

Radio Communication



The Journal of the Radio Society of Great Britain

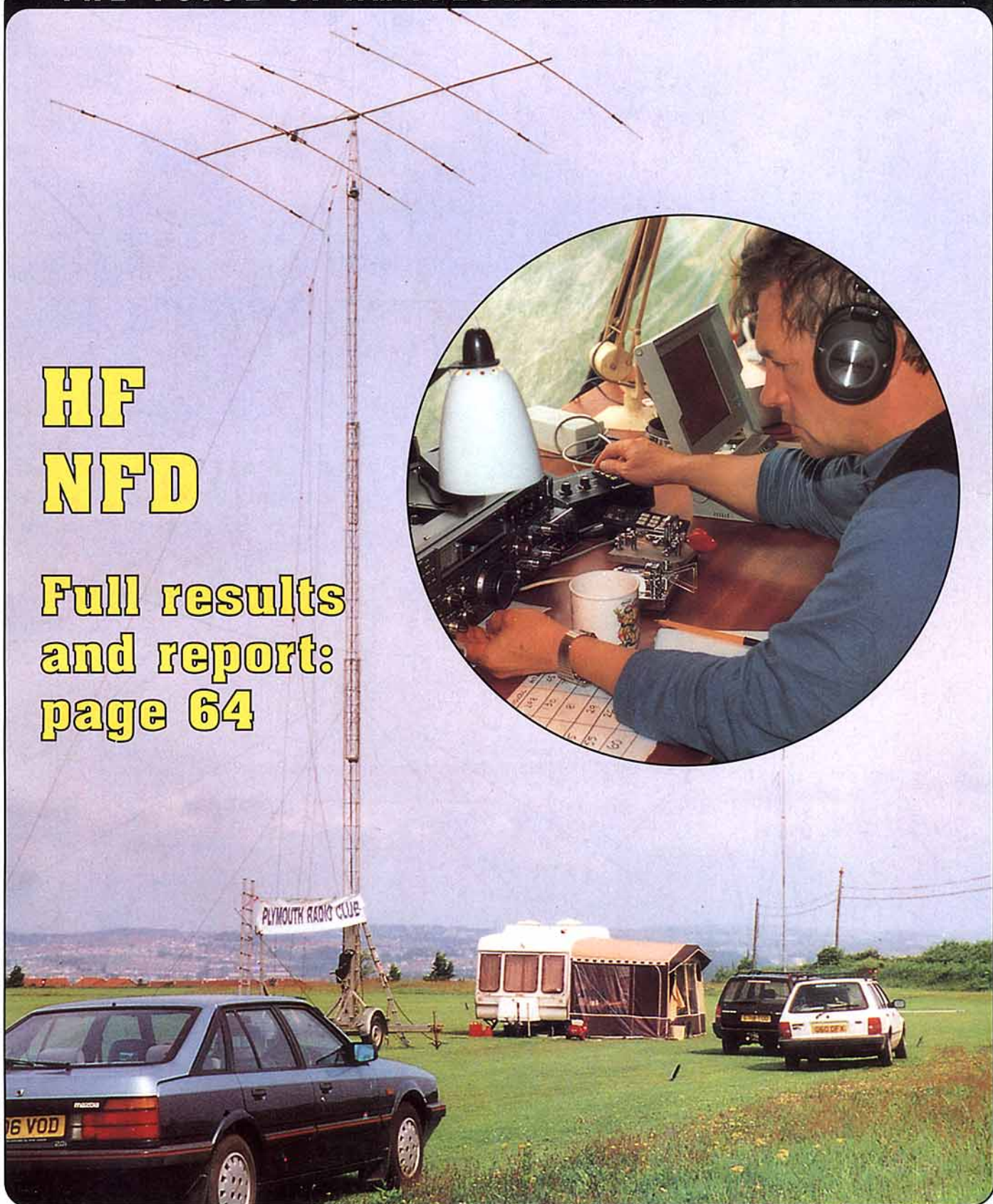
November 1992

Volume 68 No 11

THE VOICE OF AMATEUR RADIO FOR 79 YEARS

**HF
NFD**

**Full results
and report:
page 64**



KENWOOD



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Radio Communication

Christmas is coming . . .

It's that time of year again! This year we have the usual wide range of books and accessories with a minimum 15% members' discount, plus several unmissable bargains. Remember you must order before the end of December to take advantage of the offers. **Full details appear in our centre spread.** Here are some examples:

- All three volumes of **Microwave Handbook**: £22.50
- **The Bright Sparks of Wireless**: £7.50
- **Amateur Radio For Beginners**: £2.00
- **D-i-Y Radio subscription**: £6.00
- **RSGB 1993 Amateur Radio Call Book (NEW!)**: £7.00
(please add postage and packing - see page 79)

NEWS AND REPORTS

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Erwin David features a low-cost microphone with dynamic range compressor in his edited translation of an article by PE1CXO, originally published in *Electron (NL)*. In colour.

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A wobblator allows you to examine the performance of IFs, filters, detectors etc. This project by Peter Lawson, G7IXK, uses readily available components and is easy to set up. A colour feature.

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Bob Harris, G4APV, concludes his article by giving the circuits of the key and display interfaces and explaining the software. A colour feature.

Rad Com



COVER PICTURE:

Main photograph: Plymouth Radio Club's NFD station, G3PRC/P. Inset: G3OAY operating the Red Dragon Contest Group's station, GW8GT/P. They came second in the Open and Restricted sections respectively. Results - page 64. Feature - page 65.

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RADIO SOCIETY OF GREAT BRITAIN

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

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

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

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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:

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The RadCom Leader

HQ News

from the General Manager

I HAVE RECEIVED a number of enquiries recently concerning the insurance cover of RAYNET groups following the dissolution of the RSGB RAYNET Committee on 1 July 1992.

Let me reassure you that all RAYNET groups are still fully covered by the RSGB. This insurance has just been renegotiated and the limits of indemnity increased. I am arranging for copies of the RAYNET insurance to be forwarded to groups so that they, and the user services, are fully aware of the comprehensive insurance cover provided by the RSGB to RAYNET.

You will have received with this edition of *RadCom* the Society's *Annual Report*. In the past we have stood accused of keeping our membership in the dark about the workings of the Society. This year's report is designed to give you all an insight into the many areas of amateur radio in which the Society is working on your behalf.

A lot of hard work has gone into this report, so I would respectfully ask you not to dismiss it directly to the magazine rack but to take time to read it. I am sure you will learn something new about the Society's day-to-day activities; I certainly did.

Likewise, you will also have received the material for this year's Council elections. This year we have consulted the Electoral Reform Society to ensure that the election process is carried out in the most efficient manner. As a paid employee of the Society, I will not make any further statements regarding the election except to urge you not to forget to vote.

For some years now we have leased office space on the ground floor of Lambda House to a car rental company. This lease has now come to an end.

This has enabled me to put into action plans for locating the museum, library, shack, QSL Bureau and, eventually, members' shop in one area of the building. Full facilities for the disabled will be provided for the first time including parking, wheelchair ramp and disabled persons toilet.

Finally let me make a sales pitch. With the festive season fast approaching (at the time of writing this article there are only 63 shopping days to Christmas). On pages 42 and 43 of this month's *RadCom* you will find some excellent book bargains designed for the Christmas stocking. Also there is an attractive package put together to encourage the younger generation into amateur radio. So to avoid disappointment please order early for Christmas.

Peter Kirby,
General Manager

How retired policeman John, G0SKR, got his licence against all the odds

Taking it Lying Down

● **STOLEN** from Stockton and Billingham Radio Group Community Centre: IC740E S/N 18004066 and FT290R S/N 130519. Information to Malcolm Hotson, G0NRP, on 0642 249067 or Stockton Police on 0642 615600.

● **YEOVIL** ARC members are again teaching amateur radio to 14-year-olds at Kilve Court Space Science Course in Somerset at the end of October. They will use GB2KSS in their demonstrations.

● **ANY** RAFARS members, or past or present RAF personnel, in the Nottinghamshire area are invited to phone Dennis Godfrey, G0KIU, on 0623 65914 with a view to setting up regular meetings or nets.

● **CONGRATULATIONS** to the General Manager's PA, Justine, who married Steve Hodges at Borehamwood, Herts, in September.

● **THE** ever-active Scottish Tourist Board (Radio Amateur) Expedition Group will run GB6SA on St Andrews Day, 30 November. Also active will be Moscow RC and St Petersburg RC (R1SA) and Aberdeen ARS (GBOASP).

Shropshire RLO

THE NEW RSGB Liaison Officer for Shropshire is David Whalley, G4EIX, 1 Lees Farm Drive, Madeley, Telford, Shropshire TF7 5SU; tel 0952 588878.

1993-95 COUNCIL ELECTION

THIS MONTH your *RadCom* has been sent out with a separate 20-page *Annual Report*. Included as a supplement to the *Annual Report* are eight pages of election material. This comprises: Candidates statements, an election Voting Form and an AGM Proxy Form; you will need to cut the forms out of the supplement in order to use them. The only loose insert this year is the pre-paid voting envelope. Any Corporate Member who is missing the *Annual Report* or the envelope should contact Justine Hodges at RSGB HQ urgently.

JOHN GOODALL, who has been an SWL for 35 years, recently passed the RAE. Nothing special about that? Well, read his remarkable story:

"It is all too easy to complain of the ways of others. I am putting pen to paper for entirely the opposite reason. I first took an interest in radio back in 1957 when I purchased with hard earned pocket money, a pair of ex-WD transceivers. I was from that date onwards hooked on short wave listening.

"After serving as a policeman for almost 25 years, my retirement because of disability (attained in the course of duty) was a massive shock to the system.

"Throughout my years as a SWL, I had many times contemplated the RAE but sadly my knowledge was not sufficient and I never sat the examination.

"September 1991 saw me join Flight Refuelling Amateur Radio Society in Wimborne (FRARS) where with a certain amount of trepidation I enrolled on their RAE course. I attended most of the lectures and gained a wealth of information from those members of FRARS who had given up so much spare time to lecture the course. The examination date was 11 May 1992. During the duration of the course, Bert Jones a fel-



As this picture reveals, John now has his class A licence and a station which was provided by the Radio Amateur Invalid and Blind Club (RAIBC).

low student, and myself, spent many hours of private study.

"All seemed well for the examination. However, Friday 8 May saw me rushed into Bournemouth General Hospital with a heart attack and Ward 29 became my home for the next couple of weeks. My disability restricts my mobility to a motor car or wheelchairs, and now with wires and pipes, a hospital bed had been added to that equipment. And the RAE only two days away!

"Bert Jones, once informed of my predicament, waited little time before contacting the RAE course administrators at FRARS. Hands were tied due to the weekend, and

unaware of events outside hospital, I had recovered sufficiently to have the doctors inform me that the finest therapy, could be having my study notes in hospital.

"The morning of 11 May saw my condition almost stable, and I was in no danger. The RAE course coordinators at FRARS had pulled out all the stops, and were frantically seeking authority and permission to enable me to sit the RAE in hospital.

"The Hospital reserved a ward for my bed and the invigilators, and delayed my strong sedatives until 10pm. At 6.30pm I sat (or lay) the RAE. Had it not been for the thoughtfulness and consideration of my wife Shirley, the prompt action of the FRARS members, I would have been denied the opportunity to take the RAE.

"Through *RadCom*. I would like to thank all members of FRARS who gave up so much to instruct the RAE course, and to pay a special thank you to Bert Jones, Agi, G7JDW and Richard, G7HIP."

1993 PRESIDENTIAL INSTALLATION

THE SOCIETY'S 1993 President Mr P Chadwick, G3RZP, will be installed at an evening reception and dinner on Saturday 9 January (8.00 for 8.30pm). The venue is the Bonnington Hotel, Russell Square, 92 Southampton Row, London WC1.

Tickets for this prestigious event are £20 per head. members wishing to attend should apply to Justine Hodges at RSGB HQ by Friday 11 December. Please mention any special dietary requirements when applying.

IARU Region II Conference

A report by Tim Hughes G3GVV, Chairman RSGB IARU Committee

DURING THE first week of September I attended the International Amateur Radio Union Region II Conference which was held in Aruba, Netherlands Antilles. Region II is made up of countries in North, Central and South America, and the Caribbean area. Why was I there? Because decisions made in any part of the world can affect the rest of the world.

The inaugural speaker was Mr Russel Bernadina, Managing Director of the Telecommunications Company of the Netherlands Antilles, who extended his welcome on behalf of the Administration. He mentioned in particular the great importance of amateur radio in emergency communications.

The recent World Administrative Conference was reviewed: the value of amateur radio representatives as an integral part of national delegations was emphasised, as was the presence of the IARU Observer Team; a problem continues to exist in those countries where there is very little amateur activity and, consequently, little support for the amateur service. For instance, in Africa (excluding South Africa) there are only a thousand amateurs. Courses for administrations to make them more aware of amateur radio have been hosted



Tim Hughes, G3GVV, made a presentation on behalf of the RSGB to the local conference organiser Willy Gravenhorst, PJ2WG.

and given financial support by ARRL and JARL. WARC-92 was a defence of the 7MHz band; problems in this area of the spectrum come not only from broadcasting stations, but also from mobile services since many countries are unable to set up VHF links because of terrain, distance and cost.

A major review of the International Telecommunication Union (ITU) is taking place, as a result of which there will probably be World Radio Conferences every two years; this in turn will give

much less time for preparation, and so we need to be in a current state of readiness.

There were two lectures to the Conference, the first on the Region II Monitoring system by its Coordinator W7JX; his report made specific references to the successes of the Region I Coordinator, G4GKO, in the removal (in weeks) of several intruders. The second, by W6ISQ, dealt with the NCDX/IARU Multi-band Beacon Network. Its accompanying documentation showed the cover of *RadCom* for September

1983 on which a world map indicates the location of the 14.1MHz beacon network.

I joined Committee B which dealt with a wide range of topics including Emergency Communication (I was able to outline the UK arrangements), the Monitoring System, Amateur Radio in Developing Countries, and Band Plans - this was of particular importance in view of proposals relating to 7MHz. A document from Region I (of which we are a member society), covering HF Beacons, EMC and the use of the 10, 18 and 24MHz bands, was studied. Within it, RSGB's 'Code of Practice for QSL Management', was adopted and will be published in *Region II News*.

Local arrangements for the Conference were made by Willy Gravenhorst, PJ2WG, and by his team of helpers - to whom all praise must be given. Tom Atkins, VE3CDM (Secretary Region II), worked tirelessly throughout and the Conference business was conducted under the able direction of the President of Region II, Alberto Shaio, HK3DEU. Well over a hundred delegates were present including representatives of IARU (W1RU and VK3KI), Region I (PA0LOU and SP5FM) and Region III (JM1UXU, VK3ADW and ZL2AMJ). JA1AN and DK5ML were there too.

RADIO SOCIETY OF GREAT BRITAIN

A Company Limited by Guarantee (Registered in England No 216431)

Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE

Notice is hereby given that the 66th Annual General Meeting of the Radio Society of Great Britain will be held at the Royal Society of Chemistry, New Burlington Place, London W1 on **Saturday 5 December 1992 at 2pm.**

AGENDA

- | | |
|--|---|
| <p>1 To receive and, if approved, confirm the minutes of the 65th Annual General Meeting as previously circulated (Resolution 1).</p> <p>2 To receive and consider the accounts for the year ending 30 June 1992 and the reports of the Council and auditors thereon.</p> <p>3 To announce the names of members to serve on the Council for the year 1993. In the event of any successful candidate or candidates being of the age of 70 years or over it will be necessary for their appointment (s) to be confirmed by the meeting (Resolution 2).</p> <p>4 To call for volunteer scrutineers for the 1994 Council elections.</p> <p>5 To re-appoint the auditors Messrs Peter Goddard & Co and to authorise Council to fix their remuneration (Resolution 3).</p> | <p>(c) A Society bookstall will be open from 12 noon.</p> <p>(d) The Society will make available for sale an audio tape recording of the proceedings. The use of video recording equipment will not be permitted at the meeting.</p> <p>(e) Members entitled to attend and vote at the meeting may appoint a proxy to attend and, on a poll, vote on his or her behalf. The proxy need not be a member of the Society but is not allowed to speak at the meeting other than to join in the demand for a poll.</p> |
|--|---|

By Order of the Council - J C Hall, Company Secretary, 1 October 1992

REFRESHMENTS

OPEN MEETING AGENDA

- 1 Presentation of awards
- 2 President's Address
- 3 Open forum

NOTE

During the open forum Council members, committee chairmen, senior staff and officers of the Society will be available to answer questions. It would assist the Chairman in conducting the business of this part of the meeting if questions could be submitted in writing in advance of the meeting to the Company Secretary or set out on forms provided on the day. A limited number of written questions from members not present at the meeting may also be accepted if time permits.

Young Amateur Presentation

ON 27 SEPTEMBER, at the Society's HF Convention, the RSGB again hosted the Young Amateur of the Year award ceremony. As part of the continuing and highly successful Society initiative Project YEAR, this annual award goes to the most outstanding young licensed amateur. As reported in October, the 1992 winner is seventeen-year-old Martin Saunders, G7JJC and the runner-up is Neil Mothew, G7NGM, who is sixteen.

Principal guests included top officials from the RA, Mr Stephen Spivey and Mr John Nash, both of whom are directly concerned with the amateur service, Mr Ian Laybourn of the Mobile Radio Users Association, Mr Lloyd Arrow of Siskin Electronics and from Icom (UK) Ltd, Mr Paul Nicholson.

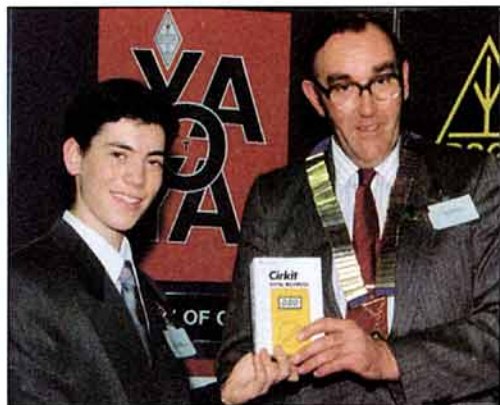
In presenting the award to G7JJC, Mr Spivey said that the entrants continue to be of a remarkably high standard. The prize was a cheque for £250 and a guided tour of the Monitoring Station at Baldock. Mr Spivey also congratulated the many volunteers who contributed their time and expertise to the Award scheme and paid particular tribute to his colleague Mr John Nash and the officers of the RSGB who had done so much to develop Project YEAR.

"Licence conditions are under continuous review" said Mr Spivey. "It is our intention to continue to improve the quality of service to the amateur and to develop the licence further whilst removing restrictions."

Mr Spivey went on to assure the audience that, contrary to rumour, the government remains "fully committed to the use of amateur radio by the young and, in particular, its application to the development of our future engi-



Young Amateur of the Year Martin Saunders, G7JJC, receives his certificate from the RA's Steven Spivey at the ceremony held at the ICL Beaumont Conference Centre.



RSGB President Terry Barnes, G13USS, presented a multimeter to runner-up Neil Mothew, G7NGM, on behalf of Cirkitt Distribution Ltd.

neers." In furtherance of this policy, he announced to much applause the intention of the RA to sponsor the award for a further two years.

Mr Terry Barnes, G13USS, President of the RSGB, then presented a Sony general coverage receiver, on behalf of the RSGB, to G7JJC and spoke of the need to "catch 'em young" if the future of our electronics industry is to be assured.

A similar theme was echoed by Mr Ian Laybourn of the MRUA, on behalf of whom he presented the winner with a week's training course at Wray Castle College. In describing the value of amateur radio to his own career, he regaled the audience with a delightful story of his operations, as a young amateur, in East Africa.

The Siskin Electronics prize of a modem was presented by Mr Lloyd Arrow who congratulated both of the young winners on their activities in the packet field and welcomed the continuing development of the digital techniques by the amateur service.

This year's runner-up,

G7NGM, was then congratulated by the President and presented with the Cirkitt prize of a digital multimeter. The MRUA gave a £25 book token and expressed their hopes for his continuing success.

Mr Peter Kirby, RSGB General Manager, disclosed that after twenty years as a professional in communications, just three months in the job at HQ had convinced him of the vital importance of the Society's youth work. He had already caught the 'bug' and was immersed in the RAE!

He went on to report that at the recent RSGB Strategy Conference the need to develop Project YEAR had been acknowledged.

The Society expressed its most sincere thanks to the sponsors, the HF Committee and to the many supporters of Project YEAR for the continuing success of the Young Amateur of the Year Award and, most particularly, to Council Member Mrs Hilary Claytonsmith, G4JKS, who had so generously dedicated so much of her time and skill to the complete organisation of this year's event.

Correction

RMG CHAIRMAN Geoff Dover, G4AFJ, has informed us of an error in his article printed last month. The GB3GC group was incorrectly listed as not having responded to the request for data. In fact the Humberside Repeater Group (HRG), which runs GB3GC, had been very cooperative. GB3GC will be closing down but this is at the HRG's request and has no connection with the revision of the Licence Schedule.

70 Years Ago

ON 22 NOVEMBER 1922 the name of the London Wireless Society was changed to the Radio Society of Great Britain. Vice-President Sir Charles Bright proposed that the word 'Radio' should be substituted for 'Wireless' because the former had been brought into official use. By substituting 'Great Britain' for 'London' the scope of the Society's work would be officially extended. This was accepted unanimously.

Kenwood and Lowe Electronics Announce Retail Expansion

FURTHER TO the announcement in September's *RadCom* that Trio-Kenwood UK Ltd are to take over distribution of Kenwood Amateur Radio products in the UK and Ireland, Lowe Electronics and Kenwood have issued a joint statement as to the future relationship between the companies:

John Wilson, Director of Lowe says "for many years the name Lowe has been closely linked with Kenwood Amateur Radio products and this will remain into the future. We have always been the largest Kenwood retailer and intend to keep that position".

Mike Atkins, Sales and Marketing Manager of Kenwood Communications Division, says that "the new distribution arrangement will allow both the Kenwood brand and Lowe's retail organization to go from strength to strength; with a new shop opened in Leeds and another planned for Oxford on the near future, Lowe and Kenwood are aiming to ensure that customers and potential customers are served even better than before".



The DX Dinner, held at the RSGB HF Convention, was attended by over 200 visitors from 30 DXCC countries. Full HF Convention report next month.

Frederick J H ('Dud') Charman, G6CJ

FREDERICK J H ("Dud") Charman, BEM, Int BSc, FBIS, G6CJ, passed away on 25 September. The RSGB was represented at his funeral by John Forward, G3HTA, and a donation in his memory was made to the Radio Amateurs Invalid and Bedfast Club.

Dud Charman occupied a unique and inimitable role in amateur radio in the UK for more than 60 years - truly a giant has gone from amongst us. It was Dud who first told us how to make antennas that gave us DX to order. In the 1930s he was widely known as the 'Aerial Wizard of Stoke Poges' - he brought to experimental radio the knowledge of a professional engineer with EMI, friend and colleague of H A M Clarke, G6OT, with whom he shared the knack of communicating technical information to us mere mortals.

He wrote a stream of articles in the old *T & R Bulletin* from the late-1920s onwards, the chapters on aerials in pre-war editions of *The Guide to Amateur Radio* and the RSGB's *Amateur Radio Handbook*, a 1950s series that introduced us inter alia to the balun, and later the capacitively loaded element.

But for thousands of post-war amateurs Dud will be remembered primarily for his many lec-



Dud Charman, President 1952.

ture-demonstrations of antennas with a microwave source which illuminated the subject with the help of tiny wire antennas above a copper table-top.

Dud was a member of the 1939 Council that decided that the work of the Society should continue in spite of the close-down of all UK amateur activity on 1 September 1939.

In early 1941, on a temporary secondment from EMI to the Radio Security Service, he developed the pioneering wideband aerial distribution amplifiers that were installed at Hanslope Park and many of the special intercept stations of RSS/SCU. But from December 1939 onwards he was also one of the most diligent and valuable RSS Group Leaders of the Voluntary Interceptors (including writing and producing a regular newsletter *The Hunt*). He was one of the small group of VIs (under the cover of Royal Observer Corps) who received the British Empire Medal in the New Year Honours List of 1946.

Over many years an ardent and skilled participant in BERU he took a deep interest in 'the human machine as a radio operator' and in the development of such aids to weak signal reception as the 'CW stereocoder' based on psychological aspects of human hearing - in the 1930s he was probably the first British amateur to build an enormous communications receiver incorporating a crystal-gate filter. Highly competitive yet always a gentleman-operator.

President of the RSGB in 1952 and later, in his long retirement, President of the Radio Amateurs Old Timers' Association, he retained his deep and knowledgeable interest in the science and pursuit of experimental radio communication. He will be greatly missed. **Pat Hawker, G3VA**

Radio Society of Great Britain - Legacy Fund

MEMBERS MAY not be aware that the Society maintains a sum of money on trust for use in specific circumstances. The trust deed contains the following details:

- 1 for or towards the acquisition or use by any other member or former member or group affiliated to or for members of the Society of any equipment, publications or facilities requisite or convenient for or in connection with radio communication (including his or their annual subscription to the Society) or
- 2 for or towards the cost of any education or training to be undertaken by a member or former member of the Society in the field of radio communication or allied subjects including maintenance of the members of his dependents which the Trustees shall in their uncontrolled discretion consider to be unduly burdensome for the member or member to finance unassisted
- 3 for or towards any other purpose which the Trustees may consider to further the interest of the Society or any of its members with power to the Trustees to pay any sum comprised in the Trust Fund or the income thereof to any

member or other person for any of the purposes aforesaid without seeing to the application thereof.

When one cuts through the 'lawyerspeak' set out above, what it all means is that the trustees have an almost unfettered discretion to apply the funds to the benefit of members or former members of the Society in the interests of amateur radio. The current Trustees of the Legacy Fund are: John Greenwell, G3AEZ; Peter Chadwick, G3RZP and John Hall, G3KVA.

The suggested form of words to be used when contemplating a legacy is:

"I give the sum of £00 free of inheritance tax to the Trustees for the timebeing of the Trust Fund of the Radio Society of Great Britain for the general purpose of that the trust fund** (and I request (but without imposing and binding obligation) that the same should be used for)"

** omit if not required

A copy of the deed setting up the trust can be supplied to anyone seriously considering contemplating a legacy by writing to: JC Hall, G3KVA, Company Secretary, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

Radio Amateurs Examination

RSGB Training Scheme praised by CGLI

NRAE Results

THE CITY and Guilds of London Institute (CGLI) has announced that 271 candidates passed the June 1992 Novice Radio Amateurs Examination, a 73.4% pass rate. At 369, the number sitting the examination was 44% higher than ever before. 962 have passed the NRAE in just over a year.

The CGLI report says: "The general performance of (NRAE) candidates . . . continues to be of a high standard. This can largely be attributed to the well organised training schemes and to the standard of instruction and guidance given."

The three-page report can be obtained from the RSGB by sending a self-addressed stamped envelope to the *RadCom* Office at RSGB HQ.

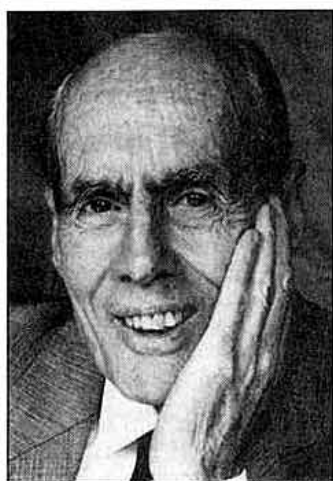
RAE Results

THE CITY and Guilds of London Institute (CGLI) has announced

that 1653 candidates passed the May 1992 Radio Amateurs Examination. The pass rate of 81.2% is the highest for several years.

The CGLI reported that: "Items on EMC were very well answered and most candidates had an excellent understanding of the topic." Recognising the benefits of practical experience, the report expresses a hope that tutors and future candidates would "devise suitable practical demonstrations For example, a low power transmitter on a dummy load, modulated with a sine wave and used in conjunction with a general coverage receiver should demonstrate the effects of sidebands. Likewise a simple transmitter can be keyed at various points in its circuit to demonstrate chirp and clicks."

The four-page report can be obtained from the RSGB by sending a self-addressed stamped envelope to the *RadCom* Office at RSGB HQ.



Group Captain Lord Leonard Cheshire VC, OM, DSO, DFC who died on 31 July, aged 74. He topped a distinguished flying career (which included commanding the 'dam busters') by founding the Cheshire Homes for disabled people. There are now more than 270 Cheshire Homes in Britain and in 50 countries abroad. Lord Cheshire became patron of the Radio Amateur Invalid and Blind Club (RAIBC) in 1990. Details of the RAIBC can be obtained from 78 Durlay Avenue, Pinner, Middlesex HA5 1JH; tel 081 868 2516.



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**TX: 144-146MHz
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AIRBAND AM RECEIVERS**

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"GOLD SEAL"
WARRANTY**

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It's no idle boast. That's what our dealers tell us; "ALINCO is now the most popular brand of handhelds" on their shelves. But then that's hardly surprising. With ALINCO you get a written 12 months' "UK Gold Seal" warranty on parts and labour. And with the new ALINCO handhelds you get the type of "bomb proof" construction that makes them so rugged. (No wonder we are happy to give a no quibble warranty!) Check them against the competition, then check the prices and finally check what everybody else is buying. It all adds up to the same answer: ALINCO.

But that's not the whole story, for inside each unit you will find the latest technology that helps to bring you the most versatile and advanced performance handhelds ever. And when it comes to sensitivity, customers all agree there is nothing to match them. Even when listening outside the amateur bands to air traffic etc. the sensitivity leaves the competition way behind.

Of course you get all the regular features such as large memory bank, multi scanning, battery save, illuminated dial, S-meter, 5 Watts capability, auto power off, programmable steps, DTMF, and a host of optional accessories. You also get an unmatched backup and after sales service by staff who are proud of their products and anxious to help in any way they can. But to fully appreciate the ALINCO handhelds you really need to read the glossy colour brochures. To get the low down on the UK's most popular handhelds write or phone today and find out how tomorrow's technology is available to you today.

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Head office: Retail and Mail Order: 22 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835/204965. Fax: 205843
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With the falling pound, there has never been a better time to buy your equipment than now. If the downward trend of Sterling continues then the cost of all imported goods will rise.

- 17.9.92



"ECONOMICAL & EFFECTIVE" that's the NEW FT890 from YAESU

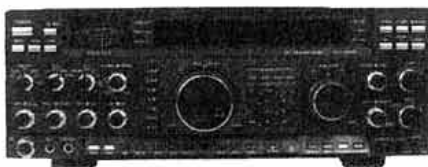
Blending the high performance digital frequency synthesis techniques from the FT990 and FT1000 with the convenience and affordability of the FT757GXII, the FT890 adds a built-in (or optionally remote) automatic antenna tuner and a wealth of convenient functions. For compact base, home and mobile stations, the FT890 sets the new performance standard.

Both Chris Lorek and Peter Hart agree the FT890 has "extremely versatile performance" and is "easy to use with plenty of useful features".

See HRT Review
June '92

See RADCOM Review
September '92

All in all a Winner!



ALSO AVAILABLE FROM YAESU:

The two unchallenged leaders in the HF transceiver field, the FT1000 and FT990.

The range is now even wider with the addition of the 12V DC FT990/DC



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SMC HQ, School Close
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9am-1pm Sat

Leeds (0532) 350606
SMC Northern
Nowell Lane Ind. Est.
Nowell Lane
Leeds LS9 6JF
9am-5.30pm Mon-Fri
9am-1pm Sat

Chesterfield (01246) 453340
SMC Midlands
102 High Street
New Whittington
Chesterfield
9.30am-5.30pm
Tues-Sat

Birmingham 021-327 1497
SMC Birmingham
504 Alum Rock Road
Alum Rock
Birmingham B8 3HX
9am-5pm Tues-Fri
9am-4pm Sat

Axminster (0297) 34918
Reg Ward & Co. Ltd
1 Western Parade
West Street
Axminster
Devon EX13 5NY
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Communications Ltd

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SMC for all your accessories

JAYBEAM ANTENNAS

Jaybeam have for many years been producing a quality product at very affordable prices. At SMC we have a large stock of these very popular antennas available for immediate delivery

HF			
MM3	10-15 20m Mini-Beam	425.53	D
VR3MK3	10-15-20m Vertical	96.35	C
TB3MK3	10-15-20m 3 Ele Yagi	425.53	D
TB2 MK3	10-15-20m 2 Ele Yagi	293.75	D
TB1MK3	10-15-20m Rotary Dipole	139.83	C
TB3/SSKIT	TB3MK2 to TB3MK3 Conversion kit	79.90	B

6m & 4m			
4Y6M	4 Ele Yagi 6m	66.00	C
4Y4m	4 Ele Yagi 4m	54.40	C

2m			
HO/2M	Halo Head only	13.87	A
HM/2M	Halo c/w 24" mast	16.10	B
UGP/2M	Ground Plane (folded radiator)	22.45	B
C5/2M	Collinear	124.55	C
LW5/2M	5 Ele Yagi	26.20	C
LW8/2M	8 Ele Yagi	33.60	C
LW10/2M	10 Ele Yagi	40.77	C
LW16/2M	16 Ele Yagi	59.46	D
PBM10/2M	10 Ele Parabeam	80.84	C
PBM14/2M	14 Ele Parabeam	98.23	D
Q4/2M	4 Ele Quad	49.59	C
Q6/2M	6 Ele Quad	64.51	C
Q8/2M	8 Ele Quad	80.37	D
DS/2M	5 over 5 slot Yagi	47.59	C
D8/2M	8 over 8 slot Yagi	65.33	C
8xY/2M	5 Ele Crossed Yagi	50.53	C
8xY/2M	8 Ele Crossed Yagi	64.51	C
10xY/2M	10 Ele Crossed Yagi	80.84	C

2m/70cm			
6Y/12Y	6 Ele 2m, 12 Ele 70cm Yagi	72.03	C

70cm			
CS/70	Collinear	132.31	C
D8/70	8 over 8 slot Yagi	47.71	C
PBM24/70	24 Ele Parabeam	73.32	C
MBM28/70	28 Ele Multibeam	38.54	C
MBM48/70	48 Ele Multibeam	61.57	C
MBM88/70	88 Ele Multibeam	85.89	D
8xY/70	8 Ele Crossed Yagi	74.03	C
12xY/70	12 Ele Crossed Yagi	91.77	C

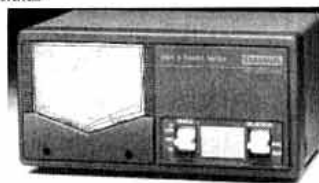
23cm			
D15/23	15 over 15 slot	80.72	C
D15/24	15 over 15 slot	80.72	C

PHASING HARNESES			
PMH2/4M	4m 2 way	27.85	B
PMH2/C	2 way circular polarisation	17.86	B

PMH2/2M	2m 2 way	19.98	B
PMH4/2M	2m 4 way	48.88	B
PMH2/70	70cm 2 way	18.57	B
PMH4/70	70cm 4 way	38.07	B
PMH2/23cm	23cm 2 way	50.76	B

SWR METERS COAX SWITCHES

SMC have a wide range of SWR/PWR meters to suit almost all applications from low power hand-held to high power HF transceivers. To complement these meters a range of high quality coax switches is also available for switching all your antennas



HANSEN			
FS710V	50-150MHz 15/150W	107.80	B
FS301MH	2-30MHz 200/2000W	42.25	B
FS711H	2-30MHz 20/200W	43.65	B
FS711V	50-150MHz 20/200W	34.99	B
FS711C	25-30MHz 10/100W	24.55	B
FS20DL	3-150MHz 1/10W	43.65	B
FS20D	3-150MHz 5/20W	43.65	B
SWR3E	3.5-150MHz 20/200/1000W	28.75	B

SMC			
OSCAR171-B3.5-150MHz		27.45	B

WELZ			
SP425	140-524MHz 5/15/150W	122.55	B

YAESU			
YS60	1.6-60MHz 20/200/2000W	95.00	B
YS500	140-525MHz 4/20/200W	63.00	B

DAIWA			
CN101	1.8-150MHz 15/150/1500W	59.95	B
CN103N	150-525MHz 20/200W	69.95	B

COMET			
CM-420	140-150/430-450MHz 15/50W	39.95	B
CM-420N	140-150/430-450MHz 15/50W	45.83	B
CD-120	1.8-200MHz 15/60/200W	76.60	B
CD-160H	1.6-60MHz 20/200/2000W	90.85	B
CD-270D	140-525MHz 15/60/200W	79.65	B

COAX SWITCHES

DAIWA			
CS201	2 way SO239 DC-600MHz 1kW	17.50	A
CS201G2	2 way N DC-2GHz 1kW HF	27.50	B
CS401	4 way SO239 DC-800MHz 1kW	69.95	B



CREATIVE DESIGN

SMC are pleased to be able to stock a comprehensive range of HF & 6m antennas from Creative Design. Built in Japan these antennas are manufactured to the highest standard using only the best materials. Also available are a high quality range of rotators to suit all applications ranging from small 2m beams to large HF multiband beams.

HF			
CV730V-1	V Dipole 40-20-15-10m	152.00	D
CD218	10-15m 3 Ele Yagi	203.50	D
CD318JR	10-15-20m 4 Ele Yagi	305.50	D
CD318	10-15-20m 4 Ele Yagi	357.00	D
CD318B	10-15-20m 5 Ele Yagi	459.00	D
CD318C	10-15-20m 6 Ele Yagi	740.00	D
CL10	10m 5 Ele Yagi	219.00	D
CL15	15m 5 Ele Yagi	325.00	D
CL40B-4	40m 3 Ele Yagi	1120.00	E
CY103	10m 3 Ele Yagi	123.00	D
CY104	10m 4 Ele Yagi	175.00	D
CV48	40m Vertical	214.50	D
AD385	40/80m Switch Box for CV48	50.00	D

6m			
CL6DX	6m 6 Ele Yagi	117.50	D
CL6DXX	6m 7 Ele Yagi	176.65	D
CL6DXZ	6m 8 Ele Yagi	235.00	D

LOG P'S			
CLP5130-1	50-1300MHz 25 Ele	189.00	C
CLP5130-2	105-1300MHz 20 Ele	129.00	C
CLP5130-3	90-220MHz 12 Ele	109.00	C

ROTATORS			
RC5-1	Round meter variable speed	223.75	C
RC5-3	Round meter variable speed + preset	280.00	C
RC5A-3	Round meter variable speed + preset	434.00	C
RC5B-3	Round meter variable speed + preset	689.00	C

BALUNS			
CB2F/2K	1:1 2-30MHz 2kW PEP SO239	30.50	B
CB2F/3K	1:1 2-30MHz 3kW PEP SO239	30.60	B
CB2F/4K	1:1 2-30MHz 4kW PEP SO239	56.00	B
CB2F/6K	1:1 2-30MHz 6kW PEP HF Input	179.00	D
CB2F/10K	1:1 2-30MHz 10kW PEP HF Input	460.00	D
CB2F/5K-6M4:1	50MHz 3kW PEP N' Input	105.75	D

A-£2.00 B-£5.00 C-£7.50 D-£12.50 E-£16.50

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TNC 24 MKII

- * No more 'add-ons' for satellite operation
- * High speed morse via satellite
- * TTL or RS232 input * CW I.D. built-in
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Only £329



TNC MICRO

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TNC 24 on Demonstration at SMC HQ

ELECTRONIC KEYS

DEWKEYSTD Star Masterkey (Standard)	59.95	B
DEWKEYM Star Masterkey (Memory)	95.00	B

ICS ELECTRONICS

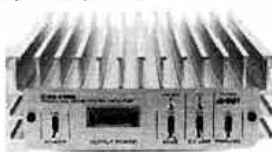
PK232/MAIL 7 Mode data terminal c/w Mail Drop	339.95	C
PK88 Dedicated High Grade Packet TU	149.95	B
D70 Morse Tutor	64.95	B

TOKYO HY-POWER LINEAR AMPLIFIERS

These are a range of high quality linear amplifiers available direct from SMC.

We have chosen these amplifiers as we feel they have been developed with the amateur radio enthusiast in mind. A wide range of models is available covering HF to UHF frequencies with input levels and output powers to suit most applications.

We believe the Tokyo Hy-Power linear amplifiers offer outstanding value for money, tremendous specifications and no compromise operation.



Tokyo Hy-Power HF			
HL100B/10	21-28MHz 10W-100W out	£182.00	C
HL100B/20	14MHz 10W-100W out	£182.00	C
HL100B/80	3.5MHz 10W-100W out	£182.00	C
HL1K	160-10m 1kW PEP input 2x4CX250B	9959.00	D
HL2K	160-10m 2kW PEP input 2x3-500Z	£1450.00	E

Tokyo Hy-Power VHF			
HL137V	2m 3W-32W pre amp	£90.95	B
HL6V5X	2m 5/10/25W in 50W out pre amp	£169.00	C
HL110V	2m 2/10W in 100W out pre amp	£220.00	C
HL180V	2m 3/10/25W in 170W out pre amp	£299.00	C
SAGRA600	2m 15-25W in 600-700W PEP output 2x4CX250B	£839.00	E
HL66V	6m 10W in 50-60W out pre amp	£131.75	C
HL166V	6m 3/10W in 50-60W out pre amp	£255.00	C
HL1K/6	6m 10W in 500W PEP output 2x4CX250B	£959.00	D
HL36U	70cm 6/10W in 25-30W out pre amp	£139.00	B
HL63U	70cm 10/25W in 50W out pre amp	£220.00	C
HL130U	70cm 3/10/25W in 120W out pre amp	£397.00	C
HL1240U	23cm 2/10W in 40W out MGF 1202 pre amp	£529.00	C

ROTATORS



Suberb engineering standards combined with pin sharp setting accuracy means new technology from Yaesu create Kenbro Hygan

A = £2; B = £5; C = £7.50; D = £12.50; E = £16.50

G-250	Bell type twist/switch CTL	£79.75	C
G-400	Bell type meter controller	£152.00	C
G-600RC	Bell type round controller	£182.85	C
G-600RC	Bell type round controller	£240.00	C
G-800SDX	Bell type 450 deg var speed	£332.00	C
G-1000SDX	Bell type 450 deg var speed	£376.00	C
G-2000RC	Bell type sound controller	£454.00	C
G-2700SDX	Bell type 450 deg var speed	£649.00	E
G-900A	Elevation meter controller	£203.00	C
G-5400B	Azimuth/elev. dual control	£379.00	D
G-5600B	Azimuth/elev. dual control	£444.00	D
RC5-1	Bell type sound controller	£223.75	C
RC5-3	Bell type preset	£260.00	C
RC5A-3	Bell type var. speed & preset	£434.24	C
RC5B-3	Bell type var. speed & preset	£689.00	D

ROTATOR HARDWARE

GS-050	Rotary bearing 1.5" mast	£20.39	B
GS-065	Rotary bearing 2" mast	£30.60	B
GC-038	Lower mast clamp G-400, 600 etc	£17.35	B
9523	Channel master bearing	£19.95	B
CK46	Rotary bearing 1.5-2.5 mast	£35.75	B
MC1	Lower mast clamp RC5 series	£35.75	C

COMPUTER INTERFACES FOR G-5400/G-5600B

IF-100PC	I/F C/W lead & software BMPC	£142.00	B
IF-100C64	I/F C/W lead & software CBM64/128	£148.00	B

ROTATOR CONTROL CABLE

RC6W	6 way G-250, 400, 600, RC XR500 per mit	£0.74	B
RC8W	8 way G-2000 create series	£0.88	B

CARRIAGE

Rotator cable £3.50 up to over 20 mtrs over 20 mtrs: £5.00

STRUMECH VERSATOWER

MAIN STOCKIST
MOST POPULAR MODELS IN STOCK



- Free Finance on selected items, subject to status. Details available on request.
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For world-acclaimed Kenwood transceivers Look to Lowe

Plus ça change, plus c'est la même chose!

As you know from the press releases, and following long negotiation, we shall be handing over the warehousing and distribution of Kenwood amateur radio equipment to Trio-Kenwood UK on the 1st of December.

I personally view this as a very positive move for both Kenwood and Lowe because it allows Kenwood to concentrate on the mechanics of distribution and allows Lowe to concentrate on what I always saw as our prime objective — the 100% support of our Kenwood retail customers.

The establishment of our service facility as the first Kenwood Authorised Service Centre is proof of the close relationship between Lowe and Kenwood built up over the past twenty years; a relationship which will grow to the future benefit of all Lowe retail customers.

John Wilson
G3PCY/5N2AAC

PS: It means "The more things change, the more they remain the same"

KENWOOD QUALITY TRANSCEIVERS FOR HF

TS-950SDX	HF transceiver with auto ATU, all filters, DSP, SO2	£3250
TS-850SAT	HF transceiver with auto ATU	£1625
TS-850S	HF transceiver without ATU	£1475
TS-450SAT	HF transceiver with auto ATU	£1375
TS-450S	HF transceiver without ATU	£1220
TS-690S	HF transceiver with 6 metres (50W)	£1395
TRC70	HF transceiver for commercial use	£1169

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KENWOOD QUALITY TRANSCEIVERS FOR VHF/UHF

TS-790E	All mode triband base stn. 2m/70cm fitted, 23cm option	£1595
TS-711E	All mode 2m base transceiver	£925
TR-751E	All mode 2m mobile transceiver (25W)	£625
TM-741E	FM tri-bander. 2m and 70cm fitted, 10m/6m/23cm options	£759
TM-732E	2m/70cm FM mobile transceiver (50W/35W). Dual rec'r	£595
TM-702E	2m/70cm FM compact dual band transceiver (25W/25W)	£495
TM-531E	23cm FM compact mobile transceiver (10W)	£415
TM-441E	70cm FM compact mobile transceiver (35W)	£345
TM-241E	2m FM mobile compact transceiver (50W)	£325

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For a rugged power supply at the right price Look to Lowe

Take a good look at the EP-925 Bench Power Supply

...and you will find it is well designed, conservatively priced, conservatively rated and provides variable voltage output from 3 to 15Vdc.

Output voltage: 3-15Vdc variable

Output current: 25A at maximum output voltage

Max current: 30A at maximum output voltage (5 minutes max.)

Ripple/Noise: Less than 10mV

Cooling: Forced air, temperature controlled fan

Input voltage: 240Vac +/-5%

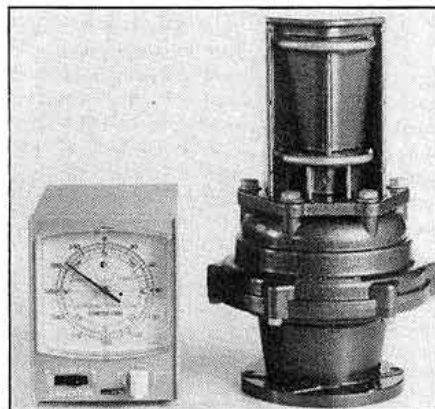


£99 inc VAT

EMOTO ROTATORS

Rotators from this long established company are amongst the best engineered units we have ever seen. Designed by an engineer who knows his subject, the EMOTO rotators are a pleasure to own. All rotator controllers incorporate clear backlit compass scales for beam heading and the cabling is simple and straightforward. Models range from the 105TSX for VHF/light HF use, through the variable speed 747SRX to a mighty 1800SFX for turning large log-periodics. Buy the best you can; it's always folly to cut corners on your rotator. The best is EMOTO.

105TSX	..... VHF/light HF use	£163
747SRX	..... 3 element HF and up	£335
1105MSAX	..... 3 element 40 metre beams, etc.....	£465
1200FXX	..... even bigger and variable speed	£539
1300MSAX	..... I believe that this turns the 16 inch guns on the USS Missouri ..	£933



HOKUSHIN - The QUALITY Power/SWR Meters

MR-1000 HF/VHF

Freq. range: 3.5MHz - 200MHz

Measurable Power Range:

0 - 50W (CW) & 0 - 200W (CW)

Dimensions:

153mm(W) 70mm(H) 112mm(D)

Cost: £49.95 (inc VAT)

MR-2000 VHF/UHF

Similar spec. as MR-1000 with freq. range of 130MHz - 512MHz.

Cost: £49.95 (inc VAT)



SCOTLAND: Sim GM3SAN, Cumberland Airport, Cumbernauld G68 0HH. Tel: 0236 721004 Fax: 0236 738322. NORTH WEST: Dave G4KFN, Newcastle Airport, Wooslington, Newcastle NE20 9DF. Tel/Fax: 0661 860418. MIDLANDS: Rob G8MPT head office. WEST & WALES: Tony G4CYE, Unit 6, Ferry Steps Ind Est, Albert Road, Bristol BS2 0XW. Tel: 0272 771770 Fax: 0272 772500. EAST ANGLIA: Tony G4NBS, 162 High Street, Chesterton, Cambridge CB4 1NL. Tel: 0223 311230 Fax: 0223 315099. LONDON: Fred G4RJS, 223 Field End Road, Eastcote, Middlesex HA5 1AZ. Tel: 081-429 3256 Fax: 081-868 2876. LONDON (HEATHROW): Steve G1WSY, 6 Cherwell Close, Langley, Slough, Berkshire SL3 8XB. Tel: 081-429 3256 Fax: 0753 545277. SOUTH WEST: Colin G3XAS, 27 Gillam Road, Northbourne, Bournemouth BH10 6BW. Tel: 0202 577760 Fax: 0202 593882. SOUTH EAST: John G3HCH, Chatham Road, Sandling, Maidstone ME14 3AY. Tel: 0622 692773. YORKSHIRE: 34 New Briggate, Leeds LS1 6NU. Tel: 0532 452657 Fax: 0532 452657. Contact: TOM, G4LAR.



HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham
B17 8OB

R SGB DX News Sheet says that FR5AI should be on the air as FR5AI/G from **Glorioso Is** this month. Also, DXpress says that WA4OBO is hoping to get on the air from **Chad** and will concentrate on the low bands. His callsign should be TT8/WA4OBO or TT8OBO and he may have already left - but should return early in 1993.

EA7EL was operating as D2EL from **Angola** for a period and should have returned there by now. There has been quite a lot of activity by D2 stations recently but I am not certain whether all will be accepted for DXCC purposes. However, ARRL has announced that credit will be given for QSOs with F6BLQ/D2 during the period between 23 June and 23 July made on 14, 21, or 28MHz. Jacky, 3B8CF, is regularly active near 7.005MHz at 0200 and on 10MHz at about the same time.

XT2DK is a new station in **Burkina Faso**. He is OE3DKS and is often in the Medical Assistance Radio net on 14.332 or 21.332MHz in the mornings.

XX9GD, in **Macao** is reported by the *Long Island DX Bulletin* to appear quite often after 1100 between 14.180 and 14.200MHz. The operators of XU0NU, XU1NU, and XU2NU are members of the French UN team in **Cambodia** - all QSLs go to F6FNU. An ARRL News Release says that documentation has been received from both XU1NU and XU0NU for the period 6 July 1992 until 6 Jan 1993 for opera-

tion on 14, 21, and 28MHz only. Another ARRL bulletin says that documentation has been approved for 5R8JD (from 6 July 1988 - cards rejected previously may now be re-submitted), S92IJ (from 10 March 1992), and S21ZA beginning August 1992.

VQ9QM, on **Chagos Is** appears regularly around 18.081MHz in the afternoons and will make skeds for other bands.

VP5JM on the **Turks & Caicos Is** may be found on 18.145 or 21.235MHz most days from 1500. 9X5SW is now V29SW in **Antigua** and he will be there for several years. He will be on all bands with an emphasis on LF.

ZS6BCR holds the callsign ZS6EZ which causes problems because he is the source of ZS0Z, ZS9Z, V51Z QSLs. His new address is in *QTH Corner*.

GHANA

WHAT SOUNDS like very good news indeed has come from John Longhurst, G3VLH/C53GV. He has recently been in Accra and while he was there he met Kofi Jackson, 9G1AJ, at the Ghana Frequency Registration and Control Board. Kofi told him that the ban on amateur radio activities will quite definitely be lifted as from 15 January 1993 when the Ghana Constitution reverts to civilian rule. The Ghana Amateur Radio Society is also in the process of being reactivated.

EXPEDITIONS

STEVE MUSTER, G4UOL, intends to make his customary visit to the **Isle of Man** as GD4UOL between 20 November and 4 December. He will be on CW only about 11kHz above lower band edges (WARC bands - 10.102, 18.070, and 24.89MHz). Steve requests 'pile-up' type QSOs only, to enable him to give more people a new country. He will be in the CQ WW DX Contest with his 3-element Yagi at 30ft, and long wire and sloper for the LF bands.



Jozef Jaworski, SP6PFH, photographed during his recent stay with Stuart Perry, G0LRX.

Skeds can be arranged by mail or by ringing 0702 334014 or (during work hours) 0375 376911 (ext.293).

The planned expedition to **Baker & Howland Is** has been postponed due to lack of operators. Hopefully it will take place in early 1993.

ON4CLM will be on the air again from Knokke, Belgium, from 30 October to 8 November. It celebrates the liberation of the town by Canadian forces in 1944 and frequencies to look for the station are 3.515, 3.685, 7.012, 7.045, 14.020, 14.145, 21.020, 21.245, 28.020, and 28.545MHz.

A large group of Japanese amateurs planned to operate KH2Y from **Guam** during the CQ WW SSB Contest and again at the end of this month in the CW section. Outside the contests they will operate using their own callsigns/KH2.

Ed, OD5/SP1MHV (a member of RSGB) and OD5/SP7LSE are operating from the UNIFIL hospital at Naqoura in southern Lebanon and after OD5/LA5GHA returned home were using UNIFIL equipment - a 20 years old Uniden Model 2020 working on 14, 21, and 28MHz - kindly lent by 4X6UO. However better equipment is on order and some 50MHz activity is hoped for. They have a 12AVQ, FD-4, and delta loop antennas.

CONTESTS

JAPAN INTERNATIONAL DX PHONE CONTEST

2300 13 November - 2300 15 November

Single operator single and multi-band (30h operation only) and multi operator single transmitter sections. Work Japan on 3.5 to 28MHz. Two points per QSO on 3.5 and 28MHz, one on other bands. Multiplier is number of Japanese prefectures worked. Copies of simplified rules available from me (SASE please). Rules and summary sheet from Five-Nine Magazine, PO Box 59,

Kamata, Tokyo 144, Japan (please send one IRC and SAE).

OK DX CONTEST

1200 14 November - 1200 15 November

1.8 to 28MHz, CW only. Single-operator single and multi-band (only 20h operation allowed), multi-operator single and multi-transmitter, QRP single and multi-band and listener sections. Exchange RST plus serial number - OK stations will give three letters indicating their district (there are 127 in total). I can supply copies of the rules - sase please. In the 1991 test G3ESF scored 177,253 points.

A.L.A.R.A CONTEST

0001 - 2359 14 November 1992

Organised by the Australian Ladies Amateur Radio Ass'n. I can supply copies of the rules (SASE please).

In the 1992 **Bermuda Contest** UK scores were: G0NYL (16,800 points), G3LHJ (7,600), G4SDJ (7,350), G1OKOW (2,695).

The results of the 1991 **CQ WW DX SSB Contest** appeared in the September issue of *CQ Magazine*. Quite an impressive British entry this time. Of special note is the achievement of **GW40FQ** who came world top on 3.5MHz and won the K6SSS Trophy by making 1180 QSOs in 91 countries and 19 zones. Other outstanding performances were by **G3NLY** who was top European (and world fourth) on 7MHz thereby winning the NZ4C trophy. **G4BUE** was world fifth in the QRP section. In the multiband section **GW4BLE** and **GM0ECO**



Proving how much fun amateur radio can be, the UNIFIL DX Gang: (l to r) Ed, OD5/SP1MHV; Teuek, OD5/SP7LSE and Roger OD5/LA4GHA.

1992 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G4OBK	84	132	129	345
G3KKJ	81	153	95	329
G2VJ	79	109	111	299
G3ING	62	89	42	193
G3IAR	51	85	22	158
G2AFV	39	45	11	95
G4MUW	-	57	37	94
G4NXG/M	-	59	28	87
G4XRV	85	-	-	85
GM0KMJ	-	-	59	59
GW4RGT	13	21	16	50

were second and ninth Europeans respectively. In the low power all band category **G4XKR** was European tenth and on 1.8MHz **G3BDQ** was fifth European. Top multi-operator single-transmitter entry was **GW8GT** (sixth European) and top multi-operator multi-transmitter **G0KPW** (fifth European). Scores were as follows (certificate winners in bold type): All-band: **GM0ECO** - 1,775,520, **G3LZQ** - 1,111,206, **G0HSD** - 979,011, **GI0KOW** - 439,470, **GM3BCL** - 291,096, **G0PWW** - 215,760, **GU3HFN** - 212,764, **G0NKL** - 117,912. In the low power category **G4XKR** - 516,975, **GM0FET** - 174,086, **G0KTN** - 108,750, **G5LP** - 89,775, **G6QQ** - 77,040, **G4NXG/M** - 65,940, **G3JKY** - 24,272, and **G4PTE** - 6,978. On 28MHz **G0AEV** scored 143,606, and in the low power section **GI0NWG** 36,904, and **GM4CHX** 29,857. On 21MHz **GW0ARK** had 365,560 points and **G3XSV** 172,270. The only 7MHz entrant was **G3NLY** with 393,908, and on 3.5MHz **GW00FQ** with 183,590. On 1.8MHz **G3XWZ** made 1,272 points. In the QRP Section **G4BUE** scored 341,130, and **G3PRI** 20,097. Multi-operator single transmitter entrants were **GW8GT** - 6,564,178, **G3NKC** 3,105,797, **G4PKP** - 1,320,894, **G0CCH** - 735,345, **G4FJE/P** - 585,795, and **GM3WOJ** - 244,713. Finally - in the multi-operator multi-transmitter section **G0KPW** came fifth in Europe with 12,139,792 points.

AGCW-OLD HOMEBREW AND OLDTIME EQUIPMENT PARTY

1300 - 1700 15 November 1992.
1300 - 1500, 7.010-7.040kHz; 1500 - 1700, 3.510-3.560MHz. CW only not exceeding 100W input. Call "CQ Hot". Classes are (A) - Tx and Rx homebuilt or more than 25 years old, (B) - Tx or Rx ditto, and (3) QRP Tx below 10W input, homebuilt or older than 25 Years. Exchange RST, serial number (from 001 on both bands), and Class. I can supply copies of the rules (SASE please). In the 1991 event G3VDL came 23rd with 106 points, G0KZO scored 58, G3AMO 46, G3DNF 45, G3YFF 32, and G3KMG 27.

AWARDS

WORKED ALL SQUARE AWARD

This is a new award from JARL. The WASA-HF requires contacting (or receiving) stations located in 100 squares on bands on or below 28MHz on or after 1 July 1992. Stickers will be issued for each additional hundred squares. QSLs must clearly indicate the square in which the station is located, or else latitude and longitude from which it can be calculated. The award costs eight IRCs and stickers four.

Application forms from the JARL Award Desk, 14-2, Sugamo 1-Chome, Toshima-ku, Tokyo 170, Japan.



Whitman ARC members: (l to r) Fred, WA1LXP; George, KC1FZ; Jack, KA1WMU; Walter, K1BZD; Ed, KA1NCS; Clem, KA1MUW; Mike, N1KBW; Rick, KC1ZX; Bruce, N1IX; Paul, N1FWD; Bob, WA1OFR; Bill, N1FRE and Walt, W1HA.

JUBILEE ON4CLM AWARD

Available to those who contact or hear ON4CLM and to mark it's 10th anniversary. Send US\$5.00 or 10 IRCs - the money is used to maintain memorials, displays and the station. Write to Radio Station ON4CLM, PO Box 110, B-8300 Knokke Heist, Belgium.

TRANSATLANTIC LINK

From Peter Jackson, G3ADV, comes news of a special activity by the Whitman (Massachusetts) ARC to celebrate the 500th anniversary of Columbus' discovery of N America. The station will operate from 1200 to 2400 on 28 and 29 November from Plimouth Plantation (a village built in 1627 style) situated near the site where the 'Mayflower' landed. Callsigns will be WA1NPO, N1IX, and N1FRE and the club will be looking for UK contacts. Frequencies to be used - 7.270, 14.270, 18.140, 21.370, 24.970, and 28.370MHz. (QSLs may be sent via the RSGB QSL Bureau or to PO Box 48, Whitman, Mass 02382, USA)

PROPAGATION

A SHORT contribution from G8KG this month which goes as follows:

"By the middle of September the steep decline in solar indices had given way to a gentle descent with the 27-day average solar flux sinking to 114 sfu - the corresponding average sunspot number around 65. The arrival of the seasonal improvement in DX conditions on the higher bands was somewhat delayed by a very marked increase in geomagnetic activity in the first 11 days of the month with several very disturbed days and the average of the daily Boulder A indices touching 30".

Smithy points out the contrast between this and and this time last year when he reported "28MHz open to all continents simultaneously at around mid-day"!

THANKS

TO THE regulars and to *Long Island DX Bulletin* (W2IYX), *RSGB DX News Sheet* (G4DYO), *Lynx DX Bulletin* (EA2KL), *DXpress* (PA3DZN), and *DX-NL* (DL1HBT).

Please let me have items for **January** issue no later than **18 November**.

BAND REPORTS

Thank you this month to G2HKU, G3s GVV, KKJ, YRM, G4s DBN, DJC, GW4KGR, G4s MUW, NXG/M, OBK, XRV, G0KDS, and the UK DX Packet Cluster (courtesy of G4PDDQ). Calls of stations using CW are in italics:

1.8MHz

- 0400 *HF0POL, PY0FF*
- 2000 *S21ZC*
- 2200 *A22MN, TR8XX, VQ9QM, 9D0RR*
- 2300 *UZ9MWU, ZD8Z, 4S7RO*

14MHz

- 0600 A35NP, KL7XD, T31AP, TN1AT, V73DO, VR6RF, *T32MV, T32O, VI4FOW, ZK1AL, ZK1HJ, ZK2 VJ, XS, 5W1UC.*
- 0700 A35KB, FK8LP, FOSJV, *KH8/G4ZVJ, V63HN, WM4M/KH3, 5W1VJ*
- 0800 T20AA, T20CB, *ZK2XM, 3D2SL.*
- 0900 A61AD, *BV4CT, VU2KKO, XX9AW.*
- 1500 *JT5AAJ, SU1CS, VQ9WM, XV7TH, 4S7VK.*
- 1600 *NU2L/VE8, S21A, V85KX, XU0NU, 9M8AJ.*
- 1800 *HS1BV, VP8ML7Q7RM, T22AB.*
- 1900 *D2FGC, HS0ZA, P43BW, VY2SS.*
- 2100 *A71BV, ZL2AAV, 3X0HNU.*

18MHz

- 0800 *KH8/G4ZVJ, NL7ZH, V73DO, ZK2VJ, ZK2XS, 9M6NA.*
- 1400 *FR5DX, OD5/SP1MHV, PJ8AO, XX9AW, ZA1BK.*
- 1500 *AP/WA2WYR, V85PB.*
- 1700 *FP/K1RH, FR5CG, KL7XO, T32MV, VP8GAV, VQ9QM, 9V1OK.*
- 1900 *F6BLQ/D2, T77C, VP8ROT, 7Q7XX.*
- 2100 *D2FGC, P40P, PJ2IARU.*

21MHz

- 0900 *FW1FM, HS0D, S21ZD, T20AA, VQ9AC, 3D2KM, 3X0HNU.*
- 1200 *BZ9AAA, FR7ZN, TA1E/O, VQ9WM.*
- 1400 *S21A, TL8PS, VU2NTA, 8Q7AA, 9M2ZA.*
- 1500 *A41RS, FH8CB, J28BG, V85PB, XU/DJ4OF, ZS9A.*
- 1600 *TR8YA, XV7TH, Y11BGD, 7Q7XX, 9M8ST.*
- 1700 *C9TDM, DU2BAD, TZ7NU, ZD9BV.*
- 1800 *FY5EM, HF0POL, VP8AQO, VR6RF.*
- 1900 *D2/F6BLQ, J5UAI, ZD8Z, 7Q7BX.*

QTH CORNER

- CO2MA** JHG1GIC, Seizou Liyama, 1064-4 Hanawa, Mashiko, Haga-Gun, Tochigi 321-42, Japan.
- GD4UOL** S.Muster, Flat 4, 60 Genesta Rd, Westcliffe on Sea, Essex, SS0 8DB.
- J5UAI** (new) NW8F, 975 Kittle Rd, Wheelersburg, OH 45694, USA.
- OD5/SP1MHV** Ed Durhajlo, PO Box 11, 78-300 Swidwin - 1, Poland (or via bureau).
- OD5/SP7LSE** via SP7EJS, Antoni Lichota, PO Box 82, 96-100 Skiemiewice, Poland (or to SP7EJS via bureau).
- OH1AF/OJ0 (CW)** Timo Klimoff, Kp 7, SF-28760 Pori, Finland.
- OH1AF/OJ0 (SSB)** Ari Korhonen, OH1EH, Sampsankatu 1 D 28, SF-29200 Harjavalta, Finland.
- P40RY** Direct only (with SASE) to PO Box 5194, Richmond, CA 94805, USA.
- S21ZD** G4APV, R.G.Harris, 62 Whirlow Court Rd, Sheffield, S11 9NT.
- V29SW** Box 1203, St. John's, Antigua, or via DL1HH.
- VQ9QM** via Bureau to W4QM.
- ZS6EZ** Chris Burger, Box 4485, Pretoria 0001, Republic of South Africa.
- 9M6/9V1YW, 9M6/9M6JO, 9M8JH, 9M8QV, 9M8SH** via SARTS bureau or P O Box 14, Pasir Panjang, S-9111, Singapore.



VHF/UHF NEWS

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

THE AUTUMN tropo season seems to have started early this year with a major opening on 16 September. There was a good aurora on the 10th, thanks to a resurgence of geomagnetic activity. It is a pity that so few readers bothered to report these events.

The Society has over 32,000 members, the great majority of whom are licensed. Approximately half are B licensees, while many of the A category are capable of transmitting on bands above 30MHz. So there ought to be thousands operating daily on the VHF/UHF bands, but where are they and what are they doing?

Having written VHF columns for 16 years, since long before the 50MHz band was generally released to British Isles amateurs, I appreciate how the pattern of activity has radically changed. In the 1970s and early 1980s, people were more inclined to come on SSB or CW in flat conditions to try to work distant stations. Now they only appear during good openings, apparently reverting to 'licensed listener' mode until the next one.

The topic of declining activity was discussed during the Business Strategy Conference in July - see page 27, September *RadCom*. There could be dozens of reasons for this apparent decline, eg majority on packet radio, bands full of digital hash, and/or EMC problems with neighbours making operating difficult, or: "I got bored with the hobby so took up golf!"

It's not all negative, though. There is still a nucleus of amateurs who are experimenting with weak signal working, who use state-of-the-art technology to improve their receivers, who construct their own optimized antennas, and so on. Their reward is the satisfaction of achieving what seemed impossible a few years ago. I report their activities hoping that others will become similarly motivated.

Most of us started on VHF/UHF with modest stations and it is only by experimenting that we can hope to improve our installa-

tion's performance. This isn't 'elitism' as some seem to infer. It is a perfect example of: 'self training in communication by wireless telegraphy . . . ' including ' . . . technical investigations' as envisaged in the Amateur Radio Licence - see clause 1(1) of Booklet BR68, where this is stated in blue and white.

Before a strategy to encourage more activity can be developed we need some real facts to study. If you used to contribute to this feature and/or are now less active than before, or have given up completely, I would like to hear from you. Any ideas you have for increasing activity would be welcome as would your constructive comments about this column.

PUBLICATIONS

THE FOURTH issue of the *VHF/UHF DXer*, published by Dave Hardy, G8ROU, includes an article by K1POO on VHF/UHF Sloping Vee antennas, a report on the 5th International EME Conference in Thorn, mods to the Star Masterkey memory keyer by G0AFH, a piece on meteor scatter procedures by G4ASR and the usual band reports. Contact G8ROU (QTHR), for subscription details.

The September *Newsletter* from the Worked All Britain Awards Group includes a progress report on members' fund raising activities towards the cost of an inflatable lifeboat for the RNLI. For details contact the Membership Secretary Brian Morris, G4KSQ (QTHR). *Talkthrough*, the newsletter of the UK FM Group (Western) is now published annually and number 36 includes the latest news of the group's many repeaters. Editor Frank Charnley, GW6SLO, refers to a recent referendum on the RSGB's repeater administration charges. Members voted three-to-one against payment on a 50% turnout [see *RadCom* October p8 for RSGB's position on this matter - Ed]. For membership details write to PO Box 3600, Altrincham, Cheshire, WA15 9LU.

Rod Smith, G4DQY, sent a copy of The Public Domain and Shareware Library's (PDSL) *New Releases: IBM PC Software Reference Guide* which is Issue 13, Supplement 2. It includes more ham radio programs to supplement the four page section in the main catalogue. That lists megabytes of software on everything from CW tutors, through logging and QSL programs, packet radio and BBS systems, to propagation aids and satellite programs - plenty for the VHF/UHF frater-

nity. See their adverts in *RadCom*. *DUBUS Magazine* is now in its 21st year. Issue 3/1992 features over 60 pages of technical reports including Part 4 of the DL6WU/DJ9BV series on Yagi Simulation using CAD software: brilliant stuff! Comprehensive reports on recent tropo, MS, EME and auroral activity, plus the popular Top Lists make up the rest of this 102 page edition. Ken Hatton, G4IZW (QTHR) is the UK rep.

BIODEGRADABILITY

OVER-EXPOSURE to ultraviolet solar radiation can cause skin cancer. UV radiation is also pretty good at degrading many plastics, making them discoloured and brittle. John Nelson, GW4FRX (PWS), used those popular, self-locking cable ties on his 144MHz four-Yagi array. After a year or so, they began to fall off, having become so brittle that they fractured.

Those used in wiring looms inside equipment, although flame resistant, are unsatisfactory for external environments. For outside use you can get UV-resistant ties, or you could use metal Jubilee clips. Self-amalgamating tape, widely employed to waterproof connectors, also degrades very quickly when exposed to UV, so cover it with wrapping tape.

PROPAGATION

SOLAR ACTIVITY was moderate at the end of August. Flux levels varied from 94 on the 27th to 139 on 6 September. Weekly averages for the three weeks from 27 August were 104, 122 and 119. Geomagnetic activity reached storm level by 3 September with an Ap index of 53 units, then declined but rose again from the 6th, reaching a severe storm level of 90 by the 10th. After a quiet period on 12/13, activity again increased to a storm level of 68 units by the 17th.

Major flare activity started on 5 September with both M and X flares recorded over the following two weeks. Such flares are accompanied by significant X-ray production. The former usually cause significant Sudden Ionospheric Disturbances, the latter major SIDs. For comprehensive notes on these terms see the Propagation section in the RSGB *Call Book* [1993 edition out now! See *Bookcase* pages - Ed].

BEACONS

A NEW 70cm beacon, GB3BSL, commenced operation on 31

August from Dundry (IO81QJ), 8km SW of Bristol. It runs 50W ERP on 432.934MHz. The antennas, donated by Jaybeam Ltd, are four 3-ele Yagis vertically stacked pointing east, at 17m AGL. The site, owned by Co-Channel Electronics Ltd, is 235m ASL. The ERP will be increased to the licensed 250W in due course. Frank Evans, GW8AWM, of the Gwent UHF Group, is the keeper.

On 6m, OH9SIX became operational in mid-August from KP36, round about the Arctic Circle in northern Finland. According to information via Ted Collins, G4UPS (DVN), it is on 50.066MHz and runs 50W to crossed dipoles. It has been heard in the UK.

METEOR SCATTER

ALASTAIR McBEATH (NLD) has been collecting information on this year's Perseids meteor stream from observers overseas. This seems to confirm that an exceptional return occurred on 11 August, 1900-2030GMT. He wrote that ". . . at least two Chinese observers were amazed at seeing so many bright meteors despite the almost complete cloud cover at times, even lighting up the clouds like flashes of lightning . . ." (CI Williams, G6ZWP (SPE), mentions a massive burst at 1948 which lasted 3min; IK0CXO (JN52) was S9+60dB, just like sporadic-E).

The parent comet of this stream is Swift-Tuttle which Alastair says was supposed to have an approximately 120 year period. It should have returned in the early 1980s, but failed to show up. One expert, Brian Marsden, thinks Swift-Tuttle may be the same comet observed in 1737 by Kegler. He predicted a return in November 1992 +/-5 months. The Leonids stream should peak on 17 November according to the IMO's *1992 Meteor Shower Calendar*. In the approach to perihelion - the closest approach to the Sun - of its parent body Comet Tempel-Tuttle towards the end of this decade, activity could increase. So it is worth trying this shower. The radiant rises about 2230 and sets around 1430. Best times are: NE/SW 0130-0700 and around 1100; E/W 0400-0900; NW/SE around 0200 and 0600-1200; N/S 0300-0500 and 0800-1300.

50MHZ

DURING SEPTEMBER, conditions on 50MHz were noticeably

**ANNUAL VHF/UHF TABLE
JANUARY TO DECEMBER 1992**

Callsign	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total Points
	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	Cty	Ctr	
G4FCD	40	26	-	-	86	23	52	19	37	12	295
G6HKM	66	64	-	-	65	23	25	16	17	9	285
G0NFH	18	27	27	4	45	13	29	11	5	5	184
G4LDR	14	19	27	5	49	16	34	10	-	-	174
G0JBA	-	-	23	1	48	17	31	12	13	5	150
GW6VZW	77	63	-	-	-	-	-	-	-	-	140
G0EHV	-	-	29	5	55	15	20	10	-	-	134
G1SWH	8	20	17	5	38	10	21	9	2	1	131
G7EWL	26	24	3	1	54	18	-	-	-	-	126
G8LHT	-	17	20	4	42	18	12	3	4	1	121
G3FIJ	-	-	14	2	51	9	29	5	3	1	114
G7CLY	15	28	-	-	47	12	2	1	-	-	105
G8ESB	7	3	15	2	37	9	14	3	7	2	99
GW0PZT	-	-	-	-	66	25	-	-	-	-	91
G4OUT	-	-	36	6	36	10	-	-	-	-	88
G14OWA	11	24	-	-	27	20	-	-	-	-	82
G0EVT	29	7	2	2	22	10	5	2	1	1	81
G7LIJ	-	-	-	-	55	26	-	-	-	-	81
G7JAF	-	-	-	-	52	11	7	1	-	-	71
G6ODT	-	-	-	-	39	12	11	5	-	-	67
G3FPK	-	-	-	-	52	15	-	-	-	-	67
GU4HUY	-	-	-	-	43	13	-	-	-	-	56
G0HDZ	2	6	-	-	15	6	-	-	-	-	29
G6AJE	-	-	-	-	8	2	-	-	3	2	15

British counties are those listed on page 65 in the January 1992 RadCom; 77 in all. Up to three different stations allowed in all 12 GM regions. Do not include EI countries. Countries are the usual DXCC ones plus IT9. Deadline for the next appearance is 26 November

down on a year ago probably due to the rapid decline of Cycle 22. G4UPS's activity report for the first three weeks lists 13 days with the comment: "Nil heard/ reported."

SPAIN

Neil Carr, G0JHC (LNH), co-editor of *Six News*, sent a list of the 82 Spanish 50MHz permit holders faxed to him by EA2LU. All use the EH prefix. Nine of the 52 Spanish provinces are supposed to be 'no go' areas. Beginning with the mainland, the list is as follows:

EH1s ANE, AST, BCB, BFZ, BLA, CON, DDU, DKV, DVY, EBJ, EH, GC, KV, LQ, QJ, TA and YV. EA2s AGZ, BLR, BUF, JG and LU. EA3s ADW, AIR, AQJ, ATJ, BKZ, CBH, CCK, CHN, CUU, DIH, DUW, DVR, DXU, DZG, ECE, EDU, EHQ, IH, JA, KU, LL, MD, UM and XO. EA4s BG, CAV, CFE, CGNED and LH. EH5s BZS, CHT, CJ, DY and OE. EH7s AG, AH, AJ, BIH, BVD, CZR, DBP, DUW, DZI, EHE, ERS, ESB, FHS, FTH, JS and UH. The Balearic Islands are represented by EH6s ET, FB, IF, SA and VQ. EH8ACW is the sole licensee in the Canary Islands, while EH9IB and EH9MH are the only two in the North African conclaves.

NEWS

G4UPS has received a list of 'firsts' from Kaliningrad made by UZ2FWA and UA2F/DK2ZF. Nick, UA2FJ, using the UZ2FWA call, worked several hundred stations in the 20-28 June period and Rolf, DK2ZF, completed 684 contacts in the 4-11 July week; he worked six UK stations cross-band to 4m.

ZA1BK operated on 8 September from Albania. The operator was JA1BK and QSLs should go via JA1HGY. This appears to have been a one-day event. The band is now available to Class B licensees in Israel and 4Z4TT is QRV from Tel Aviv. He is Baruch Sheinberg, 78 King George St, Tel Aviv 64338. Dale Strieter, VQ9QM in Chagos, monitors 50.110MHz all the time. His QSL address is to his home call, W4QM, at 928 Trinidad St, Cocoa Beach, FL 32931, USA.

ACTIVITY

25 August brought extensive E-layer propagation into continental Europe and G4UPS noted EU-TV from 0640. Throughout the morning DL, EH, F, I, OE, OK, YU and 4N stations were heard/ worked from the UK. At 1335, beacon GB3LER was S9 in Devon with Norwegian TV heard. ZB0T was S9 at 1544. In the evening there was Es to Scandinavia and the Baltic area, preceded by a short opening to V5 and ZS9.

The 28th saw more morning Es to I, OK, OZ, SM, SP and YU till 1300 and from 1825 there was propagation to Scandinavia until 2130. On the 30th, 1100-1230, there was another opening to ES, LA, OH and SM. Next morning, Geoff Brown, GJ4ICD, reported strong signals from ES, LA3 and SM3/7 for two hours. There was Es to 9A, YU, 4N and I4 in the morning of 1 September. GJ4ICD heard a weak aurora in the afternoon of the 3rd.

The evening of the 5th brought Es to I1, I6, YU3, 4N, then to EH3, 6 and 7. At 2150, G4UPS heard beacon ZD8VHF for 9min and at 2222, PY5CC was RST559 work-

ing G3NSM. There was a widespread Es opening, 1200-1400, on the 8th to DL, OE, OK and YU and also in the afternoon. GJ4ICD copied ZD8VHF for 30min from 0930 on the 15th. In the evening, G4UPS heard LU2EIO calling CQ at 1814 but he didn't reply to the several Gs who answered. LU7DZ was also copied.

Tropo propagation doesn't often feature in 6m reports but the 16th brought a good path to DL from Jersey. GJ4ICD heard S8 audio on 53.742MHz, which, he remarks, is very unusual. At 1806 on the 17th G4UPS heard GM4ILS aurorally calling CQ for 2min but beacons GB3LER and GB3RMK could not be found. Terry Chaplin, G1UGH (SFK), worked OH7BO (KP33) on 25 August, EH6ET (JM19) on the 29th, OH3MF (KP20) and OY6FRA (IP62) next day and EH6VQ (JM19) on 5 September. Colen Harlow, G8BTK (SXW), lives in a second floor flat and cannot erect any outside antennas. On 6m he uses an 18in diameter loop antenna fed with 10W. This has netted him eleven countries and QSOs have been made with YU7AU, SM0CHH, GM3JIJ, 4N2QS, IK5OEA, OK2BSL, OZ1BCE, LA8OW and SM7FJE for best DX.

70MHZ

PHIL BOORMAN, G0JBA (KNT), operated for three hours in the Trophy Contest on 20 Sept completing 28 QSOs. Best DX was GM4APA/P (SCD) at 599km. Conditions were average but the noise level was low. He used an Icom IC-735, RN Electronics transverter, BNOS 100W PA and a 5-ele NBS Yagi at 16m AGL.

Ian Cornes, G4OUT (SFD), took part in the contest and completed 30 QSOs. Best DX were GM4APA/P (SCD) at 360km and G4ADV/P (CNL) at 342km. He heard GM4AFF (GRN), G0EHV (TWR) and G2VCJ (CVE) but heard nil from EI and GI. Others were heard working GJ and GU.

144MHZ

G0JBA OPERATED portable from Holly Hill (JO01LI) during the WAB QRO Contest on 13 September but only made 92 QSOs in six hours; last year he made 164, so he wonders where everyone was? In the Trophy Contest on the 16th conditions were fairly good with good signals from GI and GM. He enjoyed the fine tropo on 16/17 September which brought QSOs with OK1UGB (JO70), DK0OG (JN68), SP6GZZ (JO81) and DL1VAA (JO61).

Dave Newton, G3JJZ (LDN), has been on the band for five years. On 5 September he was out/P at JO01DH. Using 2W from an FT-290, with an HB6CV antenna at 7ft AGL, he worked 4 Fs, 2 ONs, a GW and 2 Gs in IO94. From home he runs 25W to an 8-ele Yagi at 6m AGL and the next morning worked TMOE (JN14) for best tropo DX. In the opening on 16 September he: "... struggled to get two DLs in JN48 on CW, then FC1MOZ/P in JN27 on SSB." He was later rewarded by working LX/ON1KTE for a new country. G4OUT operated in the second leg of the CW Cumulative Contest on 16 September completing 33 QSOs. Ian's best DX were OK1FZA (JO70) at 1173km and DJ7PR (JN48) at 928km, thanks to the excellent lift. Just after the contest he completed with OK1FGA/P (JO80) at 1331km.

G6ZWP reported auroras on 21, 22 and 24 August, but with nothing worked and little heard. On 10 September he recorded Ar propagation, 1507-1906, but again nothing worked. Brian Underdown, G7LIJ (KNT), had installed some LDF4-50 feeder a couple of days before the 16/17 September lift, so was pleased to work into Poland. His QSOs included SP6HEQ (JO81), SP3RBF (JO71), and SP9s LCV, MRT, EWU and EWO (JO90). He also worked EA1, DL, F, OE and OK stations. Arlen Pardoe, GM0HUO (FFE), copied GB3LER and OY6VHF beacons aurorally from 1550 on 3 September and heard DL, G, GM, OZ and PA at

continued on page 19 ▶

HF F-LAYER PROPAGATION PREDICTIONS FOR NOVEMBER 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	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122
024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802
** EUROPE								
MOSCOW	...89995...	...99997...	...2999992..	...4998995..	21.887789942	875755567998	886432235888	++42...25++
MALTA	...78876...	...99982...	...199995...	...39889982..	331787789973	886854468998	998532236899	+++2...35++
GIBRALTAR	...376651..	...58872...	...89995...	...9999982..	12.188778972	775675557998	999853225799	+++52...25++
ICELAND	...4775...	...68971...	...289994..	...499997..	1.8888994	562176668896	888653346788	+++52...34++
** ASIA								
OSAKA	...72...	...84...	...196...	...3872...	1.475423313	1.242235764	...1.13672	...34.
HONGKONG	...19972...	...39984...	...488862...	...3777742..	1.55567741	2.22236886	...1.13685	...352
BANGKOK	3+++94	...489997...	...3688992..	...2477894..	2.15568843	4.22236888	1.13686	...354
SINGAPORE	...389885...	...589997...	...4688992..	...2477895..	2.15568843	3.22236887	1.13685	...352
NEW DELHI	4++96	...589981...	...558883...	...3367861..	311.4568844	74.1236888	62.13688	3.355
TEHERAN	...5++94...	...788997...	...8678992..	1.174578951	534412568965	8741.236888	862.13678	53.345
COLOMBO	...4++95...	...5789971...	...4478993..	1.22578961.	42.2568965	72.236899	5.13688	2.355
BAHRAIN	...5+8984...	...7789961...	...7568984..	1.1634789721	6443.1468976	984.136889	861.13678	53.345
CYPRUS	...3++971...	...6999993...	...88899971..	211887889941	765755678986	997532347899	8852.124788	+2.4++
ADEN	...5++971...	...6778983...	1.645789731	311523589963	8642.268998	984.36889	861.3677	53.345
** OCEANIA								
SUVA/S	...4762...	...15884...	...388871...	...677884...	...7556861.	...3432364..	...22.131..	...
SUVA/L	...432...242	11.66421563	22.287643763	121487666842	...266445761.	...4411253..	...11.21..	...
WELLINGTON/S	...37742...	...58864...	...888871...	...887882...	...37556851.	...2422364..	...1.131..	...
WELLINGTON/L	...777...	11.1	22.421.222	222164211432	...246433452.	...3411253..	...1.21..	...
SYDNEY/S	...28774...	...398886...	...5988981..	...5877894..	...26556882.	...4223673..	...1.1351..	2..
SYDNEY/L	...21...	...421...21	...7531.243	1.1.86431463	...75444751.	...4212562..	...1.23..	...
PERTH	...588754...	...6898761...	...5688883..	...35778961..	2.25568963	...2236884	...2236884	...33.
HONOLULU	...1...	...2...	...15...	1.2.371.	132.5231761.	263422253..	...452.131..	...2...
** AFRICA								
SEYCHELLES	...5668741..	...6668864..	1.544788731	321222689963	852...368998	951...36889	73...3678	5...345
MAURITIUS	...4688872..	...56789951.	2.444789842	42.222589975	851...268999	84...35899	62...3688	3...355
NAIROBI	...48889841..	...677899631	21.645689963	541522379986	9842...158999	984...25899	861...3677	53...354
HARARE	...25678852.	1.466789852	42.544479985	751422269998	9832...37999	984...5899	861...2688	53...355
CAPETOWN	...56889741	11.266789863	54.454468997	861532247999	9943...15899	985...2699	862...478	53...45
LAGOS	...9+889742	21.197789974	54.375468997	871663238999	99673...15899	8995...3799	7772...588	455...255
ASCENSION Is	...78768741	11.87768874	441.85446997	773273224899	99765...1699	99962...389	7784...168	555...35
DAKAR	...7++8+841	11.88778973	331.97547996	663185225899	998562...2799	98974...489	77851...268	4452...35
LAS PALMAS	...7+99962.	...8999984.	1.998879972	231.98878995	786486557899	999863224799	888631.1588	+++3...25+
** S. AMERICA								
Sth SHETLAND	...35677641	11.5777763	331.88766776	663187644567	787474311246	566541...13	23431...1	...
FALKLAND Is	...37788741	...58877762	221.88754675	554.87522367	8984752...137	788742...14	57751...1	2442...
R DE JANEIRO	...27656741	...48666762	221.77444685	554.86222488	988373...168	89874...37	87751...5	5452...2
BUENOS AIRES	...3666774.	...58766762	111.88643475	444.87421267	8883751...37	889742...4	67751...2	4452...
LIMA	...+++73.	...977751	1.3854453	223.15732245	6771554...16	7996421...3	57852...1	2452...
BOGOTA	...++873.	...97775.	1.3854463	212.5732255	6671154...27	8886321...4	77752...2	4442...
** N. AMERICA								
BARBADOS	...6++883.	...8977761	1.3844683	223.7622376	7671353...158	9986421...27	77752...5	4442...2
JAMAICA	...9++73.	...2864562	112.4742255	112.4742255	66713541...37	8885421...5	77752...2	4442...
BERMUDA	...39++83.	...598885.	...7866772	112.17754575	666145521268	8885422...37	77752...4	4442...2
NEW YORK	...7++72.	...189884.	...3887761	111.5775674	666.35542367	88844221...36	77652...3	4432...
MEXICO	...9+71.	...19673.	...386541	111.2.574233	566.52551.14	68844222...2	37752...	452...
MONTREAL	...79971.	...189983.	...4888861	111.5777733	565.35554567	888442221236	67652...13	3432...
DENVER	...385.	...5972.	...7874.	11.1.77552	564.4.265234	688442232.3	37752...	442...
LOS ANGELES	...75.	...861.	...2873.	11.1.48531	454.41.55213	488342132.1	16752...	342...
VANCOUVER	...13.	...35.	...672.	11.1.18741	453.41.47543	578342134222	25752...12...	242...
FAIRBANKS	...	...1.	...124.	11.1212562.	452.54457753	566342235544	23552...13321	...22...

The provisional mean sunspot number for September 1992 issued by the Sunspot Data Centre, Brussels was 62.9. The maximum daily sunspot number was 86 on 24 September and the minimum was 38 on 8 September. The predicted smoothed sunspot numbers for November, December and January, are respectively: (classical method) 90, 88,86; (SIDC adjusted values) 112, 107, 103.

QSL

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

● Nice to know RadCom gets out to the CIS from time to time. I received a nice card from Alex, UB4JFJ, telling me that he had read about the correspondence on QSL in a copy of the magazine sent him by G0JRN. Alex tells me that as far as the CIS is concerned QSL means 'I'll send my QSL after receiving your QSL'. He thinks the second L could mean 'later'.

● I am grateful to Tony Carruthers, G4XLA, for an update on the situation in Byleorussia about which I have already written. Tony recently visited the new bureau which is working under some difficulties because although PO Box 88 is still operating and we are still receiving parcels from them the service is rather spasmodic. Tony tells me that PO Box

88 will accept cards for RO and UO but the service is slow, indifferent and a charge is made. We have, in fact been forwarding RO and UO cards to PO Box 469 in Minsk for some time now and the system seems to be working well.

● I am grateful to I R Clabon, G0OFN, for sending me details of yet another chain letter 'scam'. He received one of these totally useless letters along with a QSL card from Czechoslovakia recently. I don't suppose I have to tell anyone out there with a modicum of intelligence to ignore such communications. The best place for them is the waste paper basket which is where I put the copy Mr Clabon sent me!

● With the continuing problems in what used to be Yugoslavia we are forwarding cards for YU2 and 9A to an address in Croatia. We are forwarding cards destined for YU3 to an address in Slovenia. However we are continuing to hold all cards for other areas of YU until we have some clear understanding that they will actually reach their destination. We hope members will bear with us in the meantime.

● For those of you who have a QSO with the Headquarters sta-

tion GB3RS you may rest assured you will receive a QSL card. EVERY contact is acknowledged - via the Bureau of course! We don't use a particularly flamboyant card but I think it is an improvement on its predecessor.

● Will members who send envelopes to their Sub Managers please remember that he or she needs to have envelopes with call signs as well as a name and address on them!

● We often receive cards from overseas Bureaux for countries that once formed part of the old British Empire or are members of the Commonwealth. I suppose some bureaux are not familiar with the IARU official bureau list and send them to us in desperation! We do our best in most cases to see that they get to their destination safely as a gesture to colleagues in other societies but it would help prevent delay if the IARU list were more widely consulted. It is revised every year and is the bureaux' bible.

● Ian Kyle, G18AYZ, tells me that whilst clearing up his shack the other day he found a packet of cards for contacts made during 1976. He is sending them out via the Bureau and apologises for

the delay! Don't you think 16 years between clear-ups is rather a long time Ian? Another one for the 'never give up hope' saga.

● On this subject I have a card in front of me to go through the bureau from a G3 to an LU5 dated August 1957. That must be a record - unless of course you know better!

John Hall, G3KVA



The impressive 2-element loop antenna used by Yoshi, JA0AWF, in Nagano, Japan. He is active on 10.1MHz.

VHF NEWS

continued from page 17

20° azimuth (QTE) till about 1830. The Faroes beacon was copied again next day at 2215. In the contest on the 5th, from 1600, he worked 2 Gms, a GW and 2 Gs on SSB in poor tropo conditions. The aurora on the 10th brought CW QSOs with DL, G, LA, ON and SM, from 1503-1640GMT.

Edward Allely, GW0PZT (GDD), had a whale of a time during the 16 September tropo. His tally comprised 32 DLs, 4 Fs, 3 ONs, 2 PAs, 2 HB9s, an OK and an LX. Best contacts were LX1CT (JN29), OK1FZA (O70), DD0VF (JO61) and HB9QQ (JN47). 15 stations were over 1000km distant. Beacons GB3VHF, EA1VHF, DB0GD (JO50), EI2WRB, PI7CIS and HB9HB were all audible in Pwllheli. Lyn Leach, GW8JLY (GNS), worked lots of choice DX in this event, best being OK1FZA and OE5VRL/5 (JN78).

430MHZ UP

G3JJZ RUNS 25W to a 19-ele Yagi at 8m AGL on 70cm. Dave thought conditions poor in the 23

August Fixed Contest with GB3MLY not heard. Then up popped EI5HN on CW for his first EI on the band.

On 15 September, GJ4ICD found the band open to OE5VRL/P and the following day EA4GR was S9-plus. Geoff reported 23cm signals from F6CTW in Paris and FC1CSU (IN93) on the 16th.

G0JBA operated on 70cm in the 16/17 September lift working DK5WO (JO30), DK0OG, DL1VAA and SP6GZZ. Phil tried 23cm and again contacted DK5WO and DL1VAA, but, despite a lengthy attempt, couldn't complete with DK0OG so concluded his 6W was insufficient.

DEADLINES

THE DEADLINE for **January** is **26 November** and for **February**, **31 December**, so please note the dates in your diaries. The fax number is 081-668 5582 and the telex one is 9312111074(CN). E-mail via CompuServe to my mailbox 70630.603 is very quick and can also be accessed via Internet. The BT Gold mailbox is 76:MSX021.

**1993 RSGB Call Book
now out! See page 43**

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Novice NEWS

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

QUITE A NUMBER of schools are involved with amateur radio in one way or another. Some have been mentioned in this column in the 'Kidlink' articles and others in their own right. Others are involved with Novice training. Graham Middleton, G6EER, has written asking whether any schools have linked the Novice course to the National Curriculum yet. I can see possibilities here, but realise that this would only be a possibility in schools where there is a resident amateur. Of course, schools where there is no amateur involvement will not even know about the Novice licence and its possible interest for their pupils - unless they are told.

Any literature reaching schools is likely to be taken into Staffrooms to be read by busy teachers in their 'spare' time which is often filled with many other things. Unless it reaches a member of staff who knows about these things, it will probably languish on the table until a tidy-minded person shunts it into the bin. May I offer a glimmer of hope?

Amateur radio societies could help if they have members who are teachers. Perhaps there is a member who can spend some time with the youngsters at school, giving a demonstration, answering questions and generally promoting the idea of an interesting and informative hobby. Remember this could lead to a future career [see Oct '92 *RadCom*, p49-Ed]. A station could perhaps be set up at the school and operated from time to time by amateurs who are not teachers.

Time-tabling can pose problems in Secondary schools, but various activities are followed out of normal school hours, and I am sure that students would attend, if only out of curiosity. Primary schools have more flexibility in their timetable, and younger children usually show an enormous amount of interest, given the chance.

As an example, Rishworth School does not have a teacher-amateur, but does have a techni-

cian-amateur - Roy, G3NBI. The Science master, Tony Vinters is dedicated to making the learning of the subject as lively as possible and a class was formed on Saturday mornings - a Novice class with a difference.

CALLING ALL SCHOOLS

ARE YOU using amateur radio, especially Packet? Before the 'Kidlink' venture I suggested that any school intending to participate could let me know, so that I could tell other schools who they may contact. It has been suggested that if there were a list of such schools who were 'radio-active', and each school had a copy, more permanent links could be forged between them. If all schools who use amateur radio could drop me a line, saying which modes are used, I'll compile a list and circulate it, updating as necessary. I think that even a small beginning could prove beneficial and will surely grow. A SASE to return the list would be appreciated.

SAFETY IN THE SHACK

DURING THE training course, a great deal of emphasis is placed on safety. In construction, station layout and in pursuing the hobby in general. I am sure that I do not need to repeat all that was said, but what about after you are licensed and on your own? Never forget what you were taught.

Although you are not operating with high power, there may still be potential hazards and you are not playing with toys. Remember that younger members of the family may go into the shack, and they are not as well trained as you are. Keep potentially dangerous things out of the way, little ones meddle. Keep the shack tidy. This

will help you to find things, as well as impressing any visitors!

SEE YOU THERE?

AT MANY radio rallies up and down the country, there is a Novice stand. The Radio club organising the rally will often set one up or invite Instructors to do so.

On the stand there will be a display - posters and photographs - on the wall, and a table full of interesting leaflets (all free) giving all sorts of information to anyone who cares to stop and browse. There will also be amateurs available to offer you advice, help and encouragement if you'd like a chat. This includes potential Instructors who may just need that last little push to convince them that Novice training is fun for them too.

I go to nearly all the relatively local rallies, whether there is a Novice stand or not, to meet the friends that I have made over the years in this hobby. If there is a stand, I can usually be found there most of the time.

It was suggested at Lancaster, that I could arrange to be in certain places at given times, so that I could meet people. I can do better than that - I always wear my 'uniform'. A turquoise Bylara sweatshirt with my name and callsign emblazoned on the front. If you do see me at a rally, please stop me and introduce yourself.

PROFILES

MEET TWO home-grown novices. Jackie passed her Novice exam last September and gained the callsign 2E1AHL. Her daughter Zoe, thought this was a very good idea, and although she entered a Novice course part-way through, she worked extremely hard, and with added help from Mum, she caught up and sat



Newly licensed Novice, Zoe, with her mother Jackie, 2E1AHL.

her exam in June, this year. The waiting seemed endless, but at last, her result was known and it was positive. Her callsign is due any time now. Pleased with themselves? Of course they are! Congratulations to both.

CALL OF THE ISLAND

FOR ONE week during August, a callsign with a difference was on the air. Jeff, G3LWM, was on holiday on the Isle of Pabay and was on the air using the callsign GM0PNS. He was hoping to contact Novices with a particular interest in philately.

Conditions were not good, and although he called "CQ Novice" he only found one - Keith, 2M0ACT, (he congratulates you on your Morse, Keith) - but he hopes that others heard him and can take up his offer by sending a listener report.

There are only 380 acres of Pabay and it lies a couple of miles from the Isle of Skye. As operation was also to take place during unsociable hours, the station was set up in a barn some distance from the house, using a small petrol generator which was also used for charging the batteries for night use as the island's large generators are only used sparingly during the day.

Pabay is licensed to issue its own stamps to cover the cost of carrying mail to the mainland and a special stamp was issued to commemorate the amateur radio event - one of the very few which carries an amateur radio callsign! Any contacts made, received a special QSL card enclosed in a first day cover.

As previously stated, conditions were poor, (although Jeff did contact ZL4PO on 40m SSB), so it is possible that you called and he did not hear you in the noise. Hence, his offer to send a card, and information about the island, in return for that report. He hopes to repeat his activities on Pabay in future years, using VHF also, and perhaps conditions will be better so he can make those Novice contacts. Any information I receive, I will pass on.

LIFEBOAT APPEAL

I CAN add to the information given in September's *RadCom* and it could be of interest to all Novices and listeners.

The WAB was formed in 1969, and many amateurs try to contact as many WAB squares as possible - and raise money for charity while making friends on the way.

PHOTOGRAPH HUDDERSFIELD DAILY EXAMINER



Denby Dale District ARS's highly successful 'Youth in Action' event, GB2YIA.

To celebrate their Silver Jubilee, the Group decided to go for a really ambitious project, and raise funds to provide a 'D' Class Lifeboat for the RNLI. They are expensive, so a lot of help is needed.

Apart from qualifying for the certificate, and swelling the funds by sending your claim and minimum donation of £3, you could help in other ways. Incidentally, after deduction of postage, all money collected is for the appeal. It is intended that the cheque will be presented at the AGM at the end of the anniversary year in 1995.

Many Special Event stations will be needed to raise the money and those stations will be glad of all the help they can get. If any Club is willing to mount a station, WAB would like to hear from you. Although it is hoped that many stations will be set up on RNLI premises, this is not absolutely necessary. Inland stations could also support this cause - after all, even land-lubbers may need lifeboat help at some time!

Special event stations need help too. Volunteers to help in setting up - and taking down. Operators, loggers, anyone interested and willing to help. Even if only for an hour or two. If you think you would like to become involved in a very worthy cause, you would find it rewarding. So, what to do?

If your local club decides to put on a station, volunteer your help. If you need to know where the nearest station is to be, make inquiries. I hope to be able to supply this information as and when I get it, but if you are impatient to know more, a letter (SASE please, to keep all the money for RNLI) to: Adrian Keeble, G4HPU, Heater Field, Colchester Road, Ardleigh, Colchester, Essex CO7 7PA, will provide it. Donations too

would be welcome. The WAB Honorary Treasurer, G4IAR (QTHR) will accept them willingly.

Some Novices have joined WAB, but you do not need to be a member to try for this award. Weekends are probably the best time to listen for the stations. Have fun, and help to swell the funds!

KINDLY NOTE

MANY NOVICES are helping at special event stations and the GX Club stations, for which the organisers are grateful. While working under supervision and using that station callsign, Novices are permitted to mention their own.

This may be the first contact that many amateurs have made with a Novice, and even if not, they are delighted at this first meeting. So delighted, in fact, that they send the customary QSL card to the station and also one to the Novice personally, requesting a card in return, often by direct mail. A nice gesture.

Unfortunately, the Novice cannot do this. Apart from the fact that they may not have personal QSL cards to send (some wait as they are embarking on a full RAE course and hope to change the Novice call) a Novice is not allowed to send his/her personal card for a contact on a band for which they are not licensed to transmit unsupervised.

Please understand - include a card to the Novice personally by all means - I am sure that it would be appreciated - but do not expect their card in return. That would contravene licence conditions.

YOUTH IN ACTION

MY IMPRESSIONS of this station have already been reported, but Tony, G0DDDB, has supplied

information about the behind-the-scenes organisation that went on before the event, the philosophy of it and the arrangement of the event itself. The aim was to introduce young people to amateur radio in a way that gave instruction through enjoyment, without stress (to all but the organisers!) in a camp setting, giving a weekend that youngsters would enjoy and remember.

First the building of the camp and station. Four caravans were used (loaned by Goodalls) as 'shacks'. Two for HF and two for VHF and UHF, and beams, dipoles and verticals grew alongside them. Large tents housed project space and living accommodation. Power was supplied by a battery of large generators. Denby Dale and District ARS invited members of local Boy Scouts, Girl Guides, Boys' Brigade and Air Cadet troops to take part and about 35 youngsters accepted the invitation.

Six mixed groups were formed and each group participated in each of the five main activities:

- 1) Build a simple crystal set with Gerald, G3SDY.
- 2) Make a morse buzzer and hand-steady game with Paul, G0LVV.
- 3) Learn Morse code with Jean, G0LPV.
- 4) See computers demonstrating involvement in radio etc with Kevin, G1FYS.
- 5) Spend time with the radios-on-air with any amateurs who were in the 'shacks'.

These activities began in earnest on Saturday morning, by which time everyone was settled in and had made many new friends.

The Morse buzzers were put to use on Sunday evening, when each group practised their CW on the other. A message was sent back and forth between groups until it resembled nothing like the original - which was hilarious.

Four prizes were presented for achievement, with a fifth prize awarded for 'most initiative and interest'. Then George G3YWI, the President of the Club, presented a certificate to everyone who had taken part.

Tony asks me to mention his thanks to all Club members who helped, a local engineering company for their financial assistance and Goodalls Caravans for the site and the facilities provided. And my thanks to Tony for telling us all about this.

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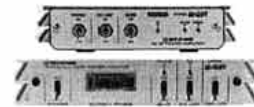
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SWL NEWS

BOB TREACHER BRS 32525
93 Elibank Road, Eltham, London
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WITH THE darker nights and mornings listeners should find that conditions on the LF bands will be showing signs of improvement. This month, I shall look at the sort of propagation you can expect on 7MHz. At the time of writing, HF conditions had been very mixed with some good openings, but there were many days when conditions were very poor - at times no signals outside Europe could be heard.

NEW QSL CARDS?

IF ANY listener is considering ordering QSL cards, I suggest that you approach G7LVD at The Capstan Press, 62 Newark Lane, Ripley, Woking, Surrey GU23 6BZ. He now has an SWL block and claims to offer a professionally produced card at a realistic price. If anyone is interested, refer to this column when writing.

While on the question of cards, the 4S0UK cards should be available by the time you read this. Also, G3VLX has taken advantage of my offer of handling the SWL QSL cards for any up-and-coming DXpeditions. He was due to visit 4S7 in October and had provisionally been allocated the callsign 4S7DEG.

WHERE ARE THEY NOW?

JOHN LORD, ORS46084/7Q7, is featured this month. John used to live somewhat in the shadows of Stan Porter, ORS45992/7Q7, but he is now licensed in Malawi as 7Q7JL and operates from the capital, Blantyre. He also holds the callsign 7Q7JWL which he uses when operating from Mamaso Bay on the shores of Lake Malawi. The picture shows John at his station. He currently uses a Kenwood TS680S, Alpha 76, PK232MBX, TA33, Long John on 21MHz, 7/3.5MHz dipole, a Butternut vertical and a 5 over 5 beam on 50MHz. At Namaso Bay he uses the same rig into an 18AVQ, a 3 element beam for 28MHz and a 4 element beam on

50MHz. G0IAS is the QSL Manager for both stations, and also does the QSLing chores for 7Q7RM and 7Q7LA. All three are very keen 50MHz operators.

John comments that 50MHz openings in August were very scarce and mainly restricted to Trans-Equatorial Propagation (TEP) to 9H and ZB. He said that there would be more 7Q7s on the air soon as there were to be ten Japanese volunteers coming to Malawi, all of whom had applied for amateur licences.

WHITE ROSE CONTEST RESULTS

THE WHITE ROSE society were pleased to receive 17 entries to the SSB leg of their Listener Contest, but were disappointed at only receiving one entry for the CW leg. It does, however, seem to be the case that listeners are quite prepared to try their luck at SSB contests, but that contesting which requires a knowledge of CW appears to be less popular. Perhaps the trend will be redressed in the near future.

Rules for the January 1993 contest will appear in a later issue, and 18 and 24MHz will again be featured.

WAB UPDATE AND EXPEDITIONS

G4OBE WROTE to update the position on activity from those areas which I had suggested were inaccessible. It seems that TR08 in Essex was activated in April of this year by the Royal Engineers Amateur Radio Group. Again, no listeners apparently caught the expedition.

As for activity from TV79 in East Sussex, G4OBE is currently organising a WAB expedition to the Royal Sovereign Light Tower. By the time this is read the trip

may well have taken place because he was only waiting for a date when a supply ship was going there.

Another rare spot mentioned was NM23 in Strathclyde. This is the island of Dutch Mans Cap. It seems that this spot can be reached by sea only when the Atlantic is calm! G4OBE holidayed in Scotland this year and while on the Island of Iona, prior to going to Staffa, he made some enquiries with local fisherman about getting on to Dutch Mans Cap. It might be possible at some time in the future but the locals require their palms crossing with either gold or folding paper before they are prepared to attempt a landing in an inflatable boat! Very definitely a case of watch this space!

NEWCOMER

IT IS A long time since I have featured a newcomer, but one letter I received recently is worthy of a mention. BRS94599 got interested in amateur radio about two years ago when he was given a Saisho SW5000 portable radio for Christmas. During the holidays he purchased a book about amateur radio and strung up a long wire. His first DX station soon followed in the shape of VY2DA. Following a letter and QSL card, BRS94599 decided to drive to Prince Edward Island while on a North American holiday to meet VY2DA in person.

7MHZ IMPRESSIONS

ANYONE TUNING around 7MHz for the first time would probably decide to give the band a miss! This is because broadcast band stations are never far away, and the impression can be gained that it is a band only for hearing local and Inter-European QSOs. How-

ever at the right time of day or night, and at the right time of year, 7MHz can provide some quite exceptional DX. Even in the last couple of years, the band has provided avid listeners to the band with over 170 DXCC countries. As conditions on the HF bands deteriorate so 7MHz will provide much more in the way of good DX.

We are, of course, moving towards the winter months and anyone choosing to do their DXing on the band will not be disappointed. The band produces many surprises, such as the Pacific at both morning and evening our time, or the Caribbean at 5.9 at 1000 when the band only seems good for Europeans.

There is so much on 7MHz that it is impossible to suggest the right time to listen. Some say that the Spring provides the best conditions, others that the best time is around the turn of the year. I can only suggest that you try the band for yourself and make your own decision. I will, however, provide some tips about where to listen. Most SSB DXpeditions tend to favour 7.045 or 7.095MHz. Other frequencies to watch are around the SSB band edge, 7.040, 7.080 - 7.085 (especially in the mornings) and 7.180 in the US phone band, again especially during early morning hours. Anyone listening can also usually be assured at hearing a VK on 7.099 (or just up into the US band) from around 0800.

DX NEWS

AMONG THE VHF reports received was one from David Whitaker, BRS25429, who heard a number of Scandinavians on the evening of 25 August. On HF conditions were reported as being mixed. There had been some highlights, such as the 9D0RR DXpedition to Iran, but otherwise luck seemed to have played a part in catching the DX. Here is a selection of the best:

21MHz: FH8CB, TL8DF, VQ9RM, V63DB, YB6MF, 7Q7XX and 9M2ZA.

14MHz: A35NP, BZ1AJ/9, J73WW, P43LJP, TA4/OH3MIG, ZF2SQ, ZK2SQ, ZK2VJ and 3B8FT.

7MHz: CE0ZAL, CX5TV, D2EL, HF0POL, PY0FF, TR8GR, and VK6HB.

3.5MHz: PY0TUP.

FINALE

ALL NEWS for the January 1993 issue must be received no later than 11 November.



John Lord, 7Q7JL (ex ORS46084/7Q7) at his station in Blantyre, Malawi. He also holds the callsign 7Q7JWL.

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The
Peter Hart
Review

TS-690S

HF + 50MHz Transceiver

THERE ARE A NUMBER of transceivers available now which offer the combination of HF transceiver with added 50MHz coverage and this provides a convenient way of being operational on 50MHz as well as the HF bands. This option is popular with the medium to lower priced, smaller sized 12 volt operated radios and, curiously, not to the larger feature packed base stations. It remains to be seen whether, over the next few years, 50MHz will retain its popularity both for the user and the manufacturer, now that 50MHz band conditions are on the decline. The TS-690S is Kenwood's latest HF + 50MHz offering, also available without 50MHz as the TS-450S. In all other respects, these two small 12V operated radios are identical.

PRINCIPAL FEATURES

THE RECEIVER in the TS-690S tunes from 30kHz to 30MHz and from 50 to 54MHz. Transmitter operation is limited to the exact amateur allocation eg 18.068 to 18.168MHz. The review radio was the version normally sold in the UK with the transmitter inhibited above 3.8 and 7.1MHz. If operation in the USA is required or DXpeditions are part of your future plans, then you will need the version normally sold in the USA. Modes covered include USB, LSB, CW, AM, FM and FSK. In FSK operation, the shift can be set for 170, 200, 425 or 850Hz and either high tones (2125Hz) or low tones (1275Hz) may be used.

Band changes are selected using Up/Down keys or alternatively in 1MHz steps for general coverage operation. The usual band stores are provided, returning the last used frequency, mode, front-end setting, AGC speed and filter setting on each band. Tuning is in 10Hz steps on SSB, CW and FSK at 10kHz per revolution of the tuning knob and in 100Hz steps on AM and FM at 50kHz per revolution of the tuning knob. Extra fine tuning can be selected which gives 1kHz per revolution on CW, SSB and FSK in 1Hz steps. This can be useful on CW when very narrow filters are used or for careful tuning of RTTY.



The usual Kenwood rapid QSY facility is provided with a 24 position click-step rotary control stepping the frequency in 10kHz increments. Alternatively a 1, 2 or 5kHz increment may be selected or 9kHz for AM in the MW broadcast band. This click-step rotary control also switches between memory channels. 100 battery backed memory channels are provided, each storing frequency, mode, filter, front-end setting and AGC speed. For split frequency working both receive and transmit frequencies are stored and the usual VFO/memory transfer operations are provided including direct VFO from memory. The memory contents may be previewed whilst remaining tuned to normal VFO mode to allow for selection and checking of contents.

Memory locations 90 to 99 may be used to store up to 10 programmable scan limits. Comprehensive scanning features are provided to allow programmable band scan, memory scan, group scan (groups of 10 memory locations) with adjustable scan speed but no dwell on detected signal. Ten of the front panel keys provide a numeric keypad for the direct entry of frequency or memory number. The usual twin A/B VFOs are provided which may be operated in split frequency mode. In this mode, a single touch key (TF-SET) provides for checking and setting of the transmit frequency. This is particularly useful for finding and netting onto the working channel in a split frequency DX pile-up. In addition, the display may be set to indicate the difference between the receive

and transmit frequencies. Receiver and/or transmitter incremental tuning (RIT/XIT or clarifier) operates over the range of +/-1.1kHz in 10Hz steps or +/-2.2kHz in 20Hz steps. Larger offsets are handled using split frequency working.

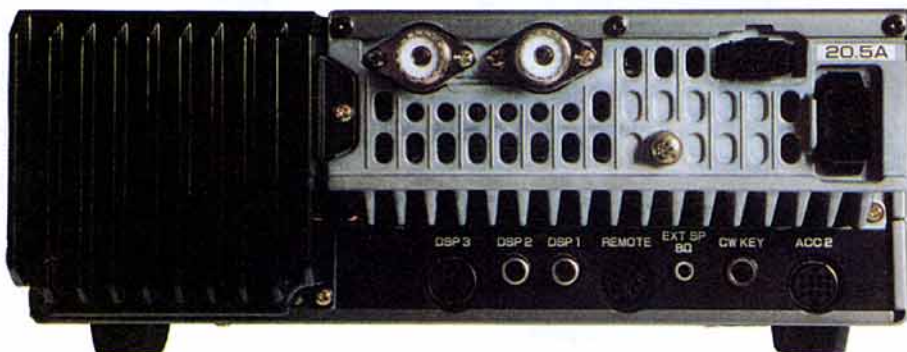
The receiver front-end is switchable between normal operation at full sensitivity and AIP (Advanced Intercept Point) giving reduced sensitivity but improved strong signal handling. An additional 20dB attenuator is also provided.

The IF filter switching arrangement is similar to the TS-950S and TS-850S models. Separate push buttons scroll through the available filters in both the 8.83MHz and 455kHz IFs. The available bandwidths at 8.83MHz are 6kHz and 'through' fitted as standard with optional 2.4kHz and 500Hz as extras, and at 455kHz, 12, 6 and 2.4kHz as standard with 500Hz as an extra. To help fight interference an IF shift is included, an audio notch filter, dual noise blankers and the ability to select reverse sideband on CW or FSK. This can be useful for eliminating close adjacent channel interference. Other receiver functions include dual speed AGC, all-mode squelch and CW pitch variable between 400 and 800Hz.

The transmitter power is variable up to a nominal 100W. For SSB, an AF type speech processor is included and VOX. On CW, only semi break-in is provided. There is no full break-in or keyer. A sub-audible tone encoder is available for FM repeaters.

As with the TS-850S, a multicoloured backlit liquid crystal display is used. This is most attractive and at least as clear and bright as the more commonly adopted fluorescent panel. The display indicates frequency to 10Hz resolution, RIT/XIT, memory number, mode, various status messages and filter bandwidth. Also included are two 30 segment bar meters. One indicates signal strength / transmit power and the other indicates audio level, ALC or VSWR. A peak hold function may be selected.

At power-on, some 32 of the radio's functions may be customised to suit individual



preferences. These include enabling/disabling of various functions, changing step sizes, display parameters etc. A basic operating mode may be selected, typically for mobile operation, where only a basic set of functions are enabled. As with other Kenwood radios, most of the functions of the radio may be controlled from a PC via the FIF-232C serial interface at 4800 bits/sec. In addition two transceivers may be linked together (TS-690S, TS-450S or TS-850S) and data transferred directly between them. Connectors on the rear panel provide dedicated interfaces to a DSP-100 DSP unit and AT-300 remote auto ATU. Two other connectors provide interfaces to a linear amplifier and data terminals but there is no provision for separate receiver antenna, transverter or IF outputs. Two antenna sockets are provided, one for HF and the other for 50MHz. A slide switch on the top of the case allows for a single combined antenna connection for HF and 50MHz.

Optional accessories include the IF filters previously mentioned, voice synthesiser, tone generator, high stability TCXO and auto ATU. The ATU functions over 3.5-28MHz with band stores and matches up to 2.5:1 VSWR.

The transceiver was supplied with three manuals. The operating manual comprised two thick volumes, each around 270 pages, with 90 pages each in English, French, Spanish, German, Italian and Dutch! This adequately covers the installation and use of the transceiver and includes a set of circuit diagrams. Computer control is covered in a separate 20 page manual.

DESCRIPTION

THE TS-690S is a convenient size for home and portable use, measuring 270mm(W) by 960mm(H) by 328mm(D) and weighing 6.9kg without ATU. The unit adopts a conventional modular form of construction with a steel frame and shielded units and a plastic overlay front panel. The PA is blown by two miniature axial fans. A 75mm diameter speaker faces

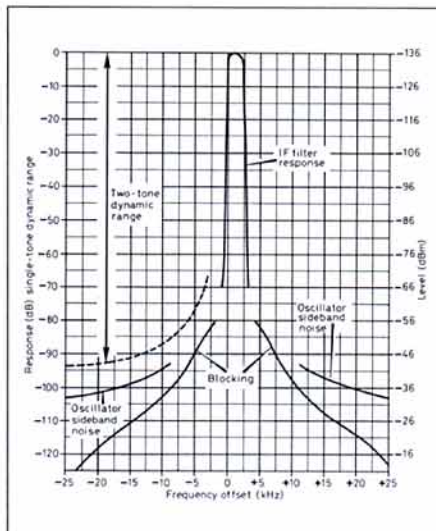


Fig 1: Dynamic range and IF filter response.

upwards through the top of the case. The receiver uses a triple conversion superhet with IFs of 73.05MHz, 8.83MHz and 455kHz. The main RF amplifier uses two parallel FETs and the first mixer, a bridge of four FETs. The main selectivity at 8.83MHz and 455kHz is achieved using low grade single section crystal and ceramic filters. The crystal filters which may be fitted as options are well worth considering for higher performance. The notch filter is implemented at audio which has the disadvantage that strong interfering signals will still capture the AGC.

On transmit, SSB is generated at 455kHz and mixed through the 8.83MHz and 73.05MHz IFs to final frequency. The speech processor is implemented as a fast acting audio compressor which is inherently good in terms of distortion. The frequency synthesiser uses a combination of DDS (direct digital synthesis) and PLL (phase locked loop) to give fast tuning and good spurious performance with a small step size. A second DDS is

used to generate the 455kHz carrier. The main CPU is lithium battery backed to retain memory contents on power down.

MEASUREMENTS

THE REVIEW RADIO was powered from the Kenwood PS-53 matching PSU and was also fitted with the 500Hz CW filter for the 8.83MHz IF. The measured performance is summarised in the table with additional comments.

RECEIVER MEASUREMENTS.

SENSITIVITY

At around 0.1µV, the radio is particularly sensitive.

S-METER CALIBRATION

The S meter calibration was similar on all modes except FM showing good linearity and range within the limits of the bar graph display. The FM performance was, as usual, poor.

SPURIOUS REJECTION

Rejection of the first mixer image was better than 80dB and IFs around 90dB with the exception of the 8.83MHz IF which was around 70dB on 7 and 10MHz. There were very few other responses and the receiver was generally very clean.

STRONG SIGNAL PERFORMANCE

The front-end signal handling was very good with a dynamic range in SSB bandwidths approaching 100dB. However, the close-in dynamic range due to the signal handling of the second mixer was a major problem. This occurred at relatively low levels and blocking of the second mixer prevented reciprocal mixing measurements of and even an accurate assessment of the -60dB IF filter bandwidth. Combined results are shown in Fig 1.

The inband intermodulation performance measured with 200Hz tone spacing was also poor and improved only marginally when the RF gain control was reduced.

FREQUENCY CALIBRATION

When measured at room temperature, the receive and transmit frequencies were accurate to within 190Hz. The CW frequency reads correctly for the selected beat note (800Hz default).

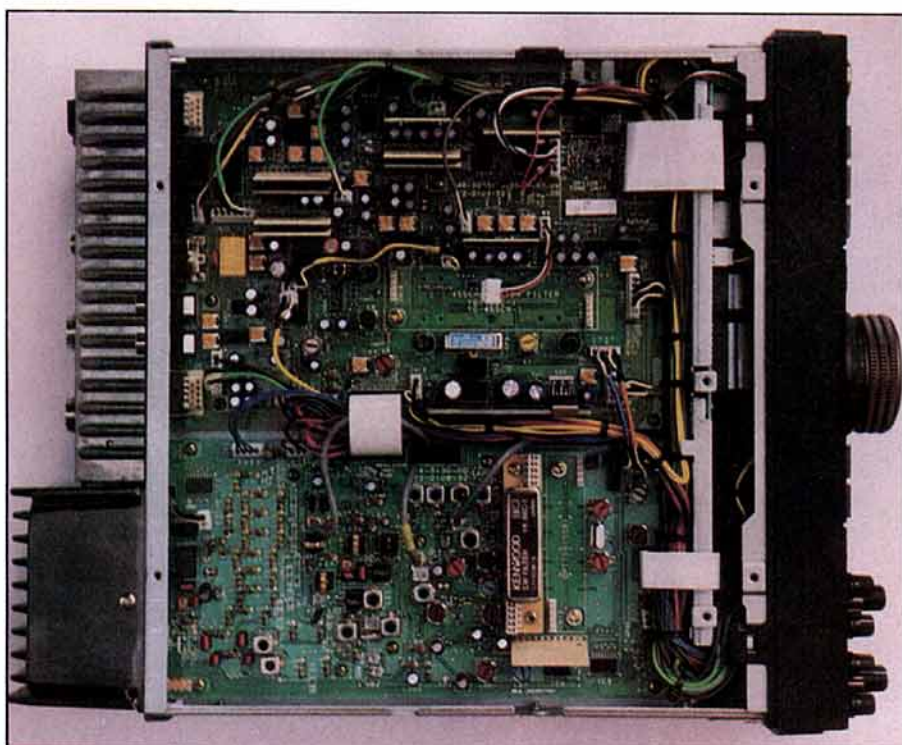
TRANSMITTER MEASUREMENTS.

POWER OUTPUT

The maximum transmit powers were slightly lower than most nominal 100W transceivers, but this may be more a function of the alignment of the ALC circuitry than of the capabilities of the PA. The power was variable down to 4W and the power reading remarkably accurate to within the resolution of the bar meter. With the auto-ATU in circuit, power levels were about 10% less. Into a mismatched load, 45-80W was produced into a 2:1 VSWR and 25-40W into a 3:1 VSWR. Into these mismatches, the ATU restored the power to about 70-80W although there were certain impedances even at 2:1 VSWR which the ATU failed to match.

SPURIOUS OUTPUTS

Non-harmonic spurious outputs were around 65-75dB down on the carrier although worse on 24MHz at around -56dB. The noise output



KENWOOD TS-690 MEASURED PERFORMANCE
RECEIVER MEASUREMENTS

FREQUENCY	SENSITIVITY SSB 10dBs+n:n		INPUT FOR S9	
	NORMAL	AIP	NORMAL	AIP
1.8 MHz	0.14µV (-124dBm)	0.4µV (-115dBm)	35µV	160µV
3.5 MHz	0.11µV (-126dBm)	0.32µV (-117dBm)	32µV	110µV
7 MHz	0.11µV (-126dBm)	0.32µV (-117dBm)	28µV	100µV
10 MHz	0.11µV (-126dBm)	0.32µV (-117dBm)	28µV	100µV
14 MHz	0.1µV (-127dBm)	0.28µV (-118dBm)	25µV	100µV
18 MHz	0.11µV (-126dBm)	0.28µV (-118dBm)	28µV	100µV
21 MHz	0.11µV (-126dBm)	0.28µV (-118dBm)	25µV	100µV
24 MHz	0.1µV (-127dBm)	0.28µV (-118dBm)	25µV	100µV
28 MHz	0.1µV (-127dBm)	0.28µV (-118dBm)	25µV	100µV
50 MHz	0.11µV (-126dBm)	0.71µV (-110dBm)	16µV	200µV

S-READING (14MHz)	INPUT LEVEL	
	SSB	FM
S1	1.1µV	0.6µV
S3	2.5µV	0.8µV
S5	5µV	1.1µV
S7	10µV	1.6µV
S9	25µV	2.0µV
S9+20	250µV	3.2µV
S9+40	2.5mV	5µV
S9+60	25mV	8.9µV

AM sensitivity (28MHz): 0.56µV for 10dBs+n:n at 30% mod depth

FM sensitivity (28MHz): 0.13µV for 12dB SINAD 3kHz pk deviation

AGC threshold: 1µV

100dB above AGC threshold for +2dB audio output

AGC attack time: 2-3ms

AGC decay time: 0.5s (fast), 3s (slow)

Max audio before clipping: 1.4W into 8ohm at 1% distortion

Inband intermodulation products: -18 to -25dB (see text)

MODE	FILTER (8.83/455)	BANDWIDTH	
		-6dB	-60dB
SSB	6/2.4	2530Hz	4000Hz
CW	0.5/2.4	540Hz	3300Hz
AM	6/6	6650Hz	12.5kHz
FM	-/12	14kHz	21.8kHz

Frequency	INTERMODULATION (50kHz Tone Spacing)		AIP	
	3rd order intercept	2 tone dynamic range	3rd order intercept	2 tone dynamic range
1.8 MHz	+8dBm	95dB	+10dBm	90dB
3.5 MHz	+8dBm	96dB	+15dBm	95dB
7 MHz	+10dBm	97dB	+17dBm	96dB
14 MHz	+12dBm	99dB	+25dBm	102dB
21 MHz	+13dBm	100dB	+24dBm	101dB
28 MHz	-2dBm	90dB	+17dBm	97dB

TONE SPACING (7MHz BAND)	3rd ORDER INTERCEPT	2 TONE DYNAMIC RANGE
3 kHz	-36dBm	67dB
5 kHz	-20dBm	77dB
10 kHz	-6dBm	87dB
15 kHz	0dBm	91dB
20 kHz	+3dBm	93dB
30 kHz	+5dBm	94dB

FREQUENCY OFFSET	RECIPROCAL MIXING FOR 3dB NOISE	BLOCKING NORMAL	TX NOISE IN 2.5kHz BANDWIDTH
3 kHz	see text	-56dBm	-70dBc
5 kHz	see text	-50dBm	-77dBc
10 kHz	see text	-35dBm	-82dBc
15 kHz	98dB	-25dBm	-85dBc
20 kHz	101dB	-20dBm	-88dBc
30 kHz	105dB	-5dBm	-88dBc
50 kHz	110dB	-5dBm	-88dBc
100 kHz	116dB	-5dBm	-90dBc
200 kHz	122dB	-5dBm	-92dBc

TRANSMITTER MEASUREMENTS

FREQUENCY	CW POWER OUTPUT	SSB(PEP) POWER OUTPUT	HARMONICS	INTERMODULATION PRODUCTS	
				3rd order	5th order
1.8 MHz	89W	94W	-65dB	-30dB	-43dB
3.5 MHz	92W	95W	-66dB	-30dB	-45dB
7 MHz	91W	94W	-64dB	-29dB	-31dB
10 MHz	91W	92W	-66dB	-24dB	-40dB
14 MHz	90W	91W	-50dB	-28dB	-40dB
18 MHz	89W	90W	-62dB	-27dB	-38dB
21 MHz	88W	90W	-64dB	-30dB	-38dB
24 MHz	88W	90W	-69dB	-29dB	-39dB
28 MHz	88W	89W	-67dB	-30dB	-45dB
50 MHz	42W	41W	-60dB	-26dB	-31dB

Carrier suppression: 52dB Sideband suppression: 70dB Transmitter noise: see table above. Transmitter AF response at -6dB: 285-2700Hz Transmitter AF distortion: 0.5%. Microphone input sensitivity: 2mV for full output. T/R switching speed (SSB): mute-TX 25ms, TX-mute 1ms, mute-RX 25ms, RX-mute 2ms

NOTE: All signal input voltages given as PD across antenna terminal. Unless stated otherwise, all measurements made on SSB with the receiver front-end set to maximum sensitivity and operating from a 13.8V PSU. All two-tone transmitter intermodulation products quoted with respect to either originating tone.

from the transmitter was somewhat higher than most other radios.

SSB PERFORMANCE

The PA intermodulation performance is good compared with most 12V operated radios. This is probably related to the lower output power and the alignment of the ALC. The speech processor did not degrade the inter-modulation performance at all. It is based on an audio compressor rather than a limiter.

CW KEYING PERFORMANCE

The keying envelope and spectrum were observed at 40WPM. The waveform showed low keying distortion although the spectrum was a little wide.

ON-THE-AIR PERFORMANCE

I found the TS-690S very enjoyable to use. It generally handles very well, the tuning is smooth and click free and the ergonomics are good. The band and mode stores are well implemented. Apart from the usual band stores, each press of the mode keys returns the last used filter settings on that mode which simplifies switching between modes.

The receiver performed well and the audio quality was excellent. There was adequate sensitivity on all bands including 50MHz and the strong signal performance seemed good. Although the AIP front-end was normally selected on the LF bands, it was by no means essential and I never found it necessary to select the input attenuator. In crowded, noisy band conditions, the limited close-in dynamic range was noticeable at times when copying weak signals. The notch filter was narrow and effective but would not prevent strong carriers from reducing sensitivity by capturing the AGC, the problem with audio notch filters.

Good reports of the speech quality were received, particularly with the processor in circuit. Note that there are no adjustments required to set up the processor. On CW the keying was crisp and, although there is no QSK mode as such, reducing the recovery delay to a minimum effectively gives QSK. If the CW pitch is varied, the sidetone still remains at 800Hz. Hence netting cannot be done against the sidetone. In this situation, the best way to net is to switch back and forth between normal and reverse CW and set to give the same pitch.

CONCLUSIONS

THE TS-690S IS A SMALL 'go-anywhere' transceiver covering all the HF spectrum plus 50MHz. It is very friendly to use and a good overall performer, although the close-in signal handling could do with some improvement. The current price inc VAT is £1395 with an extra £149 for the AT-450 auto ATU. The TS-450S without 50MHz sells for £1220. Additional filters cost £49.95 for the 8.83MHz units or £115 for the 455kHz units. For mains powered use, a 12V PSU is needed, such as the PS-53 at £249.

ACKNOWLEDGEMENTS

I WOULD LIKE TO THANK Lowe Electronics of Matlock, Derbyshire for the loan of the equipment.

Peter Hart, G3SJK



TRANSLATED AND EDITED
BY ERWIN DAVID, G4LQI

FEW AMATEURS DARE to undertake the building of a microprocessor-controlled synthesized multi-band transceiver, but the construction of accessories such as this microphone is well within the capabilities of many. Encouragement is further provided by the fact that bought desk mics cost over £60; the components for this project cost very little.

THE CIRCUIT

THE DIAGRAM (Fig 1) SHOWS connections both for a three-terminal (left) and a two-terminal electret microphone capsule. The 1nF ceramic capacitor serves to immunize the mic against stray RF and should be soldered directly across its terminals. Solder quickly, lest the mic turns very deaf! A dynamic microphone can also be used. In that case omit resistor R1, 4.7kΩ.

The BC547C transistor serves as a 20dB pre-amplifier for the signal from the microphone; its collector voltage also sets the DC level for the op-amp inputs. The collector voltage should be 4 - 6VDC on a supply voltage of 12VDC. Change the 33kΩ resistor R2 to adjust the collector voltage. More resistance yields lower voltage and vice versa.

Disregarding for now the diode circuit at its output, the op-amp is connected as a standard x100 (40dB) audio voltage amplifier, [x101 for you purists - G4LQI], for a total gain of 60dB.

The diode circuit is the heart of the compressor. Just another clipper? No, definitely not. The circuit works as follows:

Audio output from the op-amp is rectified in diodes D1 and D2, which charge capacitors C1 and C2 positive and negative respectively. Watch the polarity on the electrolytics! The voltage difference between C1 and C2 discharges via R3-D3-D4-R4. The capacitors C3 and C4 serve to make the top of D3 and D4 'cold' for AC, which has a dual purpose. Firstly, it removes AC ripple from the current through D3-D4, and, secondly, it provides an earth reference for an AC voltage divider consisting of R5 and the impedance of the diodes (D3 and D4, back-to-back, in parallel).

A low-cost microphone with dynamic-range compressor was described in *Electron* (NL) 8/92 by **Rene J Zuidema, PE1CXO**. He uses it not only with his FM transceiver but also with his camcorder.



This audio processor was designed by PE1CXO and built on a 2½ x 1" (64 x 25mm) PCB by PA0HUP.

This latter impedance depends on the DC C1-C2 discharge current through D3 and D4. The larger this current the lower the impedance of the diodes and the lower the input voltage to the op-amp's non-inverting (+) input.

Though positive, the feedback has no DC component. This permits the high loop gain and wide compression range without instabil-

ity. As the signal voltage at the op-amp input is small, the non-linearity of the diodes creates but little distortion. 1N4148 silicon diodes perform well. Germanium diodes do not work any better.

This circuit produces an output in the region of 2.5V peak to peak at the op-amp output, enough for rigs requiring an external mic amplifier. The output control RV1 is adjusted such that the limiter in the (FM) rig is activated only on voice peaks and the transmitted signal sounds undistorted. Some experimentation with resistor R6, 2.2kΩ, may be necessary. Resistance values shown are suitable for transceivers designed to work with electret or dynamic microphones of average sensitivity.

THE MECHANICS

A GOOSE NECK MIC may be nice, but mounting the capsule with this circuit in a little box which sits on the operating table is just as effective. Whether you 'eat the mic' or talk to it from across the shack, this compressor produces virtually the same output, though too great a distance makes the voice sound a bit hollow. Do keep mechanical vibrations, as from a cooling fan, away from your mike. Beware of any background chatter, even at low level and from far away, from unintentionally getting on the air!

This project has been duplicated a number of times. When used with a camcorder in lieu of its own mic, the sound is cheered up considerably.

SPECIFICATIONS

- TIME CONSTANTS:** fast attack - slow decay.
- Gain (no signal) mic to op-amp output:** 60dB
- Compression range:** 40dB
- Output impedance:** 300Ω
- Distortion:** <5% in normal usage
- DC supply:** 9 - 20V @ 2mA approx.

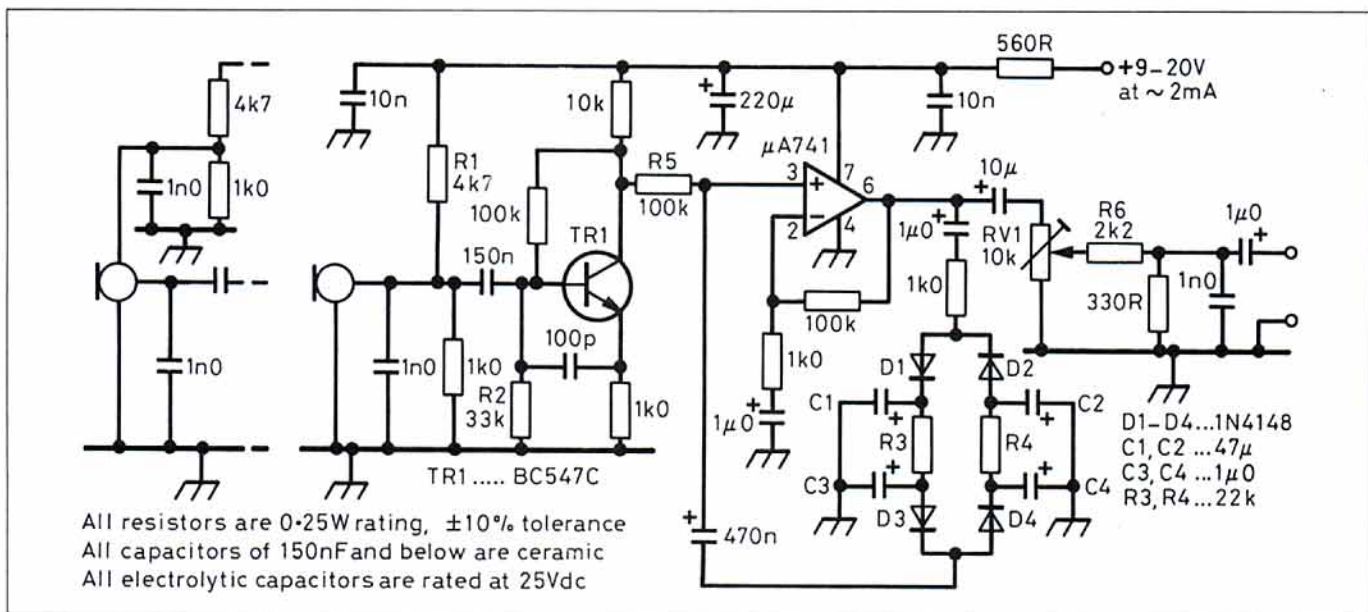


Fig 1: Microphone with dynamic range compressor. Left cut, connections for a three-terminal electret microphone.

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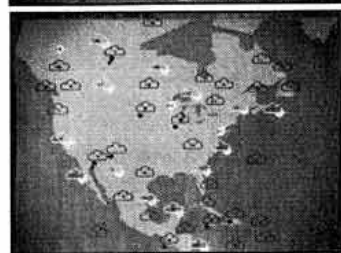
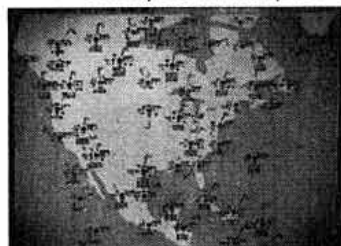
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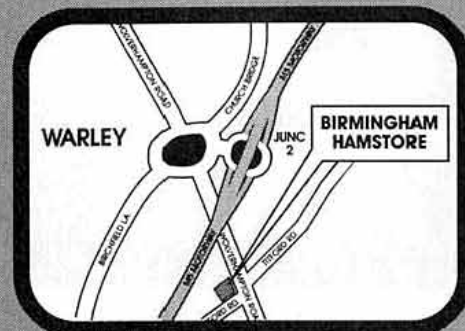
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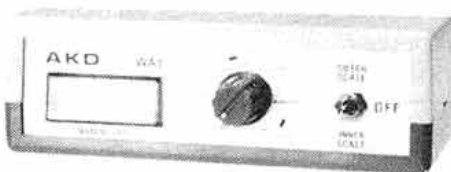
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An Inexpensive but Effective Wobbulator

by Peter J. Lawton, G7IXK

THIS WOBBLATOR can be built for a few pounds and all the components can be obtained from suppliers such as Maplin and Cirket. It is simple to use with an output in the 80 metre band. It feeds into the antenna socket of any receiver covering this band and the frequency response can be displayed on an oscilloscope connected across the loudspeaker terminals, the detector output or at any other point in the signal chain. With this instrument, one can check both IF and AF response and it is invaluable for aligning vintage receivers such as the AR88, HRO, etc.

CIRCUIT DESCRIPTION

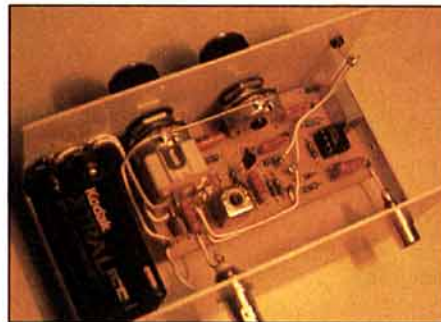
THE WOBBLATOR runs from a PP3 battery and takes a current of around 13mA. The circuit is shown in Fig 1, and consists essentially of a sawtooth voltage generator which repetitively sweeps the frequency of an RF oscillator. Nominal centre frequency 3650kHz.

The sawtooth generator is a dual op-amp type TL072. The second section of which is a voltage comparator whose output is, of course, either high or low. The comparator is arranged to be switched as the sawtooth voltage reaches equal positive and negative values with respect to earth. The frequency of the sawtooth is adjustable from about 3Hz to 10Hz by the sweep rate control. This potentiometer leaves the amplitude of the sawtooth unchanged and hence has no effect on the width of the sweep.

The sawtooth voltage of approximately +/- 3 volts with respect to earth is available direct for input to the oscilloscope's X-amplifier. Also a variable fraction of it is applied via the sweep width control potentiometer to the varicap which forms the bulk of the RF oscillator tuning capacitance. The log law width control pot provides a convenient expansion of the response curve on the oscilloscope. Also it has no effect on the centre frequency of the oscillator so the receiver response pattern remains in the same place on the screen during operation of this control.

The RF oscillator component values have been carefully optimised to give a practically linear frequency sweep with respect to time. This occurs at all deviations with no amplitude variation. The width of the frequency sweep is variable from about 2kHz to about 40kHz which allows fine examination of IF and AF filters - even those with a sharp roll-off characteristic. RF output is approximately 700µv at low impedance, ensuring that it is effectively immune to receiver input loading.

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CONSTRUCTION

An aluminium box approximately 13 x 6 x 6cm was used for the prototype (Maplin type AB7).

The circuit can be built on a single sided PCB of size 8.5 x 4cm held in place by the pots (Fig 2). The RF output is via a BNC socket and the X-amp connection is via a phono socket. It is as well to screen the X-amp lead in order that the varicap is not modulated by 50Hz pick up.

SETTING UP AND USE

As stated earlier, the RF signal is fed to the antenna input of the receiver under test. Initially, it is best to connect the oscilloscope Y input to the headphone socket or across the loudspeaker. For an old receiver, the BFO must be switched on if these points are used, but not if the signal is taken from the detector or IF strip. If taking the receiver output from the AF stages, the oscilloscope should preferably be switched to DC unless it has a reasonable low frequency response.

The sweep output is connected to the oscilloscope's X-amp socket and the time-base is switched off. The spot should now be horizontally moving under the control of the wobbulator. The receiver is next tuned to approximately 3650kHz, and the slug of the oscillator coil adjusted until the wobbulator signal is heard and the response is seen on the scope. This is all the setting up necessary. By adjusting the gain controls of the receiver and the oscilloscope, the display of the response curve can be optimised. It will probably be found best to keep the receiver gain low in order to avoid saturating any of the stages and to minimise distortion of the response

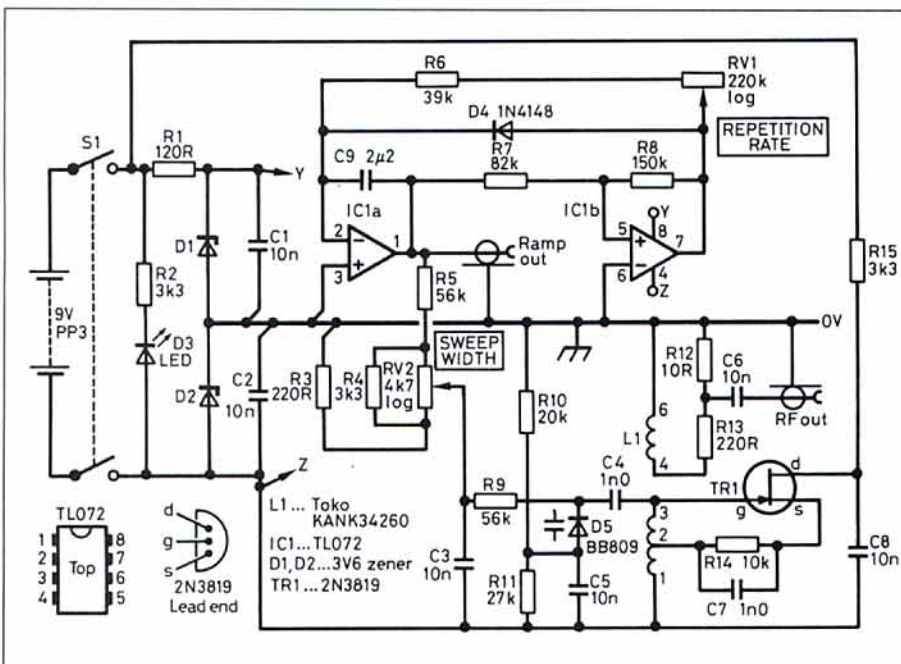


Fig 1: the Wobbulator uses readily available components, and is easy to set up.



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UK non-members price: £9. Overseas prices on application.



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- A "Can't wait for my Novice Licence" badge
- A plastic wallet so you can keep your issues of *D-i-Y Radio* safe
- An RSGB Map of Western Europe (900mm wide and 1200mm high)
- Money-off vouchers worth £2
- **D-i-Y Radio** Club card and an RSGB pen

Send cheques or postal orders, made payable to RSGB, to:



D-i-Y Radio, (Dept RC11)

RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE

PCB AND KIT SERVICES FOR RADCOM PROJECTS

PCBs

G3BIK BATTERY OPERATED AF OSCILLATOR AND WAVEFORM GENERATOR (September 1990)

PCB Layout	93990	£4.70
Full Kit (including box)		£25.85

G4WIM 50/70MHz TRANSCEIVER (May/June/July 1990)

Complete set of boards	567WIM90	£67.56
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G4PMK SIMPLE SPECTRUM ANALYSER (November 1989)

RF Board	118946	} Prices on request
Video/sweep board	118947a	
Marker generator/PSU	118947b	
Complete set of 3 boards	1189SSA		£17.62

G3TXQ TRANSCEIVER (February/March 1989)

Main IF/Audio	028945	£11.75
VFO	028946	£5.55
Driver/Preamp	028947	£6.75
Low pass filter	028948a	£7.65
Band-pass filter	028948b	£4.70
Control board	038942a	£5.30
Regulator board	038942b	£2.35
Complete set of 7 boards	0289TXQ	£27.61

BRS54049 DUAL CONVERSION MULTIMODE RECEIVE IF/AF STRIP (May/June 1985)

PCB LAYOUT	643585	£12.75
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All prices include VAT, postage and packing

These PCBs are not available from RSGB HQ, but direct from Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield, B74 4JF. Tel: 021 353-9326.

KITS

THE FOLLOWING KITS ARE AVAILABLE AS ELECTRONIC PARTS ONLY.

PCBs ARE AVAILABLE FROM BADGER BOARDS.

G3TSO	Multiband Transceiver	POA
G3TXQ	3 Band (Excl PA)	£168.75
G3TSO	Frequency Display (Excl LEDs)	£25.30
G3TSO	80m SSB Transceiver (Excl Tune Cap)	£87.00
G4WIM	Dual Band Project	POA
G4PMK	Spectrum Analyser	£53.00
G3RVM	Ultimate Keyer	£13.90
G3TDZ	White Rose Rx (Main Board)	£18.50
G3TDZ	White Rose Con Fundamental*	£7.10
G3TDZ	White Rose Rx Conv SS O/T Osc*	£9.20
G3TDZ	White Rose Rx Conv SS O/T Osc and mult*	£10.95

* Converters exclude crystals which must be ordered as a separate item

from our catalogue selection		
G3BIK	AF Oscillator	£16.30
G4ENA	QRP + QSK Transceiver 80m	£32.10
G4ENA	QRP + QSK Transceiver 160m	£33.10
G4ENA	QRP + QSK PCB only	£5.90
G4ENA	QRP + QSK Ready Punched Case	POA
Technical Topics 144MHz Doppler		
First Steps. John Case	PSU	£29.00
First Steps. John Case	PSU (case and metalwork)	£6.70

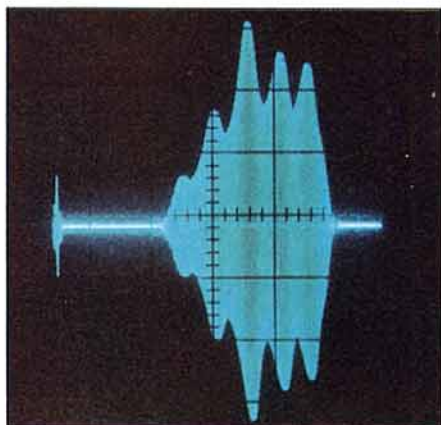
Prices shown are inclusive of P&P.

Kits for *D-i-Y Radio* projects also available

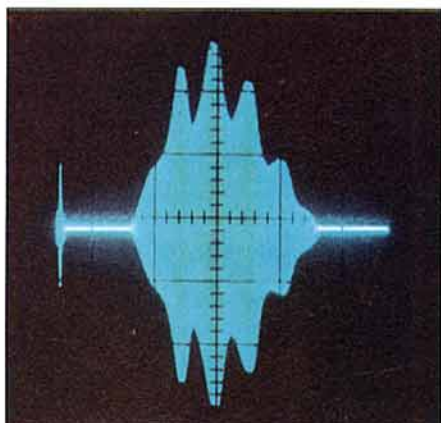
The above prices are for full component kits. The bigger kits are produced in module form if the constructor wishes to spread the cost. Please telephone for a full list.

Available from:-

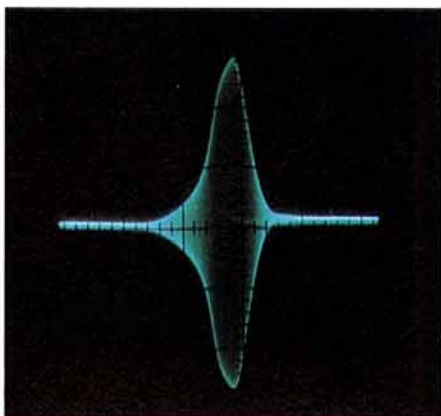
J.A.B. Electronic Components
The Industrial Estate, 1180 Aldridge Road, Great Barr,
Birmingham B44 8PE. Tel: 021-366-6928



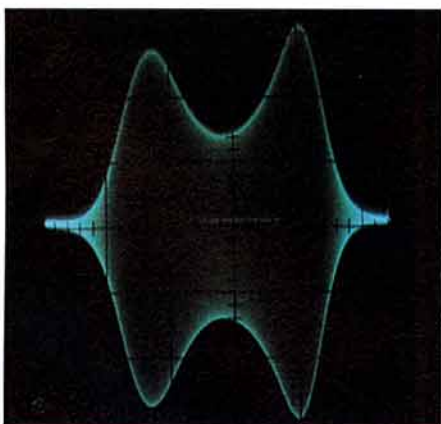
Upper sideband IF response of receiver with KVG XF9B 9MHz filter.



Lower sideband IF response of receiver with KVG XF9B 9MHz filter.



RCA AR88D 455KHz IF response (narrow position 4).



RCA AR88D detector input on widest selectivity position.

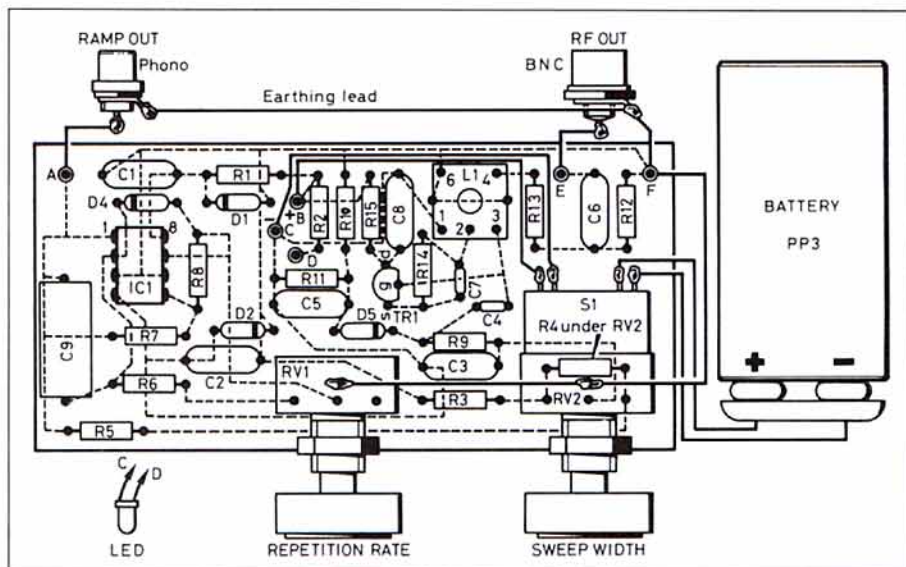


Fig 2: Components including both potentiometers are mounted on a small PCB.

due to AGC action. AGC should be off, if possible, but a quick sweep is usually acceptable as the gain then tends to set at a constant value. Gain must not alter during the sweep; this will produce a misleading trace.

By moving the scope input towards the antenna stage of the receiver, the effect of individual stages can be examined. A 1MΩ resistor on the end of the wire or a special RF probe can be used for testing the IF strip.

CALIBRATION

If desired, the instrument sweep width control may be calibrated in terms of frequency so that receiver bandwidths may be measured. To calibrate, it is necessary first to measure the voltage amplitude of the sawtooth avail-

able at the Ramp Out phono socket using an oscilloscope. Then with the op-amp removed to keep it from harm and the sweep width control set initially to maximum deviation, a DC voltage from a separate potentiometer wired across the battery is input via this socket. The potentiometer is adjusted until the input voltage is the same as the maximum sawtooth voltage and the output frequency read from either the receiver dial or a frequency meter. Then the potentiometer is set to the minimum sawtooth voltage and the output frequency is read once again. Thus the sweep width at this particular setting of the sweep width control is the difference of the two frequencies recorded. The process can be repeated for other settings of the sweep width control.

COMPONENTS LIST

CAPACITORS

- C1,2,3,5,6,8 10n 16V Polyester
- C4,7 1n0 16V Monolithic Ceramic
- C9 2.2µF 16V Polyester layer

RESISTORS

- R1 120R
- R2, 15 3k3
- R3,13 220R
- R4 3k3
- R5,9 56k
- R6 39k
- R7 82k
- R8 150k
- R10 20k
- R11 27k
- R12 10R
- R14 10k

VARIABLE RESISTORS

- RV1 220k log
- RV2 4k7 log with switch

SEMICONDUCTORS

- IC1 TL072 Dual Op amp.
- TR1 2N3819 FET
- D1,D2 3.6V zener diodes

- D3 3mm LED + Bezel
- D4 1N4148
- D5 BB809 Varicap diode (Cirkit).

INDUCTOR

- L1 Toko KANK 3426R

CONNECTORS

Phono socket (Chassis mounting).
BNC socket - 50 or 75ohm (Chassis mounting).

MISCELLANEOUS

Aluminium Case (eg Maplin type AB7)
Two knobs
Single sided PCB approx. 8.5 x 4cm.
PP3 battery and holder.
Screened external connecting leads.
A full kit including PCB, case, and all electronic parts is available price£19.90 inc p & p from J A B electronic Components, 1180 Aldridge Road, Great Barr, Birmingham B44 8PB. 021- 366 6928.
The PCB only is available for £6.45 inc p&p from Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF.

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NOW FOR YOUR FREE
SUPER 4 PAGE MARTIN LYNCH
NEWSLETTER AND USED
EQUIPMENT LIST!

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!!

Major currency fluctuations cause up to 15% increase in

THE PRICE INCREASES

... BUT NOT AT

Because of my continuing policy of holding high stock levels for all brands, I am delighted to inform readers, that we will continue to offer equipment at the usual low prices, while current stocks last. THIS WILL BE ON A FIRST COME FIRST SERVED BASIS HOWEVER!

I know there's nothing more frustrating than buying from a company with little or no stock!



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 £?



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!!



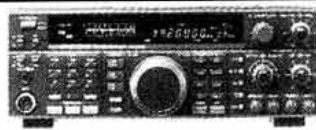
YAESU FT290R MKII

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.



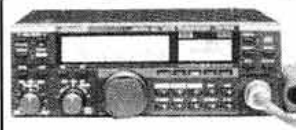
KENWOOD TS850S

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

MASSIVE STOCKS & SAVINGS . . . GOOD ENOUGH FOR MRS JONES !!!

. . . NEW AND SECONDHAND.

I want you to get the best Amateur Radio equipment available at a sensible price! That's my 'modus operandi' (how I operate). If you're buying new, you can rest assured that MARTIN LYNCH is a bona-fide authorised multi-brand stockist. I hold such a fantastic stock of equipment so you can either come along for a 'hands on' demo or purchase mail order without disappointment. Remember, all I sell is backed by the official UK distributor.

On the used gear side, if it's not good enough for me (or Mrs Jones), it will be disposed of elsewhere in the trade. If the equipment isn't right up to 'scratch', or perhaps better still up to 'spec' . . . I don't think I should sell it - and I don't think you should buy it either. It either leaves here in immaculate condition . . . or not at all!

As a reminder here is the MARTIN LYNCH ELITE sales policy - for secondhand equipment:

MARTIN LYNCH

THE ELECTRONIC HOBBIES EXCHANGE CENTRE

73 MARTIN G4HKS

286 Northfield Avenue, Ealing, London W5 4UB.

Tel: 081 566 1120. Fax: 081 566 1207

Equipment will be:

- A well known brand
- Working up to spec
- Clean or immaculate condition
- Offered with warranty
- With handbook and leads etc.
- Thoroughly checked
- Offered with money back guarantee
- MY REPUTATION IS AT STAKE IF I CAN'T DELIVER THE ABOVE!

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	A50-65	6m 6 element Beam
20-3CD 20m 3 element Beam	A50-55	6m 5 element Beam
15-3CD 15m 3 element Beam	A50-35	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
A35S 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

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**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 eritiz! 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

Japanese Yen, so watch out

ARE COMING MARTIN LYNCH !!

We can ship virtually every item ordered immediately except in rare circumstances!

Remember the MARTIN LYNCH price promise — If you are offered a better deal from another AUTHORISED DEALER anywhere in the UK, by written quotation, just bring the quote into our showroom, fax or post it, and we'll match or better their deal!! Can anyone else offer you service like that!



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.

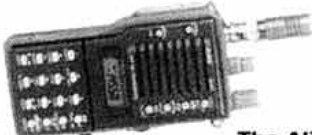
£379, with NICADS and charger included.



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**

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**.



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.



A Selection from the Icom range.

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 GBJNW? — do you really want to?] Wave goodbye to the Lincor 2 and become a man over night. **£995**



MICROKEY ELECTRONIC KEYER

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.

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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

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We can supply almost anything in this magazine within 24 hours!*
* Charge for this service £10

**Free Power Supplies
with any hf 12v Transceiver!**
YAESU - KENWOOD - ICOM



GENUINE UK STOCK! 12 MONTHS WARRANTY

**MFJ 20m QRP
CW RIG
£179**



The long awaited MFJ QRP rig has arrived. 5 Watts of CW with an excellent receiver including a 500Hz xtal filter. You also get semi break-in, rit in and a very smooth vfo from 14.00-14.075 MHz. Power requirements are 13.8V DC.

Used 3 Month Warranty

Yaesu FT-980 HF	£899.00
Icom IC-730 HF + psu	£499.00
Ten-Tec Argosy + psu	£499.00
Ten-Tec Corsair	£899.00
Ten-Tec Omni-V	£1395.00
Yaesu FT-747	£449.00
Yaesu FC-700	£109.00
Yaesu FC-902	£119.00
Yaesu SP-767 speaker	£49.00
Icom IC-2E	£109.00
Kenwood TH-215E	£149.00
Kenwood R-600 Rx	£229.00
Yaesu FT-73R	£149.00
Icom Micro 2A	£149.00
Icom Micro 2E	£149.00
FDK M-800D 2m FM	£139.00
FDK 725X 2m FM	£149.00
NAVICO AMR-1000	£149.00
Sony SW1E Rx	£99.00
Lowie HF-225	£329.00
Sony ICF-7600DA Rx	£69.00
ERA Display	£145.00
ERA Microreader	£129.00
Yaesu FL-2025 Linear	£89.00
Yaesu MH-12A2B	£19.95
ALINCO 30W 2m Linear	£59.00
SEM Transmatch	£79.00
Daiwa 2.5kW ATU	£199.00

TONNA BEAMS
VHF/UHF
All with "N"
connectors
"THE BEST"



6M	Price
20505 5 el	£59.00

2M	
20804 4 el	£32.00
20808 4 el	£41.00
20809 9 el	£39.00
20809 9 el	£39.00
20822 11 el	£95.00
20813 13 el	£55.00
20817 17 el	£69.00

70cm	
20909 9 el	£33.00
20919 19 el	£40.00

22cm	
20623 23 el	£39.00
20655 55 el	£55.00

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Peter Waters G30JV/GOPEP

**MFJ 1278 Multi mode
Data Controller**

£279



The MFJ-1278 has taken the USA by storm and is now available in the UK from stock. For the first time you get nine modes in one box! Use it for Packet, FAX, AMTOR, SSTV, RTTY, Navtex, ASCII, Electronic keyer, CW reader. Probably the most advanced modem ever offered. Now you can spend hours experimenting with the various modes, all at a very modest price and all in one box. Send today for the full details.

**Ten-Tec Omni-VI
160-10m 0-100W £1,995**



The OMNI VI is different from any other hf transceiver you have used or ever seen. Craftsman built, it employs beautifully assembled circuit boards that are easily accessible should you ever need to service them. The factory actually encourage you to take the covers off and examine the craftsmanship. No mass production here!

Receiver experts agree that good old crystal mixing can't be beaten and using this method the phase noise has essentially been eliminated. The OMNI-VI can receive signals on today's crowded bands that other popular models can't even hear. Great for contests and DX! A truly quiet receiver.

The OMNI-VI is an engineers dream. Superb IF crystal filters, an automatic notch filter that can handle any number of heterodynes, pass band tuning, 10kHz IRT and DSP 5 step audio filter. A 20MHz microprocessor takes care of all the programming with data entry being carried out from the front panel. The OMNI-VI has the fastest QSK in the business that gives effortless break-in operation on CW. You also get an iambic keyer, 100 memories, a scratch pad and a true 0-100 Watt power control. Now you can run true QRP, even milliwatts with this rig.

We have a colour brochure on this fine transceiver. The price is correct at the time of going to press but may be subject to alterations owing to exchange rate fluctuations.

**MFJ Products from Stock!
300W
HF ATU**

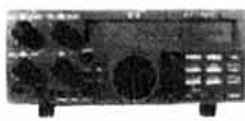


The MFJ-948 is a complete 300 Watt aerial matcher in one box. It will match coaxial, balanced feeder and single wires. A dual needle VSWR/Power meter makes adjustment simple and a 3 way aerial switch completes the package. Fantastic value!£129.00

Other MFJ Products:

MFJ-949D	ATU as above but with 300W dummy load	149.00
MFJ-901B	ATU less switch load and meter. Super!	69.95
MFJ-264	1.5kW dummy load. DC-650MHz	69.95
MFJ-260B	300W dummy load DC-160MHz	35.95
MFJ-816	HF 30/300 Watt power meter	31.95
MFJ-812B	144MHz 30/300 Watt power meter	31.95
MFJ-110	Fabulous world clock with map	29.95
MFJ-32	Packet radio handbook. Super guide!	8.95
MFJ-1286	Gray Line Graphics Programme for IBM	32.95
MFJ-1281	Easy DX logging programme	41.95
MFJ-1040	1.8-54MHz tx/rx preselector	99.95
MFJ-1020A	Indoor active antenna station. 0-30MHz	84.95
MFJ-1272B	TNC/Microphone interface	36.95
MFJ-722	Superb rx audio filter	89.95
MFJ-752C	Tuneable audio filter	109.95
MFJ-207	Antenna analyzer. Brilliant idea!	99.95
MFJ-557	Self contained CW practice key and oscillator	29.95
MFJ-407B	Electronic keyer. 8.5-WPM Self powered	79.95
MFJ-931	Artificial HF ground unit. Ideal for flats etc.	79.95
BY-1	Genuine Bencher Paddle. A precision product	69.95
MFJ-704	HF Low Pass Filter	39.95
MFJ-108B	Dual time deck top clock. LCD Display	19.95

**Ten Tec
Argonaut
£995**



We are now able to offer the latest Ten Tec Argonaut II at a new factory direct low price. This follows on from Ten Tec's new marketing policy to offer even better value for money. This 5 Watt all mode transceiver has a host of features including general coverage receiver. Ex stock.

AMERITRON HF LINEARS

NEW
600 Watts
£699!
AL-811



This linear is incredible value. We have put it through its paces and it really stands abuse. 3 rugged 811A tubes provide up to 600 Watts output from 160-10m. A hunky mains transformer and full metering is included. Used by DX-peditions it has to be amazing value at **£699 inc VAT**.

AL-80AX 1kW from 160-10m 3-500z tube. £1099.00.

Other Ameritron linears are available. Send SAE today.

NEW

FLEXI-MAST

- 9m Telescopic mast
- Closes down to 4ft
- Erected in minutes!
- Weighs just 2kg
- Auto locking sections
- Wind survival — 100mph
- Base 1.5in tip 1/4in
- Support bracket supplied
- Basis for many aerial systems
- Project guide supplied free

£59

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Pat Hawker's Technical Topics

THE ULTIMATE KISS RIG

TEN YEARS AGO (*TT*, November 1982, pp61) I described the Whaddon wartime Mk VII/B ("Paraset") as about the simplest practical transmitter-receiver of the valve era. The Mk VII has a two valve regenerative 'straight' receiver (2 x 6SK7) and a crystal-controlled power-oscillator (6V6) that provided an output of about 4-5 watts RF between 3 and 8MHz. Later (*TT*, June 1987, pp409-410) a Dutch amateur, S Pauwe, described how he had 'modernized' the design to make it more suitable for use as a simple amateur rig on 3.5 and 7MHz by adding bandspread, sidetone, audio limiting and filtering, adding a 39V zener to maintain more constant HT on the screen of the regenerative detector, and upping the power output by using a 6L6 in place of the 6V6.

A few months later (*TT*, October 1987, pp748-749), Des Vance, G13XZM, described a simple solid-state straight receiver that used a FET as an infinite impedance detector in conjunction with a bipolar Q-multiplier, using a total of just four active devices. The G13XZM design has proved popular and a number of simple receivers have been described in *TT* and *Sprat* based on this approach.

Chris Garland, G3RJT, in conjunction with an article he wrote for the club magazine of the Derby Dale (Pie Hall) Radio Society - starting off with a simple crystal set but con-

tinuing with what he calls "An Active Crystal Set Receiver". This was inspired by the G13XZM design but further simplified by substituting a 'drain bend detector' (akin to the once popular anode bend valve detector) for the infinite impedance detector. The extra gain meant that G3RJT could dispense with the two stages of audio amplification in the G13XZM design and use a pair of high-impedance headphones fed directly from the FET, reducing the number of solid-state active devices to just two: **Fig 1**.

In practice, with a few other modifications, G3RJT found the performance good enough to use the design as the receiver section of a very simple 7MHz CW QRP rig that he calls "The Ultimate KISS" (**Fig 2**). The two-stage transmitter section with an RF output of about 5 watts uses a BFY51 driving an IRF510 low-cost power-FET.

G3RJT writes: "I call this rig 'Ultimate KISS'

in the belief that it cannot be effectively simplified further. For example, the crystal oscillator has a level adjustment that operates only on receive, and permits the level of the oscillator signal picked up by the receiver to be adjusted so that it can be used as a stable BFO, very useful for working stations a few hundred Hertz away from the transmit frequency! It is doubtful if this would be possible if the transmitter had just a single power oscillator. The 'netting' facility it also provides of positively identifying the relationship of the transmit frequency to those of adjacent stations is similarly vital to satisfactory operating.

"For the receiver circuit of Fig 1, I also made some other modifications to the G13XZM design with a view to achieving maximum performance from the Q-multiplier. I use a trimmer capacitor to couple the Q-Multiplier to the tuned circuit, so that the degree of coupling can be adjusted to the minimum necessary to obtain oscillation. This trimmer (CT1) is used in practice as a pre-set range adjustment for the reaction (regeneration) control, and eliminates the need for an expensive ten-turn potentiometer. I have also selected a high gain (greater than 400) sample for the Q-multiplier transistor (TR1). This also helps to minimise the coupling between the Q-multiplier and the tuned circuit, the aim being to achieve the highest possible Q before oscillation occurs.

"I use a moveable link to couple the antenna to the tuned circuit. This is adjusted to achieve sufficient coupling for satisfactory reception, thereby minimising the damping effect of the antenna. I have also introduced T/R switching facilities.

"The receiver is more fully described in the Derby Dale journal as a logical progression from a crystal set, and is, I believe, a highly suitable 'Novice' home-construction project, since it combines absolute simplicity with quite remarkable results! It has provided the most effective piece of simple electronic circuitry I have encountered in my entire career as an electronics engineer and radio amateur. I feel it might even be called a 'two transistor communications receiver'.

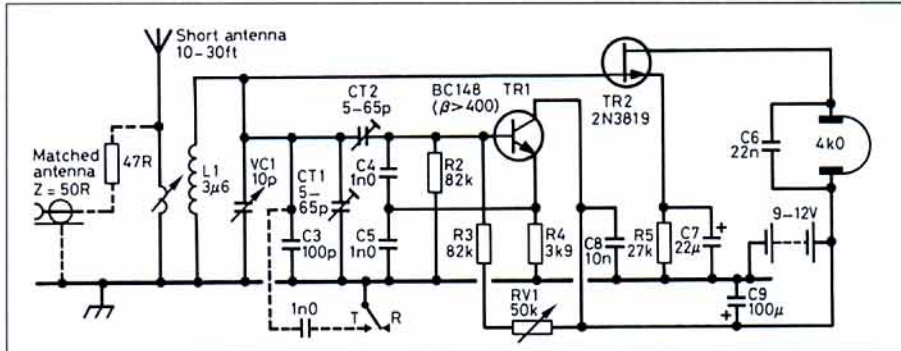


Fig 1: G3RJT's "Two-transistor communications receiver" or "Active crystal-set receiver" based on the 1987 design approach of G13XZM but using a higher gain drain-bend detector that permits the omission of the two-transistor AF amplifier provided that high-impedance headphones of good sensitivity are used.

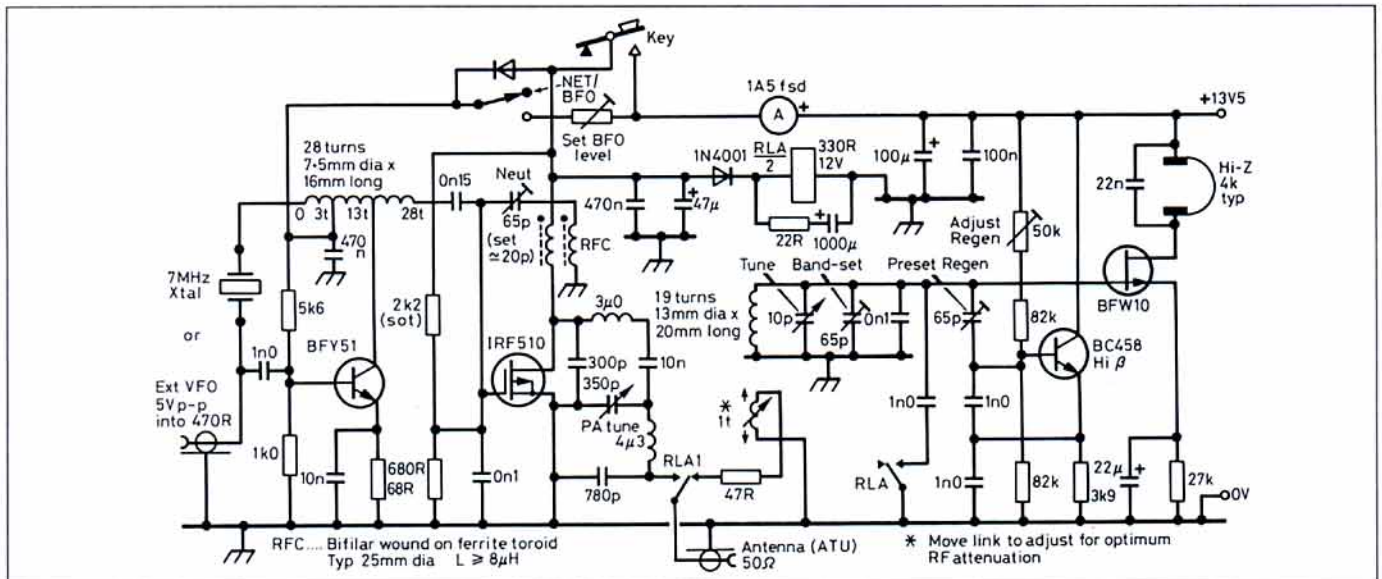


Fig 2: How G3RJT uses the simple receiver as the basis for his "Ultimate KISS transmitter-receiver" with a two-stage transmitter using a low-cost power-MOSFET to provide some 5-watts CW output on 7MHz.

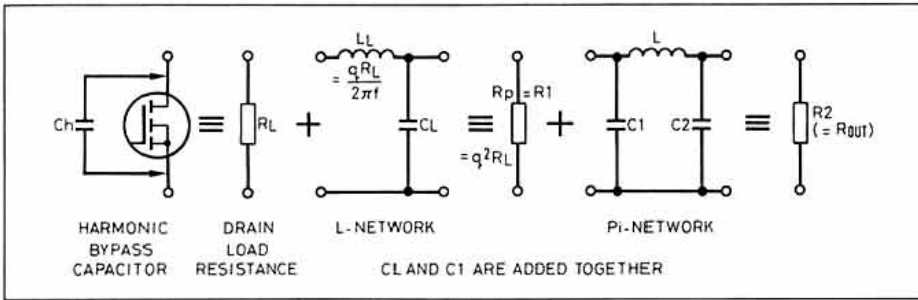


Fig 3: Development of the L-Pi tank circuit used in the Ultimate KISS rig.

"But a word of warning. It does require a good pair of sensitive, high-impedance headphones. I have two pairs, once of which is noticeably better than the other. Results with an indifferent pair of headphones could prove disappointing, and require the addition of an audio amplifier as in the original G13XZM design.

"There appears to be no special precautions needed for circuit layout, other than those one would observe when constructing a VFO in the interest of stability. I would suggest that construction be kept as simple as the circuit itself. The receiver could be built on a single piece of copper clad board drilled to take the panel controls. The copper clad side (if single sided) would face rearwards, and the circuit would be constructed on it using the 'ugly construction' or 'dead bug' method, where all grounded components are soldered direct to the copper, and are used as stand-offs to support the remaining circuitry. Components could be stuck down with 'Blutak' if so desired. The copper cladding forms a ground plane."

With regard to the transmitter section as shown in Fig 2, the PA tank circuit is an L-Pi network, which simultaneously provides impedance matching and harmonic filtering of the output: see Fig 3. The L-network transforms the very low drain load resistance of the power-MOSFET up to a value conveniently high to form the input resistance of a pi-network, which can be adjusted for output impedances over a wide range, but has been designed to match 50Ω. G3RJT has provided details of the design method he uses which he describes as somewhat simplistic but giving useful results usable to 144MHz and also with bipolar transistors. However the formulae and design steps involved, although relatively simple to use, are not really suitable for inclusion in a monthly column. The component details shown in Fig 2 should provide a reasonable guide for 7MHz using the IRF510, in conjunction with Fig 3.

G3RJT adds: "CL is combined with C1 in a variable capacitor that tunes both L and Pi networks simultaneously. C2 may be fixed if operation into 50Ω only is required, or made variable if output matching over a range of impedances is required.

"At this point some words of caution are appropriate. The L-network is series tuned with respect to the MOSFET drain load resistance, and will exhibit a minimum impedance at resonance. The PA current will therefore peak when correctly matched; it will not exhibit the familiar dip characteristic associated with a pi-network circuit. Conversely, the input impedance of the L-network is high and harmonic frequencies and harmonic currents will

induce large, even destructive voltages across it. A harmonic by-pass capacitor C_h is therefore connected from drain to ground. This capacitor is initially given a value of $1/(2\pi f C_h) = 5R_L$. Provided that its reactance is kept greater than $5R_L$ (which is 14Ω for $V_{cc} = 12V$ and $P_{out} = 5$ Watts) it will not significantly affect the component values required for the L network. The MOSFET drain capacitance will form part of C_h , and for some devices will form all of it. This is also true for bipolar transistors operating near their cut-off frequency (f_T). Once the transmitter is working, the value of C_h can be optimised by experiment for best efficiency."

MOVABLE BENCH SPOTLIGHT

G R POLLARD, GW8DOA, has sent along a sketch and brief description of a versatile spotlight that he finds useful in his workshop: Fig 4.

He writes: "The assembly is simple and cheap, but is versatile and can be used for several spotlights. It can be mounted horizontally or vertically and consists of a suitable length of water pipe, plastic or copper, held in place by two suitable plastic clips as used for radiator pipes. The spotlight can be a clip-on type and the cable is taken through the tube and fed either from the normal lighting circuit or through a plug."

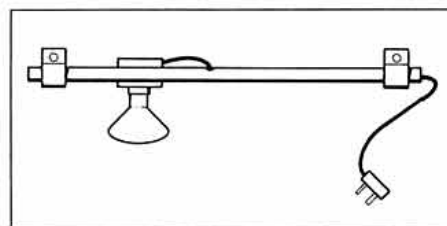


Fig 4: GW8DOA's versatile moveable bench spotlight based on a low-cost assembly.

THE SCIENCE OF HF PROPAGATION

IN THE JUNE 77, I noted the remark of old-timer Ted Cook, ZS6BT, that he believes it is time that more attention was paid by amateurs to the basic modes of radio wave propagation. The following month, Brian Austin, G0GSF, drew my attention to a new book on HF communications that had just been published, entitled *HF Communications - Science and Technology* by John M Goodman and published by Van Nostrand Reinhold of New York, 1992, ISBN 0-442-00145-2. He felt this to be very good, reflecting current thinking on HF propagation; a major plus factor from a research point of view being the

extensive list of references at the end of each chapter.

This sounded interesting. But when I discovered that this hard-cover book is available in the UK from Chapman and Hall at the not inconsiderable price (even for a 650-page book) of £54.50, I decided to restrict my efforts to seeking out a library copy to have a look through. Eventually I was successful (IEE Library, London) and would recommend anyone genuinely interested in HF propagation to do the same. It would be possible to take photocopies for personal use of particular sections for a more modest outlay!

The author believes that "HF has suffered from an inferiority complex for a number of years, having been afflicted by the presence of new and advanced satellite communications schemes . . . satellite communication has an insurmountable edge over HF over most of the globe. Nevertheless, in remote areas where satellite terminals, undersea cables, and radio relay are either non-existent or sparse, HF will remain the communication system of necessity. Furthermore because of relatively low capital investment, HF will continue to be an important medium of communication in the developing countries for some time to come. Since geosynchronous satellite coverage is not reliable in the near-polar regions, HF service is important there as well . . . HF radio, which requires no costly space segment, has remained a major component of the hierarchy of military communication systems essential for maintenance of requisite command and control functions."

Although the book is primarily concerned with HF propagation as it affects professional communications systems, including the latest adaptive and other emerging systems such as spread spectrum and real-time channel evaluation, the author notes that: "Radio amateurs have contributed significantly to our understanding of skywave propagation over the years. More importantly, amateurs provide an invaluable service during periods of time when normal telephonic or satellite communications systems are disabled. Such periods may occur during massive earthquakes, floods, hurricanes, and other natural disasters . . . The frequency prediction requirements of radio amateurs are obviously less formalized than those of the civilian, broadcast and military sectors. Still, the interest is there . . . there is a vast reservoir of HF amateur radio operators which may serve as a resource during disasters. This resource should be nurtured."

He regards the ionosphere as 'a satellite which doesn't fall down even though it may appear to be unreliable at times. Coping with ionospheric variability at HF is a traditional problem. Many of the historical concerns about HF propagation, especially that element which depends upon the ionosphere, are being overcome although they cannot be totally removed from consideration . . . The advantages of HF communication arise from its relative simplicity, its ability to provide near global connectivity at low power without relay, its ease of proliferation, and its moderate cost . . . satellite communication systems provide the bulk of existing and planned-future capability. Even so, HF will continue to have a special role to play, even in peacetime."

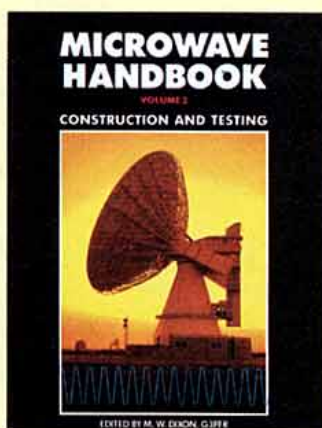


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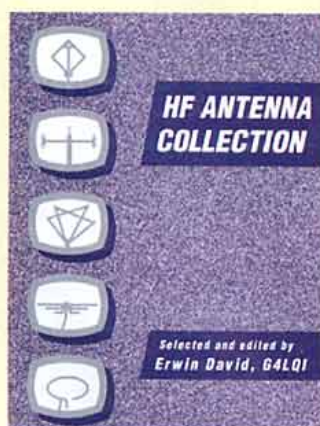
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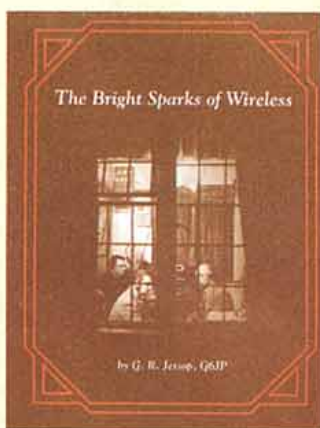
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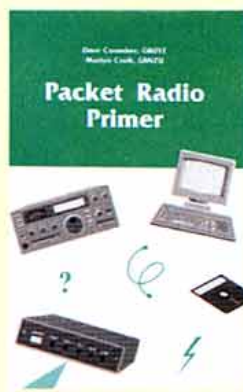
Packet Radio Primer

Dave Coomber, **G8UYZ**

Martyn Croft, **G8NZU**

This light-hearted introduction to the exciting world of packet radio will help any beginner to get started with the minimum of fuss. Detailed, practical advice on connecting up equipment is followed by a guide through the maze of configurations possible. Sample logs of contacts with various types of 'mailbox' are included to help you get the best out of the network, together with much reference information. If you're a potential packeteer, this book is for you!

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see page 79 for details. Special offers are available to members only and are valid until 31 December 1992.

Considerable space in the book is devoted to near-vertical-incidence-skywave (NVIS) propagation with the ability of such systems to provide: (1) omnidirectional communication; (2) generally constant signal level over coverage area; (3) no skip zone; (4) local terrain effects are minimized; (5) effective for valley-to-valley and 'nap-of-the-earth' (NOE); and (6) its use in electronic warfare (ie jamming etc). There is also discussion of the effects on HF communication of high-altitude nuclear explosions which result in electromagnetic pulses (EMP).

In connection with EMP, Richard Buckby, G3VGV, draws attention to an article in *Flight International* of 25 August - 1 September 1992 reporting that the UK as well as the USA and Russia is studying 'the feasibility of a microwave bomb'. This would be based on a hollow travelling-wave tube in which a radio standing-wave resonates at a fixed frequency. An explosive charge is detonated at one end, causing the tube to collapse and resulting in a massive amplification of the RF pulse. Upon detonation such a device would create a localised EMP that could burn out unprotected electrical circuits and could (like high-altitude nuclear explosions) represent a major threat to communications, radar and weapon systems. The bomb might produce a one gigawatt pulse lasting around two picoseconds. Not long, but presumably long enough to break down solid-state receiver front-ends, etc in the vicinity of the explosion!

John Goodman's book mentions north-south 'grey line' propagation but only briefly. Interesting letters on this subject have come in from David Reynolds, G3ZPF, Ted Cook, ZS6BT, and Ray Cracknell, G2AHU and I hope to return to this topic soon.

GOODBYE HEATHKIT - FAREWELL LEICESTER SQUARE

IN *TT*, MAY 1991, p29, under the heading 'Sad Story of an Electronic Hobbyist', some extracts were given of an *IEEE Spectrum* (July 1990) contribution by Robert W Lucky, who, until his retirement, was one of the distinguished group of electronics scientists at Bell Telephone Laboratories. His theme was that modern technology had all-but killed off the home-construction of electronic equipment, including the radio receivers, then hi-fi amplifiers, home computers and finally home-written computer programs that had given him so much pleasure in the past: "I went to a computer flea market that has been a source of experimental junk . . . I found myself looking at 500 stands all selling the same two dozen commercial products. What was I doing there? I hear that enrolment in electronic engineering has been dropping steadily. I'm looking at my keep-your-hands-off clone. Do you think there is any connection?"

I had been careful to point out that "As radio amateurs we are still, if only on a much reduced scale, survivors of the golden age of electronic do-it-yourself. It is still possible to experience the satisfaction of making a unique piece of equipment or trying out your own antenna ideas, even if most gear now comes from the factory in black boxes." Our Editor added that Robert Lucky's pessimistic view of

GROUND PLANE ANTENNAS CLOSE TO EARTH

A RECENT *TT* ITEM from Les Moxon, G6XN, has emphasised that the usual form of elevated ground plane antenna with two, three or four quarter-wave wire radials, as normally found in the Amateur Service, needs to be considered as a form of dipole rather than a vertical monopole antenna. As he pointed out "this has a devastating effect on a large number of sacred cows".

However, antennas for the lower frequency bands - including medium-wave broadcast antennas and antennas for 1.8 and 3.5MHz - consist of a vertical radiating element and a large number of wire radials buried in close proximity to the surface of the earth or elevated just a few feet above earth. These radials which form the 'ground plane' may or may not be resonant lengths. Such antennas are normally analysed as 'monopole' antennas.

Dr Brian Austin, G0GSF, has drawn attention to "a particularly interesting set of computed results" that has been published in *Electronics Letters*, 30 July 1992, pp1550-51. This is 'Radiation efficiency and input impedance of monopole elements with radial-wire ground planes in proximity to earth' by M M Weiner, S Zamosciany and G J Burke of The MITRE Corporation and Lawrence Livermore National Laboratory. A number of earlier *TT* items have reported briefly on earlier publications by Dr Weiner on aspects of ground-plane antennas.

The results have been computed using the NEC-GS program (an optimisation for radial-wire ground planes of NEC-3) based on an antenna geometry consisting of a vertical monopole element, of length h and radius b , on a groundscreen consisting of N equally-spaced radial wires, of length a and radius b_w , at a depth of z_0 below a flat lossy Earth surface of defined dielectric constant and conductivity. The monopole element and the radial wires are assumed to have infinite conductivity.

Results are presented in Fig 5(a), (b) and (c) for parameters with fixed values of quarter-wave height, b and b_w equal to 0.0001 wavelength, Earth dielectric constant of 15 and frequency-dependent conductivity, for a varying number of wire radials at a height of 0.0001 wavelength (ie a 'negative depth') above lossy Earth. The radiation efficiency, input resistance and input reactance are plotted in the graphs shown in Fig 5. Radiation efficiency is the ratio of the far-field radiated power to the available input power and is a measure of the power loss in the particular characteristics chosen to represent the lossy earth since the monopole element and radial wires are assumed to have infinite conductivity.

While clearly one needs to interpret these results with care - and I hesitate to give my own interpretation - they appear to show that radiation efficiency with radials a few feet above ground is virtually independent of the number of radials, at least for ground screens of normal size. This seems a further justification of the work initiated over a decade ago by Arch Doty, K8CFU, which showed, from hundreds of actual measurements, that a few elevated wire radials were as efficient as the standard broadcast practice of using 120 buried radials. The input resistance seems curiously high and presumably reflects earth losses.

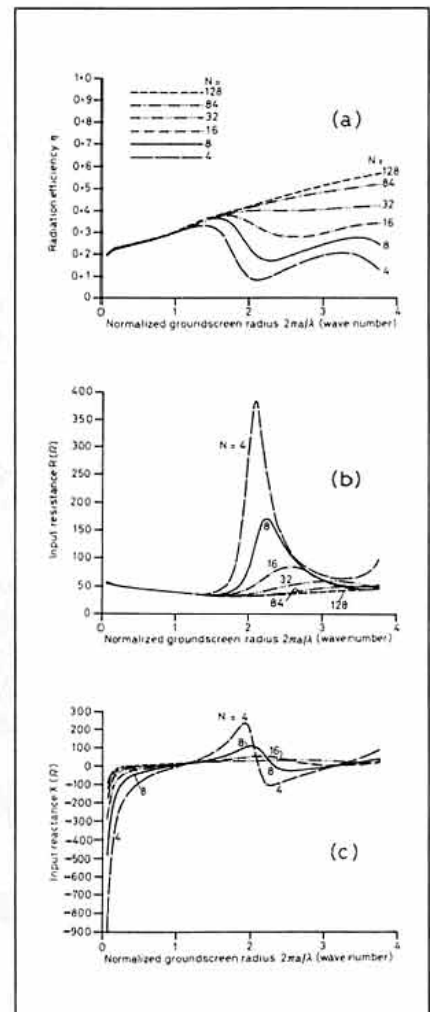


Fig 5: Computerized results shown by M M Weiner et al in *Electronics Letters* in connection with the radiation efficiency and input impedance of monopole elements with radial-wire ground planes in proximity to earth. (a) radiation efficiency; (b) input resistance; and (c) input reactance for varying numbers (N) of wire radials at a height of 0.0001-wavelength above a 'lossy' Earth of specified dielectric constant and conductivity.

the death of electronic d-i-y was not entirely supported by the number of ads in *RadCom* for kits.

Recently in *IEEE Spectrum*, July 1992, p22, Dr Lucky has returned to the passing of his (non-amateur) golden age in a piece

'Goodbye, Heathkit' with the following opening paragraphs:

"The other day a small company in Benton Harbor, Michigan, announced that it had closed down one of its lines of business, and would henceforth concentrate on other prod-

ucts. In the business community, this event passed without notice. Had Wall Street reacted, the analysts undoubtedly would have cheered the elimination of an unprofitable division. Smart decision, they would have said, and the stock would have risen.

"For engineers, however, the decision of that little company signified the passing of an era - the end of a time when it was fun and

profitable to tinker with electronics. The product that symbolized the electronics hobbyist is no more. It hurts to say it, but say it we must: goodbye, Heathkit! We shall miss you . . .

"I remember studying the new Heathkit catalogues, weighing my limitless cravings against my available dollars. I remember the thrill of seeing the big boxes waiting for me at home. I also remember the great satisfaction

in sorting through the little bags of parts, and slowly beginning to create order out of chaos . . . As the kit neared completion, the expectancy would grow, until the final moment of pregnancy and doubt arrived, and all that remained was to turn on the power. The thrill of victory, the agony of defeat - one of them lay just ahead.

"Because of very-large-scale integration or because of modern manufacturing technology, building a kit does not make sense any more [Not necessarily true of all types of amateur radio equipment! - G3VA] . . . Still, it must be said: I miss that big box of little parts. I miss the growing check marks in the yellow manuals. Bravo, Heathkit. Thanks for the memories. Thanks for a job well done."

It is some time since Heathkit first pulled out of its UK operation and then withdrew from the amateur radio market, but the loss is still felt - and there are quite a few Heathkit rigs still operating on the bands.

Dr Lucky mentions how his previous article brought letters from engineers lamenting the closing of 'Radio Row' in lower Manhattan, New York where electronics hobbyists could wander from store to store in search of surplus parts, test equipment, and kits of all sorts - now occupied by the building complex known as the World Trade Center.

For UK amateurs living within reach of Central London, much the same sense of loss can be felt when walking past the Chinese restaurants that now fill Lisle Street, off Leicester Square - a Mecca for radio amateurs (and those of an older profession) for more than 50 years, starting in the 1920s. I still use a large 'roller coaster' variable inductor, doorstop transformers etc bought there for a few shillings. Then there was Proops in Tottenham Court Road (originally at Kingston-on-Thames) so convenient when I lived in Bloomsbury. Then there was Charles Brittain in St Martin's Lane, which was an easy lunchtime step from an office in Tower House, Southampton Street. Farewell Leicester Square and those surrounding streets of beckoning surplus!

Dr Lucky quotes an engineer who got a major thrill in 1977 when BASIC came up on his kit-built computer and announced 'Ready' on the screen, adding: "Last year I purchased a new IBM clone, brought it home and plugged it in. That was about the same level of excitement as buying a washing machine."

Let us make sure, even without those Heathkit rigs and the bits and pieces from the surplus shops, that we retain at least some of the excitement of experimenting with equipment and antenna systems and all those little bits and pieces that can still find a use alongside a 'black box' transceiver. We need to hang on to d-i-y experimental amateur radio!

LOWER-COST DIRECT DIGITAL SYNTHESIS

TT, DECEMBER 1988, pp957-958 drew attention to the potential advantages of direct digital synthesis, and in the December 1990 issue of *RadCom* there was a full-length article on this subject by Dr PH Saul, G8EUX, - one of the UK's leading professional experts on this form of oscillator which can provide much lower phase noise than the conventional form of PLL synthesiser. Unfortunately, the cost of DDS boards, at least in 1988, tended to put this form of synthesiser well beyond the reach of most amateur constructors who would hesitate long before investing in VLSI chips costing hundreds of pounds.

However, Colin Horrabin, G3SBI, has recently drawn attention to DDS devices being produced by the American firm Qualcomm and marketed in the UK by Chronos Technology Ltd, Upton Bishop, Ross-on-Wye, Herefordshire, HR9 7UL (telephone 0989 85471). In particular, he points out that the Q2334 DDS chips cost about £50 in one-off quantities. The Q2334 features two DDSs in one package with choice of 20, 30, 50MHz clock speeds and a patented noise reduction circuit that gives -76dBc spurious: Fig 6. The chip has to be used with external digital to analog converters etc. (Fig 7). G3SBI notes that the 32-bit accumulator range gives fraction of a Hertz resolution at HF and that a synthesiser can be built at relatively low cost. He believes that using the Sony DAC (8-bit) CXD1171M at £4 each puts DDS technology within the reach of the Amateur Service and could lead also to many commercial applications.

A Qualcomm brochure claims: "The Q2334 DDS produces digitized samples of a sine wave that drive a digital-to-analog converter. With our DDS you obtain extremely fine phase and frequency resolution, broad bandwidth, very fast switching speed, excellent phase noise performance, and lower power and size made possible by advanced full-custom VLSI CMOS technology. Two unique features are patented. One is the noise reduction circuit which allows you to specify less expensive DACs without the expected increase in spur levels. The other, algorithmic sine lookup, provides improved spurious performance and requires so little silicon area that a second independent DDS is included in each package. With two DDSs per package you can design non-drifting I&Q (quadrature) or any other phase or frequency offset outputs, or generate two independent signals for completely separate circuit function."

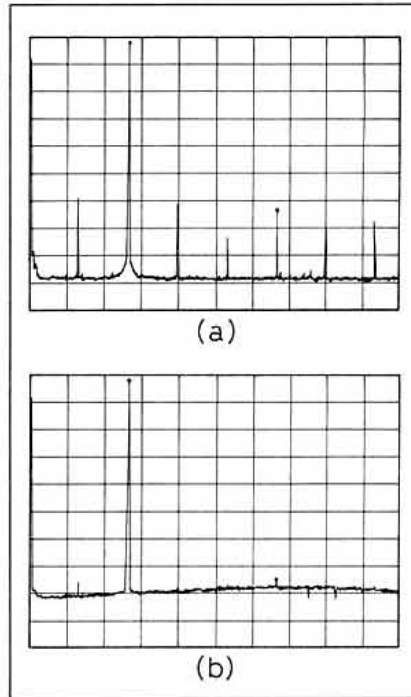


Fig 6: A patented noise reduction circuit is incorporated in the Qualcomm Q2334 dual direct digital synthesiser chip. (a) Shows spectrum output with the noise reduction circuit off showing significant level of spurs. (b) Spectrum output from a Q2334 chip generating a 4MHz fundamental at a 30MHz clock frequency. Sony CX20202A 8-bit DAC used with DDS noise reduction circuit on. In both diagrams, X-axis is 0-15MHz and Y-axis is 10dB per division.

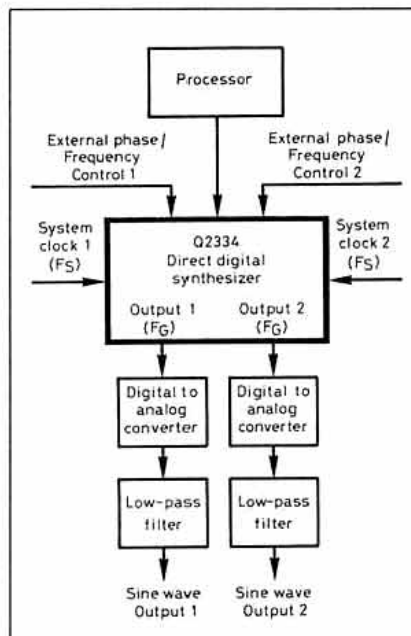


Fig 7: Block diagram of the Qualcomm Q2334 DDS system.

SUPPRESSING POWER SUPPLY SURGES

IN NOTING (TT, Sept) THE SAD FACT that even well-made power transformers eventually tend to fail, mention should perhaps have been made of the basic problem facing all electronic equipment connected to the mains supplies - the very high voltage transients that momentarily change 240V ac into kilovolt sources.

Many years ago we noted in TT (and sub-

sequently in all editions of *ART*) that a Mullard investigation at Dudley, Worcs, during a period of six weeks recorded the following substantial overvoltages: 35 of 20-40% above normal; 7 of 40-70%; and 1 of over 100%. At Cheam, Surrey, during a period of 12.5 weeks, recorded overvoltages amounted to 27 of 20-40%; 4 of 40-70%; and 8 of 70-100%. Such transient overvoltages may only last a few microseconds and seldom had much effect on valve rectifiers and power supply units, but became of increasing importance with the many solid-state appliances and equipments that began to be installed in homes during the 1960s.

High transient overvoltages generally arise from switching operations in the mains-supply network or from lightning strikes (particularly important in the case of overhead power cables in rural areas), but transients can also be created by local switching. As Gary S Tighe, KN4FY, points out in a four-page article 'Basic steps toward suppressing power-supply surges' (*QST*, July 1992, pp25-28) even turning something as simple as a table lamp on and off can cause a line-voltage surge capable of confusing a computer and damaging electronic gear. The article covers in some detail how the problem of overvoltages arises and methods of protecting equipment from them

KN4FY includes details of an investigation of line-transients at typical Swiss locations (220V lines) carried out by L Regez, Landis & Gyr, Zug, and relates these to American 120V mains supplies: **Fig 8**. The conclusion

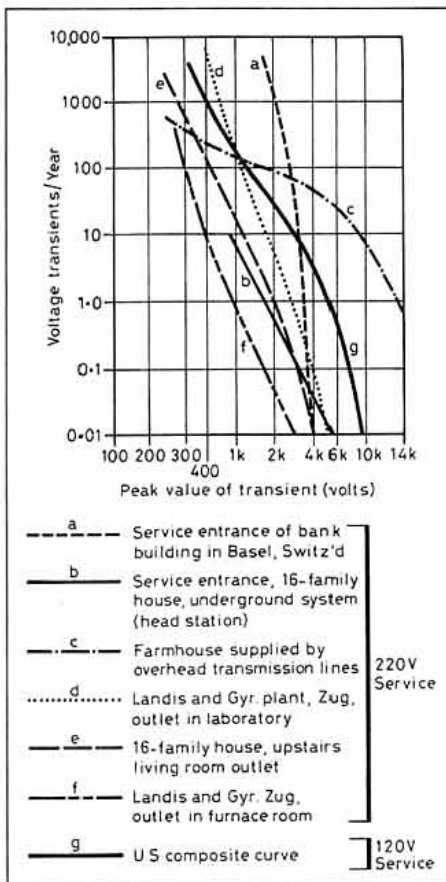


Fig 8: Frequency of line-transient occurrence versus peak transient voltage for several Swiss sites (220V service) and composite curve for US (120V service). In many homes instantaneous peak transient voltages of 1kV may occur quite frequently.

is drawn that even 120V homes may experience peak instantaneous voltages exceeding 1000V more than 100 times per year. The Swiss farmhouse supplied by an overhead transmission line would have to cope with some 10 transients exceeding 10,000V peak per year!

It is pointed out that the effects of surge voltage and noise on mains supplies can be reduced by *diverting* it (shunting it around the equipment you want to protect) or *attenuating* it (reducing its strength) before it reaches the equipment.

The article shows that bypass capacitors can divert transient energy around equipment, and a crowbar circuit provides brute-force protection by taking equipment off the line. KN4FY believes that attenuating transients by clamping them to a non-destructive level is probably the best first-line defence. While zener diodes are used for clamping DC circuits, there are a number of advantages to using metal-oxide varistors (MOVs) for power line clamping. They are fast-acting, have large junction areas that are capable of dissipating large amounts of transient power, and can be installed on AC and DC lines because they are not polarized. Because they leak little current below their clamping thresholds, they take little power from the circuits they protect.

However, should an MOV fail this usually results in a short-circuit, unlike zener diodes which usually fail open circuit. KN4FY points out that this means that MOVs should be fused for safety - actually a plus because a blown fuse or open circuit breaker can guard against subsequent surges by crowbaring the protected equipment off the supply.

An MOV possesses considerable capacitance and needs to be applied carefully in any high-frequency logic or linear circuits in which the added capacitance could compromise circuit performance. For most power-line applications, however, the capacitance (from about 150 to 2500pF in 130V MOVs) has no effect on system performance. For 240V AC mains, the usual MOV operating voltage is 275V (about 360V DC), although V250 and V260 types are also used. Suitable components are available from a number of suppliers. KN4FY stresses that "MOVs are a proven, cost-effective solution to the problem of power-supply transients. All you need to do is select and install them!"

To protect 12V DC supplies, use an MOV

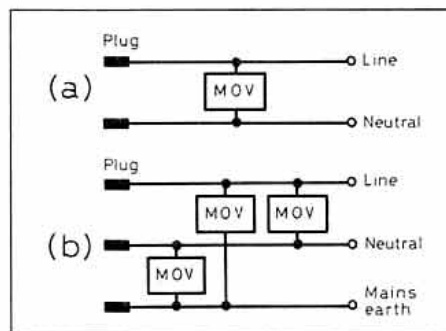


Fig 9: Diagram showing how metal oxide varistors (MOVs) can be installed to protect equipment from power line transients. (a) two-wire system with single MOV. (b) Use of three MOV devices to protect fully a three-wire system. The supply should always be fused ahead of the MOVs since they can fail as a short-circuit.

rated at 14V DC (10-11V AC) but note that for 13.8V DC supplies the MOV should be rated at 18V DC (14V AC). The peak current rating of the MOV determines the price, but as KN4FY points out, low-cost MOVs (under \$2 each for 130V rating in the USA) will cope with transients far greater than those which may be encountered on domestic supplies. The personal computer explosion has vastly increased the demand for transient suppression and surge-protected power outlet accessories are widely available. Most of these, according to KN4FY, use some type of MOV and may also include bypass capacitors and/or filter inductors. **Fig 9** shows how MOVs can be installed to protect equipment from power line transients as given in an earlier item on this subject (*TT*, Jan 1987).

HERE AND THERE

VALVE TECHNOLOGY seems suddenly to have become almost respectable. Harvey Collett, G3KI, noticed the article 'Go backwards - and glow with pride' (*The Daily Telegraph*, September 5) singing the praises of high-fidelity amplifiers based on valves (a costly business for those without well-stocked junk boxes but then hi-fi aficionados still seem prepared to spend hundreds of pounds on the dubious advantages of special loudspeaker cables!). *Electronics Australia* (September 1992) has Part 1 of a construction project 'High quality stereo amplifier using valves'. The interesting Diamond Jubilee Issue of *Practical Wireless* (October 1992) has Part 1 of a series of articles by Phil Cadman, G4JCP: 'Using those versatile vacuums'.

Jim Cookson, G4XWD noted the July advice on carefully checking the heater voltage applied to power valves and rectifiers but was reminded of the very different treatment meted out to the valves in some of the 1940s American juke boxes where it was important that the amplifier using push-pull 6L6 valves was fully warmed up from cold within 8-10 seconds of switch-on. To achieve this the heaters were initially fed with 9.8V. When the 6L6s began to conduct, a relay, acting as bias resistor, became energised and switched the heater voltage to the normal 6.3V. G4XWD recalls that despite this "barbarous technique" the valves lasted surprisingly well, although switched on and off every few minutes as punters selected their favourite discs.

John Wightman, ZL1AH (ex-G3AH), was interested in the item on the Hivac-Harries beam-tetrodes (*TT*, July) as from the days of his interest in BCL/SWL receivers at the age of ten, he used two valve regenerative sets (with a swinging reaction coil!). He became very keen on Hivac valves when he found he could buy them more cheaply than those made by the BVA firms. In 1936, he changed his output valve from a Hivac battery pentode to the Harries-Hivac HY220 battery tetrode. He used this when licensed as G3AH in November 1937, until February 1939 when he acquired a Hallicrafters Sky Champion, becoming one of those who achieved WAC and WBE (Worked British Empire) on a two-valve battery set (I never quite made WAC (missed Asia) on my pre-war two-valve battery set but did contact VK, ZE, LU, PY, VO and W etc - G3VA).

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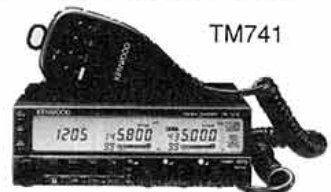
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499 LX TS790E	Trio	2mtr/70cm multimode	1250
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A Remote Controller

for the IC725/726/735

Concluding the article by Bob Harris, G4APV, MSc CEng MIEE



THE REMAINDER OF the key and display interface circuit is shown in Fig 5 and Fig 6. The controller can either be built using wire wrap techniques (the first one was, and worked first time), or a PCB is available. One has been designed for the job see components list on page 51. Fig 7 shows the layout.

The construction is straightforward but should be done in the following order:

- 1) Fit all components except the chips, EPROM socket, and SIL sockets.
- 2) Fit the through links (approx 80), unless you are using a plated through board.
- 3) Fit the EPROM socket and SIL sockets.
- 4) Fit the four solder pins.
- 5) Solder in the chips, or they can be socketed for a plated through board.

The chips need soldering in (do not socket) as they are used to make connections between the upper and lower layers of the board (unless you are using a plated through hole board).

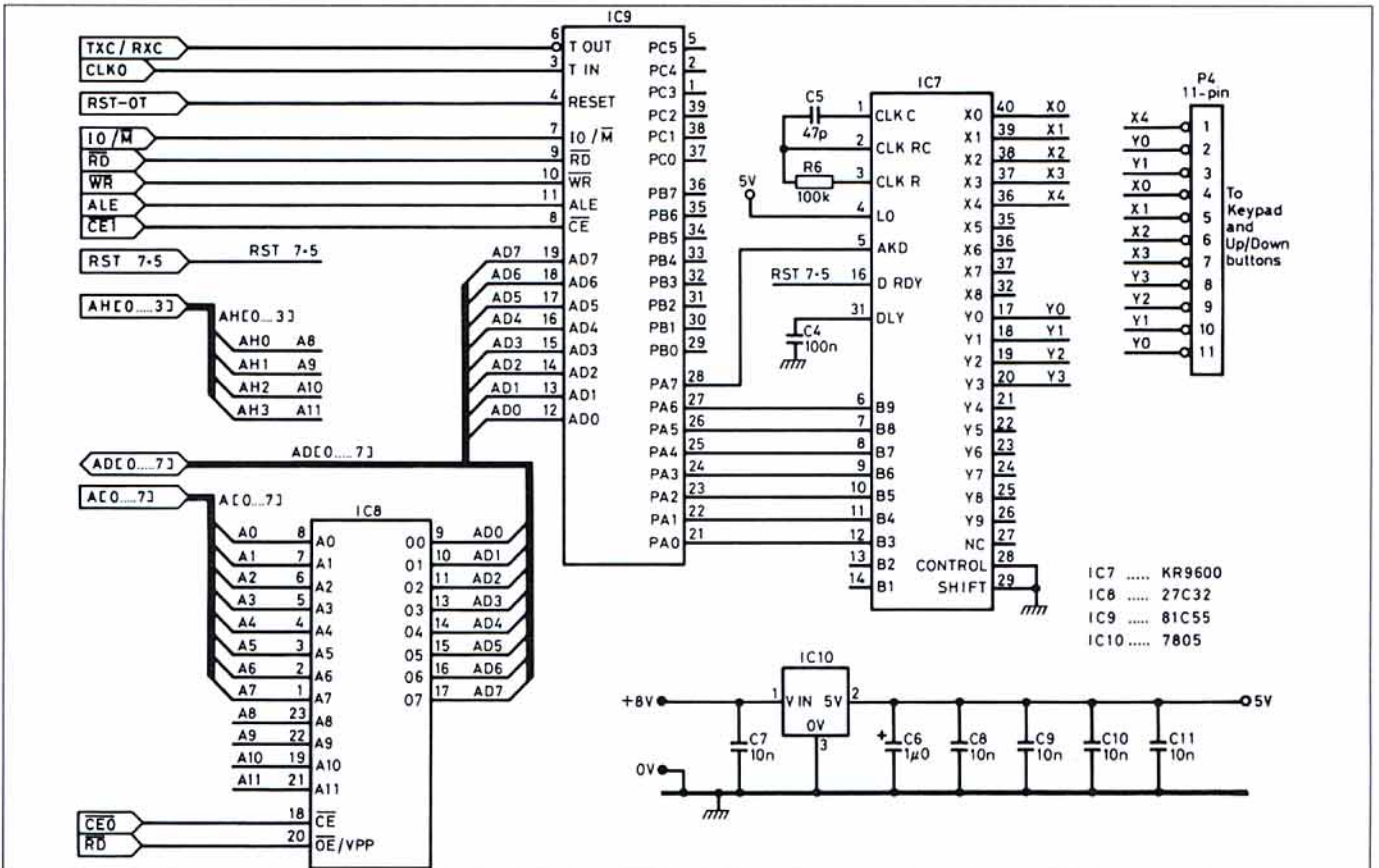


Fig 5: The key pad interface (IC7) is connected to the 80C85 CPU via IC9 – this component also contains system RAM. Program memory is stored in EPROM IC8.

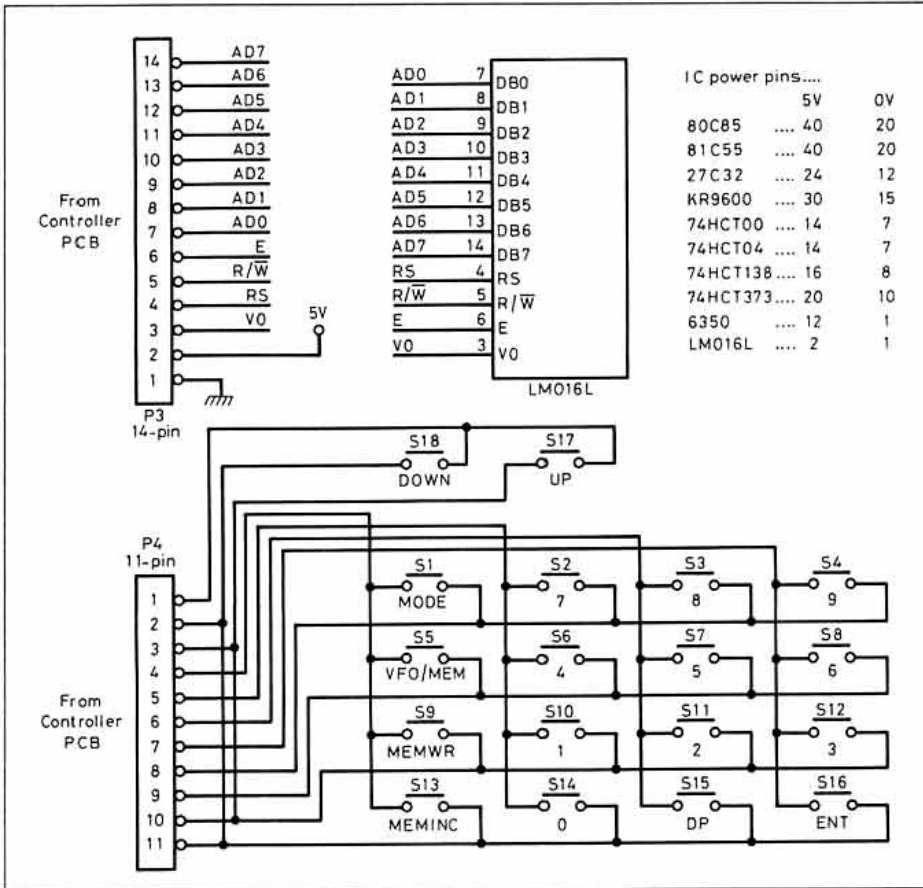


Fig 6: The keypad and Hitachi LM016L (or LM104L) display interface to the main controller board.

The display and keypad can be connected by any plug and socket based on a 0.1in (2.54mm) pitch. Various types are available and suitable. Alternatively the keypad and display can be wired directly to the board. Make sure that the keypad is matrixed correctly. Also try to obtain a keypad (often cheap at rallies) that has removable keycaps, this will allow them to be moved to agree with the required matrix. When mounting the unit in a box, use a diecast box with screened leads. This will help reduce any spurious RF radiated to an acceptable level. I only found this noticeable as a series of weak carriers on 10m. When the controller is ready to be tested directly apply the power without the rig or keypad connected and you should get a start-up message. Provided this happens then the controller's main functions are working. Now connect the rig's 'remote' socket to the serial input/output on the PCB and turn on again. You should now get the start-up message followed by, for example:

1.93300MHz LSB
VFO A MEMO 1

Turning the tuning knob on the rig will cause the frequency displayed on the controller to change in sympathy with the rig's display. The mode will change in a similar way.

Now fit the keypad, which should function correctly. If not, then check that it is matrixed correctly. If the processor gets an unrecognised code, it will just ignore the key.

DRIVING THE SOFTWARE

FREQUENCY ENTRY IS ACHIEVED by direct entry of the required frequency, eg 1,DP,9,3,3,ENT will set the rig to 1.933MHz.

If the frequency needs to change to 1.983MHz then it is only necessary to key in DP,9,8,3,ENT. Keying in a frequency outside the range 100kHz to 30MHz will just be ignored. (The software was not originally intended to drive the IC726 and hence does not operate on it's 6m sector). Keying in DP,ENT will set all digits after the decimal point to zero. For frequencies below 1MHz it is necessary to key in a leading zero, for example 0,DP,5,5,8,ENT will set the rig to 558kHz.

Tuning is by using the up and down buttons, and data from these interfaces to the microprocessor. They have a variable step size such that the first few steps are small (eg 10Hz) and then increase in size for each subsequent step. This gives fine resolution for accurate tuning but larger steps for rapid QSYing within a band.

Mode changing is achieved by repeated pressing of the mode button which cycles the rig through all the available modes. The VFO/memory button cycles through VFO A, VFO B and memory. The M+ button is used to index through the 12 memories when the memory is selected (13-24 on the IC725/726 are not available). The MW button is used to write the currently displayed frequency to the currently displayed memory.

ADDITIONAL NOTES

1) The way in which the IC725/726/735 provides data means that if the VFO or memory channel is changed at the rig end, then although the controller will always show the correct frequency and mode it will *not* show the correct VFO selected or memory number. However if either the VFO or memory channel are changed

from the controller, then the controller will show the correct information.

- 2) Split frequency operation is not available from the controller with the present version of the software.
- 3) The components were obtained from Electromail (RS Components) and Farnell. The 6350 is a CMOS 6850 and is not sold by RS. If you cannot obtain one then a suitable substitute is the MC6850P. This will still work but draw slightly more current. However, a full kit is available from J A B Electronic Components Ltd.
The display can be expensive, however various suitable ones have been found at rallies. A Hitachi LM104L has also been successfully used.
- 4) The power for the controller could be obtained as a 12V supply from one of the AUX sockets on the rear panel of the radio. This would avoid the need to make up a special lead to allow both the controller and the microphone to plug into the front microphone socket. However, I would not recommend this because even a momentary short on this will blow the fuse inside the PA compartment of the radio. It takes about half an hour to get access to this and to repair it.
- 5) For use in a vehicle a microphone amplifier is needed (the Icom hand microphone contains a preamp). Also a method of remotely controlling the AF gain and a remote on/off switch for the rig needs devising. Fig 8 shows a suitable arrangement.

ACKNOWLEDGEMENTS

I WOULD LIKE TO THANK ICOM(UK) for providing me with the original information on the C-IV protocol which allowed me to undertake this project. Also thanks to those who have built this project and provided me with feedback on improvements to the software, only some of which I have yet managed to incorporate.

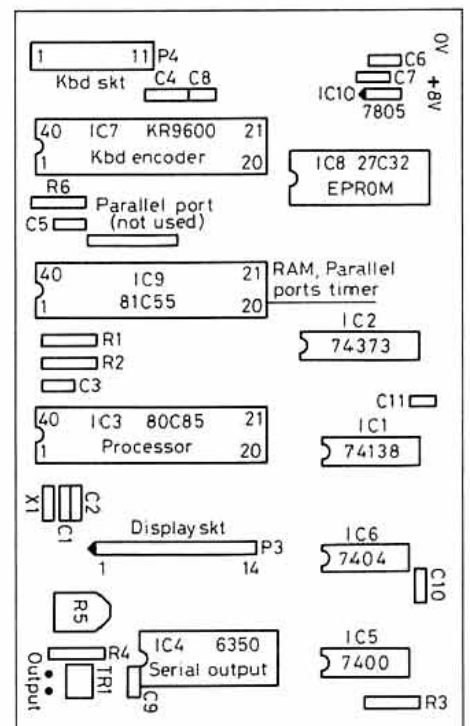


Fig 7: Layout of the main controller board.

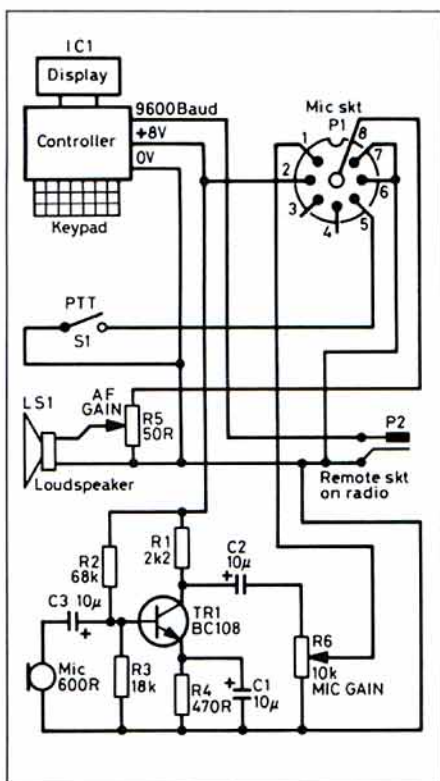


Fig 8: Remote audio interface for the transceiver.

COMPONENTS LIST

Reference	Value
C1,C2	22pF
C3,C4	100nF
C5	47pF
C6	1uF
C7,C8,C9,C10,C11	10nF
P1,P2,P5,P6,P7	Solder Pin
P3	14 Pin Socket
P4	11 Pin Socket
TR1	BC108
R1	1k
R2	47k
R3	4k7
R4	1k8
R5	10k Horiz. Preset.
R6	100k
IC1	74HCT138
IC2	74HCT373
IC3	80C85
IC4	6350
IC5	74HCT00
IC6	74HCT04
IC7	KR9600
IC8	27C32
IC9	81C55
IC10	78L05 or 7805
X1	2.4576MHz
LCD1	LM016L
Keypad	4 x 4 type

PCB Drilling Data

All holes 0.6mm except:

- 1) SIL and DIL sockets 0.8mm
- 2) Supply and output solder pins 1mm
- 3) Preset pot 1.3mm

Full kit including PCB, programmed EPROM and all electronic arts will be available from J A B Electronic Components, 1180 Aldridge Road, Great Barr, Birmingham B44 8PB. 021-366 6928.

PCB only, price £11.50 (inc p&p). Programmed EPROM only, price £5.00 (inc p&p). Both available from Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. 021-353 9326.

CONTROL PACKETS

All the packets have the same basic structure as shown in Fig 9a. The Tx address indicates the origin of the data, the Rx address indicates the destination of the data. Each Icom radio has a default address, ie the IC725 is 28H, the IC726 is 30H, and the IC735 is 04H. The controller also has an address, this can be anything. F1H is used in the examples and in the controller software. Note that the variable length data will not be used if requesting data from the radio. Fig 9b shows the structure of each byte within the packet.

CONTROL CODES

00	Not used in this application.	07	Set VFO status command. Data sent to the radio to select VFO (rather than Memory), as shown in Fig 9g.
01	Not used in this application.	08	To select either VFO A or VFO B, data is sent as in Fig 9h.
02	Not used in this application.	09	Set memory channel command, to select Memory (rather than VFO) as shown in Fig 9i.
03	This is used to ask the radio what frequency it is on. It returns the data in the form shown in Fig 9c.	0A	To select, for example memory channel 10, see Fig 9j.
04	Mode request. Data returned in the form of Fig 9d.		
05	Set frequency command. Data is sent to the radio as in Fig 9e.		
06	Note that this would give a frequency of 14.09000MHz. Set mode command. Data is sent to the radio as in Fig 9f.		

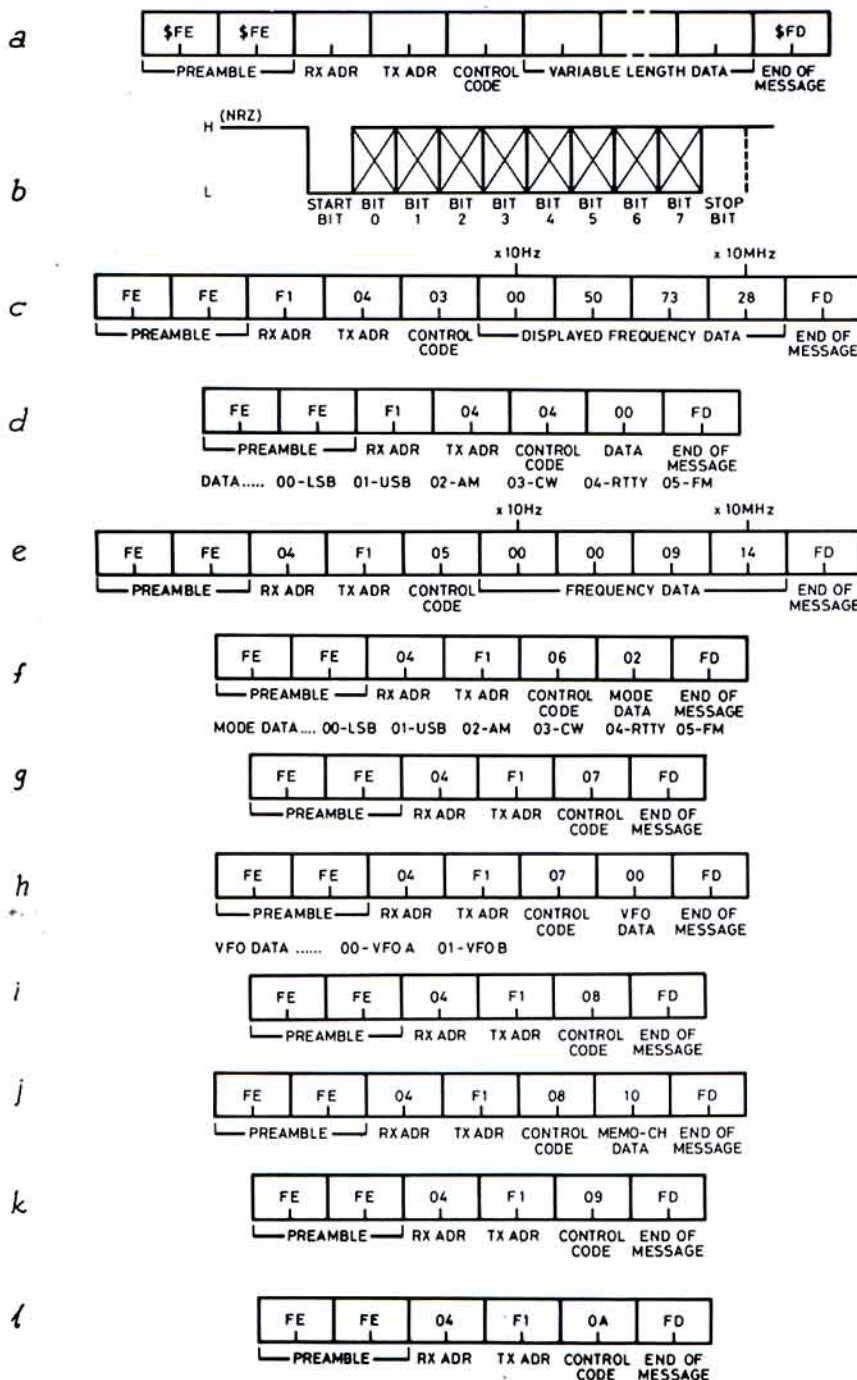


Fig 9: Control code and packet formats used on the Icom C-IV system bus.

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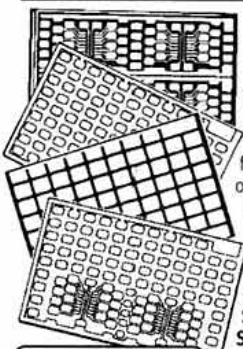
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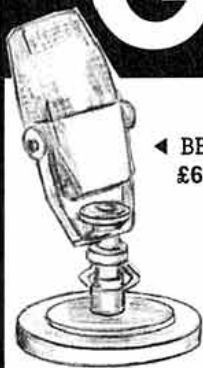
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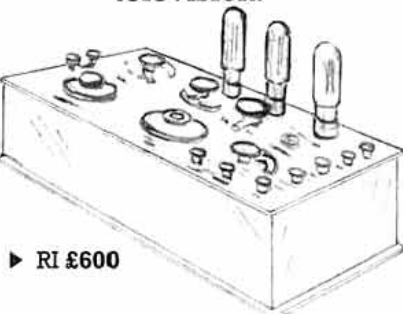
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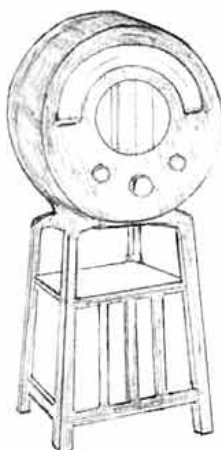
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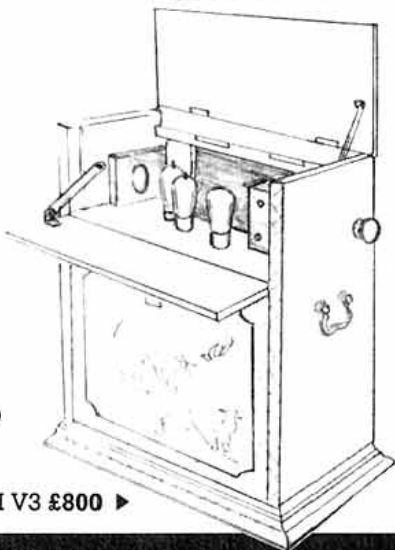


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THIS MONTH'S COLUMN is largely dedicated to packet satellite operation, but next time I shall be turning my attention away from packet. Work has prevented me from being very active on HF data modes this summer, but things are now improving and a major revamp of the station is planned.

MAKING PACKET EASIER

LOGGING ONTO MY LOCAL BBS used to be very time-consuming, so I have been grateful for a PD multi-tasking packet TNC driver program, complete with comprehensive script language. This completely automates BBS access, and still allows me to work on other desktop tasks quite independently. Such are the joys of true multi-tasking!

There is nothing new about script languages, as they are very common in general-purpose communication programs, but I haven't often seen them used in packet programs, and certainly not in true multi-tasking ones. This program is called *!ComLink V4-20* by Alan, G7ALN, and runs on all Acorn RISCOS-based computers fitted with a serial port. Contact me at GB7WRG for a copy.

IS HF PACKET JUST A RACKET?

I WONDER WHAT YOU THOUGHT of the article by Colin, 9M2CR, in the September *RadCom*? It was originally published some time ago, and it seems to me that some of his comments are rather out of date. For example, packet software has improved considerably since then, and PACTOR has come on the scene. However, what about his basic argument that HF packet is inefficient and ineffective? It must work to some extent, otherwise there wouldn't be so many people using it, and much mail forwarding wouldn't be happening, but could something else work better? What do you think?

PACKET SATELLITES

MAIL FORWARDING BY SATELLITE is one alternative, but it's very important to appreciate the highly experimental nature of these satellites. Many changes take place in the light of the experience gained. Operating via satellite isn't the easiest or cheapest form of packet operation.

INTRODUCING SATGATES

IN JANUARY 1992, GB7LAN in Lancaster became operational and joined part of an international network called SATGATE. This network of stations has been assembled by Dave, K16QE, and comprises (at the time of writing) 33 stations world-wide, who transfer personal mail around the world by using

amateur packet radio satellites called PACSATS. The name SATGATE is derived from SATEllite GATEway. These satellites provide a rapid delivery of personal mail to many distant countries, and are a supplement to HF gateways rather than a replacement for them.

They circle the earth once every 100 minutes in a low altitude orbit, and cover the entire surface of the world every 12 hours. A message left by, say, a ZL station, can be received by a European station within a few hours.

Once the mail has reached GB7LAN, which usually takes no more than a few hours from anywhere in GBR, it is uploaded onto the satellite when it passes by, and within a few hours it is downloaded by the receiving SATGATE in the destination country. Via the SATGATE, you often get a reply from VK within three days. In fact, the response time usually depends on how often the receiving station logs onto his/her BBS to check for mail!

DESTINATIONS

AS WELL AS AUSTRALIA, mail is delivered to New Zealand, South Africa, Japan, the USA (13 USA SATGATE, including Alaska and Hawaii), Argentina, Israel and the Caribbean area. From these SATGATES, mail can go via short range HF links to more countries, including Zimbabwe, Namibia, Mauritius, Indonesia, Philippines, Korea, Hong Kong, Taiwan, Mexico, Canada, all of South America, and Cyprus. This list is growing.

Quite a few GBR BBSs already route mail to GB7LAN. Roughly speaking if you draw a line from North Wales across the country to Humberside, then all BBSs north of that line plus those in Staffordshire and Shropshire, already route mail to GB7LAN. This catchment area is beginning to increase and, by the time you read this, may have changed due to the opening of more GBR SATGATES. (Stations in Northern Ireland should use E16EH @ E16EH.IRL.EU as their link.)

Currently GB7LAN exports about 40k and imports about 25k of mail per day. Generally it is only SP mail that is handled by the SATGATES, with a very few bulls at the SysOp's discretion. Mail is uploaded to the satellite twice per day, once in the morning and again in the evening. The satellite is in range of the UK for a total of about 90 minutes each day, and all activities are completed during this time. The SATGATE share the satellite with all the other users in Europe and so the satellite gets very busy when over this part of the World. This, and the limited memory capacity of the satellites, are two of the reasons for restricting the number of SATGATES and the type of mail they transfer.

THE HARDWARE

THE SATELLITE CURRENTLY in use is called UOSAT-5 (OSCAR-22). BBSs are users of the satellites with no special priority, and must not monopolise them; the large amount of BBS files on these satellites has come in for criticism from some quarters. It is possible that BBS traffic may move to the newer pacsat called KITSAT-1 (KO-23), but this is not yet certain. As a result of this the

SATGATE system would only occupy one 9k6 satellite leaving the second free for other users.

The uplink to the satellite is 2m FM and the downlink is 70cm FM, all at 9600 baud duplex. The equipment used at GB7LAN includes a 40MHz 386DX PC, an IC211E and an IC471E. The crossed 6 ele 2m and crossed 17 ele 70cm antennas are tracked by a separate VIC-20 computer, and everything operates fully automatically. However, careful hard disc 'housekeeping' is required.

DEDICATIONS

"ALL THE ABOVE COULD NOT have been accomplished without the help of G0/K8KA, NK6K, the modem designer G3RUH, the many satellite gateway stations around the world, and others too numerous to mention. If you do find that your mail uses the SATGATE system then please think about sending a few pounds to Amsat-UK to pay for the next generation of packet satellites. They will need renewing in the future, and your contributions will help to ensure the continuity of SP mail delivery via amateur packet radio satellites. 73 de Andrew, G8TZJ @ GB7LAN."

LIVE SATELLITE OPERATION

MIKE, G6AWD, IN WARRINGTON has modified his personal ground station to allow remote 'live' packet operation by up to four normal packet users at a time. The ground station consists of an FT736R dualband transceiver, TNC and PSK modem, and a PC AT running appropriate software. The antennas are controlled by a separate PC XT.

This satellite node G6AWD:SATPSK is linked to the nearby terrestrial node G4VSS:WARR on 4m, which then provides user access on 2m and 70cm. After connecting to the SATPSK node, users access the FUJI satellite on port 3 with the command C 38J1JBS-0. The reason for using FUJI is that the end user only needs a normal terminal for access, whereas the other pacsats require much more complex software.

Packet Radio Primer

by Dave Coomber, G8UYZ
and Martyn Croft, G8NZU


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Emergency!

RONALD M COWAN, GM4SRL
85 Eastwoodmains Road, Clarkston, Glasgow
G44 3RT

RAYNET MEMBERS ANSWER 999 CALL

AT ABOUT 1130 on Saturday 5 September 1992, there was a major telephone fault in the Worcester area, resulting in over 40,000 subscribers losing service, and stopping all calls from Worcester, Droitwich and Malvern to the emergency services. Officers at the West Mercia Constabulary HQ at Hindlip on the outskirts of Worcester were, however, able to speak to the BBC Hereford and Worcester local radio station on a private circuit and an appeal was made for RAYNET stations to make contact.

County Controller Tony Harland, G0WOX, telephoned the Divisional Police HQ. A call out was then initiated and RAYNET members were contacted and asked to move to the Worcester district, where local members also responded to the appeal. Contact with groups in Birmingham were also initiated as it was not known how long the emergency would last, and additional operators might have been needed for another shift.

Around 1230 Brian Jones, G8ASO, arrived at Police HQ, and G8WOX went to the Inde-

pendent Radio Station in Worcester, Radio Wyvern, to open the first link. Both radio stations then broadcast mobile telephone numbers available to take emergency calls. Other RAYNET operators were deployed to strategic landmarks, like major supermarkets and Council Offices around Worcester, Malvern and Droitwich. These locations were also broadcast for the information of the public so that they could find a source of help if required.

Fortunately, there were no incidents reported to RAYNET during the course of the afternoon, and only a couple were taken on the mobile telephones at the radio stations. The telephone system was gradually reinstated and the stand-down was given at 1800.

During the incident, thirty four members from Worcester, Birmingham (West Midlands) and Warwickshire took part, with operators from other counties on stand-by should they be required.

LARGE SCALE SEARCH TEAM

DRAWING ON ONE of the lessons learned after the Lockerbie disaster, Staffordshire is introducing a Large Area Search Scheme. Run jointly by CEPO and the County Police, this creates a large group of civilian searchers who will be available should additional assistance be needed. Staffordshire Raynet was strongly represented amongst the 84 volunteers on the first, 2-day, training course.

Day one was devoted to instruction in search organisation and techniques and first aid, while day two was a 'practical' in rough scrub on Cannock Chase. Looking for objects and a missing person in long grass, ferns, nettles and trees, in heavy showers followed

by sweltering heat, brought home the taxing realities the role involved.

Eighteen of the twenty hidden articles were found, and although the emphasis in the initial course was on search training rather than radio, the operators demonstrated the value of radio in coordinating search groups and rapid information exchange, satisfying themselves, as well as the County Police that their skills would be put to good use should they be called out 'for real'.

COVENTRY TO ROME TANDEM EXPRESS

RAYNET MEMBERS FROM Coventry, Warwickshire, Oxfordshire and Kent turned out at various times between Friday 11 and Sunday 20 Sept to provide safety communications for the English leg of the Coventry to Rome Tandem Express. This was a fund raising event for the Amanda Bevan Trust, an intensive rehabilitation centre for people suffering serious brain damage as the result of an accident. The Committee Chairman told West Midlands County Controller, Madley Smith, G8KVU, that he was delighted at the support giving by RAYNET, and was amazed at the dedication of the membership. Good television coverage, showing RAYNET's involvement followed the event.

FEBRUARY EMERGENCY COLUMN

ITEMS FOR THE FEBRUARY edition of *RadCom's* Emergency Column should be in the hands of Ron Cowan, GM4SRL, by **Saturday 28 November**. Please note his new address which is **85 Eastwoodmains Road, Clarkston, Glasgow G44 3RT**.

RADIO AMATEURS IN SEA RESCUE

WHEN TWO SMALL BOATS were rescued from the storm-tossed Pacific Ocean last September not only was an amateur radio net instrumental in the week-long effort but the radio operator aboard the Naval vessel that saved the day was a radio amateur, too!

Bob McCandless, N3KW, joined the Merchant Marine in September 1990, and was the radio operator aboard the SS *Cape Bover* during the episode. In fact at one point he was on duty in the radio room for 36 hours.

The emergency call came through to the US Coast Guard on the government's Satel-

lite Communications System who then contacted the *Cape Bover* which was returning from a 13-month trip in the Persian Gulf.

N3KW was told to go on to the amateur 20m band, where the net was in contact with the *Molly Sue*, (skipped by WA7PGH). During the emergency, he used the ship's commercial gear and its call sign, WHTW. Following the rescue, in his off-duty hours, Bob used his own amateur rig and callsign to check in with WA7PGH, for progress reports.

Bob, who lives in Mansfield Ohio, joined the Merchant Marine two years ago from a 'Jobs for Amateurs' advertisement in ARRL's magazine *QST*. A high-speed Morse operator, Bob was first licensed as W3ITF in 1953. As he explained "many ship captains still ask for their weather reports by CW."

AMATEUR KILLED IN HURRICANE RELIEF

FOLLOWING HURRICANE Andrew which recently hit the south east coast of the USA Herbert Engelman, KD4OZY, was killed by a lightning strike as he ran out to meet a relief helicopter.

He was using a hand-held to relay information to a mobile amateur radio operator at the time. KD4OZY, a member of the ARRL, was one of over 100 amateurs who took their own radio equipment to help relieve radio operators already working in the area. We pass on

our own condolences to his family. (Reproduced from the *ARRL Letter*).

SATELLITE HELPS STRICKEN ISLANDERS

UoSAT OSCAR-22, WAS USED with great success for emergency and welfare traffic during the hurricane disaster in the Hawaiian Islands. Working in conjunction with an HF BBS network, messages were collected from all over the USA and sent to the stricken area via 15m packet or via O-22 to Honolulu, then distributed using amateur radio. During a critical period O-22 shut down, but a nighttime call to Ron Broadbent, G3AAJ, of AMSAT-UK, brought fast action from the UoSAT command team and the satellite was working again by the next orbit. During the shut down, LUSAT provided a competent back-up service. This has clearly proved the value of the University of Surrey's amateur satellite projects during an emergency.

MT FUGEN DISASTER

MASS EVACUATIONS followed the eruption of this Japanese volcano. Local amateurs made a major contribution to effective communications between the disaster area and the neighbouring cities of Nagasaki and Isahaya. Children from a local primary school qualified for amateur licences, and use the club call JE6ZLV to pass news of the volcano's progress.



The SS *Cape Bover* (see 'Amateurs in Sea Rescue').



Satellites

ARTHUR GEE G2UK

21 Romany Road, Oulton Broad, Suffolk
NR32 3PJ

AMSAT-UK's COLLOQUIUM, held from 29 July to 2 August last at the University of Surrey, was once again a successful and interesting occasion. Nearly 150 people from five continents attended. Special thanks are due to the University staff who were at the same time occupied with preparations for the launch of the KitSat A (Oscar 23) satellite scheduled for launch on 10 August.

Those who were not able to attend will be disappointed at the delayed appearance of the *Proceedings* which, in the past, have been published to coincide with the Colloquium. This was because hardly any of the speakers submitted their papers in time for the publication deadline - in spite of requests in adequate time by the Honorary Secretary.

The Annual General Meeting of AMSAT-UK was held during the Friday evening. All the previous committee members were re-elected, except Vin Thompson, G4ULS, who unfortunately was unable to renew his agreement to continue service. His sensible approach will be missed on some of the tricky problems which the AMSAT-UK Committee is called upon to make from time to time. His place was taken by Denis Kitchen, G0FCL, who is responsible for producing the *Satellite Orbital Calendars*, which are much appreciated by those who have found this method of prediction more effective than crunching Kepler's Elements through a computer.

FUTURE SATELLITES

As is usual on such occasions, much news and gossip was floating around about plans for future satellites; some just wishful thinking, others more rational. Of the latter the following are worth mentioning:

SedSat: This satellite, made in Alabama, will replace the 'weight on the end of a space tether' experiment flying on NASA's SEDS-2 mission (on a Delta rocket) between the end of 1993 and mid-1994. Planned life is five years. Orbit details - inclination 39 deg, altitude 680/792km; it will be deployed upwards 46km from the Delta's upper stage. Equipment carried will be mode A and mode J; digital images (initially of the tether), as well as telemetry will be transmitted on 70cm. Initial plans speak of a mode A transponder with a 300bps BBS at the low end and a digtalker at the high end of the downlink passband; also FM uplinks will be downlinked as SSB. At the end of the tether experiment (ie about six months) SedSat will be released from the tether to fly automatically for the rest of its lifetime.

TechSat: This is a Microsat-class package being constructed in Israel. It carries the following experiments: Packet store and forwarding, GPS receiver, radiation measurements and DSP. It is intended to be compatible with existing digital communications software. TechSat will have three uplinks (on 2m and 23cm) and a 70cm downlink. The power budget is designed to work with omni-directional ground-station antennas. It will be three-axis stabilised. Launch is planned on Ariane into a sun-synchronous orbit.

ITAmSat: As reported last year, this unit is mechanically identical to a Microsat and will be compatible with existing digisat communications software. AmSat-I have already produced a functional prototype; all of the flight hardware will be made in Italy (except for the solar panels). Launch will be on the Ariane SPOT-3 mission. It will support 1200 (Fuji) and 9600bps UO-22) digital modulation. Uplinks are on 145.875/900/925/950MHz and the two downlinks will be on 435.760/810MHz.

RS-15: Little information is available about this mission except that it will be Mode A only and fly in 1993 to a 2000km 60 degree inclination orbit. It is said to be a standby for RS-12/13, which is good news indeed. As we have commented in the past, RS 12 is the best amateur radio satellite in orbit at the moment for the beginner to get started on, being in Mode K which is 21.219-21250MHz up and 29.410-29.450MHz down, frequen-

cies which most radio amateurs already have gear for. Mode A is 145.860-145.900MHz up and 29.360-29.400MHz down - again frequencies for which most radio amateurs have equipment. Its good to know that the future of RS-12 is being carefully guarded by those who are trying to keep amateur radio going in Russia and that they have plans for keeping this aspect of amateur radio going.

KitSat-B: Similar to KitSat-A, but hopefully will include a GPS receiver. Launch on SPOT-3 mission.

Spot-3 Mission: This flight is currently expected in mid to late 1993. It carries the replacement for Spot-2, so if Spot-2 continues to function well the flight is likely to be delayed. Conversely, if Spot-2 meets problems the launch will be earlier. It is likely to have a similar orbit to the current MicroSats. As well as Spot-3 it will have an ASAP carrying KitSat-B, ITAmSat, and two Portuguese amateur radio satellites which are being proposed by one of the Universities in Portugal. No other information available yet.

HutSat: This is a three-year Finnish project to test the technology and produce an engineering model leading to a later Ariane launch, possibly in 1997/98. The aims are to use GaAs technology and to give occupancy of presently unused frequencies.

Arsene: The French satellite Arsene has been planned for a long time, but construction is now complete and it is ready to fly. It is a 3-axis stabilised satellite with sun and earth sensors. Attitude control is by gas jets after ground command (about twice a year). VHF/UHF aerials are monopoles, with dipoles for 2.4GHz. Digipeater uplinks 435.050/100/150MHz, downlink 145.975MHz, 2W and 15W. Transponder uplink (16kHz wide) 435.110, downlink 2446.540MHz (0.8W, estimate 2.5m dish required). Expect doppler shift (2m/70cm) in final orbit to be about 3Hz per minute. Orbit period 17H30 with perigee 20,000 and apogee 36,000km. This should produce a slow drift from west to east with 12 hours/day average access. Launch on Ariane V58 with the Astra 1C satellite is due in less than a year.

Thanks to Richard Limebar, G3RWL, who sent much of the above.



Delegates from 24 countries attended the 1992 AMSAT-UK Colloquium at the University of Surrey. Here they are being 'organised' by Ron Broadbent, G3AAJ.



Microwaves

MIKE DIXON G3PFR

'Woodstock', Gazebank, Norley, Warrington,
Cheshire WA6 8LL

WELL, ONCE AGAIN we are nearing the festive season! It seems no time at all since I was compiling last November's column and realised that it was the last slot of the year in which to wish all readers and microwave operators seasonal greetings. May you all have a happy and peaceful Christmas and a prosperous and productive 1993! It is also time to reflect, briefly, on what has happened, microwave-wise, in the past year. This time, the answer seems to be "quite a lot", some good, some not so good.

THE YEAR IN REVIEW

FIRST OF ALL, WARC '92 has come and gone, leaving behind a number of potential problems for the Amateur Services - pressure on at least two of the microwave bands (2.3 and 3.4GHz) from professional users. Plus other pressures at around 50, 400 and 1000MHz for wind-profiling radars (WPRs). Most of these pressures have been discussed in this column, with a plea for readers' views on the subject.

Unfortunately, not many people have expressed views, so that the Microwave Committee, in conjunction with the Licensing Advisory Committee (LAC), has had to formulate what we jointly consider to be 'best position' papers for submission to the UK authority and other societies (via the appropriate IARU Region 1 channels). The call for common frequencies has been strengthened by both WARC and the outcome of a Region 1 meeting (in Vienna) last March. The next Region 1 conference is in April 1993 and we hope to take forward some positive recommendations based on our own (RSGB's) exploration of spectrum management measures which might be possible, here at home, to safeguard the future of weak-signal communication in these two bands.

On the more positive and tangible side, 1992 has seen a good increase in the levels of activity, particularly fixed-station operation in the 10GHz band, which has led to some pretty dramatic increases in the distances worked on this fascinating band. Indeed, the 1000km 'barrier' has been broken in the UK, as reported in the last column, for the first time. We have also seen the active appearance of a few Novice calls on the two Novice microwave bands, which is very encouraging. We sincerely hope that more Novices will come to use, know and love the bands above 1GHz!

Most of these advances in microwave operation are due, in particular, to the efforts of Microwave Committee members Sam Jewell, G4DDK; Charlie Suckling, G3WDG and Petra Suckling, G4KGC; in designing, supplying and promoting highly effective

home-build equipment. Our thanks must go to them. That is not to say that equal thanks should not also go to all the other Committee members (and others outside the Committee) who have also contributed positively, but perhaps less obviously, to the current advances.

TWO 'FIRSTS', TWO NOVICE YLS, TWO NOVICE BANDS.

IAN CORNES, G4OUT (RSGB VHF/UHF/Microwave Awards Manager, QTHR), recently updated the awards records with some excellent news: two 'first' awards on the two Novice microwave bands to two Novice YL operators.

The YLs were Alice Blackwell, 2E1AIZ, mentioned last time (daughter of Roger Blackwell, G4PMK) and Sarah Jewell, 2E1AJE (daughter of Sam Jewell, G4DDK). The fact that both of these young ladies have MADs (Microwave-Active Dads!) does not detract from their operating achievements. It says a lot for their dedication and effort to a field of amateur radio operating which is none-too-easy, even for their experienced fathers.

Alice's 1.3GHz contact with LA8OJ, mentioned last time, brought her the first ever Novice microwave award, Distance Award No.134, which she achieved with a mere 1W to a single 23 element Tonna Yagi. On the higher Novice band, Sarah receives the first ever Novice 10GHz award, Distance Award No.110 for a 203km contact with G4BRK/P. Old fashioned manners prevent me from mentioning the young ladies' ages directly, but the sum-total of their ages is much less than half my age. Oh, that the Novice licence had been in existence 30-odd years ago!

I'm thoroughly ashamed to say that I have not yet matched these Novice results. I have failed to work, with QRP, more than 600km on the 1.3GHz band or 150km on the 10GHz band and cannot, yet, claim a 'Distance Award' for either band! My 'Squares' effort on 10GHz amounts to four squares confirmed from four different portable locations, not even enough to make a single five-Squares award.

OTHER OPERATING AWARDS

THE OTHER AWARDS, to more 'senior' and experienced operators, listed in Ian's letter, also showed considerable achievements, and are listed in **Table 1**. Congratulations to all - keep up the good work!

Whereas 1991's (final) operating ladder was given in the July column, this month's ladder (see **Table 2**) shows the position between 01/01/92 and 30/06/92.

It looks very healthy indeed; including some of the results outlined above which have made it look even healthier! It must be quite obvious that the best DX is being worked by fixed stations, simply because they are in the best position to detect and exploit openings, by monitoring band conditions for longer periods. It is less likely that /P operators, mainly (though not always) operating in the Cumulatives, will catch these more spectacular conditions. We know that such openings are more likely and frequent, on the higher bands. Use them!

Again, a warm welcome to the Novice operators and particular congratulations to

RECENT MICROWAVE AWARDS

Call	Band	Award	No.
G8NEY	1.3GHz	20 Squares	35
G6HKM	1.3GHz	40 Squares	19
G6EOD	2.3GHz	5 Squares	19
G4EOD	2.2GHz	10 Squares	11
G4PMK	2.3GHz	20 Squares	6
G6DER	2.3GHz	40 Squares	2
G4PMK	10GHz	10 Squares	2
G8AYY	24GHz	Intermediate (>75km)	8

Table 1

1992 OPERATING LADDER

Ranked on highest multiplied score, from 01.01.92 to 31.08.92

Band (GHz)	Posn.	Call sign	Best DX km (A)	Stations worked (B)	Multiplied score (AxB)
2.3	1	G4EOD *	900	16	14,400
	2	G4PMK *	720	13	9,360
	3	G4DDK *	398	5	1,990
3.4	1	G4PMK *	661	5	3,305
	2	G4EOD *	110	3	330
5.7	1	G4EOD *	200	3	600
	2	G4PMK *	60	2	120
10	1	G3BNL *	1,027	45	46,215
	2	G3WDG *	1,008	43	43,433
	3	G4FCD *	1,039	19	19,741
	4	G4DDK *	624	25	15,600
	5	G3FYX/P	364	39	14,196
	6	G3PHO/P	338	41	13,858
	7	G4PMK *	739	13	9,607
	8	G8AGN/P	338	26	8,788
	9	G3FYX *	535	16	8,560
	10	G4JNT/P	279	28	7,812
	11	G3ZME/P	246	31	7,626
	12	G4BRK/P	228	27	6,156
	13	G3PYB/P	362	17	6,154
	14	G4DKK *	276	16	4,416
15	G4EOD *	311	13	4,043	
16	G3FNQ/P	330	12	3,960	
17	G8LSD/P	245	6	3,920	
18	G3JMB/P	245	14	3,430	
19	G3JMY/P	211	16	3,376	
20	2E1AJE *	245	9	2,205	
21	G0API/P	179	12	2,148	
22	G3GRO *	143	10	1,430	
23	G4JNT *	215	5	1,075	
24	G3JMY *	112	3	336	
25	G8AYY/P	84	3	252	
26	2E1AIZ *	70	3	210	
24	1	G4KNZ/P	90	9	810
	2	G8AYY/P	86	3	258
	3	G3NKL/P	52	4	208
	4	G3FYX/P	67	3	201
	5	G3PHO/P	45	4	180
	6	G0DJA/P	8	1	8

* = Fixed (home) station operation

Table 2

10GHZ ALL-TIME SQUARES TABLE (ranked on Squares worked)

Pos	Call	Locator	Sqrs	Best DX(km)
1	G3WDG	IO92RG	19	1008
2	G4DDK	JO02PA	15	624
3	G3BNL	IO92KA	13	1027
4 =	G8AGN/P	IO93EH	12	338
4 =	G3PHO/P	IO93EH	12	338
6	G4FCD	IO91JV	11	1039
7	G8BRK/P	IO91FW	9	228

Table 3

the owners of the two Novice callsigns which appear in the tables. I have also included a new table this month (thanks to the editors of the *Microwave Newsletter* for most of the information in the tables), an 'all-time' 10GHz Squares Table. This is a particularly noteworthy table, since it is much more difficult to work squares on the 10GHz band than it is on the lower frequency bands: this should be

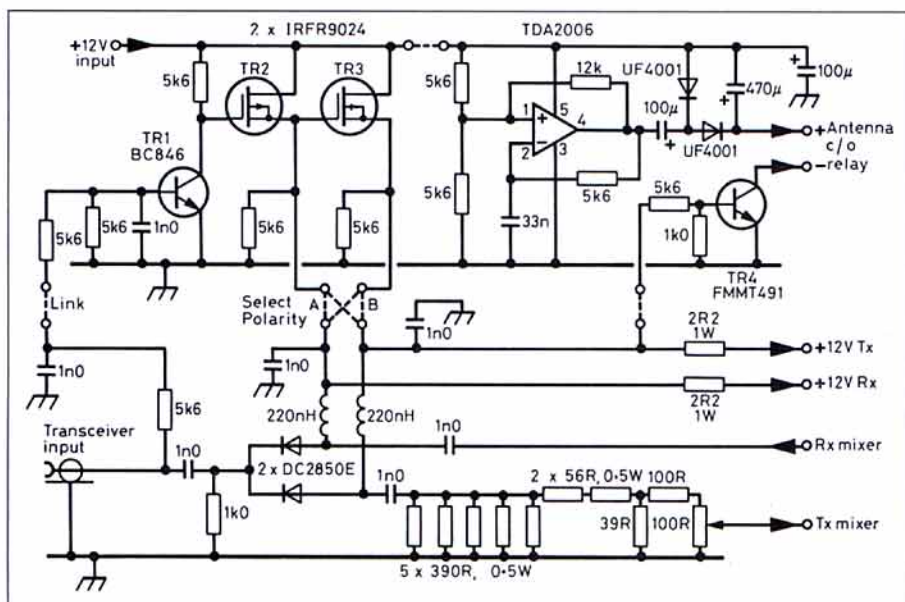


Fig 1: Control and switching unit for the KK7B transverter.

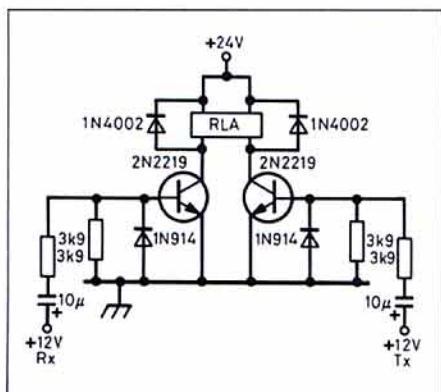


Fig 2: Changeover relay operates from 12V pulses on transmit and receive.

fairly obvious from the somewhat larger numbers quoted in Table 1 for the lower bands. With the help of the Awards Manager, I shall attempt to summarise the year's awards for all of the bands, though the information will not, of course, be available until next year!

TECHNICAL CORNER

I MENTIONED THE G4JNT transverter interface in the last column. This was recommended as a means of controlling and switching the KK7B transverter (and other microwave transverters) from the 'parent' transceiver.

A PCB for this interface is now available from the Microwave Committee Components Service (c/o Mrs P Suckling, G4KGC, at 314A, Newton Road, Rushden, Northants NN10 0SY). Some details appeared in the last issue of the *Microwave Newsletter* (August, 1992) and are reproduced here for the benefit of those who do not subscribe to the newsletter.

The unit was designed to act as the interface between a low power 144MHz transceiver, such as the Icom IC202 or Yaesu FT290R and, particularly, the G3WDG 10GHz transverter which has also been briefly featured here.

The G4JNT unit offers fully solid-state receive switching, with an adjustable attenu-

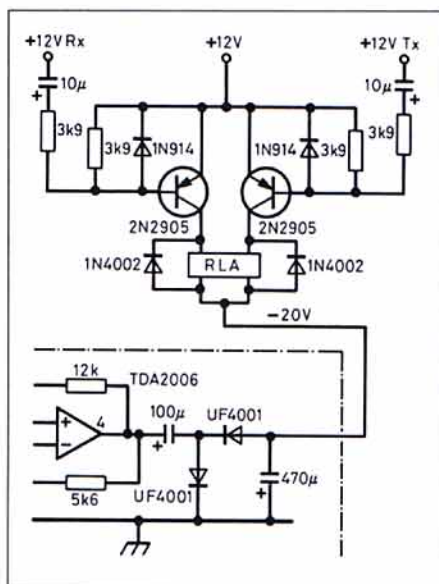


Fig 3: Negative supply gives 24V to relay from Tx or Rx input pulse.

ator to reduce the transmit power input level to the 1 to 3mW level. It utilises the antenna socket DC voltage of the transceiver to provide TX/RX switching without the need for extra control cables between the transceiver and transverter.

It also incorporates a nominal +21V inverter to provide the supply for the majority of 18GHz coaxial relays currently available on the surplus market. The circuit is given in Fig 1 and two additional circuit modifications (either can be accommodated on the PCB), to allow the use of two different types of surplus coaxial (10GHz+) relays, are given in Figs 2 and 3.

The complete unit is built using surface mount devices (SMDs) on a 55 x 74mm PCB which fits inside a standard Piper Communications Type 7764 tin-plate box. By the time you read this, full constructional details, the PCB and more 'difficult to get' components should be available as a 'short kit' from the Microwave Committee Components Service.

TR1 is controlled by the transceiver an-

tenna socket DC voltage and is used to switch two p-channel MOSFETs alternately between transmit and receive. The MOSFETs are small, surface-mount devices which have very low 'on' resistance and are rated to pass up to 9A. A PCB link enables the switching facility to be separated from the antenna line, if so desired.

The polarity of the antenna switching voltage varies from transceiver to transceiver and the polarity can be altered by means of links on the board. PIN diodes are used for switching the transceiver between the receive and transmit ports of the transverter. The power attenuator is rated at 3W continuous (carrier/FM) or 5W intermittent (CW or SSB).

The inverter circuit, used to provide the +21V relay supply is rather unusual, as it uses an audio power amplifier IC, (TDA2006), which is connected as a power oscillator at about 7kHz. The square-wave output is applied to a voltage doubler which can supply +21V at 100mA: when 'slugged' by the output capacitor it is capable of supplying a current pulse well in excess of 100mA to 'throw' a relay or waveguide switch which needs a brief pulse of more than 100mA.

Latching-type SMA relays are driven from a separate transistor, TR4. This is shown as an FM491 (SMD) but could be replaced by a BFY50 or similar. The circuit of Fig 2 should be used where the relay can be operated by grounding alternate sides of the coil. A pulse of around 100 to 200mA is generated when the appropriate 12V line goes high and pulses the associated relay coil (eg Transco relay).

The circuit of Fig 3 should be used where two (nominal) 24V positive going pulses are required to change the relay over. This is done by re-configuring the inverter to supply -12V rather than +24V, reversing the polarity of the doubler diodes and capacitors and referring them to ground, rather than the +12V rail. The circuit function should be quite clear from the diagrams.

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Mike Dixon, G3PFR

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TEN-3	10m 3 element Beam
A4S	20-15-10m 4 element Beam
A3S	20-15-10m 3 element Beam
A3WS	17-12m 3 element Beam
D40	40m Rotary Dipole
D4	40-20-15-10m Dipole
D3	20-15-10m Dipole
D3W	30-17-12m Dipole
R7	40-10m H/W Vertical
R5	20-10m H/W Vertical
AP8	80-10m Vertical
AV5	8 Band HF Vertical
AV3	20-15-10m Vertical
A50-6S	6m 6 element Beam
A50-5S	6m 5 element Beam
A50-3S	6m 3 element Beam
AR-6	6m Ringo Vertical
17B2	2m 17 element Beam
13B2	2m 13 element Beam
124WB	2m 4 element Beam
A144-7	2m 7 element Beam
A144-11	2m 11 element Beam
A144-20T	2m 10 element X Oscar
AR-2	2m Ringo Vertical
ARX-2B	2m Ringo Ranger II
AR-270	2m/70cm Vertical
424-B	70cm 24 element Beam
A430-11	70cm 11 element Beam
416TB	70cm 8 element X Oscar
ARX450B	70cm Ringo Ranger II



MIRAGE/KLM

COMMUNICATIONS EQUIPMENT

40M-2	40m 2 element Beam
20M-4	20m 4 element Beam
15M-4	15m 4 element Beam
10M-4	10m 4 element Beam
KT34-A	20-15-10m 4 element Beam
KT34-XA	20-15-10m 6 element Beam
6M-7LD	6m 7 element Beam
6M-5	6m 5 element Beam
2M-20LBX	2m 20 element Beam
2M-16LBX	2m 16 element Beam
2M-13LBA	2m 13 element Beam
2M-22C	2m 11 element X Oscar
2M-14C	2m 7 element X Oscar
432-30LBX	70cm 30 element Beam
432-20LBX	70cm 20 element Beam
435-40CX	70cm 20 element X Oscar
435-18C	70cm 9 element X Oscar

LINEAR AMPLIFIERS

A1015G	6m 10-150w g/f rx
B3030G	2m 30-300w g/f rx
B3016G	2m 30-160w g/f rx
B1016G	2m 10-160w g/f rx
B108G	2m 10-80w g/f rx
B215G	2m 2-150w g/f rx
D3030N	70cm 30w-100w
D1010N	70cm 10w-100w
D15N	70cm 2w-20w

GASFET PRE-AMPLIFIERS

KP-1/2M	2m Indoor unit
KP-1/70	70cm Indoor unit
KP-2/2M	2m Masthead unit
KP-2/70	70cm Masthead unit

TELEX hy-gain

7-2	40m 2 element Beam
7-1	40m Rotatable Dipole
205CA	20m 5 element Beam
204BAS	20m 4 element Beam
203BAS	20m 3 element Beam
155CA	15m 5 element Beam
153BAS	15m 3 element Beam
105BAS	10m 5 element Beam
103BAS	10m 3 element Beam
TH7DXS	20-15-10m 7 element Beam
TH5MK2S	20-15-10m 5 element Beam
EXP14	20-15-10m 4 element Beam
TH3JRS	20-15-10m 3 element Beam
TH2MK3S	20-15-10m 2 element Beam
DX88	8 Band HF Vertical
12AVQS	20-15-10m Vertical
14AVQ	40-10m Vertical
18VS	80-10m Vertical
66DX	6m 6 element Beam
64DX	6m 4 element Beam
215DX	2m 15 element Beam
216SAT	2m 8 element X Oscar
7031DX	70cm 31 element Beam
7030SAT	70cm 15 element X Oscar

ROTATORS

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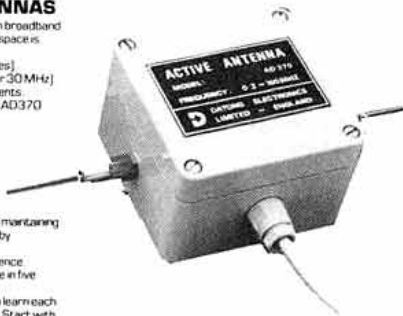
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AS SEEN 'RSGB'92'

SPECIFICATION

General Details

Frequency of Operation	Channel 1 — 145.250MHz Channel 2 — 144.825MHz Channel 3 — 144.650MHz Channel 4 — 144.675MHz
Frequency Coverage	144-146MHz via internal options
Frequency Stability	± 10ppm
Supply Voltage	12V to 14V
Supply Current	transmit — 1.5A Receive — 250mA
RF Output Connector	BNC
User Interface	7 Pin DIN (Cairo Compatible)
PSU Input	1 Metre long flying lead
Size	190 x 115 x 44mm
Transmit	
RF Output	8W
Turnaround Time	<25mS
Modulation Type	FM, 3KHz deviation
Spurious Outputs	>-60dBc
Receive	
Sensitivity	<0.25uV for 12dB SINAD
Image & Spurious Responses	>70dB
Spurious Emissions	<2nW (-56dBm)
Squelch Type	Noise operated
Recovered Audio	1 Watt into 8 ohms

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1992		
Oct	3 North East	Northumbria Centre, Washington, Dist. 12
	4 North	University Sports Centre, Leeds
	10 Scotland East	Assembly Rooms, George St, Edinburgh
	11 Scotland West	City Hall, Candleriggs, Glasgow
	17 London	Novotel, Hammersmith
	18 West	Brunel Centre, Templemeads, Bristol
	24 North West	Haydock Park Racecourse J23 M6
	25 East Midlands	Donington Park J24 M1
	31 North East	Northumbria Centre, Washington, Dist. 12
Nov	1 North	University Sports Centre, Leeds
	6 West Midlands	Nat. M'cycle Museum J6 M42 (TILL 8PM)
	7 London	Sandown Park, Esher, Surrey J9/10 M25
	8 Wales	University Union, Park Place, Cardiff
	14 London	Novotel, Hammersmith
	15 West	Brunel Centre, Templemeads, Bristol
	21 East Midlands	De Montfort Hall, Granville Rd, Leicester
	22 North East	Northumbria Centre, Washington, Dist. 12
	28 North West	Haydock Park Racecourse J23 M6
Dec	29 Scotland West	City Hall, Candleriggs, Glasgow
	5 West Midlands	National Motorcycle Museum J6 M42
	12 London	Sandown Park, Esher, Surrey J9/10 M25
	13 Wales	University Union, Park Place, Cardiff

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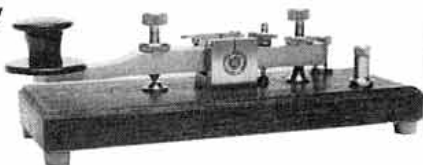


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CONTEST NEWS

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

DIRECTION FINDING

RESULTS OF BANBURY QUALIFYING EVENT

Nineteen teams assembled at Kineton High School, Warwickshire. They received two good signals, one being much stronger than the other. Most competitors headed north west towards the weaker signal. They then plotted good 'crosses' on both stations during the 2 o'clock transmission.

Station A, operated by G4DLB and G4EBF, (twenty two kilometres north west of the start), in Yarningdale Common where four hundred feet of aerial wire was erected. The transmitter was located a little distance away in a blackberry bush. Some competitors got a little wet and muddy during their search, but most were able to D/F the hidden transmitter with little difficulty.

Station B, operated by GOLDB, located twelve kilometres south east of the start on the embankment of a disused ironstone railway line, just north of Banbury where six hundred feet of aerial wire was erected. This caused some competitors to lose valuable time searching woodland in vain. The hidden Tx was concealed in a large bramble bush on the edge of a near vertical drop down onto the track bed. This station was strong at the start, and caused some teams to misjudge its true location. But most teams were able to quickly navigate the fifty kilometres separating the stations.

Afterwards, forty-four people gathered at Hardwick Community Centre in Banbury, for tea; the catering staff reported that over seventy pints of tea had been consumed!

After tea, Alan Simmons was presented with the first prize, and for the second time he collected the Banbury Amateur Radio Society D/F Shield. Chris Wells took second prize and Christine Bristow the ladies prize.

TIME OF ARRIVAL

Pos	Name	Club	Tx A	Tx B
1	A Simmons	Mid Thames	14.26	15.03
2	C Wells	Mid Thames	14.25	15.04
3	D Holland	S. Manchester	14.25	15.09
4	M Standen	Mid Thames	14.26	15.10
5	B Bristow	Mid Thames	14.25	15.12
6	C Plummer	S. Manchester	14.27	15.15
7	G Wherham	Coventry	14.26	15.15.30
8	B Pechay	Mid Thames	14.35	15.16
9	G Foster	Mid Thames	14.26	15.18
10	T Gage	Mid Thames	14.29	15.19
11	A Collett	Colchester	14.40	15.45
12	P Cunningham	Colchester	15.47	14.24
13	J Hall	Ripon	15.48	14.25
14	B Gray	Mid Thames	15.48	15.04
15	P Lisle	Mid Thames	15.48	14.24
16	A Mead	Chelmsford	15.50	14.40
17	P Clarke	Torbay	15.51	14.44
18	R Goodearf	Mid Thames	15.47	

One competitor failed to find either transmitter.

A Simmons and C Wells qualify for the National Final to be held in September.

HF RESULTS

COMMONWEALTH CONTEST 1992

Canada was the place to be for top honours this year and congratulations to John Sluymmer, VE3EJ (formerly VE6OU/3), for his record breaking score of 8415 points, beating runner-up Lee Sawkins, VE7CC, by nearly a thousand points. RSGB HF Committee Chairman Bob Whelan, G3PJT, at the start of a business trip to British Columbia, used VE7SV's station to lead the single band entries. Single band entries are not to everyone's taste but they do allow operators to grab a reasonable amount of sleep while staying competitive, and the single band entries have been tabulated separately this year to make for easier comparison.

In the UK Dennis Andrews, G3MXJ, takes the Colonel Thomas Rose Bowl, followed by Jan Fisher, G0IVZ, in his first attempt in BERU. Special mention must be made of Frank Cooper, G2QT; this year is his fiftieth entry in BERU, an incredible achievement. Licensed in 1933, he first entered in 1935 and has only missed one year - 1968 - when he was abroad. Even then he made arrangements to operate from VP6 (now 8P6) but circumstances meant that the station which he was supposed to use was unavailable. Now aged 78 and retired less than two years, he spends a great deal of time on antenna experiments and has notebooks containing all the results of his antenna work going back to 1933. In addition to a homebrew three element quad on a commercial lattice tower for HF, he has five wooden masts between 50 and 60ft in height which he raises and lowers single handed with the aid of a winch for maintenance purposes. (The creosote does its job well as half of one mast is pre-war!) Currently the masts support a five-element and two three-element wire yagis for 40m and a WJK for 80m. He modestly describes himself as 'a consistent also-ran' but it is the enthusiasm and dedication of stalwarts like G2QT which make BERU such a very special event.

Entrants again suffered QRM from the Japanese 59-Magazine CW contest, but thanks to the considerable efforts of David Rankin, 9V1RH, and Masayoshi Fujioka, JM1UXU, the Chairman and Secretary respectively of IARU Region 3, the Japanese have restructured their event into separate 48-hour LF and HF contests to be held on 8-10 January from 2200h and 9-11 April from 2300h (1993 dates), thereby avoiding a clash with BERU. The best way of ensuring that we do not get jumped on by another contest is to keep the activity level high, and this year's record score indicates that the trend is in the right direction. See you all on the second weekend in March 1993, and bring a friend! G3AEZ

Comments received with logs: "Logging by computer for first time. All went well but in trying to edit I lost thirty QSOs... will keep trying" - VE3ST; "Didn't know about BERU until a few weeks before; working shifts prevented operating, dipole on roof for 80m, no CW filter... real sport. Enjoyed this different type of contest" - VE2EOH; "Publicity in Canada is just about zero" - VE2AYY; "Only a token entry but enjoyed the brief period of operation" - GW3SB; "At age of 73 was talked into participation by VK friends" - G3BGM; "Made three new countries on 40m, had to work hard" - G4FVK; "Rather poor turnout of overseas stations, tempted to go for Worked All JA Cities award" - G3HJF; "DXNS inspired me to enter my first ever contest" - G3DEF; "Good conditions. What changes since first entry in 1935? Computerised logging the most important... no pencils to sharpen" - G3KSH; "Only had to change valve in VFO" - G3VDL; "Change in CW power seemed to do wonders. BERU still my favourite

contest" - G3XWK; "As usual most enjoyable. Nice to contact old friends" - GW3HGJ; "There's nothing else quite like BERU" - G3OZF; "15m was open to G for ten hours but the Gs went to bed. Activity between VKZL and VE was lower this year" - G3PJT/VE7; "Is this an old friends contest? Would be interested to know average age" - 9J2BO; "Total lack of propagation at times on ANY band, could we have a shut down period?" - V8SKK; "Good conditions Saturday. Little Commonwealth activity on 28MHz. Next year will be final year from here" - A2ZGH; "Apart from a blackout on 14/21/28 for an hour conditions good. What a cracking signal VP8GAV was on 21" - ZL2BCH; "Contests seem to stir up the ionosphere as the bands never seemed to be open for long. As usual a lot of fun" - VK4OD; "Another splendid BERU, nice to work so many Gs. Perhaps you should change the name to Commonwealth Annual Reunion". VK6AJ.

Checklogs received with thanks from G3FXB, G3RSD, G4BVH, G4ODV, GW3SYL, VE3EK, VK3AZT, VK3JZ, and GB5CC (HQ str, ops G4AMJ, G4BK1 & G4BUO).

The following Commonwealth Call Areas were active during the event: A2, C5, G, GB5CC, J8, P2, P29HQ, V4, V8, VE1-2-3-4-5-6-7, VK1-2-3-4-5-6-7-8, VO1, VP2M, VP5, VP8, VP9, VS6, VU, Z2, ZB, ZC, ZD8, ZL1-2-3-4, 3B8, 4S7, 5B, 5Z, 6Y, 7O, 8P, 9J.

Rules for BERU '93 appear in October's *RadCom*.

SINGLE-BAND ENTRIES

3.5 MHz

1 * VK2ETM 410

7 MHz

1 * VK7RO 1080
2 VK3APN 890
3 VK6LW 690
4 GW4HBK 480

14 MHz

1 * VK6AJ 2005
2 VK4TT 1985
3 VK3MR 1090
4 GMS3CFS 935
5 VE1ALJ 325

21 MHz

1 * G3PJT/VE7 2180
2 * G3DDY 1685
3 G3KSK 930
4 VK5AGX 910

28 MHz

1 * GMS3WQJ 1415
2 A2ZGH 1325
3 VE3HX 1300
4 G0AEV 1195
5 G3SQX 1075
6 G4IQM 835
7 G3HOX 740

VHF CONTESTS CALENDAR

1 Nov	2nd 1296MHz Fixed/SWL (Jun 92)
2 Nov	144MHz CW Cumulative (Jun 92)
6/19 Nov	1.3 & 2.3GHz Cumulative (Jun 92)
7/8 Nov	144MHz CW Marconi/RSGB 24-hour (Jun 92)
8 Nov	144MHz RSGB CW 6-hour (Jun 92)
13/30 Nov	432MHz Cumulative (Jun 92)
6 Dec	144MHz AFS/Fixed/SWL (Jul 92)
7 Dec	1.3 & 2.3GHz Cumulative
26-29 Dec	70, 144 and 432MHz Fixed Station (Jul 92)

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

THE TYPEFACE in *Contest News* has been reduced at the request of the HF Contests Committee in order to do justice to the large amount of contest information requiring publication, whilst retaining the same page allocation

TRANSMITTING SECTION

Posn	Call	80	40	20	15	10	Total
1 *	VE3EJ	685	1885	2340	2195	1310	8415
2 *	VE7CC	400	1395	2085	1990	1615	7485
3 *	ZL3GQ	770	1115	2035	2105	980	7005
4 *	ZD8LI	150	1265	1760	1860	1695	6730
5 *	VK2BJ	685	1180	2105	1265	920	6255
6 *	VK2APK	740	960	1960	955	845	5460
7 *	ZC4CZ	270	965	1475	1235	1165	5110
8 *	G3MXJ	275	915	1450	1250	1170	5060
9 *	G5G/MSYOR		915	1375	1320	1405	4615
10 *	VK4XA	395	635	1680	1105	960	4535
11 *	ZL1AIZ	615	1030	1285	770	730	4430
12 *	G0IVZ	280	845	1314	1117	834	4580
13 *	VE2AYY	260	935	1450	840	835	4320
14 *	G3TBK	200	450	1285	1305	965	4215
15 *	VP8GAV	75	425	1045	1985	605	4135
16 *	9J2BO		225	895	1480	1455	4055
17 *	ZL1MH	225	670	1190	1115	790	4020
18 *	G4ZVJ		200	1570	1245	840	3855
19 *	VE3ST	155	620	1475	960	575	3785
20 *	G2QT	300	600	1140	875	850	3765
21 *	VK58N	475	510	1380	865	405	3635
22 *	GW3HGJ	225	725	1085	925	665	3625
23 *	G3OZF	100	400	1040	1180	860	3580
24 *	VE3EJ/KZ	175	520	1075	1075	680	3545
25 *	VK5GZ	350	675	1520	765	155	3465
26 *	VG6BF			1425	1165	855	3445
27 *	VE7UZ	125	885	715	625	1070	3420
28 *	G3GW	125	575	1105	965	580	3350
29 *	VK3ZC	440	910	940	775	200	3265
30 *	G3JUG	100	400	1175	790	770	3235
31 *	VU2PTT		770	1575	470	315	3130
32 *	G3EBH	125	330	1195	735	595	2980
33 *	G3GLL	175	530	1100	750	425	2980
34 *	V85KX	75	450	940	1340	100	2905
35 *	G3CSR	100	205	890	890	730	2815
36 *	GW4XXF	100	335	1025	610	695	2765
37 *	G2HLL	100	285	1025	805	540	2755
38 *	G3SWH		225	1085	810	680	2740
39 *	G3ESF	75	325	1015	705	620	2720
40 *	VK8HA	75	325	990	580	745	2715
41 *	G5MY	75	445	900	810	445	2685
42 *	VK6RU		325	930	825	605	2685
43 *	G3LJK	100	345	1095	755	355	2650
44 *	G3KSH	100	275	980	745	500	2600
45 *	VE2EOH	240	635	710	670	325	2580
46 *	G3MPB	150	380	985	850	410	2575
47 *	GW3JI	75	325	865	685	515	2465
48 *	G0LZL	125	225	860	600	605	2415
49 *	G3VDL	125	330	740	595	580	2370
50 *	G3AFV	25	335	815	755	440	2370
51 *	G2HPF	175	415	750	465	530	2335
52 *	VK3DQ	415	335	985	260	225	2310
53 *	VK2EL	500	1090	665	50	2295	2295
54 *	VK4OD	325	360	835	775	55	2285
55 *	G3AWR	300	975	505	510	220	2250
56 *	VK2DID	255	625	575	640	150	2245
57 *	VK6BB	75	345	800	620	375	2215
58 *	G3NKS	100	375	625	660	445	2205
59 *	G3DEF		275	665	755	495	2190
60 *	G3VW	50	150	920	695	310	2125
61 *	VO1CA	265	485	445	765	165	2125
62 *	VE3YBH		540	300	840	425	2105
63 *	GM3CIX		150	810	715	390	2065
64 *	VK4XW	315	560	805	535	50	2065
65 *	ZL1HW	250	465	580	725	75	2055
66 *	VK2AYD	295	600	720	380	25	2020
67 *	VE1AY	170	325	785	330	350	1960
68 *	G3-HKO	125	280	790	600	150	1945
69 *	G3BPM	25	250	745	550	375	1945
70 *	VE3CWE		380	620	435	475	1915
71 *	G4C2B	75	225	625	500	405	1830
72 *	ZL2BCH		490	555	400	375	1820
73 *	G2BLA	75	410	410	540	380	1815
74 *	G3JKY		100	755	470	470	1795
75 *	G3YBT/P		255	640	280	595	1770
76 *	VK2AOF	280	510	665	305	1770	1770
77 *	VK3XB	255	325	665	505	1670	1770
78 *	G3GMS	50	160	765	605	100	1670
79 *	G3ZDW		255	580	375	405	1615
80 *	VE1AY	135	210	595	635	25	1600
81 *	ZL2BRT	50	655	485	230	250	1580
82 *	VK3BXA	80	485	785	125	100	1575
83 *	G4LZB		200	745	485	100	1530
84 *	G3HAL	100	350	480	310	285	1525
85 *	G4ZME		50	705	335	410	1500
86 *	G0HSD	25	100	615	470	285	1495
87 *	VK6RZ		460	425	435	150	1470
88 *	G3TEV		50	705	385	325	1465
89 *	VE3GCE	25	345	585	290	205	1450
90 *	VE3NKB		225	480	435	290	1430
91 *	G3HJF			485	480	415	1380
92 *	VK7RY	260	450	300	200	150	1360
93 *	G4ZIB		25	500	410	375	1310
94 *	G3VPR	50	175	275	415	330	1265
95 *	VK6HG		100	450	445	205	1200
96 *	Z23JO			125	280	785	1160
97 *	G3SEF		100	580	200	280	1160
98 *	VK2AIC			450	355	305	1110
99 *	G0KKG	25	100	380	340	150	995
100 *	G3BGM			550	200	150	900
101 *	VK3XF	200	400	275			875
102 *	G3WPP			350	200	325	875
103 *	GM4HQF		25	430	280	130	865
104 *	G3ZGC		125	225	410	25	785
105 *	G3GMM		25	175	315	225	740
106 *	GW3SB		240	240	240	80	705
107 *	G4FVK	50	125	255	250	690	690
108 *	G8CZ	50	125	305	125	605	605
109 *	G3VGH		25	130	140	435	435
110 *	VE2HN						

HF RULES

AFFILIATED SOCIETIES TEAM CONTEST 1993

1. The General Rules for RSGB HF Contests as published in the January issue of *Radio Communication* will apply. The top 20kHz of the allocated band are dedicated as the 'QRS CORRAL' - it is intended that operators less experienced in CW and contest techniques should be able to make contacts here in a more relaxed environment... experienced contesters using the segment are required to play fair and keep their speed right down. Contestants are reminded that those who operate in a manner not within the spirit of the event render themselves liable to disqualification, as do those who breach the rules.

2. When: 1300GMT to 1700GMT on Sunday 10 January, 1993.

3. Teams: Teams comprise up to five stations. Each team represents a society or group which is affiliated to the RSGB, and each society may enter as many teams as they wish. Which stations make up which team is determined by the society entering the event. Team placings will be determined by the total of the scores made by each station in the team, after checking. Club secretaries are held responsible for the entry, and must include a summary sheet (see 'Entries') for each team entered by the club.

4. Eligible Entrants:

(a) Each entering society must be affiliated to the RSGB.

(b) Each operator of a team station must be a member of the club he or she represents. The operator is not required to be a member of RSGB.

(c) All stations representing a club must be located within a radius of 50 miles of the normal meeting-place of the club. Where a society has "branches", eg RNARS, it may define separate "branch" meeting-places, and the team(s) entered by each branch will be considered to be entirely separate from those entered by other branches, except in respect of affiliation.

(d) Each station may be single- or multi-operator, as best suits the entrant, but no station or operator may represent more than one affiliated society, or branch.

5. Contacts: CW (A1A) only in the band 3,510-3,590kHz, with 3,570-3,590kHz reserved for slower-speed contacts (the QRS CORRAL). Any stations, including overseas, may be worked for points.

6. Contest Exchange: RST and serial number, commencing with 001.

7. Scoring: Each completed contact scores 10 points. Entrants are reminded that each unmarked duplicate contact for which points are claimed will be penalised at 10 times the claimed score, plus the score for the duplicate itself, (a total of 110 points) and that entries containing more than 5 such duplicates in all the logs combined, may be liable to disqualification.

8. Entries:

(a) Each team entry must be accompanied by a Team Summary Sheet, which must contain the following information, and be signed by an officer of the affiliated society:

Name of team (eg RNARS Copenhagen 'B')

Callsign of each station in the team
Individual claimed score for each station in the team

Claimed score for the whole team
The normal meeting-place of the club/branch

Declaration that each operator is a member of the affiliated society.

Each log within the entry should also be accompanied by a completed Summary Sheet (eg Form HFC2) as specified in the General Rules.

(f) All the entries from each competing society are to be sent in one package to RSGB HF Contests

Committee (AFS), c/o SV Knowles G3UJF, 77 Bensham Manor Road, Thornton Heath, Surrey, CR7 7AF. Packages must be postmarked no later than 1 February 1993. (Please ensure that logs are well packed to avoid loss or damage in transit.)

9. Awards:

(a) The Edgware Trophy will be awarded to the leading affiliated society.

(b) The Marconi Trophy will be awarded to the individual station having the highest checked score. (This is a truly outstanding trophy, and for the first ten years that it is awarded the winner will also receive an engraved miniature keepsake. For this reason, a particular operator will be eligible for the award only once in any period of five years; if the leader is ineligible he/she will receive a certificate of merit, the trophy passing on to the next highest scoring entrant who is eligible.)

(c) Certificates of merit will be awarded to the second- and third-placed affiliated societies.

(d) A certificate of merit will be awarded to the highest-placed Scottish affiliated society.

SSB AFFILIATED SOCIETIES TEAM CONTEST 1993

This event is scheduled for a Saturday in deference to the large number of 80m SSB operators who regularly use the band on Sundays at this time. The rules for this event are the same as those of CW AFS, except as detailed below.

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

2. When: 1300GMT to 1700GMT on Saturday 16 January, 1993.

3. Teams: Teams comprise up to THREE stations.

5. Contacts: SSB only in the band 3,600-3,720kHz. Any stations, including overseas, may be worked for points.

6. Contest Exchange: RS and serial number, commencing with 001.

8. Entries must be postmarked no later than 8 February 1993.

9. Awards:

(a) Certificates of merit will be awarded to the three leading affiliated societies and to the highest-scoring individual entrant.

(b) A certificate of merit will be awarded to the highest-placed Scottish affiliated society.

HF CONTESTS CALENDAR

- 14 Nov Club Calls (CCC) (Aug 92)
- 13/15 Nov JARL INTL DX SSB (Nov 92, p14)
- 14/15 Nov WAE RTTY
- 15 Nov OK DX (Mixed) (Nov 92, p14)
- 21/22 Nov 2nd 1.8MHz CW (Aug 92)
- 21/22 Nov All Austria CW
- 28/29 Nov CQWW DX (CW) (Oct 92, p19)
- 5/6 Dec ARRL 160m
- 12/13 Dec ARRL 10m
- 2 Jan LF Cums 7MHz
- 3 Jan LF Cums 3.5MHz
- 4 Jan LF Cums 1.8MHz
- 9 Jan LF Cums 3.5MHz
- 10 Jan AFS (CW)
- 12 Jan LF Cums 1.8MHz
- 16 Jan LF Cums 7MHz
- 16 Jan AFS (SSB)
- 16/17 Jan HA DX CW
- 16/17 Jan AGCW-DL QRP
- 17 Jan LF Cums 3.5MHz
- 20 Jan LF Cums 1.8MHz
- 23 Jan LF Cums 3.5MHz
- 24 Jan LF Cums 7MHz
- 28 Jan LF Cums 1.8MHz
- 30 Jan LF Cums 7MHz
- 30/31 Jan CQ WW 160m
- 30/31 Jan UBA SSB
- 30/31 Jan REF CW
- 31 Jan LF Cums 3.5MHz
- 5 Feb LF Cums 1.8MHz
- 7 Feb LF Cums 7MHz

NATIONAL FIELD DAY 1992

RESTRICTED SECTION

Posn	Call	Club/Group	1.8	3.5	7	14	21	28	Points	OSOs						
1	+ G3GRS/P	Gravesend RS	1097	149	651	173	566	155	612	166	547	158	1608	241	5081	1042
2	+ G3WGT/P	Red Dragon CG	804	108	354	102	561	162	672	207	647	203	1892	306	4930	1088
3	* G4MBC/P	Mid Beds CA	944	123	563	157	748	211	814	242	514	145	1106	161	4678	1039
4	5 G3MXP/P	Uckfield CG	1095	150	545	143	548	150	561	169	696	204	1191	174	4636	990
5	5 G3FXB/P	Londings CG	941	129	605	158	414	116	710	207	603	186	1162	169	4435	965
6	G4FNL/P	Lichfield CG	1037	141	491	135	552	156	603	176	539	156	1183	175	4450	939
7	G3KOB/P	Downold ARS 'A'	855	117	589	162	571	176	792	241	451	134	1092	159	4503	989
8	G0PNW/P	North West CG	733	98	412	106	625	175	654	188	516	149	1312	195	4252	911
9	G3VER/P	Verulam ARC 'C'	981	129	441	116	565	159	541	153	426	121	1162	174	4116	852
10	G3BSQ/P	Aberdeen ARC 'A'	670	90	356	106	420	113	395	113	646	194	1560	236	4047	852
11	G3ZRS/P	East Yorks CG	779	102	595	163	630	170	436	122	582	169	884	127	3906	853
12	G3KHZ/P	Parkair Electronics	632	84	322	88	521	144	405	116	403	116	1518	234	3801	782
13	G4JKS/P	Verulam ARC 'B'	1010	137	351	94	521	146	383	114	454	132	1019	151	3810	774
14	G3GLL/P	Tollesbury CG	644	83	674	181	637	173	416	118	519	149	844	122	3734	826
15	G3OZF/P	Chiltern DX Club	521	70	480	126	675	184	738	221	160	566	690	97	3670	858
16	G3WSC/P	Crawley ARC	824	116	509	134	542	156	373	100	283	76	1017	144	3548	720
17	G4BRA/P	Bracknell ARC	549	73	414	127	616	171	347	101	333	101	1249	184	3528	757
18	G3SFP/P	Scottpate ARC	951	126	358	97	616	172	589	170	243	69	699	101	3456	735
19	G4YMP/P	Gloucester ARS	810	108	392	101	319	99	433	131	389	120	1049	159	3398	718
20	G4FOX/P	Melton Mowbray ARS	856	144	298	82	468	132	489	141	340	102	920	137	3371	708
21	G4DYC/P	Norfolk ARC	660	97	225	62	813	235	583	176	496	154	543	76	3320	790
22	G0FBB/P	Windmill CG	788	105	493	140	557	138	542	150	399	128	529	85	3308	746
23	G3M3N/P	Windy Yett CG	480	64	236	66	453	123	665	189	553	161	920	133	3307	736
24	G4OGB/P	Souththorpe ARC	664	88	454	124	496	144	635	184	198	63	709	102	3156	705
25	G6UQ/P	Stockport RS	644	96	324	84	433	121	565	166	326	98	783	113	3075	678
26	G3TVS/P	Thames Valley ARTS	617	84	307	79	444	124	394	115	225	64	1025	171	3012	637
27	G3TRF/P	Maldstone YMCA ARS	536	70	155	41	421	115	353	101	321	100	1003	143	2789	570
28	G3W0I/P	Newbury & DARS	305	40	234	61	657	203	502	134	226	60	804	114	2728	612
29	G3Y0D/P	Hereford ARS	528	72	243	64	385	112	192	58	285	81	944	137	2577	524
30	G3DIT/P	South Hants TS	377	53	274	72	465	151	376	111	186	43	837	129	2497	274
31	G4HRC/P	Havering & DARC	500	68	194	51	523	141	489	147	327	93	455	71	2498	571
32	G0RSR/P	Reading & DARC 'B'	437	57	441	125	301	83	297	84	333	99	645	94	2473	542
33	G4WSM/P	Weston-S-Mans RS	332	43	254	66	480	192	528	152	299	82	368	50	2261	585
34	G4FNP/P	Eslington ARS	512	70	242	63	143	39	260	69	411	115	614	90	2182	446
35	G3WOK/P	Southdown ARS	210	28	266	83	130	72	329	96	251	73	948	154	2134	506
36	G3GCG/P	Blackpool & Fylde	537	70	223	56	378	99	348	95	189	54	431	61	2106	435
37	G4GCT/P	North Bristol ARC	316	44	190	48	364	94	429	116	307	87	462	66	2068	455
38	G3W3K/P	Powys ARC	400	116	565	180	683	216	175	42	160	25	1963	579		
39	G0ANT/P	Eden Valley RS	149	39	374	105	443	124	154	49	684	100	1825	417		
40	G4UFP/P	Exmoor RC	356	178	140	35	251	67	245	64	123	35	694	97	1809	344
41	G3FVA/P	S Manchester RC	387	51	235	62	153	42	435	136	145	43	389	58	1744	392
42	G4WLZ/P	Meirion ARS	37	5	134	35	303	83	556	148	291	62	264	39	1585	392
43	G4MDY/P	Banff & DARC	176	26	2	1	428	116	425	118	397	92	224	76	1582	429
44	G4JSP/P	Darwen ARC	214	124	103	724	238	148	39	434	66	1520	446			
45	G4ECT/P	Cheshunt & DARC	160	20	4	1	300	90	296	83	61	17	565	86	1386	297
46	G4M0T/P	Aberdeen ARS 'B'	64	9	162	43	227	65	287	87	00	23	480	68	1300	295
47	G4FBS/P	Hordean & DARC	67	64	17	224	61	434	129	129	317	377	52	1228	296	
48	G3ZME/P	Telford & DARS	397	53	64	17	208	56	184	49	86	26	236	34	1175	235
49	G3GXJ/P	Eccles & DARC					552	186							552	186

OPEN SECTION

Posn	Call	Club/Group	1.8	3.5	7	14	21	28	Points	OSOs						
1	+ G3LUT/P	Reading & DARC	798	109	500	129	615	172	779	236	661	201	1926	295	5279	1142
2	+ G3PRC/P	Plymouth RC	825	109	467	125	569	155	689	205	538	156	1894	257	4773	1007
3	* G3LCP/P	Oxford & DARS	934	128	390	105	541	154	686	209	663	202	1375	211	4589	1009
4	G3TBP/P	East Notts CG	941	131	552	148	590	174	589	179	403	124	1498	226	4573	982
5	5 G3VHB/P	Lichfield RC 'B'	879	120	526	147	637	185	568	176	729	225	1221	186	4566	1039
6	+ G3M6X/P	String & DARS	687	90	324	83	536									

National Field Day 1992

Organised and reported by Chris Burbanks, G3SJJ, with band adjudication by G4IQM, G3SQX, G2HLU, G3UFY, G3WRR, G3KHZ, G4BKI and G3KDB.

TO QUOTE the newsletter of the Gloucester Amateur Radio Society who have entered every Field Day since its inception in the 1930s (Pat, G3MA, has participated in each of those events): "We enter as a club, and although Field Day is a contest in which we aim to do as well as we can, the object is to enjoy the event. We know we will not be amongst the leaders, but we must all, as individuals, aim to improve our skills at whatever task we undertake. By approaching it with this philosophy, we will derive the maximum amount of satisfaction from our efforts and become better operators and loggers".

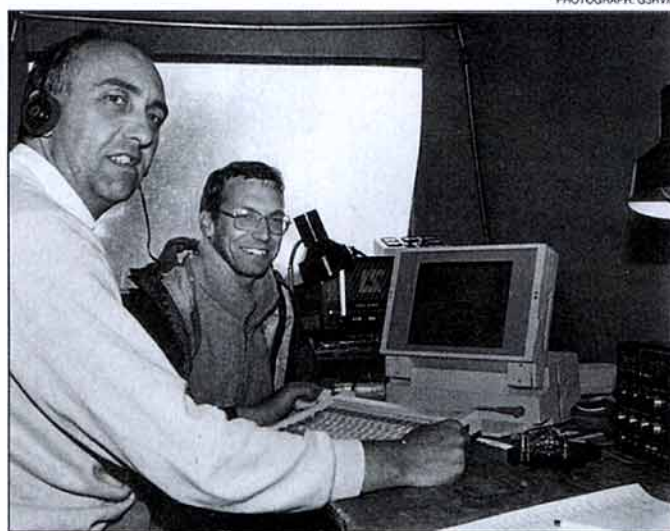
Group participation is undoubtedly the cornerstone of Field Day. It is one of the attractions of this event that all members of a team need not be contesters or even CW operators. Other expertise can be useful, perhaps a computer specialist or a mechanically minded person to work on generators and antennas.

Single-operator entrants should not be deterred though, as there seems to be an increasing interest in this area. It is obviously more difficult to assemble a portable station and keep it operational over 24 hours so maybe an award could be made in future events.

Restricted Section

THE FIERCEST competition for top places exists here and this year's event proved no exception. Once again G3GRS/P was the leading group. In the twelve Field Days since 1981 the Gravesend team has never been out of the top three. Some achievement! A 270 ft doublet across the River Wey was used to good effect on the three lower bands. Interestingly, second placed GW8GT/P, on a more elevated site, scored better on the higher bands and worse on the lower ones.

Contesting encourages inno-



The Winners! Don, G3XTT, and John, G3WGV at Reading's station G3ULT/P.

vation and ingenuity. Computer modelling with W7EL's ELNEC is being increasingly used and rumour has it that the popular 260/270ft centre doublet is not very efficient on 21MHz. Several groups employ a plug and socket arrangement to reduce the length of the antenna to a double extended Zepp on 7 or 14MHz, giving a useful 3dB gain, adding the extension overnight for the lower bands and then unplugging at dawn for the remainder of the event.

Matching units are another source of experimentation. Whilst some groups favour separate units for each band, others use a single tuner marked per band. G3GRS/P and G3KHZ/P prefer the more efficient parallel tuned system as against Z-match and T-match units. A difference in construction approach is most apparent, though, with a well engineered relay-switched device being used by G3KHZ/P.

Low Power Section

THE HFCC was pleased to receive six entries in this new section. G4BUE/P took first place using a two section doublet with a 260ft top for the lower bands, reducible to 85ft for higher frequency use. G3UES/P and G3WKS/P both had 80m loops. Antenna considerations are much the same as the Restricted section, but no doubt operating skill plays a very important part with patience and search-and-pounce techniques being critical. All participants commented on how successful they thought the idea was and will be back next year.

Open Section:

FOR THE second year running, Reading and District ARC, G3ULT/P, are overall winners and the leading Open section entry. A combination of computer-con-

trolled logging and band switching, efficient organisation, operating skills and equipment providing a very productive station. G3XTT and G3WGV were the operators with obviously good back-room help.

Congratulations also to the Plymouth Radio Club, G3PRC/P, who rocketed up the ladder to a creditable second place; G4HTD, G0IVZ and G0JNZ steered them to success. The Scottish Trophy changes hands this year, going to the Stirling and District ARS, GM6NX/P, which was operated by GM3YTS alone.

With a wider choice of antennas available for this section, more attention needs to be paid to their selection. Dipoles for the three lower bands seem to be favourite, with height being a ponderable factor. Obviously from an efficiency point of view, the 1.8MHz aerial needs to be as high as possible with some groups managing to arrange the apex above their HF arrays. For good UK and European coverage on 3.5MHz, an average height of around 16m seems a good compromise between the high angle radiation coming from lower height, required for the UK, and the lower angle required to put a good signal into Germany. 7MHz is perhaps the most difficult to tackle and probably a combination of a low (10m) dipole and a more gainy array for longer haul is ideal. On the three high bands, height is not so important as gain and a standard 3-element tribander is just not competitive.

Band Reports

1.8MHz

Conditions were reported as "quiet", "down on previous years", and "busy as usual", but all seemed to enjoy the fray. Favourite start times were between 2030 and 2115 with contacts still to be had at 0240. Noticeably, Restricted section stations in the south-eastern part of the country made the highest scores. G3GRS/P emerged band leaders by just 2 points after re-check-

Award Winners

NFD Shield	Reading & DARC	G3ULT/P
Bristol Trophy	Gravesend RS	G3GRS/P
G6ZR Memorial Trophy	Plymouth RC	G3PRC/P
Gravesend Trophy	Red Dragon CG	GW8GT/P
Scottish Trophy	Stirling & DARS	GM6NX/P
G3YF Memorial Trophy	Guernsey ARS	GU3HFN/P

ing both logs. In the Open section, G3TBK/P, with 131 contacts from 5 visits, made fewer logging errors than G5LO/P with 128 QSOs in 6 sessions.

3.5MHz

With an average points value of 3.7 from G/Eu portables, it is vital to spend time on the band but best conditions tend to coincide with those on 1.8MHz. Leading groups solve this by making short visits during the early evening with concentrated sessions from midnight, checking other bands approximately every 30 minutes to evaluate conditions. High scorers were G0BRC/P single band entry with G3CNX/P and G3TBK/P, all in the Open section. G3GLL/P and G3GRS/P were the leading Restricted groups. In the QRP section, G3WKS/P were clear winners.

7MHz

For the multiband station, little and often seemed the best approach this year with the improved propagation on other frequencies. Leading groups made ten or more visits spaced throughout the event, with peak activity occurring from 1200 - 1500 on Sunday. There was considerable competition among single-band Open section entries, with G5UM/P leading the field and using a W8JK wire beam to amass 1356 points from 443 contacts. Multi-band

leaders, G4ALE/P, used a horizontal loop to obtain their top score. In the Restricted section, G4DYC/P were clear winners with 813 points from 235 contacts.

14MHz

After an absence of 4 years, GU3HFN/P came back in style to win the G3YF Frank Hooson Memorial Trophy by a huge margin. A concentrated 22.5 hours produced 860 contacts and 2392 points and the benefits of being put onto a US packet cluster gave them a queue of State-side stations to work.



A rather unusual 'shack' at GM6NX/P.

The busiest periods seemed to be 1900 - 2200 on Saturday, 0400 - 0730 and 1300 - 1300 on Sunday with many groups taking advantage of a remarkable period of short skip lasting from Sunday morning through to the finish. Top scoring rates achieved by leading Open section stations over short periods gave a contact rate of 120 per hour with consistent averages of 60+ per hour. Top Restricted section group G4MBC/P spent 7.5 hours for their 814 points whilst G3KDB/P needed only 5 hours for 800 points. G3UES/P headed the Restricted section with 360 points using an 80m loop.

21MHz

At times, this was the highest frequency open, of course, whilst 28MHz was often a tantalising distraction for double points. Highest scoring rates were achieved by G3NJA/P (1700), G3ULT/P (1700), GM3BSQ/P (1300), and GW8GT/P (0600). Efficient band use can be measured by the number of hours spent divided by the points scored and in this respect, the order was



G3KKQ makes last minute preparations to Echelford's station G3UES/P.

G3NJA/P, GM3BSQ/P, GW8GT/P, G3ULT/P and GM6NX/P.

28MHz

This year the band produced record scores. Restricted section band leaders, GW8GT/P, with a V-Beam configuration providing considerable gain, made 1892 points from 306 contacts. Eight visits to the band netted 168 European and British portables. Open section leaders, G3ULT/P, made five visits for their 1926 from 295 contacts of which 185 were Eu and G portables. Though further West and able to profit more from sporadic E propagation, GW8GT/P's points per QSO were in fact lower than G3ULT/P (6.18 and 6.53 respectively) suggesting that the antenna was probably too good for inter-Eu contacts. DX reported was mainly from Africa, North America and Asia. In both sections, leading logs showed around 60% of the stations worked were portables, emphasising the importance of good scores on this band.

Inspections

TWENTY-EIGHT inspections reported no major problems, except for one entrant, but this was associated with interpretation of the rules on masts. Several groups who had to withdraw did not notify me and this caused one inspector to travel some 80 miles for no reason.

Survey

INCLUDED IN the stationery sent out to all 109 registered entrants was a questionnaire to gauge reaction to possible rule changes. There was a 60% response with over 80% of the respondents saying "no" to changes in Power Levels in the Open section and Bonuses for 1.8 and 28MHz. The response on the reintroduction of

1993 HF NFD Rules

IN ORDER to relieve space for contest results, abbreviated NFD rules will appear in the February 1993 edition of *RadCom* and a full set will be distributed to all registered groups before the event.

monitor receivers was 55% against and 45% for.

The HFCC having discussed the results, decided not to institute any changes in the rules for next year, but will keep the monitor receiver situation under review. The main difficulty regarding this rule is whether to allow any kind of additional receiver, including those which could be coupled together enabling a 2nd operator to align the frequency of a wanted station, or whether to restrict the use to a remotely positioned receiver for propagation monitoring only.

Finale

ALL TOGETHER a more successful NFD this year, at least for band conditions, if not weather.

Several of the previous top groups were unable to take part this year we look forward to working G5BK/P and the other groups again next year. Derek provided information on early events and it seems the first real National Field Day was probably in 1933. This would make the 1993 event, to be held on 5/6th June, its Golden Jubilee year and we are hoping for good turn out. Rumour has it that members of the Society's Council will be fielding a team! Welcome to the most popular contest in the UK.



GM3YTS operating the Scottish trophy winning station GM6NX/P.

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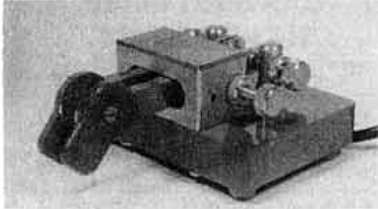
TO CELEBRATE next year's 60th anniversary Field Day, *RadCom* will be looking back on the history of this most popular event. If you have any photographs, old or recent but preferably evocative of what NFD is all about, please send them to us as soon as possible, indicating which may be kept and which you want back.



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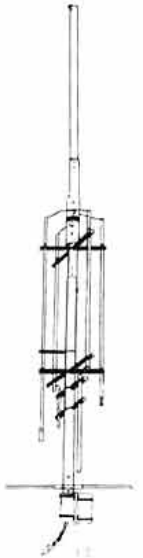
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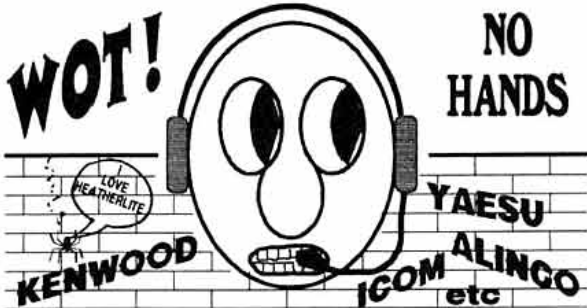
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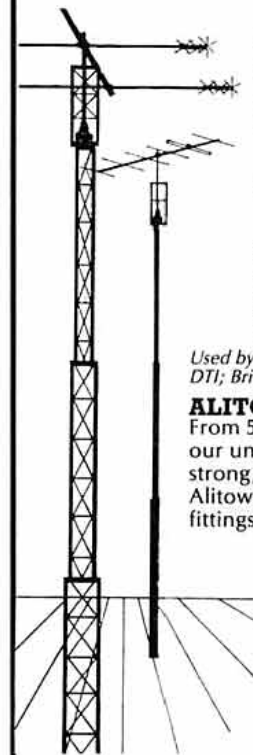
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KENWOOD R200, brand new and unused in orig packing: £430. G3NJP QTHR. (Truro) 0872 501487.

MAJORCA. Fabulous QTH, top floor, very large, one bedroom apartment, fully furnished, telephone, mini beam and full size G5RV on roof, double garage, swimming pool, garden, three balconies, storeroom, residential block-ideal retirement or holidays. Reluctant sale, part exchange UK property, cash adjustment either way. Escuturas (deeds) with sale, fee-hold: £58,000. Consider 50% sale for £30,000. Further details, SAE G4WVW QTHR. (Newcastle upon Tyne).

SHACK clearance. CM35 Altron mast, wall mount: £225. 12 ele ZL special 2M: £12. 19 ele Tonna 70cms: £14. 2M HB9CV: £2. 4M Halo: £3. 2M slim Jim: £2. 6M 5 ele Tonna: £20. 4M AKD rig, 25W: £90, as new. Kenwood SP31 spkr: £30. BNOS 3/50 144MHz linear: £45. AMT3 Amtor terminal: £70. KPC2 TNC: £90. KPC4 TNC with clock: £170. 4M tnsrvtr: £70. (Dorking) 0306 883098.

KENWOOD TS450S with internal ATU plus mic, only 9 months old: £1150 inc carr. GW3WSU QTHR. (Nr Barry) 0446 781261.

SHACK clearance. FLDX/FRDX400 HF separates: £200. FT480 2m m/mode: £230. Totoko 2m sidebander: £100. FT207R 2m Handie: £85. Mirage B108 2m linear/preamp 80W: £85. ITT Starphone 2m, single chnrl: £30. 10A pwr supply: £30. Tex (Hampshire) 0420 477533.

TEN TEC Corsair, filters 285, 288, PSU, ATU 238, DL MFJ260, mic 700C, LF 30A, all these items are new and unused due to location problems, no split, no offers: £1200 almost half price. (St Annes) 0253 780591.

TRIO 9130 2M m/mode mobile bracket lead, manual, inspect and collect or postage: £320 ono. Jim G0BGY. (New Malden) 081 9495548.

TRIO 9130 2M m/mode TX/RX 5/25W, mobile bracket, fist mike, good cond. Sell: £300 ono or exchange 2M ORO linear or FT726R 70cm & satellite modules? GOOPL QTHR. (Ludlow) 0584 876675 after 6.30pm.

TRIO TS940S with SP940 spkr and service manual: £950. FT70F converted to FT70G: £195. Microwave modules 144/28 tnsrvr: £45. FT727R with hand mic: £195. Atari 520ST upgraded to 1MB SM124 monitor, two SF354 disk drives: £195. (Northampton) 0604 864476.

TS520SE, mint condx, bxd C/W MC35S SWR Bridge FF501(LPF) all + plugs, leads, fuses ETC h/book and logbook (new) CW filter: £350. No offers. Carr extra. Peter (Guisborough) 0287 634397 (W) 0677 60302 - after 6pm (H).

YAESU FT301D solid state tcvr, digital freq readout, CW filter fitted and FV301, external VFO: £280. FP301 PSU: £75. Argonaut 515 ORP tcvr with 208A CW filter and paddle keyer: £225. Kenwood TR9130 2m all-mode tcvr: £295. Kenwood MC60A mic: £40. All with instruction mans; carr extra. G4HQJ QTHR (Folkestone) 0303 256318.

286-12 1M RAM 21M HD 5.25/3.5 FDD's EGA colour 2yr old: £385. 8088/6 640K 21 M HD 5.25 FDD mono: £175. Or PX HF tcvr. Also Pson Organiser LZII with leather case. PSU 128K data pack, manuals: £85 or PX 70cm tcvr. (Coventry) 0203 450476.

286-16 computer 3.5/1.44 floppy 42meg hard disc, colour display, mouse, windows, good condx: £400. Ring after 6.30pm. (Manchester) 061 748 4010.

6 METER tnsrvtr 28MHz. Circuit kit. Professional aligned. Full interface for TS430S. Fitted in die-cast cases: £40 ono. GW3KAJ QTHR. (Llanidloes) 05512 3511.

ALINCO 2M FM 45/5W box mounting bracket, mic, as new, not used, mobile model DR112E: £165 to include postage registered. (Birmingham) 021 327 0412.

ALINCO ALD24E dual band mobile 270 5/25 watts output mobile mount: £225. GDO all bands: £10. P + P extra. Mark GOLGJ. (Derham) 0362 691099.

ALTRON AQ6-20M 3ele beam, VGC: £100 + carr, no XYL approval. Alinco 2M FM 40W mobile tcvr. Alinco 2M FM H/Held. GW4RPL QTHR. (Caermarfon) 0286 5264.

AMSTRAD 1512 mono monitor: £65 ono. (Hendon) 0404 41026.

AMSTRAD PC1640 computer, 640K RAM, twin 5.25" floppy drive, colour display, mouse, c/w MS DOS 3.2, GEM 2.0, Wordstar extra. Halo, Supercalc 321, Ability. Ex cond: £450 the lot. G4GTR QTHR. (Bakewell) 0629 640475.

ANTENNA rotator YS. 130 50KGs: £50. Umer recorder CR210, offers? Collins Kwm2 516F2PS remote VFO, superb condx: £400. G0GGI. (Kirby-in-Furness) 0229 89635.

AR88 owners. Brand new 4 gang tuning capacitor, 4 pole wave-change switch. 50 RF coils L3.L4.L9.L10.L51.L52.L53. 15 IF cans all for AR88D. Also filter coil for AR88LF. Offers for lot. G3ION. (Southampton) 0703 769706.

AR88, VGC, buyer collects: £65. 1155 unmod.: £20. Welch pwr/swr meter, bxd as new: £40. SEM Z-Match: £35. G4KEG QTHR. (Southend-on-Sea) 0702 520094.

ARGONAUT 515 with Tentec PSU and h/book, first: £300 secures. G3UOV. (Bexhill) 0424 32583.

BBC-B computer, monitor, datacorder, h/book, RTTY/CW s/ware, interface unit, connecting cables: £95. TA33 antenna, good condx: £45. (Worcester) 0905 51805.

BBC-B/7, B/W monitor, DDFS, sideways RAM/ROM, 13ROMS incl system-delta, inter-base, wordwise +, packet, manuals, mags, books, programs on disk incl Satflow Masterfile etc. My complete 'beeb' system, twin 80/40T drives with PSU: £295ono. (Sutton Coldfield) 021 308 4764.

BEARCAT 50XL H/H rcvr with nicads, as new: £65 ono. Jaybeam D8/70cm, new: £30. D5/2M: £25. Carr extra. G3JAU. (Bournemouth) 0202 514078.

BRAUN T1000CD, mint: £180. FT70G, mint: £300. Sony PRO80: £180. Scanner AR1000: £180. 18AVT: £50. 14AVO: £50. Jaybeam LW24 70cm: £30. Log Periodic 50-500MHz Tx Rx: £50. Morse Machine, unused: £120. Telexreader: £150. Drake Controller C4: £100. (Llanelli) 0269 871382.

BSX TNCs with h/ware CW ID four in IU 9" rack: £250. Pye Europas, 704875 25 watt, 144.650 25 watt 432.675 5 watt: £50 each. EX GB7HC Amstrad PC238/65 4B RAM 65MB harddisk colour VGA monitor: £550. Jayton 286/10 3.5 floppy CGA mono, 2 serial, 1 parallel, IDE controller: £220. Julian. (Worcester) 0327 857766.

BUTTERNUT butterfly 5-band 20-10M complete mini beam dismantled: £125. Also Hy-Gain vertical 12 AVQ-S (20-15-10)M assembled and tuned, 13.5ft long, will travel on roof rack: £65 manuals with both. Jim (Bridgwater) 0278 684717.

COLLINS KWM-2 with PS-2 240V PSU and matching SM-3 mic. Classic radio, immac condx: £375. G4TMO. (Andover) 0264 353145 (answerphone).

COMPLETE HF station FT102R AM/FM, FC102 ATU, SP102 spkr unit, MD-1 desk mic, HK707 key, manuals, all in gd cond: £800. G0KOG QTHR. (Northampton) 0604 751928.

COMPUTER, printer and word processor for under: £100! Amstrad PCW-8256 with CP-M locoscript and printer for just: £99. G1XPB QTHR. (Potters Bar) 0707 57702.

CUSHCRAFT 15-4CD 4-el beam, as new, unused: £175. SSTV tcvr: £40. Variac controlled QRP pwr supply, 3.5KV: £95. Motorola 70cm 2W h/eld, xtalred for RB6 RB10: £30. 3x4-250: £25. Jim Blackburn, G4ACI QTHR (Upholland) 0695 622754.

DATONG electronics Ltd. Datong m/mode FL3 filter: £90 + post. Katsumi Electronics keyer, bxd: £45 + post. LR2 2 metres vertical: £40. Brian GOOIM. (Calne) 0249 816334.

DATONG FL3 filter: £295. Shure 444 mic: £35. 830 VFO module: £25. Datong clipper: £25. KW LFP: £35. Carr extra. (Seaford) 0323 897145.

DENTRON of America GLA1000B linear amplifier 4 x D-50A (6LQ6) valves giving 800 watts CW input and 1200 watts input PEP SSB, built in 240V supply. Compatible with solid state tcvrs, max drive of 125watts; 4 x 6LQ6's new spare valves. All bxd with h/book: £395. G4ISK not QTHR. (Alton) 0420 63944.

EINSTEIN 6k4W drives computer, mono monitor 80col, card, packet s/ware manuals, bxd: £150. Hokushin HF5 vertical antenna 80-10M: £40. Yaesu G250 rotor and cable: £50. Hi-Mound HH808 stainless steel straight key with marble base: £30. (Warrington) 0925 821414.

FIVE 4CX250B, 3 new, three bases, one chimney: £15 each. RSGB Journals 1935 - 1990 only 8 issues missing, complete: £160. SW

Mag 1949-64, bound: £120. (Bridgwater) 0278 455613.

FT1012D Mk3 WARC, mint cond with matching SP901 spkr, one loving owner from new. BXS manuals: £450. HF linear Heathkit SB200 with manuals: £250. Monitor scope KW108 with manual: £75. G4ZIP QTHR. (Heathrow) 081 890 4666.

FT1012D with mics, spkr, all VGC but FT101 blows fuses at switch-on. Phone for more details. Certainly fixable, hence: £125 the lot. Robert, GWOMOH (Rhyll) 0745 338197.

FT102 tcvr, top band thru to ten, very good order, instruction manual: £450 ono G4EJW QTHR. (Burnham on Sea) 0278 784734.

FT102, FC102, FV102 DM (rare) SP102, recently serviced, new valves, pristine condx. PWO. Bargain at: £850. no split. (Killylea) 0861 569507.

FT200 PSU, spkr, Shure 444 mike, pwr meter: £200 offers. SEM noise blanker MK1: £40. PO interference recr. No.40 A, 130kHz-33MHz 8 bands solid state, collectors item: £100. Offers. Control box for KR500 rotor: £20. For 103LBX: £20. 5" Electrostatic meter 0.5-20KV: £10. RF pwr meter, 2 metres, 0-25W oil filled load. 75 or 50 ohms: £10. Snail Blower 230v: £10. G4KDV. (Otley) 0943 463083.

FT290, chrg, nicads, case, strap: £210. Matching Daiwa LA2035R linear amp, 30W with preamp: £30. (Stamford) 0780 63604.

FT690R with Yaesu MD1 desk mic plus a 15 and 25W lineary plus SEM Z match ATU. All in good condx: £300. Buyer collects. John G1UNQ. (Coventry) 0203 336765.

FT707, excellent condx: £290. Tank antenna 19' long, six brass screw sections: £15. 21' aluminium mast 2" dia, two sections very light weight: £15. Partially completed PSU, all components: £15. Aluminium tubes 1" 5/8" 1/2" diameter. Buyer inspects and collects. Phone evenings. G2MA. (Rotherham) 0709 542708.

FT26R 2m 70cm 6m sat, vgc: £850. Crank up and tilt over lattice tower, 50', head, ground post, winches, etc VGC: £290. (Yorkshire) 0377 42550.

FT75B HF mobile tcvr, good condx: £130 ono. KW trap dipole 80-10M: £25. 16 ele Tonna, dismantled: £20. Shure 444 mic: £35 ono. Microwave modules 2M tnsrvtr: £50 ono. (Bristol) 0272 672124.

FT76GX with 2M module fitted, approx 2 years used, perfect condx: £1000 ono. May swap or PX for engineering equipment. (Blackburn) 0254 830557.

FT902DM: £425. FT790R with case, nicads and chrg: £220. FT225RD with Mutek front end: £250. BBC-B with colour monitor, Watford DVS, viewfinder, printer driver: £100. Amstrad PC1640MD, enhanced colour monitor, 30 meg hard disc, 5.25FD, 3.5 external FD, locoscript: £250. All with manuals. Altron 30ft telescopic tiltover with mounting mast with erection drawings: £175. KR400-RC rotor and controller: £75. G6LXJ QTHR. (Wembley) 081 903 4506.

GOODMANS spkrs, teak cabinets 15"x24"x11.5". £20 /PR, Thorens TD150/11 record deck: £10 Stereo sound record player: £10. Buyer collects. GMPXFR Frank. (Nr Glasgow) 0505 862581.

HEATHERLITE explorer linear and Capco 3000D antenna matching unit: £750 the pair. Prefer buyer inspects and collects but can negotiate. (Carlisle) 0228 26502.

HEATHKIT SB104A HF SSB/CW tcvr and PSU, solid state, digital freq display: £220. Packratt PK-232 m/mode data terminal: £240. G4DXO QTHR. (Hove) 0273 561616.

IC701 HF tcvr CW, IC701 PSU, SM2 desk mic, ICRM3 remote control, bxd: £350. Echostar manual satellite rcvr CW 1.8M dish, LNB, polariser, cables: £350. Video bandwidth filter for satellite TV DIXing: £50. All gear immac with h/books. G4JBH. (Yeovil) 0935 23873.

ICOM 4907c m/mode: £300. 290E 2M/m mode: £250. Both bxd and used base station only VGC MM5 70cm 10/50 linear amp: £65. SM5 desk mic: £25. Dvae G1100 QTHR. Evenings only. (Boulton) 0204 24104.

ICOM 70 + PSU + ETC's: £200. Icom 725: £450. CapCo loop AMA3+ controller 10-20

metres: £125. G4SLT. (Reading) 0734 478729.

ICOM 725 HF tcvr, HM12 mic, narrow filter: £550. Kent twin paddle Morse key plus keyer: £65. BW VS300A ATU: £110. Revex P300 DC pwr supply: £110. Challenger DX-VI six band vertical antenna: £130. IC24ET 2m/70cm dual band FM h/h incl hands-free mic, car, chrg and dual band mobile antenna: £210. BSX2 packet TNC: £50. All VGC. G4HHR QTHR (Crawley) 0293 885137.

ICOM AT-180 auto ATU, little used: £225. 'G' Whip 10-15-20 80-16m bands: £50. Mini beam HQ1: £50. DS8 80 QRP tcvr ass'd and bxd: £50. Bert G4HTM. (Basingstoke) 0256 25124.

ICOM IC3220E dual band, bxd and excellent condx: £325 ono. (Taunton) 0458 250970.

ICOM IC725, mint, FM 250Hz filter: £600. Part exchange TS930, TS440AT + PSU - cash adjustment. Two AEL813 valves, new. GOKSB 6-8pm. (Telford) 0952 612709.

ICS AMT-2 Amtor RTTY CW ASCII with manual and dumb terminal, works F.B.: £95. AR88 with manual, F.B professional calibration and aligned: £85. Manuals for Westminster W30AM, W15AM, Vanguard AM25T, Cambridge, FM10B: 50p each + postage. G4AKD (Cambridge) 0954 782974.

INVERTER, 12 or 24 volts input for 110 or 240 volts output. 500W. Offers/exchange WHY?. Contact Mark G1FYC QTHR. (Gloucester) 0452 501337.

KAM all mode, mauals, pwr pack: £170. ERA Microreader, latest mods, unused: £100. Kenwood hand mike, unused: £20. Buyer collects. G0MBM QTHR. (Peterborough) 0733 252865.

KENWOOD AT230 ATU 1.8-30MHz as new: £120. G4UFK QTHR. (Torrington) 0805 23550.

KENWOOD RZ1 W/band rcvr: £250 ono. AOR3000 comms rcvr: £495. AOR1500 scanner with SSB: £195. Kenwood TH-77E d/band hand, spare case: £295. All as new, manuals, bxd. Zenith Supersport 286/20HDD, hardly used: £495 ono. Kenwood TK801S re-aligned 70cms mic m/mount 45W: £75. Jaybeam Q42M beam: £15. Jaybeam MBM 48 70cms beam: £20 excellent condition. Tennamast ground post, winch, h/units: £55 ono. Ken. (Dunstable) 0582 605693.

KENWOOD TS140 matching spkr and ATU CW filter fitted: £560. (Chesterfield) 0246 569527.

KENWOOD TS440S, AT230, PS430 and LF-30A, together: £1100. Excellent condx, as new, necessity forces sale. Anne GOLFZ. (Redditch) 0527 585668.

KENWOOD TS440S, mint: £725. Icom IC-R71A HF RX, mint: £350. Cushcraft R5 multi-band vertical HF, nearly new: £150. G3RCE QTHR. (Porsmouth) 0705 752618/

KENWOOD TS680, HF plus 6M mic, DC lead, manual, orig packing, VGC: £590. 5 el Tonna for 6M: £20. G4BOH. (Congleton) 0477 500296.

KENWOOD TS940S (optimised SSB/CW auto ATU V51 chip): £1150. Desk mic: £30. Head set with boom mic: £35. LK550 linear (3XB-500Z tubes): £1400. MFJ master keyer (with memories): £85. Paddle key: £20. 3.5 and 7.0MHz traps, unused: £35. Current balun, new: £35. Oil filled dummy load: £35. Butter-nut HF6V (collect): £50 + PL 259's SO239's N plugs elbow straight and T connectors. G3VVE evenings. (Bristol) 0272 656783.

KW complete HF station matching units. KW2000, AC pwr supply and spkr KW ATU, KW SWR meter, low pass filter, Shure mic, semi auto bug key. KW trap dipole 80-40. All as new condx. Will not split: £225 G3PVT. (Birmingham) 021 747 2329.

KW2000A + mic, AC PSU, DC PSU, h/book + circuit, working order: £75 ono. G3XHC QTHR. (Dartmouth) 0803 833621.

MFJ Grandmaster contest memory keyer, model MFJ486: £150. Kam versions TNC: £275. G0RKJ Rich. (Liskeard) 0579 340113.

MICROWAVE modules Morse talker model MMS1 with 12 volt PSU: £110. Contact GOPYD QTHR. (Kenilworth) 0926 56494.

MOBILE tower 60ft winch up and tilt over with head unit. Inspect and collect: £1250 ono. G4BP QTHR. (Scarborough) 0723 377296.

NELSON Quad complete except some wire. Eight extra extension rods: £250 ono. Buyer collects. G4KPT QTHR. (Wiveliscombe) 0984 24212.

PK232 MBX m/mode TNC, excellent condx, latest firmware up-grade fitted CW, all leads: £250 ono. (Bedworth) 0203 490483.

PLESSEY rcvr PR1551 allmode 100kHz-30MHz solid state: £150. RA121 SSB adaptor: £75. RA137 VLF adaptor: £75. Both for RA17. (Tewkesbury) 0684 295189.

PYE A200 linear amplifiers, converts 2/4/6 mtr: £12 + carr. G3AOS. 14 Coalpit Lane, Langley, Macclesfield SK11 0DQ. 0260 252287.

RA17L HF communications rcvr with h/book and spares: £135. RA98 SSB adaptor with h/

book: £30. PSU suitable 807 linear: £15. (Ipswich) 0473 689982.

RACAL RA17L clean and in GWO, ideal rx, sensible offers, no offers: £80. (Lincoln) 0526 343290 late eve up to 11pm.

RACAL RA17L rcvr, good condx with manual and circuit: £250. GM4HWO QTHR. (Edinburgh) 031 336 5917.

RADCOMS: 1985-91, free for collection. G3MQU QTHR. (Diss) 0379 642875.

RCI 2950 brand new 28MHz FM rig, unwanted gift: £295. Mosley Elan 10/15M + rotator: £130. KW pwr/swr 100/1kw: £25. Simpson 710 freq counter: £45. Tech dip meter: £30. Datong Morse tdr: £30. All in gwo. If not available, leave message on ansafone and I will ring you. (Mkt Harborough) 0858 462233.

REVCO magnetic mount, 2M HG3F loading coil, 5/8 whip antenna, all unused: £25. Buyer collects. G3JNM QTHR. (Bolton) 0204 843999.

ROTATOR KR400 plus 43 mtrs control cable and controller set, GWO: £100 ono. G4LLJ QTHR.

RX80 Kit-built Rx (RadCom 1981 G3WPO), Nine HF bands + 2m, digital readout, mains, useful beginner's Rx: £50. SEM 'QRM Eliminator', as new: £50. Both items with full data and post paid. GM3LJU QTHR (Dunoon) 0369 87 341.

SEIKOSHA GP700 colour printer, bxd, as new. Robot 1200 compatible. Your SSTV pictures printed in colour: £150. G3IAI. (Northampton) 0604 846945.

SHACK clearance: KW500 linear rebuilt to G3ISD design: £150. G4PMK Spectrum analyser: £50. DFC230 freq controller: £35. PS30 pwr supply: £90. Capco: Roller Coaster: £15. Single gang: £15. Twin gang: £15. Cirkit 6M Insrvr kit, part built: £15. MVMS RTTY to CW converter: £10. Many valves for KW2000, incl 6CH6: £15. (Stockport) 061 477 6702.

SHURE Base station mic: £20. Cubic comms antenna tuner single wire balanced coax fwd reflected pwr: £70. AVO model 8 Mk3: £30. Two ST5 tuning units: £25 ea. Two Dragon 32, with 5 system BMK cartridge printer: £75. Codar PR40 pre-selector 1.5 to 35MHz: £15. Transistor checker model ZQM-2: £10. Advance AF Sig Gen 15Hz to 50kHz: £20. SEM FET VHF preamp: £10. (Towcester) 0327 52309.

SILENT KEY sale G0BFP. TS530SP MC50 mike: £475. Buyer collects. G0BGG QTHR. (Chippenham) 0454 218431 evenings.

SILENT KEY sale G0JTS. Trio TS830S tcvr: £600. TR7625 2M tcvr FM 5/25: £100. MVT 5000 H/H scanner: £150. All in good condx. G0GXG QTHR. (Oxford) 0865 890461.

SILENT KEY sale, hardly used, complete HF station, Icom 725 tcvr, PS55 PSU, AH3 auto ATU, orig packing and H/books. Easy to operate compact 100W station, works all bands, top band thru ten with random length wire: £750. G4WNN QTHR. (London) 081 348 0947.

SILENT KEY sale. Yaesu FL2100Z HF linear: £400. Icom R70 RX: £350. KW lo-pass filter: £15. RF field meter: £5. Morse key: £5. Various mobile antennae HF/VHF: £7. Buyer collects, all in good order. (Ashburton) 0364 52238.

SONY FM-AM multi band rcvr ICF 6800W with manual and bxd, little used: £225. (Braunton) 0271 812203.

STABILISED pwr supply 13.6V, 10A, 12A intermittent; input 220V +/-10%, 0.5% stabilised output. Unused: £40. (Camarthen) 0994 482414.

STANDARD C78 70cm tcvr, 10W linear mobile mount, good condx: £125. AEA PK88 TNC: £95. Graham G1ULB. (Manchester) 061 789 1604.

SWAN 100MX solid state HF 100W, ST3, PSUs: £395. FT101 WARC: £185. Hi-Gain vert 20/15/10: £15. C58 prtble all mode Cirkit 15W HF linear 100mW input: £20. David G4OPF QTHR (Nr Basingstoke). Callers only.

SX Scanning receiver, matching PSU: £198. MFJ deluxe Versa tuner II, mint: £110. Both carr paid. John G4YDM QTHR. (Washington) 091 416 2606.

TELEQUIPMENT D83 twin beam oscilloscope, 10 x 12 cm display, 50MHz. YAESU FT290R mutek nicad 30W linear bandwidth, twin timebases 10ns-2s/cm: £200. Telemquipment D67 twin beam scope 8 x 10cm display, 25MHz bandwidth: £150. Thurlay 1905A 5 1/2 digit intelligent digital m/meter, as new: £200. G3TCU. (Godalming) 0483 423272.

TENNER MAST wind up, 35 feet max, good cond, 18 mths old, can be seen working: £275 ono. (Southend on Sea) 0702 346826.

TENTEC Corsair 2, matching PSU, model 705 desk mic, manual: £695. FT200/FP200, YD844 mic: £150. IC2025, 2M SSB/CW, 144-144.6, manual: £110. Davis G4ERW. (Surbiton) 081 399 0922.

TNSVTR Howes 2M120M, bxd, 10W output, suit FT290. £50. Howes Speech processor, bxd, wired for FT290: £25. Realistic DX302

HF receiver AM/SSB/CW: £125. Jaybeam 6 ele Quad: £35. All ono. Darrell G0HVQ, not QTHR. (Gloucester) 0452 385911.

TOKYO hy-pwr HX240 10M-80M tvtr, base/mobile use: £195. BNOS 144-3 linear FM/SSB receive pre-amp: £95. Both bxd as new. (Wilmslow) 0625 531154.

TRIO TR8400 70cm FM mobile. Mobile mount and all connecting leads, with manual. Well looked-after: £150. GPO Teleprinter No 15 (Creed 444), exc condx with orig table, rolls, tapes: Offers. G3RHZ (Leicester) 0455 272880.

TRIO TS520 HF tcvr, 5 bands, top to ten, used receive only - failed Morse, one owner, matching spkr, MC50 mic, DL1000 dummy load, hand book: £350 or nearest. G8USQ QTHR. (Stoke on Trent) 0782 324206.

TRIO TS930S tcvr with auto ATU, MC60 desk mic, SP930 spkr earphones, SWR meter, exc cond: £495. Also Trio 9130 m/mode tcvr with hand mic, slide mount mobile antenna: £195, good condx. (Horsley) 04865 3772.

TS-940S auto tuner, voice: £975. TS850S auto tuner: £975. No snags, both perfect. G2KF QTHR. (Cornwall) 0637 878741.

TS830S, immac: £625. R-600, VGC: £225. Siskin 2/70 on-glass mobile antenna: £25. Cedar shack 10 x 8, insulated, lined: £450 ono. G3XLL QTHR. (Diss) 0379 652043.

TS930S, excellent condx. No mods, auto ATU, CW filters fitted by Lowe, original packing: £1000. Buyer collects. G3KKP QTHR. (Leeds) 0943 872231.

VALVES. Over 70 vintage valves offered free of charge to good home, details from John G0NAJ. (Middlesbrough) 0642 851128.

VERSATOWER P60FT with masthead top bearing two auto brake winches, two sets bonds, KR600 rotator control, good condx: £295. Jaybeam tribander TB3, excellent condx: £195. Jaybeam 10XY 2M antenna: £30. BNOS 30amp pwr supply: £50. Weltz SWR pwr meter: £10. (West Horsley) 04865 3772.

WRAAE SC-1 SSTV tcvr modes 8-16-32 second mono colour and fax. Complete with keyboard for text: £390. G3TRB QTHR. (Worcester) 0905 775206.

YAESU FL2100B HF linear, immac, little used: £400. G3VAZ QTHR. (Luton) 0582 574707.

YAESU FT101E + FV101B, excellent condx: £275. Trio 2M FM TR2300 manual, leads, chrg, recent service: £100. G3UAA QTHR (Leicester) 0533 875241.

YAESU FT101ZD (not WARC) fitted fan and narrow CW filter, with antenna tuner, FC901 (illuminated meters) and external scanning VFO, FV901DM. Orig owner from new (non smoker). All manuals and original packing, mint cond: £600. No splits, no offers. Tony G3CWW. (Huddersfield) 0484 842330.

YAESU FT102, good condx, FM: £500. Also Yaesu FT221, vgc: £25. 2M base: £300. Trio TS520 in good condx: £275. Welz RS485 variable 4A PSU: £40. FV707DM digital VFO, Drake base mic and Datong ASP: £35. (Essex) 0206 575258.

YAESU FT290R mutek nicad 30W linear, SWR meter, colinear: £270. SEM Tranzmatch ATU ezitune: £55. BBC B 32K recorder, as new: £55. QTHR. (London) 081 989 3471.

YAESU FT290R mutek nicad 30W linear, SWR meter, colinear: £270. SEM Tranzmatch ATU ezitune: £55. BBC-B 32K recorder, as new: £55. (London) 081 989 3471.

YAESU FT709 HF RX/TX with matching FC-70M ATU. Thumbwheel switch tuning, covers 2-30MHz (no gaps). Fitted LSB filter: £400. G4TMO. (Andover) 0264 353145.

WANTED

RACAL TA349E complete unit with wiring trays or parts thereof. Would like any documents related to this equipment. Also looking for the autotuned ATU used with this equipment in royal naval installations, believed to have number HAA114. Please write to: Nigel Boyd 2 Church Close, Lower Willingdon, Eastbourne, East Sussex BN20 9QY.

WANTED 2M QRO linear, FT726R 70cm + satellite modules. Possible exchange Trio TR9130 2M m/mode 5/25W? G0OPL QTHR. (Ludlow) 0584 876675 after 6.30pm.

WANTED E-Z match by KW or SEM or KW107, KW207 or KW109. Also Heathkit GDO, model GDO-1U. Cash settlement. (Uplowman) 03986 215.

WANTED. 432MHz linear amplifier, 400 watts plus, working or not, homebrew or bought. GW8AWM QTHR. (Usk) 0291 672466.

AP1086 ISSUE 1 (RAF Radio Stores ref nos). Also Air Publications relating to radio, radar equipment, exc prices offered. Would purchase post-war to current magnetrons, klystrons, T/R cells, TWTs, photo-multipliers, microwave and special CV types. Required static or rotary converter AC or DC input with output of 80/115V 1500/2000 cycles. Also R/x type R1355 10/D13032 unmodified. (London) 071-511 4786 or 071-790 2846. Please phone any time.

1.8M sat dish for meteosat, pref with stand/mount. (Leigh-on-Sea) 0702 711181.

70CM, 6M modules for FT726R. Have HF module surplus to requirement. Cash either way. G6YOY. (N Surrey) 081 641 3593.

AEA CP-1 modem, must be in good condx. Dave G4ABU. (Barrow-in-Furness) 0229 822044.

BATTERIES and service manual for BCC 30 (A14) military HF manpack tcvr. G4WXX QTHR. (Liverpool) 051 722 1178.

CASE for Eddystone 830, 11.75 inches deep, also manual to purchase or copy. TS120S FT707 or similar / M rig. (Cirencester) 0285 821571.

COLLINS 30S1 linear, cash or part exc Collins KWM2 75S3C 32S3 KWM 380 etc. G3GBB 0379 783657 eves & w/ends.

COLLINS. Surrounding metal case req'd to complete restoration of maltreated 30L-1. Any S-line case overall depth 13inch will suit. Can anyone assist please? G3ONU QTHR (Watford) 0923 676344.

CUB SCOUT pack would like a Cushcraft R5 aerial also synthesized 70cms FM box. Details and price please to G4CCT. (York) 0904 411864 or 432510 work.

DRAKE 7-line items, always wanted, TR7/7A, R7/7A, all options, also RV7/75 VFO, CW75 keyer, 7077 mic, SP75, MS7, TV3300LP LP filter, etc. (Notts) 0602 609345.

FERGUSON audio 3457 service manual, photosat. Loan expenses paid. Urgent reg. EA7/G2BSW QTHR. (Estepona) 010 3452 802238.

GPO type lancet (pointed) topped galvanometer for telegraph set up. Jon GWF0J QTHR. (Swansea) 0792 795517 9-5pm, will call you back.

ICOM IC202S 2M SSB tcvr, must be VGC, unmod, mic, manual etc. Delivered if poss. Patrick G1TMD (eves). (Beckenham) 081 650 6596.

KDK 2033 2M FM rig for spares or repair, anything considered. Also Trio VFO 120 and linear. GWOPLN. (Cardiff) 0222 554920.

MANUAL PC/XT or compatible in good condx, full price paid. G0OOJ QTHR. (Bordon) 0428 713348.

MY TYPE-D wavemeter now u/s. Require Ireq checker. Also main marine rcvr about 200-3000kHz mains/bttry. Gibson G3RCX QTHR (Leigh-on-Sea) 0702 521973.

R1155L-N (with 160 mtrs), prefer worker, but will consider non worker, but must be complete. G4EHT QTHR. (Lichfield) 0543 251133.

SPECTRUM analyser based on G4PMK design. Constructed to prof. standard. (London-derry) 0504 352804.

TEKTRONIC oscilloscope type 547 working or for spares, will collect. (Wolverhampton) 0902 187126.

TOWER about 60ft, Versatower or Altron. Must tilt. Will collect. Also wanted 2M and 70cm crossed yagis. Tim G4CCN QTHR. (Woodbridge) 0394 386529.

WANTED. Icom R7000 RX or similar. G3NXD QTHR. (Kidderminster) 0562 850570.

YAESU FRV-7700 freq converter in GWO, model A, B, or D covering 118-150MHz. GODWJ. (Leamington Spa) 0926 422754.

YAESU FT101 tcvr. Built in AC and 12v DC pwr supply. USB/LSB CW AM 260 watts PEP. 160 thru 10m, WWHV 10MHz. Spare 12BY7A driver and matched 6JS6A valves. As new, h/book: £200. G3PVT. (Birmingham) 021 747 2329.

EXCHANGE

TRIO 9130 plus operators and workshop manuals and many extras. Also 28MHz FM rig with manuals and base mic plus Realistic Pro-34 H/H scanner 68-920MHz with many extras. Exchange for Icom IC736 with 2, 6mtrs and 70cms or similar. G4XPP QTHR or phone after 6pm. (Durham) 0388 745787.

EXCHANGE Bird Thuline element 10W, 200-500MHz for low pwr 400-1000MHz element (or purchase). G3TGF QTHR. (Heathfield) 0435 830484.

HT106 6m sideband plus preamp plus 4/6m Yagi. Exchange for 2m m/mode or good 2m sideband. Tom Burke G1LXU (Cleethorpes) 0472 602335.

CLUB NEWS

DEADLINE - Items for inclusion in the January 1993 issue must be sent to HQ marked "Club News - DIARY", to be received by 13 November latest. If news is received by the published deadline, it should appear in the listing. It is your responsibility to ensure that items are sent DIRECT to HQ in good time. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

NOTE: This is primarily a service for clubs affiliated to the RSGB, to whom priority will be given.

AVON

BRISTOL ARC - 6 AGM/homebrew contest prize giving; 12, homebrew play & display; 19, talk 'Test Gear Calibration' by John, G4WOD; 26, computer evening; Dec 3, talk 'The (Internal) Combustion Engine Explained' by Lance, G0CCU; 10, homebrew play & display. Details 0272 721744.

RSGB CITY OF BRISTOL GROUP - 30, construction evening; Dec 14, Christmas party. Details 0275 855123.

SOUTH BRISTOL ARC - 4, simple computer programming workshop; 11, talk 'Scanners and Their Uses' by John, G6BGY; 18, free ice-cream evening - Muriel's treat. Details 0275 832222 on a Wednesday evening.

WESTON-SUPER-MARE RC - 2, club discussion evening; 30 social and constructors night. Details 0934 415700.

BEDFORDSHIRE

SHEFFORD & DARS - 12, table-top sale - £3 per table, limited tables available. Admission 25p on the night, setting-up time 7.30 to 8pm. Public admission 8pm. No traders. Details from Brian Elliott, G4MEO 0767 680043.26, amateur satellite update; Dec 10, the G4MEO challenge. Details Paul Bradfield, G1GSN, QTHR.

BERKSHIRE

BRACKNELL ARC - 11, inter-club event; Dec 9, radio festive. Details from G4AUC.

BURNHAM BEECHES RC - 2, talk 'Safety'; 16, talk 'The Fire Brigade'; Dec 7, Christmas outing. Details 0628 25270.

MAIDENHEAD & DARC - 5, talk 'The BBC Monitoring Station, Caversham Park'; 17, talk 'Technical Computing for Amateurs' by Gerald, G3MCK; Dec 3, Christmas social, prize giving & construction contest. 0628 25952.

NEUBURY & DARS - 25, home construction evening. Details 0635 63310.

READING & DARC - 12, talk 'Digital Communication' by Trevor Gill, G8IBO; 26, construction contest & alignment evening; Dec 10, AGM with cheese & wine. Details 0734 722489.

BUCKINGHAMSHIRE

AYLESBURY VALE RS - 4, mini construction contest; 18, surplus equipment auction; Dec 2, G6NB construction contest. 044 282 6651.

CHESHAM & DARS - 4, technical topic; 11, open discussion; 18, AGM; 25, video '10Gz ATV'. Details G0KZP 0494 482479.

MILTON KEYNES & DARS - 9, junk sale, Dec 14, open night. Details 0908 611005.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 6, talk 'HF DXing' by Bob Whelan, G3PJT; 13, talk 'Computer Digital Processing' by Colin, G8CTX; 20, talk and demo 'Home Brewed Test Gear' by Murray, G0PFG; 27, Morse training. 0763 243570.

CHESHIRE

CHESTER & DARS - 3, radio ideas and discussion; 10, talk 'Satellite TV' by G4EZO; 17, surplus equipment sale; 24, visit by Co-ordinator for Novice training G4VSY. Details 051-355 2833.

WOODFORD (RATEC) - 2, talk 'Computers When Valves were King' by Peter, G7JKS; 16, illustrated talk 'Life Aboard the Queen Mary' by Capt Thompson - bring ladies to this; 30, talk 'Baluns' by Andrew, G0HAL. 061 485 3912.

CLWYD

CONWAY VALLEY RC - 5, talk 'Precision Satellite Positioning' by Dr Gwyn Roberts, GW4JTG; Dec 3, talk 'Successful Fault Finding' by Mr Gwyn Hughes. Details 0492 530725.

DELYN RC - 3, hotpot supper; 17, St Johns; Dec 1, talk and demonstration on Jandek Kits. Details 0244 819618.

WREXHAM ARS - 3, talk 'British Nuclear Fuels Ltd'; 17, outdoor radio usage/requirements (Raynet/Events); Dec 1, TBA. 0978 845858.

CO DOWN

BANGOR & DARS - 6, annual surplus sale - Technical College Castle Park, 7pm. Details 0232 422762.

DERBYSHIRE

BUXTON RA - 10, AGM; 24, EMC discussion;

Dec 8, quiz night. Details 0298 25506.
DERBY & DARS - 4, junk sale; 18, talk 'Mobile HF Aerial Construction' by Barry Walker, G0LCU; 25, talk 'Home Weather Forecasting' by Roy Williams, G4NPT; Dec 2, junk sale; 9, constructors' contest. Details 0773 852475.

DEVON

AXE VALE ARC - 6, talk 'Construction of the RSGB' by John Forward, G3HTA; Dec 4, Christmas Dinner. Details 0297 33756.

DORSET

SOUTH DORSET RS - 3, activities evening - an amateur radio promotion. G4JWA QTHR.

EAST SUSSEX

SOUTHDOWN ARS - 2, talk 'Updating the Baird Television System' by David Sumner, G3PVH; Dec 7, Christmas social.

ESSEX

CHELMSFORD ARS - 3, junk sale; Dec 1, talk 'Shack Test Equipment, EG Noise Bridge' by Fred Leach, G2HNF. Details 0245 260831.

LOUGHTON & DARS - 6, visit by the RSGB Essex RLO, Malcolm Salmon, G3XVV, accompanied by Neil Lasher, G6HUI, Zone C Coordinator; 20, inter-club quiz with Silverthorn Club; 21, 30th Anniversary meal/Christmas Dinner at The Schoolhouse, Church Road, Noak Hill, Romford. 7.30pm for 8; Dec 4, Packet clinic. Your packet questions (hopefully) answered by John, G8DZH. Details 081 500 2811.

FIFE

DUNFERMLINE RS - 19, talk 'The Morse Code Examination' by Wallace, GM0GNT. Details 031 331 4340.

GREATER LONDON

ACTON, BRENTFORD & CHISWICK RC - 17, members' reminiscences of Hamming. Details 081 749 9972.

BROMLEY & DARS - 17, talk 'Mobile to Turkey' by Tony Swainsbury. Details 081-462 2689.

COULSDON ATS - 9, TBA; Dec 14, AGM. Details 081 684 0610.

CRYSTAL PALACE & DARC - 21, junk sale. Details 081 699 6940.

EDGWARE & DRS - 12, talk 'Gas Turbines Revealed' by Ian Cope, G4IUC; 26, Autumn Morse training evening. Details 081 953 2164.

HAVERING & DARC - 11, Out and About on Microwaves - Mark Robertson, G6CMS and Dave Bartlett, G4VIX; 18, constructors' cup. Details from W P Drea, Secretary.

KINGSTON & DARS - 18, Annual General Meeting and construction competition - G6BI Cup. Details 081-398 1128.

RS of HARROW - 27, talk 'Mobile Radio Communications' by Chris Friel, G4AUF; Dec 11, Christmas junk sale and social evening. Details 0895 632377 (H).

SILVERTHORN RC - 6, quiz night v Loughton & DARC. Details 081 529 4489 (eves, w/ends).

SOUTHGATE ARC - 12, construction contest judging for the G6QM Trophy; 26, G6QM Trophy entrants' demonstration; Dec 10, AGM. Details 081 360 2453.

SURREY RCC - 2, talk 'Arctic Visit' by G0/PA3BFH; Dec 7, talk 'Workshop Practices'. Details 081 660 7517.

SUTTON & CHEAM RS - 19, talk 'Secret Listeners' by Brian, G8DIU. Details 081 644 9945.

WIMBLEDON & DARS - 13, meet the committee; 27, surplus equipment sale; Dec 11, Christmas social. Details 081 397 0427.

GREATER MANCHESTER

ECCLES & DARS - 3, talk 'Superannation' by G8VF; Dec 1, talk 'The Ferranti Argus' by G8DTF. Details 061-773 7899.

STOCKPORT RS - 11, construction competition. Details 061 439 4952.

SOUTH MANCHESTER RC - 6, talk 'Fibre Optics'; 13, Annual Dinner; 20, talk 'Globe Trotting, Part 1' by G3SVW; 27, factory visit. Details 061-969 1964.

GWYNEDD

DRAGON ARC - 2, video evening; 16, surplus equipment sale; Dec 7, Ron Watson-Jones - with more amazing pictures. 0248 600963.

HAMPSHIRE

BASINGSTOKE ARC - 2, talk 'Raynet - Past, Present and Towards 2000' by G0EWO; 29, 2m Foxhunt - OS174 - Fox: Eddie, G4SQZ; Dec 7, Christmas social and quiz night. 0256 25517.

HORNDEAN & DARC - 5, talk 'HF Contesting' by Ed Taylor, G3SOX; Dec 3, video evening. Details 0705 472846.

ITCHEN VALLEY RC - 13, talk 'Liquid Crystal Displays' by Dr David Coates; 27, talk 'Building and Operating QRP Equipment' by Keith, G3XUO. Details 0703 736784.

THREE COUNTIES ARC - 4, talk 'New on the Air - BBC Radio Surrey' by a speaker from the BBC; 18, talk on a Trip to the Dayton Hamvention in the USA by Rob Mannion, G3XFD; Dec 2, talk 'Amateur Television Transmission' by Mike Sanders, G8LES. Details 0420 83091.

WINCHESTER ARC - 20, talk 'Some Design Notes and Problems in LF and MF Radiating Systems' by Les Lester. Details 0962 89550.

HEREFORD & WORCESTER

BROMSGROVE & DARC - 13, visit by RLO Dave Gourley, G0MJY - Waseley Hills Country Park; Dec 11, Christmas party - Waseley Hill Country Park. Details 0562 710010.

HEREFORD ARS - 6, talk 'Electronic Warfare' by Peter Chadwick, G3RZP; 20, annual junk & equipment sale; Dec 4, talk on 'EMC' by Philip Martin. Details 0432 355297.

VALE OF EVESHAM RAC - 5, 'Brain of VERAC' super quiz organised by Chris, G6CMP. Details 0386 41508.

HERTFORDSHIRE

CHESHUNT & DARC - 11, talk 'Bomber Navigation in World War 2' by Reg Davey; 25, Annual General Meeting; Dec 9, talk 'German World War 2 Radio Equipment' by Richard Walker, G4PRI. Details 0992 464795.

HODDESDON RC - 12, Annual General Meeting; 26, talk 'Radio Controlled Flying' by Ray, G0MEO. Details 081-804 5643.

STEVENAGE & DISTRICT ARS - 3, tips, hints and kinks - share your ideas and thoughts; 10, practical night; 17, annual darts invitation - venue TBA; 24, talk 'Talking Newspapers for the Blind' by Gary, G0ETA. Details 0438 724509.

VERULAM ARC - 24, talk 'Remote Imaging' by Mr John Tellick; Dec 13, Christmas Rally; 15, AGM. Details 0923 262180.

HUMBERSIDE

BRIDLINGTON & DARS - 12, talk 'Cadet Radio' by John, G3ZYF and Jack, G5VO; 26, talk 'QRP' by Dave, G0DEB; Dec 10, Christmas Dinner - Balmoral Hotel. Details 0262 673635.

GOOLE R&ES - 13, video evening; 20, Repeater Report with Steve, G8VHL; Dec 4, Christmas Dinner; 11 Christmas quiz. Details 0405 769130.

NORTH FERRIBY UNITED ARS - 6, talk 'Top Band DX' by Neil, G4DBN; 20, talk 'Emergency Planning Communications' by Mike Norrie; Dec 4, surplus equipment sale; 11, talk 'DIY RTTY' by Chris, G6KIA. Details from Frank, G3YCC.

KENT

DARENTH VALLEY RS - 11, talk 'Video Servicing' by Peter Martin, G0GIR; 25, construction night and Slow Morse; Dec 9, Christmas Dinner (provisional). Details from Len Lawrence, G0HRD, QTHR.

MAIDSTONE YMCA ARS - 6, RAE course; 13, construction competition; 20, RAE course; Dec 4, RAE course; 11, Christmas social. Details 0622 670936.

RC of THANET - 'CHANGE OF DATES' - club now meets on the 2nd and 4th Thursday in the month.

SEVENOAKS & DARS - 16, talk 'Fact, Fallacy and Foible' by Jack Brown. Details from The Chairman, c/o Sevenoaks District Council, Argle Road, Sevenoaks TN13 1HG.

SOUTH EAST KENT (YMCA) ARC - 4, Novice orientated amateur activities evening; 11, Winter project - update; 25, illustrated talk 'Wire Aerials' by Ian, G3ROO; Dec 2 NOAA evening; 9, other members' shacks. Details 0304 372656.

WEST KENT ARS - 20, talk 'Packet Radio' by P Burton, G3ZPB. Details 0892 664960.

LANCASHIRE

BURY RC - 10, junk sale; Dec 8, AGM. Details 0204 883212.

CENTRAL LANCS ARC - 2, video night; 16, bring & buy evening. Details from G0KMU QTHR.

FYLDE ARS - 12, construction competition. Details from R J Bourm, G7CUL.

PRESTON ARS - 12, talk 'QRP Radio Construction' by Rev Dobbs; 26, illustrated talk 'Look at Lancashire' by Mr Green; Dec 10, Christmas buffet - members and wives and friends. Details 0772 686708.

THORNTON CLEVELYS ARS - 2, quiz organised by G2GBH; 9, talk 'The Ordnance Survey'; 16, surplus equipment auction; 30, TBA. Details from G4BFH QTHR.

LEICESTERSHIRE

CHARWOOD ARCC - 14, RSGB 'Club Call' contest. Details G4RVW QTHR.

LEICESTER RS - 16, talk 'Ham Radio Over 50 Years' by Jake, G3AAQ; 30, HF & VHF NED slides and video; Dec 14, talk 'Raynet' by Derek, G1SPA. Details Leicester 762241.

LOUGHBOROUGH & DARC - 3, illustrated talk 'The Titanic and Radio' by G8SNF; 10, talk 'John's Submarine'; 17, NoA VHF 70cm etc; 24, talk and demonstration 'Packet Radio' by G4CCI. Details 0509 218259.

LINCOLNSHIRE

LINCOLN SW CLUB - 11, talk and demonstration on Jandek Products by Derek Pearson, G3ZDM of Jandek; 25, talk 'Lincs Integrated Voluntary Services' by Mr K Bush, Secretary, LIVES. Details 0522 750757.

LOUTH & DARC - 'NEW VENUE' - club now meets on the 3rd Tuesday of each month at The Wellington Hotel, Ramsgate, Louth, at 7.30pm. Details from Neil, G0JXJ, The Bungalow, Main Road, Grainthorpe, Lincs LN11 7HX.

SPALDING ARS - 13, construction contest; Dec 11, talk 'Fitting RF Connectors' by G3XDA. Details 0778 425367.

MERSEYSIDE

WARRINGTON ARC - 3, talk 'Amateur Radio Emergency Services' by Guy, G8NRF; 10, quiz organised by Dixie, G0JPC; 17, surplus equipment sale. Details 051 487 8076.

WIRRAL & DARC - 11, home constructors competition combined with social night and prize presentation; 25, TBA; Dec 9, Chairman's night. Details 051 648 5892.

LIVERPOOL & DARS - 3, construction contest; 10, open night; 17, talk 'Operating Procedures' by G3XSN; 24, surplus sale. Details from Gordon, G4VVR QTHR.

NORFOLK

ARC FAKENHAM - 3, a look at North Wales on video; 14, club calls contest on 160m 2000-2400GMT - venue QTH of G0MQU & G6MDM. Details 0485 528633.

NORFOLK ARC - 4, 'real radio' evening; 11, talk 'Raynet Snow Report' by Andrew Sparkes, G1LZQ; 15, surplus equipment auction/bring & buy (doors open 10am); 18, PCBs Made Easy - bring your designs for an etch-in; Dec 2, visit to Anglia TV; 9, CW quiz - all can take part!. Details from G0KWP 0603 618810.

YARMOOUTH RC - 5, talk 'Mechanical Television' by G3OEP; 19, AGMs - Club and Raynet - and homebrew competition for OEP Prize; Dec 3, debate 'We need more YLs in Amateur Radio'. Details Yarmouth 721173.

NORTHAMPTONSHIRE

Kettering ARS - 10, talk 'RSGB' by Mr John Allen. Ask your questions concerning RSGB matters; Dec 8, Christmas get-together and social (provisional). Details 0536 514544.

NORTH YORKSHIRE

HAMBLETON ARS - 5, practical evening; 12, RAE course; 19, talk 'Mobile Robotics' by Paul, G1FGI; 26, RAE course. Details 0609 776608.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM - 5, forum; 12, talk 'Very Early Radio' by Ron, G4NZU; 19, construction; 26, talk 'Std Freq/Time Signals' by Martin, G6ABU; Dec 3, forum; 10, talk 'Tuning Club HF Equipment' by Trevor, G0IXR. Details 0602 232604.

MANSFIELD ARS - 5, talks 'RSGB HF Contests - Hints and Tips' and 'Computer Logging' by Chris Burbank, G3SJJ. Details from G0NZA, 0623 755288.

SOUTH NOTTS ARC - 6, open forum; 13, RIS; 20, construction at Fairham College; Dec 4, open forum; 11, construction at Fairham College. Details 0602 211069.

OXFORDSHIRE

OXFORD & DARS - 26, talk 'Electronic Warfare' by Peter Chadwick, G3RZP (provisional); Dec 10, Christmas mince-pie party. G0RFS, QTHR.

SHROPSHIRE

TELFORD & DARS - 11, visit to Earth Satellite Station, Telford; 18, club project; 25, video evening. Details 0746 761203.

SOMERSET

TAUNTON & DARC - 6, talk 'Air Traffic Control' by Gary Booth, G3HKA; 20 talk 'Ionising Radiation, Part 1' by Graham Wills, G0GTR. Details from G3WNI QTHR.

YEovil ARC - 5, talk 'Tuned Circuits' by G3MYM; 12, bring & buy/junk sale; 19, club 80-20m rig project G3PCJ; 26, completion and testing of Receiver G4GVM. Details 0300 20975.

SOUTH YORKSHIRE

BARNLEY & DARC - 'Club is running an 8-day trip to Friedrichshafen next year. Anyone interested contact E Bailey, G4LUE, 0226 716339' - 2, Rally briefing; 9, Rally post-mortem; 16, talk 'QRP' by Rev George Dobbs; 23, construction competition; Dec 7, Christmas buffet; 14, junk sale. Details from G4LUE, 0226 716339.

STAFFORDSHIRE

STOKE-ON-TRENT ARS - 'NEW VENUE' - Old Swan Inn, Hartshill Road, Stoke-on-Trent. Details from Norman, G1JJE, 29 Chetwynd Street, Wolstanton, Newcastle, Staffs ST5 0EQ.

STRATHCLYDE

KILMARNOCK & LOUDON ARS - 3, talk and demonstration 'Introduction to HF Data Modes' by Barry, GM3YEH; 17, talk 'HF Maritime Communications' - What and where to hang ships & rigs, with communications procedures - by Bill, GM3ZRT. Details 0563 820052.

WEST GLAMORGAN

SWANSEA ARS - 19, talk and demonstration 'Ground Plane Antennas' by Jeff Diplock, GW3UZS. Details 0792 403527.

WEST OF SCOTLAND ARS - 6, debate 'Does Raynet have a role in today's modern communications?'; 20, Scottish Nuclear - Talkabout; Dec 4, talk 'Electronic Developments in WX Predicting' by Angus, GM4JYZ. 0698 350926.

SUFFOLK

FELIXSTOWE & DARS - 2, construction contest. Details 0473 642595 (daytime).

IPSWICH RC - 4, Morse tuition; 11, junk sale; 18, Morse tuition; 25, TBA; Dec 2, Morse tuition; 9, quiz v Stowmarket. Details 0473 742072.

EVENTS DIARY

LEISTON ARC - 3, Annual General Meeting; exchange of surplus equipment - Sizewell Club, Leiston. Details 0728 832924.

TAYSIDE

DUNDEE ARC - 3, talk 'Keys' by a member of the Morse Enthusiasts Group Scotland; 10, construction; 17, talk 'Activities Within the RSGB and Amateur Radio' by Ian Suart, GM4AUP; 24, construction. Details from GM4FSB QTHR.

WARWICKSHIRE

BARTG - 14, AGM, 2pm at 'The Green' Wine Bar and Restaurant, The Green, Mere Green Road, Four Oaks, Sutton Coldfield. Refreshments provided. Details Ian Brothwell, G4EAN, QTHR, tel: 0602 262360.

STRATFORD UPON AVON & DARS - 9, talk 'DX from Clipperton Island' by Vincent Denecker, G0LXM; 23, talk 'Intelligent DXing - Knowing What, When and How' by Bob Whelan, G3PJT; Dec 14, talk 'Aeronautic Electronics' by Nick Feakes, G0NKY. Details 060 882 495.

WEST MIDLANDS

MIDLAND ARS - 4, 11, 18, 25, RAE class; 27, Atari night; 30, computer night; Dec 8, Christmas party. Details 021 628 7632.

STOURBRIDGE & DARS - 16, surplus equipment sale. Details 0384 423938.

WEST SUSSEX

MID SUSSEX ARS - 5, shack work and discussion night; 12, talk 'Antennas' by Malcolm Healy, G3TNO; 19, G3JGR Silent Key Sale.

WEST YORKSHIRE

DENBY DALE ARS - 4, Annual General Meeting; 18, talk 'QRP' by Rev George Dobbs, G3RJV. Details 0484 429238.

HALIFAX & DARS - 17, video 'The Lancaster Story'; Dec 15, Christmas social - free pie and peas for members. Details Halifax 202306.

KEIGHLEY ARS - 26, talk 'A Dog Has Two Tales' by G4ZVD. Details Kathy, 0274 496222.

NORTHERN HEIGHTS AR&ES - 4, talk 'HF Radio in the Arctic' by Dr Mike Warrington, G4EMW; 18, discussing next year's syllabus. Details 0274 673116.

SPEN VALLEY ARS - 19, talk 'Microwaves the Easy Way' by Dave, G0DDA; Dec 3, talk 'Romania' by Ian, G4MLW. Details 0484 716453.

WAKEFIELD & DARS - 3, pie & pea and construction competition. Details 0924 240577.

RALLIES AND EVENTS

This is a list of all rallies, hamfests, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact call sign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

31 OCT/1 NOV

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

1 NOVEMBER

TWELFTH NORTH DEVON Rally - Holsworthy Memorial Hall. 10.30am to 5pm. Bring & buy etc. Details from K J Nicholls, G8MXI, QTHR.

8 NOVEMBER

BARNSELY & DARC 2nd AR Rally - Willowgarth Senior High School, Brierley Road, Grimethorpe, Barnsley. Mid-way between Pontefract and Barnsley, just off the main A628 Barnsley/Pontefract Road. Doors open 11am (10.30 for disabled visitors). Traders; radio clubs and specialised groups; Bring & Buy; food & drink; licensed bar; car parking. Talk-in S22. Details Ernie, G4LUE, 0226 716339 (6pm-8pm 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, G8BHE, 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. Auction starts at 12 noon. Details Ian, G4OCC QTHR, 091 3840827.

15 NOVEMBER

BRIDGEND & DARC Rally - Bridgend Recreation Centre (junct 36 M4). Doors open 11am (10.30am for disabled visitors). Bring & buy; swimming pool; 2 cafeterias; 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. Details from Mike, G0PRO, 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. Trade stands, societies, bring & buy etc; refreshments + bar. All at pavement level with facilities for the disabled. Details from Dave, G1IOO 0204 24104 (eves).

29 NOVEMBER

COULSDON ATS Bazaar - HQ 4 Purley Scout Group; access via public car park in Lion Green Road, Coulsdon. Opens 10am. Refreshments. Flea market and traders' stalls. Talk-in station G4FUR/P on S22. Details G6HC 081-684 0610.

13 DECEMBER

CENTRE OF ENGLAND Christmas Radio, Computer, Electronics & Communications Rally - National Motorcycle Museum, near NEC Birmingham, juncy 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 prize. Details from Frank, G4UMF, 0952 598173.

LEEDS & DARS Annual Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey, Leeds (junct of the Leeds Outer Ring Road with the Bradford Road). Doors open 10.45am. 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.

OLDHAM ARC Mobile Radio Rally - Queen Elizabeth Hall, Civic Centre, West Street, Oldham. Doors open for Morse Test participants at 10am, for disabled visitors at 10.30am and 11am for others. Admission £1, free for under

14's. Catering facilities; parking facilities free. Talk-in on 2m S22 from 9am using callsign GB4ORC. Morse Test applicants should contact RSGB for application forms prior to 20 December 1992. General and traders' enquiries to Kathy, G4ZEP on 061-633 0550 (W) or 061-652 8617 (H).

GB CALLS

The list below shows all special event stations licensed for operation during this month and up to 8 August. It was taken from the HQ computer on 6 June. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

1 NOVEMBER

GB4MSS Multiple Sclerosis Society
GB200Y 200 Years Wryley & Essington
GB2GMM Guglielmo Marconi Memorial

2 NOVEMBER

GB4RSL Royal Signals Llandudno

8 NOVEMBER

GB4CIN Children In Need
GB4LTT Leis Try That
GB6CIN Children In Need

13 NOVEMBER

GB0CCL Christ Church Lisburn

14 NOVEMBER

GB4CGS Cardinal Griffin School

24 NOVEMBER

GB0HLC Harrogate Ladies College
GB1HLC Harrogate Ladies College

26 NOVEMBER

GB8SA St Andrew

27 NOVEMBER

GB0PF Pilgrim Fathers
GB1PF Pilgrim Fathers
GB5CW CW Contest
GB6SA St Andrews

28 NOVEMBER

GB2SAC St Andrews Church

29 NOVEMBER

GB200Y 200 Years Wryley & Essington

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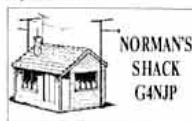
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● UR95, 2.3mm, 50 ohm, mini nylon coax.....	30p/m
● UR111, 2.3mm, 75 ohm PTFE mini coax.....	40p/m
● UR57, 10.3mm, 75 ohm low loss coax.....	70p/m
● UR70, 6mm dia, 75 ohm transmitting coax.....	30p/m
● Double screened, 75 ohm coax, 8mm dia.....	40p/m
● UHF low loss TV downlead, 75 ohm.....	25p/m
● 75 ohm twin balanced feeder, 400 w PEP.....	20p/m
● 300 ohm standard ribbon.....	20p/m
● RG62AU, 6mm dia, 95 ohm coax.....	50p/m
● Single core screened cable, 2.3mm dia.....	12p/m
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The Last Word

IONOSPHERIC RESEARCH

With reference to 'Ionospheric Research by Radar' (*Radcom*, August), I would like to draw your attention to an historical error in para 4 which states that Appleton and Barnett used a pulse method for ionospheric investigations in 1925.

In fact, their classical experiment to determine the height of the lowest reflecting layer was based on an interference technique using frequencies in the region of 1MHz and was reported in a letter to *Nature* dated 21 February 1925 (*Nature*, Vol 115, p333, 1925), the BBC co-operated by allowing the use of the MW transmitter at Bournemouth while the receiving station was at Oxford where the strengths of the ground and night sky waves were approximately equal. The difference between ground and sky wave path length, assuming a layer height of about 80km, is in the region of 240 wavelengths. Small changes in transmitter frequency modified the number of wavelengths in both paths and hence the difference between them. Signal maxima occurred when the difference was an integer with minima at the mid points. The frequency change required for movement between adjacent maxima would have been about 4kHz for an initial frequency of 1MHz. The results confirmed a layer height of about 85km but the authors pointed out that uncertainties arise in the presence of multiple reflections or elliptical polarisation.

The pulse method for layer height determination was pioneered by Breit and Tuve and was reported in the *Physical Review* for September 1926 (Vol 28, p554) ie a year after the Appleton/Barnett results. A considerable part of the paper is devoted to description of the equipment which was based on various commercial MCW transmitters together with a superhet receiver and both mechanical and CRT oscillographs. The majority of the measurements were at frequencies around 4.25MHz and showed reflections from heights in the range of 80km to 200km. The methods of height calculation and possible errors are discussed. This work formed the basis of the subsequent development of the pulse techniques which are widely used today.

The references quoted above are available in the British Library and have been summarised in many of the older text books such as Terman.

Another minor criticism is that the distinction between the pulse techniques used for determination of layer height and critical frequency compared with those for radar probing could have been made clearer. As stated, ionospheric sounding uses frequencies in the HF range up to the critical frequency, say 16MHz. Below this point a significant part of the incident energy is refracted directly back to the sounder and there is only limited penetration of the ionosphere. At the much higher frequencies used for radar probing there is deep penetration and, at any instant, the radar illuminates a volume which is related to the beam width and pulse length. The energy impinging on this volume is scattered in all directions and results in a small signal in the direction of the radar.

A small omission is any mention of oblique sounding which is widely used for evaluation of particular paths and is probably responsible for some of the 'wandering' interference on the HF bands. An explanatory legend on the ionogram might also have been helpful.

Apart from the historical error, these comments are not intended to detract from an otherwise interesting article.

P L Stride G2BUY

SEALED WITH A KISS

In at least two recent editions of *RadCom* the expression KISS has been used - Fig 11, p37 of the October issue is typical.

I am continuing to proclaim my ignorance by asking just what this KISS means. All my enquiries of my contacts can only remind me that there is, or was, a pop group using that name, which is probably why the letters have been scrawled on several local road signs.

Always in capitals - never with any punctuation marks - is it another 'nimby' or what, please!

Frank W Wells G3ATJ

[The initials stand for 'Keep it Simple, Stupid' and it is generally used in connection with home construction - Ed.]

LEISURELY BUT ENJOYABLE

Slow Morse Contest, 7 September 1992: Thank you, thank you, thank you for this short but very enjoyable contest. I only listened, but it was refreshing to hear good quality Morse, good manners and all at a speed I could copy - more please.

Peter Lewis G3WBI.

THE MORE THE MERRIER

It is not often that I feel moved to write to The Editor in response to someone else's published letter, but I am afraid that the content of Mr T E O'Neil's letter (*The Last Word*, October) has so incensed me that I find it impossible not to react.

Mr O'Neil is of course entitled to his opinion, but I would hope that the average radio amateur is not so narrow-minded as to believe that only those who come into the hobby in the 'traditional way' are eligible to share our enjoyment. For example, when I sat the RAE it was a full written exam, and standards of neatness, handwriting and English were all considered in marking. However, I do not consider myself any better than those who have passed the modern exam. Neither do I consider that a Class A is necessarily better than a Class B, but maybe I am biased, as I was a G8 myself for many years!

Please let it be put on record that I, for one, applaud the hard work and careful consideration of all RSGB staff, Committee Members and others who conceived, planned and finally obtained the Novice Licence privilege for beginners to our hobby, of every age and persuasion. Restricting the entry level to a certain age group would be a retrograde step, and quite possibly lose us a few potential converts. Let's face it, we need all the new blood we can get.

Tony Oakley G4HYD.

AGE NO OBJECT

I was saddened to read Mr O'Neil's comments on the Novice Licence. In his letter Mr O'Neil mentioned the Consultative Questionnaire published in the September 1988 issue of *Radio Communication* (his so-called *RadCom* Referendum). Had Mr O'Neil read the information document associated with it (pages 675-678) properly, he would have noticed that it stated on page 676 "This will provide a sufficient grounding to enable anyone to enter the hobby". To re-enforce this it goes on to say "An early goal will be to present a simpler means of qualification for young people and indeed the not so young". If, as Mr O'Neil suggests, the Novice Licence was meant for young people only, why was there no mention of an upper age limit in the document?

From reading Mr O'Neil's comments I get the impression that he is totally against the Novice Licence scheme. By expressing it as an 'easy option' his attitude could be construed as elitist. In the past certain individuals expressed their displeasure at new concepts for our hobby, remember Class 'B' Licences? And the multiple-choice RAE? Attitudes like those expressed by Mr O'Neil can only do harm to our hobby and drive away the new blood we need.

I would like to remind Mr O'Neil that this 'easy option' offers a very limited access to our amateur bands. The NRAE is only the first step on the ladder and his comments cast a slur on those, both young and old, who have worked hard to take that first step.

A Sammons, G0EAG, Novice Licence Instructor

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.

A QUESTION OF BALANCE

In a learned journal, it is useful to have articles and letters from those who hold extreme and nonconformist attitudes in order to make the rest of us challenge current orthodoxies. I can think of a number of examples from the scientific press over the last decade or so. There was the fellow who is convinced that AIDS is nothing to do with HIV, James Lovelock and the Gaia model, and Hoyle and Wickramasinghe about comet-borne bacteria seeding life on earth.

These articles are designed to stimulate wide-ranging discussion and to bring out from the woodwork other holders of extreme views and strong opinions leading to a lively debate.

'Stop the Packet Racket' (*RadCom*, September) is an extreme view and should be seen as a controversial statement of one person's position, right or wrong.

Unlike items in most learned journals, where peer review works to remove inaccuracies and downright untruths from proposed articles, it seems that this article has made a few rather outrageous points based on a limited knowledge of the subject. I would hope that in the future the editorial team ensure that a wide range of comments from those who have a good knowledge of the subject will be passed to the author in order that factual inaccuracies are corrected.

I am not a fan of HF packet, nor of Amtor. I think that both are flawed and that new modes like Clover, using DSP techniques and adaptive methods, are the way forward. Simple ARQ and CSMA methods are not ideal under real HF conditions, let us work towards methods which are designed for our use and for equipment which we have or can build, rather than adaptation of commercial techniques.

In summary I like to see controversial articles, but if they contain factual inaccuracies these should be corrected and removed by the author before publication.

Neil Smith G4DBN.

[*'Stop the Packet Racket'* was sent to two members of the *Datacomms* Committee and to our *Datacomms* columnist before publication. So far, I have received nothing refuting the views expressed in it - Ed.]

IMAGE OF THE RADIO HAM

I was delighted by your Leader in *RadCom*, October 1992, and wish to add my congratulations and appreciation to the many others I feel sure you will receive from members.

Unfortunately what I believe was an Americanism 'Ham' for 'Home-Amateur' has been perpetuated over the years, to our disadvantage. To journalists, editors of newspapers, and the general public, the British interpretation of the word 'Ham' conveys the exact opposite of the image we wish to portray. 'Ham' viz:- bumbling, unskilled, incompetent person as in ham actor, ham fisted, etc etc. With journalists, editors and others unable or unwilling to differentiate between licensed radio amateurs, CBers and radio idiots, we have enough image problems without being dubbed 'Hams'. Can we, or do we, wish to do anything about it?

Whilst on the subject, a word or two about 'amateur' in our title. Again, unfortunately, it is often confused with 'amateurish' . . . unskilled'. In fact, the term amateur, as we know, simply means engagement in a sport or hobby without personal gain. The amateur is often as, or more, proficient than the paid professional. (British world pairs figure skating champions, for example).

Much is also under discussion about 'novices'. 'Novice' simply stated means a 'beginner' and, as RSGB pointed out from the outset of the Novice Licence negotiations, it covers all age groups, not just children as some correspondents have assumed.

Len Roberts G3EGX

DX FROM THE OTHER SIDE

The recent series 'HF DX - the Inside Story' has been most interesting. I would like to make a point from the opposite side of the fence.

I have recently been working in Bangladesh and for a short period operated as S21ZD. That brought the total number of stations on air in Bangladesh to two. Even though conditions were not good, I had impressive pile-ups.

The practice that lost the most contacts was that of using the wrong phonetic alphabet. The use of Santiago, Japan, Washington etc makes life much slower and more difficult, particularly if band conditions are poor or, as in my case, there is a high noise level.

If you want to work DX, stick to the correct phonetics; it must pay off in the end.

Bob Harris, G4APV/S21ZD

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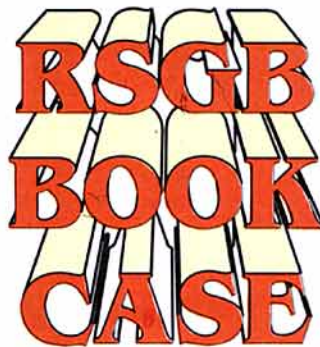
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