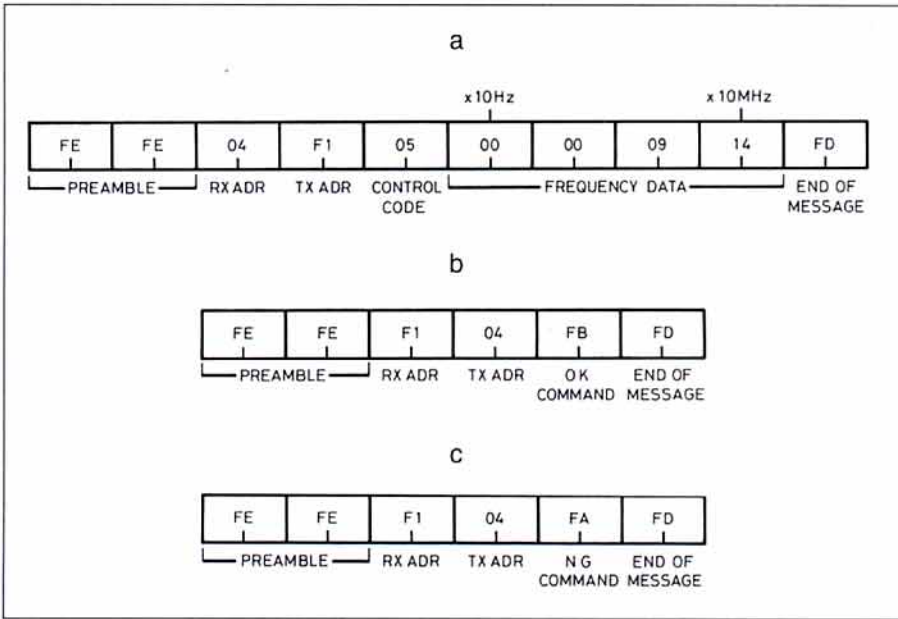
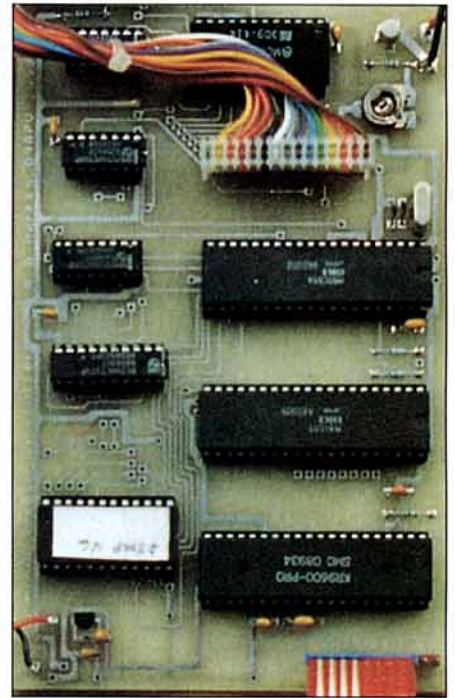


Fig 2: Format of data sent and received on the Icom C-IV bus. Fig 2a (top) shows a request for a frequency change. A successful operation produces the message of Fig 2b from the transceiver, and an unsuccessful outcome results in the format of Fig 2c.



The controller PCB interfaces with a two-line LCD display, with keypad control via a KR9600 IC.

unsolder the diodes. If you have any doubts about doing the work yourself or have problems about invalidating the warranty then ask your dealer to do it. It should not be expensive. Note that page 12 of the IC726 manual contains an error, at the time of writing. It says 'Default 28H (40dec)'. This should read 'Default 30H (48dec)'.

The Eurocard size PCB contains nine chips including three 40 pin types. The KR9600 keyboard encoder interfaces the keypad to an 81C55 parallel I/O chip (this also contains the system RAM of 256 bytes and a timer). The processor is an 80C85 which uses a 27C32 EPROM as it's main memory. The serial input and output is via a 6350 (a CMOS 6850). The remaining chips are latches etc. The display is a Hitachi LM016L which is driven directly off the processor's bus lines. The microprocessor and address decode section of the circuit is shown in Fig 3, and the display interface in Fig 4. Details of the keypad encoder and remaining circuitry will be shown next month.

SOFTWARE

THIS IS WRITTEN IN 8085 assembler as a series of modules, all of which were individually tested and then linked together to form a complete program that occupies some 2k of the EPROM.

Interrupts are used for the keypad and for data arriving from the rig. The program basically sits in a tight loop looking for either a flag indicating that an interrupt has occurred, or that either the up or down tuning button is being pressed.

I see no point in describing the detail of the software. If you wish to modify it then the source code is available – just let me have a formatted IBM compatible disk with an SAE.

LINK CHANGES FOR CORRECT BAUD RATE AND ADDRESSES

Baud Rate	IC725	Diode Matrix	D3
9600	D2 Fitted		Not Fitted
1200	D2 Not Fitted		Fitted
300	D2 Fitted		Fitted

To change from 1200 baud to 9600 baud remove D3 and fit D2 onto the 'main unit' circuit board under the bottom cover of the IC725.

Address matrix:

D57	D58	D59	D60	D61	D62	D63
1	2	4	8	16	32	64
		●	●		●	

– As originally fitted
– Required for correct operation

To change from the default of 28H to the required address of 04H, remove D60 and D62, and fit D59.

Baud Rate	IC726	Diode Matrix	D3
9600	D2 Fitted		Not Fitted
1200	D2 Not Fitted		Fitted
300	D2 Fitted		Fitted

To change from 1200 baud to 9600 baud remove D3, fit D2 on the 'main unit' circuit board under the bottom cover of the IC726.

Address matrix:

D57	D58	D59	D60	D61	D62	D63
1	2	4	8	16	32	64
		●		●	●	

– As originally fitted
– Required for correct operation

To change from the default of 30H to the required address of 04H, remove D61 and D62, and fit D59.

IC735

The baud rate and address are set by a series of link jumpers on the PL unit under the top cover. The address is already set correctly at 04H.

Baud Rate	Jumpers	DB5
—	DB4 Not Fitted	Not Fitted
9600	DB4 Fitted	Not Fitted
1200	DB4 Not Fitted	Fitted
300	DB4 Fitted	Fitted

To change from 1200 baud to 9600 baud, remove link DB5 and fit link DB4 on the 'PL unit' circuit board under the bottom cover of the IC735.

Table 1

... to be concluded



Book Review

RADIO COMMUNICATION CONCEPTS: ANALOG

By Ralph S Carson

First edition published 1990 by John Wiley & Sons Inc, xx + 470 pages, (hard covers), ISBN-O-471-62169-2.

THIS NEW American book by Professor Carson (University of Missouri-Rolla) is primarily intended for those practising engineers whose training has been based largely on digital concepts.

Admittedly, a number of the problems set at the end of each section are related to amateur radio, and much of the text would be useful to those designing (rather than building the designs of others) amateur equipment. But it is essentially a theoretical/mathematical textbook concentrating on circuit and concept analysis based throughout on the material of trigonometry and the trigonometric Fourier series. The publishers recognise that "to gain the most from this book, the reader should have at least a rudimentary understanding of basic electronic devices and their circuits, the ability to follow calculations of the coefficients for a trigonometric Fourier series in one variable, and the capacity to recognise a differential equation but not necessarily to solve it".



The text is in ten sections plus six appendices, a bibliography and a six-page index. It provides an in-depth coverage of both linear and non-linear mixing; noise, including noise spectra, thermal noise, shot noise and other noise sources; special functions and filters: amplitude-modulation processes (including DSB and SSB); angle modulation (FM, phase modulation, detectors, the PLL as FM demodulator and frequency synthesiser); the superheterodyne radio receiver; spurious responses; and intercept points. The appendices include tables of integrals and listings for two computer programs in BASIC.

There are some puzzling features: the book itself is titled as above but the jacket and blurb omits 'communications' and refers only to "Radio Concepts: Analog". There is a noticeable absence of any detailed treatment of sine-wave oscillators. In brief, not a book to be bought unseen by the 'amateur, amateur' but a useful tool for the serious engineer seeking an analytical study of analogue concepts.

G3VA

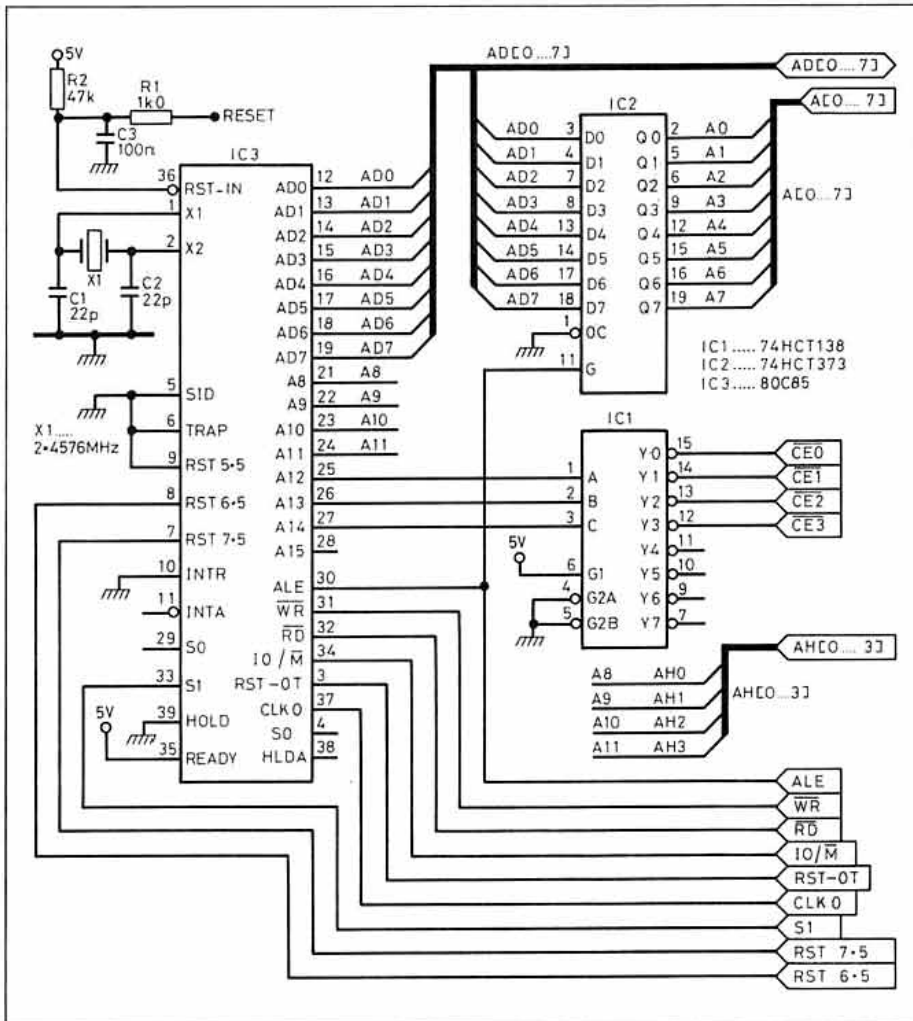


Fig 3: An 80C85 microprocessor (IC3) is used for the Remote Controller. This has multiplexed data/address lines, with the least significant address byte latched by IC2. Display and bus control circuits are enabled by IC1.

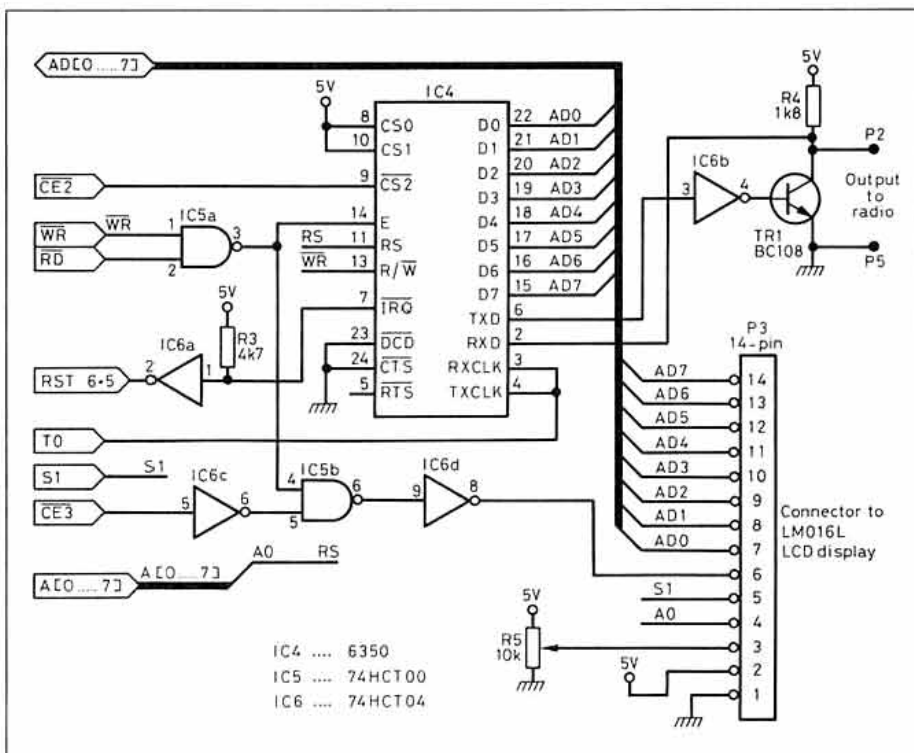
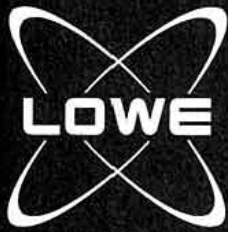


Fig 4: The display interface uses an Hitachi LM016L which is driven directly from the microprocessor's data bus. IC4 is a UART (Universal Asynchronous Receiver Transmitter) and drives the transceiver bus lines via IC6b and Tr1. The variable resistor R5 controls the brightness of the display.



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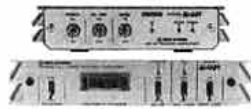


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PLIERS-TYPE RF CURRENT PROBE

IN THE JULY *TT*, p39, Dave Plumridge, G3KMG, mentioned that he had seen "many years ago in *TT*" a device involving a spring-type of clothes peg with two half toroids which could be clipped round a coax cable to form a current transformer with diode rectifier and meter, that could be used to measure the current flowing on the outer-braid of a coax feeder cable (or the RF current flowing in an antenna wire-element or an open-wire feeder).

This has brought in some correspondence. Colin Greenaway, G3UGG, Eric Sandys, G12FHN, and Malcolm Horton, G4DMH, explained why I had not been able to trace the item in *TT*: the reason was simple - it was not in *TT* but described in an article by M R Irving, G3ZHY, 'The peg antenna meter' (*RadCom*, May 1972, pp297 and 301). G3ZHY pointed out that he had used a small toroid that would fit over a wire conductor or small-diameter coaxial cable but the two halves would not close on thicker cables, and his device had not been intended to work above about 3.5MHz. He had noted that "the only items needed are those components shown in Fig 1, some fixing cement such as Plastic Padding, together with a hand-drill, hacksaw and a small file. A little patience is required when cutting the ferrite ring, and two attempts were necessary by the author before obtaining a satisfactory clean break. Those seeking perfection should try to obtain the use of a jeweller's diamond saw."

Dick Rollema, PA0SE, also noticed G3KMG's remarks and has sent along full details of a rather more ambitious pliers-type RF current probe (Photo and Fig 2) that he described in his 'Reflecties door PA0SE' column in *Electron* (VERON) in July 1990. He writes: "Such devices are widely used by the 50Hz power people. In German it is called a stromzange, in Dutch a stroomtang (ie current pliers).

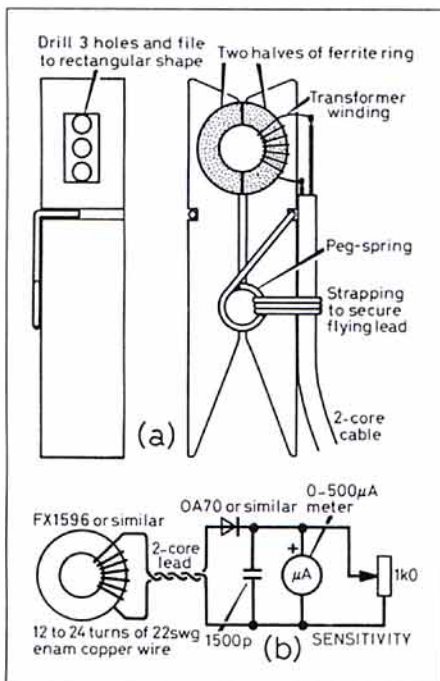
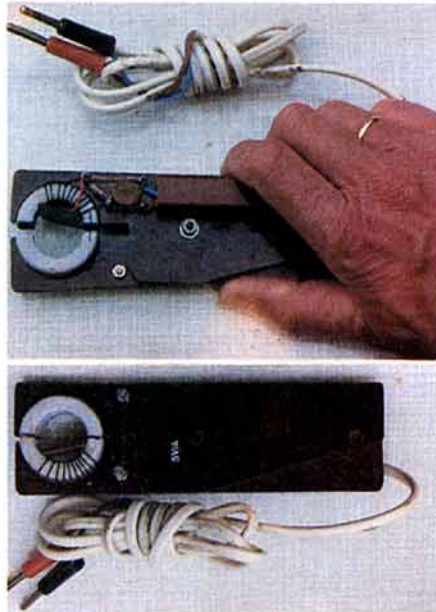


Fig 1: (a) Basic constructional details of G3ZHY's peg sensor as described in 1972. (b) The complete ferrite ring RF meter.

Pat Hawker's Technical Topics



The PA0SE pliers-type RF current probe.

"When the toroid is clamped over a conductor the latter acts as a one-turn primary of a current transformer, the winding on the toroid core forming the secondary. Thus, in Fig 2 the secondary current flows through R resulting in an RF voltage across R. This is rectified by diode D, and after the bypass capacitor C fed to a high-resistance voltmeter; a digital type is easy to read. [Note that the voltmeter must be far enough away from the source of RF to ensure that there is no direct pick-up - G3VA]. To make the reading independent of frequency, the reactance of the secondary winding should be at least $5R = 5 \times 56\Omega = 280\Omega$.

"I used a 'violet' Philips toroid of 38mm outer-diameter, 4C6 ferrite, $\mu = 125$. The measured self-inductance of the winding is $15.6\mu\text{H}$, (before splitting the ring it was $17.7\mu\text{H}$, showing the effect of the two airgaps, even though the two halves fit together perfectly). The $15.7\mu\text{H}$ inductance results in a reactance of 345Ω at 3.5MHz so is more than enough. On 1.8MHz, the reactance is only 177Ω , introducing an error of almost 5%, but nevertheless still a useful sensor.

"The difficult part is splitting the ring. First, make two sharp notches opposite each other, using a file (a thin diamond disc would be ideal if you are on good terms with your dentist). The toroid is then clamped with its lower half in a vice. A piece of wood is put against the upper half and struck a blow with a hammer. With luck, a clean fracture . . . without it, try again. My second try was successful. After the secondary winding has been wound on, the two halves are fitted to the 'pliers' with some epoxy.

"I made my 'pliers' out of paxolin, but other materials such as perspex, suggest themselves. The toroid is kept closed by a spring and opens when the 'pliers' are squeezed. Keep the two halves in the closed position while the epoxy cures. Be very careful that no epoxy gets into the gaps between the two parts of the ring (voice of experience)!

"To calibrate the sensor, I used the arrangement shown in Fig 3. The sensor is clamped over the upturned U-loop. The transmitter should have variable CW output. R is a 50Ω dummy load. If the meter, V, shows a voltage of U_{dc} then the current through the loop is $I_{\text{rms}} = (0.707 (U_{\text{dc}} + 1.2V))/50\Omega$. The 1.2V accounts for the voltage drop across the two silicon point-contact diodes. By varying the transmitter output (do not exceed the maximum permissible voltage across the diodes) the DC output voltage of the sensor can be plotted against the primary RF current. I found a perfectly linear response when the RF current was 50mA or more. Below that value the diode in the sensor introduces some non-linearity. The conversion factor in my case worked out at 5VDC per 1A RF current. The response proved frequency independent up to at least 30MHz.

"I have found this RF current probe a most useful device. I use a long-wire antenna about 37m long on 1.8, 3.5 and 7MHz. The wire is fed directly at one end via an L-network. The 'cold' side of the network is connected to a radiator of the central heating system. The current sensor shows that indeed most of the current flows via the radiator pipe to earth. But considerable current also flows via the mains-cord of the transmitter with even some via the earthed triangular metal mast that supports

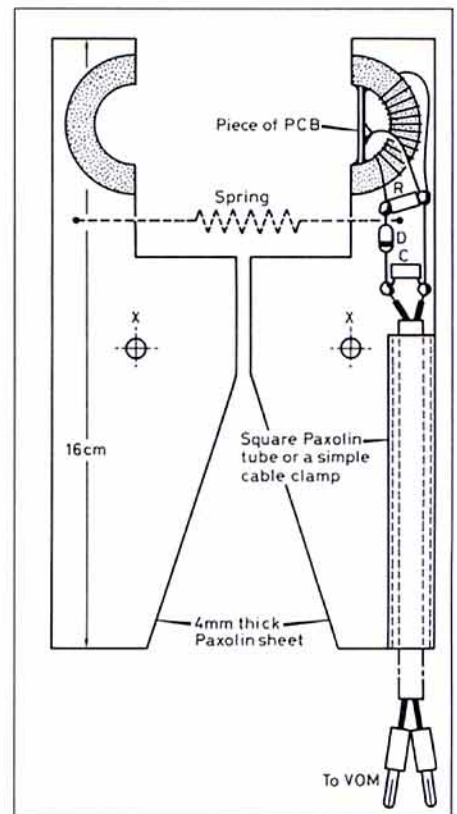


Fig 2: Details of PA0SE's pliers-type RF current probe. R is 56Ω . D is germanium point-contact diode. C is 10nF ceramic. Philips toroid OD 37mm, Ferrite 4C6 $\mu 125$, violet. Winding 10 turns of 27SWG enamelled wire. Inductance is about $15.7\mu\text{H}$.

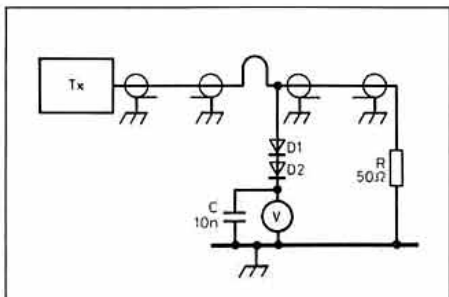


Fig 3: Arrangement used for calibrating the probe. D silicon point-contact diodes, R 50Ω, C 10n ceramic capacitor.

one end of the antenna. It is interesting to note that the current does not divide evenly over the structural elements of the mast!

"I have also used the current probe to check the current in the loops of my 'Optiquad' antenna. It was gratifying to note that on 28, 21 and 14MHz, where I made my measurements, current maxima occurred at the expected positions and also that the current in the left and right halves of the loop were equal. This showed that the baluns were performing correctly although I already knew that because the sensor detected no current on the outside of the coaxial feeder cables connected to the baluns (the baluns used by PA0SE were described in *Eurotek* by G4LQI, *RadCom*, August 1992, p51).

"To sum it up. I consider that an RF current probe of this type is a must for serious antenna experimenters."

Wire-loop current probes and their uses are described by Les Moxon, G6XN, in *HF Antennas for all locations* (p237) and a ferrite probe with a fixed gap in the toroid was included in *TT*, November 1984, stemming from Dick Kelsall, G4FM. This was basically similar to the PA0SE probe but without the advantage of being able to open and close the gap so that it could be used with large diameter cables etc. G4FM also experienced the problem of cutting ferrite cores without fracturing them. His solution was to cast the ring in polyester resin (from a glass fibre repair kit) inside a suitable piece of plastic tubing resting on a sheet of glass laminate. When the resin was set he was able to file a slot through the resin and ferrite core without difficulty.

DECOUPLING CAPACITORS - WHY USE TWO WHEN ONE WILL DO?

SOME COMMON CIRCUIT TECHNIQUES tend to be accepted as the thing to do without anyone questioning them. Once the technique becomes common practice it acquires an air of authority and a momentum of its own. One such technique could be the use of a parallel combination of large-value and small-value capacitors to extend the effectiveness of RF bypassing over an extended frequency range.

The technique probably stemmed from the long established system of connecting an RF-type capacitor (ceramic or mica etc) across an high-value electrolytic capacitor when it is necessary to provide RF bypassing/decoupling. This was (and is) an effective system since electrolytic capacitors tend to be very ineffective for RF bypassing, although provid-

FULL-WAVE ENVELOPE DETECTOR

FERGUS VEITCH, G4LEV, draws attention to an item in the 'Ideas for Design' feature of *Electronic Design*, May 14, 1992, pp94-95. This is entitled 'Envelope Detector is Very Simple' by Thomas J Schum.

This points out that envelope detectors are simpler and less expensive than synchronous detectors but have non-zero rectification thresholds and are thus less sensitive. Schum presents a two-transistor circuit (Fig 4) that is claimed to provide the best of both worlds: it offers the virtually zero rectification threshold of a synchronous detector, but without the complexity. The arrangement is described as follows: "The circuit is an amplifying full-wave envelope detector that has two transistors connected in parallel except for their bases, which are driven by RF signals that are 180° out of phase. For biasing purposes, the two transistors are treated as a single Class A device.

"The method of driving the transistors out of phase with one another has two main effects. First, thanks to emitter coupling between the transistors, this type of detector smooths the portion of the conduction function near the zero crossing, where control passes from one transistor to the other. Second, due to collector coupling, the circuit eliminates the positive excursions of the output, allowing only the negative half of the amplified envelope Because the detector can amplify, it can be made extremely rugged by keep-

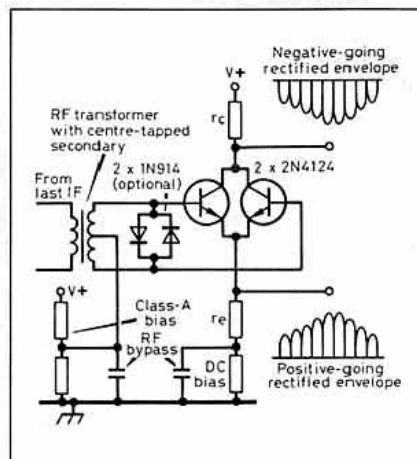


Fig 4: Claimed as simple yet sensitive, this amplifying full-wave detector circuit has almost zero rectification threshold and presents a highly linear RF load to a final IF stage. The gain for the collector output is given approximately by r_c/r_e . The emitter output gain is slightly less than unity.

ing the average input voltage below 0.1V and by placing clipping diodes across the RF input as shown in Fig 4. Because the detector threshold is virtually non-existent, it presents a highly linear RF load to the final IF stage. That feature, together with the fact that the detector can work with very low level signals, can significantly simplify the design of the final IF stage."

ing low impedance at 50-100Hz and audio frequencies. It must therefore have seemed logical to adopt this approach when providing RF bypassing in low-impedance solid-state circuits such as power amplifiers when an RF decoupling capacitor may need to be of the order of 0.1μF or so and capable of passing significant RF current.

But should such capacitors be augmented by a second, lower-value capacitor? This is common practice and a typical arrangement is shown, for example, in the 15 Watt linear amplifier in the highly-respected ARRL book 'Solid State Design for the Radio Amateur' (Chapter 4) [Available from RSGB; see p78].

Dr Brian Austin, G0GSF, draws attention to a paper 'Effectiveness of Multiple Decoupling Capacitors' by Clayton R Paul (University of Kentucky) in *IEEE Transactions on Electromagnetic Compatibility*, May 1992, pp130-133. This calls into question the effectiveness of using a parallel combination of large-value and small-value capacitors to increase the effectiveness at the higher frequencies and to overcome the effect of lead inductance. With detailed mathematical analysis, computed and experimental results, the author shows that this scheme is not significantly effective: Figs 5 and 6. The improvement at high frequencies is at most 6dB over the use of a single large value capacitor.

The paper concludes that the use of a small-value capacitor in parallel with a larger-value capacitor only minimally reduces the high-frequency impedance of either capaci-

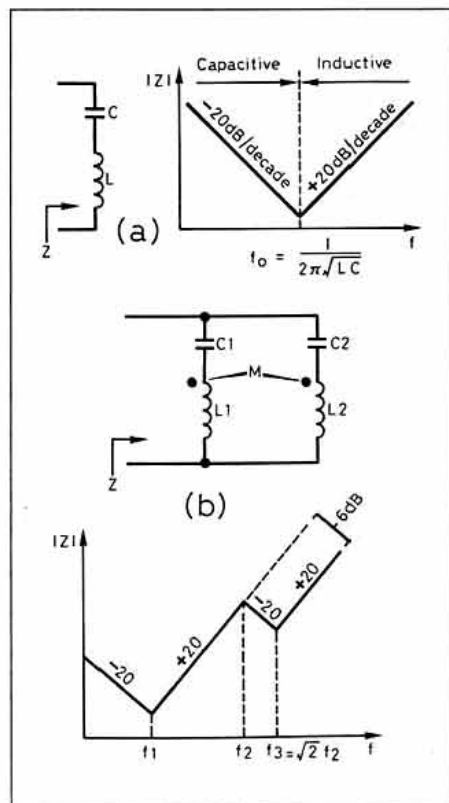


Fig 5: (a) The effect of lead inductance on capacitor impedance with minimum impedance at the self-resonant frequency. (b) Equivalent circuit for parallel decoupling capacitors and the Bode plot of impedance.

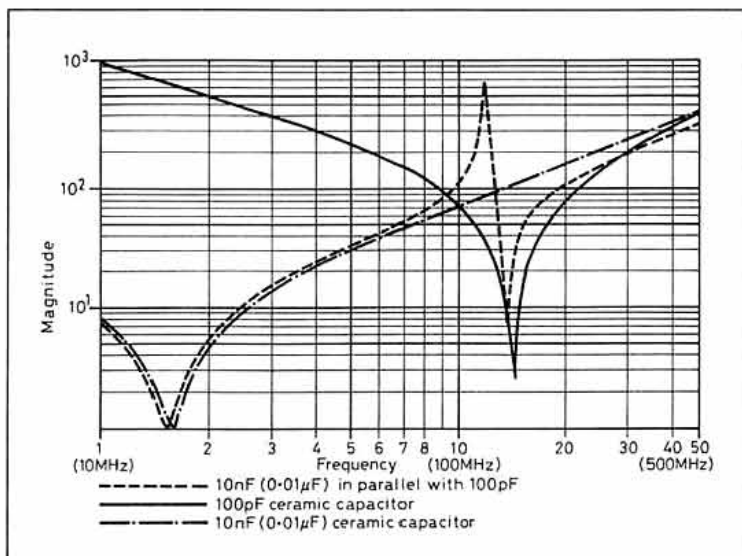


Fig 6: Measured impedances of a 0.01µF and a 100pF ceramic capacitor individually and in parallel from 10 to 500MHz. (Source Paul, IEE Trans EMC).

tor. A rather large reduction in impedance occurs only over a very small frequency range. Component and installation variations can cause this narrow range to vary in frequency so that the seeming benefit cannot be relied upon: "Therefore this scheme does not significantly improve the high-frequency impedance of capacitors above their self-resonant frequencies. Between the self-resonant frequencies of the two capacitors, the impedance of the parallel combination exhibits a resonance where the impedance is actually larger than that of either capacitor. Above the self-resonant frequencies of both capacitors, the impedance of the parallel combination is reduced at most by 6dB. This high-frequency reduction of some 6dB may not be worth the expense of the additional capacitor or its installation and could be attained by using only the larger value capacitor while simply cutting its lead lengths in half!"

As GOGSF puts it: "This paper presents a good case against doing what we have all taken for granted."

ANGLO-POLISH CLANDESTINE RADIOS

IN *TT*, JULY 1990, p31, I gave some background information on the highly-regarded series of clandestine radios designed at the Polish Radio Centre Workshops at Stanmore between 1942 and 1945, including some details of the AP5 transmitter-receiver that had a 16W 6L6 transmitter and 6K8/6SJ7/6SC7 superhet receiver. Since then it has become clear that there are still quite a few of the AP-series equipments around but that collectors find it difficult to identify positively which model they hold. It has also emerged, thanks to F C P Flanner, G3AVE, that many of these transmitters were built in Birmingham by Monitor Radio Company, located at Stechford Birmingham, a firm with which a number of local amateurs were involved.

Although there also appears to have been a few models that do not fall into any of the main types, the majority of sets were as follows (the AP classification was adopted by 1943 to avoid confusion with SOE models A-1, A-2 and A-3). All the Polish A/AP models

- A-1, 3.5-9.5MHz, 2 valve superhet 6K8-6SC7
- A-2, 3.5-15MHz (Tx 4-8 and 8-16MHz), 3V 6K8-6SJ7-6SC7
- A-3, 2-8MHz, 2V superhet 6K8-6SC7
- AP-4, 2-8MHz, 3V superhet 6K8-6SJ7-6SC7
- AP-5, 2-16MHz (3 wavebands), 3V 6K8-6SJ7-6SC7

The AP4 models were used for medium-distance working, for example for UK-France links, whereas the AP-5 for the longer distance UK-Poland links. Some of the Polish 15/16MHz sets were also dropped into Czechoslovakia. The higher-power BP3, BP4 and BP5 sets used a 829 double-tetrode with a power of some 60 Watts. BP3 and BP5 covered 2-8MHz, the BP4 4-16MHz. All BP models used a four-valve superhet receiver: 6K8-6SK7-6SQ7-6SC7 with an IF about 1.5MHz.

Many of the AP5 sets seem to have been built by Monitor Radio under guidance of Polish technicians who regularly visited the factory. The company, set up in 1939 or 1940, was located at the Parkinson Stove Company, Stechford, Birmingham in a building formerly housing the Gas Lamp Street Lighting Department of Parkinson's whose street lighting business had been reduced by the black-out restrictions. Monitor also manufactured Eureka 210MHz beacons which were dropped into Europe to guide Allied aircraft to agent dropping zones or to special bombing targets. The Eureka/Rebecca system as used in this way was a form of secondary radar with the Eureka transponder forming the ground element and Rebecca the airborne component. It was designed at TRE and a later version was used by paratroops during the Normandy campaign.

According to G3AVE, among those associated with Monitor Radio were Colonel Colley (licensed amateur but callsign unknown), George Brown, G5BJ (who introduced VHF radio to the Birmingham Police in 1942), George Flanner, G3KBA/T, Ken Field, G3PVT, Bruce Raynor, G4FYN etc.

used a similar metal enclosure as illustrated in the July 1990 *RadCom*, with a single 6L6 as transmitter, and 5Z4 rectifier, but differed in frequency coverage, receiver line-up and component placement. The receivers all had regenerative detectors (the super-gainer form of superhet) with an IF of about 1.5MHz:

EARTHS, LOSSES AND VERTICAL ANTENNAS

RECENTLY, I WAS CHECKING ON the early history of the BBC's original 'Empire Service' that was launched from Daventry almost exactly 60 years ago, in November 1932. It was interesting to find that the quite complex series of vertically-polarized directional antenna arrays, plus some omnidirectional Franklin Uniform vertically polarized antennas for the 49, 31, 25, 19 and 16m bands, had proved unsatisfactory. They provided weaker than expected signals into the various target zones from the two 10kW STC transmitters, and as a result the BBC engineers began a series of experiments with horizontally-polarized dipoles. These were initially strung from the 500ft masts used for the original 1600m Daventry long-wave station opened in 1925. This has since been relocated to Droitwich.

As described in Edward Pawley's *Engineering History of the BBC, 1922-72*: "Early in 1933 it became clear from reports from listeners that the Daventry transmissions were not being received as well as might be expected and poor performance of the transmitting aerials appeared to be a likely cause. A series of experiments with different types of aerial was undertaken, the first step being to suspend simple horizontal dipoles from the 500ft masts carrying the Daventry long-wave aerial and to compare their performance with that of the existing low vertical aerials. The first test was made in May 1933 to compare directly a high horizontal half-wave dipole (10 wavelengths above the ground) dimensioned for an operating frequency of 11.86MHz - with one of the low vertically-polarized non-directional aerials.

"The results of this comparative test were quite definite and showed the high aerial to give a gain of 5 to 10dB in the strength of the signals received in Buenos Aires and Bermuda. In December 1933 a high horizontal half-wave dipole dimensioned for 9.7MHz was compared with a low vertical four-element aerial operating on the same wavelength and oriented on India. The high dipole was found to give equal strength signals in Ceylon (Sri Lanka), on the centre line of the directional transmission, although the theoretical gain of the four-element aerial was 9dB above that of the non-directional dipole. At this time it was not known whether the superiority of the horizontal aerial was due to its polarisation or to its height above ground."

Pawley describes how further tests were made between October 1934 and March 1935 with eleven different antennas on 12MHz, using 350ft towers, in order to determine the choice between horizontally and vertically polarized antennas and to discover the minimum mast height for optimum reception with a given transmitter power. The conclusion reached was that, at least at Daventry, horizontally-polarized antennas were better than vertical, that it would be unnecessary to have more than four horizontal radiators stacked vertically at half-wave intervals, and that the lowest element should be not less than one-wavelength above ground.

Since then, to the best of my knowledge, HF broadcast antennas have been horizontally polarized for sky-wave transmission whereas medium- and long-wave broadcast

antennas are almost invariably vertically-polarized in order to provide maximum ground-wave coverage, although I recall a *TT* item about a Telefunken MW T-antenna design that could be switched at night to horizontal polarization for medium-distance skywave coverage.

Radio amateurs, of course, are seldom able to have their antenna elements a full wavelength above ground - at least on most of the lower frequency bands - and have learned how to make reasonably effective use of vertically-polarized antennas including ground-planes and phased arrays of monopoles. It should however always be appreciated that vertical antennas close to the ground, whether tuned against real earth, elevated radials, or as vertical dipoles, have a performance that is significantly affected by ground conductivity and the presence (in domestic environments) of many vertical 'lossy' objects. It is partly for this reason that amateurs usually find that elevated ground-plane type antennas perform significantly better than monopoles, even where these have a good earth-screen. All those text books that show monopoles with optimum radiation right down to zero elevation are, for most amateurs, just wishful thinking, unless operating /MM.

In *TT*, January 1985, Les Mitchell, G3BHK, underlined that, for most amateurs, the domestic environment includes many lossy, conductive and semi-conductive objects, the majority of which tend to be vertically inclined (Fig 7) and to have a significant effect on either the radiated pattern of an antenna, or else absorb and dissipate a significant amount of the energy radiated from the antenna. It should be appreciated that whereas a resonant insulated guy wire, for example, will re-radiate most of the energy it picks up (affecting the radiation pattern but not the total power radiated) lossy objects, such as a tree trunk, a building, poorly-conductive earth, etc, will dissipate a large proportion of the energy induced or fed into them. This loss tends to be significantly greater for vertically-polarized antennas than those horizontally-polarized.

However, Les Moxon, G6XN, has recently sent along some notes on an improved form of a type of vertically-polarized antenna that has been featured a number of times in *TT* following my use of it in the early 1970s: the inverted ground-plane (or Vertical-Tee). The following notes and Fig 8 will eventually appear in a new edition of his *HF Antennas for All Locations* book:

"Starting from ground level an increase of height of ground-plane antennas with suitable attention to loading and tuning can be expected to result in greater efficiency due to the disappearance of ground losses. Up to 3dB of gain due to height can be expected, as well as a better chance of clearing obstructions. This process, pursued to its limit, results in antennas such as the inverted ground-plane: Fig 8(a): the two-wire form shown at Fig 8(b) improves bandwidth, reduces end-voltages, and assists with matching to coaxial line. It may be noted that this method requires shortening of the radiator by about one-sixteenth of a wavelength, a matter of little consequence since R is reduced by only 15%.

"The arrangement of Fig 8(b), which scores

heavily in terms of convenience, was compared experimentally with the Zepp feed form shown in Fig 8(c), with and without a G6CJ-type balancing stub. Apart from establishing the credentials of the new method, the results were highly instructive. Differences in field strengths were small provided the current on the outer of the coaxial cable was sufficiently low, a condition achievable in the case of the Zepp by using either the stub or the more convenient linear trap.

As this was a one-off experiment it should not be assumed to apply in other cases without further checking, but it would appear that the absence of any path to ground ensures that the same current has to flow in both feeder wires. In the case of Fig 8(b) the trap was needed only in the event of maladjustment of L. Bandwidth was adequate for coverage of the 21MHz band even in the case of the Zepp feed.

"If vertical polarization is favoured and two supports are available the inverted ground-plane antenna of Fig 8(b) can be recommended. This can also be used as a horizontal half-wave dipole or a top-loaded ground-plane antenna at half the frequency."

Les also mentions that at long last the ARRL have accepted his 20Ω figure for the radiation resistance of a ground-plane antenna, as this has now been backed by their own computer study. The recognition that, as he has often pointed out, the GPA is a form of dipole and not a form of monopole antenna has a devastating effect on a large number of sacred cows but, adds G6XN "it may be more than a coincidence that the large numbers of radials demanded by some authors ties in very closely with the mesh size requirements specified by Proctor 'Input impedance of horizontal dipole aerials at low heights above the ground' (*Proc IEEE*, part 3, May 1950) - a very important reference since it is possible to extrapolate from Fig 9 etc to get an idea of ground losses in horizontal wires generally. Vertical wires do not induce significant losses. The reference also shows effect of ground screens."

My 1970s version of the inverted ground-plane antenna was derived as a single-element version of the Bobtail array mentioned and illustrated in the July *TT* (p39). This has encouraged Bill Wheeler, G3BFC, to comment as follows: "When *TT* first referred to the

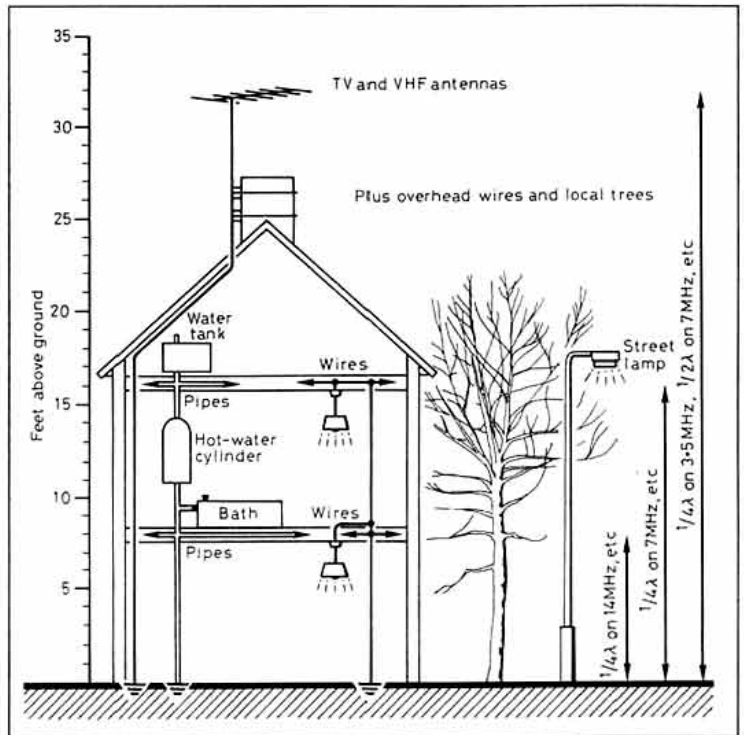


Fig 7: The possibility of unwanted resonances of metal conduits, pipes etc in a typical residential environment as suggested in *TT*, January 1985, by G3BLK. The houses can also have broadband resonances. Energy induced will be re-radiated by a lossless 'element' but will be absorbed by 'lossy' conductors, including the earth, building, tree trunks, etc.

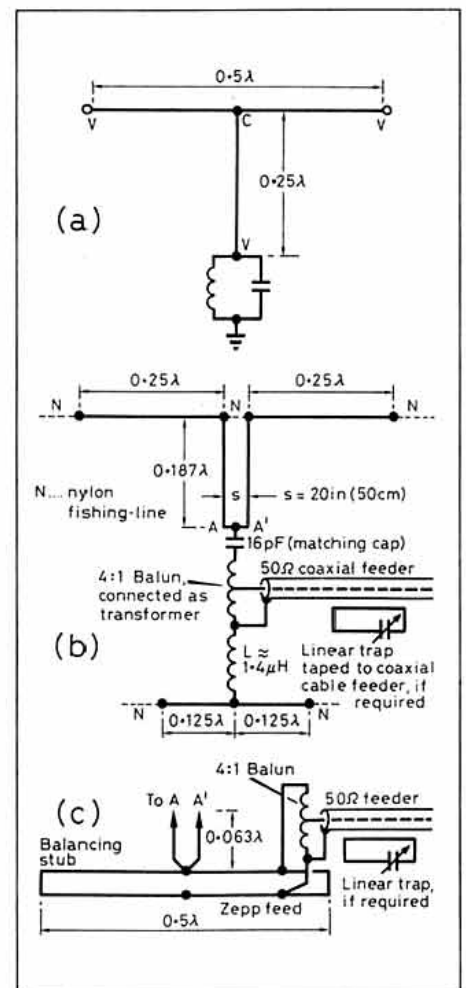


Fig 8: (a) Basic inverted ground-plane (also known as Vertical-Tee) antenna. (b) G6XN's recommended method of end-feeding from coaxial-cable. (c) Zepp form of feed as tested by G6XN.

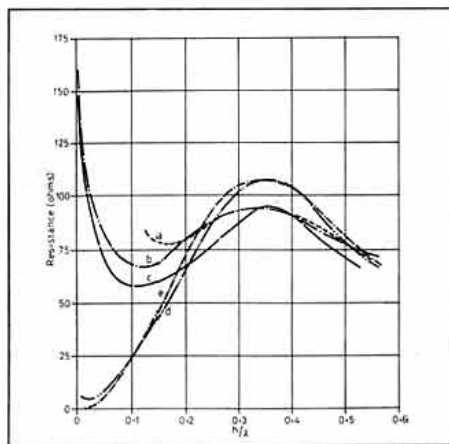


Fig 9: Measured input impedance of a resonant horizontal half-wave dipole above ground where h is height above ground. (a) Calculated for soil permittivity of 6. (b) Dry ground. (c) Wet ground. (d) Conducting mat (large, fine-mesh copper mat representing perfectly conducting ground for comparison purposes). (e) Calculated for infinite permittivity. Results quoted are for an open site covered with short grass and having a gravel subsoil, of which a sample measured a value of six after a long spell of fine weather. Above the dielectric ground there is a large increase in the radiation resistance of the antenna as it approaches ground-level. Close to the ground the radiation resistance is about double that of a similar antenna in free space. (Source: Proctor, *Proc IEE*, Part 3, May 1950)

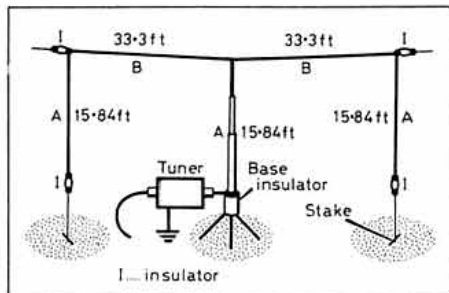


Fig 10: Bobtail curtain for 14MHz as originally used by G3BFC at 9Y4BFC in 1970.

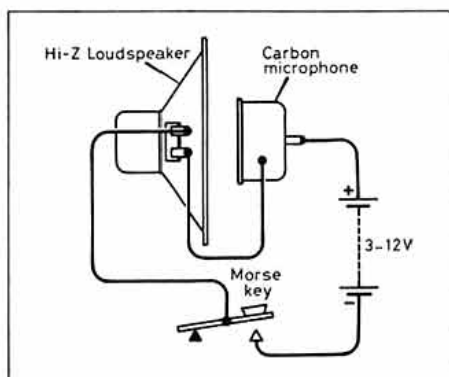


Fig 11: KISS form of Morse code practice oscillator using the howl-round between carbon microphone and speaker or headphone.

Bobtail in 1970, I was living in Trinidad and operating 9Y4BFC. I constructed the antenna as shown in Fig 10 using four radials and a tuned LC circuit. It performed well over the 4500-mile path to the UK in the evenings on 14MHz. Later, back in the UK, I returned to the Bobtail using the same approach as at 9Y4BFC. My near neighbour, Bill Sykes, G2HCG, suggested that I omit the radials and LC and replace them with a tuned closed stub - this worked well. Then along came 'Con-

trolled feeder radiation' (CFR) by G2HCG in *RadCom*, May 1990 and July 1991. So my Bobtail was made simpler still using CFR in accordance with the July, 1991 article again with good performance. However, size was then reduced to two vertical elements instead of three, but with each carrying equal current rather than the original version in which the two outer of the three elements carried half the current of the centre element.

"Fig 5 of the July, 1992 *TT* showed a two vertical element form of Bobtail directly fed at the top with 52Ω co-axial cable although I consider the dimensions given in this account should be read in reverse. I have found a 28MHz version seems to work well when compared with a three-element monoband beam (not as well since the comparison is hardly a fair one).

"To sum up, of the various Bobtail-type configurations I have tried, the two element version using a tuned toroid as described in the two *RadCom* articles by Bill Sykes (the founder and Chairman for many years of Jaybeam Ltd) is well worth considering."

It seems to me that the G3BFC version with the 'reversed' dimensions changes the arrangement from a broadside array to an end-fire system, though both approaches seem logical enough.

While on the subject of vertically-polarized antennas, it seems worth noting a comment from C W ('Mick') Cragg, G2HDU, about my comment in the August *TT* that a folded monopole has lower earth losses than a simple monopole (not claimed by Tony Preedy, G3LNP, for his 'folded-tee' antenna). He writes: "This has been stated many times, and in many places, but I have never seen an acceptable proof. It seems to be taken for granted, but a little thought will show that in fact the earth current is the same as with a simple monopole, so that for a given earthing system the loss is the same. There is no question that the feed point impedance is higher since only half the current flows in each side of the folded monopole. However, both of these half currents flow in the earth so that the total earth current is the same as with a simple monopole. I would be interested to learn whether the antenna pundits agree."

While one could use two separate earths for a folded monopole putting the earth currents in 'parallel', this would be unusual and G2HCG appears to have a valid point, although there seems evidence that in practice the efficiency (as well as the effectiveness) of the folded version may be significantly higher.

AN EARTHED HOME?

DENNIS UNWIN, G0FMT, has come up with a novel solution to the problem of providing an effective earthing system for a 1.8MHz Marconi-type antenna. He writes: "I have a garden much too small for a $\lambda/2$ antenna on Top Band but can just manage a rather bent $\lambda/4$. A good earth is therefore needed. I started with two aluminium earth stakes just outside the shack window. This resulted in a feed impedance of 58Ω. Since the impedance of a quarter-wave antenna is of the order of 15Ω, this suggests an efficiency of about $15/58 = 26\%$ (the figure of 15Ω was arrived at following extensive tests).

"I attempted to improve the efficiency by

increasing the number of earth stakes to five. This lowered the feed impedance to 46Ω, giving an efficiency of about 33%. A much folded counterpoise produced similar results, but using both earth stakes and counterpoise gave no further improvement. I then tried the effect of a length of wire draped around the floor of the shack on the ground floor of my bungalow. This resulted in a noticeable improvement, the feed impedance dropped and received signals increased slightly.

"My bungalow has solid floors over which carpet tiles have been laid. Some tiles in the shack, hall and a bedroom were lifted and two strips of self-adhesive copper foil, 20mm wide, were laid throughout this area, each about 15 metres long, and the ends connected to the ground point. With this arrangement the impedance had now dropped to 25Ω so efficiency was now about 60%. Used on its own, the copper foil earth was slightly superior to the five outside earth stakes but best results were obtained by using them together. If in fact my estimate of antenna impedance (15Ω) is too low (as has been suggested) then the figures become even more impressive.

"The copper strips seem too short to be acting as a counterpoise and calculations of the likely capacitance of the copper foil earth produced figures much too small to account for its performance. It was then realised that the concrete floor contains steel mesh reinforcement, and it is assumed that the foil is acting as capacitance coupling to the steel mesh ground sheet thoughtfully provided by the builder. It would perhaps have been just as effective to have used a layer of aluminium cooking foil covering the shack floor, but the system now works so well that I am not prepared to change it. I wonder how many other amateurs are literally sitting on an effective earthing system without realising it."

TIPS AND TOPICS

THERE CAN BE NO DOUBT that computer studies based on the Method of Moments software are providing antenna designers with a most valuable new tool. But such programs need to be used with care and a good understanding of basic antenna theory and practice. Also they need to be confirmed by practical experiments. There seems to be a growing tendency for some amateur-radio publications to publish designs based solely on computer studies. As Les Moxon, G6XN, puts it: "I'm afraid my attitude to computer studies tends to be highly sceptical. It is essential for conclusions to be reconciled with all the known facts. I feel there are far more computer addicts than experimenters with adequate factual knowledge, plus the necessary programming skills.

Roger Davis, ZS5L, in *Radio-ZS*, May 1992, p3 writes: "It amazes me that people go to extreme lengths to make the most complicated oscillators on which to practice Morse Code when with an old carbon microphone, a high impedance loudspeaker, a battery and a Morse key, an oscillator can be constructed that gives a good tone and works first time: Fig 11. The high impedance speaker can be replaced by an earpiece from an old pair of headphones or, once again, from an old telephone headset. An 8Ω speaker can be used but a 22Ω current limiting resistor must then be placed in series with the circuit. G3VA

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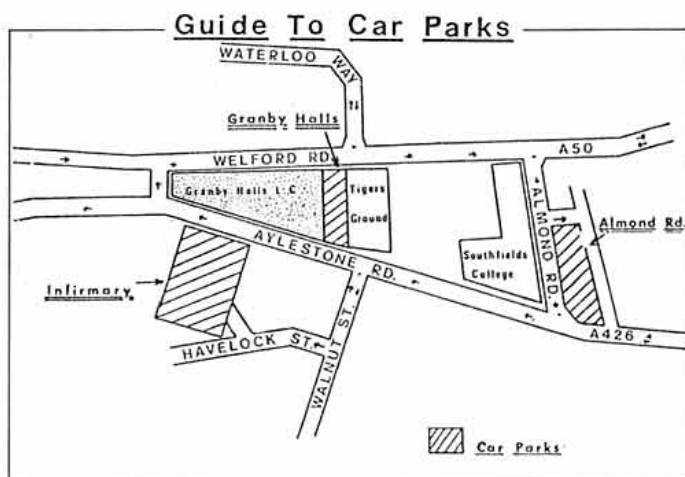
The Leicester Amateur Radio Show Committee

welcomes you to the

21st Leicester Amateur Radio & Electronics Exhibition

THE SHOW will be at the usual venue of the Granby Halls, Aylestone Road, Leicester (just off Junction 21 of the M1) on Friday 23 and Saturday 24 October. Opening times are 10am to 6pm (Friday), 10am to 5pm (Saturday), disabled 9.30am. Admission price £1.50, concessions £1, (discounts for block bookings).

- * **Extensive Trade Exhibition**
- * **RSGB Book and Information Stand**
- * **Bring and Buy Stand**
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- * **RAOTA AGM**
(Conference Room, Saturday 2.30pm)
- * **Talk-in by GB2GH on S22 and SU22**



SPECIAL HOTEL ARRANGEMENTS

Block booking terms have been negotiated with the following hotels for the duration of the show:

Grand Hotel, Granby Street: £21 per person per night including breakfast. Telephone 0533 555599

Post House, Braunstone Lane: £24 per person per night for a twin or double room, £31.50 for a single room, including breakfast. Telephone 0533 630500

Park International Hotel, Humberstone Road: £19.50 per person per night including breakfast. Telephone 0533 620471

Holiday Inn, St Nicholas Circle: £25 per person per night (twin room), £35 (single room), including breakfast and all facilities in the health and leisure centre, swimming pool and sauna. Telephone 0533 531161

Belmont Hotel, De Montfort Street: £80 for two nights, including breakfast and dinner. Telephone 0533 544773

Alexandra Hotel, London Road: £28 for a single room (£40 double/twin) including breakfast. Telephone 0533 703056 (G6HSF, Andy).

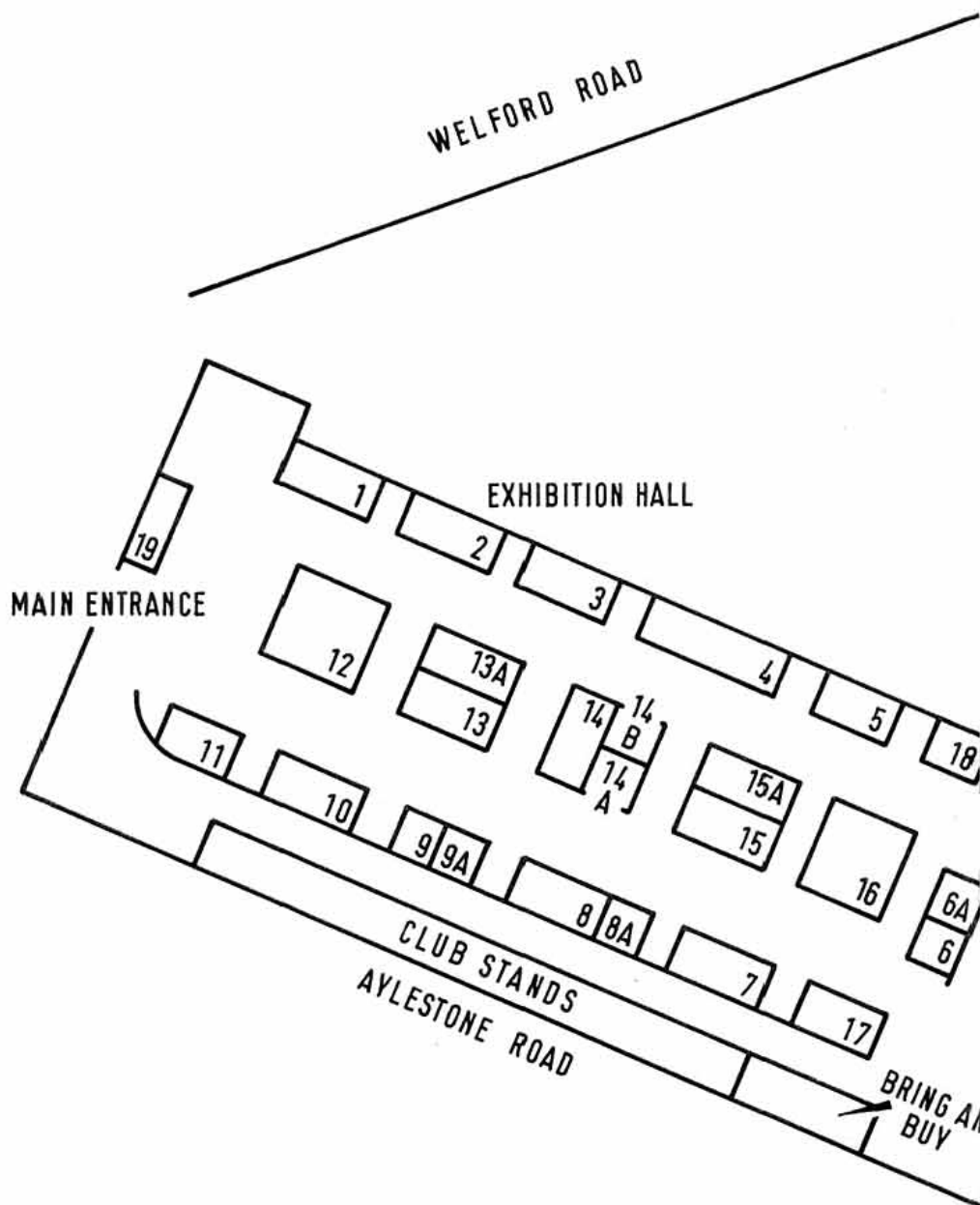
Don't forget to mention that you are visiting the Granby Hall Amateur Radio Show to take advantage of these block booking prices.

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Exhibition Hall

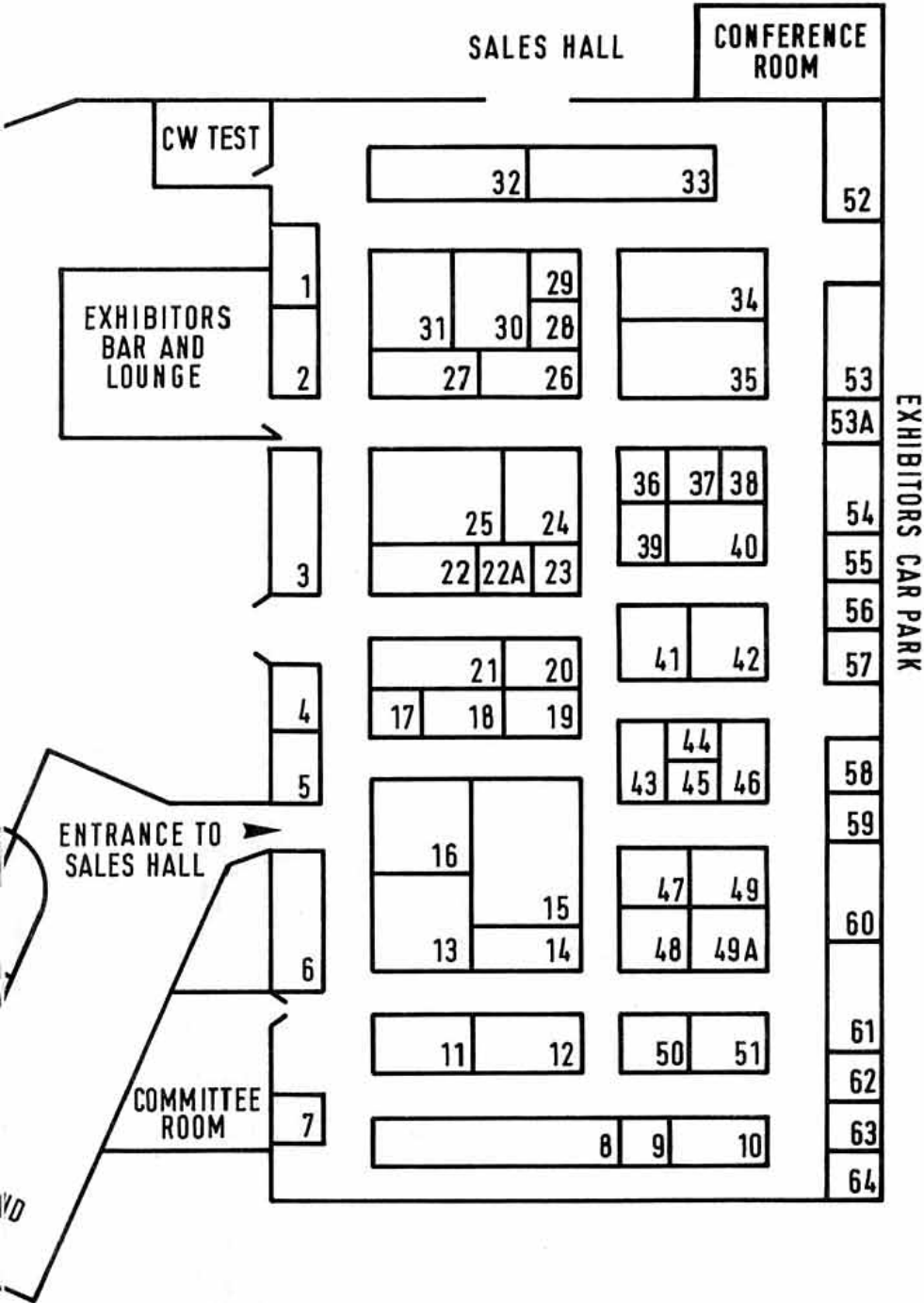
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Waters and Stanton	15
JMG Electronics	16
Mutek	17
Dressler Comms	18/19
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JAB Electronics	21
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TABLES

- Qualitas Radio
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- Quartzlab
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- RF Engineering
- Kanga Products
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LEICESTER SHOW PRODUCT NEWS

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

Nevada Communications Stand S42

EARTALK IS a new speaker/mic that operates from the ear only. Two models are available to suit most makes of transceiver. The unit is practically invisible and produces clean and crisp transmitted audio.

Also on show will be the Vectronics VC-300D Antenna Tuning Unit with peak-reading digital bargraph display (see photograph). This is rated at 300W and is compatible with most antennas including verticals, dipoles and mobile whips.



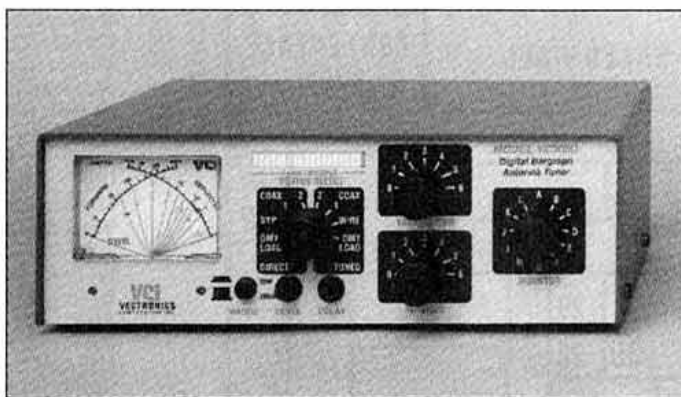
Jandek Stand E9

PRODUCTS FEATURED in the new Jandek catalogue can be seen at this year's Leicester show. The successful formula of modular design and standard circuitry continues with the introduction of kits enabling construction of HF SSB receivers, transmitters, and transceivers.

The company now has five year's experience in kit production and the designs combine new modules with older, tried and tested ones. Initially, single band versions for 160m and 80m will be available with multiband designs later.

There will also be ferrite and iron-dust cores from Amidon of America and cases from Minffordd of Ffestiniog, together with an extensive range of components for the constructor.

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



Lee Electronics Stand S53

THREE NEW Standard hand-held transceivers to be featured at Leicester are the C188 series (2m), C488 series (70cm), and C588 dual-band transceiver (2m and 70cm). Power output in each case is up to 5W depending on the battery pack used. Accessories such as headsets, extra memory and a CTCSS unit are also available. All three sets have a battery-saving standby mode, for extended battery life. In addition the C588 has dual-band scanning.

C M Howes Communications Stand E9a

THE C M HOWES stand will be offering a new range of prototype boards known as Speriboards. These are good quality glass-fibre boards designed for experimental circuits. A number of different track patterns are available, and on some boards the pads are surrounded by a ground plane for good high frequency performance.

A full range of kits will also be available including the new AB118 active antenna.

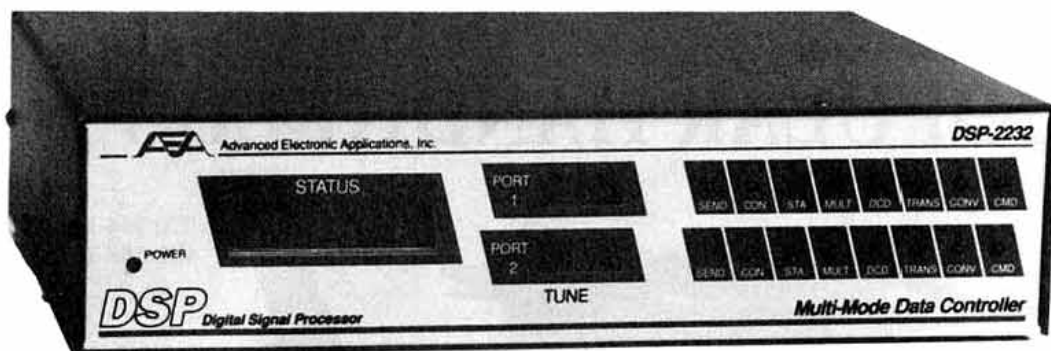
Waters & Stanton Stand S15

THE LONG-AWAITED Alinco DJ-4FE 2W 70cm hand-held will be on sale. This should prove to be an ideal first Novice transceiver. Also the DJ-180 2 metre hand-held offers excellent value, as the price includes an AC charger and ni-cad pack.

For those on a restricted budget, the Ramsey range of kits offers QRP transmitters, HF DC Receivers and a 2m receiver.

Other products on show will include the 30ft Fleximast and the latest range of products from MFJ and Ten-Tec. OptoElectronics of the USA have announced some new, high sensitivity counters, and these will be available together with stocks of the new and highly successful Jim (formerly Mizuho) QRP HF SSB/CW transceiver.





ICS Electronics Stand E7

TWO VERSIONS of the AEA DSP-2232 Digital Signal Processing modem are now available after several years of intensive development. They are the first products of this type on the amateur market, and according to the manufacturers represent the future of amateur digital communication. Future modem implementations will be by means of simple firmware changes, and a large number of options are available to satisfy the requirements of the discerning packet enthusiast.

Eastern Communications Stand S22

EASTCOMM WILL be showing all that's new from the Icom, Yaesu, Alinco, AOR and Kenwood ranges.

Their comprehensive display will also include keys, power supplies, SWR meters, coaxial switches, dummy loads and antennas.

Mutek Ltd Stand S17

LEICESTER 1992 will see the release of a new high performance 2 metre transverter. The TVVF 144a Mk II has been equipped with a new GaAs FET front end and a 25W high power amplifier.

An external ALC control enables the output level to be adjusted between 1 and 25W. A special introductory discount will be available at the show.

Siskin Electronics Ltd Stand E17

NEW PRODUCTS from Siskin Electronics include a four-port PC-TNC which is supplied with the world standard G8BPQ networking software.

They can also supply the Switchmaster audio switch, for those who need to switch between several TNCs and/or microphones. This product is individually customised to your requirements by Siskin, and may be expanded as required.

Whether you are a complete newcomer to the packet radio scene or an 'old hand' Siskin has something to offer. They claim to have the largest selection of packet radio products in Europe backed up by first-class technical support.

Amdat Stand E15

THE COMPANY will be featuring a new TNC from DRSI. The DPK-2 is a stand alone TNC which can easily be connected between your computer and radio to give access to the fascinating world of packet radio.

The TNC is fully compatible with the TAPR TNC-2 so it can be fitted with NETROM or THENET to act as a node, but as standard it is delivered with the latest TAPR 1.1.8 software which includes the DRSI Personal Message System and automatic CW identification. Amdat say that this unit is priced as much as £50 below similar specification products.

R A Kent (Engineers) Stand E14a

LATEST VERSION of the R A Kent Morse Tutor will be on display. This small, lightweight, battery operated unit is ideal for improving or maintaining your proficiency. The company's range of morse keys - renowned throughout the world for their performance and reliability - will also be featured at the show. This includes both single and twin paddle types which are available ready assembled or in kit form. The kits take less than an hour to assemble and no special tools are required.

SEM Stand S55

INTERFERENCE MAY become a thing of the past with the VHF QRM Eliminator from SEM. This works over a frequency range of 130-180MHz and is effective in substantially reducing computer noise as well as strong local amateur QRM and out-of-band signals. It connects in the antenna lead and is automatically bypassed on transmit. See this and the complete range of other products from SEM at the show.



COME AND SEE THE RSGB

on Stand 1 (Exhibition Hall)

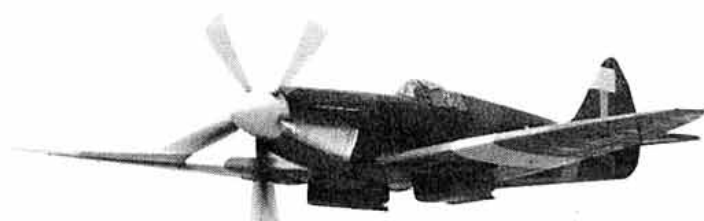
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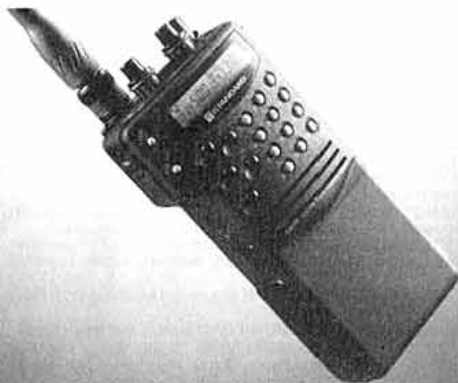
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CNB162 Nicad battery pack (12V @ 600ma)	£70.00
CWC150K Wall charger for CNB160/161/163	£14.69
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AR-1500 Handheld 500KHz-1300MHz AM/FM/SSB 1000 mems	£279.00
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Land Mobile Radio

A Career in the Industry?

by Peter Burton, C Eng, MIEE, G3ZPB

HAVE YOU THOUGHT about turning your hobby into a career? There is a vast industry out there that designs, sells, installs and repairs professional radio communications equipment. The industry is PMR (Private Mobile Radio), also known as LMR (Land Mobile Radio); radios that are used to do a job of work in a taxi or security company, or police force etc.

THE EQUIPMENT THEY USE

A VERY WIDE RANGE of radio and computer equipment is used, ranging from a crystal controlled hand-portable on a single channel to a complex multi-channel, multi-site computer controlled network covering the country. Much older equipment is crystal controlled - most PMR users are restricted in operation to one or two channels and there is not, therefore, so much need for the multi-channel synthesised transceivers that amateurs use. But, much current equipment is synthesised as this offers other advantages such as being able to set the equipment onto the specified channel without the delay incurred while waiting for the supply of crystals.

At the other end of the range are Cellular Radios - look inside one and you find part of it is a complex 1320 channel transceiver operating in the 900 MHz band. Probably the larger part, though, is the sophisticated computer controlled data signalling system which rivals amateur packet radio.

All the radio systems are channelised, mostly on 12.5 kHz spaced channels (half the normal 144MHz amateur band spacing). Virtually all new licences are for FM, although there are still many old AM systems giving good service. In view of the heavy congestion on most channels, base stations and mobiles are generally limited to a maximum of 25W ERP - no 100W linears allowed here!

Receiver design has the emphasis on slightly different parameters to those required by amateurs. Whereas we normally look for excellent sensitivity and as good a strong signal handling capability as the design will give, the PMR designed set usually places highest priority on the strong signal handling capability, and sensitivity comes second. This is because QRM usually governs range and not signal strength (most channels are shared with several other users).

EMPLOYMENT CHOICE

DEPENDING ON YOUR SKILLS, training and interest, jobs can range from bench serv-



PHOTOGRAPH COURTESY SINCLAIR COMMUNICATIONS LTD.

ice, RF design, installation, computer program writing to selling and marketing.

Service of the equipment is usually carried out in the supplier's workshop but may take place in the customer's premises or even at a remote hill-top site. The work can vary from installing crystals and trimming onto frequency, to fault finding a microprocessor controlled signalling card or base station.

If your knowledge and experience are great enough, the concept and design of products may be your line. Most products are developed by a team of engineers with some, perhaps, specialising in certain parts of the project such as transmitter output, frequency synthesizer or microprocessor control.

Installation work is varied. It could involve installing mobile equipment in a car, van, coach or other motor vehicle. Otherwise it could be base station equipment or antennas, often at remote or difficult-to-access sites, eg a lift room in a tower block or the top of a hill or mountain. Mobile installation follows many of the basic principles of fitting an ordinary car radio, but you need a good head for heights for some base station sites!

Because many systems are computer controlled, there is much scope for software writers. Applications vary from writing code for microprocessors controlling signalling tone generation and detection, to a control system for multi-channel radio telephones with automatic customer billing.

Maybe your skills are not so much technical, but more the ability to sell. Good, all this equipment has to be sold to the customer in a professional manner. You may work within a 10 or 20 mile radius of the office, or cover a large part of the country depending on the

company you are working for, and the product with which you are involved.

MORE INFORMATION

I HAVE ATTEMPTED TO GIVE an introduction to the wide range of jobs available and levels of skill required for the Land Mobile Radio Industry.

If you want to work in the engineering side of the industry, there are some firms who will take you on with just the knowledge and experience gained as a radio amateur. However, to progress much beyond a fitter or junior technician level you will probably need formal training and qualifications. This requirement may be met in a number of ways: either a home correspondence course, part time course at technical college or full time course at college or university. Your local library should have a list of local colleges.

A look through *Yellow Pages* telephone directory will provide details of local companies operating in the field if required.

Alternatively, an organisation called the 'Mobile Radio Training Trust' has been set up to co-ordinate activities between, on the one hand, colleges saying they cannot find jobs for their students and on the other, industry who want to fill their job vacancies. The MRTT can provide you with a list of colleges offering suitable courses together with a list of many of the larger companies in the field. The address of the MRTT is PO Box 10, Twyford, Reading, RG10 8AZ. Also they may be contacted via the author, QTHR, who is Treasurer and a trustee of the MRTT.

With training and qualifications, you could become a 'Professional Radio Amateur'.

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DEDICATED 2M PACKET TRANSCEIVER

MODEL 144 PK

Wood & Douglas are pleased to announce the release of a new product for the amateur market — a dedicated 2M packet transceiver. The 144PK benefits from our commercial activity in the telemetry and data communication markets and offers the UK amateur a product that is UK designed and manufactured with all the attendant qualities that you have come to expect from Wood & Douglas. The 144PK will allow you to liberate your imported transceiver to fulfil its designed role safe in the knowledge that a high quality, reliable product has taken its place as the backbone of your data comms. The unit is fully synthesised and can potentially cover the whole 2M band with repeater splits etc, all 'designed-in' with only minor changes.

AS SEEN 'RSGB'92'

SPECIFICATION

General Details

Frequency of Operation	Channel 1 — 145.250MHz Channel 2 — 144.625MHz Channel 3 — 144.650MHz Channel 4 — 144.675MHz 144-146MHz via internal options
Frequency Coverage	± 10ppm
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	8W
RF Output	<25mS
Turnaround Time	FM, 3KHz deviation
Modulation Type	>-60dBc
Spurious Outputs	
Receive	<0.25uV for 12dB SINAD
Sensitivity	>70dB
Image & Spurious Responses	<2nW (-56dBm)
Spurious Emissions	Noise operated
Squelch Type	1 Watt into 8 ohms
Recovered Audio	

The discerning packet operator will identify with this product and we expect it to become, as our products have in the past, the measure by which other products are judged.
The 144PK is available direct from ourselves or from Siskin Electronics.

Introductory Price: £190 + VAT

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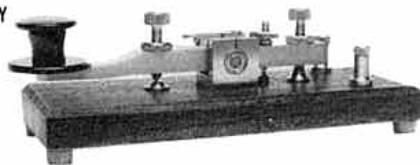
Quality

MORSE KEYS

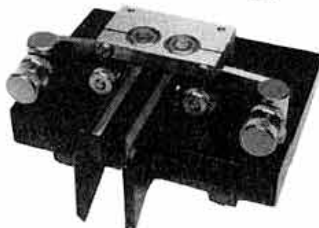
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AMSTRAD REPAIRS phone me for an estimate. 73s John G3TLU

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R. N. Electronics

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“ I now have worked 115 DXCC countries on 50 MHz, 107 are confirmed, and I have sent an application for the award to ARRL together with the cards from SM7FJE. It will be the two first awards for 6 m in Sweden.”

SM7AED

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handhelds mobile

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COLLECTED AND DESCRIBED
BY ERWIN DAVID, G4LQI

DIGITAL SIGNAL Processing (a 'buzz-word' in advertising) describes the Very-Large-Scale Integrated (VLSI) circuits which perform on one chip the analog-to-digital conversion, the digital processing and the digital-to-analog conversion. They are still too slow to handle frequencies above audio and the lower IFs, have insufficient dynamic range for RF applications and the best are very expensive. (See *TT*, *RadCom* Feb 92, p38).

Some DSP ICs are now within an amateur price range and Kenwood offer a DSP-100 accessory designed to stand on top of their TS-450/850 transceivers. See *RadCom* Oct 91, page 35. The DSP-100 manual says its input (from the transceiver) is at 36.891MHz but does not disclose where or how this frequency is generated. The DSP-100 output is at 455kHz, the third receive IF and transmitter modulation frequency.

Being an accessory, the DSP-100 does not need to duplicate basic transceiver facilities such as IF filters of standard bandwidth for each mode and a notch filter (though multiple tracking DSP notches could be more effective than the TS4-50S audio notch - G4LQI).

WHAT CAN THE DSP-100 DO?

ON SSB RECEIVE

The DSP-100 can shape the audio response without the pass-band ripple and the ringing one expects from crystal or mechanical filters with steep sides. When using DSP, the 'thru' position is selected in the 8.83MHz second IF. The DSP-100 permits audio cut-off (-6dB) to be switch-selected; 100, 200, 300 or 400Hz at the low end and, independently, 2600, 2750, 2900 or 3100Hz on the high side. This makes the narrowest DSP bandwidth 2600-400 = 2200Hz and the widest 3100-100 = 3000Hz. Compare this with the 2400Hz standard SSB filter. This flexibility permits the selectivity to be tailored to band conditions, provided always that the improved fidelity possible with a wider-than-standard receiver can only be realized if the received signal actually contains the corresponding highs

A Digital Signal Processor is said to be the latest 'must' for the sophisticated amateur. Its mystique seems to derive mostly from lack of technical information. **G Schwarzbeck, DL1BU**, tested a Kenwood TS-450S HF transceiver with and without its DSP-100 audio processor and published his findings in *cq-DL* July 92.

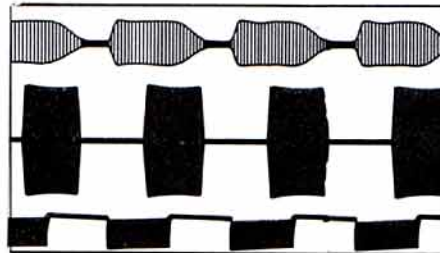


Fig 2: TS-450S. Dots keyed at 60WPM. VOX off, DSP-100 fast. Bottom: key closures. Centre: RF envelope. Top: side tone.

and lows. Fig 1 shows the effect. The horizontal axis is linear in frequency and the

vertical axis is linear in voltage, not in dB. Note that, within the audio pass band, the response is not flat but has an approx. 5dB de-emphasis. This is done in the transceiver, presumably to reduce hiss.

ON TRANSMIT

The DSP-100 can do several things. When transmitting SSB, there is the same selection of audio cut-off frequencies as on receive. Also, there is a 5dB pre-emphasis to compensate for the receiver roll-off. If transceivers with DSP-100 are used at both ends of a QSO, the best selectivity/fidelity mix consistent with prevailing conditions (signal strength, QRM, QRN) can be selected. When the full 3kHz bandwidth can be used at both ends, the result is almost hi-fi. The DSP-100 also improves suppression of the carrier, the unwanted sideband and some intermodulation products, albeit at the expense of some extra noise at and below the -50dBc level. The DSP-100 has a two-tone signal source to facilitate setting up the ALC threshold.

On CW, the DSP-100 controls the rise and decay of the CW envelope, 2ms for fast and 4ms for slow CW, thereby reducing the spread of key-clicks. Also, DSP eliminates shortening of high-speed dots. See Figs 2 and 3.

On FSK, the manual (which is adequate for operation but virtually devoid of hard technical info) claims that DSP makes for "a cleaner signal that reduces error".

IS THE DSP-100 FOR YOU?

PURISTS, SUCH AS THOSE who would not buy a stereo system without a graphic equalizer (as compared to simple bass and treble pots) would want one for SSB. It provides the best speech fidelity currently available with commercial amateur transceivers. So might CW speed merchants who cannot eliminate key-clicks by simpler means, or whose shortened dots rile their opposite numbers. As for the rest of us, we are looking forward to the day when all these goodies will be routinely incorporated in transceivers of the price class we can afford, as it is now in Kenwood's top TS-950SDX.

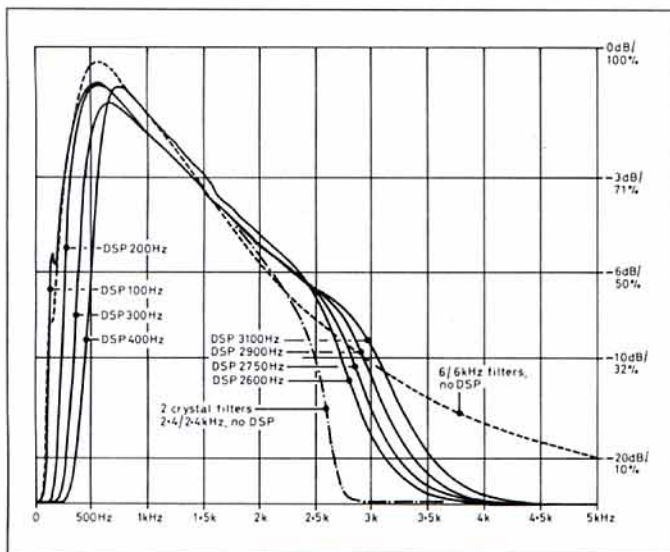


Fig 1: TS-450S. SSB Receiver Pass Band from antenna to speaker. Dot-dash curve: 2.4kHz filters in second and third IF, no DSP. Dotted curve: 6kHz (ie AM) filters in second and third IF, no DSP. Solid curves: no filter in second IF, DSP-100 has been installed in lieu of the third IF.

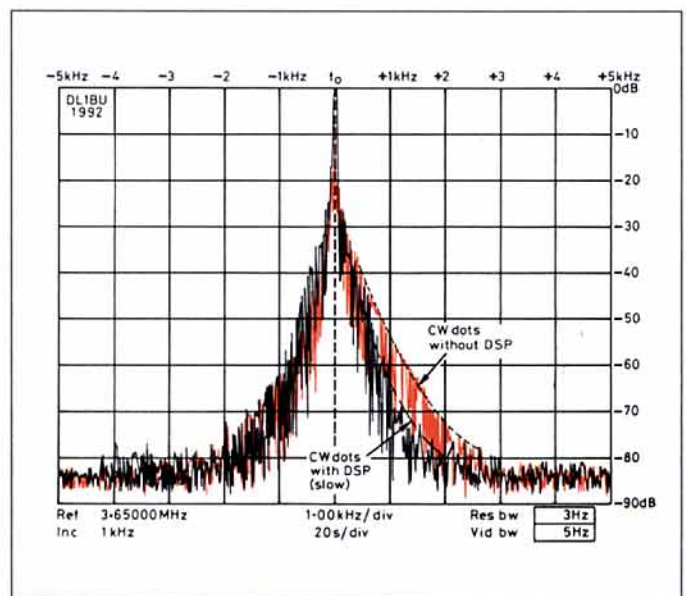


Fig 3: TS-450S. Dots keyed at 60WPM on 3.65MHz. Key click spectrum with and without the DSP-100 digital signal processor.

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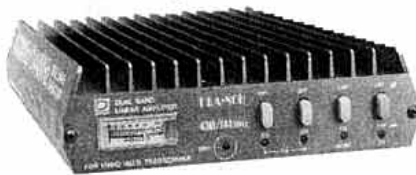
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See HRT August 1992 for Review.



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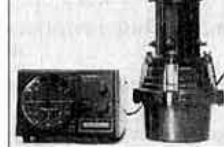
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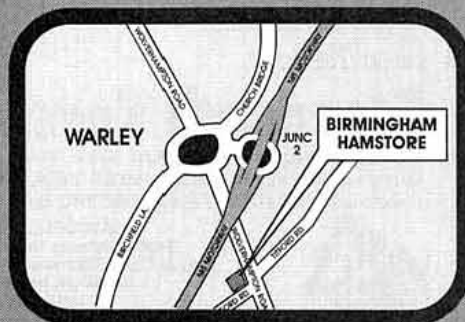
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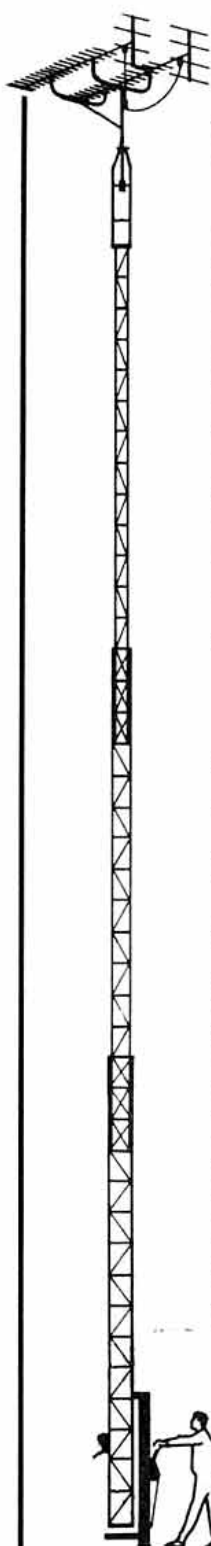
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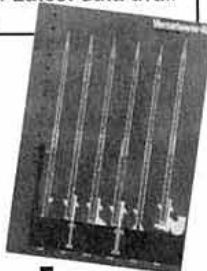
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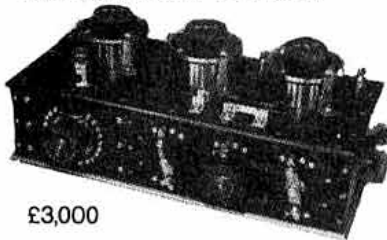
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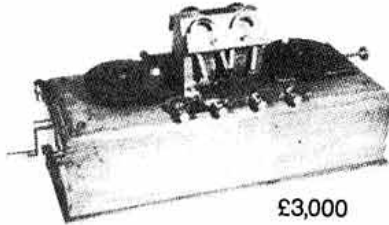
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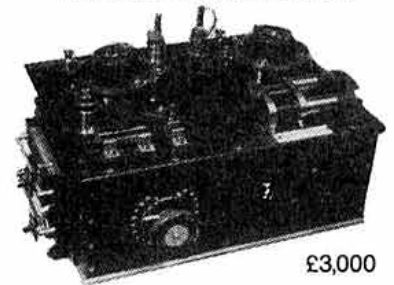
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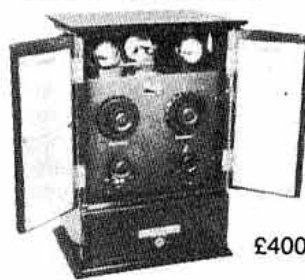
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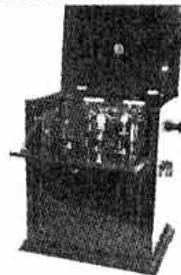
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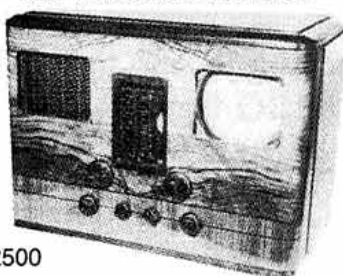
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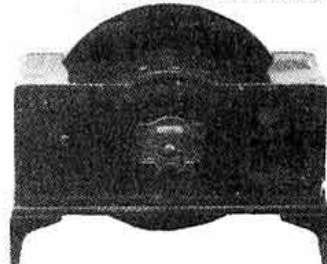
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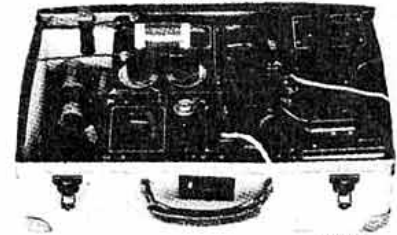
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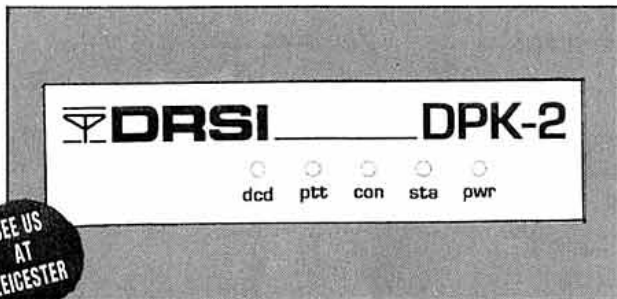
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QRP

GEORGE DOBBS G3RJV
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FOR THE LAST EIGHT YEARS the Yeovil Amateur Radio Club has organised a QRP Convention. The 1992 event, on 10 May, drew more low power operators and constructors than ever before, not only from the UK but also from abroad. The day included four lectures, several traders selling components and kits, the GB2LOW talk-in station and a fine display of home built equipment. The event was heralded on the air with the 'Yeovil Fun Run' a contest won by Bob Hudson, G4JFN.

The lunchtime diversion was an interesting construction competition to build an 80 metre receiver using no more than one diode and one three terminal transistor. The receiver and its antenna had to be confined within a volume of no more than 2500cc, with no single dimension exceeding 200cm. Ingenious constructors produced some interesting looking receivers, the winner being Tim Walford, G3PCJ.

OUT AND ABOUT

THE RECENT *RadCom* series 'HF DX - The Inside Story' prompted Roger Laphorn, G3XBM, to send me a series of photographs entitled 'HF DX - The Outside Story'. Roger has been running a remarkably simple and inexpensive little station on his back lawn.

The station is a Mizohu MX2 2 metre SSB hand-held transceiver (200mW) driving a home built 2m to 10m transverter. This simple transceiver arrangement with a rechargeable lead-acid battery, an SWR Bridge and a base loaded mobile whip provides the portable station. The mobile whip is merely plonked onto the lawn without extra radials.

The whole station cost around £80. The MX2 accounts for £60 of that, the rest was either made or acquired secondhand. This little back garden station has produced SSB contacts all over Europe and into the mid-west of the USA. Roger has recently worked into Italy on 6 metres using a newly built 2 metres to 6 metres transverter in the same kind of arrangement.

A USEFUL TIP FOR DIRECT CONVERSION RECEIVERS

GUS TAYLOR, G8PG, writing in the G QRP Club journal *Sprat*, describes a useful idea to reduce breakthrough in direct conversion receivers from broadcast stations. Very often fitting a simple resistive attenuator on the antenna input can be of some help but often not a complete cure.

G8PG has had considerable success using a different method of coupling the antenna to the input tuned circuit. This involves replacing the conventional antenna coupling coils to the antenna tuning unit with coils wound from small bore coaxial, or screened cable, the braid of which is connected to form a Faraday Screen. This involves replacing the existing coupling winding with an equivalent winding made from small bore coax.

At the 'hot' end of the winding the antenna is connected to the inner of the coax. At the earthy end, the coax inner is connected back to the screen of the coax at a point adjacent to the beginning of the winding. This point is then grounded. Note that at the 'earthy end' of the winding there is no ground connection to the screen on the coax cable. A single turn winding of this type is illustrated in 17.10 of the *RSGB Radio Communication Handbook* reproduced as Fig 1 above.

Modifying a Z Match antenna tuner in this way produced very much sharper tuning when loading the antenna and reductions of up to 9 S-points in out of band signals. This form of coupling also considerably attenuates any harmonics at the transmitter output.

G8PG used thin screened cable for his experiments, which was probably microphone cable. Although designed for audio use, it seems to work without noticeable losses.

PHOTOGRAPH: G4PDG



'HF DX the Outside Story': Roger Laphorn, G3XBM, with his tiny 10m SSB station (see 'Out and About').

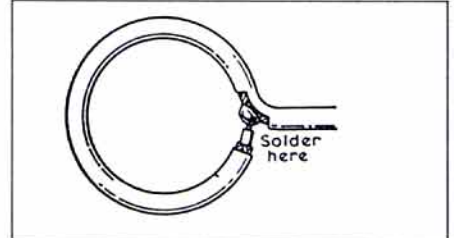


Fig 1: A shielded link coil made from coaxial cable. The outer braiding is left in position but does not form a closed loop. The inner conductor is soldered to the outer braiding at the point shown.

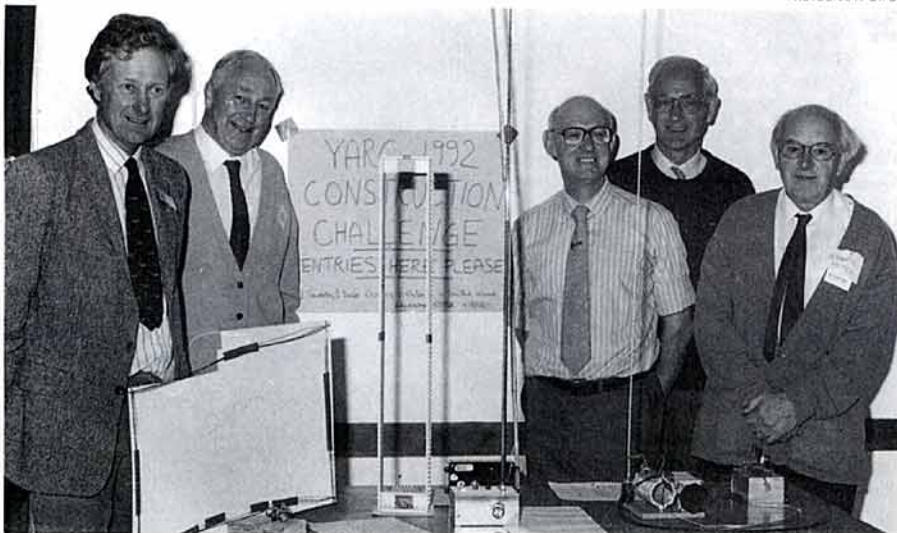
SOMETHING TO READ

I GET FREQUENT LETTERS about suitable books to read to provide a background for low power operation or QRP construction. Only a few years ago there was not much choice in reading material, but now the RSGB's 'Book Case' pages in *RadCom* [see pages 78 and 79 - Ed] provide some good reading on QRP. All of the books listed in this section are valuable, not only to the established or would-be QRPer but also in providing a source of useful information for any radio amateur.

I'd like to mention the *G-QRP Club Circuit Handbook* (RSGB) which has been compiled from the first eight years of the G QRP Club journal *Sprat*. Another edition with all new material will be prepared shortly. Readers wishing to subscribe to *Sprat* can receive a sample copy by sending me a large (A5) SASE.

No library of QRP amateur radio material can be complete without some of the work by Doug DeMaw, W1FB. His book *W1FB's QRP Notebook* (ARRL) is a good general introduction to the practical aspects of the subject. I would link this with *W1FB's Design Notebook* (ARRL) to be found in the 'General Technical' section of the *RadCom* 'Book Case' pages. Doug's work is also featured widely in *QRP Classics* (ARRL) and he is the joint author, with Wes Hayward, W7ZOI, of *Solid State Design For The Radio Amateur* (ARRL). *QRP Classics* is a compilation of articles from *QST* magazine, which have provided much of my background technical reading for the last 15 years. *Solid State Design For The Radio Amateur*, although now slightly dated, has been the source book of circuit ideas for many QRP constructors since the late 1970s. If you are a novice or a beginner in the hobby, a lot of useful information can be gleaned from Doug DeMaw's *First Steps In Radio* (ARRL).

A lot of very good books to choose from. My only regret is that most of this material is published in America and tends to arrive here at slightly higher prices. The good news is that the books are easy to obtain, either from the RSGB (at a special discount to members) or from other technical book stockists.



Yeovil ARC's Construction Challenge at its QRP Convention: (l to r) Tim Walford, G3PCJ; Derek Alexander, G4GVM, (Chairman); Rob Micklewright, G3MYM; Peter Welch, G3OFX and Peter Matthews, G3BPM.



EMC

MEGAN SMITH, G0MEG
EMC Committee Secretary

THE FIRST TITLE COULD well apply to myself, as I am writing it in August in very sticky weather but, as the magazine will not be out until October, the title applies to various problems with central heating. Thanks to David, G1OSC, for his usual sterling work; Mike, G3WHN, who gave me his contribution at RSGB'92 in Birmingham, and last but not least to Peter, G3SPL/S79PDL, who wrote from the exotic location of the Seychelles!

HOT AND BOTHERED?

FRANK CLAYTONSMITH, G3JKS, a keen contester, suffers from interference on the 3.5MHz band during the day which blots out many signals making contest operating difficult. He traced the interference to a new Potterton central heating controller installed 25 metres away from his antenna in the house next-door-but-one. The model number of the controller is EP3000. The interference, which is amplitude modulated with a 100Hz buzz, appears at a number of HF frequencies including 3550kHz (QRP calling!), 3577kHz, 3715kHz, 3883kHz. The levels from an 80m $\lambda/2$ dipole are up to +40 dB μ V (100 μ V) or S9 on a TS-830M transceiver whose 'S' meter had been calibrated. The exact frequencies and levels vary through the day, possibly as the heating system turns on and off. The interference appears to be conducted out via the mains supply and switched outputs and it somehow gets coupled onto the telephone line where it is radiated by several overhead telephone wires. This made direction finding very difficult! By complete contrast, EMC Committee member Dave Lauder, G1OSC, has a Landis & Gyr electronic central heating controller called a 'Microgr' model RWB 20. Although this switches 240V mains, it is powered by a single 'AA' battery lasting several years. It uses a 32.768kHz watch crystal and G1OSC can detect absolutely no RFI from its electronics on any frequency!

Peter, G3SPL/S79PDL, wrote to me about burglar alarms following the recent articles in *RadCom*. He included a tale of false alarms caused by his central heating system. I hasten to add that this was when he was in England, not in the Seychelles! The alarm system control panel was a CPF2 but he could not recall the manufacturer. Anyway, the false alarms coincided with the gas fired central heating boiler starting up. He thought it might be the spark generator (which ignited the gas) radiating RF or possibly the signals coupling through the mains wiring - or a combination of the two. He cured the problem by putting a simple RC filter on the sensor input lines of the alarm control panel, consisting of a 330 Ω series resistor and 100nF capacitor to the 0V line of the panel.

Another *RadCom* reader who enjoyed warmer climes is Mike Sloan, G3WHN, and when he returned to England he decided to get rid of his old solid fuel boiler and replace it with a new gas-fired one. This was duly supplied by Potterton and fitted by West Midlands Gas.

He writes: "Now what was that buzzing noise? ... Some weeks later I went on air from the new QTH ... Michael! The boiler is acting strangely!" You can all guess what was happening, the boiler was going on and off with his transmitter! By this time he had discovered what was causing the buzzing: Two electronic thermostats had been fitted to the system. One was a room thermostat and the other a boiler thermostat, models PRT2 and PTT2 respectively. These were connected to an Electronic Programmer model EP6000. Neither of them would latch properly. They both oscillated violently, for a period of up to thirty seconds, each time the thermostat gave the order to switch on before finally settling. G3WHN continues "In itself this was a serious design fault and the introduction of a nearby RF source heightened the problem considerably."

"The first reaction was to make sure that the station came up to the highest possible EMC standards. Fig 1 shows the layout. This follows good engineering practice and nothing untoward was discovered. It will be noticed that two low pass filters are in use. The second filter is placed after the peak reading wattmeter to eliminate any possible harmonics associated with this useful instrument. Whilst all antennas are usually adjusted for optimum VSWR on preferred frequencies, they are generally multi-band ones. These include a G5RV, W3DZZ and a full-size loop for 80 metres. The ATU is used mainly as a harmonic filter. The earthing system consists of a number of ground stakes connected together with 10mm earthing cable. The problem could now be tackled with some confidence."

Mike made a good general point here for any EMC problems - first ensure your own set-up is in order. He then tested on all bands from 2m to 160m and power levels of between two and five watts. As soon as the dummy load was switched in, the problem disappeared.

He contacted West Midlands Gas and the Potterton Service Department who were initially very co-operative and helpful and sent him a modified thermostat by return. The modification consisted of a disc ceramic capacitor wired directly across the +ve and -ve pins of the IC, an LM324N. This is a low-voltage 4x operational amplifier. Unfortunately, tests showed that this modification had

little effect on the problem. He contacted Potterton again and sent details to West Midlands Gas and the EMC Committee. Eventually, he got a letter from Potterton which indicated they would not do any more for commercial reasons. In the meantime, he had got permission from the installers (so as not to invalidate their guarantee) to try replacing the offending room thermostat with a Honeywell bi-metal design salvaged from the old system. This reduced the problem but he did not have another thermostat for the hot water cylinder.

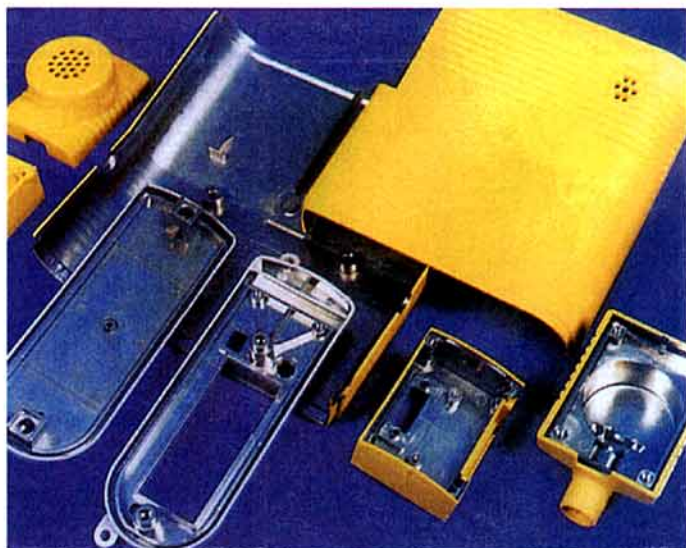
West Midlands Gas fitted two new Honeywell type thermostats and the problem disappeared. G3WHN was also pleased that they had a source of RF filters for a variety of other possible EMC problems associated with central heating installations. Fortunately the Potterton EP6000 programmer appeared to be totally immune to RF.

After some experimentation with the original offending thermostats, to try and pin down a solution, G3WHN discovered that spraying the insides of the plastic cases with five coats of Maplin's Electrolube nickel screening did the trick. However you would have to be extremely careful to mask items such as terminal blocks inside the case before spraying. In addition, no spray should be splashed on the outside of the case as any unforeseen mains leakage would make the coating live!

Mike concludes "This problem took over six months to resolve, but resolved it was. The experience proved to be valuable and gave an insight into the priorities or otherwise given to EMC problems in the competitive business world."

STICKING METAL TO PLASTIC

READING G3WHN's EXPERIMENTS with screening the inside of a plastic case reminded me of an article by Greg Prescott in the April *Electronics Manufacture and Test* magazine. This showed how commercial firms approach the idea of sticking metal to plastic. Some use a similar paint to that tried in Mike's experiments but others use more sophisticated techniques. Modern hand-held transceivers need to be made from very lightweight materials which rule out most of the



A commercial approach to sticking metal to plastic.

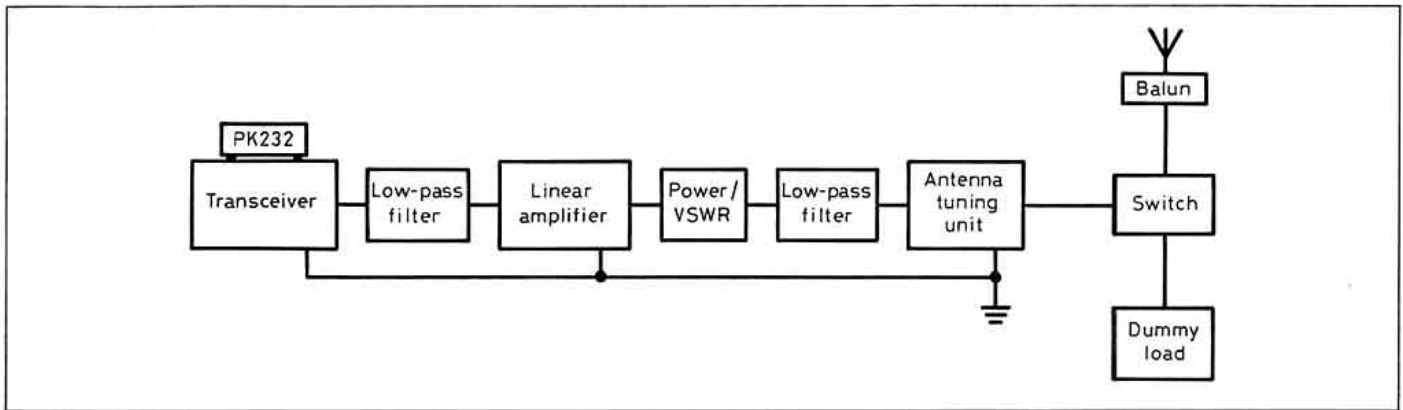


Fig 2: An additional low-pass filter ensures correct readings from the Power/VSWR meter, and a low overall harmonic output.

metals which would be ideal for shielding purposes, and the casing needs to be rugged to withstand knocks and bumps. Mobile radios have to withstand temperature variations from frost to +50°C or more, together with large variations in humidity and vibrations.

One technique which can solve this type of problem is vacuum deposition of metal coatings. A coating of just 2.5 microns (μm) thick can provide enough shielding for many applications. The coating does not flake off when the item is dropped and can withstand thermal shock and temperature cycling such as is found in mobile transceivers. An additional benefit is that it is so thin it has almost no effect on the shape of the plastic moulded cases so that they still fit together snugly. Greg Prescott stated that this 2.5 μm coating offered better shielding than an equivalent 40 μm thick coating of epoxy-loaded paint.

The process for vacuum deposition is relatively simple. First, areas not to be coated are masked off and a 5-stage ultrasonic surface cleaning is done. Then the plastic cases are put into a high vacuum metallisation chamber where the appropriate thickness of say, pure aluminium is deposited on the surface.

For higher levels of shielding, sputter coatings are used. This technique allows virtually any metal or combination of metals to be deposited in thicknesses from 0.1 microns to 5 microns. One advantage of sputtering is that it can be used on cases made from *exotic* materials including carbon fibre, carbon loaded plastics, epoxy composites and polyamides. A typical application might be a single layer of nickel.

Such processes use expensive tools and equipment and are well beyond the average amateur's pocket, however the principle behind the shielding is exactly the same as using the nickel paint tried by G4WHN on his misbehaving thermostats.

INTERNATIONAL EMC

THE IARU IS A FEDERATION of national amateur radio societies of which the RSGB is a member. The IARU has a Region 1 EMC working group which met at the 1992 Ham Radio exhibition at Friedrichshafen, Germany on 27 June. The RSGB EMC Committee was represented by Hilary Claytons-Smith, G4JKS, who also acted as secretary for the meeting. She was visiting Friedrichshafen at her own expense. A particularly important area of IARU EMC work which was reported at the meeting is representing the interests of radio ama-

teurs on international EMC standards organisations such as CISPR. Thomas Sprenger, PA3AVV, reported on recent CISPR activities which are relevant to amateur radio and the following is based on his report:

With immunity standards, the general trend is towards a level of 3V/m or 130dB $\mu\text{V}/\text{m}$ for immunity of domestic equipment to radiated fields. Although this level is lower than radio amateurs would like, in the long term it should have a favourable effect on the number of breakthrough complaints. Unfortunately, the current CISPR standard for the immunity of sound and video equipment (CISPR 20) is based on a lower limit of 1.78 V/m (125dB $\mu\text{V}/\text{m}$) and it contains a large number of specific frequency ranges where lower levels of immunity are allowed.

Limits of emissions of interference in amateur bands is a subject which requires constant monitoring by the IARU. The IARU Region 1 EMC WG expressed concern about microwave ovens radiating interference in bands allocated to amateur (satellite) services and to satellite TV services. It was admitted that the amount of leakage could be reduced by improving the design of the doors but representatives of the microwave oven industry argued against tightening of the limits on the grounds of increased product cost. Although no agreement was reached this year, this matter is likely to be on the agenda again at the next annual CISPR meeting. A worthwhile success of the IARU EMC WG has been in standards for new gas discharge lamps which are energised by RF. Manufacturers of these lamps wanted the CISPR limits for emissions of RF interference to be relaxed between 1.6 and 4MHz which would have included the 1.8 and 3.5MHz amateur bands. Thomas Sprenger, PA3AVV, the IARU delegate made a proposal which was accepted, that the limits should only be relaxed from 2.0 to 3.4MHz so as to provide better protection of the amateur bands. Clearly, these lamps may still produce RFI in the 1.8 and 3.5MHz bands within the existing limits but how much remains to be seen.

EXOTICALLY ALARMING!

AS I MENTIONED BEFORE Peter, G3SPL/S79PDL, wrote a long letter from the Seychelles. When he was in England he installed a domestic alarm system using Racal-Guardall Apollo PIR's. He found he could run 100W of CW or RTTY on 14 or 21MHz with a low antenna without any problems. In his

warmer location he uses an RS Components control panel and Enforcer PIR sensors from Pylonix. He has had no false alarm problems when operating on 7, 14 and 21MHz up to 200W even with the system set.

He also used the Apollo units for an installation close to two 250kW HF broadcast transmitters. The field that the alarm system is working in is up to 10 volts per metre and the sensors have given no problems. Another Racal-Guardall product was used for the control panel, the Countess. Peter says it has good filtering against RF and induced transients. However he found that the remote keypad which was supplied with the unit was a poor performer in high HF fields; there is insufficient RF filtering on the input leads. Unluckily he happened to choose a cable length to this unit which was a quarter wave long at one of the broadcast transmitter frequencies, and this blew a transistor driving the outgoing data line. When he examined the circuit board there was a distinct shortage of capacitors suitable for HF decoupling. After fitting the leads to the keypad with RF filters he has had no more problems.

Well, I think that ought to be the last word on alarms for a while, but I couldn't resist putting Peter's comments in the column from such an exotic location!

EMC AND YOUR LICENCE

IN MAY THE RSGB Licensing Advisory Committee received a letter from the RA on the subject of 'The EMC Directive and the Radio Amateur'. It pointed out that because the EMC Directive will come into force in October and because some equipment may come onto the market bearing the 'CE' mark; which intimates that it has been built to the Directive's Immunity Standard, there was a need to reflect this situation in the amateur radio licence. It was suggested by the RA that the inclusion of an additional paragraph to note (l) of the *Terms, Provisions and Limitations* Booklet BR68, would be sufficient to draw radio amateurs' attention to this.

As this proposed paragraph had EMC implications a special weekend meeting of the RSGB EMC Committee was called. The suggested paragraph was studied and a modified version was drawn up together with several pages of technical commentary on the proposed changes. The EMC Committee's response was passed to the LAC who submitted it to the RA in July. At the time of going to press (mid August) a response is still awaited.

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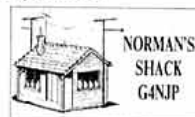
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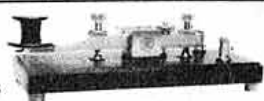
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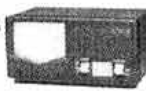
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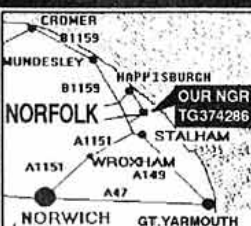
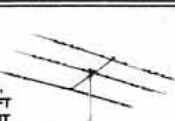
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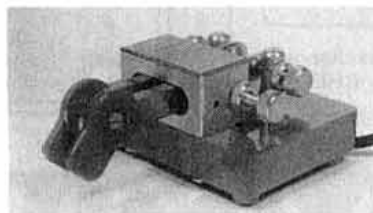
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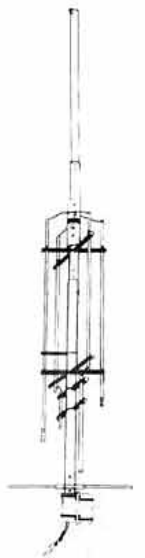
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TRANSVERTERS, 50MHz drive, 500mW output, >15dB RX gain

	Boxed kit	Boxed built
0.5-5W drive, TRC2-6i, TRC4-6i, TRC10-6i	£85.50	£125.50
25W output with TA2S3, TA4S3, add	£60.00	£78.50

TRANSMIT AMPLIFIERS, linear class AB, switched

	Boxed kit	Boxed built
2.5W in 25W out, also 5W in 25W out and 10W in 45W out, TA2S1, TA4S1, TA6S1	£56.25	£68.75
With preamp, TARP2S1, TARP4S1, TARP6S1	£72.75	£95.00
0.5W in 25/35W out, TA2S2, TA4S2, TA6S2	£71.00	£89.25

RECEIVE PREAMPS, 20/26dB gain, 100W handling, low noise

	Boxed kit	Boxed built
RP2S, RP4S, RP6S, RP10S, RP15S, RP20S	£27.50	£39.00
Masthead version, RP2SM, RP4SM, RP6SM	£39.50	£49.00

RECEIVE CONVERTERS, low noise

	Boxed kit	Boxed built
28MHz IF, RC2-10, RC4-10, RC6-10	£38.25	£49.50
144MHz IF, RC10-2, RC6-2, RC4-2	£38.25	£49.50

SPEECH PROCESSOR, increases average power output on SSB

	Boxed kit	Boxed built
Suitable for HF and VHF, SP444E	£25.00	£40.00

FM BOARDS for HF receivers and transceivers

	PCB kit	PCB built
FM demodulator for R600, FRG7 etc FD455	£7.00	£9.00
FM demodulator for HF transceivers, FD311X	—	£47.50
FM modulator for CW SSB AM rigs, FM2000	—	£18.50
FM modulator for CW SSB only rigs, FM3000	—	£35.50
FM demodulator for CB SSB rigs, FD3-11	£25.25	£43.00
FM modulator for CB SSB rigs, FM1000	£5.00	£7.00
FM mod/demod for AM CB rigs, FM455	£9.00	£13.50
Noise squelch for HAM or CB rigs, NS1000	£11.50	£15.50
10.7MHz IF filter board for FM CBs, SF10.7	£8.00	£9.00

FOUNDATION TRANSMITTER, 144MHz, 6 channel, 0.5W, CW and FM

	PCB kit	Boxed kit
Supplied with S20 crystal, FTX201	£36.50	£49.50

COMMUNITY BROADCAST TRANSMITTER, 88-108MHz band, 0.5W

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	PCB kit	PCB built
1750Hz repeater toneburst, AT1750	£5.00	£7.00
Piptone, like APOLLO beep, TP1000S	£7.00	£9.50
Kaytone, morse dah-di-dah, KT1000	£9.00	13.25
Tunetone, nine tones, TT1000	£9.50	£14.50

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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'.

4 OCTOBER

BLACKWOOD & DARS Rally - Oakdale Community College, Blackwood, Gwent. Doors open 10.30am; admission £1. Traders; bring & buy; videos; raffle; Talk-in on S22. Details from Norman Davies, GW0MAW, 0495 227550.
GREAT LUMLEY Radio Rally - The Community Centre, Great Lumley, Nr Chester-le-Street, Co Durham. Opens 11am (10.30am for disabled visitors). Trade stands; refreshments; bring & buy. Entrance fee: £1 includes a programme; children under 14 accompanied by an adult free. Details from Barry, G1JDP, 091 388 5936.
WINCANTON Radio and Electronics Rally - Wincanton Racecourse, Somerset. 10am to 4pm. Under cover. Trade stands; car boot sale; refreshments; free parking. Talk-in on S22. 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 G4E2U, QTHR, 0474 533866.

11 OCTOBER

ARMAGH & DUNGANNON & DARC Rally - Gosford House Hotel, Market Hill, Co Armagh. Doors open 12 noon. Usual traders; bring & buy; refreshments. Talk-in on S22. Details G18RLE, 0762 870423.
HORNSEA ARC Rally (ELHOEK) - Floral Hall, Hornsea. Opens 11am (10.30am for disabled visitors). Trade stands; tombola; raffle; bring & buy. Ample car parking. Details from G4IGY, 0964 533331.
SOUTH DEVON RC Computercations 92 Computer & Radio Rally - Hillhead Camp Site, Dartmouth Road, Brixham. Opens 10am. Trade stands; car boot sale (weather permitting); bring & buy; raffle; refreshments. Talk-in on S22 G7FDC & G4SSD; SES GB4CPU. Unlimited free parking; overnight camping. Details from W T Trezise, G6ZRM, 0803 522216.

23/24 OCTOBER

LEICESTER ARS Show - Granby Halls, Leicester. All usual facilities. Details from Frank Elliott, G4PDZ, 0533 871086.

31 OCT/1 NOV

6TH NORTH WALES Radio & Electronics Show - Aberconwy Conference & Exhibition Centre, Llandudno. Entrance fee: £1 adults, 50p children under 14. Details from GW7EXH, 0745 591704.

1 NOVEMBER

TWELFTH NORTH DEVON Rally - Holworthy Memorial Hall, 10.30am to 5pm. Bring & buy etc. Details from K J Nicholls, GBMXI, QTHR.

8 NOVEMBER

BARNSELY & DARC 2nd AR Rally - Willwogarth Senior High School, Briarley Road, Grimsthorpe, Barnsley. Mid-way between Pontefract and Barnsley, just off the main A628 Barnsley/Pontefract Road. Doors open 11am (10.30 for disabled visitors). Traders; 20 radio clubs and specialised groups; Bring & Buy; food & drink; licensed bar; car parking over 1500 cars. Talk-in on S22. Details from Ernie, G4LUE, 0226 716339 (6pm-7pm please).
MARS/STOCKLAND Mobile Radio Rally - Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Trade stands; bring & buy; free parking. Admission £1. Details from Norman, GB8HE, 021 422 9787.
TYNE & WEAR REPEATER GROUP Auction - Fencehouses Community Centre, Fencehouses, nr Chester-le-Street, Co Durham. Doors open 10.30am for booking in goods. Auction starts at 12 noon. Details from Ian, G4OCQ QTHR, 091 3840827.

15 NOVEMBER

BRIDGEND & DARC Rally - Bridgend Recreation Centre (jct 36 M4). Doors open 11am (10.30am for disabled visitors). Bring & buy; swimming pool; 2 cafeteria: bar; Toner etc. Details from GW3RVG, 0656 860434.

22 NOVEMBER

BISHOP AUCKLAND RAC Radio & Computer Rally - The Spennymoor Leisure Centre, Spennymoor, Co Durham. Easy to find from major routes through the area (A1(M) etc). Under new management team this year. Catering and bar facilities plus other amenities of a top class leisure facility. Details from Mike, G0PRQ, 0388 766264.

WEST MANCHESTER RC Winter Rally - Bolton Sports & Exhibition Centre, Silverwell St, Bolton. Doors open 11am (10.30 for disabled visitors). Admission £1, children free. All usual trade stands, societies, bring & buy etc; refreshments available all day + bar. All at pavement level with facilities for the disabled. Details from Dave, G1IOO 0204 24104 (eves).

13 DECEMBER

CENTRE OF ENGLAND Christmas Radio, Computer, Electronics & Communications Rally - National Motorcycle Museum, near NEC Birmingham, Jnc 6 M42. Opens 11am (10.30 for disabled visitors). Admission £1 (reduction for RAIBC members). Over 60 traders, bar & restaurant; ample parking. Concessionary rates for those wishing to visit museum. Talk-in on S22. Christmas Special: 'Spot the Cracker' which will be on many of the trade stands to win a free prize. Details from Frank Martin, G4UMF, 0952 598173.
LEEDS & DARS Annual Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey, Leeds (jct of the Leeds Outer Ring Road with the Bradford Road). Doors open 10.30am. All usual facilities. Details from John, G0FWP QTHR, 0532 589652.
VERULAM ARC Christmas Rally - University of Hertfordshire (formerly Hatfield Polytechnic). From 11am to 5pm. Usual traders; bring & buy; raffle. Trade enquiries 0923 211643.

24 JANUARY 1993

LANCASTRIAN Rally - University of Lancaster. Admission £1. Doors open 10.30 for disabled visitors. Details from Sue, G1OHH QTHR, 0524 64239.

7 FEBRUARY 1993

SOUTH ESSEX ARS Radio Rally - Paddocks Long Road, Canvey Island. Details from Ken Hendry, G0BBN, 0268 755350.

14 FEBRUARY 1993

CAMBRIDGE & DARC Radio and Computer Rally. Details from G6UGI, 0763 243570.
2ND NORTHERN CROSS Rally - Rodillian School (jct M1/M62). Details from Dave Gray, 0532 827883.

21 FEBRUARY 1993

EAST COAST AR&C Rally - Leisure Centre, Vista Road, Clacton-on-Sea. Details from CLPK, 0255 474292.

28 FEBRUARY 1993

6th TAW & TORRIDGE Rally - Bidford Halls. Details 0271 860930.

6 MARCH 1993

VHF Convention - Sandown Park Exhibition Centre. Stand bookings to Les Hawkyard, G5HD, tel: 0409 281 342. Details from Geoff Stone, G3FZL, tel: 081 699 6940.

13/14 MARCH 1993

LONDON AR&C Show. Details 0923 678770.

21 MARCH 1993

NORBRECK ARE&C Exhibition. Details from Peter Denton, G6CGF, tel: 051 630 5790.

29 MARCH 1993

PONTEFRAC T & DARS 13th Annual Components Fair & Spring Rally. Details from Colin Wilkinson, 0977 677066.

4 APRIL 1993

WHITE ROSE ARS Radio Rally - Change of venue to: Allerton High School, King Lane, Leeds 17. Detail from A A Bartram, G7ELS.

12 APRIL 1993

CENTRE OF ENGLAND Easter Rally. Details from Frank Martin, G4UMF, 0952 598173.

25 APRIL 1993

BURY RS Hamfest. Details from Laurence, G4KLT, 061 762 9308 (eves).

9 MAY 1993

MARS/DRAYTON Mobile Rally. Details from Peter, G6DRN, 021-443 1189. Traders bookings Norman GB8HE, 021-422 9787 (eves).

16 JUNE 1993

25th SPALDING Mobile Rally. Details from M T Kettlewell, G4TWR, 0775 722940.

13 JUNE 1993

24th ELVASTON CASTLE Mobile Rally. Details from John Robson, G4PZY, tel & fax: 0332 767994; trade enquiries to Peter Neal, G3WFU, tel & fax 0332 700265 (evenings).

27 JUNE 1993

36th LONGLEAT AR Rally. Details from Shaun, GBVPG QTHR, 0225 873 098.

11 JULY 1993

SUSSEX AR&C Fair. Details & traders' booking from Ron Bray, GBVEHQTHR, 0903 763978 (H) 0273 415654 (W).

25 JULY 1993

COLCHESTER Radio & Computer Rally. Details from Frank, G3FJF, 0206 851189.

22 AUGUST 1993

WEST MANCHESTER RC Summer Rally. Details from G1IOO, 0204 24104 (evenings).

19 SEPT 1993

CENTRE OF ENGLAND Autumn Rally. Details from Frank Martin, G4UMF, 0952 598173.

GB CALLS

The list below shows all special event stations licensed for operation during this month and up to 30 October. It was taken from the HQ computer on 4 September. These call-signs are valid for use from the date given but the period of operation may vary from 1-28 days.

1 OCTOBER

- GB0CDX Coastal Defence X
- GB0CSR Civil Service Radio
- GB0MOD National Mod
- GB1EED Eagle Centre Derby
- GB2GMM Guglielmo Marconi Memorial
- GB2PG Paul Godley

2 OCTOBER

- GB0CDR Coastal Defence R
- GB2RAF Royal Air Force
- GB6HF Houghton Feast

3 OCTOBER

- GB0BDC Barnsley Diabetic Centre
- GB2PLY HMS Plymouth

4 OCTOBER

- GB4EKG Essex Kite Group

8 OCTOBER

- GB2RCC Radio Caravan Club

9 OCTOBER

- GB4DHX Dunfermline Hobbies Xhibition
- GB4RAF Royal Air Force

11 OCTOBER

- GB0LSU Loughborough Students Union
- GB4CPU Computercations

16 OCTOBER

- GB2IRC Ipswich Radio Club

17 OCTOBER

- GB0CDC Coastal Defence Carisbrooke

19 OCTOBER

- GB50SCC Sea Cadet Corps

27 OCTOBER

- GB0HLC Harrogate Ladies College
- GB1HLC Harrogate Ladies College

30 OCTOBER

- GB4RSL Royal Signals Llandudno
- GB6RAF Royal Air Force

SILENT KEYS



WE HAVE BEEN advised of the deaths of the following radio amateurs:

G0BHZ	Mr W Pybus	15.7.92
G0FTT	Mr J Griffiths	22.8.92
G0HWG	Mrs D Judges	06.8.92
G0JHN	Col J Parker	09.8.92
G0JHP	Prof J Peacock	May 92
G0NEK	Mr N Houghton	17.6.92
G1IOO	Mr L Thomas	
G1VOU	Mr IO Mottram	10.6.92
G2AQV	Mr SR Bennett	20.8.92
G3CJC	Mr KM McGowan	
G3FGF	Mr R Murphy	26.2.92
G4RBX	Mr H Humphreys	05.8.92
G4SUW	Mr A Oswald	26.8.92
G4VRY	Mr DJ Bryan	31.8.92
G6INC	Mr AE Lindridge	
GB8BG	Mr GT Collins	01.8.92
G8YZW	Mr MJ Shepherd	08.7.92
G14CXO	Mr IA Kernohan	21.3.92
G14YQB	Mr WM Archer	22.7.92
G18FOK	Mr HJ Campbell	07.5.92
GW1HNA	Mr A Boardman	
LA7PC	Mr K Christiansen	
RS15683	Mr AM Beresford-Cooke	OBE
RS25992	Mr J Milburn	28.9.91
RS267	Mr CCN Krom	Oct 91
RS39861	Mr HNS Wilkinson	29.7.92
RS47096	Mr JR Wixon	June 92
RS90725	Mr JEW Kerchevall	
RS91782	Mr HS Gowan	
VK6VW	Mr B Pemberton	25.7.92



Jamboree On the Air 17 - 18 Oct

THE 35th JAMBOREE On The Air is scheduled to take place over the weekend 17/18 October, from 0000 on the Saturday to 2400 on the Sunday (local times). Scouts and Guides all over the world will be using amateur radio to celebrate their shared interest. Many administrations have relaxed their greetings message regulations just for this event. This year, the World Federation of Great Towers has invited JOTA participants to use their towers for both amateur and commercial radio communication. The following towers will take part: Centrepont Tower in Sydney, Donauturm in Vienna, CN Tower in Toronto, Tour Olympic in Montreal, Empire State Building in New York, Eiffel Tower in Paris, Euromast in Rotterdam, Ostaniko Tower in Moscow, and in the UK the Blackpool Tower and London's Telecom Tower.

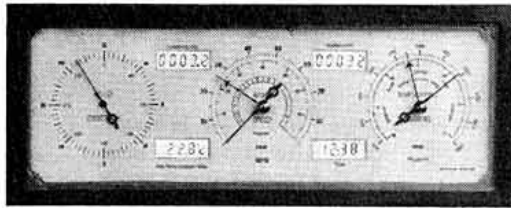
Any participating station *not* using a GB call-sign should notify RSGB HQ by Friday 2 October to be included on the JOTA list. This list is available only on receipt of a large SASE sent to: Sylvia Manco, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

● TO CELEBRATE the 35th JOTA, all Austrian stations will use '35' as the figure in their call-signs during October.

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'73 Elaine

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DECEIT?

'Deception by Interference' I think is the correct legal term. I am referring, of course, to the original 'information' published in *RadCom* about the Novice Licence (or Student Licence as it was then styled) and on which the infamous 'RadCom Referendum' (The Consultative Questionnaire) of September 1988 was based. The entire affair is reviewed and encapsulated in the July 1989 RSGB publication entitled *Novice Licence (a discussion document)*.

The aspect of the Novice Licence to which I take vehement objection is that it is available to adults. I am assured by the more ardent supporters of the Novice Licence that participation by adults was understood from the outset. If that was indeed the case, then it seems to have been one of the best kept secrets in the history of our hobby!

A read through the July 1989 publication referred to earlier will show that almost every mention of 'people' is prefaced by the adjective 'young'. The number of references to Scouts, Guides, Boys Brigades, Schools and other centres for young people is almost beyond counting. The inference that this new licence was primarily, if not exclusively, intended as an aid for the education of people of or about school age is both compelling and overwhelming. Clearly, this was the basis upon which the amateur population of the time voted and, not surprisingly, the proposal received substantial support.

I would venture to think that if the 'available to all' situation was made clear at the time, then the views expressed by members would have been decidedly different. It would be interesting to hear when and under what circumstances the 'no upper age limit' concession was slipped into the legislation.

I think that the time is now long overdue for a reappraisal of the terms of the Novice Licence with a view to rectifying this anomaly. I can see no justification whatsoever why the 'easy option' of the Novice Licence should be available to an adult person in good health. If that person proclaims a genuine interest in amateur radio, the appropriate and *only* means of entry into this hobby should be via the traditional route of the RAE - and this should present such a person with no real difficulty.

I shall therefore be campaigning for a review of the Novice Licence along the following lines:

1. That the Novice Licence may be obtained only by persons:
 - (a) under the age of 18, or
 - (b) by any persons for whom, by reason of health or other recognised circumstance, such a licence is likely to be socially beneficial.
2. That no persons over the age of 21 may continue to hold a Novice Licence except as referred to in 1(b).

Perhaps the Society will now go some way towards redressing the unfortunate information imbalance of its circa 1988 statements by publishing this letter and by giving consideration to the holding of a second 'referendum' on the Novice Licence?

T E O'Neil GM4PRO

[I will not comment on the main thrust of Mr O'Neil's argument - that is for members to do - but I would point out that the Novice Licence is not "the easy route"; a Novice has very limited privileges and it is still necessary for those of all ages to pass the RAE to gain a Full Licence - Ed]

NOT JUST FOR NOVICES

Recently I have purchased several copies of *Practical Antennas for Novices* by John Heys, G3BDQ, which I have added to numerous other antenna volumes in my library.

John's is a unique contribution to the art of antenna design and is essential reading for every Novice and a work not to be neglected by 'full licence' holders. I hope that other instructors will recommend it to their students.

David JM Ruddery (Senior Novice Licence Instructor)

SPURIOUS MORSE

I was sorry to see in the piece on Morse Test abbreviations (*News and Reports*, September) 'HW CPY?' For over 50 years we have happily sent 'HW?' at the end of the first over, meaning "How are my signals?", and at the end of subsequent overs, when required, 'OK?' This spurious addition is the product of a generation that apparently cannot hear, and will I am afraid inevitably be associated by many of us with the prefix G0. There is a perfectly good way of ending an over: 'AR'.

Yours with (singular) 73, J B Roscoe G4QK

The Last Word

NOT ALL BAD

I have always been saddened to read continually of the bad behaviour of a small minority of repeater users, who create an undeserved mantle for the majority. I feel I must appraise you of a situation which recently occurred with the assistance of many users of and listeners to GB3WL (West London VHF).

A shooting club of which I am a member recently helped in raising money to provide chocolate for the profoundly retarded children of Queen Mary's Hospital for Sick Children in Carshalton, Surrey. These children are liable to choke should they be left unattended with standard sweets.

During the course of many contacts I mentioned this point and, to cut a long story short, the users and listeners of GB3WL donated the magnificent sum of £500 which was duly presented to the Hospital in their name. A truly lovely "thank you" letter was duly received and circulated.

May I through *RadCom* express the gratitude of all the suffering children within that hospital who through the kindness shown will now be able to enjoy the simple pleasure in life that we all take so much for granted. As an avid user of repeaters during my many hours on the road, may I finish by asking that your readers do not continue to 'tar all with the same brush' as has been the case for so many years.

Chas Foulsham G6YOY

NOT PAST IT

In December 1989 I returned to the fold in the form of a Short Wave Listener after an absence of 38 years (previously VS6CF). I was content to remain an SWL considering myself as too old to start studying for the RAE and lubricating the wrist for the Morse test!

An increase in leisure time came in 1991 in the form of redundancy, combined with the general opinion of would-be employers that at 60 years old I was 'past it'. Thus I decided to disprove this theory and study for the RAE.

It may encourage others to know that the only sources of instruction I had came in the form of two RSGB publications: *How to Pass the RAE* and *Radio Amateurs Examination Manual*. This sounds like a publicity blurb, but is a fact as I had no other contact for instruction via clubs, other amateurs etc. I found both of these publications very good. It was not easy - I spent six months studying and sitting the mock exams and marking them myself to determine my progress. It does require a good deal of self-discipline and dedication, in my case about 8 hours per week, but it can be done and was done as described.

I have a few people to thank for helping me obtain my 'ticket': G2VF for re-introducing me to the RSGB, G4FZH and G3HB for writing the manuals (also the RSGB for publishing them) and the Morse test examiners at the Bembridge Amateur Radio Club, Isle of Wight whose understanding and encouragement helped keep me from 'falling apart' on the day! And last but not least - myself - for simply not accepting that I was 'past it'.

Reg Brookes G0SER (ex BRS92745)

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.

RACKET ECHO

Congratulations to Colin Richards, 9M2CR ('Stop the Packet Racket', *RadCom*, September) for being the first to recognise publicly the gross inefficiency of the packet system as it is applied in amateur radio. Since becoming the first station in the UK (in June 1985) to implement packet radio direct from the published AX25 Protocol using home-brewed software by G6FYU, I have been waiting for someone to 'tell it like it is'.

Using our packet program running in a 6800 micro-processor I have been able to analyse the packets hurtling across the bands both at HF and VHF. Even on VHF over 90% of the packets analysed do not contain any valid text and merely comprise overhead data, including callsigns of originator and destination with routing information, message number sent and received and various other bits and flags demanded by the protocol. The whole thing is then rounded off with a ludicrously complicated sixteen bit checksum designed to pick up a small error, where a simple checksum would have been quite adequate. On HF the situation is much worse and scarcely any packets are successfully transmitted and acknowledged.

It is interesting to examine why the system works so badly at this level. The protocol is based on X25 which was devised for use with computer networks and we have failed to recognise the essential limitations imposed by a radio circuit. On a computer network all users can generally hear each other with equal facility but with a Radio network each user enjoys a different QRM background from his neighbour. Thus, choosing the right moment to launch a packet on the basis of the perceived occupancy stands a good chance of being wrong, especially on HF where the vagaries of propagation and earth curvature compound the difficulty.

Now what happens when a packet fails to get through? As soon as the failure is detected the machines drop the small amount of text completely and then start asking each other if they are still in contact, a process known as polling. On the rare occasions when the link is re-established it is likely that as soon as they resume the textual traffic with an inevitably longer packet it will fail again because the longer the packet, the greater is the chance of clashing with another packet. So we finish up with all the users polling away like mad, surely the ultimate tower of Babel!

AMTOR on the other hand is a breath of fresh air. It works well because it was designed with radio in mind. The packets are short, the error checking is simple and the correct destination is ensured by accurate time slots. Almost all such packets are successful and contain few overheads.

I think as forward-looking amateurs we deserve something much better than AX25 for the twenty-first century, but of course many commercial interests have now nailed their colours firmly to the AX25 mast!

Denis J Walker BSc(Eng) CEng MIEE G3OLM

AARDVARK ADVERT

I wonder if the person responsible for accepting advertisements in the *Members' Ads* section of *Radio Communication* ever checks to see what is being sold in the columns. The small print at the top of the page says "Ads for CB equipment will not be accepted" and rightly so! However, there seems to be no other restriction on what may be advertised, and I feel that the time has come for some new rules to be introduced.

My main grievance is coming across ads for Houses, Cottages, and QTHs, etc (no less than three in the first column of the September issue!). I feel it unfair to accept such ads; if I want to buy a house I look in *Dalton's Weekly*, not *RadCom*. I can even remember seeing in the past an advert for an automobile. Isn't it about time we restricted the ads to equipment that is connected with amateur radio only (rigs, computers, TVs, satellite, antennas, etc)? I wonder if I am the only member annoyed by this practice.

Incidentally, before you change the rules, please find enclosed an advert for disposal of my pet aardvark (it should get top billing now that ads are inserted alphabetically).

Mike Goodall G0MGJ

[Yes, we do read the *Members' Ads*, and more is cut out than you perhaps realise. I think it is legitimate to advertise a house in *RadCom* if, for instance, the neighbours already tolerate amateur radio, or planning permission for a tower exists, or the garden or location is particularly suitable for our hobby; you won't get that from *Dalton's Weekly*. Advertising your brother's house or a sofa is stretching a point, however, so I have deleted your aardvark ad - Ed]

RSGB BOOK CASE

Antennas

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G L Hall, K1TD, P Rinaldo, W4RI, M Thompson, KA1DYZ
A collection of antenna articles with something for everyone. 175 pages. **(£10.25) £8.72**

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Everything you need to know about beam design, construction and operation in this new 2nd edition. 268 pages. **(£7.50) £6.38**

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Doug DeMaw, W1FB
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James Lawson, W2PV
An edited and updated series of important articles first published in *Ham Radio* in 1980. 210 pages. **(£10.00) £8.50**

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AMATEUR RADIO AWARDS BOOK (RSGB)

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William Nelson, WA6FOG
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Pat Hawker, G3VA
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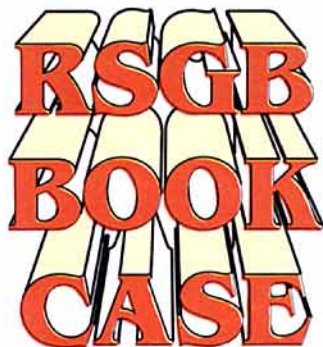
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WISE BUY BARGAINS!

ALL PRICES INCLUDE P&P + VAT

PYE MF5U UHF Europa 3CH + mic	£35
PYE M212 UHF Olympic 'T' Band 1CH + MIC + ccts	£30
PYE MF5U UHF Europa as above but as new and boxed	£45
PYE PF1 UHF, old faithfuls for 70cms with batts	£12
PYE PF2FMB E band for 4M. units only	£12
STORNO 5114S 12ch. 25w. A band synthesised with mod info	£55
STORNO 800 UHF handheld with battery and ccts	£25
NOLTON NOVA 281 synthesised E band up to 80ch on 4M and up to 40w o/p with full mod info	£40
Eprom for above giving 40ch am. +40 fm. on 4m.	£10
NOLTON NOVA 281 fully modded and tested on 4m	£90
NOLTON NOVA 242 small 10ch. mobiles for 4m am/fm. + info	£35
PYE L9U wallmounting UHF base stations sim to Europa	£25
MOTOROLA MC80 UHF mobiles for 70cms with connection info	£30
MOTOROLA MC80 A band mobiles for 2m. with connection info	£30

We now accept ACCESS/VISA orders on the telephone. PMR radios are sold "as is" but are checked for completeness before despatch. Please call or send SAE for more info or full PMR lists.

G.W.M. RADIO LTD

40/42 PORTLAND ROAD, WORTHING, SUSSEX BN11 1QN
TELEPHONE: 0903 234897 FAX: 0903 239050

BRANCH MANAGER AND SALES ASSISTANT

Icom (UK) Ltd. are opening a new Radio Hamstore this autumn in **North West London** and will require a Branch Manager and Sales Assistant to run this exciting new retail outlet.

The manager must hold a UK Amateur licence and preferably have retailing experience. A junior would be considered for the post of sales assistant providing they have adequate qualifications.

Successful applicants will qualify for our normal, generous staff benefits including BUPA, company pension and a profit-related bonus scheme.

Please write, with your CV, to Dennis Goodwin at the address shown below.

 Icom (UK) Ltd. Unit 9
Sea Street Herne Bay
Kent CT6 8LD.

ICS

LIMITED SPECIAL OFFER OF EX-DEMONSTRATION EQUIPMENT

Item	Description	Price
LA-30	AEA 1.2 KW HF Linear Amplifier	£669.95
MET-1	Meteosat System for IBM-PC with 1.0 metre dish	£499.95
QT-1	Antenna Tuner (scratched top)	£75.00
Antenna	7-30 MHz Single Element Trap 'V' (used)	£50.00
ST-2	Digital Thermometer and Probe	£11.95

Prices include VAT at 17.5%. Cost of postage on request.

All items are virtually as new (except where indicated) and are guaranteed for 12 months.

Only limited quantities are available. First come first served. Check availability. We take Access and VISA.

ICS Electronics Ltd, Unit V, Rudford Industrial Estate,
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Telephone: 0903 731101 Facsimile: 0903 731105

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NEXT COPY DATE

The display advertisement copy date for our December 1992 issue will be 19th October 1992

FORTHCOMING REVIEWS

In depth reviews by PETER HART

NOVEMBER — KENWOOD TS690
DECEMBER — LOWE HF150

HELPING HANDHELDS



- IC-P2E**
144MHz FM transceiver.
- IC-P4E**
430MHz FM transceiver.
- Easy to operate and compact in size.
 - Dual function display.
 - 1750Hz tone call.
 - 100 memory channels.
 - Variety of tuning steps.
 - Full, programmed and memory scan functions.
 - Cartridge-type battery pack.
 - Memory transfer function.
 - 24 hour clock.
 - Monitor function.
 - External DC jack.
 - Lock function.
 - Auto power save.
 - Dial select function.
 - Wide range of accessories.
 - 49(W)x105(H)x38(D)mm.



- IC-X2E**
430/1200 MHz Dual Band FM transceiver.
- Lightweight and compact.
 - Simultaneous 2 band receive capability.
 - RIT and VXO functions for the 1200MHz band.
 - 3-way tuning system.
 - 60 memory channels.
 - Optional packet beep and tone squelch for quiet standby.
 - Built-in pager and code squelch for selective calling.
 - 24 hour clock with ON/OFF timer.
 - External DC jack.
 - DTMF capability.
 - Auto power saver.
 - Monitor function.
 - 1750Hz tone call.
 - 54(W)x135(H)x38(D)mm.



- IC-P2ET**
144MHz FM transceiver.
- IC-P4ET**
430MHz FM transceiver.
- Artificial intelligence function that allows easier operation.
 - Compact rounded body design.
 - Newly developed battery packs.
 - Trial mode.
 - 1750Hz tone call.
 - Dual tuning system.
 - 100 memory channels.
 - Optional pocket beep and tone squelch.
 - Optional pager and code squelch functions.
 - Easy-to-see display.
 - Illuminated keyboard.
 - Auto power saver.
 - Memory masking.
 - DTMF capability.
 - 49(W)x105(H)x38(D)mm.



- IC-W2E**
144/430 MHz Dual band FM transceiver.
- Compact size.
 - Total convenience for dual band operation.
 - 1750Hz tone call to access repeaters.
 - Optional pocket beep and tone squelch for quiet standby.
 - Auto power saver.
 - External DC jack.
 - 60 memory channels.
 - 3-way tuning system.
 - High-speed scan and priority watch.
 - Built-in pager and code squelch for selective calling.
 - 24 hour clock with on/off timer.
 - Programmable offset frequency.
 - 54(W)x154(H)x36(D)mm.

ICOM handhelds offer an amazing range of functions at an affordable price, models vary in complexity, they are fun to use *and* easy to operate. Ergonomic design makes an ICOM handheld the ideal partner while on the move.

For further information about ICOM products and the location of your nearest authorized dealer contact: Icom (UK) Ltd. Dept RC Sea Street Herne Bay Kent CT6 8LD Tel: 0227 741741 (24hr). Fax: 0227 741742



ICOM

YAESU

UK Sole Distributor
South Midlands Communications Ltd, S.M. House,
School Close, Chandlers Ford Industrial Estate,
Eastleigh, Hants SO5 3BY.
Tel: (0703) 255111.

Yaesu's Pair of Aces



The FT-26/76 hand-helds make your life simple with all the features you will ever need. They're easy to use and designed to fit comfortably in your hand, and weighing in at just one pound each, the FT-26/76 lets you travel light. For complete details on these handhelds call your nearest Yaesu dealer now!

FT-26/FT-76
Hand-helds that make
your life simple

- ✓ FT-26: 144-146MHz, FT-76: 430-440MHz.
- ✓ Supplied as standard with FNB25 and NC28C.
- ✓ 53 Memory Channels.
- ✓ 5 Watt Output, 12V DC NiCad Batteries Available.
- ✓ Four User-Programmable Power Levels (with FNB-27).
- ✓ Built-In Vox.
- ✓ Built-In DTMF calling For Selective Or Group Calling.
- ✓ Backlit Display and Front Buttons.
- ✓ Direct 12-Volt Operation With E-DC-5 Adaptor.
- ✓ Key, PTT and Dial Locking.
- ✓ Automatic Repeater Shift (ARS) Built-In For 2 Meters.
- ✓ Automatic Power Off.
- ✓ Selectable Channel Steps.
- ✓ Automatic Battery Saver.
- ✓ User Selectable Channel-Only Display, Simple Operation For New Hams.
- ✓ Accessories Options:
A selection of batteries and leather cases. Desktop quick charger (NC-42 1 hour). CTCSS encode/decode unit (FTS-17A). DC adaptor with noise filter (E-DC-5). Mobile mounting bracket (MMB-49).

Performance without compromise