Radio Communication

The Journal of the Radio Society of Great Britain

May 1994

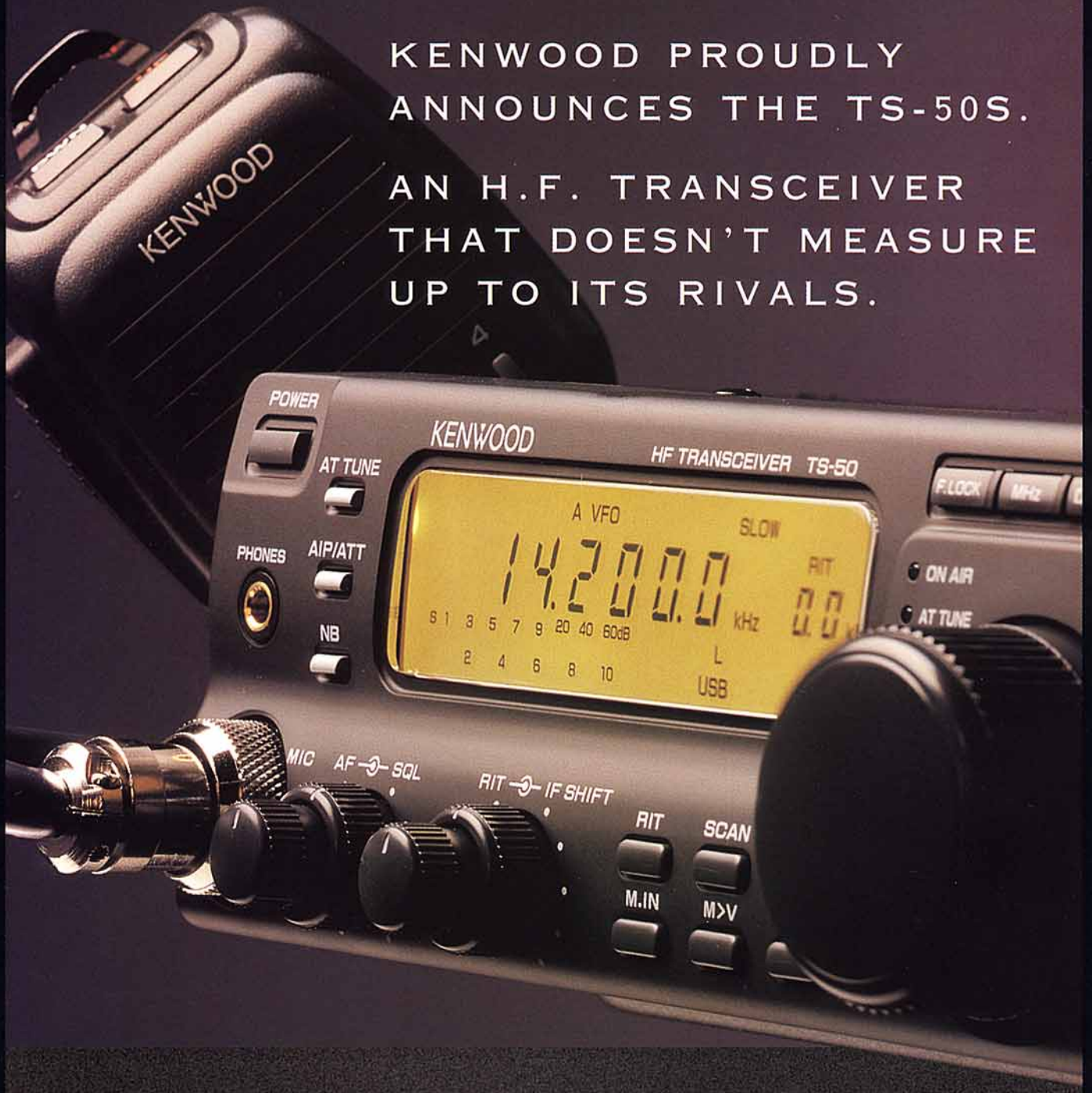
Volume 70 No 5

THE VOICE OF AMATEUR RADIO FOR 81 YEARS

The RX84 Advanced HF Receiver Project

KENWOOD PROUDLY ANNOUNCES THE TS-50S.

AN H.F. TRANSCEIVER THAT DOESN'T MEASURE UP TO ITS RIVALS.



If Kenwood's TS-50S wasn't the world's smallest H.F. transceiver, it would still be a mighty impressive piece of equipment.

Its maximum output of 100W, combined with 100 memory channels, gives its operators a versatility that other, bulkier H.F. transceivers struggle to match.

The multi-function microphone, menu system and user-friendly "fuzzy logic" Direct Digital Synthesiser makes it simple to operate on the move. And a host of features, from Advanced Intercept Point to switchable AGC circuit, means that although the TS-50S is small, its performance is a big talking point.

Your local Kenwood specialist dealer has the full technical story. So all that remains to add is the price: around £1000.

After all, the Kenwood TS-50S may be the world's smallest H.F. transceiver. But you don't need the world's biggest bank account to own one.

KENWOOD

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Radio Communication

COVER PICTURE:
We start this month a major five-part HF receiver project – the RX84. On top is a 90 year old coherer receiver.
PHOTOGRAPH: OZ5KG

NEWS AND REPORTS

TECHNICAL FEATURES

REGULARS

REVIEWS

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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UK associate member under 18: £16.00. Family member: £14.00
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Affiliated club or society/registered group (UK): £16.00 (including *Radio Commmunication*). (Subscriptions include VAT where applicable.)

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

Membership application forms are available from RSGB HQ

RSGB Main Switchboard:
0707-659015

The RadCom Leader

Meeting the Members

THE PURPOSE OF THIS COLUMN is to keep you informed of the happenings at HQ, as well as up to date with matters affecting amateur radio in general. This month, I want to remind you of two of the ways in which the Society is promoting an exchange of information and views – by meeting you, the members.

Regional Meetings

FIRSTLY, I WOULD LIKE TO BRING to your attention the current round of RSGB Regional Meetings. It has been felt within Council for some time that the Society should hold a number of meetings around the country. These meetings are designed to bring together members and non-members along with elected members of Council and HQ staff to discuss the workings of the Society and amateur radio related matters.

The first of these meetings was held in Newtown, Powys, at the end of March and although the attendance was disappointing, purposeful discussions were held and a lot of useful information exchanged. A brief report can be found on page 6 this month.

The next Regional Meeting is scheduled to take place on Sunday 5 June at Brighouse, West Yorkshire. The details are shown opposite. Please remember it is an open meeting so both RSGB members and non-members are welcome to attend.

HQ Open Day

WITH SUMMER APPROACHING, all the staff at HQ start to ask the date of the next HQ Open Day. This is a fun day for us; an opportunity to open our doors to our members, to show off HQ and to give an insight to the services we provide. One of the most pleasurable aspects of Open Day is the opportunity to put faces to those we have talked to over the telephone at times throughout the year.

Last year we expanded Open Day to encompass the large yard area at the rear of Lambda House. This year we intend to do the same and we are planning to have more displays etc.

HQ Open Day this year is on Saturday, 4 June. The details are shown below. Please try to come along; we will be delighted to see you.

Peter Kirby, General Manager

NOTICE BOARD

RSGB Headquarters Open Day

Saturday 4 June

Visit your HQ and bring your friends and family to this fun occasion.

- Meet the staff
- See the QSL Bureau
- Use the GB3RS shack
- Tour the Museum
- See how *RadCom* is produced
- Browse round the Bookshop

***PLUS*: Club stands, refreshments and competitions.**

NEWS & REPORTS

● EDGWARE AND DISTRICT Radio Society has a Straight Key Evening on Friday 20 May, starting at 1900. It is not a contest but an activity night when the use of straight keys is encouraged. Activity centres on 3.55MHz. GB2SKE and GX3ASR/P will be operational; one of these will be available above 3.56MHz to encourage Novice participation. Reports and comments would be welcomed by G3SJE, QTHR.

● ATV repeater GB3HV, run by the Home Counties ATV Group is operational again after two years off the air. GB3HV is near High Wycombe (IO91OO), and operates on channel RT 3 (in on 1248MHz; out on 1308MHz). The repeater keeper is G8LES, QTHR.

● GX3CRW/P commemorates the 250th anniversary of Crowborough's Sir Henry Fermor School. The call will be active on 21 May, 24 June and 2 July. Anyone who has been associated with the school is asked to contact Mick Smith, G6UUO, QTHR.

● WORTHING AND DISTRICT ARC celebrates the 10th anniversary of the restoration of the High Salvington Post Mill on 15 May. GB0HSM will operate from the site of the mill from 1030 to 1700 on 80, 40 and 2m, and packet.

● GB4CRO is a special event station run by the Central Lancs ARC in conjunction with the Cave Rescue Organisation from 28 April to 2 May. Operation is expected to be on 20, 40 and 80m.

● WATERS AND STANTON have their annual Open Day on Sunday 22 May. Radio bargains and free food and drink are available from 10am. A good day is promised to all visitors.

● OVER ONE HUNDRED competitors from nine countries took part in the first IARU Region 3 (Asia and Oceania) ARDF competition in Beijing last October.

● THIS YEAR'S WACRAL Conference is at St Edward's Conference Centre, Malvern, from 8 to 10 October. Details from Garth Martin, G3IER, QTHR

● THE 10TH YEOVIL QRP Convention takes place on 8 May. See *RadCom*, April, page 73 for details.

● THE LATEST callsigns issued by SSL at 12 April were in the G*0US*, G*7SH*, 2*0AH* and 2*1CU* series.

Severe physical disability from birth proves no bar to a Class A licence

Gail's Hard Road to Amateur Radio

AMATEUR RADIO recognises no physical limitations; whatever the handicap, there is something within it for everyone.

Gail Taylor was born prematurely – an incredibly tiny baby weighing less than two pounds. Her chances of survival, even for one night, were very slim. She was hastily christened and placed in an oxygen tent; she survived, but there was a price to pay.

Over-exposure to oxygen caused blindness. Epileptic fits followed (these have since ended) and she was diagnosed spastic. At seven years of age, Gail could not talk, walk or control her limbs. Trapped in a wheelchair-world, she could only scream. The frustration she must have been suffering can barely be imagined.

Her parents, however, did not give in. They looked for the positive things in Gail – great intelligence, a very high level of concentration, a remarkable memory *and* determination.

Gail now speaks five languages – besides English – fluently and also knows some Russian and Chinese. Her greatest strength however, is her knowledge of music – she is familiar with the classics and enjoys tuneful pop music. So what came next?

Bill, G0DVW, (who told us Gail's story) introduced the idea of amateur radio to her and work began. Imagine – an operator who could speak to nearly all foreign stations in their own language! Gail passed the Morse test before taking the RAE, which she passed on the second attempt.

If you hear Gail, she is G0UNF, make her welcome – she has travelled a harder road than most of us – her sense of achievement must be greater. Congratulations Gail. Welcome to the world of amateur radio.

[Thanks to *Novice News* columnist Esde Tyler, G0AEC, for this heartwarming story – *Ed.*]

Gail, G0UNF, has found great pleasure in her new hobby.

RSGB Regional Meeting

West Yorkshire

ALL RSGB members are invited to a Regional RSGB Meeting to be held on Sunday 5 June. The venue is the Forte Crest Hotel, Brighouse, West Yorkshire. Doors open at 12.15, for a 12.30 start. This is the first Regional Meeting to take place for many years in this area so come along and meet RSGB officials, including Council Members and the General Manager. Non-members are also welcome to attend.

Boxing Day Life Savers

THREE RAYNET Members happened on an injured boy, twelve-year-old Alfie McLelland, whilst they were walking on the Clwyd mountains on Boxing Day. Their radios and their training enabled help to be summoned quickly and accurately.

Cheshire's County Emergency Planning Officer, Mike Cull, commented: "I feel extremely proud of these Raynet chaps. Undoubtedly they saved Alfie's life by their actions. Raynet in Cheshire works closely with the County Emergency Planning Team and this is the quality of response we have learned to expect of them."

Turn to our *Emergency* column on page 73 for the full story and photograph.

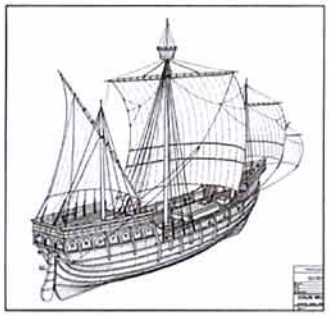
● DR J BLUNDELL, G3BDM, has been installed as Worshipful Master of the Radio Fraternity Lodge No:8040 for 1994/95. He sends greetings to other RSGB Masonic Members and would be pleased to hear from them via the Secretary Sam Fisher, G4AKT, QTHR, or direct.

Bristol Cabot 500

IN 1497 John Cabot sailed west from Bristol to find an alternative route to the 'spice islands' of the Pacific. Like Columbus five years earlier, he encountered the unknown lands of the Americas. Columbus found the Caribbean islands but John Cabot discovered Newfoundland and sailed down the east coast of what is now the USA. It was this and another voyage the following year which formed the basis for the British claim to North America.

In 1997, a replica of Cabot's ship *Matthew* will re-enact this historic voyage on its 500th anniversary. This month, sees the keel laying ceremony for the replica at Bristol City Docks. There follows a programme of events over the next three years.

To help celebrate the anniversary, and to follow the building of the replica ship, GB500JC will operate on HF and VHF/UHF from the Redcliffe Wharf Visitors Centre. The station will initially operate at weekends, but becoming progressively more active towards 1997. As many different modes as possible will be used by the organiser Roy Blanning, G0NZU. Roy would like to involve stations in Newfoundland and in the various towns in the USA bearing the name Bristol. He can be contacted QTHR.



The overall blueprint for the replica of the *Matthew* designed by the eminent naval architect Colin Mudie.

Eastern Europe Enters Equipment Market

THE FIRST East European Fair of Radio Amateur Equipment takes place in the Polish town of Legnica from 27 to 29 May. The event is promoted as "an answer to dynamic development of the radio amateur communication (in Eastern Europe) and the lack of opportunity for meetings and exchange of experiences".

The fair's main purpose is for producers and distributors of amateur radio equipment to present their wares for the first time in this part of the world. Additionally there will be meetings of special interest groups and trophy presentations.

Further details can be obtained from: Targi Legnickie, Biuro Organizacyjne, 59-220 Legnica, Rynek 32, Poland; telephone 010 48 76 560219, fax 010 48 76 560735.

Some of the RSGB officials on hand to take members' questions at the Powys Meeting: (l to r) Dave Gourley, G0MJY (Council Member); Clive Trotman, GW4YKL (Council Member); Peter Sheppard, G4EJP (Council Member); Peter Kirby, G0TWW (General Manager) and 'Smudge' Lundegard, G3GJW (Council Member).

Powys Regional Meeting

THE FIRST RSGB Regional Meeting for many years took place in Newtown, Powys on Sunday 27 March. Members of the Society as well as non-members were invited to meet and question Council Members, Staff and other officials. Zone E Council Member, Clive Trotman, GW4YKL, chaired the meeting.

The enthusiastic audience took part in wide-ranging discussions on such topics as: how to attract more members; the format of the *RSGB Call Book*; the book publication programme; *RadCom*; SSL; Callsign number plates; licence requirements; coordinating club secretaries; *GB2RS*; and planning permission.

The Newtown meeting is intended to be the first of several meet-the-member events announced by President Ian Suart at his installation ceremony last January.

PHOTOGRAPH: YAESU (UK) LTD

Barry Cooper, G4RKO, is the new head of Yaesu (UK) Ltd. He joins Yaesu from the Digital Equipment Company where he was Business Development Manager for Defence Sales. When not working, his main interests are CW DXing and contesting. He is a founder member of the Thatcham Amateur Radio Contest Group, a member of the Chiltern DX Club and is Chairman of the Newbury and District Repeater Group.

The President of the Yaesu Company Mr Jun Hasegawa, JF1AAA (right), presented an FT-990 to *HMS Belfast* at the RSGB London Amateur Radio and Computer Show. Group Chairman R D Wilson, G0FEK, gave a GB3RN plaque to Mr Hasegawa as a token of thanks.

Dorset Senior Novice Instructor

THE RSGB's Senior Novice Instructor for Dorset, Phil Mayer, G0KKL has changed his address. He now lives at: 16 Haig Avenue, Canford Cliffs, Poole, Dorset BH13 7AJ; telephone 0202 700903.

S Wales EMC Coordinator

WE ARE sorry to have to report that the RSGB EMC Coordinator for South Wales is now a silent key. Any members whose problems were being dealt with by Charles Barry, GW3BUT, should now contact another co-ordinator, or telephone the RSGB EMC Committee Chairman on 0277 218531.

Licensing Problems

LETTERS ARE still being received about the issuing and renewal of licences by Subscription Services Ltd. These are all noted and passed on to the Radiocommunications Agency.

The Society's advice to members who experience difficulties remains as follows: Communicate with SSL in writing; Retain copies of all correspondence; Keep your most recent Licence Validation Document safe and produce it if you need proof of having qualified for a licence; If you need to appeal, contact the RA and send a copy to the RSGB.

Members have also reported problems with changing standing order and direct debit instructions with their banks. It is wise to check that your licence fee has been paid on time, and to contact your bank and SSL without delay if something has gone wrong.

Broadmoor's on the Air

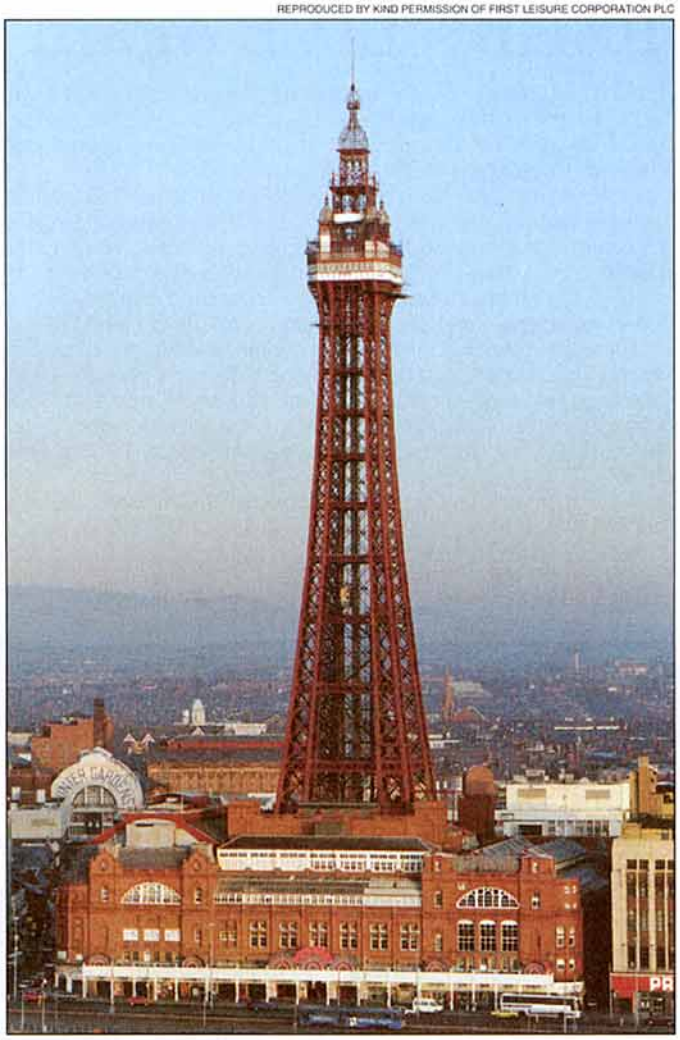
A NEWS ITEM in *Broadly Speaking*, the magazine of Broadmoor Hospital explains how two radio amateurs on the staff have introduced a Novice course for two patients who have shown an aptitude towards electronics. Thanks to donations by Sir James Savile, Martin Lynch and the RSGB's Hilary Claytonsmith, a radio station has been set up. Other members of Broadmoor's staff have been invited to join Novice courses and RAE classes run by the Reading and District ARC and local colleges. This will be the first time that patients at this secure hospital have been allowed to use radio to communicate with the outside world.

RADAR Forces Call-up

THE WW2 Air Forces Radar Reunion is keen to contact anyone who was involved in operating, maintaining, installing, designing or building ground or airborne radars. The Historic Radar Archive has recorded the radar careers of nearly 2,000 wartime personnel and reunited many who have not met for over 50 years.

A three-day reunion, to be held in Blackpool 20 – 22 May, is packed with events and opportunities to renew friendships.

For information about the reunion or the archive, contact Harry Jurd, 9 Chelmer Court, Basingstoke RG21 2DT, tel: 0256 25980.



What a QTH! This month the famous Blackpool Tower is 100 years old. On 14/15 May, GB0TWR will be operated by six local amateurs (G0NXU, G4JKO, G0RIJ, G0PES, G0BDA and G7MPT) from the public walkway at the top of the tower. Activity will be on 80 and 40m CW and SSB and 2m. Visitors to the station will be most welcome.

Earthquake!

ON 30 SEPTEMBER 1993, the Marathwada region of India was struck by an earthquake. As soon as the news reached the JNA Wireless Association of Bombay the 'scramble team', which had trained for two years, swung into action. One group travelled to the disaster area with HF, VHF and satellite equipment, whilst another manned a control station at state government headquarters.

Over the next few days, teams of amateurs came from many regions of India to help, and their contribution to the success of the operation was publicised in the press and on television. A number of lessons were learned which should make the assistance even more effective next time.

● THE ANNUAL vehicle licence in Alaska is free to any amateur who carries multiband HF equipment in his car. This is Alaska's "thank you" for the lifeline provided by amateurs following the 1964 earthquake.

Help the Blind

RSGB MEMBER R L S Harrison, G3EPK, has busied himself since his retirement by producing cassettes for blind people in Hertfordshire. There are four groups of volunteers who duplicate about a hundred tapes each month and repair damaged recorders. This takes no more than two days a month.

Mr Harrison feels that, at the age of 80, he should be looking for someone to take his place and would be pleased to hear from anyone in the Hertfordshire area who would be able to help. He adds that there is plenty of job satisfaction from this work.

Military Mobile

OVER THE weekend 28-30 May, the Horndean and District Amateur Radio Club will be operating GB50DD from the Military Vehicle Rally which takes place on Southsea Common in Portsmouth. The event is expected to attract 1200 military vehicles from all over the world.

This is the third year the club has run a special event station at the rally; previously the call GB6OL was used. The station will use HF and VHF throughout the weekend and all contacts will be confirmed via the bureau.

Details of the Military Vehicle Rally can be obtained from John Taylor-Cram on 0705 250463. More information about GB50DD is available from HF station manager Alex Johnson, G0DHZ, on 0705 643469, or VHF station manager Adrian Buswell, G7EWG, on 0705 254178. Both are available via packet @GB7HJP.

BARTG Contacts

THE BRITISH Amateur Radio Teledata Group (BARTG) has announced a number of contact people, including:

Membership Info and Subs: Peter Adams, G6LZB, QTHR, tel 0923 220774.

Manager of BARTG Rally: Peter Nicol, G8VXY, tel 021 453 2676.

BARTG attendance at your rally: Ian Wilkes, GW3FSW, tel 0745 570538.

Operate in Estonia

THE RA HAS informed us that Estonia has implemented the CEPT TR61-01 recommendation. This means that a reciprocal licence is no longer required for British stations to operate in Estonia. Full Class A and Class B licensees may operate (within national licence restrictions) using the prefix ES followed by a number indicating the district in which the operating takes place.

This unusual QSL card will be sent to those working the special stations which will celebrate the official opening of the Channel Tunnel on Friday 6 May. GB0CT will be run by members of the British Rail ARS and TM5TSM by the Groupe de Radio-Amateurs Cheminots SNCF (GRAC). All HF bands will be used, as well as VHF.

GB2CW Changes

THE FOLLOWING are updates to the schedule for the RSGB's *GB2CW* Morse Practice Service, which is detailed on page 84 of the 1994 *RSGB Call Book*.

For North East England, the schedule is now: Mondays, Tuesdays, Thursdays and Saturdays at 2000 on 145.250MHz FM. The operator is G4RXR from Peterlee, County Durham.

For North-West England, there is a new *GB2CW* transmission on Mondays at 1900 on 145.250MHz, operated by G4OTN in the Preston area. The transmission on Sundays at 1200 on 145.575MHz is now operated by G0RDH of Morecambe.

From Wales, a new transmission takes place on Fridays on 3.55MHz at 1830. It is operated by GW0TAF at Neath, West Glamorgan.

For South-East England, the following broadcasts have been discontinued: Fridays on 433.450MHz and on Saturdays and Sundays on 145.250MHz by G4HL, G4NPM and G0DQI.

Additional volunteers for the *GB2CW* Morse Practice Service are invited, particularly from people able to provide national coverage on the 1.8 or 3.5MHz bands. Volunteers are also needed for transmissions on the 144MHz band in areas where there is an identified local need. Anyone interested is asked to contact the *GB2CW* coordinator David Pratt, G4DMP, QTHR.

Keep Clear of Mir

USERS OF two-metre channel S22, 145.550MHz, are reminded that this frequency is used by the amateur radio station on board the Russian space station Mir. There are five orbits each day and the window for contacts with the UK lasts about ten minutes. You may be asked to move from this frequency, or to stand by for a few minutes to allow these space contacts to take place, and your cooperation would be very much appreciated.

RSGB's LIVE Again

LAST YEAR'S major consumer electronics exhibition, LIVE '93, was declared "the most successful launch event in decades". For the first time in 25 years the capacity of Olympia's Grand Hall was exceeded. And the RSGB was part of that success.

LIVE '94 is to take place at Earl's Court from 20 to 25 September and the Society is playing a key part in coordinating a village of amateur radio exhibitors. In addition to our own stand, which will be demonstrating amateur radio to the general public, displays will be mounted by Amateur Radio Exchange, Icom UK, Lowe Electronics, PW Publications, Trio-Kenwood, Waters and Stanton, and Yaesu.

The show covers all aspects of consumer electronics, including music, broadcasting, computers, photography and communications. The huge list of exhibitors include such household names as Sony, Sharp, Yamaha, Apple, Canon, Philips, Amstrad, Panasonic, British Telecom, Sky TV, Toshiba, Pentax, Microsoft, Nikon, *TV Times* and *PCW*.

We'll be bringing you more information on LIVE '94 nearer the date, but don't forget to put it in your diary now.

RAE Courses

STARTING IN late May, is an RAE course in **Meopham, Kent**. This is an evening course, but special arrangements can be made for people on shift work etc. Further details can be obtained from the course tutor Len Buck, G0DLR, on 0732 823483.

Eric Elsley, G3YUQ, runs an evening RAE Class. He is considering running a daytime course at John Bunyan Community College, **Bedford**. Anyone who is interested in this course, which could start in September, should contact Eric without delay 0234 768120.

A course for the December RAE will be held Thursdays at 7pm at the **Yeovil** Amateur Radio Club's QTH: Red Cross HQ, Grove Avenue, Yeovil. Enrol 12 May 7.30 - 10pm. Details: Rob Micklewright, G3MYM, on 0935 79027.

USA Exams

EXAMINATIONS WILL be held in London for the US Novice, Technician, Codeless Technician, General, Advanced and Extra Classes of licence on 14 May. A mailing address in the US is required and the examination fee is £4.00. Full details can be obtained from Ives Remedios, AC4WT, London ARRL-VE Team, 44 Kingsway, Wembley HA9 7QR; tel 081 902 5995 after 7.30pm.

Novice RAE

THE CITY and Guilds report on the March **Novice RAE** is available by sending an SASE to the Amateur Radio Administration Dept at RSGB HQ.

Novice RAE Dates: 6 June, 12 September and 12 December 1994.

Stolen Equipment

FOLLOWING A NUMBER of major thefts from amateur radio dealers, the Society has published a list of items of stolen equipment. Members are advised to check the list (see page 91 this month) before buying 'bargain' radios.

£100 Reward

An FT-747 HF transceiver was stolen from Waters and Stanton Electronics on 15 March. It was brand new but without the DC lead, microphone or instruction book. A reward of £100 is offered for information leading to the return of the radio, serial number 3F960040.

● STOLEN from G3KEC in Torpoint, Cornwall, a Cushcraft R7 vertical HF antenna. This was carefully dismantled and all parts removed, including guy wires. Any information, please, to J M Garner, G3KEC, QTHR.

PHOTOGRAPH: G3KPD

Rallies 12,000 miles apart: (top) brisk business on the RSGB Book Stand at the London Amateur Radio and Computer Show, and (down under) a small part of the biggest rally in the southern hemisphere, at Gosford, nr Sydney.

Friedrichshafen '94

WE ARE sorry to have to report that Nicky Cappelluto, G0PVC, is now a silent key. Nicky was organising the RSGB's Friedrichshafen 1994 trip with other members of the Barnsley and District Amateur Radio Club. We would like to reassure those who have booked that the trip will still go ahead, and Betty, his widow, has taken over the organisational work. For detailed information about the Friedrichshafen visit, see *RadCom*, February, p61.

ICS

BACK TO BASICS!

STOP PRESS: AEA PK-96 1200/9600 baud TNC now available!

HOW TO CHOOSE A MULTI-MODE DATA CONTROLLER

It's easy to get blinded by the latest Gee-Whizz firmware from the various manufacturers. But does it really matter? Other manufacturers will catch up at the next firmware revision.

With today's crowded band conditions and a declining sunspot cycle, what matters most is the ability to dig weak signals out of the noise and QRM! This requires sharp filtering with a wide dynamic range and the ability to track weak signals in the noise. A lot of components are required for this, and so it is the obvious target for cost cutting by some manufacturers. Switched capacitor filters with limited dynamic range are one common solution.

One manufacturer stands out from the crowd though. With its no-compromise modem designs based on active bandpass filters combined with a threshold tracking demodulator (or Digital Signal Processing in later designs), AEA gives you the power to pull in the weak signals. AEA manufactures the widest range of amateur multi-mode data controllers in the world — and have been doing so longer than anyone else.

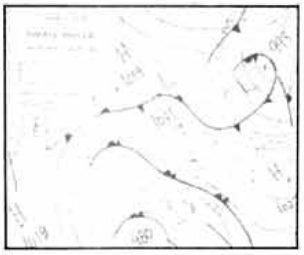
So next time someone tries to dazzle you with firmware features, don't be taken in. Tell them that **it's the hardware platform that counts.**

To find out more, send for the latest 1994 AEA colour catalogue and price list. See how buying the best needn't cost you the earth.

DSP-2232 **£899.95**; DSP-1232 **£725.00**; PK-900 **£499.95**; PK-232 MBX **£385.00**; PK-96: **£239.95** *Post and Packing extra.*

THE BEST IN WEATHER SOFTWARE FOR THE IBM-PC

ICS-FAX III



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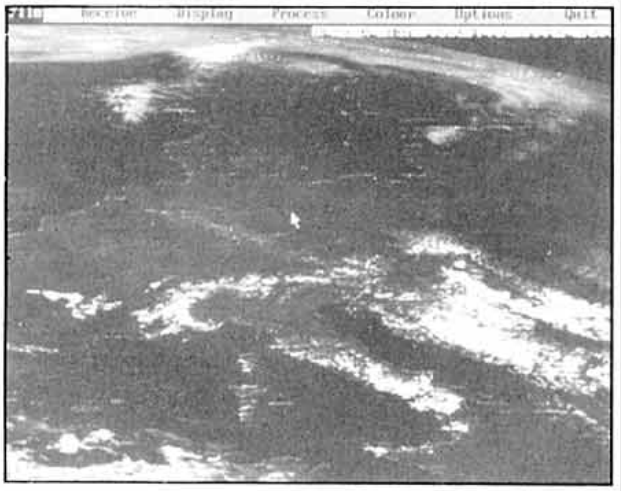

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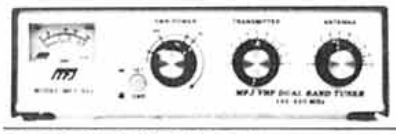

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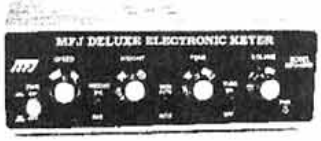

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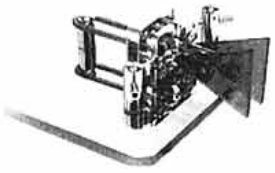

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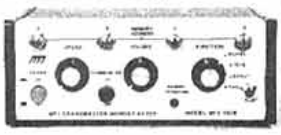

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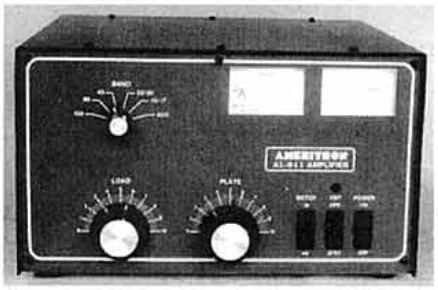

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TA-34-M	4 EL 10/15/20M
TA-34-XL-WARC	5 EL 10/12/15/17/20M
TA-53-M-WARC	4 EL 10/12/15/17/20M
PRO-57-B	7 EL 10/12/15/17/20M
PRO-67-B	7 EL 10/12/15/17/20/40M
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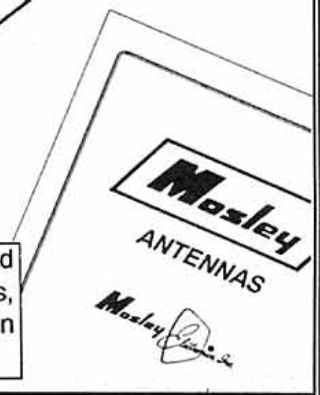

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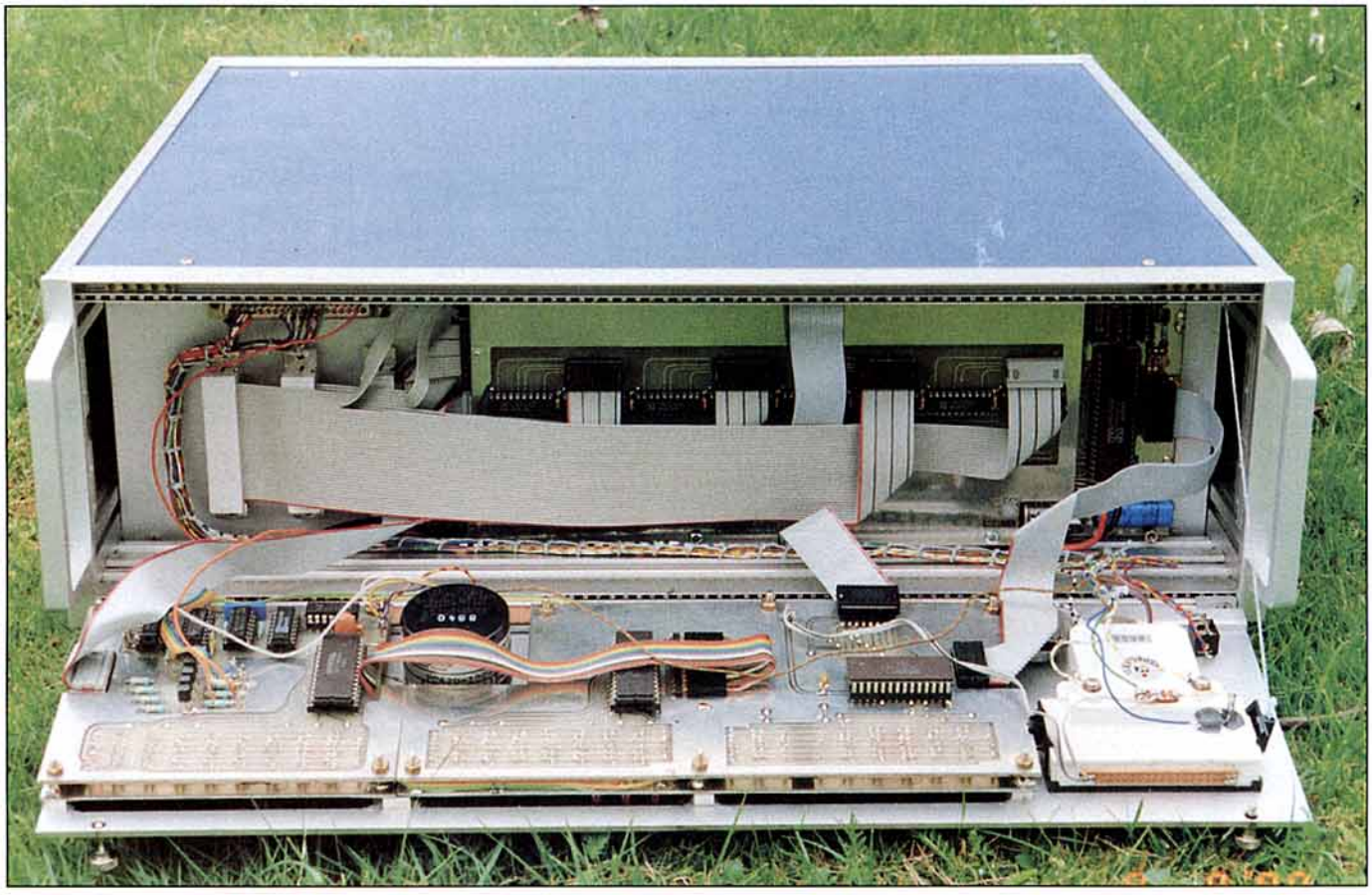
THIS MONTH'S LEADING PROJECT

RX84 Advanced HF Receiver

The first of a five part project by Tommy E Bay, OZ5KG



DURING THE YEAR 1984, the first plans of a new receiver began to emerge. They were photocopied and filed under 'RX84', and this title became the name of this new receiver project.

I believe that an advanced experimental project like this can only be successful if it is carried by two or more enthusiastic persons working as a team. This allows problems to be solved by discussion and that there is always someone to 'push on' when eagerness declines. I'm sure my very good friend and companion, OZ1CCC, of this and other projects, will agree.

In his book *Communications Receivers* [1], Ulrich Rohde suggests that there will not be any major improvements to the RF circuits of the HF receiver in the coming years. He says that the professional interest in the HF range is decreasing, because the commercial traffic is in the process of changing into more reliable media, like satellites and cables, leaving only a minor military interest in shortwave.

Despite this, Dr Rohde claims the greatest challenge to receiver design is on the HF bands. An HF receiver must be able to cope with fading and weak signals, strong unwanted adjacent signals electrical interference and noise. As these are the problems facing the present day amateur HF radio operator there is still a need for further HF receiver development.

Microprocessors and digitalization form a large part of amateur and commercial designs these days with synthesizers and the low-frequency filtering being used fairly extensively. Although digitization of circuits will increase as time goes by, receiver input circuits will most probably remain analog for many years to come.

The RX84 is an advanced project incorporating the latest developments in HF receiver technology. It takes information and inspiration from many sources, any one or more of which could be included in your receiver or transceiver design.

Although this is a complete receiver project it is not a detailed construction article and does not have designed printed circuit boards and component lists.

With this design there is space in the cabinet sufficient for the transmitter modules so that the receiver can be changed into a transceiver at some future date.

DESCRIPTION

THE RECEIVER USES the up-conversion technique and the overall design is shown in **Fig 1**.

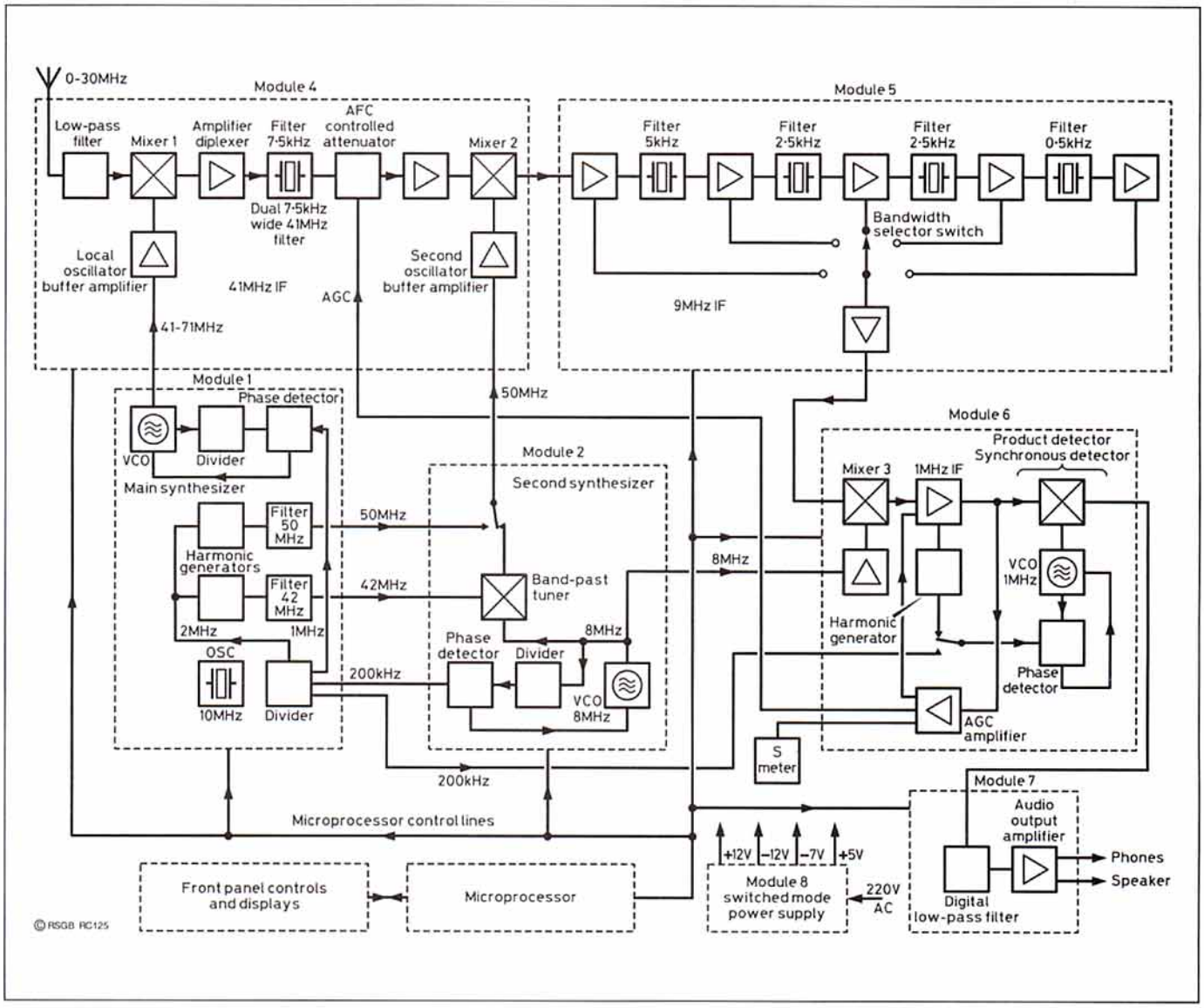


Fig 1: Block diagram of the complete RX84 receiver.

It has general coverage from 0 to 30MHz, with a first intermediate frequency of 41MHz, and a second IF of 9MHz. This second IF frequency was chosen because of the availability and low cost of 9MHz crystal filters. The final IF is at 1MHz, which gives improved detector performance compared to 9MHz and eliminates BFO leakage to the main IF amplifier.

The receiver is built in modules, sized 10 by 26 centimetres (standard Eurocard), which fits into a commercially manufactured standard 19 inch cabinet (ELMA). Height of the cabinet is 13cm and the depth is 42cm. The front panel is hinged, to give access to the compartment containing the micro processor controlling the receiver. Displays and control push buttons are mounted at the rear of the front panel. This method contributes to the electrical screening of the processor; computers are very noisy circuits.

All the modules fit into the cabinet from the rear, and are connected via 64-pin plugs. An exception is the main synthesizer, which has a 96-pin connector. Multi-connectors are available with coax connectors built in but these are very expensive. For this reason RF connections are made using separate SMB connectors and RG 316 50Ω coax.

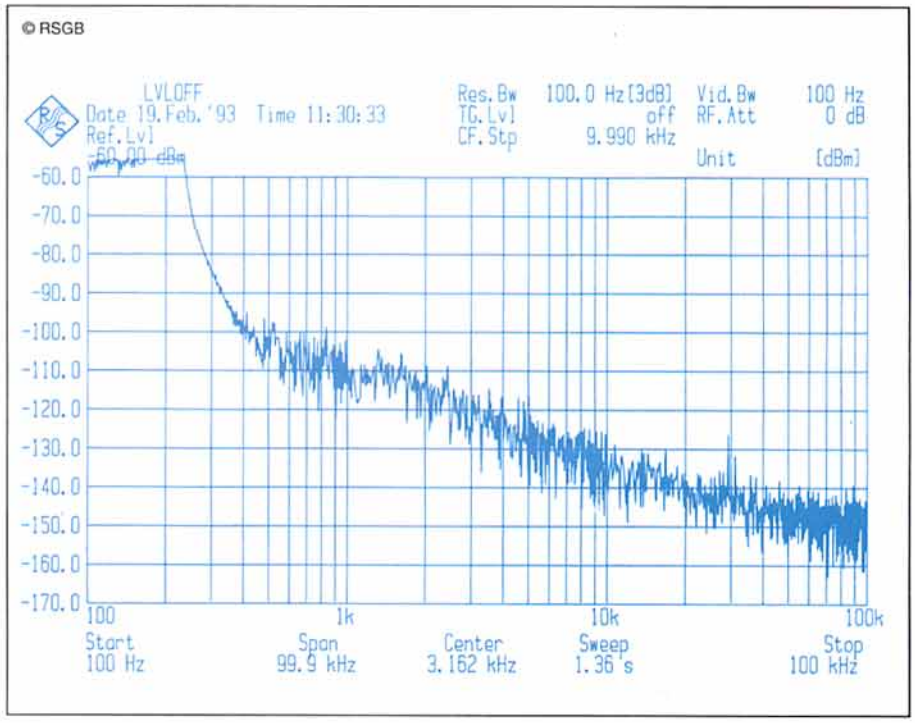


Fig 2: Synthesizer phase noise.

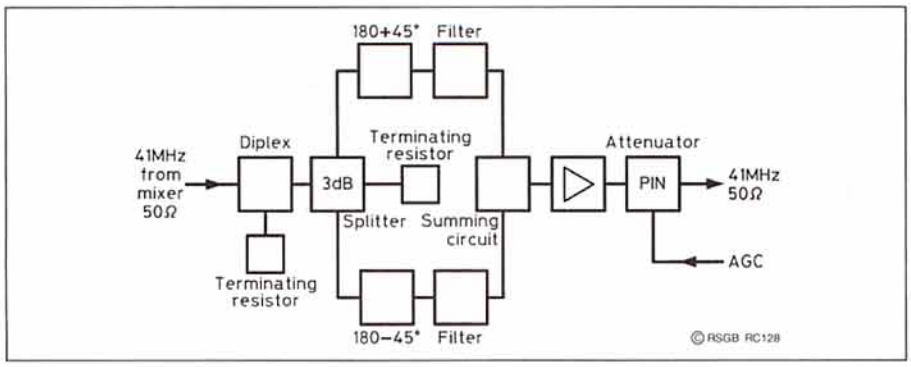


Fig 3: First mixer terminating circuit, block diagram.

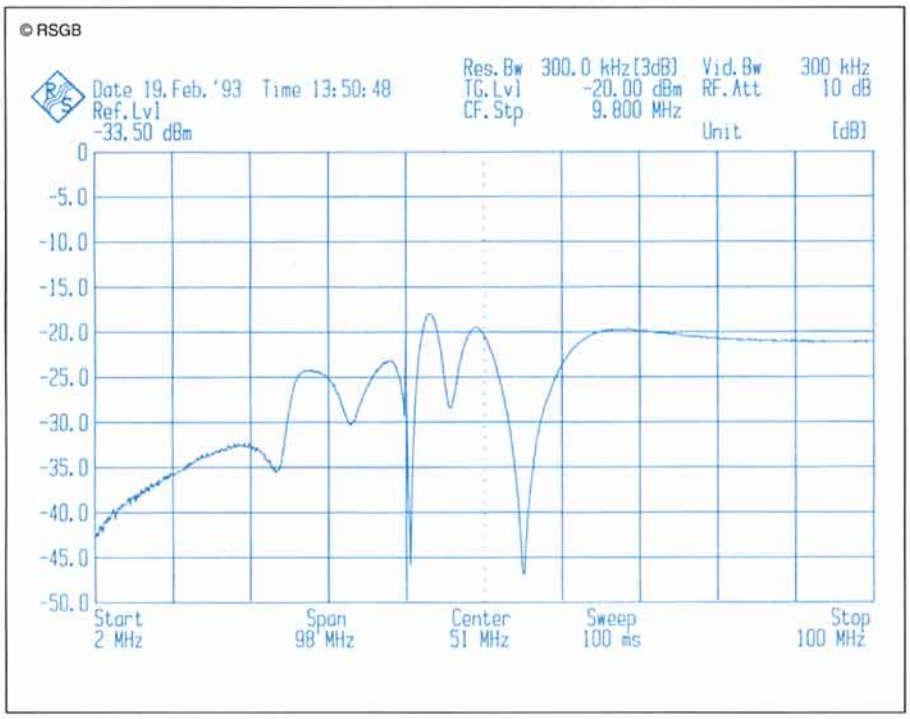


Fig 4: First mixer terminating circuit return loss.

The receiver comprises the following modules, see Fig 1:

The **input module** (Module No 4) contains the input protection circuits, low-pass filter, first mixer and first IF amplifier with crystal filter at 41MHz and the second mixer for the second IF at 9MHz. Additionally, it contains the two amplifiers for oscillator injection.

The **main synthesizer** (Module No 1) produces the injection signal to the first mixer. The reference frequency for this, is derived from a temperature controlled 10MHz crystal oscillator. Other signals, described later, are also derived from the reference oscillator.

The **second synthesizer** (Module No 2), which is locked to the 10MHz reference, produces the local oscillator signals for the second and third mixers. This module also contains the mixers for the pass-band tuning system.

The **IF filter** module (Module No 5) contains four crystal filters at 9MHz. These are:

- AM filter, 5kHz wide
- SSB filters, comprising two 2.5kHz wide filters connected together to form a 2.2kHz 16-pole filter.
- CW filter 0.5kHz wide.

In the FM mode, only the 7.5kHz wide filter in the first IF (41MHz) is active.

The **detector** module (Module No 6) contains the mixer for the third IF at 1MHz, AGC-circuits and detectors for AM, FM, SSB and CW. In the AM mode, the product detector operates as a synchronous-detector.

The **audio filter** and **output amplifier** (Module No 7) contains a digital low-pass audio filter, audio gain control, and output amplifier, capable of an output of 10 – 20 watts (today's loudspeakers are not very efficient!)

The **mains power supply** (Module No 8) is a switched mode type, with additional series stabilisation.

To prevent interference from the microprocessor and from the power supply, all of the modules are enclosed in electrically screened metal boxes. An unetched circuit board of 26 x 10cm (standard Eurocard) is used as the base of the enclosure with a one inch strip of thin, tinned sheet metal, soldered on to it and forming the sides of a box. Shorter pieces of strip sheets, split the main box into smaller screened compartments, in order to further screen the smaller circuit boards from each other. This also permits easy replacement of a board.

The width of the modules varies from 31mm to 101mm (the main synthesizer contains three boards).

DESIGN CONSIDERATIONS

AS STATED EARLIER, HF receivers must be able to operate over much greater levels of signal strength and be able to receive weak signals in the presence of strong ones. To achieve this the receiver must have a wide dynamic range. The most critical part of the receiver design is the front end that precedes the main selectivity-determining circuits.

Receiver dynamic range is defined as two-thirds of the difference from the third order input intercept point, to the noise floor. Assuming a IF-filter bandwidth of 2.2kHz (normal SSB bandwidth), a noise figure of 10dB (more than adequate for the shortwave range, with dipole antennas), correspond to a noise floor of – 130dBm. If the receiver front end shows an intercept point of +40dBm, this equals a dynamic range of (130 + 40) x 2/3 = 113.3dB.

To achieve a receiver front end performance like this requires that the local oscillator signal must be exceptionally 'clean' in respect of sideband noise. Otherwise reciprocal mixing will set the limit for the receiver performance, rather than the mixer itself.

Assuming the IF-filter stop band attenuation is infinite, the sideband noise rejection must be greater than a figure equal to the dynamic range, plus the bandwidth factor in dBs, below the carrier level and measured at ± 20kHz from the oscillator carrier (see Design Note 1). In the present case, this will amount to – 113 ± 33 = – 146dBc/Hz at ± 20kHz (a 2.2kHz filter is 33dB 'wider; than 1Hz).

Very few synthesizers will meet this specification. The synthesizer we have used in this project has a sideband noise of – 137dBc/Hz at ± 20kHz, dropping to – 147dBc at ± 100kHz, as shown in **Fig 2.**

It follows that the first mixer should have a high third order input intercept point. For many years, it has been possible to build mixers with high input intercept points greater than + 45dBm. However, obtaining performance figures like this demands wideband termination of all three mixer ports.

In order to overcome this problem, an attenuator pad could be inserted between the mixer and the filter. As an example, a 6dB pad

DESIGN NOTE 1

NOTE: In professional VHF specifications, the adjacent channels are often used as reference. This could be done in the HF range, if it was not for the fact that channel separation would be 3kHz, compared with 15kHz on VHF. One of the difficulties would be the first 7.5kHz wide (in this case) IF filter. It would permit the adjacent channels to slip through to the second mixer and second IF. This means that the intercept of both mixers will contribute to the intermodulation products built-up, as well as the sum of the sideband noise from both oscillators must be below – 146dBc/Hz at ± 3kHz from the carrier.

would insure reasonable matching (12dB of return loss), but at the same time, the receiver noise figure will decrease 6dB.

The effect would be that the noise figure of the first IF amplifier will degrade by the 6 – 7dB in the mixer, plus the 6dB in the attenuator, making the total receiver noise figure in excess of 15dB.

A preamplifier could be added to regain the sensitivity, at least in the high frequency end of the range, but this will degrade the input intercept by the same number of dB, as the gain of the amplifier.

Our design, based on ideas published in 1982 by Michael Martin (DJ7VY) [2], uses a diplexer and two equal two-poled crystal filters, see **Fig 3**. This provides front selectivity, while at the same time ensuring an impedance match to the output port of the first mixer inside the filter pass band and in the stop band.

The mixed signals, are fed through a 3dB hybrid splitter and two all-pass circuits for phase shifting the signals, in the one branch + 45° and in the other – 45°. The phase difference of the two signals are 90° as they reach the crystal filters.

In order to regain the – 3dB from the splitter, the signals within the pass-band of the filters, are added, after a delay in one of the branches by 90° to regain phase coincidence, and are terminated at the input of the low noise first amplifier.

The signals in the filter stop-band will be reflected due to mismatch. They are phase shifted an additional + and – 45° in the all pass filters on their return, and will now be at counter phase, to be absorbed in the splitter terminating resistor.

Because the all-pass filters will maintain 45° phase shift over a limited frequency range, a diplexer is added in front of the splitter, in order to expand this range. The resulting return loss for the mixer is shown in **Fig 4** on the previous page. The VSWR is better than 1:1.5 from DC to several hundred Megahertz. The total loss of the circuit is less than 2.5dB.

The loss of the two crystal filters is specified below 1.5dB, and their intercept point to be between + 38 to + 45dBm, depending on the frequency spacing of the measuring signals. However, it will not influence the receiver performance, because the antenna signal at this point is attenuated by both the mixer loss and the loss in the terminating circuit.

The detailed circuits of this receiver will be explained in following issues together with appropriate design considerations.

REFERENCES

[1] *Communications Receivers, Principles & Design* by Ulrich Rohde and T T N Bucher.

[2] 'Verbesserung des Dynamikbereichs von Kurzwellen Nachrichten Empfaengern' by Michael Martin, DJ7VY.

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Westflex 103, low loss air spaced 50 ohm **95p/m**
RG213U, (UR67), Mil spec, 50 ohm low loss **70p/m**
UR43, 5mm dia, 50 ohm, single centre **30p/m**
RG58CU, 5mm dia, 50 ohm, stranded centre ... **30p/m**
RG174U, 2.3mm, 50 ohm, miniature coax **35p/m**
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 **25p/m**
300 ohm standard ribbon **25p/m**
RG62AU, 6mm dia, 95 ohm coax **50p/m**
Single core screened cable, 2.3mm dia **12p/m**
Two core screened cable, 5mm **30p/m**
3 core mains, 5 amp, cable **25p/m**
6 core rotator cable, heavy duty **45p/m**
8 core rotator cable, heavy duty **65p/m**
14 SWG HD copper **25p/m**
16 SWG HD copper **20p/m**
PVC coated AE wire, light duty **8p/m**
Red/black DC power cable, 8 amp **30p/m**
Red/black DC power cable, 15 amp **45p/m**
PVC coated AE wire, heavy duty **12p/m**
NEW UR67 50 ohm HD with robust outer sheath **90p/m**
NEW 75 ohm heavy duty twin balanced feeder **60p/m**
NEW 300 ohm heavy duty slotted feeder **60p/m**
NEW 16swg stranded copper aerial wire **30p/min**
NEW 450 ohm ladder ribbon feeder **65p/m**
Self amalgamating tape **£3.80**
Dipole centre boxes **£2.50**
Polyprop egg insulators **50p**
4in dog bone insulators **70p**
Half kilo multicore solder **£5.00**
N CONNECTORS FOR ANDREWS 4/50 and 5/50, Cellflex ⅞th cable etc — SAE for special surplus lists.

Postage on cables up to 20M £3.00, over 20M £5.00

SPECIAL OFFER!

WESTFLEX 103 . . . the super low loss 50 ohm cable at the affordable price (we sell nearly 80% of our production to the commecial market . . . inc HM Govt, BBC, BT, Racal and other UK blue chip companies as well as several tons a year for export) . . . **100m drum to the amateur market for £80 plus £6 delivery.**

ADAPTORS . . . all 50 ohm
BNC plug one end . . . SO239 socket the other end ..... **£1.60 ea**
PL259 plug one end, BNC socket the other ... **£1.60 ea**
N plug one end, SO239 socket on the other end **£3.00 ea**
N plug one end . . . BNC socket on the other, MIL spec ..... **£3.50 ea**
BNC plug one end . . . N socket on the other, MIL spec ..... **£3.50 ea**
PL259 plug one end, Phono socket on the other **80p ea**
Phono plug one end, SO239 socket the other **80p ea**
BNC plug one end, Phono socket on the other **80p ea**
3.5mm plug one end, SO239 socket on the other **80p ea**
N plug one end, C socket on the other, MIL spec **£4.00 ea**
N plug one end, with C plug on the other, MIL spec ..... **£4.00 ea**

SPECIAL HANDY OFFER!

BURNDEPT BE600 hand portables, UHF, 420-470MHz, 6 channel. Complete and good condition, no batteries (take 2x9v PF1 Rx type) **£25** each postage £3

20 way Automatic Battery Chargers/Processors for above 9v batteries . . . will also suit PFI Rx and BE470 Batteries etc **£25** each postage £5

MIL SPEC PROFESSIONAL CONNECTORS

Below we list our stock of MIL spec professional connectors . . . these are mainly by GREENPAR and are normally SILVER PLATED bodies, pressure sleeve clamps, PTFE insulators & silicon rubber gaskets . . we normally hold large stocks and most of the lines are repeatable . . . the prices are extremely good value and below normal trade price for small quantities.

All the types below are with pressure sleeve clamp

N TYPE
N plugs . . . for UR67/RG213 ..... **£2.60 ea**
N plug . . . special for Westflex 103 ..... **£5.80 ea**
N line sockets . . for UR67/RG213 ..... **£2.50 ea**
N plugs for 5mm cable (UR43/76 RG58 etc) **£2.60 ea**
N chassis sockets . . . 4 hole fix ..... **£2.00 ea**
N in line adaptors . . . 2 x N sockets back to back ..... **£3.00 ea**
N in line adaptors . . . 2 x plugs back to back **£3.60 ea**

BNC
BNC plugs for UR43/76/RG58 or any 5mm coax ..... **£1.20 ea**
BNC chassis sockets, round hole fix, open back **80p ea**
BNC chassis socket, round hole, insulated type **60p ea**

SPECIAL OFFER!

GREENPAR 5mm entry PL259s with pressure sleeve entry glands (like N type cable entry), the ultimate quality in PL259s with silver plated bodies and PTFE insulators, were £3 ea . . . **now only £2.50 each** . . . 10 for £23.00.

Popular standard connector lines

PL259 PLUGS
PL259 plugs . . . excellent quality to take 10.3mm coax UR67 etc ..... **60p ea**
Reducers for above to take 5mm coax . . . ie RG58/UR43/76 ..... **20p ea**
Reducers for above to take 7mm coax . . . UR70/TV coax etc ..... **25p ea**
PL259 plugs . . . with built in reducer for 5mm coax ..... **60p ea**
Angle PL259 plugs . . . side 5mm coax entry ..... **£1 ea**

MICROPHONE PLUGS & SOCKETS
4 pin mic plug . . . the piece on the end of the mic lead ..... **80p ea**
4 pin mic plug . . . angle type, with side cable entry ..... **£1.30 ea**
4 pin mic socket . . . chassis mt to suit above .... **80p ea**
4 pin mic line males . . . used to extend mic leads etc ..... **£2.40 ea**
6 pin mic plug . . . with 5 holes on the outside, 1 in the middle ..... **£1.20 ea**
6 pin mic socket . . . chassis mt to suit above **£1.20 ea**
6 pin mic line male, used to extend leads etc **£3.00 ea**
7 pin mic plug ..... **£1.50 ea**
7 pin mic socket . . . to suit above ..... **£1.50 ea**
7 pin mic line male . . . like to piece on the set but line type ..... **£3.00 ea**
8 pin mic plug ..... **£1.50 ea**
8 pin mic socket . . . to suit above chassis mt **£1.50 ea**
8 pin mid line male . . . other way around from the bit on the mic ..... **£3.50 ea**
NB The piece which goes on the end of the mic lead we call a plug . . . it is in fact a line female connector and the male side which is fitted on the rig we term a socket . . . it is in fact a chassis mt male.

TNC
TNC plugs for 5mm coax ..... **£1.80 ea**

PL259
PL259 plugs . . . high quality, with PTFE insulation & silver plated bodies for UR67/RG213 (not pressure sleeve type) ..... **£1.20 ea**

ADAPTORS
BNC plug one end to N socket the other ..... **£3.50 ea**
N plug one end to BNC socket the other ..... **£3.50 ea**
PL259 plug one end, N socket on the other ... **£3.50 ea**
SO239 socket to SO239 socket . . . in line ..... **£1.50 ea**
BNC socket to BNC socket in line ..... **£1.60 ea**
All the above connectors are 50 ohms

BNC SERIES
BNC plugs . . . 50 ohm for 5mm cable, standard quality ..... **75p ea**
BNC plug . . . 50 ohm high grade MIL spec, silver plated .5mm coax ..... **£1.20 ea**
BNC plug . . . 50 ohm for 10.3mm coax, RG213 etc ..... **£4.00 ea**
BNC 50 ohm chassis sockets, round hole **80p ea**
BNC 50 ohm chassis sockets, round hole, insulated mount type ..... **60p ea**
BNC 50 ohm chassis sockets, square flange type, 4 hole ..... **90 ea**
BNC coupler . . . 2 sockets, back to back in line, 50 ohm ..... **£1.60 ea**
BNC coupler . . . 2 plugs back to back in line, 50 ohms ..... **£2.00 ea**
BNC adaptor . . . 50 ohm, a plug and socket at right angles ..... **£2.00 ea**
BNC T connector . . . 50 ohm, 3 x BNC socket outlets ..... **£3.00 ea**
BNC T connector . . . 50 ohm, 2 x BNC sockets & 1 x BNC plug out ..... **£3.00 ea**
BNC chassis socket . . . Greenpar to take RG174/UR95 etc ..... **£1.00 ea**
BNC dustcaps . . . to fit on any BNC socket, Greenpar ..... **50p ea**
BNC sockets . . . 75 ohm, 6mm coax cable entry, chassis or line, MIL spec ..... **70p ea**
BNC coupler . . . 75 ohm, 2 sockets back to back, line or chassis mt, HQ ..... **80p ea**

TNC SERIES
TNC plugs . . . 50 ohm, 5mm cable entry, MIL spec, silver plated ..... **£1.80 ea**
TNC sockets . . . 50 ohm, 5mm entry, line or chassis mt, MIL spec ..... **£1.50 ea**
TNC couplers . . . 50 ohm, socket to socket back to back, line/chassis ..... **£1.50 ea**

N SERIES
N plug . . . 50 ohm, 10.3mm entry, UR67/RG213/103 etc MIL spec ..... **£2.60 ea**
N plug . . . 50 ohm, 5mm entry, UR43/76 RG58CU, MIL spec ..... **£2.60 ea**
N plug . . . 50 ohm, large 20mm entry, MIL spec, Greenpar ..... **£4.00 ea**
N plug . . . 50 ohm, large 23mm entry, MIL spec, Suhner ..... **£4.00 ea**
(Any of the above 3 large plugs could be adapted for Heliax cables)

SPECIAL OFFER!

GREENPAR SO239 LINE JACKS for 5mm cable, 50 ohm with pressure sleeve entry gland, a rare connector, silver plated and PTFE, were £2.50 **now £2 each.** 10 for £18.00.

NB POSTAGE EXTRA ON CONNECTORS etc of 75p. 30p stamps for complete lists. Trade prices to est retail outlets

W.H.WESTLAKE

WEST PARK, CLAWTON, HOLSWORTHY, DEVON EX22 6QN
Tel 0409 253758
Fax 0409 253458

HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham B17 8QB

APOLOGIES TO those who read the item DX Honor Roll Listings (the spelling of 'honor' is the American version!) in the March column and found apparent omissions and inaccuracies. Unfortunately this item had been held over from last year due to lack of space and the February *QST* referred to was February *1993*! The most recent *complete* listing comes from September 1993 *QST* which listed the callsigns of those who had confirmed contact with at least 316 of the then current maximum of 325 countries on the list. Please note that these are *current* totals and not 'all-time' figures:

Mixed: (325) G3AAE, G3GIQ, G3KMA, G3LQP, G3RCA, G3RTE, G3SJH, G3UML, G3ZAY, G4ADD, G4BUE, G4BWP, G4FEU, GW3AHN. **(324)** G3ALI, GW3ARS. **(323)** G3MXJ, G4EDG, G3IUF. **(322)** G3FXB, G3HCT, G3HTA, G3NSY, G3VIE, G3YJI, G4DYO, G4GIR, GM3BQA. **(321)** G3FKM, G3JAG, G3JEC, G3KDB, G3RUX, G3TXF, G3XTT, GM3ITN, GW4BLE. **(319)** G2FSP, G3COJ, G0DQS, GM3CIX. **(318)** G3KLL, G4ZYQ. **(317)** G4CNY, G4CP, GM3WIL. **(316)** G3MCS, G3VKW, GM3YTS, GM0AXY.

Phone: (325) G3KMA, G3RCA, G3SJH, G3TJW, G3UML, GW3AHN, GW3CDP. **(324)** G4ADD, G4BWP. **(323)** G3ZAY, G4WFZ, G0CGL, GW3ARS. **(322)** G3NLY, G3VOF, G3ZBA, G4DYO, G4GED, G4GIR, GM3BQA. **(321)** G3JEC, G3YJI. **(320)** G3XTT. **(319)** G4PTJ. **(318)** G4LJF, G0DQS. **(317)** G3BRD, G4LVQ, G4ZYQ. **(316)** G3MCS, G3VIE, G3VKW.

CW: (324) G3KMA. **(322)** G4BWP, G4EDG. **(321)** G4GIR.

This was the *complete* listing at the time and many more calls will have been added since! Future annual lists will appear in the new ARRL publication *The DXCC Yearbook* the 1993 edition of which first appeared in early February 1994. This is an interesting book because it also contains– amongst other items– recaps of the DXAC and Awards Committee voting during 1993, a list of the 100 most needed countries, and a review of the DX year just passed. It will be an annual publication and it is believed that it will be sent to those who have had active DXCC activity during the past year and to current Honor Roll members. (This *may* only apply to ARRL members–April *QST* does not seem to be too clear about this).

Bruce Edwards, G3WCE, apologies to all for the signal being radiated by *G3WCE* who is pirating his call on 1.8MHz. The *real* G3WCE always uses an electronic keyer!

CONVENTION

THE PROGRAMME for the RSGB International HF and IOTA Convention was issued in April together with a booking form. During the past few weeks a large number of talks have been firmed up as follows: 'Three outstanding DXpeditions: 3Y0PI' by Peter Casier, ON6TT; ZD9SXW by Roger Western, G3SXW; and VK9MM by John Linford, G3WGV. 'Transceivers' by Peter Hart, G3SJX (a regular contributor to *RadCom*). Three talks of interest to the LF fanatics– 'LF Antennas' by Bob Reif; W1XP, 'LF Propagation' by Neil Smith, G4DBN; and 'Phased arrays for 80 and 40 metres' by Bob Whelan, G3PJT. Four sessions will relate primarily to IOTA. Also definitely arranged are 'Contest College' by the HF Contests Committee, 'Antenna Circus' by Dick Joyce, G3WLM, and 'Cluster Workshop' by John Clayton, G4PDQ.

The 1994 Convention is of course a very special occasion as we will be celebrating IOTA's 30th birthday (party) on Friday evening 7 October. The DX Dinner will be on Saturday 8 October. The event ends on the ninth – see page 68 for more information.

Would readers please note that *all three streams* will start at 0930 on Saturday morning. Prices are unchanged from last year. Contact Neville, G3NUG, for your programme and booking form.

SRI LANKA

THE RADIO Society of Sri Lanka has written to the Society giving the news that there has been a recent revision of regulations there. There is now a Novice A licence with operating privileges in restricted parts of 3.5, 21, 28, and 144MHz– these have a 4S6 prefix. A Novice B licence has permission to use 144MHz only and in this case the prefix is 4S5. There are two full licence classes– General (all bands) with up to 500W SSB output, and Advanced which is similar but with up to 1000W output. Both use the familiar 4S7 prefix.

BAND REPORTS

Many thanks this month to G2HKU, G3GVV, G3YRM, GW4KGR, G4OBK, G0MHC, and the UK DX Packet Cluster (via G4PDQ). Callsigns printed in italics were of stations using CW:

1.8MHz
0000 *VQ9QM, W0RU, ZD8M, 5N0MVE.*
0700 PJ9B, *V31WW*, ZL2JR.
1800 ZL2JR.
1900 *A71CW, FK8CP, VK3IP.*
2200 *HL1IUA, SV8CS, SV9CVN, VK6HD.*

3.5MHz
0000 PY0FM, *G3PJT/VP9*, ZB2FK.
0400 *3Y0PI.*
0700 *FG5FR, HK0/K1WGM, J52AG, V31UO, ZL1BGD*, 3Y0PI.
0800 FM5DN, VE8RCS.
1700 *S21ZG.*
1900 *A71CW*, VK4YD, *7Q7RM.*
2100 A92BE, EY8JA, *FH/DJ2BW, JE3CYW, 8Q7LX*, 9G1MR.
2300 *D2EYE, FG5FR, FH/DJ2BW, ZS6NW, ZS9Z*, 5T5SV, 9K2MU.

10MHz
0000 *FY5FY, 3Y0PI, 5U7V, 9Y4NW.*
0800 *JA2CG, KL7U, TI9CF, ZL1CH.*
1500 *3D2KR.*
1600 *FH/DJ2BW, VQ9MZ.*
1700 *A92FV, KL7U, TL8NG.*

14MHz
0800 A35SQ, BZ5HAN, ET3SID, H44MS, PY0FM, TI9CF, 3D2ER, 3Y0PI.
0900 BV2KI, FK8GT, FO4OK, FO4PF, SV2ASP/A, V85PB.
1000 JT1BV, YI1AA.
1100 P29DX, *T30CC*, T30JJ, V63SD, V73C.
1400 BV7GA, TI9JJP, XX9AS, 9V1ZS.
1500 *A71CW*, P29VH, S21ZG, *V85KX, VQ9CM*, 9M6BZ, 9M6LS, *9X5HG.*
1700 A41JR, VK6CHI, *VQ9SS*, ZS8MI, 3B8DL, 4S7NB.
2000 J52AG, PY0A, V29NR, *ZS0X*, 5Z4MR.
2100 C53GB, J6/DL9XAT, S01MZ, V29MR, ZD8ZKR.

18MHz
0900 *D2EV, YI9CW*, ZD9BV, *ZS9Z.*
1000 FK8CP, *ST2AA, T30RT*, TA2FD, VK9NS, 3Y0PI.
1100 A71CW, JT1CC.
1400 *FH/DJ2BW*, HC4L, 7Z1IS/P.
1500 *V31RM, VP5/AB5MF*, ZS8MI, 7Q7JL.
1600 *A22MN, J52AG, PY0B*, YI1AL, 5T5MS.
1800 *K4ZLE/EL2, J52AG, 8Q7LX*, 8R1XPO.
2000 *KL7KN, PS0P, ZS9Z.*

21MHz
0800 BY5QF, VZ, VR2BH.
0900 FH/DF9PG, HL0B. *XU7VK.*
1000 A61AF, BY4BPT, KH0AE, TJ1MR.
1100 BV2GA, C53HG, ET3SID, S21AM, 7Z1IS/P.
1300 C92DG, FR5BT, S21ZG, V85PB, YB0ASI, 9G1RQ.
1400 FH/DJ7HK, FR/G0IXC, *TU2MA, V31UO*, ZS0X.
1500 *C91J*, FR/G0IXC, J52AG, V51C, *YI9CW.*
1600 *ET3YU*, TI9JJP, *ZS0X*, 3Y0PI, *5R8DG.*
1700 AH6HY, D2EGH, KH6/W7GMV, V29AD, 5H3LM, 5U7K.
1800 FH/DF9PG, ZD8M, *DL9GMM/5N0.*

24MHz
1000 *FH/DJ2BW, VK6RO, ZS9Z.*
1400 A71BW, *PS0F, TL8NG*, 9G1SD, 9X5DX.
1500 *V31RM*, ZD9BV, ZS8MI.
1600 PJ2MI, ZS9Z, *ZS0X*, 5T5MS.
1900 FY5FJ.

SEANET 1993 CONVENTION

AS FOR THE 1992 Darwin SEAnet Convention, new ground for the venue of the 1993 event was again broken. SEAnet '93 was held in Dhaka, Bangladesh. This was the 21st Convention which up until 1992 had been held exclusively in an a SEAN country. The Dhaka convention was the first to be held at a venue on the Indian sub-continent. But maybe not the last. Read on.

The host society was the IARU member society for Bangladesh– BARL– and the Convention hotel was the Songaron. The SEAnet station used the callsign S21SEA and operated from the hotel most of the time. The QSL manager for S21SEA is I Kobayashi, JA0AD. A home-brew two-band two-element quad, a G5RV and a T2FD on the roof of the ten storey hotel ensured that the station got out quite well.

BARL followed the conventional programme of events with registration on the Friday morning and early afternoon. As SEAnet time (1200UTC) is at 6.00pm Dhaka time the official opening had to be held at 4.30pm so as to allow the chief guest, The Honourable Minister of Post and Telecommunications, to open the

QTH CORNER

BV9P	BV2TA, Tony H C Kuo, P O Box 112-16, Taipei, Taiwan.
D2EV	Helmut van Edig, DL3KBQ, Hartsteinstr 3, D-53115 Germany.
ET3YU	P O Box 60349, Addis Ababa, Ethiopia.
T32BB	DF6FK, Norbert Willand, Box 389, D-63110 Rodgau, Germany.
V85BG	c/o P O Box 373, BSB 3703, Brunei, Darussalam.
V85JD	S Sgt J D Bill, No 1 Sqn ATUDB, BFPO 605.
5X5A	Alex Plantz, Box 9276, Kampala, Uganda.
5X5F	Sam Berhan, Box 7047, UNICEF, Kampala, Uganda.
ZS9Z	Chris Burger, ZS6EZ, P O Box 4485, Pretoria 0001, RSA.
9N1AA	Satis, P O Box 2, Rajbirj, Nepal.

Convention and then listen to the net on 14MHz. The first day concluded with a welcome dinner and Bangladeshi cultural show.

The second day was spent on a cruise vessel, the LCT *Kajal* sailing up river and then returning to Pagla and the hotel for the Grand Banquet. Whilst on the river some of the more enthusiastic delegates operated maritime mobile using a rig kindly loaned by Rashid, S21AR.

The third and final day was the traditional Plenary Session during which the business of SEAnet was discussed.

The final item of business was the date and venue of the 1994 event and two invitations were placed before the meeting. The first presentation was by Mrs Mumtaz, VU2KAN, who proposed Hyderabad in Andhra Pradesh, India, while the second was by Rashid, 9M2RS, President of MARTS. He mentioned that 1994 was a 'Visit Malaysia Year' and since the proposed venue was Malacca – a very historic city on the west coast– he believed that MARTS could receive support from the Malaysian tourist organisations.

It was decided that the 22nd SEAnet Convention will be held in Malacca between 11 and 13 November and MARTS will be the host society. Information may be obtained from MARTS, P O Box 10777, 50724 Kuala Lumpur, W Malaysia. Please mark "for the attention of Sangat Singh, 9M2SS, Secretary, Organising Committee."

Note well that India has now shown a positive interest in SEAnet Conventions so who can say what venues may come up for future SEAnets? In the meanwhile the actual Net continues to meet daily at 1200 on or near 14.320MHz.

DX NEWS

THE LATEST LIST OF operations which have now been accepted by ARRL for DXCC credit includes the following: 3V8W (starting 17.7.93 and only CW QSOs on 7, 14, 21, and 24 MHz), 7Q7JA (7.5.90), 8Q7BX (7.12.93), 8R1/KD4GMV (11.1.94), 8R1/KK4WW (11.1.94), 9M2/DK7PE (17.5.93), A35CW (6.1.94), FS/W2QM (1.12.93), H44/DK7PE (13.12.93), HI8/7Q7JA (19.7.91), P29VCW (18.5.93), VK9MM (18.9.93), V51/7Q7JA (18.7.93), V63MV (23.12.92), YJ0AXX (23.12.93), ZD9SXW (29.9.93), ZK1ACW (17.1.94), ZV0ASN (1.1.94). Credit for contacts after these dates may be claimed immediately. The number of unprocessed applications at the end of February was 497 (52,707 QSLs) and the DXCC Desk received 687 applications (60,558 QSLs) for endorsements and new awards during the month. Applications being sent out at the end of the month had been received three weeks earlier. Interestingly enough, January and February 1994 brought in 75% more applications and 83% more cards than in the same months in 1993!

1994 WARC BANDS TABLE

	10MHz	18MHz	24MHz	Total
G4OBK	59	91	79	229
EA5DQE	–	71	29	100
G0MHC	29	36	14	79
GJ4GG	21	32	8	61
G3IAR	26	11	1	38

Members of the Oklahoma DX Association were hoping to visit **Cocos Is** during May. According to *DXPRESS* the team leaders are AH6MM and AH9B and they hope to leave Costa Rica on 10 May and operate for seven days on the island. There may be up to twelve operators and seven stations involved (five HF, one 50MHz, and one satellite). A possible list of operators includes V73C, AD1S, AH6MM, TI2JJP, XE2CQ, KH6UY, N5MIH, N0AFW, and AH9B. Major operating emphasis will be placed on CW, RTTY, and the WARC and LF bands. However, according to later information in *RSGB DX News Sheet*, a message from AH9B said that some Costa Rican amateurs were trying to force their national society to discredit any trip that had a QSL manager resident outside Costa Rica. Craig said that therefore the trip has been postponed until these issues are resolved. Nick, G3KOX, and Paul, G4CCZ, may still be in **Chile** and operating as CE/G0SMC. Priority was to be given to WARC band operation.

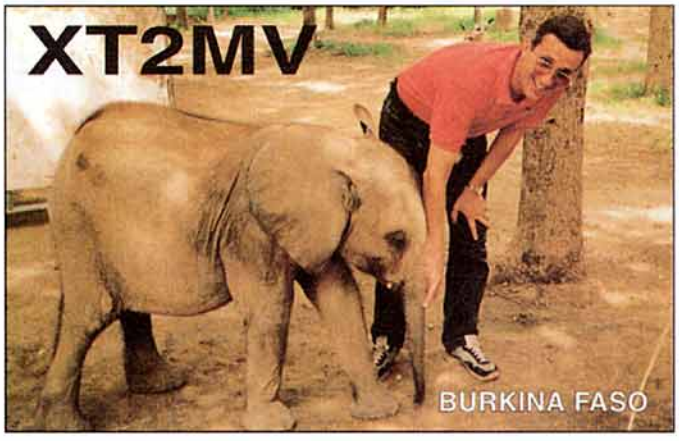
HA0WH will be in **Cambodia** for two weeks beginning about 5 May. He has the callsign XU0HW and he and XU7VK (HA7VK) hope to be on all bands CW and SSB. They hope to visit Rong Is in the Gulf of Thailand for a few days as XU9HA. This will probably be a new IOTA island. David Hardy (VP8HJ/G4BXH etc) is in **Dubai** but has not yet succeeded in getting a licence. However, he is allowed to operate from A61AD whenever he has time– which is mostly on Saturday between 1100 and 1500. He favours the WARC bands and is mostly on CW. A61AF is a new club station located at the Dubai Men's Higher College of Technology which is now quite active. Dave also gives the sad news that A61AB died in a microlight crash recently.

VU2STG and his wife are on the **Laccadive Is** for a few months. They have been heard signing as VU7LI on SSB and taking part in nets.

Rick, 7P8EB, writing from **Lesotho** tells me that someone is using the callsigns 7P8RQ and 7P8EQ on the air and asking for QSLs via IS0LYN. Rick has checked with the Lesotho authorities and the operator using these calls is definitely not licensed. However, it seems that IS0LYN *is* sending our QSLs and LARS is very anxious that genuine Lesotho amateurs do not get a bad name as a result. Paul, F6EXV, who is at present in **Rwanda** as 9X5DX asks DXers *not* to make duplicate contacts.

OVSV has informed me that the Austrian Communication Authority has permitted the use of the special callsigns in the series OE-A to OE-Z (26 calls) for club stations only and for special events–mainly contests. OVSV club stations have been allocated OE– A, B, C, D, Q, R, S, T, U, V, W, X, Y, and Z (14 calls) and the remaining twelve will be issued to non-member club stations.

The much prophesied trip to **Pratas Is** by a large group of DXpeditioners was still awaited at the time of writing. According to *RSGB DX News Sheet* Martti Laine, OH2BH/VR2BH, said there was to be another small expedition due to take place late in March by a group of rather inexperienced Taiwanese operators who have not been on the receiving end of a pile-up before!



Vincent Magrow (who represented REF at the recent Presidential Installation in Glasgow) in his other role as XT2MV in Burkina Faso.

BLUE MOUNTAINS EXPEDITION 1994

BETWEEN MID-MAY and mid-August RAFARS member Paul White, G0HBA, will be operating as VE8RAF from the Blue Mountains in Arctic Canada (80.38N, 85.26W). Paul is with a Joint Services scientific expedition to Ellsmere Is, under the approval and sponsorship of the Royal Geographical Society and the patronage of the Rt Hon Lord Shackleton KG FRS. Limited power will restrict operation to one or two hours a day with most operation on CW from a PCR320, giving 30W maximum output. Should propagation be good SSB will be used. Frequencies and times will initially be based on May '94 propagation predictions but updates will be given via RAFARS members W1BFA and G3BKG and on the daily RAFARS Net on 3.710MHz ± at 1830 local time. In addition 28 and 50MHz beacons will operate continuously as part of the scientific work be-

ing undertaken – probably on 28.193 or 28.197MHz, and 50.005 or 50.018MHz. Of necessity QSOs will need to be crisp and contest style probably using split frequencies.

RAFARS is proud that from many hundred potential candidates throughout the three Services for places in the twelve-man team, one of its members has been selected.

CONTESTS

AGCW QRP/QRP PARTY

1300– 1900 1 May

3.510 – 3.560 MHz, 7.010 – 7.040MHz. CW only. Class A up to 10W input, Class B up to 20W input, Class C – listener. Exchange RST/QSO nr/Class. One point for QSOs with own country, two with elsewhere. Multiplier is DXCC countries on each band. Send entries before 31 May 1994 to: Stefan Scharfenstein, DJ5KX, Himberger Str 19a, D-53604 Bad Honnef 6, Germany.

DANISH SSTV CONTEST 1994

0000 7 May– 2400 8 May

3.5 to 144MHz (no WARC bands) following IARU Region 1 SSTV bandplans. Two points for the first QSO with each DXCC country and one for additional contacts. One point bonus for contacts with Danish stations. Mail logs no later than 7 June 1994 to: Carl Emkjer, Soborghus Park 8, DK 2860 Soborg, Denmark. I can supply copies of rules (SASE please).

CQ M CONTEST

2100 14 May to 2100 15 May

CW and SSB. 1.8 to 28MHz plus satellites. No WARC bands. Single operator single and multi-band, multi-operator multi-band, and listener sections. Exchange RS/T plus QSO number (from 001). Same station may be worked once per band only. QSOs with own country count one point, with others in the same continent two, and with other continents three. Listeners get one point for logging one side of the QSO and three for both. Multipliers are the countries in the 'P-150-C' list worked on each band (NB: This differs slightly from the DXCC list but I do not have a copy). Send logs to the Krenkel Central Radio Club of the Russian Federation, P O Box 88, Moscow, Russia, to arrive no later than 1 July 1994. (I have photocopies of rules–SASE please).

Sid May, G4CTQ, currently in Ethiopia transmitting as ET3SID. He is very active in the formation of the new Ethiopian Amateur Radio Society.

CQ WPX CONTEST

0000 28 May– 2400 29 May

Photocopies of rules as published in *CQ Magazine* available. SASE please.

PROPAGATION

AS G8KG SAYS "no great change but a few interesting trends for the May number . . . ."

His report goes as follows: "The period under review was dominated by the recent increase in geomagnetic activity, the 27-day average of the Boulder Index rising above the 20 mark with a number of daily values above 30 and a peak of 58 on 22 February. At the same time the mean level of solar activity had declined steadily over a period of 60 days from 120 to only 93 sfu. "

As a result, HF band conditions were generally poor for much of the period from mid-February to the Spring Equinox but sandwiched in between the disturbed periods there was a short spell in late February and the first week of March during which even the higher bands were in good shape. At the time of writing there were signs that a 27-day repeat of that good spell might be arriving but with the seasonal decline of MUFs in our hemisphere and the corresponding rise south of the equator the highest usable frequencies will increasingly be on to the south of the East/West line."

THANKS

AS USUAL to everyone who sent in information for use in the column. Also to the authors of *DXPRESS* (PA3FQA), the *Lynx DX Bulletin* (EA2KL), the *Long Island DX Bulletin* (W2IYX), and *RSGB DX News Sheet* (G4DYO). Information for the **July** issue must reach me no later than **19 May** please.

VHF/UHF NEWS

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

THIS MONTH sees the first appearance of the 1994 Five Band Table. Numerous auroras, some contests and a few tropo openings to France and Spain have helped several entrants to get off to a good start. Winter Sporadic-E (Es) has provided further country points for 50MHz devotees. The basic rules are stated at the foot of each listing but if further clarification is required, send an SASE to the Purley address.

BEACONS

STEFAN HECK, LA0BY, advises that the two beacons in northern Norway are still operating (QRV) 24 hours per day. Located at JP99LO, they are LA7SIX on 50.051MHz - 20W/4-ele Yagi - and LA7VHF on 144.892MHz - 50W/10-ele Yagi; both beam at 190° with 5 degrees of elevation. To conserve power only dots are transmitted in between identification.

LA7SIX has been received in Morocco (CN8) by Es, and LA7VHF has proved the existence of Auroral-E propagation during the summer. It has also been copied via Es up to 2300km. Send reception reports sent to LA0BY at Floyvegen 25, N-9020 Tromsdalen, Norway. These beacons are operated by the Tromsoe Radio Club which would be grateful for any donations to defray upkeep and running costs; its PostGiro account number is 0806-3187721.

REPEATERS

23CM VOICE repeater GB3MM (WMD) on RM6 has closed down. A new location is awaiting site clearance. Contact Mr M A Gould, G4OKE, (QTHR) for latest details. The Stoke-on-Trent repeaters GB3ST, GB3VT and GB3SE went QRT on 19 March due to loss of site permission. Anyone who can assist with locating a new site should contact Geoff Booth, G8DZJ, whose address is correct in the current *RSGB Call Book* (QTHR).

Dorset UHF repeater GB3DT on RB0 became operational again on 12 March from Blandford Camp. It was QRT from last August so that essential repairs and renovation to its antenna tower could be undertaken. Its keeper is Mr T N Hordley, G8BXQ (QTHR).

PUBLICATIONS

ISSUE 1/1994 of *DUBUS* magazine is a special 120 page edition. Of interest to UHF operators is a 20-page article entitled 'Tetrode Power on 432' by Russell Miller, N7ART. He describes a 70cm grounded grid, stripline power amplifier using the Russian GS23B valve. With 50W drive, 3.11kV plate voltage and 520V on the screen, the measured output is 1.5kW at 56% efficiency in class AB2. There are ten pages of mechanical details plus circuit diagrams of the PA and power supply (PSU) including the screen over-current circuit.

The other articles in the Technical Reports section are all for microwave enthusiasts. There is comprehensive EME, tropo, MS, Es and aurora news and the usual Top List of squares worked on all bands from 50MHz to 241GHz. This issue includes the 1993 volume index and the latest beacon list. The UK representative for *DUBUS* is Roger Blackwell, G4PMK (QTHR).

The February issue of *The VHF-UHF DXer* features Sam Jewell's 'Tech Slot' devoted to the Hewlett-Packard 8620C solid state sweeper, which is now appearing on the surplus market. John Regnault, G4SWX, has an article on his screw-jack antenna elevation system. The rest is devoted to band reports. The editor and publisher is Dave Hardy, G8ROU (QTHR).

The Spring issue of *VHF Communications* includes major articles on D-I-Y gain blocks, the intermodulation properties of switching diodes, monopole antennas, lightning and over-voltage protection, receivers for GPS and GLONASS satellites, a notch filter for 70cm ATV interference and a hybrid PA for 144MHz using the Mitsubishi M57727 module. The English edition of the magazine is published by KM Publications, 5 Ware Orchard, Barby, Rugby, CV23 8UF.

The February report of the *Six and Ten Reporting Club* includes the solar indices and geomagnetic K indices data. There were 18 days of geomagnetic disturbances in the month, when the Kp index at any of the three British observatories rose to five or

more. There were major storms on the 6th and 21st. There are 50MHz propagation reoprts from Brazil, Britain, Greece, Japan, Malta, Sweden and Zimbabwe. For subscription details contact Ian Brotherton, G2BDV (QTHR).

CQ-TV is the quarterly journal of the British Amateur Television Club. The February issue, number 165, is another excellent, high quality production. The magazine is always packed with interesting articles on construction and operating. This 88-page issue includes an eight page supplement detailing members' services; a large range of PCBs for past and present projects is listed. *CQ-TV* is edited by Mike Wooding, G6IQM. The BATC membership secretary is Dave Lawton, G0ANO (QTHR).

FIRSTS

TO COMPLETE Pat Allely's, GW3KJW, list of British 144MHz firsts, here is the GW list in calls, date, time and mode order where known. GW4CQT-4U1ITU 6/79; GW4CXM-9H1CD 23/6/76 1728 Es; GW4CQT-CN8CC 4/6/78 Es; GW4CQT-CT1WW 6/6/77 MS; GW3MFY-DL1RX 14/10/61; GW8AWS/P-DL7QY 10/75; GW3MFY-EA1AB 27/3/65 2000; GW6APZ/P-EA6FB 8/83 MS; GW8VHI-EA8XS 5/7/84 2147; GW3MFY-EA9GK 13/7/80 1821 Es on FM.

GW2ADZ-EI8G 18/4/51 2120; GW4CQT-F0HI/FC 28/6/79 1500; GW2ADZ-F3LQ 14/5/50; GW3UO-G5MQ 22/10/49; GW8SU-GC2FCZ 16/6/54; GW5MQ-GD3DA/P 28/7/51; GW2ADZ-HB1IV 12/9/53; GW3MFY-HG3GG 4/7/65 1010; GW3ZTH-I4BER 21/10/73 MS; GW4CQT-IS0PUD 23/6/76 Es; GW8BXQ-IT9JLG 25/5/77 Es; GW3LEW-OE5XXL/2 5/9/71; GW4GSS-OH0AA 4/7/78.

GW2HIY-OK2VCG 6/10/60 A; GW2ADZ-ON4HC 13/5/50 1952; GW4VEQ-OY9JD 8/88; GW5MQ-OZ2FR 8/9/51; GW2ADZ-PA0HA 13/5/50 1735; GW4FRX-RA3LE 25/5/87; GW2HIY-SM5BZZ 19/10/63 A; GW3ZTH-UT5DL 4/1/74 MS; GW4CQT-UW6MA 12/8/77 MS; GW3BA/P-YU1EXY/P 4/7/65 and GW4CQT-ZS5ZY 23/12/79 EME. If there are any prior claims or extra information, please write. For example, has no Welsh station worked HB0, YO or LZ?

CONTESTS

THE BATC organizes contests on the second full weekends in March, May, June, September, November and December. They all start at 1800UTC on the Saturday, finishing at 1200UTC on the Sunday. The one on 14/15 May is a microwave event for fast scan TV (FSTV) only, 24cm and above. The 11/12 June contest, called 'Summer Fun,' is for slow scan TV (SSTV) and FSTV on all bands.

There are several VHF/UHF contests in May and June, including the new 'Back Packers' 144MHz series which run from 1100 to 1500UTC; see p82 in the January *RadCom* for the rules. The first of these is on 22 May and the next on 12 June. Please refer to the *Contests Classified* section for a list of all RSGB and IARU events.

DX NOTES

THIS YEAR is the Silver Jubilee of the Worked All Britain Awards. John Fitzgerald, G8XTJ (BUX), sent details of a proposed DXpedition to NW Scotland, 10-24 June, by G7BXA, G7DKX, G7HSP and G0NES. Lots of rare WAB squares will be activated on 6m and 2m in The Isle of Mull, South Uist, Benbecula, North Uist and Skye, with Ben Nevis (IO76LS/NN17) a possibility. Frequencies suggested are 50.122, 50.222 and 144.222MHz. For further information, contact Peter Austin, G7BXA (QTHR). Tel: Leeds (0532) 563462, or by packet G7DKX@GB7GBY.

Roger Betts, G0TRB (SFD), is planning a 6m DXpedition to the Isle of Man in TT week, 3-10 June. WAB squares could be SC17, SC36 and SC47. He is the UK custodian of 'The Rabbit Award' which can be claimed by anyone: "Who has talked for over 15 minutes to a fellow amateur," to quote from the parchment (the derivation of 'Rabbit' is probably Cockney rhyming slang; rabbit and pork = talk). Send him an SASE for details - QTHR.

METEOR SCATTER

THE ETA-AQUARIDS meteor stream should peak on 3 May, according to the *1994 Meteor Shower Calendar* published by the International Meteor Organization. The KR1P predictor suggests 1830 for the peak time, but the radiant is only above a mid-UK horizon between 0200 and 1300. Times when the reflection efficiency exceeds 50% are: NE/SW 0330-0830; E/W 0500-1030; NW/SE 0700-1130 and N/S around 0500 and 1100. All times are UTC.

Alastair McBeath, who compiled the IMO calendar, sent some interesting data about last December's Geminids following receipt of reports from visual observers. The shower produced a very fine display and on the 13/14 December night, he counted 367 Geminid meteors in 6.5 hours. A Romanian colleague recorded 700 in 7.75 hours. The Zenithal Hourly Rate (ZHR) was 100-130, depending on location and clarity of sky.

The Quadrantids were difficult to observe due to Moon position and clouds, but a ZHR of 50-80 during the 3/4 January night is suggested. From Sussex, Robert White observed radio reflections from Budapest Radio on 67.4MHz, using a dipole antenna. Alastair constructed a graph from his raw 10min and hourly counts which shows a pronounced peak at 1500 on the 3rd, and a lesser one from 2100 till 0200 on the 4th.

MOONBOUNCE

144MHZ

G4SWX (JO02PB) was QRV on 29/30 January and completed with RA3YCR, last heard in 1988. 'YCR now uses six 21-ele DJ9BV Yagis and was initial - ie station worked for the first time - number 241. Nothing was heard from the VP2MGR expedition. The activity weekend on 26/27 February brought four more initials; DK9OY, UT5ER (KN78DR) who is ex-RB5EF with 1kW and four 16-ele 'BV antennas, SM6CMU and UR3EE (KN88DC) ex-UB3EE, with 1kW and four 16-ele F9FT Yagis. All these were random QSOs.

The REF contest on 19/20 March was; ". . . . a real disaster . . . . with noise temperature around 500° K and 1.5dB excess path loss." John concludes it was: "A total wash-out." On the 26th he completed a sked with N3AJX at 0100 and a random QSO with K2RTH at 0144 for two more initials. At 0030 on the 27th, WB0GGM, with 300W and four small Yagis, was initial number 248.

Mike Ray, G4XBF (IO91), sent copious details covering the history of his EME interests. The station, assembled at a new site with the assistance of Kevin Rampton, G1KAW, first produced RF on 29 May 1993. Further improvements are planned for this summer. They only operate on random in sked weekends (SW), though will take skeds if asked.

They were QRV 25-27 March and on the 25th, completed with LA8YB, F6IRF, KB8RQ - very loud and: "Painful to listen to with the FL3 filter in circuit." - and SM5MIX. New initials till moonset on the 26th were K2GAL, K2RTH, KA5AIH, N5JHV and WA6MGZ. Moonrise brought PA3EPD and ON4GG and in the early hours of the 27th, SM6CMU and OH7PI were also new. 15 other stations were heard including JL1ZCG, K5GW, WA3HMK and S57TW.

Edward Allely, GW0PZT (IO72), heard some of the bigger stations on 19/20 March. A call to N1BUG at moonset on the 19th brought a 'QRZ' and at moonrise at 0940 SM5BSZ was 6dB over noise for 15min. SM5FRH was copied at moonrise on the 20th. At moonrise on the 27th, JL1ZCG had a large pile of Gs calling him. ON4GG, a four-Yagi station, was also heard 3dB over noise.

432MHZ UP

In his March *432 and Above EME News* Al Katz, K2UYH, reports good conditions during the Feb-

ANNUAL VHF/UHF TABLE

January to December 1994

Callsign	50MHz Cty	50MHz Ctr	70MHz Cty	70MHz Ctr	144MHz Cty	144MHz Ctr	430MHz Cty	430MHz Ctr	1.3GHz Cty	1.3GHz Ctr	Total Points
G6HKM	24	6	–	–	21	11	24	6	–	–	92
G0FIG	–	–	–	–	33	14	19	9	3	2	80
G1AWF	3	1	–	–	47	10	–	–	–	–	61
G8XTJ	15	3	–	–	30	7	–	–	–	–	55
GW0PZT	–	–	–	–	35	11	–	–	–	–	46
G4OUT	–	–	12	2	25	5	–	–	–	–	44
G4MUT	6	2	13	2	11	2	–	–	–	–	36
G3UOL	9	2	–	–	18	3	–	–	–	–	32
GW6VZW	9	11	–	–	–	–	–	–	–	–	20
G3FPK	–	–	–	–	13	4	–	–	–	–	17
GU4HUY	–	–	–	–	5	4	–	–	–	–	9

British counties are those listed on page 81 in the January 1994 *RadCom*; 77 in all. Up to three different stations allowed in each of the 12 GM regions. Do not include EI counties. Countries are the current DXCC ones plus IT9. Deadline for the July issue is 26 May.

ruary SW but with diminished activity due to bad weather in many parts of the world. There were no activity reports from any British operators in this issue. YO2IS is active most SWs and would like more skeds but reports trouble getting into the 20m VHF net. Szigy is up to 120 initials and 384 QSOs.

Doug McArthur, VK3UM, wrote: "I am working on a completely new version of the Sky Noise/Tracking program. It will do everything but send your CW (and make the coffee). It will include a visual sky temperature display, graphics (1024 x 768 x 256) and colour. It will enhance the existing software and allows a lot of 'I wish I could do that' applications. It should be ready for Gothenburg."

Dave Dibley, G4RGK (IO91), wants to get going on 23cm EME but reports that the FM signal from the new GB3HV ATV repeater in High Wycombe; ". . . . is completely wiping out the narrowband section of 23cm to the extent that I cannot operate on the band at all. Even everyday tropo is impossible." Tests with other operators confirm that these 'sprogs' are; ". . . . S9 some 20 or so miles away all over the weak signal part of the band."

Dave has contacted the group but the problem remains unsolved. There is a three-pole filter in the output, so perhaps it needs tweaking or replacing by a more efficient one. GB3HV is on RT3, input 1248.0MHz, output 1308.0MHz. It is located at IO91OO and is operated by the Home Counties ATV Group. Its keeper is Mr M J Sanders, G8LES (QTHR), whose telephone number is Alton (0420) 563859 and to whom reports should be sent.

50MHZ

CHRIS GARE, G3WOS (HPH), secretary of the UK Six Metre Group, reports a full quota of sponsors for the Jordan operation, scheduled for 29 May to 26 June. They are South Midlands Communications Ltd, Nevada Communications, R N Electronics and Kent Keys.

Bill Meinerts-Hahn, G3UOL (WMD), is now QRV with an FT-290 Mk 2, 25W transverter and HB9CV antenna. He found conditions in the 13 March leg of the UKSMG contest very poor. David Warr, G4RQI (YSW), uses a TS-670 multiband transceiver and hopes to work a few stations crossband to 4m in the Es season. Ela Martyr, G6HKM (ESX), operated in the 13 February leg of the contest which provided all her 24 counties. On 7 March she worked SM3EQY (JP81) in an aurora; he was the only station heard. G8XTJ mentions GJ4ICD as the only DX of note in the 13 March UKSMG contest.

Ted Collins, G4UPS (DVN), mentions two new Polish beacons; SR5SIX (KO02) 50.023MHz 5W to a dipole and SR6SIX (JO81) 50.028MHz 10W to a dipole. The information came from SP5CCC and SP4TKK. The QSL route for San Marino Club station T70A is: T70A Radio Club, P O Box 77, I-47031 Republic of San Marino. Ugo Sollini, I4SJZ, stated that the club's 6m permit had lapsed and that they were pressing the authorities for a new one.

G4UPS's morning tropo tests with G3CCH still produce consistent results and the subsequent random MS skeds with SM7AED usually come off. A telephone call from Arne at 1548 on 7 March advised him of an aurora, after which he worked a few 'locals' the event fading by 1915. Beacon GB3RMK (IO77UO) was auroral at 1603 on the 9th. Apart from that, things seem to have been very quiet on the band.

In Germany, the 600 original 6m permits expired and a new temporary experiment started on 9 February. All Class B licensees can now use 50.8-51.0MHz, CW and SSB only, 25W ERP to horizontal antennas. They will have to register their stations and those near the three remaining Band 1 TV transmitters are restricted to non-TV hours.

70MHZ

IAN CORNES, G4OUT (SFD), operated in the Fixed Contest on 27 March making 17 scoring contacts, all Gs except for GD4IOM. No EI, GI, GJ, GU or GW stations were heard. GM4ZUK/P was worked by Midlands stations but Ian didn't hear them. Conditions seemed quite reasonable but activity was low and fading (QSB) was deep.

G4RQI is still using a PW 'Meon' transverter, 10W PA and 5-ele MET Yagi; David is building a 25W PA to run off 28V. On 20 March he worked GM0NAI and GM3WYL (IO75) on CW around 1045, the first GMs worked outside of contests. He has been QRV in the Cumulatives but found activity poor with many of the well-known calls absent.

144MHZ

ALEC TRUSLER, G0FIG (SXW), operated in the 5/6 March contest and his best DX were towards the east with many DLs worked in squares JO30, 31, 40, 42 and JN39. In an aurora on the 7th he contacted GMs in IO75, 85 and 86. On the 8th the band opened up to the southwest with beacon EA1VHF (IN53) S9 all day. Many EAs in IN53 were worked, plus others in IN63 and 73.

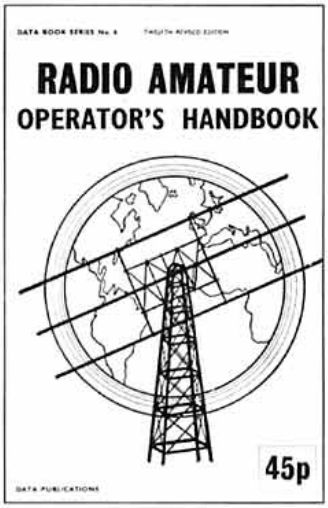
In the 7 March aurora, Andy Wyspianski, G1AWF (LDN), worked four GMs including GM7JED (WIL) for a new county and square. In the Spanish opening next day he contacted EA1s in IN53 and 63 with S2 reports each way, and Fs in IN78, 88, 94 and 97. RN1NW/MM was heard in the English Channel on the 26th. G6HKM also caught the aurora working GMs and LA1ZE (JO28). Ela contacted EA1s DHG and DDU in the opening on the 8th. G8XTJ's best DX in the March contest were G4KUX and DL3EBM in disappointing conditions.

GW0PZT mentions the several auroras between 22 February and 28 March, many of very short duration, 15-20min. Very northerly events were noted on 9-11 and 15 March but the best one was on the 7th, when GM4VVX/P (IO78) brought a new square for Edward. Best DX in the 5/6 March contest was ON7RY at 656km.

Clive O'Hennessey, GW4VVX, travelled to IO78WA in early March with a couple of friends. With a generator borrowed from GM0HBI, they operated /P from near the top of Knockarthur, 280m ASL in rain, sleet, frost, wind and mud! 35 stations were worked in the contest and in the aurora on the 7th he made 33 QSOs from all over the UK plus DL, ON and PA in a couple of hours.

Joe Ludlow, GW3ZTH (GNM), analyzed his portable results for last year. He made 1189 QSOs with 940 stations in 24 countries and 130 squares. F, G and DL stations accounted for over half the total. He was out /P on March 26 and called F/GW7KTP/P at 0905 on schedule. Tim had taken a TS-751E and 15-ele Yagi with him on holiday and gave Joe a new square, IN95. F6DBB (IN96) and F6HLV (IN97) were subsequently worked in flat conditions.

With falling pressure and an approaching cold front next morning, he was out /P again and contacted F/GW7KTP/P; more Fs were worked later. There was a Belgian QRP contest in progress but Joe only worked ON4GG (JO20AR) and ON4SG (JO20XN) before QRT at 1000 when the rain started. He also worked RN1NW/MM (IO80), whose home QTH is Petrozavodsk (KP71ES).



The correct photo of the *Radio Amateur Operators Handbook*. See March *VHF/UHF News*.

430MHZ UP

G0FIG OPERATED on 70cm in the tropo lift on 8 March and Alec's best DX were F6ANQ (IN94), F5MOO (JN07) and F5DJB (JN03) - all new squares - F6CRP (IN96), EA1s DKV and TA (IN53), both over 1000km. Going back to 6 February, G6HKM worked GI8AYZ (IO64) and GI8FLQ (IO74) in very poor conditions in the last hour of the 70cm contest.

During his Scottish trip, GM4VVX/P only made three 70cm QSOs with his FT-726R and 21-ele Yagi. GW3ZTH/P made 85 contacts with 73 different stations on 70cm last year. Joe worked 11 countries and 34 squares and notes that conditions were better than on 2m, but that activity was low.

G0FIG is now QRV on 23cm with an IC-1271E, 10W to a 55-ele Yagi with masthead preamp. Alec opened his innings on 5 March, first QSO being with G1HWY (IO90), followed by G3MEH and G4RGK (IO91). On the 8th, he contacted F5GHP (IN96), who was only running 0.5W, F6CCH (IN96) with 2W, F1HNF (IN97) and on the 12th, F6DKW (JN18).

FINALE

GRATIFYING TO have reports on all bands for a change; keep them coming. The July copy deadline is 26 May and the August date is 30 June. The BT Gold mailbox is 76:MSX021, the combined fax and telephone answering machine is on 081 763 9457, the CompuServe ID is 70630,603 and the Internet route 70630.603@compuserve.com.

DIGITAL NEWS FROM SISKIN...

SISKIN SPRINT 9600 TNC

You may have noticed recently manufacturers such as ICOM UK and KENWOOD have announced new transceivers capable of direct connection for 9600 baud packet radio (without mods). Up until now many users have been hesitant about diving into their cherished transceivers to hook up for 9600 but now all that's needed is a simple connection lead! To coincide with these changes in the market place we are pleased to announce the Siskin SPRINT 9600 TNC which we think will have as much if not more impact than the Tiny 2 which launched four years ago (15,000 Tiny 2's ago).

The **SPRINT** features include:

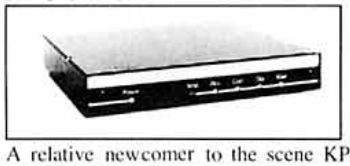
* 128K ram with "JUMBO" PMS
* 9600 G3RUH licensed circuitry superior for all types of signals, not just those that are 5 & 9
* 9.8MHz clock speed
* TNC-2 compatible mode for TheNet, BPQ, DEDHOST, KISS etc.
* Specialist commands/support for DX Cluster operators
* Specialist commands/support for the X1J on line deviation board
* Radio baud rates up to 38.4Kb
* Terminal baud rates up to 57.6Kb
* Specialist commands to support GPS

Initial deliveries to us are scheduled around early May but no doubt in true Packet Radio style early June is probably more realistic.
Price £199 incl. Leads & software.

WHAT ABOUT TINY 2 OWNERS?

If you already own a TINY 2 you can upgrade to the G3RUH standard by simply adding our **NB-96** daughter board with only very minor surgery (just two track cuts). You can even go one stage further and make your Tiny 1200/9600 switchable for complete compatibility This board may also be used to upgrade the PK-88, most MFJ, DSRI and 100% TNC-2 compatibles. **Price £95.00**

KPC-3 128K



A relative newcomer to the scene KPC-3 sales with Siskin have been rising rapidly over the past few months. All KPC-3's sold by Siskin now include 128K ram as standard ready-made cables and software. **Price £149**

THE SISKIN MINI-PAK SYSTEM

This popular little Packet radio modem is actually built INSIDE a conventional 9 way D shell using advanced surface mount construction. The Mini-Pak is compatible with virtually all IBM PC and compatibles offering many of the features of its standalone cousins (Tiny 2 . KPC-3 etc.) at a very affordable price. Supplied with ready-made software and manual **Price £69.95.**

NEW BOOKS .....

We've recently taken stock of two really super books for the Packet Radio enthusiast....

The first is entitled *"THE BBS SURVIVAL GUIDE"* (73 pages) by Roger Cooke G3LDI and tells all you need to know to get the most out of F6FBB BBS as a mere mortal. After reading it we were quite amazed by some of the things you can do while logged on to an FBB BBS like current Amateur Satellites status, check another Amateur's QRA (Maidenhead) locator or LAT/LONG and even a beam heading from your QTH!!!! For every book sold £1 is being donated to AMSAT. **£4.50** plus £1.00 P & P.

The second is entitled *"WHAT IS YOUR TNC DOING?"* by Gloria Metcalf KA5ZTZ (120 pages) and yes it actually lets you know just what is going inside that little box of flashing lights on your shelf! **£10.95** plus £1.50 P & P.

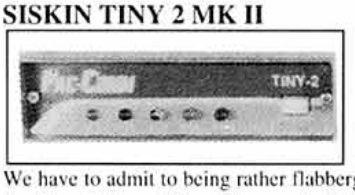
ANOTHER NEW HF MODE .....

Further to our ad in last month's RadCom GTOR is now available for all KAM PLUS models and early KAM's with the enhancement board fitted. GTOR is essentially an HF high speed file transfer mode utilising a high degree of data compression making it ideal for passing long ASCII and Binary files over varying Quality HF links. Available now (if you bought a KAM PLUS or enhancement board after Feb 1 1994 from Siskin you will of course be entitled to a free upgrade).

"GATEWAY" FROM AEA

In fact this update for the PK-232MBX, PK-900 and DSP units has been available from December 1993 but we decided to let it settle down a little before releasing it. The update offers nothing particularly spectacular for the PK-232 (basically just a non-conventional node of sorts and some minor AMTOR/PACTOR listen features) but for the PK-900 and DSP units does now support TRUE dual port multi-mode Gateway facilities (I.E. VHF packet in, HF PACTOR/AMTOR OUT). Available now - **£39.95**

SISKIN TINY 2 MK II



We have to admit to being rather flabbergasted by the Tiny 2s incredible track record. We are now moving over 100 units a month in the UK alone and yet one rarely spots one on the second-hand market. The Tiny boasts many uses including DX Cluster, Satellite and network applications. Of course it's also the ideal TNC for the newcomer as all Tinys supplied by Siskin retail include a ready made computer and transceiver cables for YOUR set-up and of course free software for virtually ANY popular home computer (not just PCs).
Price £139.00

PACCOMM NEWS.....

Version 3.2 of the PacComm PMS firmware should be around by about 10th May with some useful new features plus bug fixes. V3.1 owners may update free by sending their existing eprom and SAE.

READY-MADE CABLES....

For digital equipment can often be a nightmare for many. Siskin stocks the widest selection of ready made computer-to-TNC and transceiver-to-TNC cables in Europe at sensible prices. If perchance we don't hold it in stock our professional cable manufacturing facility can normally despatch the cable you need within 48 hours at regular prices.

JUST STARTING OUT ..... ?

Just in case by some freak of nature you've never seen or heard of Siskin before our ONLY business is Digital Radio and our aim is to help YOU the newcomer through those difficult stages. We accomplish this by offering the widest range of digital products available in the UK today backed up an out of hours telephone help line and in most cases ready-made cables and software to help make starting out just that little bit more painless.

KA & PKGOLD Version 9

You've probably heard both KAM & PK-232 owners praising the virtues of this superb software package from Interflex Systems and quite rightly so. Apart from being one of the easiest multimode programs nothing can touch it in terms of features and performance. If you'd like to "Try BEFORE you buy" please mail us a PC diskette (any type) plus SAE for the Test-drive version.
PK-88/KPC-3 version - **£59.95**
KAM/PK-232 version - **£69.95**
Versions also available for the PK-900 and DSP range too. This program WILL multi-task under Windows and users tell us it beats the socks off Pakratt and HostMaster!!!!!

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LAST WEEKEND was not exactly a high point of contesting for me since, for the first time in several years, work conspired to prevent our group entering the HF SSB WPX contest. While listening around from home I suffered the usual contest withdrawal symptoms – no, not cold sweats and the shakes – but just wishing I had managed to find a couple of spare days to put some antennas up. However, it was good to hear a reasonable number of UK stations having a fairly serious go at the event – particularly in the multi operator, single transmitter category. I have spoken to a number of these groups since, and all seem to have enjoyed themselves enormously. Conditions seemed lousy on Saturday with no real US opening on 15m, but Sunday was much better with many people enjoying running the big stateside pileups!

Not doing WPX in the usual serious way also reminded me of just how much can be worked using just 100W and a low wire antenna. With just a few hours of casual 'search and pounce' operation I worked 200 people including some good DX, and it really showed that anyone who was prepared to put some effort in could make a respectable score with really quite a small system.

Perhaps one of the keys to contesting when you know that you will not be very loud is not to hit your head against a brick wall if you don't have to! I mean this metaphorically of course, but for example, if you hear one of the big guns like P40V on Saturday on 15m and he doesn't come back immediately, don't worry about it – he will be there again on Sunday and will have a much smaller pile-up which will take less time to crack. However, you may also hear him on 160m where conditions may be very different the next night or his visits to the band will be few. Perhaps you hear a much more casual operator from somewhere rare who may only be on for an hour or so in the whole event – in these circumstances you should be prepared to spend a little longer trying to crack the pile up. All the usual tricks and cunning required for DX pile-up cracking like tail-ending – not calling immediately he goes over etc – apply doubly in a contest of course!

However, through all of this, you should remember that at the end of the contest, an additional multiplier will be worth the same number of points as a certain number of QSOs. You can make an estimate of your expected final score and multiplier totals at the start of the event, and from this you can work out approximately how many extra QSOs you would need to replace one lost multiplier. By comparing this number with your QSO rate at a particular point in the contest you can judge how long you can afford to call a particular station. It is also worth noting that the QSO/multiplier number displayed by CT may not be a good indicator until well towards the end of the contest since this number is based upon the number of multipliers which you have now rather than the number you will have at the end of the event. These major international events are something which the average club can have a go at, and while without a very large amount of hardware you may not expect to come top in the world, or even in Europe, you can still have a great deal of fun. A good part of the club's membership may be occupied in the entry through operating, multiplier spotting, antenna erection, computer support, logging, generator repair, camping, cooking and so on.

GET ORGANISED

THE CW leg of WPX takes place on 28/29 May, and a GX/GC/GS etc club call is always in demand as a rare prefix multiplier in this event. This requirement for such a variety of skills in contesting shows just how good an activity contesting is for clubs. This is a good time for clubs to make up a calendar of the contests in which they plan to take part this year. You probably need to balance HF and VHF events depending on the interests and resources of your own club, but there are plenty of options to consider.

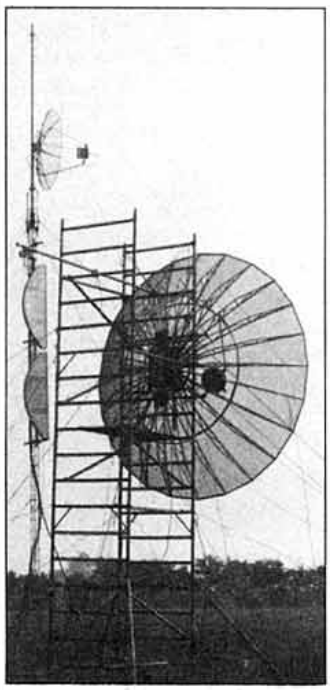
During the summer season, on HF, the field-days and the IOTA contests seem very appropriate; and at VHF, the May 2m, VHF NFD, the 6m and 2m trophies and the low powers are good options. Remember that for VHF NFD, you do not have to have all four bands in order to have fun! And of course it is never too early to start planning for the winter season. Quite a number of the groups entering WPX this year have been on during one or more previous WPXs and have improved parts of their stations and their tactics in an attempt to improve over their previous placings in the contest. I am equally sure that we will see many of this year's new entrants doing the same in 1995. Although having fun is the most important requirement in contesting, the pursuit of excellence is surely also a very large part of what contesting is all about.

NO BIG STATION?

SOME OF the recent discussions on contesting have almost suggested that those people who put a lot of time and effort into building up big stations are competing on unfair terms. I feel that this viewpoint is completely spurious. The people involved in *all* of today's most successful contesting stations started life towards the bottom of the results tables. It is through a desire to improve their performance that these people have invested their time and effort in improving station and operator performance. The results which you will achieve in a contest are proportional to the amount of effort which you are prepared to put in.

It would be absolutely absurd to expect to *win* a contest if you are not prepared to make this investment. Contest winners spend a lot of time honing their operating skills – an excellent article by K6SG in the *World Radio* magazine Nov 93 from the USA says: "Outstanding operators are not born, they're *made*! Best to start early. Take part in smaller contests . . . . Even if you don't participate, practice tuning around and copying calls and exchanges as you would in a contest".

The leading contesters are also prepared to optimise their station for a particular contest, for example by accepting that they cannot have an optimum set of antennas for every contest in the air at the same time, and so they will spend days completely changing the antenna system over between contests. Now, these committed stations will usually win the major contests (there are always some exceptions), but this shouldn't be seen as a barrier to the other entrants, who after all do form the bulk of the activity and entries, from gaining enormous pleasure out of contesting. Contesting is about continuous improvement, and if for whatever reason you are not in a position to become a 'big gun', you still have a wealth of opportunities to improve upon your previous scores, or to come top of people using equipment similar to yours, or perhaps to compete amongst yourselves in the local club.



The Three Spires Contest Group's Antennas for the 1993 23cm and 13cm trophies. Behind the 4m dish (pictured in *Microwaves*, March is a tower section supporting a smaller dish and the unusual pillbox antennas for 23cm which give a near omni-directional pattern.

LIMITED BUDGET

LACK OF money has been raised as a major inhibitor to success in contests, but I really do believe that this is much more of a red-herring than most people think. The costs of several thousand pounds which have been mentioned as being required to build up some of the big arrays pictured in this column is utterly spurious, and with careful purchasing, along with some innovation and home construction, figures in the several hundred pound regime are far more appropriate. Certainly if you just go out and buy the best, new, off-the-shelf equipment you need to spend a lot of money. However, if you think carefully about what you really require, you buy suitable second-hand equipment, and you build some parts of the station – say antennas and amplifiers – you can reduce the bill to a fraction of what it would have been if it were all bought new. In a future column I will take a detailed look at some 'case-histories' of successful contesters who have done it on a shoe-string. Successful contesting is far more about brains than it is brawn!

QSL

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

JOHN CLOUGH, GM0MDD, pointed out to me that he is incorrectly shown in the RSGB *Call Book* as dealing with QSL cards in the series GM0MAA to GM0MZZ. It should in fact read GM0MAA to GM0ZZZ. Sorry about that John.

The new QSL Sub-Manager for the G0S series is: Steven Bryan, G0SGB, 99 Greystones Road, Whiston, Rotherham, South Yorkshire S60 4BH. Our thanks to his predecessor J Anderson who, unfortunately had to give up the job for personal reasons. Steve tells me he has over 1000 cards lying at his home for a particular punter - but no envelopes. Now that really isn't cricket. If amateurs just starting in the hobby can't be bothered to collect their cards there is no hope for the rest of us!

When you write the RST on a QSL card have you ever thought where that originated? Well, I am grateful to John Forward, G3HTA, for enlightening me. Apparently it was originated by Arthur Braaten, W2BSR, in order to overcome the difficulties of the old QSA-QRK system. He published his proposed alternative in the *T & R Bulletin* in October 1934. The Braaten Code was based on the three important characteristics of every telegraphy signal, namely Readability, Strength and Tone. Braaten originally proposed a signal strength scale of five categories but succumbed to pressure for nine. In addition to all this Braaten very generously donated a trophy to the Society to be awarded to the English (G) amateur that scored the highest number of points in the ARRL DX Telegraphy Contest. If anyone out there would like a copy of the 1934 article send me a stamped addressed envelope (about 7 x 4 inches) and I will gladly let them have a photocopy.

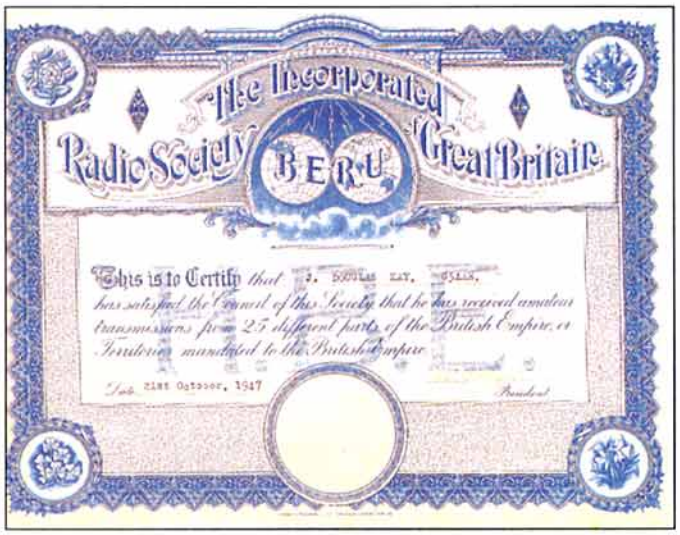
QSL CARDS

HAROLD FUDGE, G3DZS, relates a sad story. He agreed to act as QSL manager for UV6ARS's DXpedition to UD land. The calls used were UD8F and RD9Z. Harold has quite a number of cards awaiting reply but he cannot get hold of the logs from UV6ARS and is still awaiting blank QSL cards from him. Harold thinks it might be because of the current situation out there in the CIS but he doesn't want hopeful punters to think he is reneging on his responsibilities as a QSL Manager. He asks have I any influence with the hierarchy at Box 88? Not that I've noticed. Can anyone offer any advice or information that might help Harold?

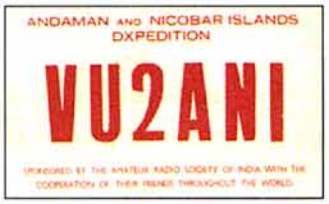
A nice letter was received at Potters Barr from Petar Filipovic, YT1WW, the YU QSL Bureau Manager, saying that the most recent consignment of cards got through. He goes on to say that the Welsh and Serbian languages share some 600 words and a language scholar at the University of Beograd is preparing a PhD thesis on the subject. I bet not many people knew that!

Peter Hildebrand, G3VJO, has written with an interesting point which is worth airing. Peter uses commercially produced log book software and has had some difficulty in printing the labels for his QSL cards. The difficulty relates to the way in which signal reports are shown on the card. As I understand it the software will only print a report label for signals received and not one for the transmitted report. Peter has queried this with the originator of the program but has been told that he should: "send confirmation of the report you received from the station to him not the report he gave you. Rx is the one that goes on the label". I am not too sure what those words mean but I think what the author of them is saying is that it should be the RST given to me during a QSO that should be put on a QSL card I send to the other operator. If that is so then I have been doing it wrong for the last 30 odd years and so has John Forward, G3HTA (who knows the odd thing or two about DXing!)

To put it simply, if I work a ZL using CW and during the course of the QSO indicate to him that he has an RST of 579 then those are the figures I will write on my QSL card I send to him (via the Bureau of course!) I say that because certain awards require a minimum RST to be proved. How can an applicant for such an award prove compliance with such a requirement if the transmitted RST is not shown on the QSL cards he has to submit to the award manager? Now, if anyone has any better ideas I would be delighted to hear from them because I am always willing to learn.



John Kay's, G3AAE, Heard British Empire Award issued for hearing 25 different countries located in the British Empire.



Rare Location QSLs, from top left to bottom right: Bhutan, from AC7A, for a CW QSO in 1963 on 20m: Tunisia, from 3V8AH, for a SSB QSO in 1971 on 40m: Heard Island, from VK0HI, for a SSB QSO in 1983 on 20m: Andaman Islands, from VU2ANI, for a CW QSO in 1960 on 10m: Libya, from 5A0A, for a CW QSO in 1987 on 20m.

Derek Buckley, G3VLX has written to say that he already has over 200 cards for G4DHF/TF which he hopes will be collected soon. He understands the call made some 6000 contacts.

John Kay, G3AAE, has a fascinating collection of QSL cards and award certificates. Well he would wouldn't he - being number 1 in the UK on the DXCC Honour Roll? So I borrowed some of the more interesting items to share with readers of this column. In subsequent issues I will use the shorthand 'from the John Kay Collection' as a reference.

First, some interesting QSL cards from John's collection. The six most wanted countries in 1993, according to *DX Magazine*, were as follows: Peter 1st Island, Bhutan, Libya, Andaman Is, Heard Is and Tunisia.

Disregarding Peter 1st Island because of the recent DXpedition there that leaves the top five as shown above. Well here are examples of cards from each of these rare countries. The galling thing about them is that John has duplicates of *all* of them!

So there you are. Get cards from those five countries and you have the five rarest cards of 1993.

AWARDS

CYRIL COLLINS, G8SC, tells me that he obtained his first Empire DX Certificate as VQ4SC whilst in Kenya in 1948 using AM phone exclusively to qualify for it. Not content with that he got another one as G8SC in 1963 using a mixture of AM and SSB. He still has the two personalised badges, certificates and an RSGB T & R badge he obtained in 1931. Cyril says, however, that now he is pushing 82 he has given up "this DX-chasing lark!"

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HF F-LAYER PROPAGATION PREDICTIONS FOR MAY 1994

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

Time / / GMT	28MHz 000001111122 024680246802	24MHz 000001111122 024680246802	21MHz 000001111122 024680246802	18MHz 000001111122 024680246802	14MHz 000001111122 024680246802	10MHz 000001111122 024680246802	7MHz 000001111122 024680246802	3.5MHz 000001111122 024680246802
* * EUROPE								
MOSCOW	.....	.....	...122212 32.	...345444651	2146666677885	7665444455789	7632111112478	43.....4+
MALTA	.....	.....1..	...122222 43.	...355445762	3137776778897	9776554557799	9863222235578	++3.....24+
GIBRALTAR	.....	.....	....1...21.	....3222244 1	2..4665668885	8557655567799	9875332235578	++42.....25+
ICELAND	.....	.....	.....	.....111112.	1...3444456 4	6335655555678	7765332234 57	5542.....24
** ASIA								
OSAKA	.....	.....	....11111...	...133333 12.	1.124323444 63	....2...2463	.....23.	.....
HONGKONG	.....	....11..1...	...123223 2..	..124433 5521	1.113323 5774	2.....2475	253	.....2.
BANGKOK	.....	...1111111..	..123433 4 41.	..134544 6641	2111232 35786	3.....2577	1.....255	22
SINGAPORE	.....	...1121121..	..134433 4 41.	..234544 664.	2111232 35784	3.....2577	1.....256	23
NEW DELHI	.....	...1121121..	..133433 4 42.	..234544 6652	3221122 35786	63.....2578	4.....257	24
TEHERAN	....11..11..	...2222233 1.	..144444 5641	1.454455 7873	5453222 35798	853.....2578	73.....257	4.....24
COLOMBO	....11..1...	...223223...	..134544 5 12.	..244555 7442	3321132 35686	63.....2578	5.....257	2.....24
BAHRAIN	...111111 21.	...223323 42.	..244555 6752	1145445 57884	6552222 35798	863.....2578	73.....257	4.....24
CYPRUS	...111111 21.	...233333 43.	..156665 6762	2147777 78885	7676555 66899	9863222 34689	8631....1368	+4.....35
ADEN	...1122233..	...223445 52.	1.154556 7853	3235445 57886	8653112 35799	973.....2578	751.....257	52.....24
** OCEANIA								
SUVA/S	.....	.....	.....11.1..	.....112212 2.	..1243233 541	..2321..243.	...1.....11.	.....
SUVA/L	.....1.	...1.....31	11.3.....63	2215.....74	2246311 1263	..342...1431	..11.....11.	.....
WELLINGTON/S	.....	.....	.....	...121 11..2.	1124422 21153	1133121..2352	..11.....12.	.....
WELLINGTON/L	.....	1	11.1.....3	3212.....25	5455 1.....55	2244 2...253	..11.....12.	.....
SYDNEY/S	.....	....1.....	...232.....	..14541.11.1	1136532 23424	1.132...2464	...1.....251	.....2.
SYDNEY/L	.....	1	1.....4	31.1.....16	42253.....46	1124 2...163	...2.....141	.....
PERTH	....11.....	...223.....	..14551.....	1.35653.....	4233532 1112.	42.12...2462	2.....256	23
HONOLULU	.....	.....	.....11..	....11..2211	..113211 4421	.1332 1..22..	..11.....	.....
** AFRICA								
SEYCHELLES	...1122231..	...223445 31.	1.154556 7632	3135445 57765	7552122 35789	963.....2578	74.....257	5.....24
MAURITIUS	...1122233 1.	...234445 621	..155566 7863	2.354555 7886	7163232 35799	953.....2578	751.....257	52.....24
NAIROBI	...1123344..	...233556 621	2.154566 8854	4136445 67887	8664222 35799	9851....2578	772.....257	54.....24
HARARE	...1123455 2.	...233567 741	2..555678 974	5116555 57897	9656222 35799	9863....2478	874.....257	54.....24
CAPETOWN	....113541..	...133566 2..	...465678 51.	...665567 731	41.653235 776	8714 2...2478	8731....257	54.....24
LAGOS	....113556 2.	...132567 85.	21.354568 982	5316644 57895	9856421 24799	9974 1...1478	8741....257	542.....24
ASCENSION IS	....111246 3.	....323468 61	....644579 83	21..754568 96	7511531 23789	9853 2...1478	8751....157	552.....24
DAKAR	....111345 3.	....323567 61	1..164566 884	4314754 45896	8766532 22689	9974 2....378	8751....157	552.....24
LAS PALMAS	.....1122.	....222235 4.	1..155456 773	3114766 77896	8557766 66799	9986433 33589	8863211 11268	++3.....35
** S. AMERICA								
Sth SHETLAND	.....1343..	.....25651.	.....46784.	....155787 1	1.1..222 4786	6452 1...1468	7751....146	552.....3
FALKLAND Is	.....12343.	.....24576.	....156788 2	2....355689 4	6332132 24688	9874 2...1368	7752....136	552.....3
R DE JANEIRO	....112243.	....224466 1	1....445688 4	421.155557 87	8752332 22589	9974 2....258	7752.....37	552.....4
BUENOS AIRES	.....12233.	....124465 1	1..1.345678 4	4212.445678 7	8756.322 3579	9974 2....248	7752.....16	552.....3
LIMA	.....12.	112231	2....1.344464	41.131444 467	8534522 32247	8864 21....15	7752.....2	442.....
BOGOTA	.....1.	111131	1....2233354	4...2444 3456	8423432 21237	8864 21....4	6752.....1	342.....
** N. AMERICA								
BARBADOS	.....12.	1112231	2...1433 3464	41.125444 477	8533432 21257	9864 21...25	7752.....3	442.....
JAMAICA	.....1.	11121	1....122224 3	3....233 3356	7422132 21126	7864 21....3	5752.....1	242.....
BERMUDA	.....	1121	1....222224 3	3....433 3366	7312232 21247	7864 21...14	5752.....1	242.....
NEW YORK	.....	.....1.	112132	2....222 3245	631.132 22236	6753 21...13	4742.....1	.42.....
MEXICO	.....	.....1.	111132	2....2 3234	5211..232 2113	4753 2....1	1542.....	.22.....
MONTREAL	.....	.....	111122	2....122 3244	621.132 22246	6753 21...13	3642.....1	.42.....
DENVER	.....	.....	.....	11112	4211..122 2223	3553 1.....1	1442.....	.....
LOS ANGELES	.....	.....	.....	11122	3111...232 22	2453 1...1...	.241.....	.....
VANCOUVER	.....	.....	.....	11	2111 1..122 22	2353 2...1...	.141.....	.....
FAIRBANKS	.....	.....	.....	.....	1112321 12222	1233 21..2211	..11.....	.....

The provisional mean sunspot number for March 1994 issued by the Sunspot Data Centre, Brussels was 31.7. The maximum daily sunspot number was 62 on 3, March and the minimum was 8 on 20 March. The predicted smoothed sunspot numbers for May, June and July, are respectively: (classical method) 32, 30, 28 (±7); (SIDC adjusted values) 20, 17, 15 (±4).

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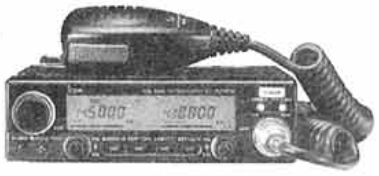

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TSB3303	144/430 G/Fibre 3.0/6.0dB 120W 1.15m	£49.95	C
TSB3603	144/430/1296 G/Fibre 6.5/9.0/9.0dB 3.07m	£99.50	C
TSA6001C	144/430 duplexer Nskt – PL259 + N plug	£25.50	B
TSA6011E	144/430/1296 triplexer Nskt – PL259 + 2 x N plug	£43.95	B
TSA6601	144/430 15/60W mini SWR/PWR meter	£39.50	B

MOBILE			Carr
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TSM1316	144/430 2.15dbi/3.8dB 100W 0.44m	£21.50	B
TSM1339	144/430 3.0/5.5dB black 50W 0.89m	£26.50	B
TSM1312	144/430 3.0/5.5dB 50W 0.89m	£26.95	B
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SWL NEWS

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

TWO LISTENERS recently informed me that they had acquired a PC and asked if there was any SWL software on the market which would enable them to run a *real-time* log and enter SWL contests. To my knowledge there is not, but if any reader has definitive information about SWL software packages, please let me know.

There are a number of software packages which enable amateurs to run *real-time* logs, and sufficient contest logging programs. However, the question is whether there is an SWL version of 'Turbolog' or the G3WGV or K1EA contest logging programs. Has anyone thought of making the SWL side of the hobby a little easier?

SWL CONTESTS

RESULTS OF MY SWL CQWW Challenge and the White Rose SWL Contest will be appearing soon. A reminder too that the Society's SWL Contest takes place in July – rules a little later. First, news of two events which take place in June.

18 and 24MHz: It is time once again to see how many SWLs are active on the higher WARC bands – 18 and 24MHz. The last time I arranged a period of listening on those bands several more listeners came forward than the time before. I am now looking for at least ten logs. The idea, simply, is to log stations heard on each band between 1 and 30 June. There will be no prizes, but to add a bit of competition the rules will allow three stations from each country to be logged on each band. Stations in Europe count one point, stations outside Europe count five points.

The final score is the number of points on each band multiplied by the number of different DXCC countries on each band added together – ie 100 points on 18MHz plus 75 points on 24MHz multiplied by 35 countries on 18MHz and 20 countries on 24MHz, giving a score of 100 + 75 = 175 x 35 + 20 = 55; – a final score of 9625. I have explained the scoring system fully because a number of listeners like contests but cannot understand the scoring systems and therefore do not enter. Hopefully, the explanation will tempt a few more listeners away from 14MHz to enjoy the more peaceful surroundings of 18 and 24MHz. Conditions in June will favour Sporadic-E propagation, so there should be some good European openings on 24MHz.

All bands: Fresh from the success of their LF Contest, the White Rose Amateur Radio Society has organised a Set Listening Period Contest on 18 / 19 June covering eight bands but in three-hour chunks. Those interested are invited to drop David Whitaker an SASE for a copy of the full rules. His address is Hillcourt, 57 Green Lane, Harrogate, North Yorks HG2 9LN.

FIRST FIRTH WEEKEND

ADVANCE NEWS from Mike, GM4SUC, that the teams who gave us the excellent Lighthouse Activity Weekend last August, which attracted 257 Award claims, are to run a similar activity weekend this year. It will be the 'First Firth Weekend' over 27 / 28 August. It is a little early for the full details except to whet your appetite by advising that there will be two Awards this year. A 'merit' Award will be available this year – with a gold rosette and ribbons – to any SWL (or licensee hearing, or working) 10 of the 11 stations that will be active. More details nearer the event. A specimen of this year's certificate is reproduced here.

1.8MHZ CONTESTS

SINCE THE last *SWL News* was written, two 1.8MHz SSB contests have taken place. Both failed to produce too much interest from correspondents, especially the CQWW contest on the last full weekend of February. However, BRS25429, 32525 and 95258 reported 56 countries active – G, GM, GW, GU, GI, EI, DL, LX, OE, HB9, PA0, ON, F, LA, SM, OH, OY, OZ, C3, EA, EA6, EA8, I, T7, CT, CU, CT3, HA, YU, S5, 9A, T9, Z3, ZA, SV, ES, YL, LY, OK, OM, LZ, SP, YO, RK2(UA2), ER(UO5), EW(UC2), UA, UA9, UR(UB5), LY, YL, 4L, VP2E, P4, W and VE.

The following weekend saw the ARRL SSB Contest. Conditions to the States were better with a number of W1-5 mentioned in logs, and DX in the Caribbean was heard in the form of C6, KP4 and P4.

Royal National Lifeboat Institution

FIRST FIRTH WEEKEND

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For Successfully Contacting or Hearing the Requisite Special Event Stations on 27/28 August 1994

DATE _____ _____ GM4SUC
Awards Manager

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GB2FF	FIRTH OF FORTH	GLENROTHES & DISTRICT A.R.C.
GT2DF	DORNOCH FIRTH	SUTHERLAND & DISTRICT A.R.C.
GT2SF	SOLWAY FIRTH	WIGTOWNSHIRE A.R.C.
GB2FM	MORAY FIRTH	MORAY FIRTH A.R.S.
GB2CF	CROMARTY FIRTH	EASTER ROSS A.R.S.
GB2BF	BEAULY FIRTH	INVERNESS A.R.C.
GT2PF	PENTLAND FIRTH	CAITHNESS A.R.S.
GB2FW	WIDE FIRTH	ORKNEY A.R.G.
GB2FT	FIRTH OF TAY	DUNDEE A.R.C.
GB2FC	FIRTH OF CLYDE	AYR A.R.G.

The First Firth Weekend was conceived and co-ordinated by Ayr Amateur Radio Group

One of the certificates which is available for logging different stations on the Scottish Firths during August.

MEDIA COVER

ON THURSDAY 3 March the Open University TV Service broadcast a programme on 'The Sun's Magnetic Forces' in their *Images of the Cosmos* series. I understand that it was most interesting, especially to those who delve into the mysteries of propagation. Most of these programmes are repeated, so it will pay readers to look for a repeat showing – assuming that the first broadcast was missed.

HF NEWS

IN GENERAL, the bands were not very productive during February, but the DX was there for those with time to dig it out. The 3Y0 expedition did a superb job and many listeners reported hearing them on 6, 7 or 8 bands.

Also in the period under review listeners were able to log the Expeditions to ZS9 (Walvis Bay) and ZS0 (Penguin Island). Both *countries* became part of Namibia at midnight on 28 February and DXCC status was expected to be lost. The ZS0 seemed most elusive, but ZS9Z was heard on several bands, including 24MHz.

The WARC bands also provided some interesting DX. The most rewarding on 18MHz included AP2JZB, C53HG, EK7DX, JW5NM, TY1IJ, V31RM and 3B9FR. On 24MHz conditions seemed good towards the end of February and in early March. Several listeners, including myself, bagged a number of new countries. Some of the best DX was FH/DK2BI, TY1IJ, V51HK, VS6CT, ZC4IW, ZS8MI and 3B8/F5PXQ.

On the traditional DX bands, 7MHz provided some good DX with V29NR very loud on 28 February. KG4CI was also a very strong signal at 2325 on 1 March, while the evening of 4 March gave some excellent propagation to Japan. On 1.8MHz David Whitaker and I were surprised to hear ZL2JR at 0649 on 6 March. Philip Davies, RS95258, monitored the first legal operation from Abu Ali by 7Z1IS/P at 1125 on 6 March on 21MHz. It seems this is different from Abu Ali which older hands will remember counted for DXCC. ET3ZU/A was one such expedition in 1971.

FINALE

NEWS, VIEWS and DX news for inclusion in the **June** *SWL* must arrive no later than **13 April**.

NOVICE NEWS

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

CONTESTING IS yet another aspect of the hobby – and there is a wide following for it. Even if you do not take part, there is a lot to learn from simply listening.

It is too late to enter the Slow CW (QRS) Cumulative contest which started on Tuesday 5 April, but not too late to listen and even join in to give someone else points. The rules and dates were published in full in Contest Classified in January *RadCom*. By making just a few contacts, your commitment will not be too onerous but will be a taster for next time. And you'll be very popular as contacts with Novices count for quadruple points!

Lawrence, G4HTD, wrote asking how many of my readers turn to the contest pages at the back of *RadCom*? As he says, there is a great deal more to contesting than just collecting a brief contact, passing the minimum of information and then "next please".

Within the limitations of your budget have you the most efficient station and antenna system that you can devise? Have you tried to experiment to find the best conditions when making distant contacts? Do you know your equipment well enough to get the very best out of it? Have you ever spent time just listening and trying to pick out fainter stations? If there is a committed contester in your radio club, why not ask for advice.

One last point. If you did take part but do not feel it is worthwhile submitting your log, think again. Even if you do not reach the first three, you may be surprised when you see the results in print. The more people who submit logs will help to show the interest in contesting, which sometimes receives a bad press.

Lawrence promised to tell me when there is something of special interest to Novices – so watch this space for further details.

DID YOU HEAR?

DID YOU HEAR Tetney Primary school featured on *Waveguide* on the BBC World Service? This school has been mentioned in this column before.

Paul, G0NUE, the Head Master, has introduced amateur radio into the curriculum with great success. The pupils get the chance to speak to amateurs (mainly in other parts of the UK to overcome any language problems) and also learn a little about the scientific aspects of the hobby. The children speak very confidently and clearly and obviously enjoy what they are doing while learning about other areas and calculating the distance between themselves and the stations worked.

If you listen on Tuesday or Thursday afternoon between 3.750 and 3.770MHz you may hear the school station, GX0PHA. Have a word with the children – I have a feeling you will hear some of them again in later years when they are older and take up the hobby in their own right!

DID YOU SEE?

AND DID YOU see the programme *Why Don't You?* on BBC television during the Easter holidays?

In this programme, a television crew filmed Emma, 2E1BVJ, at home and at school to show youngsters one way to fill their spare time, following a hobby which could be entertaining, *and* could also help to shape a future career.

The technicalities and excitement of becoming a TV star for a brief period are best described by Emma herself, which she does very fluently in the next issue of *D-i-Y Radio* so I will not steal her thunder. (I do recommend that you take out a subscription for this publication if you do not already do so – there is always something of interest for the newly licensed – and indeed, for everyone else – see p 16 for details.)

Science teacher Anthony, G7OKW, and technician Roy spend their Saturday mornings constructing, training and operating the School station GX0SQA. Apart from the adults, the club consists of two amateurs, eleven Novices and ten trainees with other interested students waiting to follow in their footsteps. In all this, they are ably assisted by Emma's dad Richard, G3UGF – who gave me the information. I took a tiny part as Emma's contact on 70cm.

GX0SQA can often be heard on Saturday mornings – when youngsters willingly return to school to take part in all the school radio club activities. I should imagine that many schools would like to see so many of their students so keen to return to school in their spare time!

SKE

STANDS FOR Straight Key Evening, which takes place on Friday 20 May, and the organizers – the Edgware and District Radio Society – are hoping that you will join them. This is not a contest and your involvement can be as great or as little as you wish.

From about 1800UTC, listen for GB2SKE and GX3ASR/P around 3.55MHz – with one of those stations operating above 3.56MHz to encourage Novices to join in. GB2SKE will also operate during the afternoon on 7MHz – CW of course. The aim is to encourage the use of a straight key in a friendly, relaxed way. No matter how hesitant you are, you will not be pressured – just made welcome.

John, G3SJE, extended the invitation and tells me that, last year, in spite of working in the Novice allocation of 80m, and listening carefully for weaker signals, GB2SKE did not find a single Novice licensee . With over 200 Class A licences issued, he hopes that one or two of you will find your way on to 80m on Friday 20 May. Go on – make his day!

Famous for six minutes: Emma Constantine, 2E1BVJ, being filmed for BBC TV's *Why Don't You . . . ?*

ANTENNA ROLL

NEVILLE, 2E1ACS, enjoyed going to the wide open spaces up on the Yorkshire hill-tops with his Dad, Ken, G8VDP, to work 2m and 70cm DX. They would set off with car and roof-rack loaded with a *big* aerial. Very successful they were too, but it all had to be dismantled again at the end of the expedition and repacked in the car. There had to be an easier way.

So they visited a contract towel supply company, and cadged an old roller towel - the kind that are resident in public toilets. True, it was torn, but there was over twenty feet of good strong fabric in one length. Mum sewed rufflette tape down each edge which gave a safe anchorage for the 2m elements, and for 70cm elements, another strip of the same tape was sewn further in as they are shorter. Each element was numbered and marked with a tape to show its position. With the rufflette tape also marked (21, 22, 23 etc for 2m and 71, 72, 73 etc for 70cm) it was an easy job to slip them into place when they reached the chosen site.

A driven folded dipole and a reflector completed the aerial – also easy to slip into the curtain tape at previously marked points. A six foot pole and two guy ropes completed the system – and they were in business. Dowelling rods kept the ends under control - also slipping into the slots. Safety pins were always taken in case an extra anchorage point was needed. A sloping field with a convenient tree were the final requirements. After setting up, if a direction change was required, all that was needed was to uproot the pole and move it round.

They also made a two-pole version in case they were in a treeless spot. The elements were made from wire coat hangers and an old Yagi supplied the folded dipole for 2m. Their list of distant contacts grew and grew. Cornish stations expressed surprise to learn that ten watts was all that was needed to make the trip.

After a very satisfying outing, disconnection and dismantling the aerial, rolling it up and loading the car takes minutes and everything is tidily stowed away for next time. Thanks to Ken and Neville for sharing their simple but cheap and effective idea. Neville supplied diagrams. If you would like a copy, I could send one.

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Novice Note Book

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

TOBACCO TINS ARE like clothes pegs, the number of uses that can be found for them is almost boundless! Here are two more two uses for tobacco tins that everyone can use in their workshop. The first is a soldering iron stand and the second a 'helping hand' or printed circuit board (PCB) holder.

Both these items require that the base is relatively heavy. In this case the tobacco tin forms the base and is weighted by filling it with old woodscrews and odd sized nuts and bolts, pellets or slices of lead. I filled mine with molten lead, but this isn't advisable for the beginner.

SOLDERING IRON STAND

THE COIL TO SUPPORT the soldering iron can be made from a brazing rod or a carefully straightened wire coat-hanger.

The coil is wound using a broom handle as a former, with a 3.5mm hole drilled 10mm into the side of the handle about 200mm from the end. Insert one end of the wire into the hole. Wind the spring with the first three or four turns close together and the rest spaced a bit wider. Having completed the winding use a small hacksaw to cut off the piece of wire in the hole and the spring can be slid off the handle. Make a small loop in the coil, using pliers, and fix the coil to the tobacco tin base using a nut and bolt and a couple of washers. Constructional details are shown in the photographs.

HELPING HAND

FOR THE 'HELPING HAND' a large paper clip is fixed to the base, also using a nut and bolt and a couple of washers. The base is weighted as described above. Printed circuit boards and components can then be held in place, clipped into the paper clip, while that tricky soldering job is done.

HINT OF THE MONTH

THE SUBJECT OF AERIALS is one where hints and tips are always worth remembering and, when money is short, a large saving can be made.

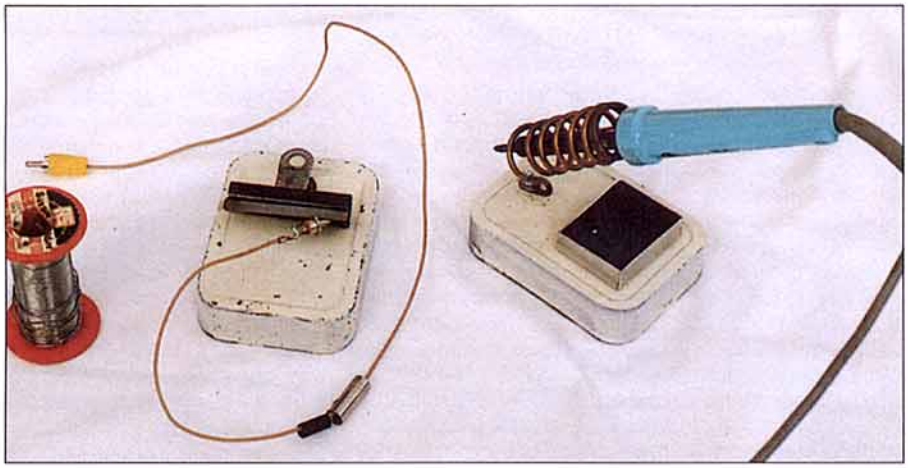
Insulators are a case in point; you could spend quite a lot of money but to little advantage. It is imperative that you have very good insulation on the ends of your aerial. At this point of any antenna system there is always a high impedance and so any leakage can cause severe losses. So often we see a single 'egg' insulator and for the most part this will do a super job but only until it gets dirty. At that point the losses will tend to increase rapidly.

The coil is secured with a nut and bolt through the top of the tin.

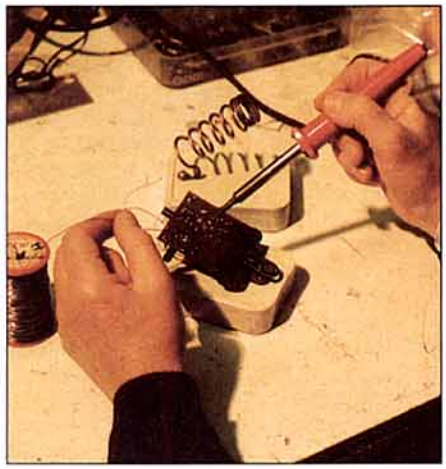
Well, how can we overcome these problems cheaply? By increasing the length of the insulator! We could use four or five insulators in series as used on ships' aerials, but the cost is prohibitive.

A good substitute is a length of strong monofilament such as fishing line or strimmer line. Fisherman's knots can be tied at each end of a two or three-foot length and will outperform the 'egg' insulator as well as being almost invisible!

Has anyone got any hints or tips? If so, send them to me at the above address.



Two very useful additions to the shack; a Helping Hand and a soldering iron stand.



The soldering iron stand in use.

RADCOM NEWS FEATURE

ZD9SXW on CW from Tristan Da Cunha

Concluding a two-part feature by Roger Western, G3SXW

ARRIVING IN a different part of the world means re-learning propagation. Which bands will open to where and when? It takes a few days and it's challenging to watch for openings, file the information in your head and work out what to do next to meet your operating priorities. Where possible WARC bands would be favoured rather than 14/21MHz, where ZD9 had been most available in the past. JA and West Coast W/VE would be the major population areas with the shortest openings so should not be missed.

Assumptions about openings need always to be checked. Its easy to get locked in to a pattern of band changing so the trick is to keep flexible. Also, you may have missed a useful opening in the first few days when busy operating on a different band. It was a question of finding paths to each area on each band so as to please as many people on as many bands as possible.

The main conflict of priorities on this trip was around 2100UTC when Japan could be worked on 80/40/30m, yet Europe was also available on those bands and on 20, as well as western N America on HF. The JA path was reliable at their sunrise and also long-path just after my sunrise. However this was mostly on LF, with strong signals, the HF bands having very restricted openings. The W6/7s could be easily worked on 40/30 metres around 0700 but needed good conditions for the higher bands to open late afternoons. In the early evenings they had to share some of those other priorities.

Conditions were available on all bands to South America and Europe for long periods. The North/South path to Europe was really excellent. When listening to such large numbers of stations calling, you can notice the shifting peaks of path. Mornings it would start to the East in UA and UB, moving to Scandinavia and then across to Western Europe. A lot of the time all areas are audible but the source of the strongest signals shifts. From my end it seemed that I could work stations from all over Europe all day but if you were calling with a weak signal then there was a peak when chances of getting through were best.

Unfortunately the path to VK/ZL was blocked by the mountain. No ZLs were worked at all and only four contacts into VK, all on long-path around 0700. There was nothing I could do except to listen for them in the pile-ups and to call "VK/ZL only" whenever hearing one of them.

As always 80 and 160 were the least predictable. The first evening on 80 provided excellent signals from Europe as well as JA, but the path to Europe was unreliable on later days. Top-band requires enormous amounts of patience. Signals slowly lift above the noise for a few moments then drop away again. Seldom was more than one signal heard at a time and it seemed that the path was slowly moving, with a highly specific end point. UK had better propagation than continental Europe. Only 21 W/VE QSOs were made on 160 but many more were heard calling who were not copying me.

On nights when the islanders have been fishing the mains electricity is left on for the freezing plant. This happened on four nights of my stay. During those nights there were good openings on 40m but 160 and 80 provided few QSOs between 0200 and 0600. Their best times were in the evenings.

As the trip went on sunspot numbers dropped but the equinox lift had helped. Throughout the summer the flux was well below 100. It peaked at well over 100 just as I was starting up and dropped gradually into the nineties.

The Pile-ups

OVERALL, THE higher the frequency the higher the QSO rates (**Table 1**), perhaps because signal to noise ratio is progressively better as you approach 10m. Demand on 18 and 24 MHz was a little lower, reducing rates somewhat.

Size of pile-up is determined by many factors, such as rarity, signal strength, operating styles etc. QSO rates are determined by size of pile-up (not too big), operating abilities at both ends and most importantly signal differentiation, so calls can be identified. Vast numbers of signals within a few hertz of each other can blur into one continuous noise, even if they are not loud. I was constantly experimenting with receiver settings to get selectivity.

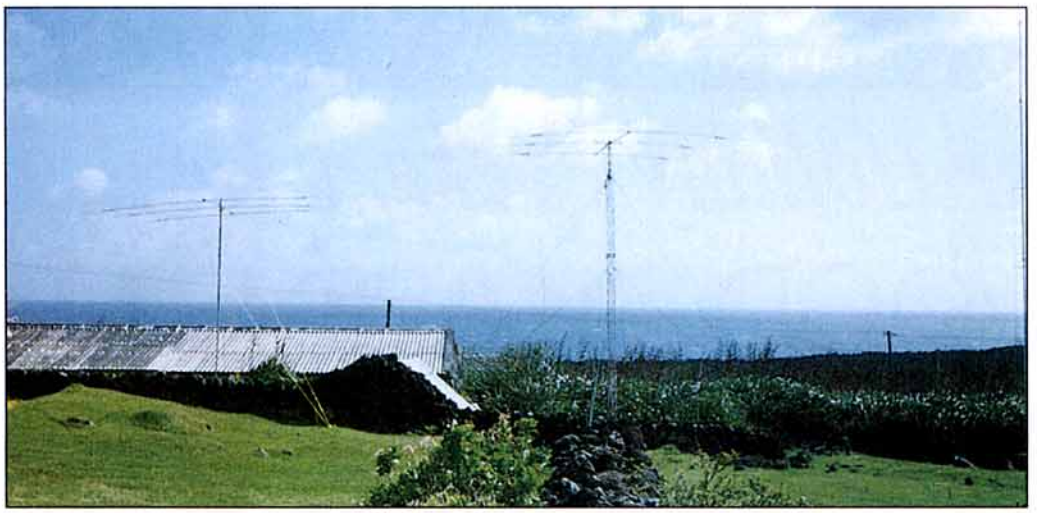
The problem of the big pile-ups needs discussion. Some expeditioners control size by reducing power. Those that can not then hear you will stop calling. I do not support this suggestion because it prevents stations with smaller antennas from making a contact. A better alternative is to spread the pile-up frequency wider. This can be done simply by going back to stations on the

Band	QSOs	QSOs per Hour
160	82	11
80	750	59
40	2761	98
30	2534	105
20	3194	136
17	3069	121
15	3256	135
12	3184	118
10	4403	142
Total	23233	114

Table 2: QSOs rate.

	160	80	40	30	20	17	15	12	10	ALL	%
Europe	55	194	788	1118	1883	2164	2511	2178	3021	13912	59.9
NorthAmerica	23	218	1323	593	631	592	571	986	1313	6250	26.9
Asia	0	217	534	803	606	260	123	35	31	2609	11.2
SouthAmerica	4	47	89	12	43	28	35	27	47	332	1.4
Africa	1	11	20	13	13	14	19	8	11	110	0.5
Oceania	0	0	5	4	6	1	0	1	0	17	0.1
TOTAL	83	687	2759	2543	3182	3059	3259	3235	4423	23230	100.0

Table 3: QSOs by Continent.



Antennas at ZD9SXW (l to r): A3WS 3-ele, 10MHz Ground-Plane, TH3 3-ele, Inverted Vee 7MHz, GAP vertical. This is the view North to Europe.

upper edge all the time. Clever callers learn quickly and call higher in frequency. Keep doing this for some minutes and the pile becomes spread as wide as you want it. But the band should not be filled with QRM from your pile-up. Mostly, the width can be restricted to 5kHz.

Another way to reduce pile-up size is to call by areas. This was my favoured solution on many occasions, particularly on 40 and 80m. But in order to minimise frustration amongst those waiting I kept the areas very wide (eg Eu, JA, W/VE) and changed every few minutes. The occasional caller who gets impatient after waiting a few seconds can be ignored and as with most other aspects of pile-up behaviour the vast majority co-operate very well indeed.

Control of pile-ups can be improved by sending your own call-sign frequently, repeating back corrected call-signs, sending an information message often (QSL route, QTH) and especially by being rhythmic, transmitting at predictable intervals and sending regular content. Each transmission ended with either "5NN" or "UP", to clarify whether I was now expecting to hear only the one station being worked, or to hear everyone call in. Some callers may be having problems copying, either because of QRM or because of CW speed. If they hear the same thing many times over, in the same order, there's a better chance of following what's going on. Also, a balance is needed on CW speed. Maybe some non-CW operators were trying to make a contact. I sent at about 32WPM which seemed to achieve the best QSO rate.

The vast majority of callers are highly efficient, calling at the right times, on the right frequencies and being brief. Chaos on my own frequency seemed to be worst on 40 metres. I'm not sure why that is but have noticed the same from home on other expeditions. As we all know the worst offenders are mostly from the South and East of Europe. Continuous calling is now very common. Conversely, the problem of calling with only the suffix is becoming much less, in CW pile-ups at least.

Pirate activity was a problem at times. It was frustrating to hear Europeans working 'me' on top band, leaving my own calls unheard. It was also irritating occasionally to hear someone take over the pile-up when I went QRX and continue to make QSOs for me. The biggest volume of pirate QSOs seems to have been with JA and W6/7 on 15 metres around 22-23GMT with signals believed to be coming from UA0. This pirate disappointed many stations.

The amount of operating varied according to other activities such as antenna work and socialising. The biggest score was 1,988 QSOs on 4 October with 14 hours QRV, the smallest was 396 contacts on 20 October, when preparing to leave. The overall average was 1,000 QSOs daily.

Life on Tristan

THIS IS a truly isolated, tough, self-sufficient, rural community. Their life is crime and stress-free. It was a real pleasure to get away from the ills of the modern world for a while.

The island has fascinating origins; there are only eight family names, most originated by ship-wrecked sailors. Whilst they came from different countries the culture is now entirely British.

Space in the village and for animal grazing is scarce because almost all the island consists of sheer cliffs. It is actually a steep mountain rising from the sea to over 2,000m. Each family tends its own sheep, chickens, cows and potato patches. The main diet is a delicious variety of potato that is used creatively. The men go fishing and work on the harbour extension project, or on local amenities such as electricity supply.

Everyone was so friendly and welcoming, with ready laughter. They have no television, only video recorders. They are very sociable, friends dropping in for a chat and a drink and every birthday is an excuse for a party. There is one bar, a Supermarket, the church, the Gift Shop, Post Office, Museum and cemetery, that's all!

The Tristan language is fascinating. The vocabulary is English but spoken very rapidly with many words and syllables omitted. By the end of the trip I had tuned in but it was the source of much good-natured leg-pulling.

The biggest single factor influencing life on the island is the non-stop wind. The direction of wind and sea-swell determine whether it can be a fishing-day. On such days the gong is sounded at 5.15am and four or five boats spend the day on the crayfish grounds. That gong woke me too but its message was different: You can operate tonight, Roger!

My hosts: Andy, ZD9BV and Lorraine, ZD9CO.

Return Home

WE BOARDED the *Agulhas* on 22 October with calm seas. The last QSO was at 2359UTC on 21 October, with VO1NA. Farewells were made and again the remoteness of the place struck me at that moment. In this modern world of airplanes there's always the chance of revisiting anywhere at some future time, but here? That sense of possible finality is rare. I will try to return to Tristan one day.

Much time on the return voyage was spent analysing logs, and teaching Morse to three young South Africans who were keen to learn. Back in Cape Town ZS1AAX kindly transported me to the airport. Security staff at Cape Town airport will never forget my hand-luggage. The officer burst out laughing and called each of his colleagues in turn to try and lift it! I arrived home on Sunday 31 October after exactly six weeks away.

QSL

ON ARRIVING home there were 1,491 envelopes waiting for me and my local postman was in shock! Since then the total has increased to over 4,000, containing some 9,000 QSLs. All direct cards were answered before the end of January. Such a trip is enormously enjoyable but the comments with QSLs add extra pleasure. I am thrilled that so many could make contact with a new country or the last one needed for CW DXCC, or 300th country on 40 metres etc.

Thanks

ANDY AND Lorraine made the trip possible. They not only opened their home to a complete stranger but made the stay very enjoyable in every way. Thank you both for creating a life-long friendship. Also to all the other islanders who welcomed me so warmly, put up with flickering lights and thumping noises on their cassette players.

Thank you to the Island Council, Administrator and Post Master for the permissions and to Tristan Investments for arrangements to transport me and all the equipment.

Also to Cushcraft for a discounted A3WS that worked perfectly. I'm also extremely grateful to the 99% of operators who called in the pile-ups so efficiently and helped make the operation a success. Finally to my friends G3TXF and G3WVG for help, much encouragement and advice.

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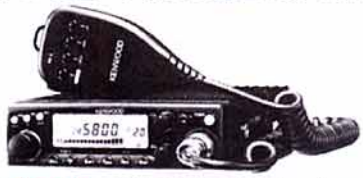

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IDEAS FROM ABROAD

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

A home-made **tri-band HF beam** that worked first time was designed by **Henno Schotten, DJ1FO** and described in *CQ-DL* 2/94.

AN INTERESTING FORM of two-element Yagi, the mono-X-beam, appeared as an 'Antenna Project' in the 1991 *ARRL Handbook*. **Fig 1** shows its construction. Four aluminium tubes are mounted X-wise on a square centre board. Two adjacent tubes make the director, the other two the radiator. An end-loading wire is connected to the tip of each tube to tune each element to its desired frequency.

This X-beam is said to have a gain of >6dBi and an F/B ratio of 18dB. The feed-point resistance is near 50Ω. [Computer analysis of a single band X-beam by RSGB HQ showed that the above claim on gain and front-to-back to be broadly true, however two large side lobes were shown only 4dB down from the main lobe –*Ed*]

MY 10-15-20M VERSION

FEATURES OF MY TRI-BAND X-beam are:

- Turning radius only 3.30m.
- 4-way symmetry, hence no wind torque on the rotor.
- No expensive capacitors required for the traps.
- Tuning without interaction between bands.
- Only a dip meter and an SWR indicator are required for tuning.

CONSTRUCTION

THE X CONSISTS OF FOUR identical arms. Each is made up of three lengths of 25mm OD x 22mm ID aluminium tubing, spliced end to end with 22mm D nylon rods.

These rods are 230mm long, of which 100mm is inserted into each tubing end; this leaves 30mm insulating gaps which are then bridged by traps. **Fig 2.** Stainless bolts through the tube ends and the nylon rods secure the assembly and provide connections for the traps.

The four arms are assembled on a centre-board made of tufnol measuring 400 x 400 x 10mm. Two 2-bolt pipe clamps and stainless steel hardware hold each arm to the board, which, in turn, may be attached to the rotor or stubmast in any convenient manner. A light plastic line connects the tips of the four arms to keep them from swaying sideways.

The end loading wires are made of 2.5mm² finely-stranded PVC-insulated copper, eg split hi-fi speaker cable. The 14MHz wires connect to the tips of the arms; the 21 and 28MHz wires to the centre-side bolts of the 21 and 28MHz traps, resp.

Plastic choc-block inserts, tightened onto the ends of the loading wires, serve as attachment points for strings which draw each loading wire towards its opposite number; a spring, actually a 13mm wide elastic band cut from a car tyre inner tube, tensions each such string.

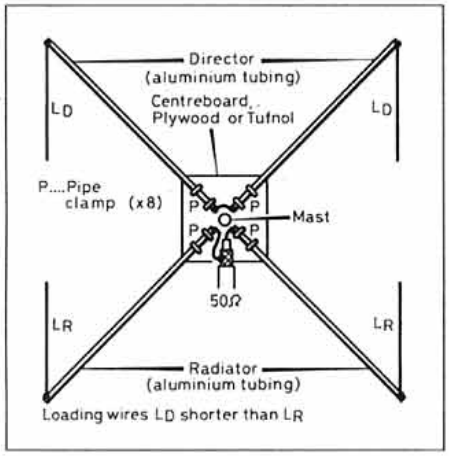


Fig 1: Top view of the single-band X-beam from the *ARRL Handbook*.

THE TRAPS

COILS OF RG58C/U COAXIAL CABLE serve as complete tuned circuits. The outside of the braid acts as the inductor; the capacity between the centre conductor and the inside of the braid makes a high-voltage high-current capacitor which appears in parallel with the inductance if connected as in **Fig 3**. These traps are OK up to 300W.

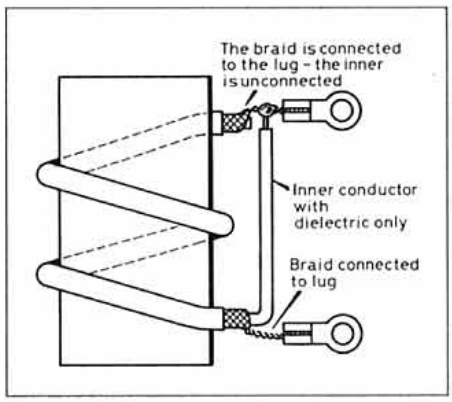


Fig 3: Traps without a discrete capacitor are easy to make and adjust. Four turns of RG58C/U tune to 28.5MHz; five turns to 21.1MHz. Weatherproofing is required.

All eight traps use identical formers made of 40mm outside diameter PVC plumbing tubing as shown in **Fig 4**. Four turns are required for 28.5MHz and five turns for 21.1MHz. The exact frequency, as measured with a dip meter, is set by squeezing or spreading the turns, which are then fixed in place with UHU-plus cement*.

The traps cannot be wound on the insulating rods used to splice the tubing sections as then the ends of the latter would couple to the traps as shorted turns. Therefore, the traps were offset above the insulating rods and tied to them with soft nylon ribbon.

ADJUSTMENT

TO START WITH, ALL 12 loading wires are made longer than my adjusted lengths shown in Fig 2 (say 150mm longer for 28MHz, 225mm

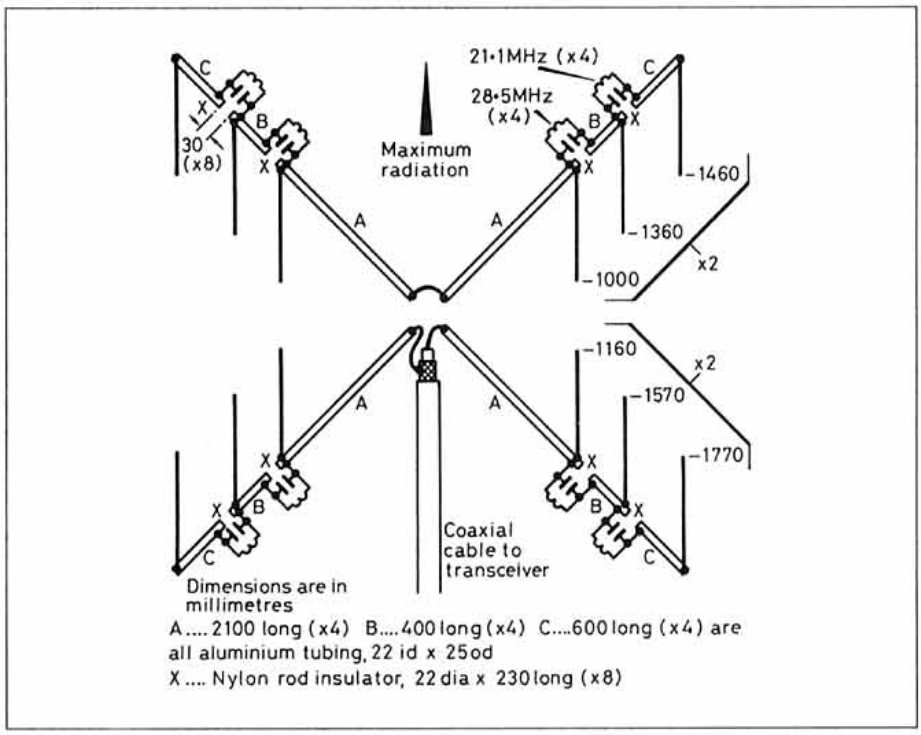


Fig 2: The DJ1FO X-beam for 14, 21 and 28MHz. Good performance from a small turning radius and easy tune-up for the DIY amateur with modest means.

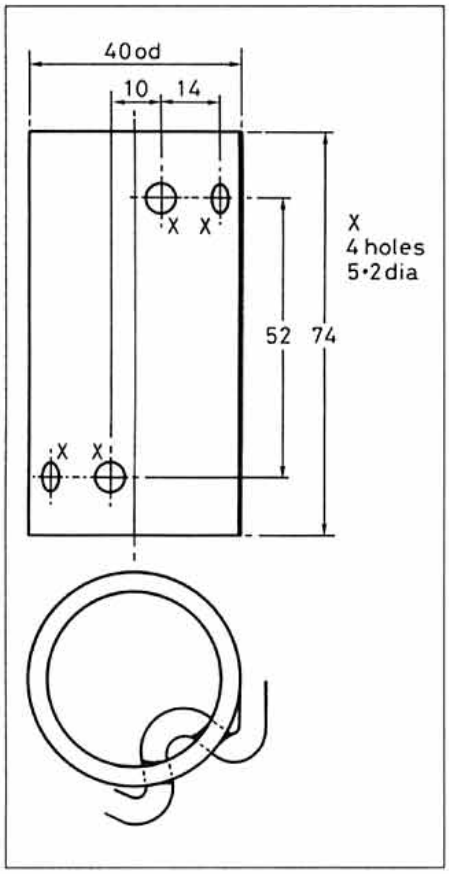


Fig 4: The trap formers are fashioned from plumbers' PVC tubing. One size is used for all traps.

for 21MHz and 300mm for 14MHz. Don't forget the jumper between the director halves! – *G4LQI*).

Support the beam within reach from the ground as far removed from large metal objects as possible. The aim of the procedure is to bring the resonant frequency of the beam, as seen at the terminals where the coax feeder is to be connected, to just above the lower end of the band being adjusted. Subsequent lifting of the beam to its operating height will then raise the resonant frequency to near centre-band.

Adjustment consists of snipping equal bits off all four wires relating to the band being tuned; this preserves the length differential between the radiator and director loading wires.

28MHz tuning comes first, trimming the four innermost loading wires. 21MHz comes next, 14MHz last. (With the extra length of the loading wires, the initial resonances will be well outside each amateur band; *do not* use the transmitter and SWR meter as a resonance indicator. Connect a few turns of wire to the feed point and couple the dip meter to them. Then do the clipping, till resonance occurs just inside the band. Now you can verify your work with the transmitter and SWR meter before repeating the procedure on the next lower band – *G4LQI*).

COMMISSIONING

WHEN FIRST TRIED, the arms of my beam drooped too much; a 1m extension of the stub

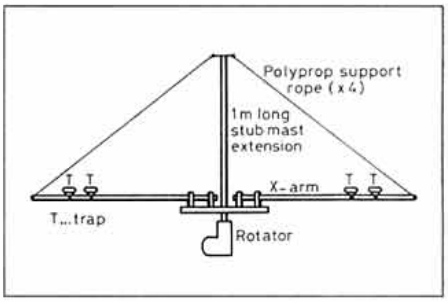


Fig 5: A stub mast extension and polyproylene cords keep the X-arms from drooping.

mast and light polypropylene cords (washline does fine – *G4LQI*) from its top to the tips of the arms solved that, **Fig 5**.

The most difficult part of the job was getting the beam onto the roof. Altogether, the mechanical work took more time than anticipated, but the effort was well rewarded. The final SWR ratios were 1.1:1 on 28 and 21MHz, 1.3:1 on 14MHz.

★ Waterproofing the ends of the coax windings is essential. GW4FRX shows how in *RadCom*, January 1989 and in the *HF Antenna Collection* p184 (RSGB).

SWR ANALYSER

TURN TO page 44 for a review of a very useful device for measuring experimental aerials.

RADCOM Helplines FOR MEMBERS

● Mr M G O'Hanlon, G4GYD, wants a **Weston Standard Cell** (1.0186 volts). If any one can help please contact G4GYD on tel: 0707 325257 or write to him QTHR.

● Ian, GM0UHC (ex GM8LWR) needs a circuit diagram for an **AKI Stereo Amplifier** type AM-2400. Any information to Ian, GM8LWR, QTHR.

● Mike, G4AYO, is seeking the manuals (or a photocopy) for a **Drake 2B Rx and a Drake 2NT Tx** for I2MNL. All expenses reimbursed. Contact Mike on 0742 350434 or write to him QTHR.

● Mr J Hewett, G4SVE, after reading the May 1986 *Technical Topics* entitled 'Optimising Coaxial Traps' by the late Geoff Roberts, G3ENY, needs information regarding the calculation of wire in the outer legs of the dipole given the coil inductance. Also a programme listing giving suggested pipe sizes for the traps. If anyone can help, write to G4SVE who is QTHR.

● Henning, SM0PRY, has a **Standard** VHF/UHF Transceiver model C500 and now needs the address for Standard in the UK, to get an English Instruction Booklet and a new battery case. If anyone has the address of a representative of Standard in the UK, write to Henning Juhlin, SM0PRY at Gribbylundsvagen 77, S-183 67 TABY, Sweden, or tel: 08-756 00 86.

● Mr V E Roberts, G3EGY, wants any information, circuit diagrams, manuals etc on a **Modem, Model AVT – FVT**, made by Bishopsgate Terminals Ltd. Also any information on a Danish made Data System. IDA3270RS. Any information to G3EGY, tel: 0782 324407 or write QTHR.

● Peter, GM4AXS, has a quantity of **spares for a Harris/3M Photocopier model 6215**, which he wishes to give away free, just pay the carriage (Toner unit is heavy!). Anyone interested to contact Peter, GM4AXS on tel: 0631 71442.

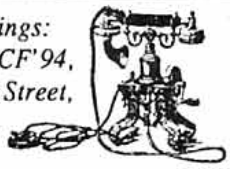
● Hugh, G4TMO, is looking for adivce on the feasibility or otherwise of converting a **YAESU FT-70G HF transceiver**, covering 2-30MHz on transmit and 500KHz-30MHz on Receive, to transmitting on the 160 metre band. If you can help, contact Hugh Kemp by tel: 0264 353145.

● Chris, G8JFJ, needs tuning and bandchange knobs for the (1940) **Hallicrafters SX28 'Super Skyrider'** Receiver. Also needs a circuit diagram and a complete set of handbooks for the (1950) **Hallicrafters panadaptor** SP44. Photocopies would be OK. If you are able to help, contact Chris, on 0705 596836.

● Mr N Lowson, GM4XRF, wants circuit diagrams for a **FDK Multi-725X** 144MHz Transceiver. Any information to GM4XRF, tel: 0307 464619 or write QTHR.

● Ken, G4WAS needs a Service/Operating Manuals for **Advance LF Oscillator Type H1E**, and also for **Telequipment Oscilloscope Type D66**. Any information to Ken, G4WAS, write to him at QTHR, or tel: 0922 475057 weekends only.

● John, G0FZW seeks a service, maintenance manual, circuit diagram for a **SHARP SF 750 Photocopier**. Any information appreciated, for originals or copies. All costs will be reimbursed. Contact John by telephoning 0937 583359.



Simply Silicon

by Paul Lovell, G3YMP

MOTOROLA MC3423 OVERVOLTAGE PROTECTION

- 4.5 to 40V operation
- Programmable cut-out voltage
- 300mA SCR drive
- 8-pin DIL package
- Can be used with positive or negative supplies
- Adjustable overvoltage duration
- Typical supply current 5mA

MANY AMATEUR transceivers require a 12V power supply, and this is often stabilised with a series regulator employing a number of parallelled power transistors (eg 2N3055). Whilst normally proving a reliable and effective configuration, a short circuit in just one of the power transistors can result in up to 20 volts output from a nominal 13.8V power unit. Voltages such as this can easily damage a modern solid-state transceiver, even if it is protected by a suitably rated fuse. Such a fuse may well take several tens of milliseconds before it blows.

Thus some form of overvoltage protection is desirable, and this is where the **Motorola MC3423** IC really comes into its own. This easily obtainable chip protects sensitive (and often expensive!) electronic circuitry from overvoltage transients or regulator failures when used in conjunction with an external 'crowbar' Silicon Controlled Rectifier (SCR).

The 8-pin DIL device, whose pinout is shown in **Fig 1**, senses the overvoltage condition, and quickly 'crowbars' or short circuits the supply, forcing either a current limiting condition or the opening of a fuse or circuit breaker. The important advantage of this circuit is it's speed, with complete protection in just a few microseconds. Many constructors are likely to require cut-off at about 15V, and circuit values for this are shown in **Fig 2**. However, the resistors associated with pin 2 may be selected so that the circuit will trip on any desired voltage between about 2.6 and 35V. The graph of **Fig 3** may be used to select a suitable value for R1. Alternatively use the equation:

$$V_{trip} = 2.6V\ (1 + (^{R1}/_{R2}))$$

CHOOSE YOUR FUSE

MOST AMATEUR RIGS with 100 watts RF output will operate quite happily with a 20A fuse in the DC supply. Any SCR (Thyristor) operating in the circuit of Fig 2 should have a continuous current rating of at least 40A so as to blow the fuse rather than the SCR. It is most important that a very low resistance path exists between the fuse, SCR and power supply for the circuit to be effective.

The arrangement shown is used (with minor variations) in a number of high-grade commercial power supplies, and has proved useful and reliable in my own 25A home-built unit. Motorola can also supply a similar IC, the MC3425, which incorporates an output to indicate an undervoltage fault condition, as well as the overvoltage properties of the MC3423.

SCR gate current is limited by the resistor RG in Fig 2, and a value of 33Ω (1 watt rating) has been found satisfactory for protecting a 13.8V supply. This resistor will need to be increased for higher supply voltages to prevent the maximum output current of 300mA being exceeded. Minimum values of RG are given in the full data available from Motorola.

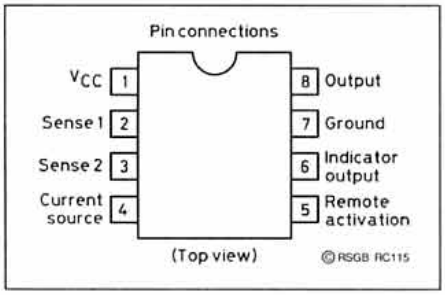


Fig 1: Pin out of the 8-pin DIL package.

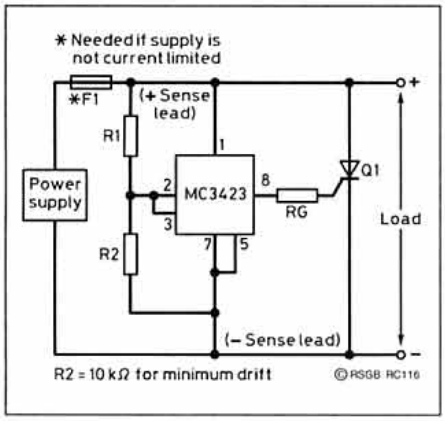


Fig 2: MC3423 Basic Circuit configuration.

MANUFACTURERS SPECIFICATION

TO FILL THE NEED for a low cost, low complexity method of implementing crowbar overvoltage protection (OVP), an IC has been developed for use as an OVP sense and drive circuit - the Motorola MC3423.

The MC3423 has been designed to provide output currents up to 300mA with a 400mA/μS rise time in order to maximise the capabilities of the crowbar SCR. In addition its features include an adjustable minimum overvoltage duration to reduce accidental tripping in noisy environments, and a remote activation input.

The internal block diagram of the MC3423 is shown in **Fig 4**, and the package includes two comparators, a 2.6V reference and a high current output stage. This output, together with the indication output transistor, is activated either by a voltage greater than 2.6V on pin 3 or by a TTL/5.0V CMOS high logic level on the remote activation input, pin 5.

The circuit also has a comparator-controlled current source which can be used in conjunction with an external timing capacitor to set a minimum overvoltage duration (0.5μS to 1.0mS) before actuation occurs. This feature allows the OVP circuit to operate in noisy environments without nuisance tripping.

AVAILABILITY

THERE SHOULD BE no problems in obtaining the MC3423, which is available from a number of mail order suppliers. The price for single devices from Electromail is £5.62 + VAT (total £6.60) including P&P. The stock number is 307-890 and an informative data sheet (No J3396) is also available on request when ordering. Readers may also be interested to know that the latest Electromail catalogue lists suitable SCRs to use in conjunction with the IC.

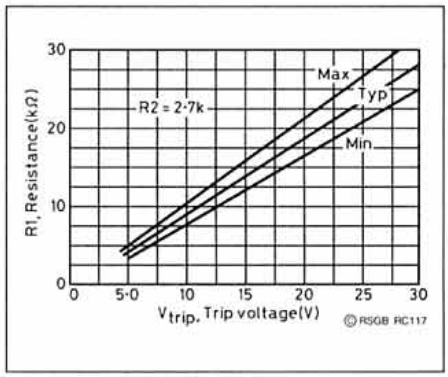


Fig 3: Selection of R1 versus Trip Voltage for the MC3423.

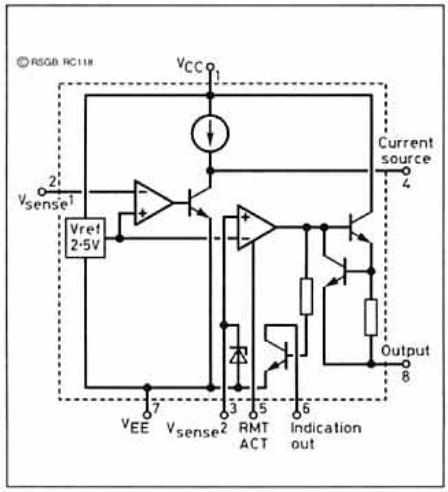


Fig 4: Internal block diagram for the device.

NOTE: Device characteristics and application notes in *Simply Silicon* are compiled from manufacturers' published data. Circuit diagrams are included for experimental purposes only, and have not been proven by *Radio Communication*. Transmitting equipment must be operated in accordance with national regulations. All data is copyright of the device manufacturer.

IN PRACTICE

IAN WHITE, G3SEK
52 Abingdon Road, Drayton, Abingdon, Oxon OX14 4HP – or @ GB7AVM

GROUNDING THE UPSTAIRS SHACK

HOW DO I CREATE a good RF ground for my upstairs 'shack'?

LIKE MANY PROBLEMS, this one is hard to solve by confronting it head-on, but after asking around on the DXcluster network I heard from someone who successfully managed to sidestep it.

The difficulty with achieving a good RF ground in an upstairs room is the distance down to 'true earth' . . . . whatever and wherever that might be! Even if you could engineer a superb low-impedance earth connection at ground level, the distance up to the shack is a significant fraction of a wavelength on the higher HF bands and above. The resonant frequency of your ground lead will be difficult to estimate, since the lead will be top-loaded by your equipment and also loaded by the house wall to which it is attached. However, we can identify two situations that are almost equally bad (**Fig 1**). If the lead resonates at some odd multiple of a quarter-wave, it shows a high impedance to the RF currents that you were wanting to bypass to earth. On the other hand, if the lead resonates as a half-wave, it will conduct RF currents to earth but it also has a high-voltage point halfway down which will couple RF into the house wiring. In either case, your so-called 'RF ground' lead isn't doing you much good. These or similar situations are likely to arise on any band above 10MHz.

Here's the story of a well-known HF DXer who operates from an upstairs bedroom. He had lots of problems with RF getting into the mains wiring, and tackled them head-on with large numbers of ferrite rings. Although the situation was just about under control, it obviously wasn't satisfactory: time for some radical thinking! He reasoned that since he uses balanced antennas, centre-fed with coax via baluns, he doesn't really *need* an RF ground at all. On the contrary, trying to provide an RF ground lead actually *invites* RF down from the antenna and into the house wiring. Following the advice in *The Radio Amateur's Guide to EMC* (RSGB) [see this month's *Book Case* on pages 94/95 – *Ed*] he isolated his entire shack from the mains at HF by winding the lead from each of the 13A sockets supplying the equipment on to a stack of RSGB ferrite rings (**Fig 2**). He used five rings per stack (joined using super-glue) and as many turns of the mains lead as would fit, which happened to be ten. When he also disconnected the external ground lead, the RFI problems cleared up immediately!

Take care about mains earthing. Although the RF choke in Fig 2 isolates the equipment from ground as far as RF is concerned, it still provides a safety connection through to the mains earth. This arrangement is also safe to use with Protective Multiple Earthing (PME), provided that the antennas are totally insulated from earth and are beyond reach in the event of a fault. If you are on a PME mains system, read Appendix 1 of *The Radio Amateur's Guide to EMC* and consult a qualified electrician.

Since this HF DXer's house has a conventional 'three-wire' mains system, he could attach extra earth connections. The outer conductors of the coax feedlines are connected to the tower, which has its own earth for lightning protection. The ground-mounted vertical antennas for the lower HF bands are some way down the garden and their coax feedlines are buried for most of the way back to the house; this effectively strips any RF currents off the outer conductors and once again provides a degree of lightning protection.

Thanks to some clear thinking and careful attention, this particular amateur's HF station is now free from RFI problems caused by currents in the mains. He didn't *need* an RF ground at all – which is surely the best answer to the original question! Try it – it might work for you too.

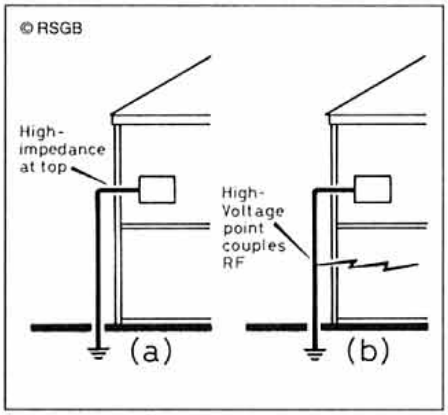


Fig 1: Why RF ground leads from upstairs seldom work. (a) Ground lead with quarter-wave resonance (or odd multiples) is ineffective; very little current will flow into it. (b) Ground lead with half-wave resonance (or multiples) will have high-voltage points which couple RF into house wiring.

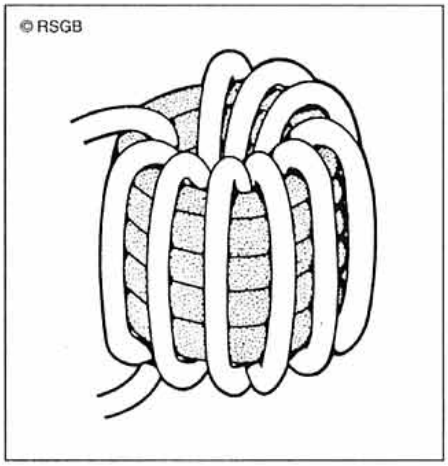


Fig 2: Mains choke using 3-core cable wound on a stack of five 'RSGB' ferrite rings (from *The Radio Amateur's Guide to EMC*). Strip off the outer covering and use as many turns of all three wires as will physically fit.

POSTSCRIPT

This successful outcome probably wouldn't have happened without the help of a clip-on RF current meter [1]. The situation only becomes clear when you start to make *real measurements* of the RF currents on feedlines and mains wiring. For example, if you measure 50mA on the feedline but only 30mA on a mains lead, there must be another 20mA going somewhere else . . . . and you need to find out where.

G0SNO's RF current meter is an ideal weekend project, even for a beginner. The only special component is the split ferrite core (Maplin Electronics, code BZ34M). If you substitute BAR28 Schottky diodes for the original BAT85s, all the components including the 100μA meter can be obtained from the same source. Even if you don't have a junk box to raid, it still shouldn't cost you much more than a tenner. One modification I would recommend is not to rely on the rather flimsy arrangement for clamping the two halves of the ferrite corer together – it isn't made for repeated use. Instead, make some sort of non-conducting tongs or a clip to bring the two faces of the core into firm, close contact. One builder has successfully adapted a pair of plastic pliers intended for handling 'live' car ignition leads [see *Technical Topics*, October 1992, for a clothes-peg version – *Ed*].

RECOMMENDED BOOKS

HOW DO I CONVERT a 'Model xxx' mobile radio to the amateur bands?

READ G4HCL'S 'BIBLE', the *Surplus 2-Way Conversion Handbook*. This covers all aspects of identifying and converting ex-PMR (private mobile radio) equipment that has appeared on the UK surplus market in the past few years. The popular first edition is now out of print, but is still available from booksellers Poole Logic (who appear at most major rallies) and from Anchor Surplus in Nottingham.

Different types of equipment are always appearing on the surplus market so author Chris Lorek, G4HCL, is already working on a new edition. Meanwhile you can keep up with new conversions by Chris and colleagues in *Ham Radio Today*.

SSB CARRIER ADJUSTMENTS

HOW DO I ADJUST the SSB carrier balance on my transceiver? What equipment do I need?

ALL YOU NEED IS another SSB receiver or transceiver. The adjustment only takes a few minutes, so you should have no trouble in borrowing one for the occasion. From the manual for your rig, identify the screwdriver adjustments for SSB carrier balance – usually a preset potentiometer and also a trimmer capacitor.

If you remember how an SSB signal is generated, the carrier oscillator is used to shift your audio signal (actually a range of audio frequencies) upwards in frequency to create a double-sideband RF signal (**Fig 3**). This is done in a balanced modulator which makes the frequency conversion and at the same time suppresses the carrier signal – it has done its job and isn't needed any more.

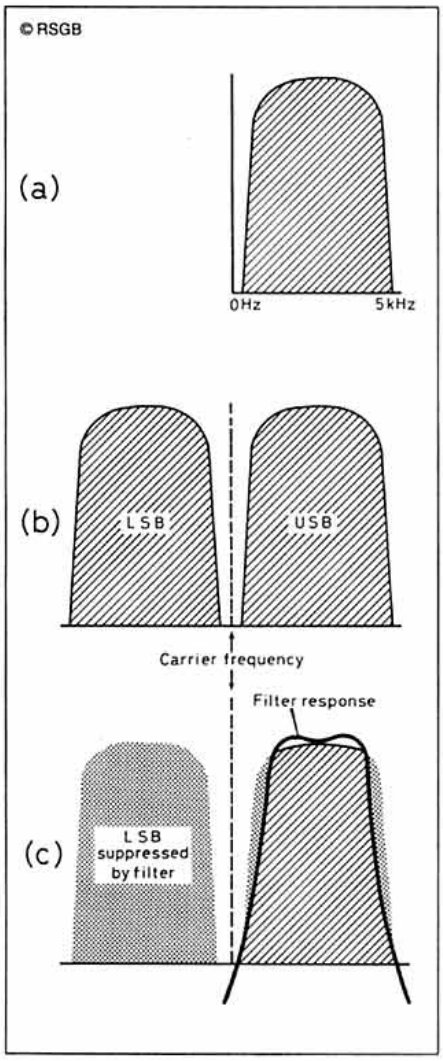


Fig 3: Generating a filtered upper-sideband (USB) signal from the original audio. Note in (c) how the filter passband modifies the audio frequency response.

The potentiometer and trimmer capacitor are part of the balanced modulator. The carrier is then further suppressed by the action of the crystal filter that selects the wanted sideband. The filter response is fixed, so if you want to generate the opposite sideband you have to switch to a carrier frequency on the other side of the filter passband.

Returning to your rig with its covers off, unplug the microphone so that there will be no modulation. With the transmitter and the second receiver both tuned to the same frequency but no antennas connected, switch your rig over to transmit. On the second receiver you can now hear all the low-level components of your transmission: hum pickup from the open microphone socket, some synthesizer noise and also – if you tune the receiver off-frequency a little – the beat note from your 'suppressed' carrier.

Carefully adjust the trimpot and capacitor to minimize this unwanted carrier signal. Usually the potentiometer makes most of the difference, but the two adjustments interact so you'll need to repeat them a few times. That's all – it's done!

On an HF rig, change to the opposite sideband and repeat the adjustment if the carrier suppression isn't good enough. You may have to compromise on the settings to achieve adequate carrier suppression on the two sidebands. With a VHF/UHF- only transmitter you can concentrate on the upper-sideband setting only, unless you actually transmit LSB for satellite working.

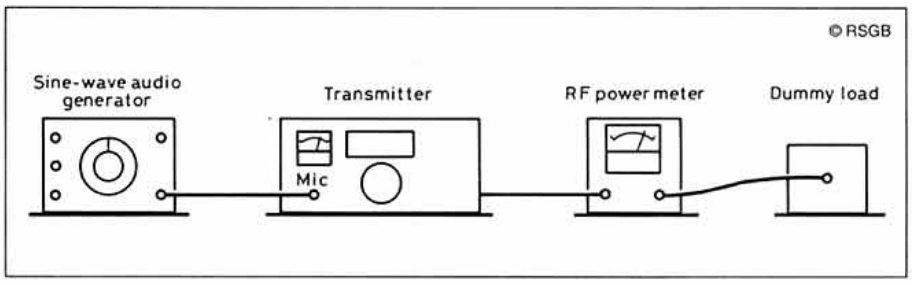


Fig 4: Test setup for measuring audio response of an SSB transmitter.

Although some service manuals suggest that you can make the adjustment using a power meter connected to the antenna socket, I wouldn't advise it. You certainly can't use an ordinary power meter capable of reading 10 or 100W – it isn't sensitive enough. If your transmitter produces 100W and the carrier suppression is 60dB or better, the power meter would need to be capable of reading down to 100 microwatts or less. Such meters are delicate and expensive, and the sensor element could easily be destroyed by a switching transient. In contrast, a separate receiver with no direct connection can hear the signal from your transmitter quite plainly, but cannot be harmed by it. A professional engineer would use a spectrum analyser to adjust the carrier balance with modulation applied, but I'm sure you'll find the above method more than adequate.

HOW DO I ADJUST the SSB carrier frequency?

THAT'S SOMEWHAT TRICKIER, and does require some test equipment. There isn't a universal 'correct' answer. Rather, the (suppressed) carrier frequency needs to be in the right place in relation to the passband of the crystal filter (**Fig 3**) to give the optimum frequency response for your voice. For example, if the filter's passband at the –6dB points is 2.4kHz wide, most English-speaking adult males will probably want the available 2.4kHz bandwidth to cover 300Hz-2.7kHz. In other words you'd want to set the carrier frequency 300Hz down the skirt of the filter response. If instead you go 500Hz down the filter skirt, the audio frequency response would move up to 500Hz-2.9kHz and the transmission might sound 'thin' and 'toppy' – unless you're a woman or a young person, in which case it might sound just right. It all depends on your own particular voice characteristics.

Thus it isn't merely a matter of measuring the carrier frequency and adjusting it to a 'correct' value. What you need is to measure the audio frequency response of your transmitter. To do this, connect a sine-wave audio signal generator into the microphone socket, and notice the variation in the RF power level as you sweep the audio frequency up from about 100Hz to 4kHz (**Fig 4**). If you're going to try this, two precautions are necessary: the audio generator must produce a clean sine-wave whose amplitude doesn't vary as you sweep the frequency; and you need to be sure that the RF output power level always remains below the threshold of the transmitter's automatic level control – otherwise the ALC action will create the illusion of a wider and flatter frequency response than is actually the case. Make a sweep with the audio generator, and if the audio response isn't as you'd like it, adjust the carrier frequency and try again. Then change sidebands and repeat the process with the other carrier crystal. Finally, you'll need to readjust the carrier balance on both sidebands.

THE GENTLER TOUCH

IN RESPONSE TO THE March item about removing large and potentially valuable ICs from printed circuit boards, GM4ANB has suggested an alternative, "if you don't care what happens to the PCB afterwards, but just want the chip."

"Use a blowtorch. Hold the board, component side down, over a bowl of cold water (use an oven glove!) Blast away at the pins of the chip you want and shake the board when all looks molten. If you are quick, the chip itself does not have time to get hot enough to die, and the fast drop into water keeps it that way. This has worked even with 'sensitive' components such as CMOS rams."

Well, he certainly meant what he said about not wanting the board afterwards! The secret of GM4ANB's method is to do it *quickly* – hence the blowtorch – but you won't manage that if the auto-insertion machine has bent over the pins on the IC. If so, you'll have to carefully straighten each pin with fine-nosed pliers and the soldering iron before the countdown to 'ignition', and then slip a long, flat knife-blade under the IC package to help it come away from the board.

In a situation where there's little to lose except your eyebrows, why not give it a try? (GM4ANB, G3SEK or the RSGB shall not be held liable under either Scottish or English law for whatever happens next . . . !)

REFERENCE

[1] *EMC* column, *RadCom*, April 1993, p74.

IF YOU HAVE NEW QUESTIONS, or any comments to add to this month's column, I'd be very pleased to hear from you by mail or by packet (see head of column). But please remember that I can only answer questions through this column, so they need to be on topics of general interest.

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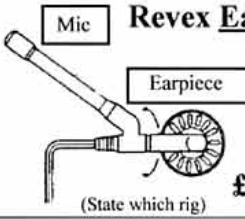

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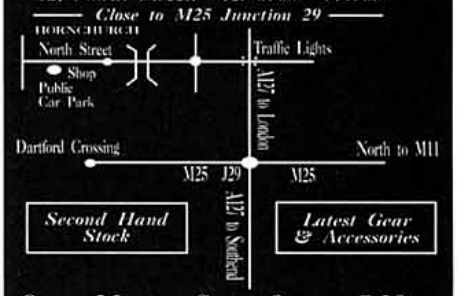

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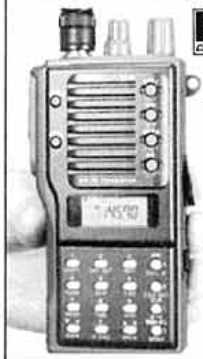

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RADCOM USER REVIEW

The MFJ-249 HF/VHF SWR Analyzer

by Rev George Dobbs, G3RJV

I CAN SAY, with some truth, that I am not an antenna expert. But I do like to get my antennas right. I use only low power on all bands. I also like simple instruments and my first impression, on being sent the MFJ-249 to evaluate, was that this would be a simple piece of equipment to use.

THE BASIC OPERATION

THE MFJ-249 HAS FEW controls. The RANGE control selects the frequency band, the TUNE control adjusts the oscillator within the selected range and an LCD readout shows the frequency. Under the LCD display is a conventional looking SWR meter. Apart from sockets, the only other item on the case is the on/off switch.

The basic operation of the Analyzer is measuring or adjusting the SWR of an antenna and this is simplicity itself. Connect the antenna to the SO239 connector on the unit. Set the range to the desired band and the tuning control to the desired frequency using the frequency readout. The meter gives the SWR. The tuning control can be rotated, with the unit switched on, to "scan" for the lowest SWR. I tried it with several antennas including the rubber duck from my 2 metre handheld, all with successful results. I then pulled out all my antenna tuners, about six of them, mostly home-made. Connecting each in turn to my doublet antenna I used to MFJ-249 to resonate a range of bands with each tuner. It was easy and told me quite a lot about the merits and otherwise of the tuners.

The MFJ-249 works by putting a low level signal into the unit being tested. I measured the signal as being a little over 3mW; obviously better than tuning up an antenna using a transmitter. What criticisms I have relate to the oscillator and the digital readout. The oscillator exhibits a fair degree of warm-up drift. I did not attempt to measure it but it could be seen on the counter. The tuning control is also very coarse and accurate frequency netting is not easy. In practice neither of these is much of a problem because for the commonest use of the unit, getting an antenna resonant within a desired portion of a band, exact frequency location is not required. The frequency readout is not backlit which could be a problem at low light levels but the contrast is good enough for most locations.

DIFFICULT ANTENNAS

RECENTLY THERE HAS BEEN a lot of interest in reduced space antennas which probably reflects the shortage of garden space in modern homes. A lot of ideas for small outdoor and indoor antennas have appeared in the amateur radio literature and it is an area for keen experimentation. Such antennas are notoriously difficult to tune and 'get right'. The MFJ-249 would be a great help in such experimentation.

Although I rarely try small antennas at home, I am interested in portable operation usually in conjunction with taking a caravan to various European locations. I have spent hours getting loaded whip antennas tuned for the HF bands so I put the MFJ-249 to work on my array of mobile antennas. I have an ancient set of Hustler Whips and loading coils bought on the flea market at Dayton. On a cold damp winter's day in a local park the MFJ-249 enabled me to set these up on any band quicker than I have ever known before. I also followed the same procedure with a set of Sandpiper mobile whips. This is definitely an instrument to take for portable or mobile use on the HF bands!

Caught up with enthusiasm, I decided to make my own 20m mobile whip. I have just built a 20 metre mobile SSB transceiver and had already been looking at data to build a lightweight whip for the band. Following the data, with a bit of 'cut and try' I had the whip built, resonated and in use with an hour. The MFJ-249 made the operation easy and facilitated a complete ad-hoc redesign of the loading coil half way through the construction of the antenna.

OTHER USES

MFJ PROVIDE AN EXTERNAL input socket to use the unit as a Frequency Counter. The counter is more than adequate for the amateur test bench. Its frequency range is from about 10Hz to well over 200MHz with a sensitivity of 200mV in the HF range; a worthwhile piece of equipment in its own right. The oscillator could also provide a useful signal source for the test bench. Many of the other features require the use of a few other components and are extensions of the basic SWR measuring facility.

A very interesting application is to turn the unit into a wide range Dip Meter. In an article in *QST* November 1993, 'An Accurate Dip Meter Using the MFJ-249 SWR Analyzer', David M Barton, AF6S, describes a simple add-on probe. After experimenting with a range of inductor probes on the SO239 socket of the MFJ-249, AF6S devised a single probe which can be used to provide accurate and clear dip measurements over the whole range of the instrument. He claims that the result gives a better dip meter than you can buy for the addition on one home-wound inductor, two resistors and a capacitor. With these extra applications, the MFJ-249 could provide a good starting point for an amateur test bench.

The MFJ-259 being used to check a VHF version of the G2AJV antenna. This instrument is particularly useful for evaluating new designs (or turning ideas into aerials), especially where resonances of early prototypes fall outside the band.

CONCLUSIONS

THIS IS THE MOST USEFUL piece of test equipment I have found for a long time. It works well in its intended function, and very useful that is too. The bonus is that the MFJ-249 can perform a whole range of useful functions on the test bench. My first thoughts were that this is a good piece of equipment for the 'antenna fan' but it is also just as useful for the non antenna specialist; the antennas can be quickly sorted out to get on with other things. The UK price is not cheap but with the extra features, it does represent good value.

We had the opportunity to take a look at the (later) **MFJ-259** Analyzer at RSGB HQ. This is similar to the 249 with the addition of a resistance meter. Our findings were very similar to G3RJV's, but our additional comments are as follows:

THE MFJ-259 WAS particularly useful in evaluating and setting up a 20 metre mobile model of the toroid coil antenna described in the April and May editions of *Radcom*. In fact it would not have been possible to assess the characteristics of this antenna in the short time available without it. It proved possible to do hours of work in minutes.

We decided to test some of the antennas but on the RSGB Headquarters roof using the MFJ-259 but had rather puzzling results. The SWR on all the antennas tested very high but further tests using a conventional SWR meter showed that all antennas were OK. The accuracy of MFJ-259 was tested on a dummy load and it appeared to function correctly.

The problem seemed to be environmental. Possibly the high RF fields caused by the HQ 50MHz beacon and local MW broadcast station might be to blame. Once the beacon was switched off, better (but not perfect) results were obtained. As we were not in the position to switch off the local broadcast stations the MFJ-259 was tested on the antennas at one reviewer's home QTH. The results were good and correlated well with conventional SWR meter readings.

We constructed the simple add-on probe as described in *QST* and tested it with a 'standard' 7MHz tuned circuit made from a 5µH coil and 100pF capacitor; the SWR Analyzer was able to detect it at a distance of about 1 inch.

During the review the internal batteries originally fitted became exhausted. By connecting an FT290 external battery supply (which uses the same external power connector as the MFJ-259) to the external power socket, the Analyzer would not work. Further investigation showed that the supply polarity of the FT290 and the MFJ-259 were opposite and that the meter had been damaged through lack of protection.

Waters and Stanton repaired the review unit free of charge and returned it in a few days. Take care – if you use a non MFJ-259 power supply ensure that the polarity is correct as shown on the side of the instrument next to the power plug.

The MFJ-259 is available from Waters and Stanton Electronics, 22 Main Road, Hockley, Essex. SS5 4QS, telephone: (0702) 206835 or 204965.

The Analyzer costs £259. Our thanks to Waters and Stanton for loan of the evaluation unit and the subsequent repair.

MANUFACTURER'S SPECIFICATION

The MFJ-259 HF/VHF SWR ANALYZERS can:

- Measure an antenna's SWR at a specified frequency
- Find the frequency at which the antenna has the lowest SWR
- Adjust an antenna for minimum SWR
- Adjust an antenna tuner
- Measure an antenna feedpoint resistance (259 only)
- Test and tune stubs and transmission lines
- Determine the velocity factor of transmission line
- Determine the characteristic impedance of transmission line
- Test RF transformers
- Test RF chokes
- Measure the resonant frequency of a tuned circuit

Frequency Ranges:

1.8 – 4.000MHz
4.00 – 10.00MHz
10.00 – 26.20MHz
26.20 – 62.50MHz
62.50 – 113.00MHz
113.00MHz – 170MHz

Power Requirements:

8-18 volts at 200mA (to external socket) or
8 AA alkaline batteries at 190mA

RADCOM TECHNICAL FEATURE

MSF Locked Frequency Reference

The conclusion of a two part feature by A. C. Talbot, G4JNT

BY USING THE INTERNALLY generated 60kHz, it is possible to set up the receiver chain without using an oscilloscope.

Firstly, set up the tone decoder by feeding the 60kHz signal present at pin 9 of the 74HC74 to the MSF input. Adjust the 10k preset until the carrier LED lights. Now the tone decoder itself may be employed to set up the ferrite rod tuning. Adjust the preset capacitor and coil position until the LED is flashing reliably. In areas of low signal strength the phase meter could be used to maximise the received signal to noise ratio by adjusting for maximum deflection at the maxima and minima of the beat signal.

OPERATION

WHEN FIRST SWITCHING ON, with the loop set to 'lock', the meter will be observed to swing with a cycle time of a few seconds. After 3 to 4 swings, the amplitude will die away and the meter should sit at mid scale. If the two signals present at pins 1 and 2 of the 7486 are examined on a dual beam scope, no movement between them should be seen.

If the switch has been set to 'free' and the system free-running, then it may be difficult or impossible subsequently to achieve lock without switching the unit off and waiting for a few minutes. This is because, whilst free-running, the integrator output will probably have ramped up to its maximum of around 10 volts.

When the loop is subsequently closed, this voltage pulls the VCXO frequency outside the loop lock range and a beat frequency of 1Hz or so may be seen, the loop never being able to lock up to this frequency error. The quick solution is to discharge both 470µF capacitors so that they ramp up from zero towards the nominal tuning voltage of around 3V as if the unit had just been turned on.

One other problem that may occur is if the programmable divider (**Table 1**) is set to give an output where a close harmonic falls at 60kHz. (15, 20, 30kHz etc) In this case there is likely to be enough 60kHz leakage to cause the MSF signal to be overridden, and allow the loop to lock to itself. Should this occur, the carrier light will remain on and the VCXO frequency will either ramp to its maximum or minimum values. If left unchecked, it is possible that the tuning voltage could rise so high that subsequent lock cannot be achieved, in the same way as described above.

The 108MHz output should be sufficient to drive a 1N23 type microwave diode to 10mA or more diode current. This will give strong enough harmonics to be heard easily at 10GHz. At this frequency, on an SSB receiver, the received note is 'clean' but it is unlikely to be completely steady. A randomly varying change in the beat note of some 30 – 100Hz, over a period of several seconds, will probably be observed, due to several reasons. The primary one is the characteristics and signal to noise ratio of the MSF signal. Interference will perturb the loop operating point and cause a frequency variation whilst the loop tracks the signal. Another cause is instability in the VCXO. This random variation is actually phase noise, although it is difficult to think of noise as being at fractions of a Hz!

An interesting test is to warm the crystal by holding it whilst listening to the beat note. As the crystal warms up the frequency will quickly (within 1 – 2 seconds) drift. Over a longer period this will be corrected by the loop and the original beat return. Good construction techniques around the crystal oscillator will minimise this effect.

LOOP DESIGN

THE PHASE LOCKED LOOP has a very demanding specification. It has to reject totally the 1Hz component caused by the carrier pulsing. The sample and hold significantly reduces this component, but considerable 1Hz sidebands are still present. To achieve this, the loop bandwidth has to be significantly less than 0.5Hz and a figure of 0.12Hz was chosen. To calculate the values for the integrator time constants the characteristics of the VCXO and phase detector must be known. The VCXO constant (Kv), when divided down to 60kHz, was measured and a figure of 0.13Hz / volt obtained.

The phase detector figure can be calculated by assuming the output changes between the supply rails, ie from 0 to 5 volts, when the phase varies from 0 to 180°. Thus giving a phase detector constant of $5 / \pi = 1.4$ volts / radian. A damping factor of 0.7 is used as giving an optimum compromise between loop tracking and lock up characteristics. The standard equations for phase locked loop lead-lag network time constants are employed:

$$t2 = \frac{2}{2\pi.BW} = 2.6\ s$$

$$t1 = \frac{(1 + KvKd.t2)^2}{4.2\pi.KvKd} \qquad t2 = 3.56\ s$$

FREQ	X Y Z	FREQ	X Y Z	FREQ	X Y Z	FREQ	X Y Z
1.000	0 1 0	200.000	0 3 3	3.750k	1 5 0	62.500k	0 7 2
2.000	0 1 1	240.000	1 2 3	3.840k	1 2 7	75.000k	1 6 2
4.000	0 1 2	250.000	0 4 1	4.000k	0 4 5	80.000k	0 5 7
5.000	0 2 0	300.000	1 3 1	4.800k	1 3 5	93.750k	1 7 0
6.000	1 1 0	320.000	0 2 6	5.000k	0 5 3	96.000k	1 4 7
8.000	0 1 3	384.000	1 1 6	6.000k	1 4 3	100.000k	0 6 5
10.000	0 2 1	400.000	0 3 4	6.250k	0 6 1	120.000k	1 5 5
12.000	1 1 1	480.000	1 2 4	7.500k	1 5 1	125.000k	0 7 3
16.000	0 1 4	500.000	0 4 2	8.000k	0 4 6	150.000k	1 6 3
20.000	0 2 2	600.000	1 3 2	9.600k	1 3 6	187.500k	1 7 1
24.000	1 1 2	625.000	0 5 0	10.000k	0 5 4	200.000k	0 6 6
25.000	0 3 0	640.000	0 2 7	12.000k	1 4 4	240.000k	1 5 6
30.000	1 2 0	750.000	1 4 0	12.500k	0 6 2	250.000k	0 7 4
32.000	0 1 5	768.000	1 1 7	15.000k	1 5 2	300.000k	1 6 4
40.000	0 2 3	800.000	0 3 5	15.625k	0 7 0	375.000k	1 7 2
48.000	1 1 3	960.000	1 2 5	16.000k	0 4 7	400.000k	0 6 7
50.000	0 3 1	1000.000	0 4 3	18.750k	1 6 0	480.000k	1 5 7
60.000	1 2 1	1.200k	1 3 3	19.200k	1 3 7	500.000k	0 7 5
64.000	0 1 6	1.250k	0 5 1	20.000k	0 5 5	600.000k	1 6 5
80.000	0 2 4	1.500k	1 4 1	24.000k	1 4 5	750.000k	1 7 3
96.000	1 1 4	1.600k	0 3 6	25.000k	0 6 3	1000.000k	0 7 6
100.000	0 3 2	1.920k	1 2 6	30.000k	1 5 3	1.200M	1 6 6
120.000	1 2 2	2.000k	0 4 4	31.250k	0 7 1	1.500M	1 7 4
125.000	0 4 0	2.400k	1 3 4	37.500k	1 6 1	2.000M	0 7 7
128.000	0 1 7	2.500k	0 5 2	40.000k	0 5 6	2.400M	1 6 7
150.000	1 3 0	3.000k	1 4 2	48.000k	1 4 6	3.000M	1 7 5
160.000	0 2 5	3.125k	0 6 0	50.000k	0 6 4	6.000M	1 7 6
192.000	1 1 5	3.200k	0 3 7	60.000k	1 5 4	12.000M	1 7 7

X	Divide by 6 selector	Switch A
Y	Divide by 5 selector	Switches B,C,D
Z	Divide by 2 selector	Switches E,F,G

Table 1: Frequencies available from programmable divider.

Choosing a capacitor value of C = 470µF gives the necessary values of the resistors around the integrator to meet these time constants:

R1 = t1 / C R2 = t2 / C

Taking the nearest preferred values gives the values shown in the circuit diagram. A final network is added at the integrator output to give further attenuation at 1Hz. A time constant of 1.2s, formed by 56k and 22µF gives a further 19dB reduction in this component, whilst the time constant is fast enough not to affect the loop tracking performance. Without this extra filter, around 10Hz of frequency shift (at 10GHz) was noted every time the carrier was switched off. With the filter no shift was discernible.

CONCLUSIONS AND FURTHER MODIFICATIONS

THE FREQUENCY REFERENCE generated is more than good enough for 24GHz narrowband work in CW bandwidths! The unit has been designed so that different parts may be used separately as individual constructors wish. If other output frequencies are desired the following modifications could be made:

1) A 30MHz VCXO could be used instead of 12MHz, with a division ratio of 500 to give 60kHz. This would give access to 10MHz and 5MHz, not available from the unit described.
2) An output level of +10 dBm at 96MHz has been obtained from the multiplier, by changing the capacitors across the tuned circuits to give a quadrupler followed by a doubler stage.

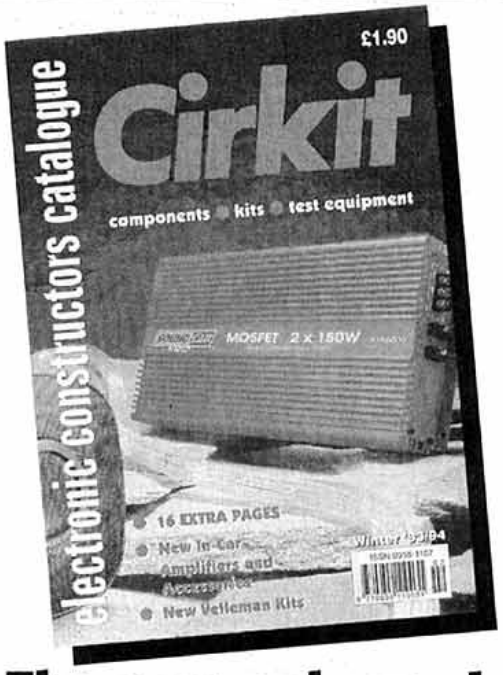
There is further scope for optimising the loop feedback function. If the loop bandwidth could be narrowed still further, it would be less susceptible to noise and interference (but more so to oscillator stability). It would then probably be necessary to employ non-linear techniques to improve lock up time and pull in range.

If it is intended to use this unit portable, it may be necessary to temperature stabilise the crystal oscillator to prevent it moving outside the pull in range at temperature extremes. One way to do this would be to use the crystal heaters supplied by the RSGB's Microwave Component Service [Note 2].

NOTES

1 No components list has been provided as this article is intended as a source of ideas, rather than a perfectly reproducible construction project.
2 The RSGB Microwave Components Service can be contacted c/o Mrs P Suckling, G4KGC, 314A Newton Road, Rushden, Northants NN10 0SY; tel: 0933 411446.

WINTER 1993/94 CATALOGUE



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S.E.M. Q.R.M. ELIMINATOR

Following years of production experience of our Q.R.M. Eliminator with 1,000s in use world-wide we now have the Mark 2 version. The main improvements are EASIER ADJUSTMENT for a null and greater frequency range. Coverage down to 100 KHz allows you not only to remove interference from T.V.s etc, but you can also null out local stations and hear the DX station on the same adjacent channel.

Do you suffer from local interference? The answer is probably yes. If you moved your receiver into the country you would be amazed how quiet your reception would be. The noises you hear on the H.F. bands are produced by local electrical equipment.

This completely new idea, developed by S.E.M. can provide the complete removal of any of these local interference problems. You don't even have to know what or where the source is. It can be your computer next to your receiver, next door's TV or RF welding equipment in a factory several miles away.

The Q.R.M. ELIMINATOR connects in your aerial lead (you can transmit through it). Connect an auxiliary aerial, this can be any other aerial eg a 2 metre one or a few metres of wire in the room, because wide band amplifiers are used to increase the level of the Q.R.M.

Your unwelcome signal will arrive at the two aerials with a different phase and by adjusting the phase of the signal from the auxiliary with the ELIMINATOR controls you can remove it *BEFORE IT ARRIVES AT YOUR RECEIVER*. Forget all the inadequacies of "noise blankers", this is a new different concept.

Sceptical? As W4CXH in Florida says, "I can now talk to my British friends again, I tell them the mains noise is S7 and you are coming thru 5 and 4". The Practical Wireless Review says, "Does it work? Yes it does". Other comments "A remarkable achievement" or "It works like magic. It even works on static rain" and many comments about being able to operate again after years of enforced inactivity because of some local interference. Read Chris Lovek's review. He was a sceptic!

Size: 6in x 2in x 3in deep. **Sockets:** SO239s. **Supply:** 12(10-14)V. 150mA. **Frequency Range:** 100 KHz-60MHz. May be transmitted through. **Price: £98.50** (including VAT and delivery).

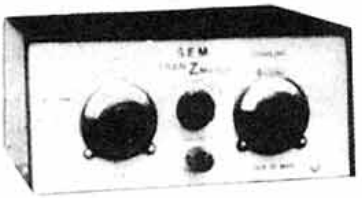
V.H.F. Q.R.M. ELIMINATOR

130-180 MHz, **£119.50.**

NEW S.E.M. PACKET MODEM

This unit will connect between your P.C. and 2M, F.M. rig to provide packet radio with the various TNC emulation programmes readily available. State 9 pin or 25 pin socket on P.C. Price £49.90.

S.E.M. TRANZMATCH MKIII



The only Aerial Matcher with UNBALANCED and TRUE BALANCED OUTPUTS. 1kW 1.8-30 MHz, £179. Built-in EZITUNE (see below), £59.50. Built in Dummy Load, £10.90.

EZITUNE. Allows you to TUNE UP to receive instead of transmit. FANTASTIC CONVENIENCE. Stops QRM. Boxed unit, £65. P.C.B. and fitting instructions to fit any ATU, £59.50.

FREQUENCY CONVERTERS. V.H.F. to H.F. gives you 118 to 146 MHz on your H.F. receiver, Tune Rx, 2-30 MHz, £79.50. Ex-stock. H.F. to V.H.F. gives you 100 kHz to 60 MHz on your V.H.F. scanner, £69.50. Ex-stock. Plug in aerial lead of any receiver. Tuning from 100 MHz up.
2 or 6-METRE TRANSMATCH. 1kW, will match anything, G2DYM or G5RV? on V.H.F., £55.00. Ex-stock.
DUMMY LOAD. 100W THROUGH/LOAD switch, £39.50. Ex-stock.
VERY WIDE BAND PRE-AMPLIFIERS. 3-500 MHz. Excellent performance, 1.5dB noise figure. Bomb proof overload figures, £49.50 or straight through when OFF. £59.50. Ex-stock.
R.F. NOISE BRIDGE. 1-.170 MHz. Very useful for aerial work measures resonant freq and impedance, £65.00. Ex-stock.
COSMIC MEMORY KEYER. The most comprehensive keyer available. 4 x 48 character memory messages which can be combined or call each other and contain operational commands. Many more facilities all being called or interrogated via the key! £117.90 inc.
IAMBIC MORSE KEYER. 8-50 w.p.m. auto squeeze keyer. Ex-stock. Ours is the easiest to use, £65.00. First class twin paddle key, £39.50. Ex-stock.
TWO-METRE LINEAR/PRE-AMP. Sentinel 40: 14x power gain, e.g. 3W-40W (ideal FT290 and handhelds), £135. Sentinel 60: 6x power, e.g. 10 W in, 60 W out, £145. 10 W in, 100 W out £175.
H.F. ABSORPTION WAVEMETER. 1.5-30 MHz, £55.00. Ex-stock.
MULTIFILTER. The most versatile audio filter. BANDPASS Hi Pass, Lo Pass and two notches, £95.00. Ex-stock.
HIGH PASS FILTER/BRAID BREAKER. Cures T.V.I., £9.95. Ex-stock.
CO-AX SWITCH. Three-way + earth position. D.C.-150 MHz, 1kW, £39.50. Ex-stock.
12 MONTHS COMPLETE GUARANTEE INCLUDING TRANSISTORS. Prices include VAT and delivery. C.W.O. or phone your CREDIT CARD No. Ring or write for further data or catalogue. Orders or information requests can be put on our Ansaphone at cheap rate times.

RADCOM USER REVIEW

FT-11R and FT-41R Hand-Held FM Transceivers

VHF and UHF handies reviewed by RSGB HQ staff

THE YAESU FT-11R/41R are very compact FM hand-held transceivers, using the latest in microprocessor control, for use in the 2m/70cms amateur bands. They feel solid and fit well into the palm of the hand.

These transceivers have two independent VFOs, and 150 memories are programmable from the keypad. Memory features include scanning, independent Tx/Rx frequencies or programmable offsets, two pairs of programmable sub-band limits for scanning, selectable scan skip for busy channels, scan resume on carrier drop or after a pause, priority monitoring and an instant-recall CALL channel. Standard channel steps from 5 to 50kHz are selectable and 1MHz steps are also available for tuning.

Transmitter power is selectable in four levels, allowing up to 5W output when used with only a 9.6V battery pack.

New features include naming of memory channels and DTMF Autodial memories with up to six characters of your choice. Also, DTMF Message Paging allows you to send and receive six-character messages automatically. Ten memorised messages can be stored in an outgoing-message bank, while a separate incoming-message bank stores the ten most recent incoming pager messages.

All this is packed into a case 142 x 58 x 25mm (less antenna). This includes the battery which occupies nearly half the volume of the unit! The die-cast alloy rear case/heatsink and thick high-impact polycarbonate plastic front panel and battery cases provide a rugged unit. Rubber gaskets seal external connectors to protect against dust and rain.

OPERATION

THE LCD DISPLAY (**Fig 1**) is comprehensive and, although read-out of the channel frequency is quite clear, the indications of programmed functions are rather small.

Knob count is minimized to a single rotary selector, normally used as a channel selector. Push-buttons are used for the volume and squelch controls, which do not have the ease of control as knobs but this is the price paid for this degree of miniaturisation.

An attractive feature is the selectable back lighting of the LCD (display) and keypad.

A comprehensive 60-page operating manual gives all that most owners would wish to know. Each key on the main front keypad has more than one function, and a couple of hours spent experimenting and studying the manual were found to be essential.

A circuit diagram is included but you would have to be fairly skilled in repairing miniature electronic equipment to make use of it.

In addition to power output selection, features to extend battery charge life include Automatic Battery Saver, which monitors operating history and optimizes the save duration accordingly; Tx Save, which automatically reduces transmit power during periods of no modulation and high incoming signal strength; selectable-period APO (Automatic Power Off) to turn off the radio after a period of inactivity; and selectable always-on or five-second illumination of the display and keypad.

ON THE AIR

IN USE, THE RECEIVER was sensitive and modulation reports were good. No evidence of spurious responses was found, and all the controls functioned well. However, the tiny microphone/speaker was easily overloaded.

The FT-11R is priced at £299 inc VAT, which includes the battery and charger. The FT-41R costs £329.

Our thanks to Yaesu (UK) Ltd for the loan of the review models.

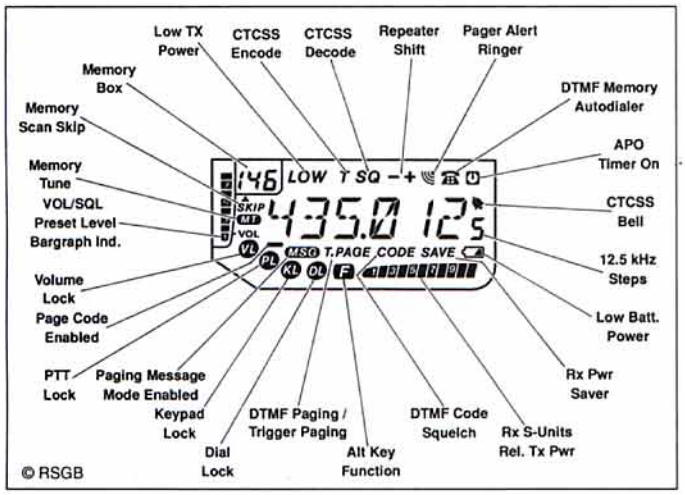


Fig 1: The display is nearly half this size.

MANUFACTURER'S SPECIFICATIONS

GENERAL	
Frequency range:	144-146MHz or 148 (430-440 or 450)
Number of Channels:	151 or 75 in alpha-numeric mode
Channel steps:	5, 10, 12.5, 15, 20, 25 and 50kHz
Input voltage range:	4.0 to 12VDC
Current Consumption:	15mA Standby (Saver On) 140mA Receive @ 11.0V, w/200mW AF 1.5A Transmit @ 5W (1.2A Transmit @ 4.5W)
Dimensions:	142 x 58 x 25mm with battery, less antenna
RECEIVER	
12dB SINAD Sensitivity:	>0.158µV. (>0.177µV)
Adjacent channel selectivity:	>64dB
Intermodulation:	>60dB
Audio output power @ 11.0V, @ 10% THD:	0.2W @ 8Ω
TRANSMITTER	
RF output power @ 11.0V*:	5.0,3,1.5 &.3W (3.5, 2.0,1.0 & 0.2W)
Modulation type:	F2, F3

*11.0V provided by PA-10 Mobile Adaptor.
The figures in brackets relate to the FT-41R

FOLLOW THE ROAD

The sunny weather is here so there's no excuse not to treat yourself to that new MOBILE installation you've been thinking about. H.F. or V.H.F., the choice of equipment and accessories has never been so great - call into the shop and see for yourself! Better still, give me a blast on or around 1.933MHz, "TopBand" and we'll have a rag chew, you'll be amazed at the activity. By the way, there's no repeaters, so you won't need a tone burst - but you will work at least 100-150 miles mobile to mobile in the evening. Who needs a repeater anyway?

Most of the offers this month include a minimum extra of £25 gift vouchers, rising to a massive £100 on some items. The vouchers are redeemable against any future purchase, have no time limit or catch. Despite the excellent service from MARTIN LYNCH, you still get unbeatable value!

Kenwood TS-50S

O.K., I'll admit I use one myself together with auto ATU. The amount of people I've worked and the reports received always brings a smile to my face and I haven't got a linear hidden in the boot! It'll take you a couple of hours to fit (or use my fitting service), the complete system and like me, you won't leave it alone!

FREE £50 Martin Lynch Gift Voucher

How's this for a complete package?

- ❍ TS-50S Mobile Transceiver
- ❍ AT-50 Auto Antenna Tuner
- ❍ PRO-AM Single band Antenna 10/15/20 or 40m
- ❍ Body mount for the above
- ❍ Free Coax and plugs

Only £325.00 deposit and 12 payments of £83.33 INTEREST FREE + Martin Lynch £50 Gift Voucher!

Yaesu FT-840

FREE £50 Martin Lynch Gift Voucher

Either as a base or mobile, the new HF transceiver from Yaesu scores high. This month I've put together two systems, one for home one for your car. You choose.

- ❍ FT-840 H.F. Transceiver
- ❍ FC-10 Auto Antenna Tuner
- ❍ MMB-38 Mobile Bracket
- ❍ Pro-Am Single band Antenna 10/15/20 or 40m
- ❍ Body mount for the above
- ❍ Free Coax & plugs

Only £225 deposit and 12 payments of £83.33 INTEREST FREE + Martin Lynch £50 Gift Voucher!

FREE £50 Martin Lynch Gift Voucher

Alternatively, how about this for a base Station set up:

- ❍ FT-840 H.F. Transceiver
- ❍ Manson EP 925 Heavy Duty 25A PSU
- ❍ MFJ 948 Antenna Tuner
- ❍ Full Size G5RV Antenna
- ❍ Free 50ft Coax & plugs

Only £225 deposit and 12 payments of £75.00 INTEREST FREE + Martin Lynch £50 Gift Voucher!

Yaesu FT-747GX

FREE £100 Martin Lynch Gift Voucher

Yaesu have just finished production and I've got 50 pieces at a spectacular money saving offer. The most cost efficient way of working H.F. mobile or base and at a price that harks back to B&B days! All right Bern?

- ❍ FT-747GX H.F. Transceiver
- ❍ MFJ 945D Mobile Antenna Matcher
- ❍ MMB-38 Mobile Bracket
- ❍ Pro-Am Single band Antenna 10/15/20 or 40m
- ❍ Body Mount for above
- ❍ Free Coax and plugs

Only £175 deposit and 12 payments of £66.66 INTEREST FREE + Martin Lynch £100 Gift Voucher

FREE £100 Martin Lynch Gift Voucher

FT-890

Luxury mobile or base station, the FT-890 is as good in the car as it is in doors. All the facilities of a big base station, it's the worlds smallest 100W H.F.'er with an internal auto atu.

- ❍ FT-890 H.F. Transceiver with Auto ATU
- ❍ MMB-38 Mobile Bracket
- ❍ Pro-Am Single band Antenna 10/15/20 or 40m
- ❍ Body Mount for above
- ❍ Free Coax and plugs

Only £439 deposit and 12 payments of £91.66 INTEREST FREE + Martin Lynch £100 Gift Voucher!

FREE £100 Martin Lynch Gift Voucher

or as a base station:

- ❍ FT-890 H.F Transceiver with Auto ATU
- ❍ Manson EP925 Heavy Duty 25a PSU
- ❍ Full Size G5RV Antenna
- ❍ Free 50ft coax & plugs

Only £449 deposit and 12 payments of £100 INTEREST FREE + Martin Lynch £100 Gift Vouchers!

NEW!!

ICOM IC-820H

The very latest Dual Band 2/70 Multimode base station from Icom has already found a place in my shack! 35 Watts on 70cm and 45W on 2m, the performance has finally surpassed that offered by the IC275/475 series and it's all neatly packaged into a box no larger than a single bander. It's available on INTEREST FREE and I will take in your part-exchanges as deposit!

Only £489 deposit and EIGHTEEN PAYMENTS of £77.77, interest free.

THE NEW ICOM IC-736

100 watts on HF + 100 watts on SIX!

The IC-736 is a worlds first all mode all band 100w transceiver including the brilliant SIX METRE BAND. No other manufacturer has given you so much in one package. Based on the already best selling IC-737 introduced last year, just look at the additional features:

- ❍ 100 watts from 160m - 6m inclusive YES! 100 watts on Six!
- ❍ Built in Mains PSU
- ❍ Dual Antenna ports
- ❍ Now with R.F Gain control
- ❍ Dual display
- ❍ See & check second VFO instantly
- ❍ Mid-size package

No other radio offers you so much - for so less. Have Icom got it right? I should say so! Call now for the best advice and price!

These 'early birds' not only grabbed the best deals, they were also treated to breakfast too!

VHF/UHF HAND PORTABLES

Can't bear the thought of drilling holes or making a semi-permanent install into your vehicle? then cast your eyes on my Handie range! Same rules apply, small deposit then FREE FINANCE over 12 months and claim your FREE £25 Martin Lynch Gift Voucher!

	deposit	twelve payments
Yaesu FT530 The best selling Dual Bander + EXT RX	£46	£35.75
Yaesu FT11R The neatest full feature 2M Handie	£39	£21.66
Yaesu FT41R As above but 70cm, both EXT. RX	£41	£24.00
Kenwood TH78E Dual Band does everything Handie	£89	£33.33

How about these over SIX MONTHS INTEREST FREE. (Sorry no FREE VOUCHERS!)

	deposit	six payments
Yaesu FT23R The toughest of all the 2m Handies	£39	£35.00
Kenwood TH22E 2m Handie. Something to do with a HAT?	£29	£35.00
Kenwood TH42E As above but on 70cm. Nice and easy op.	£59	£35.00

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£10 carriage on all items

140-142 NORTHFIELD AV

- TO MARTIN LYNCH

If you can't handle H.F. mobile operation, (you don't know what you're missing!), then how about some money savers on my VHF/UHF range? All are payable on INTEREST FREE and come with a £25 Martin Lynch Gift Voucher!

	Deposit	Twelve Payments
Icom IC281H *NEW* 50W 84 Memo's Ext RX 2M FM mobile	£99	£25
Icom IC2340 *NEW* 35/45W Dual Band Ext RX FM mobile	£149	£45
Icom IC2700 *NEW* Remote Head 35/50W 120 Memo's Mob	£169	£55
Yaesu FT2400 Built like a tank 45-50W Mobile 2M rig	£89	£25
Yaesu FT2200 As above but on "SlimFast" diet+ AIR RX	£69	£25
Yaesu FT5200 Dual Bander, Quick Release Head, 35/45W	£145	£42
Yaesu FT290R Mk2 2m all mode transportable, 2.5W	£79	£35
Yaesu FT790R Mk2 as above but on 70cm. Ideal novice	£119	£40
Kenwood TM251E Latest 2m 50W FM with 70cm RX+9600Baud	£79	£25
Kenwood TM451E As above but 70Cm, 35W with 2M RX	£85	£27
Kenwood TR255E Latest Remote Head 45W 2m Multimode	£179	£60
Kenwood TR455E As above, but 35W on 70CM 9600 Baud	£219	£65
Kenwood TM732E Remote head dual bander, extended RX	£149	£45
Kenwood TM742E The only Remote head with 3rd band Opt.	£169	£55

DID YOU KNOW

Martin Lynch offers a fitting service to anyone who travels to the shop for his or her very own H.F. or VHF system? It's carried out professionally and we set the antenna up for you.

Please call the sales team first for a booking.

"If you don't want the super Finance offers and just want to pay money or plastic, then ring for your very own tailor made quotation. My package price promise applies" By the time you read this advert, (sometime in April probably), we will have been in our new superstore premises for over six months. On moving in, I had to display four times the amount of product both new and used. For those of you who have visited us you may have noticed duplications on some of the big H.F. demonstrators. We always underline how fresh the stock is and it's time to "sell off" some of the demo stock. It's not pre-owned and will be offered with a proper twelve month warranty. For the sake of it sitting in the display cabinets and the manuals being read for a few months, you can save a fortune. First come, first served. Offers will not be repeated on my "vaulted" stock items. All are available on INTEREST FREE. Please phone first - don't send your money - there are only one or two of each!

1. YAESU FT1000	List £3499.00	Display model	£2995.00
2. YAESU FT990DC	List £2199.00	Display model	£1699.00
3. YAESU FT890	List £1299.00	Display model	£1079.00
4. YAESU FT840	List £ 879.00	Display model	£799.00
5. YAESU FT747GX	List £ 829.00	Display model	£669.00
6. YAESU FT767GX	List £1799.00	Display model	£1499.00
7. YAESU FT736R	List £1699.00	Display model	£1449.00
8. ICOM IC737	List £1549.00	Display model	£1349.00
9. ICOM IC729	List £1325.00	Display model	£1225.00
10. KENWOOD TS950SDX	List £3799.95	Display model	£3599.00
11. KENWOOD TL922	List £1749.95	Display model	£1599.00
12. KENWOOD TS850S	List £1699.95	Display model	£1569.00
13. KENWOOD TS450S	List £1399.95	Display model	£1299.00
14. KENWOOD TS50S	List £ 999.95	Display model	£899.00

I also have a selection of Handies and mobiles that require shifting... If you want something in particular and don't mind a "demo" but new model, then ring the sales team NOW!

DIGITAL FILTERS

The full range of Digital filters including JPS, J-Com W9GR, TimeWave and others are now available. They all fit in line with your A.F. output and are fitted in seconds!

W9GR DSP Multimode filter	£299.00
TimeWave DSP-9 Noise Filter	£169.00
TimeWave DSP-59 320 filter variations	£299.00
JPS NTR-1 Wide band noise & tone remover	£199.00
JPS NFR-7 As above with selectable centre frequency	£279.00
JPS NIR-10 As above with notch filter, removing multiple hets.	£399.00

AOR NEW AR3030

The AR3030, is the very first in a range of ShortWave receivers from AOR. Using the famous "Collins" filters, the performance over the entire range (50KHz-30MHz) in uncompromised So get your order in now!

AA&A 'CAPCO LOOPS'

Whether you're using a FT747 or a top flight FT1000, if the space is limited, try the new range of CAPCO LOOPS for yourself.

Magnetic Loops

AMA-3 200W 13.9 - 30 Mhz	£249.95
AMA-4 100W 1.8 - 4.2Mhz	£399.50
AMA-5 150W 3.5 - 11Mhz	£299.95
AMA-6 150W 6.9 - 24Mhz	£279.95

(£20 Carriage on these items)

Antenna Tuning Units

SPC-300D Roller Coaster, 300W RMS, 1kW pep	£299.95
SPC-3000D Roller coaster 1kW RMS, 3Kw pep	£399.95
VFA. Variable frequency antenna	£99.95

And don't forget the high power range of baluns, all ratio's.

VARGARDA ANTENNAS

Recently appointed the only London retailer for this excellent range of Swedish antennas, the full Vargarda range is now available from stock.

In addition to the antenna range, the range of stacking kits can be obtained. Call for free catalogue.

3	ele	6m beam	**£85.55**
3	ele	2m beam	**£38.35**
6	ele	2m beam	**£47.00**
9	ele	2m beam	**£61.10**
6	ele	70cm beam	**£39.00**
13	ele	70cm beam	**£54.10**
19	ele	70cm beam	**£76.00**

PACKET & DECODERS

Moving to a larger premises has also enabled us to show off our massive range of new & used datacomms equipment. Here is just some of the range stocked:

AEA PK-900	**£549.95**
AEA PK-232MBX	**£385.00**
AEA PK-88	**£169.95**
Tiny 2 TNC	**£139.00**
KAM	**PHONE!!**
KPC-3	**£139.00**
MFJ 1278	**£339.95**
Universal M400	**£399.95**
M900	**£529.00**
M1200	**£399.95**
M8000	**£1279.00**
Momentum MCL 1200	**£229.00**
ERA Microreader	**£189.00**

MFJ PRODUCTS

Here are just a few examples of their unbeatable range:

MFJ-249 Digital SWR Analyser	**£229.00**
MFJ-1786 Super Mag. Loop	**£299.00**
MFJ-949E Antenna Tuner with load	**£169.00**
MFJ-948 Antenna Tuner	**£149.00**
MFJ-1278BX All mode Packet Controller	**£339.95**

You Want Antennas...I've Got Antennas!

★ **HOWES KITS NOW STOCKED** ★

The New Improved CobWebb Antenna

The latest design from Steve G3TPW is his new CobWebb antenna, covering 14/18/21/24/28MHz, 1Kw input. Only 8ft x 8ft (when errected), maximum 3:1 v.s.w.r. at band edges, stainless steel fittings and only 6 kilos in weight. **£199.00**

THE LEGENDARY OUTBACKER

From our Foster Lager drinking mates down under, the "OutBacker" Mobile antenna range is the ultimate in discreet looking H.F. antenna systems. If you don't want your car to look as if it's just run off a bumper car track at a fair ground, then thank NEVADA for distributing the product in the U.K. Then buy one from me...

9561 Outbacker 80-10m 6ft multi band antenna	**£189.95**
9562 Outbacker (T), as above with TopBand	**£219.00**
9565 Outbacker Junior. No TopBand, only 4ft	**£179.95**
9568 Perth 80-10m 7.5ft THE BUSINESS antenna	**£199.95**
9569 Perth (T), as above, with TopBand. Lovely.	**£235.00**
9571 Sprung Mobile Mount for any of the above	**£59.95**

CUSHCRAFT ANTENNAS

Hands up those of you that have been waiting months for you beloved Cushcraft R5 or R7? Since the middle of last year we've always had them in stock, and provided there hasn't been a mad rush, (the word's been spreading fast), I should still have some! Here is the part of the range that is off the shelf or only 3-4 weeks away on back order.

R7 Vertical. 40-10M now in it's mk2 state, it really is a winner	**£420.00**
R5 Vertical 20-10M, as above, no radials required with this one either!...	**£315.00**
A4S 4 ele Beam, for those who take H.F. seriously	**£468.00**
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TSM-1332	2m/70cms	4.5/7.2dbi	1.50m long	£44.95
TSM-1607	2m/70cm/23cms	2.8/6.0/8.4dbi	0.78m long	£49.95
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TSB-3002	2m (2 section)	6.5dbi	2.87m long	£44.95
TSB-3003	2m (3 section)	7.8dbi	4.50m long	£69.95
TSB-3303	2m/70cms	3.0/6.0dbi	1.15m long	£49.95
TSB-3302	2m/70cms	4.5/7.2dbi	1.79m long	£69.95
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VINTAGE RECEIVERS – AR88D, HRO ET AL

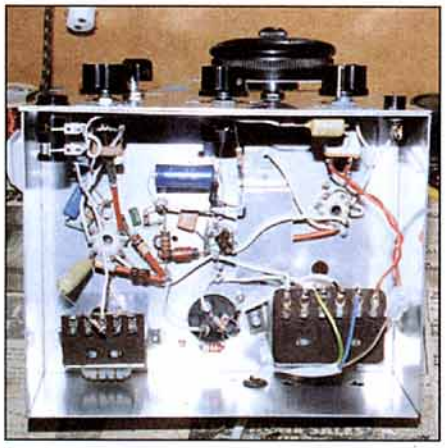
Pat Hawker's Technical Topics

VALVES IN HF/VHF receivers are obsolete or at least obsolescent – how can one argue with this received wisdom! All one can say is that old soldiers never die they only fade away. There are still many classic receivers over 50 years old yet still providing their owners with excellent results on the amateur bands – and even a few constructors who find pleasure in putting together simple valve receivers.

Tony Tuite, GW0NSR (ZB2A 1950-54) has one of the classic AR88D receivers designed by RCA and now over 50 years old. He writes: "It still gives yeoman service, particularly on the lower bands. It cost me £6 10s plus a 1s 6d taxi trip to bring the heavy beast home! Recently, my XYL Joy is currently taking a Novice course at our local club so that alongside the AR88 sits a recently acquired Codar AT5 transmitter and PSU (£9.00 at the club junk sale). This can easily be modified to limit the power to the Novice 3W limit – and seems set on encouraging Joy later to progress from Novice to Class A. Meanwhile I have been using the set-up on 3.5MHz to work into Siberia, VE, LA, W5 etc on an 83ft antenna".

I recall that some years ago Ron Glaisher, G6LX, told me that the wartime RCA design was actually developed to meet a British inter-service specification. In the hectic days of 1940 no British company was available to meet this advanced receiver requirement and a delegation went to the States and persuaded RCA to undertake the project.

It emerges that there is also a firm British connection with the famous HRO receiver. In a *TT* item "HRODDITIES" (April 1992, p37) I wrote: "Although it is now some 45 years since I last used an HRO receiver built by the National Company of Malden, Mass, this set remains in my mind as the classic valve communications receiver designed for the amateur radio market. Perhaps this is just a nostalgic prejudice that stems from the five busy years (1941-46) spent spinning the unique PW dial of HROs (up to three at a time) for Special Communications, but the sound design of these sets is reflected in the number



Rotor-IV type receiver as constructed by C M Lindars.

that are still in good working order . . .". The item noted that the mechanical design of the early HROs was the responsibility of James Millen who had trained as a mechanical engineer, with the prototype electrical design undertaken by Herbert Hoover Jr, W6ZH, son of the former US President. As pointed out in Raymond S Moore's *Communications Receivers*: "The PW dial and gear drive, the ganged capacitors and the ganged coils and (plug-in) coil compartments are classics of mechanical design."

Recently Eric Sandys, GI2FHN, has drawn to my attention a fact that must be new to many who have used or admired the HRO dial which provides 500 clear calibration points in conjunction with the gear drive and four-gang tuning capacitor. He writes:

"Perhaps it has escaped my notice but in all the articles on the HRO receiver I have never seen an acknowledgment that the 'PW' dial was a British invention. Patent Specification 419,002 "Improvements relating to Angular Motion Indicators" Application Date May 8, 1933. Complete Accepted November 5, 1934: "We, The Sperry Gyroscope Company Ltd, a British Company, of Great West Road, Brentford, Middlesex and William George Harding, a British Subject, of . . . . North Acton, London W3 do hereby declare the nature of this invention to be as follows:- This invention relates to angular motion indicators such as the dials of ships' compasses, radio tuning instruments, and the like, and has particular reference to a method of magnifying the motions of the dial or compass card of a repeater compass or other repeating device actuated by remote control from a master compass or master transmitter . . . ."

GI2FHN continues: "Presumably Mr Harding was an employee of the Sperry Gyroscope Co Ltd. I wonder whether he was responsible for any other inventions with a radio interest and whether he knew of the widespread use made of his invention during WW2 and subsequently. I notice on the reverse side of the National dial there is a small embossed logo which I take to be that of the Sperry company. The dial and drive unit was also made by Muirhead & Co Ltd during the 1940s and on the reverse side of their dial the Patent No 419002 is quoted and also 'Manufactured under Licence granted by the Sperry Gyroscope Co Ltd.' William Harding surely deserves a belated pat on the back should he still be with us."

For some home-brewers, the "classic" valve receiver remains the traditional two- or three-valve regenerative "blooper" and a number of magazines have been resurrecting such designs in recent months. For the uninitiated, the CW/SSB performance possible with such simple receivers continues to come as a great surprise. It was the relatively poor performance on AM that encouraged the general adoption of the superhet in the late 1930s.

Back in December 1976, *TT* published the circuit diagram (**Fig 1**) of the Dutch Radio Rotor Model IV, a commercially manufactured receiver based on two twin-triode ECC81

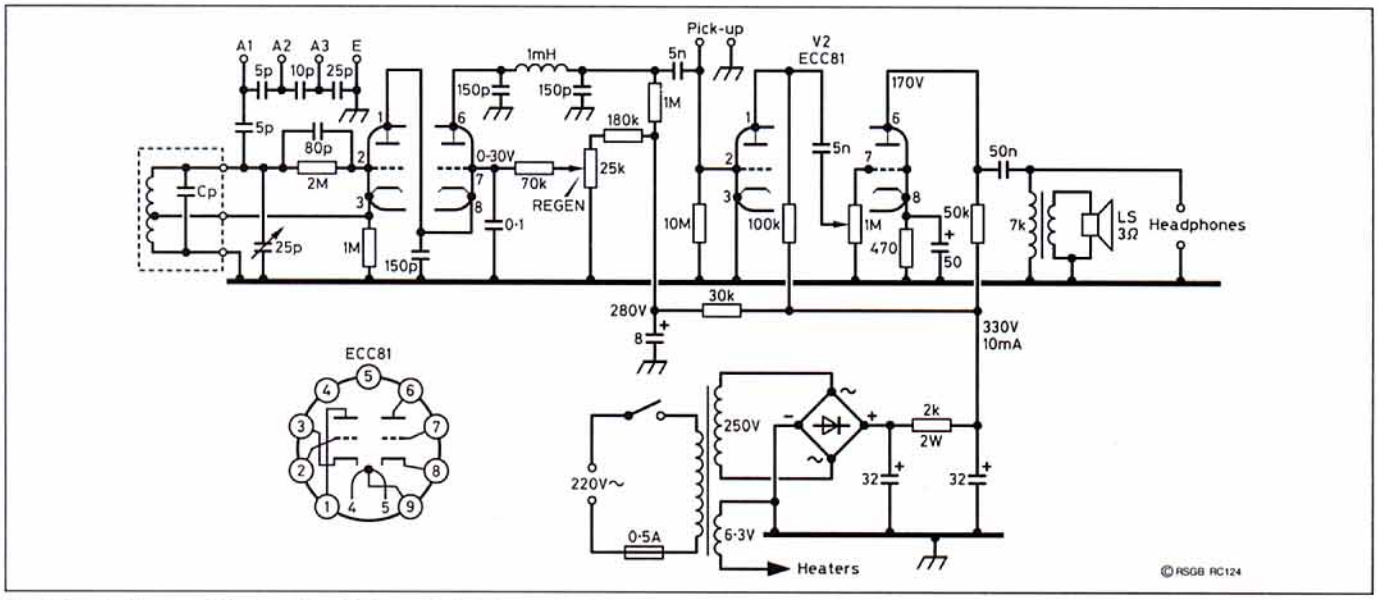
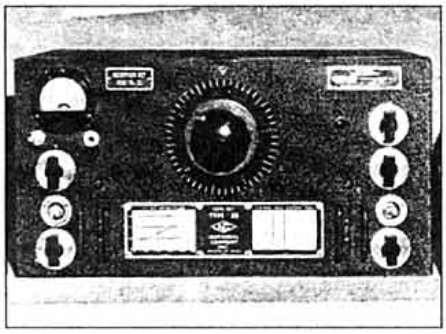


Fig 1: Circuit diagram of the Dutch Radio Rotor Model IV 0-v-2 receiver using a cascode-type regenerative detector as published in *TT*, December 1976.



Wartime advertisement photograph of the HRO receiver highlighting the famous PW tuning dial now known to have been a British invention.

valves with plug-in coils. Richard Kay, G3OQF/HB9ANW wrote: "Being completely fed up with all the commercial gear adverts, it was a real pleasure to see this circuit. I built it in a day, just a lash-up on the kitchen table and it worked first time (my coil was for the 3.5MHz band) . . . . After struggling with the Dutch text in the original "Electron" write-up I found the reason for the 1-megohm resistor in the cathode of V1 was to tame the reaction a bit."

C M Lindars also found the receiver brought back memories of the 'good old days' when similar receivers were the mainstay of shortwave reception. He found that a screen was essential over the grid leak and capacitor of V1 in order to minimize the pick-up of "ticky hum which would mar the excellent performance of this circuit where the audio gain is very high". He opted for Denco DP (valve type) plug-in coils. He added: "Sensitivity and selectivity are very good and the little receiver will provide much enjoyment to the SWL. The good performance on SSB makes it a useful standby when the main receiver is undergoing repair or modification. He offered readers layout details of his version."

Some 17 years later, Mr Lindars has sent along some photographs of his Rotor IV-type receiver. He writes: "Many readers sent for the suggested layout, and since then I have spent some time seeing if it could be improved in any way: I moved the transformers below deck and used a switched antenna input arrangement in lieu of the sockets on the front panel. I have wound a coil which covers 5.5 to 17MHz with a 160pF tuning capacitor. This coil has a B9A base and is so connected that an ordinary 'green' Denco coil may be used if desired."

WORKING WITH BALANCED LINE

OVER MANY YEARS, *TT* has pointed out the value of open-wire and ladder-type balanced feeders – and many suggestions for the construction of low-cost spreaders etc – not only in reducing feeder losses compared with coaxial cables but also, even more importantly,

EASY-TO-BUILD 25W MF/HF AMPLIFIER

MANY OF THE SOLID-STATE linear amplifiers that have been outlined in *TT* have tended to provide an output of around 10 watts and to take advantage of low-cost FET and HEXFET devices. A rather different approach is adopted by Gary Breed, K9AY in the February *QST* (pp31-34) in which the emphasis is the ease with which it can be built, low harmonic output etc rather than minimum possible cost. To quote K9AY's introduction: "Here's a 25W, 1.8-through-30MHz class-A linear power amplifier that's simplicity itself. What makes it simple is the use of a self-biased transistor module requiring few external components. To control harmonic output, a set of five-section low-pass filters is included. Power-supply requirements are +28V at 2.5A and –5V at 200mA. With a gain of about 13dB, a 1–1.4W driving signal is all that's needed to deliver 25W output. Gain is flat within ±0.75dB across the frequency range."K9AY shows that the amplifier (**Fig 2**) can be upgraded to 50W output by the use of an alternative transistor module. While packaged transistor amplifier modules have long been used at VHF, this has been much less common at HF where discrete devices with external biasing resistors etc have been usual. The modules used in this amplifier are made by one of the smaller, specialized US semiconductor companies, MicroWave Technology (4268 Solar Way, Fremont, CA94538) as the SLAM-0111 ultralinear 25W, class A self-biased power JFET module (50W version SLAM-0122) with SLAM an abbreviation for 'Solid-state-triode Linear Amplifier Module'. These devices include thick-film bias resistors which set the gate bias for class-A operation and establish a 50Ω input impedance. At the rated power and supply voltage, the push-pull output impedance is also 50Ω, requiring simply 1:1 balun transformers at the input and output.

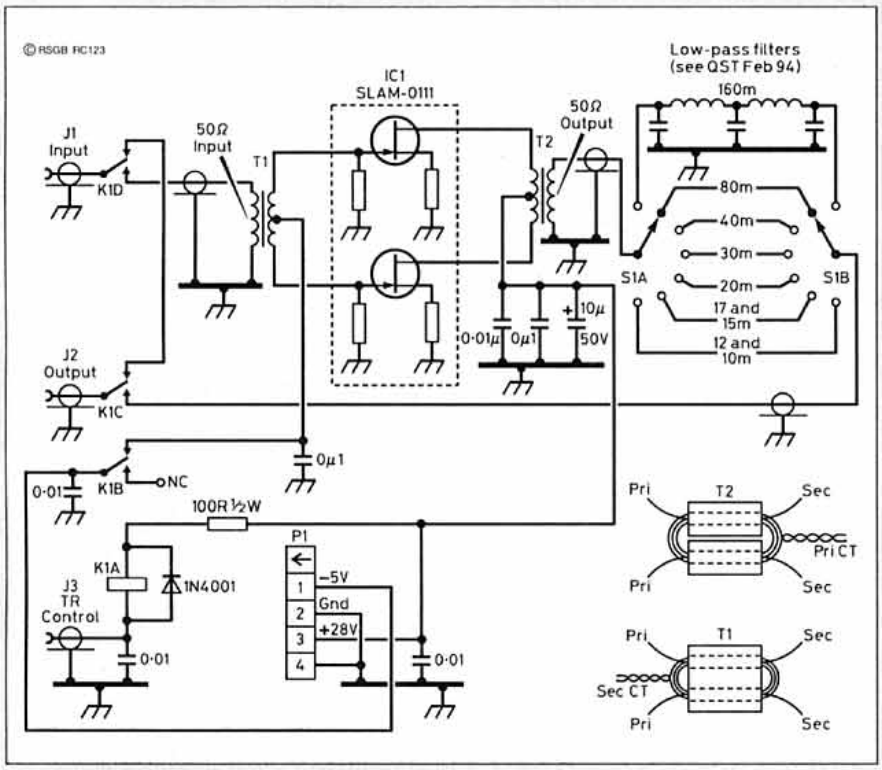


Fig 2: Circuit diagram of the K9AY 25W, 3.5-30MHz Class A amplifier based on an ultralinear self-biased FET module made by Microwave Technology. For further details see *QST*, February 1994.

The article provides full constructional details and also indicates that kits of components (including circuit boards, heat sink and rotary band switch but not the enclosure, connectors, TR relay or power supplies) are available from Crestone Engineering, PO Box 3702, Littleton, COL 80161 (25W kit $115 + $6 shipping). Clearly it is not the cheapest watts per dollar approach but K9AY summarises the case for the module approach: "This project shows how new RF products can make home construction of amateur equipment very easy. Home-brewers can benefit from a growing trend in RF product engineering: reducing development time by using 'super components' that require few external components and little engineering time to design them into a product.

"A secondary purpose is to show how even simple software tools can be used to speed up design. The programs used to design the amplifier's low-pass filters are inexpensive, and accurate at frequencies in the MF/HF bands. In this case, they made it possible to examine trade-offs among standard-value components for seven different filters, without having to build, measure and tweak each one.

"The result is a linear power amplifier with good gain and performance. Its uncomplicated design leaves little room for error, and no fancy test equipment is needed to build it successfully. Projects this easy can make an old-timer forget about the 'simpler' days of vacuum tubes!"

in facilitating the use of multi-band antennas of which the 'tops' are not necessarily resonant on all (or any) bands. Admittedly, coax often seems easier to use and does not require an ATU with balanced output but there is much to be said for learning to make the best use of balanced line feeders.

A two-part article 'Working with balanced line' by Fred Bonavita, W5QJM (*CQ* January 1994, pp56, 58-59, Part 2 February pp26-27) provides useful information on using balanced feeders, drawing in part on RSGB publications by G6XN and G3BDQ. The USA makes considerable use of 300Ω balanced feeder for TV reception, and there is apparently available 450Ω 'windowed' (ladder) cable that does not seem to be advertised in the UK but would clearly simplify the use of balanced feeders.

Ribbon feeders do have the disadvantage that they change impedance when wet (at one time 300Ω feeder inside plastic tubing was manufactured in the UK to reduce this effect). There is still a lot to be said for home-constructed open-wire feeder with a spreader about every one or two feet. There are numerous sources of suitable plastic rods and strips to use to form spreaders, although it is advisable to check that the material is reasonably resistant to UV radiation.

For those more used to coax feeders, W5QJM provides a list of hints about installing balanced feeders:

"Keep them clear of metal. The rule-of-thumb holds that balanced line should be kept away from metal a distance equal at least to twice the width of the line. For 300Ω TV-type ribbon, for instance, that would be about an inch. For 600Ω line with a spacing between conductors of as much as 6in, the separation from metal should be at least a foot. Ladder-line and open-wire line cannot be taped to the leg of a metal tower but should be stood-off [W5QJM gives as an example the use of lengths of 3-foot long, 1-inch diameter schedule 40 PVC pipe to stand-off the line from the legs of the tower – *G3VA*].

"Don't bury the line.

"Changes in direction of balanced line should be gradual, not abrupt. An arc is preferred to a sharp angle.

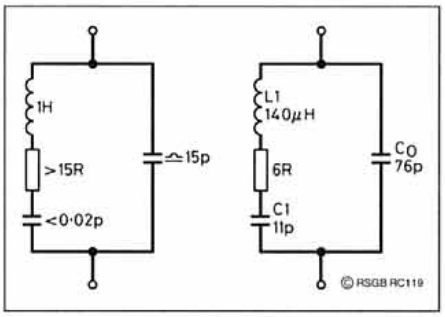


Fig 3: Equivalent circuit of (a) typical quartz resonator and (b) 4MHz ceramic resonator as described in 1985 by K2BLA.

"Avoid long, unsupported runs of twin-lead, especially in areas of high winds or where icing could occur. This applies also to coax feeder.

"When running balanced feed line, whether under the eaves of the house, up the side of a tower, or to the feedpoint, twist the line at least twice in every 3ft of length to minimise unwanted reaction and coupling to nearby objects."

VARIABLE-FREQUENCY CERAMIC OSCILLATORS

IT WAS NOTED IN *TT*, December 1985 (see also *Technical Topics Scrapbook* 1985-89, p69) that the long search for variable frequency oscillators of high stability and low phase noise 'jitter' had for long been dominated by the quartz crystal. In more recent years other control elements including cavities, ceramic dielectric resonators, yttrium indium garnet (YIG), surface acoustic wave (SAW) devices, steel and glass delay lines (eg PAL television delay-line components) etc have been used. Such control elements ranged from the lowest frequencies well up into the microwave region but all tended to be based on the principle of the control device stabilizing the oscillator frequency at or near a specified frequency.

The variable crystal oscillator (VXO) has long been used as an effective means of 'pulling' the frequency of a crystal over a limited frequency range (usually of the order of about 0.1% of the nominal frequency) without undue degradation of the stability. However this is equivalent to only about 7kHz for a 7MHz crystal, even with inductance as well as capacitance loading, and although a useful means of providing a 'rubber crystal' to dodge interference, is not in itself an ideal range for a receiver or transmitter oscillator.

The *TT* item quoted briefly from a long article in the still-missed *Ham Radio* magazine of June 1985, pp18-26 by Al Helfrick, K2BLA (who a year or two later in *RF Design* introduced the concept of low-cost spectrum analysers; see many entries in *Technical Topics Scrapbook* pp85-89). K2BLA showed that low-cost ceramic filter resonators, as used to form the IF filters of broadcast receivers, when loaded by mechanically-variable or electronically-variable capacitors could be 'pulled' over much wider tuning ranges than higher-Q crystals. He quoted a range of some 2% compared with 0.1%, representing a stable tuning range of about 200kHz for a 10.7MHz ceramic resonator.

The main price to be paid for this extended tuning range is the greater temperature susceptibility of ceramic resonators compared with that of AT-cut crystals. For a fixed frequency oscillator using a ceramic resonator, the temperature drift could be minimized by using special –4400ppm/°C ceramic capacitors as the feedback elements.

K2BLA stressed that a ceramic-resonator VXO/VCO can be considered a useful compromise, offering much of the low phase-noise and short-term stability of a crystal oscillator, with a tuning range approaching that of a good LC oscillator. The Q of a crystal can be as high as 500,000. With a ceramic resonator the equivalent inductance is much lower and the Q typically 600, although the series resistance is lower; nevertheless this is significantly higher than that of an HF LC circuit with a typically Q of less than 60. **Fig 3** shows equivalent circuit parameters for 4MHz resonators.

K2BLA provided circuit diagrams of both capacitor and varactor tuned ceramic resonator oscillators using a 10MHz resonator and capable of covering the entire 10.1 to 10.15MHz band. **Fig 4** shows his mechani-

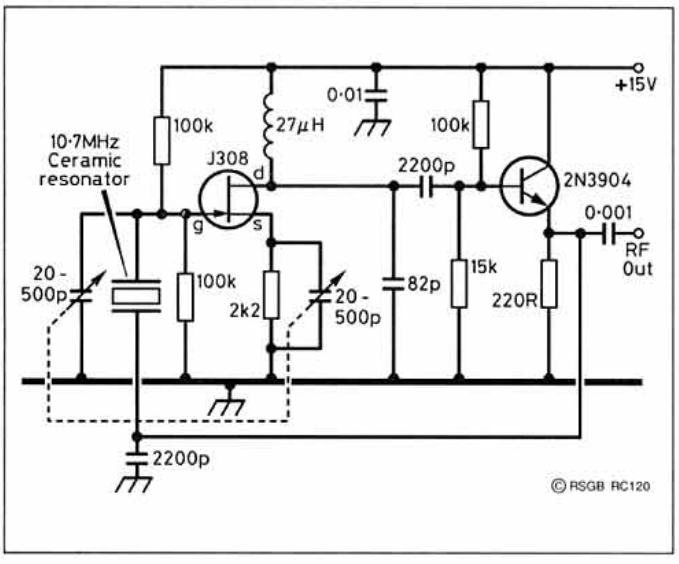


Fig 4: Mechanically-tuned variable-frequency 10MHz ceramic resonator oscillator (K2BLA).

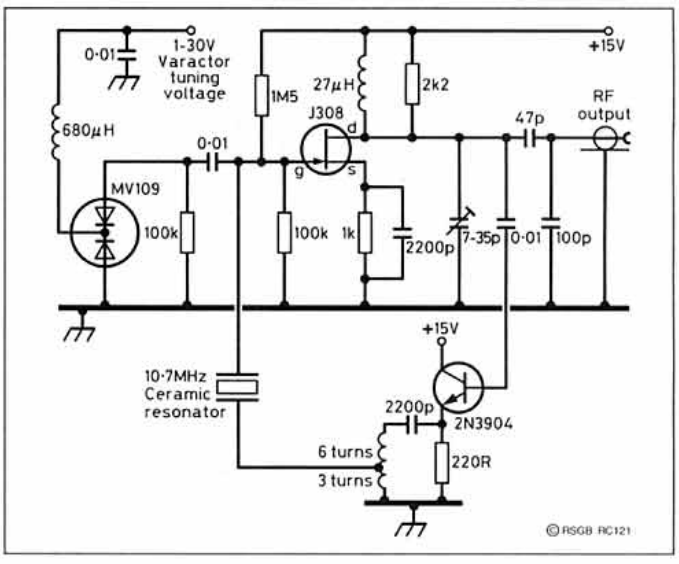


Fig 5: Varactor-tuned version of the K2BLA 10MHz ceramic resonator oscillator.

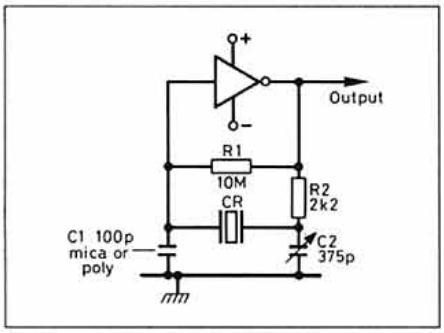


Fig 6: Arrangement used by G3BBD providing some 70kHz shift with a low-cost 3.58MHz ceramic resonator oscillator using a 375pF variable tuning capacitor and capable of good stability provided that the temperature of the resonator remains reasonably constant.

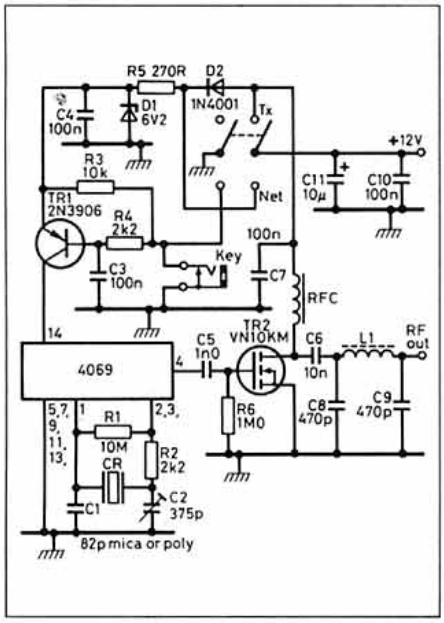


Fig 7: How G3BBD used his ceramic resonator oscillator to control a 1W QRP transmitter/driver covering about 3.52 to 3.59MHz with single 3.58MHz resonator.

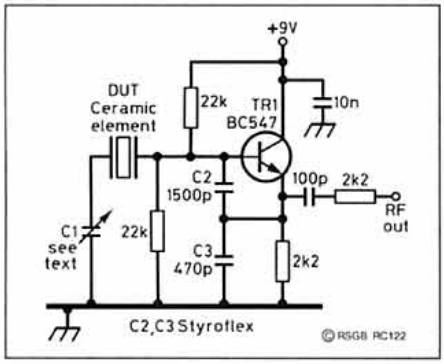


Fig 8: LA8AK's variable-frequency ceramic oscillator capable of covering the 3500 – 3600kHz CW section of the 3.5MHz band with a single 3.58MHz ceramic resonator.

cally tuned oscillator. Unfortunately it is not readily amenable to simple temperature compensation and has a temperature variation of approximately 230Hz per °C. Although it needs to be kept away from heat sources it is capable of forming an operationally useful variable oscillator. **Fig 5** shows a basically similar arrangement but electronically tuned.

Some five years later John Townend, G3BBD contributed an item to *TT* (February 1991, pp30-31) describing his experiences with ceramic resonator oscillators which had been sparked off by the *TT* summary of K2BLA's Ham Radio article, and noting the availability of 3.58MHz ceramic resonators costing only 54p each: "Experiments with this resonator in an oscillator circuit (**Fig 6**) using one hex-inverter section of a CMOS 4069 IC showed that it produced a frequency-stable output (provided that there was little change in the ambient temperature) over a range of some 70kHz with a 375pF variable capacitor. It was found that the oscillator could be keyed by breaking the supply to the device without significant chirp provided that the supply voltage did not exceed 7V.

G3BBD continued: "A simple QRP (1W) driver/amplifier transmitter was then constructed (**Fig 7**) using the oscillator. This provided a frequency coverage from 3.522MHz to 3.590MHz – a most useful section of the 3.5MHz CW band. Because the oscillator is keyed, full break-in operation is provided. A second section of the 4069 IC was used as a buffer stage driving a VN10K VMOS device providing an output of a little over 1W. This would be more than adequate to drive one of the VMOS or HEXFET amplifiers that have been described in TT to provide, say 10W output. John Beech, G8SEQ in TT, November 1993, p48 provided advice on using 455kHz ceramic filters as fixed-frequency beat-frequency oscillators".

More recently, Ian Braithwaite, G4COL, in 'Using Ceramic Resonators in Oscillators' (*RadCom*, February 1994, pp38-39) has provided further practical advice on the type of results that can be expected, together with a listing of the ceramic resonator frequencies (with part number codes) available from Electromail (RS Components) and Maplin.

The G4COL article encouraged Jan-Martin Noeding, LA8AK, to try the effect of using this approach, using an oscillator circuit that he has often used in the past for variable crystal oscillators. The values of the feedback capacitors were increased to a compromise between that required for a crystal-oscillator and Seiler-type VFO circuit: **Fig 8**.

This arrangement has been tested with a few available resonators: two Murata 4.00MHz (type 4.00G CMU (blue colour); and one 3.58MHz resonator of unknown manufacture (type KBR 3.58MS), see **Table 1**.

He finds that with this arrangement the elements will resonate above and below the stated frequency, and that more than 100kHz tuning range is possible with 3.5 to 4MHz ceramic resonators. Oscillation ceases if the value of the tuning capacitor is too low. As with conventional Clapp oscillators, the output voltage varies over the tuning range, but within a 3.50 to 3.55MHz segment this is only about 3dB.

Since the main purpose of these experiments was to ascertain the useful tuning range, no attempt was made to optimise the oscillator for stability. But LA8AK stresses that as with other variable frequency oscillators, it is necessary to choose stable good-quality capacitors.

As an application for this VFCO approach, LA8AK has built a direct-conversion receiver using only low-cost, readily available components. This is based on the RA3AAE subharmonic anti-parallel diode mixer/detector (2 by 1N4148 diodes) as described in *ART7* (pp131-2) for 7 and 14MHz. With a BC547/BC557 cascode RF amplifier, 0.1µV CW signals on 7 and 14MHz can be read, providing a comparable performance to his Atlas 210-X. The receiver is to be described shortly in the Norwegian journal *Amatør Radio*.

1	15pF	40pF	80pF	115pF	150pF
1)	4023kHz	3965kHz	3935kHz	–	3916kHz
2)	4047kHz	3972kHz	3943kHz	–	–
3)	3620(0.25V)	3549(0.6V)	3517(0.8V)	3500(0.9V)	3490(0.95V)

The value shown in parenthesis is RF output (Vrms)

Table 1: Frequency versus tuning capacitance (C1).

MAINS PRACTICE & ADAPTERS

COMMENTS CONTINUE TO ARRIVE on the *TT* items (December 1993 and March 1994) on the question of differing mains practices in various countries and the general need for more 'consumer awareness' of travellers, including amateurs operating equipment overseas.

David Long, G3PTU – a former IBA colleague – writes: "You have stirred up a hornets nest over mains supplies .... I had heard about the harmonization of the mains supply in the European Union, yet when my local Yorkshire Electricity was contacted recently they seemed blissfully unaware of the impending arrival (January 1995) of the 230V AC specification!

"I have acquired some knowledge of the French practice of electricity supply. For very small consumers of, say 9kW peak, the supply is usually wired single-phase. For larger consumers in rural areas the supply is three-phase. A sliding household tariff is used which is higher for larger consumers.

In older properties socket wiring and lighting are often mixed on 10A or 15A fuses. Some sockets in a room may have some 380V between them. With modern French property there are usually three sockets wired back to a 16A fuse and a separate 10A circuit is used for the lights. The supply authority does not provide the earth, which has to be provided by the consumer but a RCCB (residual current contact breaker) always seems to be fitted. Voltage is still specified as 220V ± 10% but in practice the regulation in rural areas can be abysmal.

"In the UK, the days of the British BS1362A socket may be numbered since the European Union does not like 'ring mains', a system which does have some shortcomings.

"On the more general topic of 'Earths', I recently had the opportunity to use an old water pipe, which had been succeeded by a plastic pipe to form an Earth. Contact with the water pipe was extended to the shack using

a length of 10mm Mains earth cable. To my surprise a DC resistance measurement to the Yorkshire Electricity cable outer (the house is not PME) showed a high value of 70W, despite the fact that the water pipe is about 0.7m below the surface and some 20m long. This illustrates that in some areas, a good low-resistance Earth is difficult to establish.

"Where no RCCB is fitted, the safety of an installation depends on the fault causing the fuse to blow by current flowing to earth and the protection offered by a 70ohm earth will be virtually non-existent.

It is my contention that every shack (and preferably every house) should have RCCB protection. There are still domestic fatalities occurring, for example, due to an open-circuit earth connection in the plug top of domestic appliances such as washing machines."

This topic of consumer safety is taken up by Philip Mansell, G3VKN, who writes:

"For some 14 years I have run a small shop selling electric equipment, electronic components, DIY materials etc and find that problems due to lack of electrical understanding are perennial . . . . Naturally, I make every effort to ensure that all the equipment I sell is more than 'fit for its intended purpose' and entirely safe. Yet, much as I would like to sell only items of 'Rolls Royce' quality, the economics of the marketplace dictate that the shop needs to carry a range of items, from a small basic plug-in PSU to stabilised units at twice the price. Both types have their legitimate applications but trying to explain to the uninitiated the pro's and con's of each is a nightmare. I tend to emphasise that when required to drive an expensive piece of equipment it is not worth attempting to penny-pinch with a low-cost PSU.

"More worrying, from a safety aspect, is the widespread misuse of mains plug-converters. My shop is near the local university so much of our trade is with students, both British and from overseas. While voltage harmonisation with mainland Europe is (supposedly) imminent, the day of the 'Europlug' is not – so plug-in converters are in great demand.

"'Shaver' adapter: this 3-pin 13A to 2-pin Continental/British/North American socket is fused at 1A (240W). While inevitably a compromise adapter but quite adequate for its intended use. Unfortunately, the majority of foreign students require it for their 600-1200W hairdryers so I have many requests for replacement 20mm ceramic 5A fuses. Trying to explain why I refuse to sell them such a fuse for that purpose, not to mention the considerations with Class 2 earthed appliances when applicable, tests both my patience and my limited linguistic abilities.

"Until last year the only safe solution was to cut off the continental plug and replace it with a British BS1363 type – much to the consternation of the customer. One local shop with unqualified staff were substituting 5A fuses in the adapters until the local Trading Standards Officer stopped the practice. I did an adiabatic test on some units and found that melting of the fuseholders occurred when passing some 5A.

"'Tourist' adapter: Fortunately there is now an approved adapter from British to most Continental/Australian 2-pin and 3-pin plugs rated and fused at 13A. This is a fixed unit – not the type with suspect swivel selection pins which I have known occasionally to fall apart in use. Even with this adapter I have some reservations about the 13A current rating, though I am slightly reassured by the fact that continental appliances with such fitted plugs should not exceed 6A under normal circumstances. Nevertheless, the 13A fuse does not protect properly the flexible cable.

"American appliances: I never cease to be amazed by people who bring back appliances from the USA unaware of the supply difference (not to mention TV transmission standards). For an expensive, low-power piece of equipment, buying a suitable mains transformer may prove to be a good financial proposition (I won't sell the nasty cheap non-transformer adapters which can be hazardous). But for appliances incorporating even quite low power heaters, adequately VA-rated transformers may cost more than ten times the original cost of the appliance concerned!

"Finally, I agree that the ideal solution is consumer education provided that care is taken in deciding what information is given to the individual consumer. After spending some 15 years in teaching electrical engineering in further education and industry, it is always apparent that there is no point in trying to explain technicalities to someone with little-or-no technical ability: it is sufficient – and often safer – if they are just made aware that differences exist and are given a set of rules to work with, where necessary; for example guidance on correct fusing of mains plugs. Engineering will always be a compromise between perfection and cost. Most of us can't afford perfection, even if it were achievable. However I can live with this philosophy provided always that general health and safety are not compromised."

When the question of the proposed 230V –6% + 10% specification was originally raised by G3HB in TT, February 1994, pp53-54, I added the note "Since these tolerances cover the present 240V, I remain uncertain whether a voltage change will actually be introduced next January". Increasingly, this seems doubtful. As noted above, when G3PTU quizzed his local Yorkshire Electricity, they evidenced no awareness of any pending change.

Christopher Eley, GW4FTW, was concerned at the implications of a lower supply voltage on the efficiency of appliances and on the current consumption meters. He wrote to his supplier South Wales Electricity plc (SWALEC) who replied: "Basically, the nominal supply voltage will remain at 240 volts and all meters will be tested using this standard output at varying inductive power factors to comply with the 1983 Energy Act. With regard to supply voltage as far as the company is concerned, there is no proposal to affect change. With reference to the system voltage tolerances, there is no proposal within this company to move away from the ± 6% tolerance presently in force." As GW4FTF puts it "It seems that, here in South Wales at least, it is a case of 'all change but no change' – whatever Europe says!"

D/E Valves manufactured by Hivac and Lissen in the 1930s.

HERE & THERE

HEINRICH KAIPERT, DJ6ZF, noted G4BWE's ingenious, simple-to-build form of permeability tuning for his Newbury 3.5MHz direct-conversion receiver (*TT*, March 1994, pp43-44) but adds a supplement: "Having been confronted with a similar mechanical 'problem' using two coils that had to be tuned simultaneously, I turned to the tuning assembly of an old car radio.

With this comes a gear drive 'for free' and three coils which, in my case, could easily be adjusted to the required inductance by merely partially unwinding them. Another 'goodie' is that you can preset the slugs, since this is provided by the factory for 'push-button' tuning of the car radio." Dr Tom Going (58 Cambridge Road, Southend, Essex SS1 1ES, home tel: 0702-334391), an ardent researcher into the history of valve technology, writes: "In the 1930s there were a number of small firms making valves in the UK but very little is known of their activities, how many employees they had, their key personnel etc. Two of the most interesting are Hivac (The High Vacuum Valve Company) and Lissen.

Hivac produced the well-known miniature and midget valves, as well as a range of Hivac-Harries critical-distance (beam) output power tetrodes (see 'The UK and the beam-tetrode' *TT*, July 1992, p38) and the Hivac-Harries all-purpose A15 valve. They also produced the mysterious J240, a double-tetrode RF pentode 'three-in-one' design dating from 1935, and said to have been produced for a specific home-construction design.

Their factory was in the Farringdon Road in London, a centre of the scientific instrument trade. Lissen of Isleworth, London produced a range of battery valves, a few 4V mains types and in 1934, the ACFC and FC2 triode-hexode valves, which, if issued, were the first such valves to be made in the UK. The company then faded out of the scene, either at the end of 1934 or early 1935. I would very much like to talk to anyone who was working for either company at the time, or who can shed any light on the technical, commercial or social life of either firm."

CORRECTIONS

In Fig 6 of the February *TT*, the MJ2955 transistor is shown incorrectly. It should be a pnp-type with the emitter connected to the 15R resistor and the collector to the 2N3055 pass transistors.

In Fig 5 of the February *TT*, the FETs should have been described as type 2N3819 not 2N3899.

Apologies for these errors. ***G3VA***

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This Month's Book Choice

Reviewed by John Hall, G3KVA

THE VIBROPLEX CO INC 1890 - 1990

William R Holly, K1BH

Published by Vibroplex Co Inc, 1990. 91 pages. Soft Covers. Available from Eastern Communications at £23 (£27 if signed by the author).

REPETITIVE STRAIN INJURY is a fairly commonly used phrase these days and yet the 19th Century equivalent was the reason for the bug key being invented. Then it was known as telegrapher's cramp or paralysis, so to avoid its consequences the search was on (from as early as 1860) for an improved method of transmitting Morse code.

One of the solutions was patented by an American called Horace G Martin in 1902 using these words: "My invention relates to telegraphic transmitters, and has for its object, broadly, to provide an instrument of this character which shall retain all the merits of the Morse key, but shall be so constructed that it will make all dots automatically, leaving it in the power of the operator to adjust the length of the dots and leaving the spaces and dashes wholly at the control of the operator - that is to say, the operator may lengthen or shorten the dots, the spaces and dashes remaining at his control, or lengthen the spaces and dashes at will, the dots remaining constant. My invention, in other words, provides a simple effective method of sending that wholly avoids the intense nervous strain of the Morse key and still retains its merits". He called that key the Autoplex.

Those words ensured Martin was credited with being the 'inventor' of the Vibroplex. The rest, as they say, is history and it is that fascinating history that William R Holly, K1BH, has so meticulously documented in this book *The Vibroplex Co Inc 1890 to 1990.* Not an inexpensive publication - but then quality never comes cheaply.

Although initially learning the art of using a bug in the early 50s on a J36 Lionel key, I acquired a Vibroplex Presentation key some years ago as a wedding anniversary present from an indulgent spouse.

This design of key first appeared in 1948 and is still in production. So I must own up to being somewhat partisan about the key and its makers. Actually owning one made the task of reviewing the book so much more interesting.

The path to what today is regarded as a symbol of quality was not an easy one. Intrigue, court actions and disputes litter the history of Vibroplex and Bill Holly has faithfully recorded all of them in a chatty, easily readable style and has corrected many popular myths and misconceptions about the company and its products.

The book is beautifully printed on high quality art paper and contains photographs and reproductions of the original patents and their drawings. The cover bears a foil stamped photographic copy of the original hand painted sign used by the Vibroplex Company and the back a reproduction of the now famous 'bug' trademark. The Company, despite having changed ownership several times, celebrated its centenary in 1990 and is still very much in business today. The book celebrates that milestone in code transmission history.

There are photographs on just about every page showing keys from 1860 to the present day iambic complete with textual references and explanations. Did you know for instance that there was a vertical Vibroplex, that no marble based Vibroplex has ever been discovered despite rumours to the contrary or that Vibroplex made radios in the 1920s?

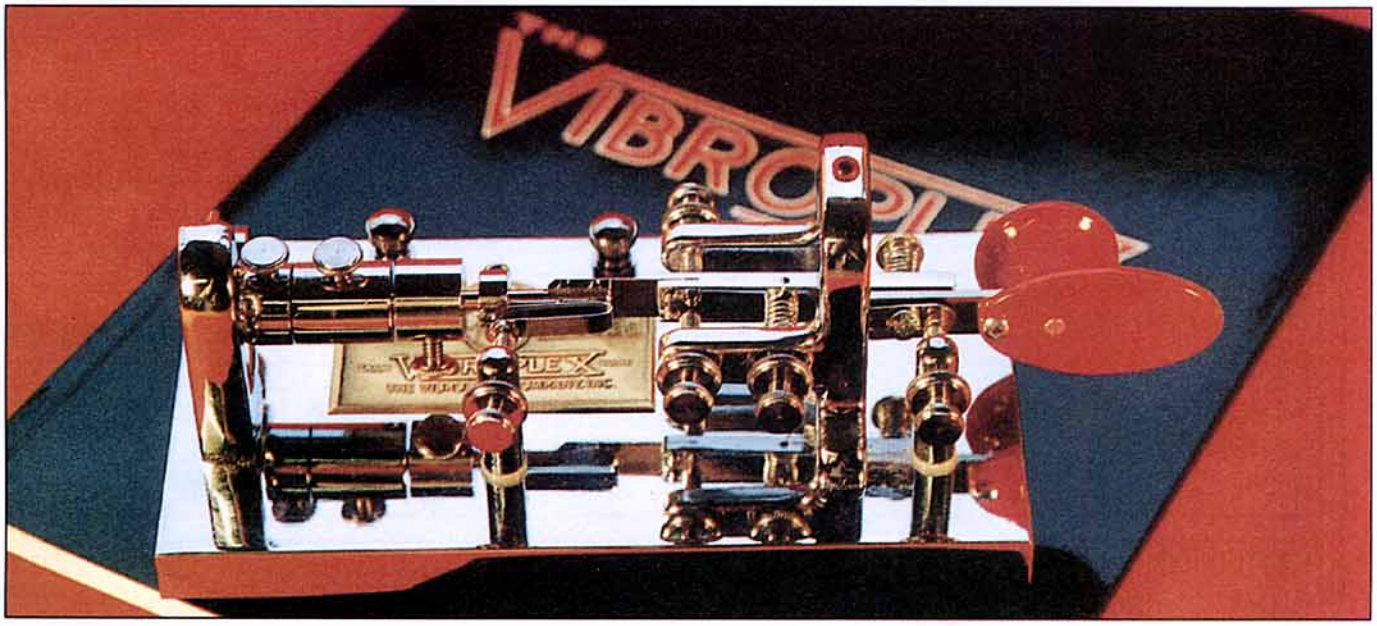
There is a chapter on dating Vibroplex keys which includes close-up photographs of each type of label and the dates of use together with a full list of models and dates of manufacture.

All in all an engaging 'must' for the Vibroplex owner or devotee and well worth a read by any Morse enthusiast.

RADCOM USER REVIEW

Vibroplex Original Deluxe

RSGB HQ staff check out this classic Morse key



THE WORD Vibroplex has been synonymous with the quality bug key for nearly 100 years. As *RadCom* readers cannot fail to have noticed from their double-page colour photograph, Eastern Communications recently obtained the UK franchise for Vibroplex keys, so we thought it was time to see whether the Original Deluxe stands up to modern operating conditions.

The key comes well-packed in a very thick box, with an elastic band preventing the paddle and damper mechanism from moving in transit. The key is supplied with the large speed weight fitted . Other weights are available as options at a cost of £11 each inc VAT. Included is a detailed 'exploded diagram' showing all of the parts, plus a list of the spares and their cost. A separate price list details all of the Vibroplex products available from Eastern Communications, including keys, paddles and even mugs and tee-shirts.

INSTRUCTIONS

TWO SETS OF INSTRUCTIONS come with the Original Deluxe. One is a disappointingly terse half-page which includes only one sentence on adjustment! The other, seemingly to compensate for the lack of official guidance, is a two-page article originally published in *QST* and written by Brian Murphy, VE2AGO. Although not specific to the Vibroplex, this article is most helpful and is recommended to any bug key user, experienced or not.

MECHANICS

ALMOST UNCHANGED FROM the original 1947 design, the key weighs a massive 1.8kg (mostly the half-inch thick base) and is mounted on three rubber feet; this ensures that it cannot move across the bench during normal use. All parts, except the contacts and the paddle are chromium-plated, making for a very smart piece of equipment. A dust cover is available as an optional extra.

The main adjustments are carried out by moving six screws with lock nuts, each of which is easily moved without tools. When set up, the speed is altered by adding and subtracting weights (coarse adjustment), and then moving the weights along the arm of the key to provide fine adjustment.

IN ACTION

HAVING ADDED THE WEIGHTS, and adjusted the key, the real test comes with on-air use. It was tested over a couple of months of operating on the HF bands, including a stint in the RSGB 7MHz Contest. It was also compared to an old Japanese bug key which had been in daily use for some years.

In operation, the Vibroplex has a very smooth feel, with good bearings and excellent balance. There was just the right amount of tactile feedback from the dot spring through the arm of the key to the operator's fingertips. It was even possible (though not recommended) to send Morse without the rig's sidetone turned up.

Like a violinist playing a Stradivarius for the first time, the first-time Vibroplex user will discover that his sending improves and long overs at speed become a pleasure.

Plainly, the many years of progressive development which has gone into this key have paid off.

There are two criticisms, however, which seemed surprising in the light of the above. Firstly, it seemed difficult to obtain a slow enough speed for LF DX working (say, 10WPM) without an uncomfortably large movement of the key's arm.

Secondly, the speed adjustments were fiddly and, since the arm is round, the weights had a tendency to slip round the arm during adjustment. This latter was not a problem with the cheap Japanese key which had a straight arm like a hacksaw blade. Clearly, rapid speed adjustment is not a high priority for Vibroplex users.

CONCLUSION

THE VIBROPLEX ORIGINAL DELUXE is a superb example of the mechanical key and is highly recommended to connoisseurs of this type of instrument. It not only makes an attractive addition to the shack (and probably a talking point too) it is a real pleasure to use. The cost is quite high at £145 including VAT and P&P (UK) but, once bought, you wouldn't need to replace it for a very long time. And, unlike its electronic counterparts, it's RF-proof.

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IARU OPERATING GUIDELINES

Procedures for Meteor Scatter

by David Butler, G4ASR, RSGB VHF Manager

A comprehensive guide to the IARU Region 1 meteor scatter operating procedures

METEOR SCATTER (MS) is unlike most other propagation modes, in that neither station can hear the other until an ionised meteor trail exists to scatter or reflect the signals. The intermittent nature of MS propagation means that special operating procedures are necessary.

The aim of a formal procedure is to enable contacts to be made as quickly and as easily as possible. It also ensures that a maximum of correct and unmistakable information is received. Within IARU Region 1 the procedures are the subject of international agreement and should therefore be employed.

SCHEDULED AND RANDOM CONTACTS

THERE ARE TWO types of meteor scatter contact, scheduled or random.

(i) A scheduled contact is where two interested stations have arranged in advance upon the mode, frequency, timing and duration of the test. This may be done by exchange of letters, or via the European VHF net which is active around 14.345MHz.

(ii) Non-scheduled contacts are made by calling CQ or responding to a CQ call and then following the IARU procedures. These are called random contacts.

TIMING

IT IS RECOMMENDED that stations use 2.5 minute periods on CW and one-minute periods on SSB. This period gives quite satisfactory results. However, improving technical standards make it possible to use much shorter periods. With scheduled contacts you can arrange for any time period you wish but it is recommended that the periods are kept to one minute or less especially during major showers. The use of 'break' procedures within scheduled contacts is very effective. On SSB this could be every 15 seconds if so desired.

(i) All MS operators living in the same area should, as far as possible, agree to transmit simultaneously in order to avoid mutual interference.

(ii) If possible northbound and westbound transmissions should be made in periods 1, 3, 5 etc counting from the full hour. Southbound and eastbound transmissions should be made in periods 2, 4, 6 etc. It should be noted that stations in the UK have chosen by default to transmit during the second period.

(iii) Start times should be arranged to be on the hour eg 0000, 0100, 0200 etc. This makes the best use of everyone's operating time. It can indicate how much time a station may have before the next scheduled contact.

SCHEDULED DURATION

SCHEDULED CONTACTS are usually of one or two hours duration although during shower periods this can be reduced to 30 minutes or less. Every uninterrupted schedule period must be considered as a separate test. It is not permissible to break off and then recommence at some later time.

CHOICE OF FREQUENCY

(A) Scheduled contacts

The frequency selected for scheduled contacts should avoid popular transmission channels taking into consideration the mode and band plan. For example CW schedules could be arranged to run between 144.130 and 144.150MHz, and SSB from 144.150 to 144.190MHz or from 144.410 to 144.450MHz.

(B) Non-scheduled contacts using CW

The frequency used for CW calls should be 144.100MHz. Contacts resulting from such CQ calls should take place in the range 144.101 – 144.126MHz. The following procedure should be used by the caller to indicate during the CQ on which exact frequency he will listen for a reply and carry out any subsequent CW QSO.

(i) Select the frequency to be used for a QSO by checking whether it is clear of traffic and QRM.

(ii) In the call, immediately following the letters 'CQ', a letter is inserted to indicate the frequency that will be used for reception when the CQ call finishes. This letter indicates the frequency offset from the actual calling frequency used: CQA = 1kHz from calling frequency; CQB = 2kHz from calling frequency; CQC = 3kHz from calling frequency all the way to CQZ = 26kHz from calling frequency. For instance, CQE G4ASR CQE G4ASR would indicate that G4ASR was listening on the calling frequency plus 5kHz. In all cases the letter used will indicate a frequency *higher* than the CQ frequency. Contacts will therefore take place in the segment 144.101 – 144.126MHz.

(iii) At the end of the transmitting period the receiver should be tuned to the frequency indicated by the letter used in the CQ call. If a signal is heard on this frequency and identified as an answer to the CQ call the transmitter should be moved to the *same frequency*. The entire QSO procedure will then take place there.

FIRST NUMBER (burst duration)
2: bursts up to 5 seconds
3: bursts of 5-20 seconds
4: bursts of 20-120 seconds
5: bursts over 120 seconds
SECOND NUMBER (signal strength)
6: up to S3
7: S4 to S5
8: S6 to S7
9: S8 and stronger

Table 1: MS report codes.

(C) Non-scheduled contacts using SSB

At the 1993 IARU Region 1 Conference it was agreed that the frequency segments 144.195 – 144.205MHz and 144.395 – 144.405MHz should be used for SSB operation. In an attempt to spread out activity no specific calling frequency has been mentioned. However during non-shower periods it will generally be expected that stations will call on either 144.200MHz or 144.400MHz. During major meteor showers, operation should be anywhere within the 10kHz segments, having first ensured that the frequency is not in use.

CW TRANSMISSION SPEED

SPEEDS UP TO 2000 letters per minute (400WPM) or higher are now in common use. For non-scheduled work a speed of more than 800 letters per minute is not recommended. In scheduled tests the speed should always be agreed before the test. Note that in some countries the national PTT requires the call signs to be sent at a slower speed at the end of each transmission. Check that the message being sent is correct and readable before and during transmission.

QSO PROCEDURE

(A) Calling procedure

Scheduled contacts start with one station calling the other. Eg "UV1AS G4ASR UV1AS G4ASR . . .". For non-scheduled operation the call is in the form: "CQ G4ASR CQ G4ASR . . .". On CW the letters 'DE' are not used unless required by the national PTT.

(B) Reporting system and procedure

The report consists of two numbers as shown in **Table 1**. A report is sent only when the operator has positive evidence of having received the correspondents or his own call sign, or parts of them.

It is given as follows: "UV1AS G4ASR 38 38 UV1AS G4ASR 38 38 . . .", and should be sent between each set of call signs, three times for CW, twice for SSB. The report must *not* be changed during a QSO, even though a change of signal strength or duration might well justify it.

(D) Confirmation procedure

(i) As soon as either operator copies *both of the call signs and the report* he can start sending a confirmation report. This means that *all* letters and numbers have been correctly received. Confirmation is given by sending an R before the report: "UV1AS G4ASR R38 R38 UV1AS G4ASR R38 R38 . . .". Stations such as mine with an R at the end of the call sign could possibly send "UV1AS G4ASR RR38 RR38 UV1AS G4ASR RR38 RR38".

BBB	both call signs missing
MMM	my call sign missing
YYY	your call sign missing
SSS	duration and signal strength report missing
OOO	information incomplete
UUU	faulty keying or unreadable

Table 2: Missing information codes.

(ii) When either operator receives a confirmation message, such as R38, and all other required information is complete he must confirm with a string of Rs, inserting his call sign after every eighth R: "RRRRRRRR G4ASR RRRRRRRR G4ASR . . .".

When the other operator has received Rs the contact is complete and he may respond in the same manner, usually for three periods.

(E) Requirements for a complete QSO

The requirements for a valid contact is that *both* operators *must* have copied *both call signs*, the *report* and also an "R" (ROGER) to confirm that the other operator has done the same.

MISSING INFORMATION (CW)

IF A CONFIRMATION report is received at an early stage in the contact, the other operator has all the information he needs. The strings shown in **Table 2** may then be used to ask for missing information. The other operator should respond by sending only the required information. This approach must be used with great caution to prevent confusion.

METEOR SCATTER USING SSB

Contacts are conducted in the same way as on CW. Letters are generally spelt in the ICAO alphabet but may be spoken without phonetics during a schedule. The letter R in confirmation reports is pronounced "Roger".

PROCEDURES ON 50, 70 AND 432MHZ

Most activity on the 50MHz band is currently with the use of SSB. The MS calling frequency for SSB is 50.350MHz and that for CW is 50.300MHz. The standard periods of one minute for SSB and 2.5 minutes for CW are still utilised.

There is infrequent MS activity on the 70MHz band. The recommended MS calling frequency is 70.150MHz. However most activity is with DXpedition stations who generally operate on pre-arranged frequencies in the SSB segment of the band.

Similarly, 432MHz activity is very low and all tests are scheduled.

FURTHER READING

VHF-UHF Manual, RSGB, and *VHF/UHF DX Book, DIR.* See RSGB *Book Case*, pp94-95.

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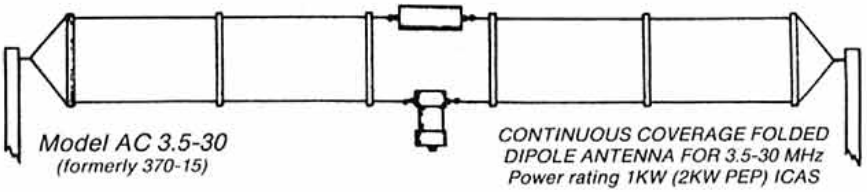

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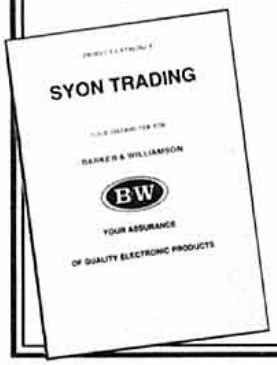

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PRODUCT NEWS

Note: Product news is compiled from press releases sent in by the manufacturers and distributors concerned. Details are published in good faith but *Radio Communication* cannot be held responsible for false or exaggerated claims made in the source material.

THE MAURITRON Technical Services ***Catalogue of Technical Books*** (edition 20) contains a host of useful titles covering computer hardware, CB radio, VHS and Betamax video recorders (including *Video Recorder Faults Repair Guide for Beginners* at just £3 + £2.35 P&P), teletext decoders, televisions, switch mode PSUs, tape recorders, radios, remote controls, vintage radios, valves, and military surplus equipment . . . . and much more.

Other stock items include circuits of Yaesu rigs, PC diagnostics software, equivalents listings, Babani books and a wide range of service manuals.

Mauritron Technical Services, 47A High Street, Chinnor, Oxfordshire OX9 4DJ; tel 0844 351694, fax 0844 352554.

AT A TIME WHEN all rigs seem to look the same, it's refreshing to see the IC-281H 50W **144MHz Mobile** from Icom.

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Available from many retailers or from:

Icom (UK) Ltd, Sea Street, Herne Bay, Kent CT6 8LD; tel 0227 743001, fax 0227 741742.

THE TEAM WHICH designs and manufactures the **Lowe receivers** has separated from Lowe Electronics retail to become an independent manufacturers.

Lowe Production Ltd is headed by John Wilson, G3PCY, one of the three who founded Lowes in the 60s. The Lowe receivers have become world famous for their fresh approach to design and their combination of high performance and ease of use. John Wilson commented: "I'm obviously delighted that our efforts have been so successful, and I wish to thank all who supported my dream of establishing a British manufacturing presence in the tough world of consumer electronics."

Lowe Production Ltd, Unit 23 Cromford Mill, Cromford, Derbyshire DE4 3RQ; tel 0629 826157, fax 06290 826263.

● KENWOOD have appointed a new dealer in the Midlands. Castle Electronics is run by John Taylor, G6VJC and Geoff Wainhouse, G4AQU.

Castle Electronics, Unit 3, Baird House, Dudley Innovation Centre, Pesnett Trading Estate, Kingswinford, W Midlands DY6 8XZ; tel 0384 298616.

● APOLOGIES TO **Eastern Communications** for publishing their fax number instead of their phone number. The correct number should have been 0692 650077.

ICS ELECTRONICS sell two **Antenna Analyzers** from AEA Inc combining a frequency synthesizer and an accurate low-power SWR bridge, these hand-held devices can plot SWR vs frequency on a small LCD screen, plus they will check your feeder loss in dB. The SWR-121 HF covers 1 - 32MHz and the SWR-121 VHF/UHF covers 120 - 175MHz, 200 - 225MHz and 400 - 475MHz. Plotting is in steps of 1kHz (HF) or 10kHz (V/UHF). Each is sized 4.3 x 8.5 x 2.25 inches (109 x 216 x 57mm) and weighs 1lb 10oz (0.74kg). Optional software is available to interface the SWR-121 to your home computer at 960Bd to give plotting on screen and control from the keyboard.

ICS Electronics Ltd, Unit V, Rudford Industrial Estate, Arundel, West Sussex BN18 0BD; tel: 0903 731101.

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Available from: Cirkit Distribution Ltd, Park lane, Broxbourne, Herts EN10 7NQ; tel 0992 444111.

RADCOM TECHNICAL FEATURE

G2AJV Toroidal Antenna

The conclusion of a two part feature by Roger C Jennison G2AJV*

MY MORE RECENT experiments have culminated in the very successful application of the twin toroidal configuration in scaled-up versions at 80 metres. The first of these is designed to operate in very restricted space at ground level (**Fig 6**). The toroidal coils were wound with 12SWG copper wire on a two inch mandrel. When curled round to form a torus they each have an outer diameter of ten inches (254mm). The lower coil is supported two and a half inches (64mm) above an eighteen inch (450mm) square aluminium plate by sheets of expanded polystyrene.

The upper coil rests on a plastic tray supported by a rustic tripod (see photo on page 67) hastily constructed from the proceeds of a recent tree pruning operation. The two coils are connected by a vertical 18SWG wire and the free end of the upper coil is connected by similar wire to an aluminium top plate, supported by a plastic plant-pot so that it is about 4.5 inches (115mm) above the top of the upper coil. the inner conductor of a 50Ω cable from the transceiver is connected to the free end of the lower coil, and the outer conductor is connected to the lower plate, which sits on the ground.

From **Fig 7** it can be seen that this particular 80m antenna presents a capacitive reactance on both sides of the resonance at 3.6MHz but the addition of a good ATU will match it over the whole spectrum shown in **Fig 8**. It is interesting to note that, when properly matched, the field strength continues to rise with the wavelength, ie as the antenna becomes relatively shorter.

If you construct one of these antennas, you will find that the spacing between the metal plates and the toroidal coils has a marked effect on the tuning and on the radiation efficiency. It is probably advisable to start with my dimensions and then experiment for optimum results. Beware of shorts between the turns at the inner circumference of the toroids. I have found that it is advantageous to squirt molten polythene, from an electrically heated glue gun, in a ring about a centimetre wide around this circumference. it serves the double purpose of adding mechanical stability and electrical insulation. I have also afforded some protection from the elements by placing eleven-inch Pyrex glass pastry dishes snugly over each coil. The 80m antenna will easily handle high power. I have operated the prototype on 400 watts and have had good reports from all over Europe.

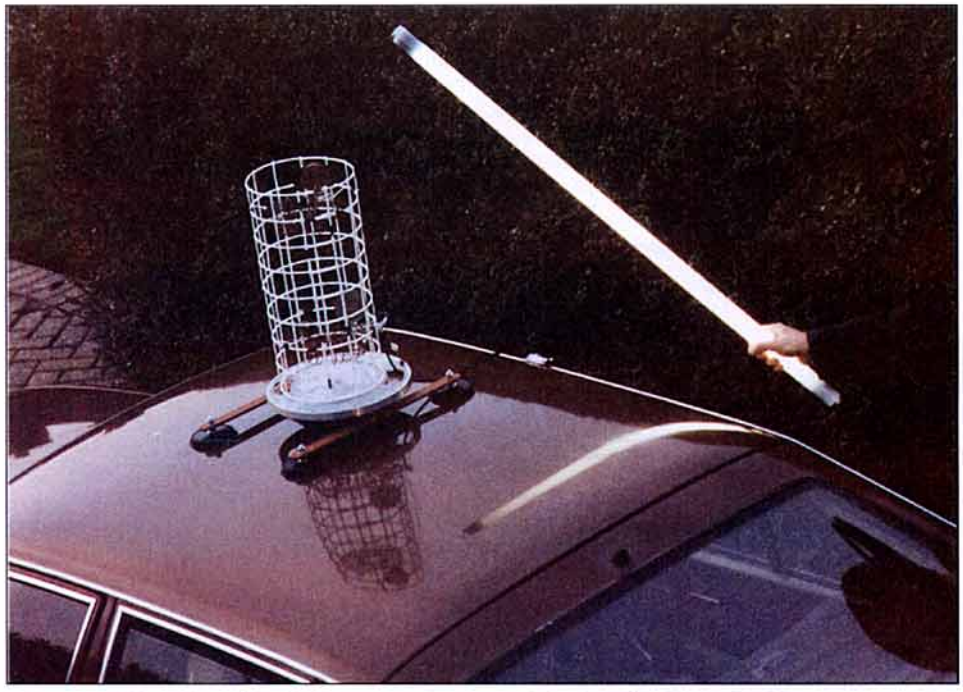
> The antennas described in this article are radically different from any previously published designs. Provisional tests, by the *Radcom* Team, of a 20 metre mobile model indicate that it has a wide bandwidth and is every bit as good as a traditional centre-loaded low loss mobile antenna. We feel that it is not a beginners' antenna and the warnings at the end of the article *must* be heeded.

DIPOLE TOROID ANTENNAS

THE TORROIDAL ANTENNA can be configured as a horizontal dipole and mounted in the loft. I originally used the same toroidal windings supported horizontally, about three feet apart, on a 6inch plastic drain pipe. The method of feeding is shown in **Fig 9**.

The two free connections of the toroidal coils are each connected to metal plates about six inches from the coils, like the top plate in the previous design. The size and spacing of these plates will have a marked effect on the resonance and you will have to experiment to optimise the performance in your own QTH. If you get it right the antenna will match to the feeder and will perform quite well. The resonance of this centre fed system is sharper than that of the end fed variety, which was designed for operating very close to the ground, but you should be able to get a perfect match without any extra antenna tuning components.

The end plates of the 80m dipole antenna are rather large if one just converts the single ended version in the above manner. It is preferable to use about 140 turns in each coil, which should reduce the area of each plate to a little over 1ft² (0.093m²). The basic polar diagram has a 'figure-of-eight' pattern and the electric polarization is roughly along the common axis of the toroids so that there is much to be said for mounting the antenna vertically, thereby obtaining all-round radiation without wasting power at very high angles of radiation. It is advantageous to feed the antenna via a



This 20m mobile version of the G2AJV antenna is supported within a roll of plastic fencing.

balun and you may like to experiment with the optimum transformer ratio. On most bands a 1:1 transformation is optimum but, for reasons which I have not yet ascertained, my 80m antenna prefers a 4:1 balun. I have had a number of 80 metre transatlantic 'phone QSOs with this configuration in the attic.

My antennas on 15m and 17m use the same configuration with 1:1 baluns and are also wound with 2in (50mm) diameter coils of hard drawn copper wire formed into toroids. The 15m version has 18 turns on each coil and the 17m version has 21. The inner diameter of the toroids is about 1½in (38mm), this is not critical. The tuning plates are about 5½in (140mm) and 6½in (165mm) in diameter, respectively. If they are too small, just add a bit of aluminium foil to increase the absolute capacity of the plates. A neater solution is to use variable diameter plates. These can be constructed from four thin aluminium discs about 4in (100mm) in diameter. They are fastened with a single bolt about half an inch from the edge and form an adjustable size clover-leaf capacitor plate. For 80m use an assembly of 9in (225mm) discs. The coil spacing is not critical and the dimensions given can be used as a guide for the other bands.

MOBILE HF ANTENNAS

I AM GRATEFUL to Peter Dodd, G3LDO, for spurring me to try a version of the 2m mobile design, shown in Fig 5 (see part one), scaled to 20m. It uses two coils, each of 28 turns of 12 or 14 SWG wire wound on a 2in (50mm) diameter mandrel. As a guide, for this series fed design, the total length of wire should be just under half a wavelength. The space between the coils is about 12in (300mm) and the bottom of the lower coil is 4in (100mm) above the metal roof of the vehicle.

A mobile antenna can be assembled into a light plastic container which is held on to the roof of the car by elastic (bungee) ties to the roof guttering [Note 1].

The centre of the coax feeder is connected to the bottom coil as shown in Fig 5. The coax braid is connected to ground (in this case the car roof), either directly, or capacitively via a mag-mount, as close to the base of the antenna as possible.

If difficulty is experienced matching the antenna to the feeder a solution is to insert a high voltage preset capacitor in series with the connection between the coax inner and the coil. Additional windings may be required on the coil to bring it back to resonance within the band [Note 2].

This antenna exhibits higher frequency resonances which can be usable. I have had a QSO with K7BDY in Arizona on 15 Metres using one of these higher resonances modified with top capacity.

"Clothes baskets serve well as supports."

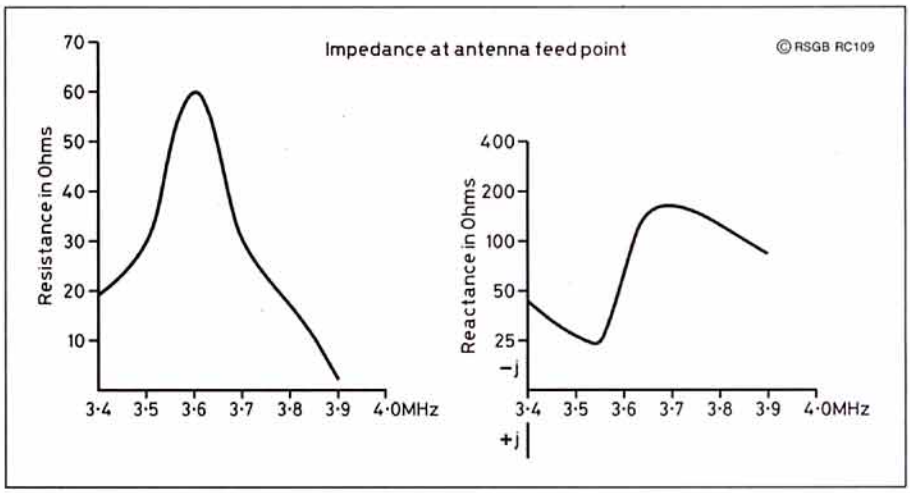


Fig 7: Impedance diagram of an 80 metre toroid antenna.

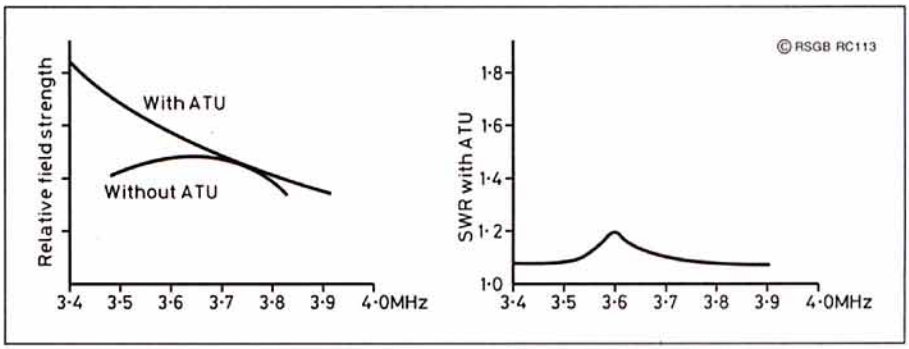


Fig 8: Relative field strength and SWR measurements of an 80 metre win toroidal antenna.

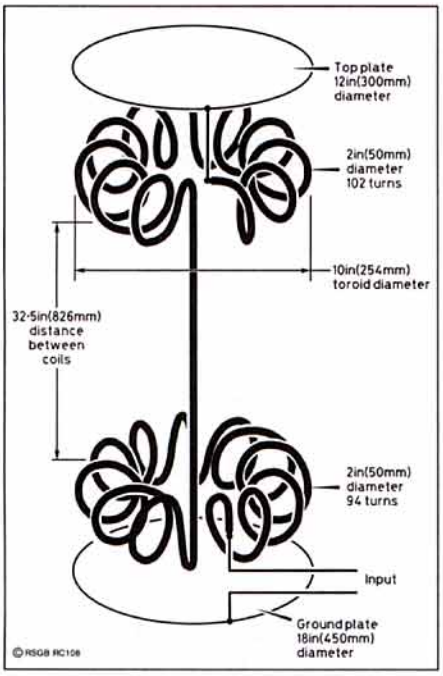


Fig 6: 80 Metre toroidal antenna

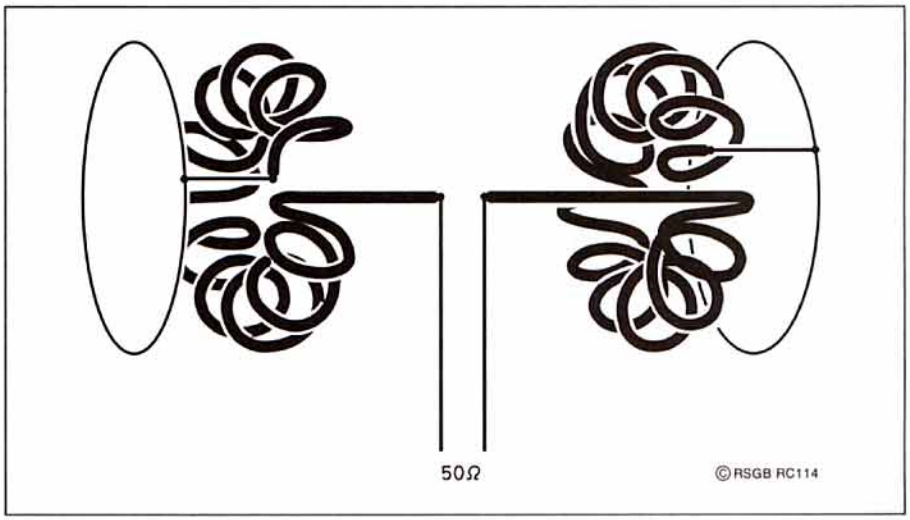


Fig 9: A horizontal dipole using the same toroids as in Fig 6, spaced about 3ft (915mm) apart.

80m double toroid ant using Pyrex dishes to support the coils and aluminium plates as capacity hats.

CONCLUSION

I NOW MOUNT ALL MY ANTENNAS vertically, slinging the toroids within hoops. Polythene bowls or open mesh plastic clothes baskets serve well as supports. The coils are slung from these by means of short, horizontal, nylon cords passed around suitably spaced turns. These structures are quite stable and simple to make.

These antennas occupy very little space so the longer wave versions could be useful to radio amateurs who have little or no garden and are limited to very confined spaces such as a bed-sit, garage, attic or school laboratory. [The compact toroidal antenna in the photograph on page 13 last month was for 1.8MHz, not 18MHz as stated in the caption - *Ed*]

It is fun designing and making them and there are lots of possibilities for radio amateurs to make improvements on my basic structures and to use the same principles on any band, but please don't go into commercial production without consulting me*. If you follow the guide-lines given in this article, I guarantee that you will have successful QSOs.

However, remember that it is a compact antenna so do not expect it to rival a matched half-wave resonant dipole at a reasonable height. Nevertheless it should make low-band operation possible for those of us who have very restrictive QTHs.

EDITORIAL NOTES

[1] Many modern cars do not have guttering. One solution for fitting an HF antenna to the roof of a car is to use a four-footed mag-mount (see photo) obtainable from Tennamast Scotland; tel 0505 503824.

[2] Matching this antenna to the feeder can be complex. We hope to feature more details in a later article.

[3] In Fig 2 (*Radcom*, April) reference to 'Electric lines of force' should be 'Changing electric lines of force'

WARNINGS

[1] Do not to touch the end plates when the antenna is energised or you will get a very nasty radio frequency burn, for the potential between them may sometimes reach 20kV.

[2] Very high displacement currents exist at the centre of these toroid coils. If the coils are supported at the centre using lossy plastic or wood, not only are the losses high but there is a danger of overheating and fire. This warning is particularly relevant if the antenna is mounted in a loft.

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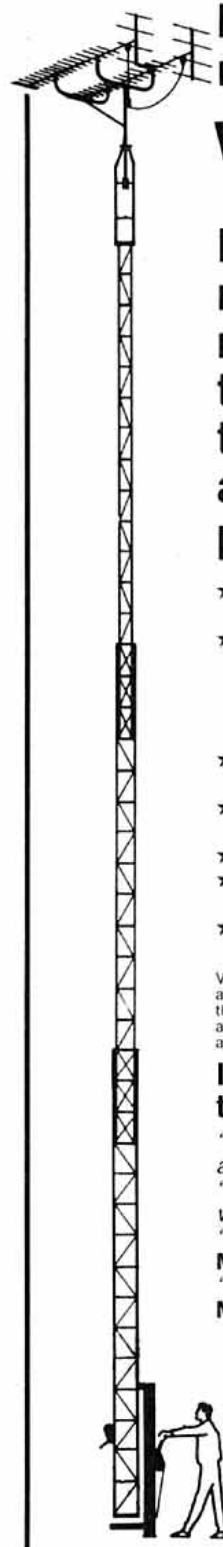

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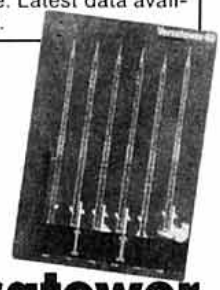

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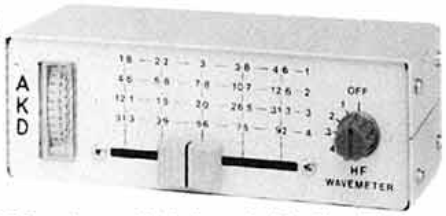

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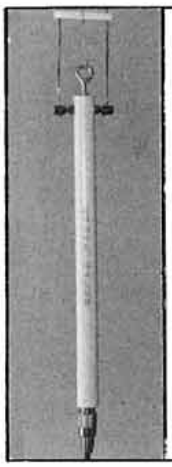

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AP3	Automatic Speech Processor	£16.80	£24.90
DFD4	Add-on Digital Read-out for superhet radios	£49.90	£69.90
CTU30	ATU covers all HF bands + 6M for receiving or 30W TX	£39.90	£46.90
CTU150	ATU – all HF Bands up to 150W	£49.90	£57.90
ST2	Morse Side-tone or practice oscillator	£9.80	£15.90
XM1	Crystal Calibrator for frequency checking	£16.90	£22.90
TRANSMITTER KITS – expandible into transceivers with matching receiver and VFO kits			
CTX	40 or 80M Band versions very popular QRP TX	£15.50	£22.90
MTX20	20M 10W CW TX - work the World!	£29.90	£39.90
AT160	Dual Band 80 & 160M AM/DSB/CW .5 to 10W PEP	£39.90	£62.90
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AA2 Kit: £8.90 **Assembled PCB Module: £13.90**

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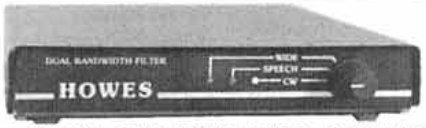
AB118 Kit: £18.80 **Assembled PCB modules: £25.90**



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73 from Dave G4KQH, Technical Manager.

Communications Centre *(Photo Acoustics Ltd.)*

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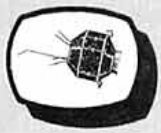


Satellites

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

JOHN BRANEGAN, GM4IHJ, has recently produced a most comprehensive report on studies he and colleagues have been making on Arctic HF Radio Propagation.

The main impetus for this study began when Pat Gowen, G3IOR, began to try to explain some of the surprising results obtained on Mode A (29MHz down) OSCAR Satellites in the early 1970s. Investigation into these have been continued by a group of UK radio amateurs throughout the past few years concluding with observations from the last amateur radio satellite – RS12 which provided them with an almost perfect probe for their investigations.

In a related but separate study, Prof Bob Brown, NM7M, began collecting evidence which revealed that far from 'being dead', as far as HF Propagation was concerned, the Arctic regions in their winter months of twenty four hours of darkness, had at least two modes of useful propagation as high as 29MHz, which could be exploited on a roughly one day in five basis. Indeed, follow up work by GM4IHJ has established that these events have a pattern and are to a great extent predictable, thus bringing the subject to a point where it can be usefully used by all radio amateurs who wish to use it.

Several different procedures have been employed to unravel the at first rather mixed evidence, whereby the propagation mode was observed. G3IOR combined regular operation on RS12 with terrestial DX working on 14, 21 and 28MHz. GM4IHJ favoured by his more northly site, complimented this with regular checks on 28MHz beacons and communication type traffic. NM7M monitored RS10 and RS12 from his station in the Pacific North West of the USA. He also carried out regular checks on long and short path HF communication circuits. Short wave listener J K Anderson in Skagen, Denmark, added essential corroboration to everyone else's studies, monitoring the RS10 and 12 satellites from his home station.

By May '93 it was becoming clear that a careful watch on Solar events was producing evidence of a direct connection between what happened on the sun and what happens a few days later over the Earth's Polar regions. Forewarned by solar events it gradually became possible to discern in the records a regular pattern of events. Attention to this pattern has revealed that almost all the propagation events can be coupled to a precursor event on the sun.

Readers who would like to see a copy of this report should get in touch with John at 8 Whitehills, Saline, Fife, Scotland KY12 9UJ or via packet@GB7SAN.78.GBR.

BRINGING SPACE INTO THE CLASSROOM

THE THIRD INFORMATION Forum for Youth organised by the EURISY Association will be held this autumn at the Euro Space Centre in Transinne, Belgium.

The objects of the EURISY Association are to promote European awareness of the key role played by Space technologies, in particular in monitoring and protecting the environment and their contribution to everyday life; and also to bring home to the public the importance of these challenges and inform young people, especially, of the promising potential, in human and professional terms of satellite systems. It does this primarily by organising a number of activities, many of which are concerned with education and training.

The Forum, under the patronage of Hubert Curien, EURISY President, will have the theme: 'Bringing Space into the Classroom'.

The three-day training course is aimed at students living in European and Mediterranean countries, aged 16 to 19 and studying at a Secondary or Technical college. The working language will be English, but translation into French and Dutch is planned. Remote-sensing and space science specialists, teachers and the media will contribute.

Joined by a number of European astronauts, the young participants will be able to exchange ideas and gain an insight into the advantages of the new technologies and the many applications that will be possible for them – the first generation that will really reap the benefits of space in everyday life.

There will also be an exhibition of work submitted by the students. These technical projects will be required to link up with the Forum's themes. A panel will judge the best entries according to various criteria: originality, the European dimension, educative value and quality of scientific content. this will be followed by a prize-giving ceremony.

Parallel to the Forum, a half-day round table session on the theme of 'Europe's teachers faced with the challenge of Space' – will be devoted to teachers, the difficulties they encounter and the scope for them to integrate remote-sensing and space science applications in secondary-school teaching. For further information contact 16 bis, Avenue Bosquets 7500, Paris. Tel: (331) 4705 1779. Fax: (331) 45 51 21 60.

DOVE ACTIVITY

OSCAR 17 – THE SATELLITE DOVE – is once again active on 2 metres. Since its launch in 1990, it has run into a series of problems, which have prevented it carrying out its prime function of 'being the first satellite specifically designed to transmit spoken messages to promote Peace between peoples of the world'. As it has a specially designed speech synthesizer any language can be fed into it, but Portuguese, English and Russian were to be used at first. So said the press release at the time of its conception. Its sponsor, Dr Junior Torries de Castro, and BRAMSAT, Brazil's amateur radio satellite organisation pushed on well with its design and construction, which was of the Microsat type. It was launched on 22 January 1990, along with three other microsats, all of similar construction and it went into a Polar LEO orbit (Low Earth Orbit) with a period of 100.8 minutes.

The Brazil 'Peacetalker' as it was christened, was intended also to transmit various telemetry parameters measured through its many internal sensors, so becoming a complete source of study of satellite in-orbit behaviour. The data provided by these sensors was to be transmitted in synthesized speech with no special codification. As Dr Junior de Castro emphasizes, "this feature has immense educational value, enabling anyone equipped with a 2 metre FM receiver to collect the telemetry data, from beginning-teenagers' classes studying Physics for the first time to high-level students and scientists in many areas of scientific research seeking reliable and easily accessible data."

With regard to the 'Peace Messages' to be broadcast to schools around the world, arrangements were made to record suitable short messages, from representative sources from various countries which could be retransmitted from the satellite as appropriate for the particular country the satellite was over. A formidable task indeed!

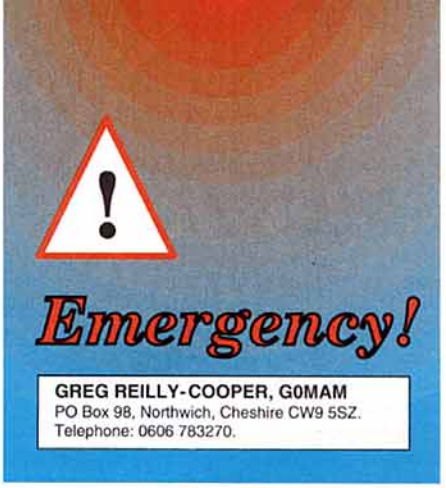
At the 1989 AMSAT-UK Colloquium, a representative of BRAMSAT was present collecting taped recordings from various people of these 'short messages' in keeping with DOVE's objectives and I was asked to do the English one. I have therefore watched the development of the DOVE Project with much interest. Unfortunately I have not so far heard my voice coming down from Outer Space!

All went well up to the launch, but problems soon manifested themselves shortly after. Telemetry was alright, but during software development, the two metre transmitter became stuck 'on'! Shades of September 1982 when a similar set of circumstances occurred with the first of the UOSat satellites!

DOVE was rescued by using a high power EME transmitter which forced a signal into the 2 metre command receiver. Voice capability was tried out in 1992 and was reasonably successful at first, but became garbled, the cause of which was unknown so it was turned off to prevent further problems. There were also numerous hardware failures.

A Recovery Plan was drawn up by Harold Price, NK6K; Bob McGwier, N4HY; Jim White, WD0E; Bob Diersing, N5AHD and Bill McCaa, K0RZ. Thanks to their hard work it is now possible to load software up on 2 metres successfully. DOVE is not yet 'speaking' but if all goes well, it is only a matter of time until it becomes fully operational.

A very good account of the steps taken by the team working the Recovery Plan is to be found in the *1993 AMSAT-NA Space Symposium 'Proceedings*, published by ARRL, 225 Main Street, Newington, CT 06111, USA. Price $12. ISBN 0-87259-444-0.



Emergency!

GREG REILLY-COOPER, G0MAM
PO Box 98, Northwich, Cheshire CW9 5SZ.
Telephone: 0606 783270.

THREE RADIO AMATEURS turned heroes on 26 December (Boxing Day) when they saved a young boy who had plunged fifty feet down a mountain-side at the popular Loggerheads Visitors Centre near Mold in North Wales.

The rescue involved the North Wales Police helicopter, Paramedic and Ambulance services and the Clwyd Mountain Rescue Team. The three, Anthony Lewis, G6LBC, Graham Pemberton, G7NEH, and Peter Baston, GW0PJA, all members of the West Cheshire Raynet Group, were out hill-walking at the time with the intention of using their radio equipment from the summit of Moel Fammau (554 metres ASL) to contact other distant stations.

A member of the public approached the three, asking if they knew where to contact the Park Wardens' service as a boy had fallen from a path, down the very steep valley-side into a river below and was unable to get back up. Anthony used his climbing expertise to make an unaided descent down to the casualty whilst Graham, who is also a member of the Chester St John Ambulance Brigade, gave instructions on First Aid from the cliff-top.

Peter put out a call for assistance using GB3MP and the call was quickly answered by Brian Lancaster, G6YCW, in Tarporley, Cheshire. Cheshire Police were alerted and they passed the details to North Wales Police who scrambled the Police helicopter, Paramedics and the Mountain Rescue team. Details of the incident – casualty status, location (with accurate NGRs) and terrain, were relayed to the Police via Brian. The helicopter was then able to take a paramedic directly to the incident. The paramedic was lowered down the cliff-side to Anthony and the casualty, and made him as comfortable as possible until the Mountain Rescue team could effect his safe recovery.

The land-based emergency services were guided to the incident, from the Visitors' Centre by Graham who remained in close radio contact with the scene to provide information to the ambulance crew and Mountain Rescue team. After some two hours with the casualty, all were brought up the hillside by the Mountain Rescue team and the boy was taken off to hospital.

The boy, aged twelve, was from a nearby village and had been out cycling on a new mountain bike – a Christmas present – when he hit a large rock and was thrown from his bike, down the side of the valley and into the swollen river below. He managed to pull himself out of the river but was unable to move any further as the hill was too steep and because of injuries to his knee. He had been calling out for help for some time before a member of the public heard his shouts and happened upon the three Raynet members. He is now recovering, having been released in plaster from hospital, but plans to resume his riding when able.

North Wales Police praised the three for using their skills as a team and being equipped properly for the terrain. They were amazed at the use of 70cm between the visitors' centre and the incident, and 2m to relay via GB3MP to a station some 30 miles away! The Police have to resort to repeater-units fitted into their vehicles and even then have difficulty working locally in such difficult terrain (heavily wooded with steep cliffs and valleys).

This incident was reported in *The Chester Chronicle*, which highlighted the operators' Raynet membership, thus bringing into the public consciousness yet again the value of amateur radio in emergency communications. It was featured again by the BBC World Service when the *Wave Guide* programme broadcast the RSGB Emergency Communications Officer talking about Raynet generally and G6LBC about the Loggerheads rescue.

"Well done" to the three Raynet members, who are pictured below in their Raynet gear, and to G6YCW in Tarporley who handled their message.

Boxing Day heroes: (l to r) Graham, G7NEH; Peter, GW0PJA and Anthony, G6LBC.

NEW SOFTWARE FOR EMERGENCY COMMS

SEVERAL RAYNET GROUPS are currently evaluating a new 'Automatic Packet (Position) Reporting System' program for emergency communications use. Written by an American amateur with experience of emergency communications, the program allows multi-user access and features a 'rolling-map' display which is updated automatically if GPS equipment is in use but can very easily be kept up-to-date manually as an operation or exercise develops. Initial response from volunteers testing the system has been very favourable and enhancements for use within the UK are already being written.

CAIRO

ONE OF THE MOST AWKWARD problems to be overcome in an emergency situation is the failure of a simple accessory (eg a microphone) when the only replacements available are wired for use on a different transceiver. Equipment manufacturers all specify different pin-configurations for their accessories and, since most of us are reluctant to invalidate warranties by carrying out modifications inside our transceivers, a different solution had to be found.

The CAIRO system, developed by Dr Peter Best, G8CQH, at Aston University, overcomes incompatibility problems and is so simple that you wonder why you didn't think of it yourself. It also allows some quite remarkable remote operations, but its biggest advantage is the way in which it makes all accessories compatible with all transceivers, without modifying the transceivers at all.

Peter has kindly offered to visit any club or Raynet Group and demonstrate the system, provided that at least 30 – 40 people are expected to attend He makes no charge for this and those who have previously seen his demonstration have said that it is a very worthwhile way to spend an evening. Anyone wishing to arrange for him to visit should contact Peter directly on 021 359 3611 (ext 4274) during office hours.

RAYNET ON AIR DAY – 2/3 JULY

KEVIN SNELLING, GW7BSC, has now collated all the packet-mail responses to the Raynet On Air Day idea and, in response to the majority of those received, the 'ROAD' will operate between 1500UTC Saturday, 2 July and 1500UTC Sunday, 3 July 1994. Further details are available from Kevin by packet – GW7BSC @ GB7IMB – or tel: 0633 262488.

RAYNET EXCHANGE?

ONE OF THE EMERGENCY communication groups abroad with which I am in contact has tentatively suggested that, in addition to exchanging ideas and material, we might like to "exchange people".

Such a venture would obviously require further discussion and much planning but is certainly interesting. The idea has been mooted so what do *you* think ? No further details are available at present but I will be happy to pursue the idea if there is sufficient interest from Raynet volunteers in the UK.

IS YOUR GROUP ON PACKET YET?

THERE IS NOW A REGULAR exchange of Raynet news and other related traffic on the packet network and groups with packet capabilities are kept very much more informed than was previously the case. If your group does not have access to the UK packet network and you would like to receive copies of those bulletins, please contact me.

Data Stream

RICHARD STERRY G4BLT
1 Wavell Garth, Sandal Magna, Wakefield,
West Yorkshire WF2 6JP

IN THE MARCH COLUMN, I featured the Cognito commercial packet radio system. It seems that I made a couple of incorrect assumptions. The baud rate is apparently 6000 not 9600, at a frequency of around 190MHz rather than 900MHz. There are three other similar systems in the UK; PakNet using 4800 baud at around 160MHz, Ram Mobile Data using 8000 baud at around 450MHz, and Hutchison Mobile Data using 9600 baud also at around 450MHz.

All these systems use a sort of DC-coupled direct FM known as Gaussian Minimum Shift Keying (GMSK) modulation. They require all Tx and Rx frequencies to be accurate to ± 200Hz, and the receivers require a special linear phase filter. Each system has a different signalling protocol, and transmissions are totally synchronous; ie there are no packet collisions, so retries are confined to situations where corruption has occurred or where the signal strength is very low.

PakNet is rather different in that a specific end-user application, eg QWERTY keypad as in the Cognito terminal, has not been built-in to the hardware. Instead, it features a small radio modem using the universal protocol of X28, which enables many different applications to be connected directly to the PakNet X25 network, without any specialist interface device or software.

Typical applications are credit/charge card terminals, (remember that, next time a shop assistant swipes your card across the reader), security systems, (no wires to be cut and no telephone connection delays), telemetry from remote water company sites etc, remote metering for electricity suppliers, vehicle location in conjunction with a GPS (Global Positioning Satellite) receiver, traffic movement monitoring, and so forth.

In fact, on the subject of traffic monitoring and PakNet, you may have noticed the boxes and VHF antennas for the General Logistics 'Traffic Master' system alongside the inside lanes of motorway. These are to detect delays and congestion rather than speeding motorists!

Many thanks to my telecomms industry contacts for that information.

NEW G-TOR MODE FOR HF

WHEN PORTING PACTOR across to the KAM and KAM-Plus, the people at Kantronics decided that they could do even better. The result is a new mode which they call G-TOR, short for Golay-TOR, and which will now be standard in the KAM-Plus and KAM enhancement firmware. Existing users of the KAM-Plus and enhanced KAM can purchase a firmware (ie EPROM) upgrade. At the time of writing no details of price or availability in the UK are available.

G-TOR is broadly similar to PacTOR, and in use is pretty much the same from an operator's point of view. The same AFSK tone pairs are used. However, the cycle time of 2.4 seconds is much longer than the 1.2 or 1.4 seconds used by PacTOR. Three baud rates are used, depending on the quality of the path: At 100 baud there are 21 actual data bytes, at 200 baud there are 45 data bytes, and at 300 baud there are 69 data bytes. This gives theoretical maximum throughputs of 8•75, 18.75 and 28.75 CPS (characters per second), though with built-in Huffman coding (as per PacTOR) the effective data rate should be more.

COMPARISONS WITH PACTOR

It is claimed that a 9k file was transmitted on 20m with an effective average throughput of just over 30 CPS, which is impressive, and that PacTOR on the same band averaged about 8 CPS. In a series of tests carried out throughout January 1994 it is claimed that G-TOR averaged 23.7 CPS and PacTOR averaged 8.6 CPS. PacTOR is capable of doing better than that provided the link stays operating at 200 baud, but it seems that during the tests PacTOR frequently dropped down to 100 baud when G-TOR was able to keep going at 300 baud. Theoretically, PacTOR could have managed up to about 13 CPS under ideal conditions. However, what is not known is how much better the PacTOR throughput would have been if a 'proper' SCS or PacComm PacTOR controller had been used (these have a slightly more sophisticated error-correction system called Memory-ARQ due to special hardware).

The improved performance is apparently due to Golay-coded FEC (Forward Error Correction) and Interleaving. In effect, each bit is transmitted twice, but not immediately adjacently, which reduces the effects of short noise spikes. Also, a certain amount of redundant information is transmitted which can enable the data to be reconstructed without the need for a repeat, provided not too many bits have become corrupted. It goes even further than this, because if the last two frames are received correctly, the parity information can be inverted and used as data, which enables very good performance on a good quality link.

Whether G-TOR will be a significant improvement over PACTOR under all conditions is as yet unknown. For example, though it may be reasonably immune to noise spikes on 20m, how will the longer transmit frames cope with all the QRM and QRN on 40m? (I certainly find that PacTOR struggles much more under these conditions than on, say, a quieter band but with random static pulses and weak signals.) What bandwidth does G-TOR occupy at 300 baud, and will it still fit into a 500Hz filter bandwidth? Will the interleaving and subtle use of the parity bits cause problems with monitoring by third parties? Only time will tell, but it is clear that there is a long way to go before the 'perfect' HF data modes emerges, if indeed it ever does. However, in order to achieve a significant increase in performance, it seems likely that DSP (Digital Signal Processing) will be required, as with the proposed PacTOR level 2.

WILL IT CATCH ON?

Kantronics are publicising G-TOR widely, and are inviting interested parties to license the protocol from Kantronics, in an effort to promote its adoption. The mode does not require any more sophisticated hardware than PacTOR, but there may be problems for other companies if they have insufficient space available in the firmware for the extra code. Only time will tell, but it seems to me that if the mode is confined to Kantronics units then it stands little chance of de-throning PacTOR. I can do no better than to quote the President of Kantronics Inc, Dr Phil Anderson, W0XI: "In any event, the success of a protocol (system) will be determined by the consumers, not the dealers or manufacturers".

If G-TOR is successful, this might jeopardise any chances of Clover ever becoming popular. The latter mode has been very frustrating for me as a columnist. There are plenty of technical details, and lists of Clover BBSs, plus a little anecdotal information to be found, but so far I have been totally unable to obtain any practical reports from 'ordinary' users. The requirement for specialist, (expensive), hardware, and the stringent transceiver requirements, have certainly not made it an instant 'hit' with amateurs, but clearly someone somewhere must be using it. If I were a user, and Clover turned out to be as good as claimed, then I for one would want to trumpet the news from the roof-tops! Strange . . . .

KENWOOD TS450 HINT

I SAW THE FOLLOWING information from Clarindo, PY1BKJ, and thought it might apply to other radios and controllers on occasion.

He uses a Kenwood TS-450S HF transceiver with a KAM-Plus multimode controller, and was experiencing distortion of the transmit audio when using the microphone in SSB mode. The KAM was connected to the Accessory-2 socket on the rear panel, and physically disconnecting it was the only way to prevent the distortion.

To cut a long explanation short, Kantronics advised him that the audio input sensitivity on the rear Accessory-2 socket was so high as to be picking up low-level noise from the KAM and associated wiring. This noise mixed with the microphone signal, to produce the distortion.

The solution is to reduce the input sensitivity of the radio, thus making it much less sensitive to low-level noise, and to increase the output level from the controller to compensate. The KAM-Plus has a potentiometer

David Thomas, G4OGW ('Old Grey Whiskers'), at his portable station in Prague.

R28 and a link (K9) which can be removed to increase the output on the HF port, and in the case of the TS-450S the input sensitivity control may be labelled VR18. This latter control can be used to set the recommended RF output level in a data mode such as RTTY; ie 'fine-tuning'.

If you experience a similar problem with this or other combinations, it may be worth checking if the cause is the same. However, do please make quite sure that you are adjusting the correct controls or links; refer to the manuals!

TRIP TO CZECH REPUBLIC

THIS COLUMN IS MOSTLY about technical matters, so for a change let's look at a more human aspect of data comms. David Thomas, G4OGW, ('Old Grey Whiskers'), is a fairly regular business visitor to the Czech Republic, and at the beginning of 1994 decided to take some packet equipment with him for the first time. George takes up the story . . . .

"Life seems to comprise long periods of waiting and short periods of doing, especially if you travel by air. My plane was due to leave at 1450UTC. I barely arrived in time and after the further delay of emptying my hand baggage for a security check, rushed into the departure lounge only to be informed by Tannoy that the flight to Prague was delayed until 1730; time for a beer and a scan through the handi-packet manual that had arrived by post from Siskin that morning. This TNC together with my Tandon NB/386SX laptop computer, IC-W2E handheld transceiver, Quantum battery, and a flexible Slim Jim aerial built by G4ORB from twin TV feeder, formed my portable packet station.

"Following a late arrival and dinner in Prague I was at last alone in my hotel, and with mounting excitement I jammed the end of the Slim Jim in a crack between the wall and ceiling of my room, connected up the rest of the station, threw the switch and was rewarded by a flashing scroll of OK call signs on the screen. My TNC was driven by Lan-Link v2•10 software. As I operate this program at home for packet, AMTOR and PacTOR, it was, of course, very familiar and presented no problems in operation, which is more than I can say for the first node entered. This operated on the Rose node system and took a little bit of sorting out. The main operating frequency for packet in the Czech Republic appeared to be 144.800MHz, on which several successful contacts were achieved that evening."

THE VISIT

"One of my first contacts was with Miro, OK1SBB, who kindly invited me to visit his QTH the following day. This invitation was gladly accepted and I spent a very pleasurable few hours that Saturday, discussing life in general and amateur radio in particular, over several glasses of splendid Czech beer interposed with the odd glass of Slivovitz. I had taken the precaution of accepting the kind services of my friend Lojza, who acted as driver and interpreter when the going became difficult, (and subsequently driving inadvisable). I learned that under forty years of Communism, data communications were forbidden, most equipment is homebrew and at

Miro, OK1SBB, at his kitchen based packet radio station.

present there are no APLINK connections to Western Europe in existence. The problem being that the majority of HF transceivers available in the Czech republic have mechanical relays that are too slow for AMTOR. However it is hoped that the first APLINK station will be in operation early in 1994.

"The OK packet system is in itself incomplete as at present trunk systems do not exist. Apparently much of the 70cm spectrum is being used for commercial purposes so trunk links will have to be set up on 23cm, which would be very expensive. Whilst of all the ex Eastern-block countries, the economy of the Czech Republic is probably in the forefront of recovery, the average industrial wage is still only £1786 per annum, which places much of the commercially available amateur gear beyond the reach of many Czech operators."

COMPUTERS GET EVEN FASTER!

PERSONAL COMPUTERS have been getting steadily faster since the machines based on the Zilog Z80 CPU in the early 1980s. The IBM-compatible PC family has progressed from the 4.7MHz clocked 8088 CPU, through the Intel 80286, 386, 486 and finally to the Pentium (a 586 in all but name) 32-bit CPU. The Pentium generates a lot of heat, and perhaps represents the end of the line for that particular branch of chip technology.

Those CPU chips are known as CISC (Complex Instruction Set Computers), as they have a large set of instructions to cope with many different operations. A different approach is known as RISC technology; Reduced Instruction Set Computer. The CPU has a much smaller set of instructions, but it can carry them out very rapidly indeed, and in fact combine several actions in one clock cycle. The effect can be a spectacular increase in speed. The first manufacturer to produce RISC-based personal computers on any scale was the Cambridge-based UK company Acorn Computers Ltd, using chips designed in conjunction with VLSI Technology. This was in 1987, (yes *seven* years ago), though it wasn't until 1989 that the original 'Arthur' operating system was replaced by the superb RISC OS multitasking desktop. The original clock speed was a mere 8MHz, but even so the performance was vastly better than any PC then available, and even now my 4-year-old machine with upgraded 25MHz CPU and slow 8MHz RAM is still only outpaced by the very fastest 486 PCs! (I am comparing similar multi-tasking applications here).

The Microsoft Windows 3.1 desktop is an attempt to achieve the user-friendliness of the Apple MAC and Acorn RISC OS desktops, but is disappointingly slow. No doubt Windows 4 will be much better, and of course IBM haven't been idle and have been working on improving their OS2 operating system.

APPLE TAKE A RISC

Apple have announced a range of RISC-based computers and upgrade boards, known as Power MacIntosh. Their advertising hype rather cheekily implies that RISC computers were only previously used in specialist engineering applications; those of us who know better can only smile! The joke is that although these particular RISC chips were produced by Motorola, Apple and Acorn have a joint company called ARM Ltd which produces RISC chips for Acorn computers, for the Apple Newton, and for incorporation into specialist equipment made by other companies. However, it is fair to say that the Acorn RISC machines have been mainly confined to specialist markets such as Education and DTP.

The new top-of-the-range Apple machine runs at a clock speed of 80MHz, and is claimed (probably correctly) to be the fastest personal computer in the World. Having seen what my comparatively old Acorn will do with 25MHz and slow RAM, I can only assume that the Apple's performance will be extremely spectacular on software which is optimised for the RISC processor.

The new range of machines is the result of a collaboration between Apple, Motorola and even 'Big Blue' IBM itself, (how times have changed). Therefore, the new machines will run both Apple and IBM applications under MS Windows, (under emulation). There are many other interesting features which I won't go into here, including the possibility of voice recognition software in the future. However, the thing which I find most exciting is that we now appear to be seeing a trend away from hardware-dependent software, and also towards more standardisation of graphical user-interfaces.

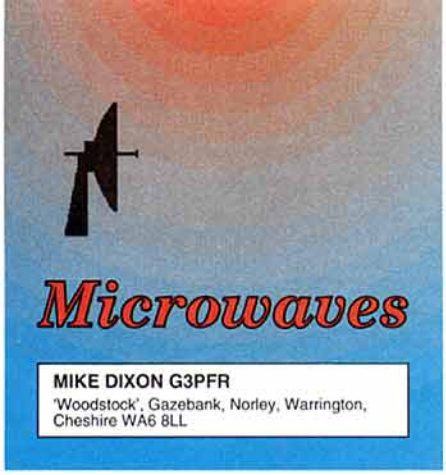
That should mean that one day we might be able to run the same software regardless of the make and type of CPU chip in the machine.

Acorn will have launched their new range of RISC computers by the time you read this, and it will be interesting to see how they match up to the new Apples. As well as being able to to run MSDOS and Windows applications under emulation, (which is a little slow), some machines may have an Intel co-processor as standard, and it's even possible that Apple MAC compatibility will be achieved in some way.

I wouldn't be surprised if Intel change tack on processor technology fairly soon, perhaps in favour of RISC, and I suspect that it won't be long before MSDOS is abandoned; existing software could be run under emulation to maintain compatibility of existing software.

Computers have been stuck in something of a rut these past few years, so perhaps now things are starting to change. I hope so!

AR SK 'Rick' G4BLT @ GB7WRG.#19.GBR.EU GB7PLY (PACTOR) end.



Microwaves

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

MIKE SCOTT (QTHR), tel: 0494-881298, has confirmed the date and venue of the next Southern Group Round Table as Sunday 19 June at the premises of the Crawley Amateur Radio Club, Pease Pottage, near Crawley, West Sussex. Further details of times and how to get there can be obtained from Mike, details above.

VALE, G3VVB

VHF/UHF AND VERY MANY microwave operators (myself included) will be saddened to learn of the death of Cyril James, G3VVB, in January 1994, after a short illness. Cyril moved to Cornwall many years ago. As well as his interest in sailing, he was a skilled engineer. Starting with a request from a fellow amateur to produce a 23cm filter, he went on to produce, on request, precision metalwork for all kinds of amateur requirements, ranging from fabricated dish feeds and filters to multiple 2C39 PA cavities for 1.3, 2.3 and 3.4GHz. Most of us who have built the well known G3WDG 10GHz designs owe a debt to Cyril who 'mass-produced' the precision cavities built into our equipment.

He was an active member of his local radio club, English China Clays RC and of the Mid-Cornwall Repeater and Beacon Group. GB3MWB, on 1296.860MHz, will remain as a memorial to his dedication to amateur radio.

OPERATING NEWS

CHARLIE, G3WDG, AND PETRA, G4KGC, seem to have set some more UK 'firsts'. In brief, successful one-way packet exchanges on 10GHz between G3JVL and G3WDG/4KGC (both fixed stations) over a very obstructed path using NBFM (SSB didn't work!).

Next, reception (one way) of P5 TV signals from G3ZFP over another very obstructed path of about 40km.

During January, G4KGC worked VE7CLD via EME, G4KGC running about 30W output to a 10ft dish and VE7CLD some 20W to a 12ft dish - signals were received immediately, on sked. G4KGC worked WA7CJO via 10GHz EME, late on 31 December under variable tropospheric conditions.

What, you might ask is the effect of tropospheric conditions on an EME contact? It seems that prevailing weather conditions at the UK end of the contact made it difficult. At the time deep, heavy, cloud and rain and possibly some kind of frontal conditions combined to weaken both the 10GHz signals and the SatTV (11-12GHz) signals at the UK end, SatTV being weak and 10GHz signals either very strong or not there at all. The 'WDG/KGC TWTA PSU didn't like the weather either: power output was 'variable' which may also have contributed to 'QSB'. There's a lot to be learned about 10GHz operating and propagation under extremely low signal and adverse weather conditions!

OPERATING LADDERS

TABLE 1, GIVES THE FINAL positions in the 1993 Operating Ladder ranked, as usual, on multiplied score (ie stations worked multiplied by the best DX in kilometers). Congratulations go to Petra Suckling, G4KGC, for a very convincing leading 10GHz score and to Microwave Committee Chairman Steve Davies for his clear lead at 24GHz.

Congratulations to the runners-up, G4FCD on 10GHz and G3PHO on 24GHz, for their creditable efforts. Our thanks to all who submitted entries.

Table 2 is the latest update of the All-Time Squares Worked on the 10GHz band. G3WDG is clearly 'Top of the League'. The fantastic Scandinavian DX of last year has not, so-far, been repeated, but time, patience and dedication must surely push the UK (tropo) record beyond 1039km 'ere long and Squares well above 30?

BEGINNER'S CORNER

IN THE NOVEMBER 1993 COLUMN I mentioned that members of the Microwave Committee were working on several microwave transverter projects, one of which was a basic, low-power 144MHz/1.3GHz compact, single board design. This was intended to be used with a low power 2m transceiver as either a '23cm' transverter (to be improved, as convenient or desired, by the addition of a Tx PA stage and an Rx LNA) or as an 'IF' unit (1296 -1298MHz) for transverters for other, higher, microwave bands. Prior to this, in the September 1992 column, I outlined the KK7B 'no-tune' 144MHz/1296MHz transverter as being suitable for use by Novices or beginners, although the size of the unit would make it difficult to integrate it into a compact, portable system.

The new G4JNT-004 design resulted from a desire to produce a simple but effective single board design combining the design principles of the G4DDK- 001 LO source with some of the MMIC techniques of the KK7B design.

The result is a single board unit which fits into a 'standard' 150 x 55 x 30mm tin-plate box, compatible in size with most portable equipment (including the G3WDG 10GHz modules) and suitable for integration into a VHF to microwave Tx/Rx system. The design, shown in **Fig 1**, incorporates four sec-

Band	Position	Callsign	Stations Wkd.	Best DX (km)	Multiplied Score
10GHz	1	G4KGC	86	793	68198
	2	G4FCD	70	802	56140
	3	G3FYX/P	55	781	42955
	4	G3JVL	58	717	41586
	5	G4RFR/P	49	414	20286
	6	EI/G3ZME/P	41	454	1861
	7	G4LDR	24	775	18600
	8	G4DDK	27	684	18468
	9	G(W)4BRK/P	53	324	17172
	10	G0API	37	405	14985
	11	G3GNR	29	510	14790
	12	G3FYX	44	315	13860
	13	G3JMY	44	278	12231
	14	G3GRO	38	296	11248
	15	G4BRK	48	234	11132
	16	G3PHO/P	36	303	10908
	17	G8LSD/P	35	304	10640
	18	G3BNL	23	432	9936
	19	G4KNZ	37	247	9139
	20	G3ZTR/P	25	356	8900
	21	G3JMB/P	27	304	8208
	22	G4JNT	23	334	7683
	23	G3UYM/P	24	303	7272
	24	G8DKK	30	234	7020
	25	G8AGN/P	23	303	6969
	26	G4MAP	23	295	6785
	27	G3FNQ/P	21	313	6573
	28	G3UKV	18	242	4356
	29	G3NWU	10	433	4330
	30	G8KMH/P	21	197	4137
	31	G4KNZ/P	8	331	2648
	32	G4LDR/P	6	97	582
	33	G8AYY/P	2	86	172
24GHz	1	G4KNZ/P	16	156	2496
	2	G3PHO/P	9	120	1080
	3	G3FYX/P	7	118	826
	4	G8AYY/P	9	86	774
	5	G3FNQ/P	5	120	600
	6	G4MAP/P	6	90	540
	7	G3UYM/P	5	85	425
	8	G3ZTR/P	2	81	162
	9	G8KMH/P	1	65	65
	10	G3GNR	1	46	46

Table 1: 1993 Operating Ladder - Final Positions

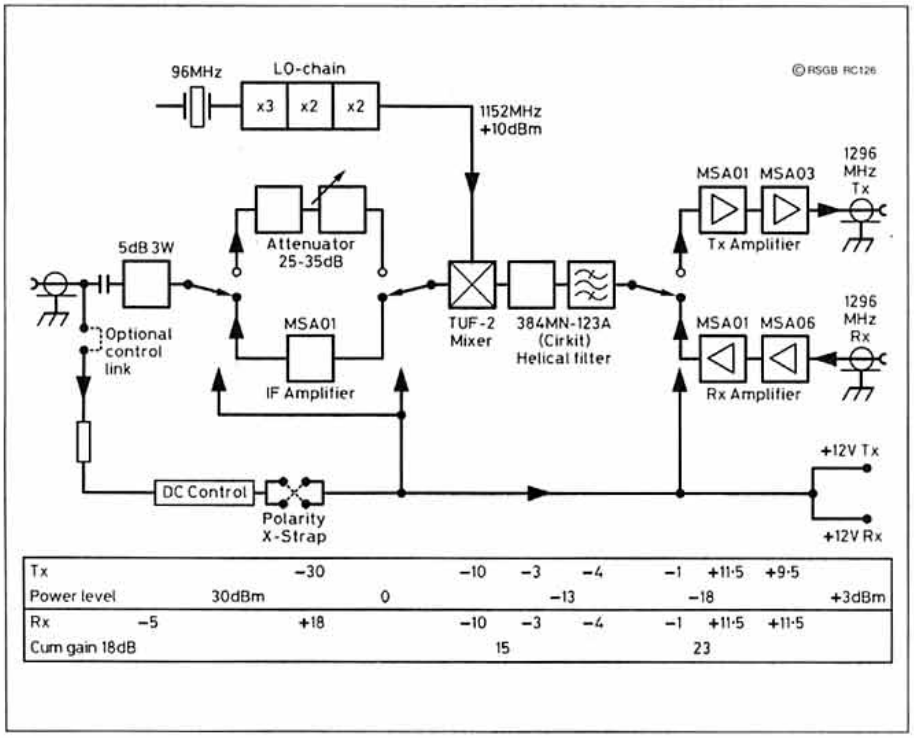


Fig 1: 1296 transverter block diagram and gain distribution

tions:

1. LO chain, useable up to 1300MHz. This is an SMD version of the G4DDK- 001 and provides +10dBm (10mW) drive to the mixer.
2. The RF section, comprising a bi-directional double-balanced mixer, two- stage helical filter (for image and LO rejection) and broadband transmit and receive amplifiers using MMICs. Typical Tx output is +3 to +5dBm (2 to 3.5mW) and the Rx noise figure about 4dB. Tx/Rx switching is solid-state. Separate RF ports are provided for Tx and Rx, making interfacing to a PA and LNA a straightforward job. For high power work (or "hill-topping", where signals can be very strong, even with QRP), additional filtering of the Tx signal is advisable (more on this later). Both the mixer and helical filter are 'drop-in' units.
3. A PIN diode switched power attenuator (rated at 3W continuous) allows straightforward interfacing with 2m rigs such as the IC202 or the FT290. A receive IF preamp completes this section of the unit.
4. Tx/Rx DC voltage switching is incorporated, based on the well-known G4JNT-001 interface and control unit, widely used with the G3WDG modules. This can optionally use either the DC voltage present on the 2m rig's antenna connector or the auxiliary switching relay which is also present in most rigs.

The switched DC voltages (up to 3A each) are available on connectors for the external control of other equipment, such as relays or PA bias supplies. A simplified block diagram of the unit is given in Fig 1, together with the Rx gain and Tx 'power distribution budget'. That is, the result of the cumulative gains and losses designed into the circuit. These figures are based on 'worst-case' figures using the Avantek MSA series MMICs.

It is quite likely that more output may be available in practice, due to component and construction 'spread'. The module 'mini-kit' is now available from the RSGB Microwave Committee Components Service, c/o Petra Suckling, G4KGC, 134A Newton Road, Rushden, Northants NN10 0SY. Another 1.3GHz item under current development is a 20W PA (using a Mitsubishi 'brick'), with low-pass lumped element output filter (0.35dB insertion loss) and a band-pass input filter, both intended to ensure a very clean transmit signal, as mentioned earlier. It is also hoped to include a PCB mounted antenna relay, but this is subject to further tests. More on these and other modules as soon as the tests are complete.

Psn	Callsign	Locator	Squares	Best DX (km)
1	G3WDG	IO92RG	30	1008
2	G4KGC	IO92RG	21	793
3	G4DDK	JO02PA	20	684
4	G3BNL	IO92KA	17	1027
5	G4FCD*	IO91KX	17	802
6	G8KQW/P	IO90GA	15	390
7	G8LSD/P	IO90TV	15	304
8	G3JMB/P	IO80TV	14	304
9	G4RFR/P	IO93UU	14	414
=10	G3PHO/P	IO93EH	12	330
=10	G8AGN/P	IO93EH	12	330
12	G3JMY	IO81RM	12	278
13	G4FCD+	IO91JV	11	1039
14	G8APZ	JO01DO	11	1026
15	G4JNT	IO90IV	11	334
16	GW4MAP/P	IO82JG	11	311
17	G4PMK	IO93GT	10	739
18	G3NWU	IO94JQ	10	433
19	G8DKK	IO91VX	10	275
20	G3ZME/P	IO82QL	10	270
21	G4BRK/P	IO91FN	10	234
22	G0API	IO80XS	9	405
23	G4KNZ	IO91PJ	9	247
24	G4LDR	IO91EC	8	775
25	G0API/P	IO80UU	8	277
26	G3UKV	IO82RR	8	242
27	G3JMB	IO91WA	4	48
28	G3NWU/P	IO94MJ	3	290

* Old QTH
\+ New QTH

Table 2: All Time 10GHz Squares/DX Ladder

HELD OVER!

SPACE HAS RUN OUT! I've had to hold over several long items including details of the waveguide version of the G3WDG HEMT preamplifier which I'd promised to give in this issue. Meanwhile, if anyone is desperate to have details, contact the Microwave Committee Components Service, address above!

Similarly, the G4DDK-009 2.8 to 3.5GHz microwave source with output at about +11/12dBm. The development of the G3WDG 2.5/3GHz to 11/12GHz multiplier/ amplifier from the G3WDG-001 is progressing, with output up to +16dBm reported. I've also had some correspondence concerning 23cm activities, noteably from G3XDY, amongst others.

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Hampshire: SMC Headquarters. 0703 255111.

Lancs: Holdings Amateur Electronics. 0254 59595.

Merseyside: A R Communications Ltd. 0925 229881.

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This is a new version of the Crossed Field Antenna system which is a slender multi-core cable which can be held anywhere by a single support. Two versions are designed so that the user can choose the most suitable for the circumstances; the EMDR 1 is 10 metres long (33ft), and the EMDR 2 is 16 metres long (48ft). Both will radiate on any band from 1.8 MHz to 30 MHz (ie Top Band is 10 metres) using the Phasing Unit which is sold with the radiator cable as a package. No other ATU is necessary. The cable is low-loss polypropylene and is 1cm wide and 0.2cm thick, and can go under doors and past window frames.

Amateurs prevented from operating until now by difficulties due to residence in either a small city house, or an apartment block, or retirement home can now be solved. For instance a city house can have the EMDR over the roof lying on the slates. At an apartment block part of the antenna can be taped to the side of the balcony. From an upstairs room the EMDR can be tied horizontally out to a tree.

COST IS DOWN

The cost of an EMDR and its Phasing Unit is considerably reduced on the earlier high power CFA GP 4. At the time of drafting this is not finalised, but the price is likely to be around half the cost of the earlier device (ie about £200). The power capability is 200 W PEP. Telephone after April 28th for firm delivery and price information.

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CONTEST CLASSIFIED

All rules should be read in conjunction with the General Rules published in *Contest News* January 1993

VHF RULES

432MHZ FIXED/ SWL

Date: 21 August

Time: 1700-2100UTC

Rules: General rules apply plus rule 14c. County/Country/QTH Locator Multiplier.

Sections: S Single operator fixed; O Other fixed; L Listeners.

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

144MHZ TROPHY/ SWL

Date: 3/4 September

Time: 1400-1400UTC

General rules apply

Sections: S Single operator Fixed or Portable; M Multi-Op Fixed or portable; L Listeners; SS Six-hour section Fixed stations.

IARU contest. Please score 1pt per kilometre for IARU entry and also radial ring for RSGB. Entries scored by kilometres will be entered into IARU contest. Please duplicate cover sheet and logs if entering IARU.

SS Operation for any continuous six-hour period (no breaks, continuous six-hours), starting at any complete hour ie 1400-2000 or 0000-0600, not 0823-1423). Only one such entry per station. Entry to both the full 24-hour and six-hour sections is not allowed, choose one or the other not both. Certificates will be issued for the 1st and 2nd places in each of the sections S and M for both Fixed and Portable stations (four certs per section)

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

4TH BACK PACKERS 144MHZ

Date: 4 September

Time: 1100-1500UTC

Adjudicator: G4DHF

Rules: See 'A new series of contests for 1994', *Contest Classified*, January.

NOTES FOR CONTESTERS:

All entries must be postmarked at the latest by the 16th day after the end of the contest, ie if contest ends on a Sunday (say 1 October) then the entry must be postmarked on or before the third Tuesday after that Sunday (17 October). For VHF Field Day an extra week is allowed, ie the fourth Tuesday. Any late entries can only be accepted at the discretion of the adjudicator.

No recorded delivery or registered post.

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

QTH information to be exchanged on 70MHz only. However not all 70MHz contests require this information, see individual rules and General Rule 24 (1994).

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

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

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

VHF RESULTS

VHF CHAMPIONSHIP 1993

This is the first time that an overall championship has been run by the VHF Contests Committee to find the top Club/Group (multi- operator fixed or portable stations) and Home station (single operator, fixed station as defined in the General Rules). Entry into this competition was automatic if you participated in one or more of the individual contests that were part of the VHF Championship. These contests were: March 144/432MHz, 50MHz Trophy, 70MHz Trophy, 144MHz Trophy, 432MHz Trophy, 1.3GHz Trophy, 2.3GHz Trophy, May 144MHz, 144MHz QRP and the 432MHz QRP. The normalised results for these contests were added together to produce the final Championship table shown below.

Over the year, almost 170 different clubs/groups and single operators entered the two sections of the Championship. The Open section ended up as a three way battle between the Northern Lights, Spalding and District Amateur Radio Society and the Victory Contest Group. Eventually the final blow was delivered by the Northern Lights when they won both the 144MHz and 432MHz QRP contests. The single operator section was equally close for a long time until G4PIQ won three contests late in the year to pip G6HKM at the post.

Congratulations to the Northern Lights for winning the Open section. They will receive the RACAL RADIO CUP for this achievement. Congratulations to Andy Cook, G4PIQ for winning the Single Operator section. He will receive the JOHN PILAGS MEMORIAL TROPHY for this achievement. The winners and runners-up will also receive certificates.

G0FCT

OPEN SECTION

Posn	Group	Points and No of Contests entered	
1	Northern Lights	6331	9
2	Spalding & DARS	4778	10
3	Victory CG	4647	7
4	Warrington CG	3198	5
5	Three Spires CG	1694	3
6	Bracknell ARC	1674	6
7	11th Hour CG	1662	6
8	Windbreakers CG	1643	2
9	Wirral & District ARC	1620	2
10	I R Dixon	1600	3
11	A1 CG	1570	2
12	Flowerpot Men	1520	2
13	Swale ARC CG	1455	3
14	South Devon RC	1192	6
15	Andrew Kissack	1000	1
16	Windbreakers & Hadrabs CG	1000	2
17	Colchester R A	933	2
18	Northumberland CG	891	2
19	M J Pemberton	821	3
20	Allen Duncan	806	2
21	Three Legs VHF CG	767	1
22	Parallel Lines CG	757	1
23	Trowbridge & DARC	718	1
24	West London ARS	666	1
25	Chris Partington	610	2
26	Peter Tribe	606	2
27	Kintyre Window Cleaners CG	597	1
28	Two Counties VHF CG	564	2
29	Atherstone ARC	533	2
30	Crawley ARC	530	2
31	Gwent UHF Group	475	1
32	West Kent ARS	470	2
33	Mid Cheshire CG	467	7
34	Scunthorpe VHF CG	453	1
35	Rob Briggs	447	1
36	Bryan Bourne	441	1
37	Tiverton (SW) ARC	393	2
38	East London Exiles	384	2
39	Stroud & DARS	379	2
40	Chepstow Wireless Society	378	1
41	UNIBOL CG	335	1
42	T S Day	322	1
43	Sam Powis	319	1
44	Caversham Contest Club	315	1
45	Wakefield & DRS	313	1
46	Radio Society of Harrow	293	1
47	Southampton University ARC	286	1
48	A D Jay	274	1
49	Horndean & DARC	266	1
50	Hereford VHF CG	258	1
51	Chesham & DARS	258	2
52	Wyre VHF Group	253	1
53	Ochil Hills CG	246	1
54	John Smith	221	2
55	David Wood	219	1
56	Far Canal CG	218	1
57	I McLuskie	212	3
58	Telford & DARS	209	1
59	Colin Redwood	200	1
60	Cambridge & DARC	199	1
61	South Birmingham RS	196	2
62	Queen Mary ARCG	167	2
63	Abingdon CG	166	1
64	R K Smith	158	1
65	Ipswich RC	157	1
66	Welwyn & Hatfield ARC	154	1
67	P J Davenport	145	1
68	Paul Bradbeer	143	1
69	Guildford & DRS	140	1
70	Peter Croucher / Mick Worsfold	136	2
71	Torbay ARS	123	1
72	South Manchester RC	119	1
73	Guernsey ARS	104	1
74	GW8AWM/P	104	1
75	D C W Hewitt	101	1
76	King's Lynn ARC	74	1
77	North Kent RS	72	2
78	Coulsdon & Wimbledon RS	66	1
79	Reading & DARC	60	1
80	Tony Crake	57	1
81	Reigate ATS	53	1
82	Great Lumley ARES	50	1
83	Martin Coles	49	2
84	Swansea ARS	38	1
85	GM4VVX/P	29	1
86	A Seago	21	1
87	Wood & Douglas CG	21	1
88	Plymouth Univ	18	1
89	P Cordrey	7	1

SINGLE OP FIXED STATION SECTION

Posn	Callsign	Points entered	No Contests
1	G4PIQ	3000	3
2	G6HKM	2028	4
3	G0TDF	1000	1
4	G3SKR	1000	1
5	G4EQD	1000	2
6	G4KUX	1000	1
7	G4WKN	1000	1
8	G4LRT	987	2
9	G3XDY	951	2
10	G4DEZ	918	4
11	G3NAQ	789	1
12	G1GEY	766	2
13	G3FDW	709	1
14	G0NYL	684	2
15	G3BPM	617	1
16	G0NFH	577	1
17	G8FBG	531	1
18	G8ZRE	518	3
19	G3MEH	475	3
20	G3NKS	466	1
21	G6SPS	445	2
22	G0EHV	418	1
23	G3JYP	410	1
24	G4AFJ	389	1
25	GM3POI	346	1
26	G0ODQ	336	1
27	G1GHA	330	1
28	G4ZDA	321	1
29	GW3JXN	315	1
30	G0AEV	303	1
31	G1GCT	302	1
32	G4FOH	301	1
33	G4LDR	294	1
34	G3APY	283	1
35	G4OUT	280	1
36	G0ADH	261	3
37	G0RRC	247	2
38	G0SYK	247	2
39	G8ZQB	246	1
40	G7MLB	237	1
41	G4KLX	209	1
42	GM8ORG	187	1
43	G1FYC	177	1
44	G6WOI	169	1
45	G3OIL	164	1
46	G0MYE	149	1
47	G5UM	136	3
48	G6FQZ	127	1
49	G0CDA	122	1
50	G8IFU	117	4
51	GM4JJJ	115	1
52	G3JDM	112	1
53	G3RHH	100	1
54	G1TWS	99	1
55	G0TCD	97	2
56	G7OWD	93	1
57	G1OGY	87	1
58	G3YSX	76	2
59	G7OZE	73	1
60	G0SWG	72	1
61	G1KFB	66	1
62	G7AZP	64	1
63	G8JXV	63	1
64	G7GAB	59	1
65	G0HVQ	59	1
66	G7JHZ	56	2
67	G6HXU	51	1
68	G4TJE	47	1
69	G3YHF	45	1
70	G3FIJ	45	1
71	GM0NXP	44	1
72	G0HDZ	44	1
73	G8CDW	28	1
74	G4DDK	25	2
75	G0LJD	17	1
76	GU4HUY	17	2
77	GM7LVJ	14	1
78	G7LSH	4	1

VHF/UHF CONTESTS CALENDAR

7 May	70cm Trophy (Feb 94)
7/8 May	432MHz to 24GHz (Feb 94)
21/22 May	144MHz/SWL/Single/All Others (Feb 94)
22 May	1st Back Packers 144MHz (Jan 94)
4 Jun	50MHz Trophy (Feb 94)
4/5 Jun	IARU 50MHz (Feb 94)
12 Jun	70MHz CW (Feb 94)
18 Jun	432MHz FM Fixed & Open

HF CONTESTS CALENDAR - 1994

29 Apr	QRS Cumulative (Jan 94)
7/8 May	*ARI DX (Mixed Mode)* (Apr 94, p20)
9 May	QRS Cumulative
14/15 May	*CQ-M (Mixed Mode)* (May 94, p20)
28/29 May	*CQ WPX CW* (May 94, p20)
4/5 Jun	NFD (Rules from G4IQM)
18/19 Jun	*All Asia SSB*
25/26 Jun	Summer 1.8MHz CW (Apr 94)

HF RESULTS

IOTA CONTEST 1993

ISLAND STATIONS (* = MULTI OP)

Posn	Call	IOTA	QSOs	Pts	Mult	Total
1	CS4B*	EU040	2053	14985	172	2577420
2	EJ1D*	EU121	1996	12240	126	1542240
3	V7A	OC028	1994	14638	104	1522352
4	GW5LP/P*	EU124	1473	10130	150	1519500
5	P29DX	OC034	1384	11210	114	1277940
6	SM7CRW*	EU037	1355	10363	121	1253923
7	ED3IM*	EU078	1288	9196	120	1103520
8	G0KJW/P*	EU120	1302	7725	117	903825
9	IP1/I1HYW*	EU083	1224	8610	100	861000
10	GM2LO*	EU009	951	6920	116	802720
11	LA9DAA	EU061	1241	8950	88	787600
12	5Z4IOTA*	AF067	1362	9045	85	768825
13	DL0HRO/P*	EU129	862	6415	103	660745
14	F6IMS/P	EU032	1099	7156	89	636884
15	SK7DX*	EU137	1024	7450	83	618350
16	E22DX*	AS007	1085	10130	57	577410
17	ED3BI*	EU154	1329	8545	64	546880
18	SV1BDO/8*	EU075	1357	8540	60	512400
19	CQ3H	AF014	1150	7325	64	468800
20	TM5TBN *	EU156	1048	6320	71	448720
21	OH9OM/P	EU126	1025	7520	57	428640
22	SM4DHF/7	EU138	706	5270	81	426870
23	VE1BVD	NA010	918	5865	66	387090
24	EJ4GK	EU006	972	6413	58	371954
25	GD0PLT	EU116	753	4618	79	364822
26	EJ6FR*	EU007	767	5550	59	327450
27	ED1EK*	EU142	721	4975	60	298500
28	EA8BGY	AF004	574	4070	64	260480
29	OH1BBF	EU096	694	5220	48	250560
30	EA8BWW	AF004	566	4293	58	248994
31	VE1YDX/P	NA127	592	3765	66	248490
32	ED7ITE*	EU152	742	4720	52	245440
33	F5OGG/P	EU105	607	3785	64	242240
34	SK3BP	EU087	547	3875	55	213125
35	DL0PDM/P*	EU098	467	3705	54	200070
36	JF1SEK	AS007	311	2430	81	196830
37	YB3OSE	OC021	501	3945	49	193305
38	N6QLQ/YB5	OC143	459	3520	54	190080
39	IT9VDQ/IE9	EU051	580	4000	47	188000
40	GM3USL/P*	EU123	639	3903	45	175635
41	JA7BEW	AS007	380	2625	59	154875
42	WB3CDX	NA083	552	2525	57	143925
43	DL8AAM/P	EU098	323	2440	56	136640
44	VK6LC/P	OC164	349	2315	45	104175
45	SP6NVK/1	EU132	311	2350	38	89300
46	VE3UWC/VE8	NA008	450	2785	32	89120
47	JE3TXA	AS007	551	3370	26	87620
48	ED3TIE*	EU154	450	2710	31	84010
49	G4RTO/M	EU120	184	1445	48	69360
50	RZ1OA/A	EU153	280	1805	38	68590
51	EA6ZY	EU004	354	2790	22	61380
52	G3XZO/P	EU011	195	1345	43	57835
53	OH5AD*	EU140	274	2015	28	56420
54	K1DW	NA137	305	1380	38	52440
55	AA7AV	NA065	200	1070	44	47080
56	VY2SS	NA029	267	1830	25	45750
57	IS0LLJ	EU024	64	830	48	39360
58	GW0REP/P	EU124	223	1615	24	38760
59	IL3/IV3UHL	EU131	294	1815	21	38115
60	OH6MIL	EU101	254	1635	18	29430
61	SM1CXE	EU020	135	1135	26	28990
62	NN2C	NA026	70	643	41	26363
63	AA5ZA	NA142	335	785	31	24180
64	JH4RHF	AS007	152	1045	23	24035
65	OU1CHD/6	OC129	111	1020	20	20400
66	VE7XO	NA036	60	625	32	20000
67	EI6GF	EU115	148	940	20	18800
68	VK3EW	OC001	90	680	18	12240
69	LA1XDA	EU062	191	1160	10	11600
70	JH1UUT	AS007	60	530	21	11130
71	LA8LA	EU036	30	385	25	9625
72	ZY0PS	SA026	50	450	19	8550
73	ED5DKR	EU093	85	620	13	8060
74	ZY7XC	SA046	137	855	9	7695
75	PR0R	SA026	75	510	9	4590
76	OZ1FMO	EU029	36	345	12	4140
77	JA8GTO	AS078	16	170	7	1190
78	LA/SM3JBE	EU076	12	145	8	1160
79	JA1BUI	AS007	9	100	5	500
80	YC3MIG	OC021	4	50	3	150

EUROPE (* = MULTI OP)

Posn	Call	QSOs	Pts	Mult	Total
1	LZ1KDP*	731	6510	188	1223880
2	RB5MT	681	4955	157	777935

CONTEST CLASSIFIED CONTINUES ON PAGE 80

CONTEST CLASSIFIED CONTINUES from PAGE 79

3	LY3MR*	551	5010	114	571140
4	CR8A	657	5005	100	500500
5	R3A/UA9OBA	779	5615	79	443585
6	IK7EOT*	371	3615	120	433800
7	DK7NP	269	2890	119	343910
8	US7W	374	3285	101	331785
9	FD1NLY	311	2720	118	320960
10	OZ5MJ	553	4280	66	282480
11	LY2BUU	214	2230	117	260910
12	F6BVB	302	2660	95	252700
13	SP6NIC	220	2265	104	235560
14	4Z4DX	328	2038	113	230294
15	SP6PCM	215	2450	87	213150
16	IK2HTW	135	1710	120	205200
17	ES5RY	237	2555	78	199290
18	HA8XX	273	2480	79	195920
19	EA3BT	293	2525	77	194425
20	LY2BTA	332	3208	60	192480
21	OE1MBB	176	2120	86	182320
22	SP1EOI	186	2230	81	180630
23	UO4OF	260	2280	75	171000
24	SP5CJQ	124	1845	89	164205
25	HA5AWH	133	1760	87	153120
26	CR5E	354	2780	55	152900
27	HA2KNP*	260	1950	74	144300
=28	SP6TUM	155	1795	79	141805
=28	HA7UW	151	1795	79	141805
30	OZ4RT	144	1680	78	131040
31	HA5NK	157	1800	72	129600
32	LX4B*	367	2505	48	120240
33	HA5NG	151	1725	69	119025
34	OK1AD	99	1405	80	112400
35	EA5OL	109	1465	75	109875
36	IK1PMR	119	1470	73	107310
37	IN3XUG	214	1800	59	106200
38	RA3AUU	153	1585	65	103025
39	OM3CRH	112	1410	73	102930
40	YL2PJ	134	1545	66	101970
41	RA3NC	210	1390	69	95910
42	DL7VOG	103	1345	71	95495
43	IN3KTT	157	1465	64	93760
44	SP9FKQ	87	1305	71	92655
45	I4CSP	92	1245	71	88395
46	SP2ZFJ/P	161	1610	53	85330
47	EA4EP	95	1285	63	80955
48	OM3TEG	129	1295	56	72520
49	SP5MXA	103	1320	54	71280
50	LY2FN	115	1325	52	68900
51	SP2AHD/A	99	1270	54	68580
52	SP6FER	84	1150	57	65550
53	IK8SMZ	88	1035	63	65205
54	EA3CZM	94	1115	54	60210
55	SP4SHD/P	136	1395	43	59985
56	IK2RPE	91	1010	54	54540
57	SP7EOE	94	1040	52	54080
58	EA3GHQ	132	1275	42	53550
59	EA7CIW	68	930	57	53010
60	OH2BUF	70	965	54	52110
61	OH1AF	165	1655	30	49650
62	SP6MLX	71	1020	48	48960
63	EA5KB	72	920	50	46000
64	SP8OON	74	930	45	41850
65	OM3WST	90	980	42	41160
66	PA0KHS	78	880	46	40480
67	EA3LS	59	790	50	39500
68	UA6LAK	71	890	44	39160
69	EA1EXU	65	825	44	36300
70	SP4CUF	84	955	36	34380
71	SP7GAQ	44	660	44	29040
72	SP2WEI	53	715	40	28600
73	OK1FKV	45	660	43	28380
74	OH3NM	66	810	35	28350
75	SP7FQI	54	730	33	24090
=76	OK1AOU	67	750	30	22500
=76	RB5QRW	100	900	25	22500
78	CT1QF	50	660	34	22440
79	LZ3HI	88	730	30	21900
80	RA3QJ	103	855	25	21375
81	OZ3SK	40	590	36	21240
82	OK2BDI	49	635	33	20955
83	OK2DB	44	580	36	20880
84	SM5DUT	44	630	33	20790
85	IV3PVD	58	645	32	20640
86	DL2GBB	65	545	36	19620
87	SP2EIW	39	525	31	16275
88	OK2PJD	50	600	27	16200
89	EA1EDF	32	480	32	15360
90	EA1ACP	46	555	26	14430
91	EA7BYM	30	450	27	12150
92	SM3DXC	36	375	28	10500
93	UB5XBD*	44	435	21	9135
94	SP4OZ	32	430	21	9030
95	LA5RBA	59	555	15	8325
96	SM4BTF	41	465	17	7905
97	SM3LIV	37	400	18	7200
98	YO7ARY	48	475	15	7125
99	OK2BGR	25	355	20	7100
100	OH6UP	31	335	20	6700
101	SP6URF	32	380	17	6460
102	UC2CBB	42	285	14	3990
103	IK3OGL	20	260	15	3900
104	LA2MV	31	305	12	3660
105	S59ZZ	18	240	14	3360
106	EA2CR	21	275	10	2750
107	EA1DFP	14	200	13	2600
108	DA0HDM	30	220	11	2420
=109	SP9ZKN/P	19	235	10	2350
=109	UB4QWW	25	235	10	2350
111	EA1EXJ	12	160	10	1600
112	ON9CJP	10	150	10	1500
113	SP6DVP	10	140	6	840
114	SP8KEA	9	115	5	575
115	SP1RKM	3	45	3	135
116	OH5LBR	2	20	1	20

ASIA

Posn	Call	QSOs	Pts	Mult	Total
1	RV9WB	66	785	40	31400
2	UA9CVQ	56	730	38	27740
3	UN9LX	95	805	21	16905
4	UA9C/RW9QA	36	290	10	2900
5	VU2KAN	18	225	11	2475

AMATEUR RADIO DIRECTION FINDING

RSGB VHF ARDF NATIONAL RULES (1994)

1. The frequency will be 144.145MHz

2. The carriers, either voice modulated or unmodulated, will be for 30 seconds every 5 minutes. A warning will *only* be given 2 minutes before the *first* carrier is due. The second fox will start transmission as soon as the first carrier ends.

2(a). Clues will *not* be given as this could give an unfair advantage to some teams.

For the same reason as above, the fox should *not* transmit outside the prescribed times on *any* frequency.

3. There are no restrictions on polarisation or antenna type provided the antenna is not moved or adjusted after the commencement of the foxhunt. If a beam is used, it should be directed to the central point of the foxhunt area.

4. Transmission power should be a minimum of 2.5 watts output and remain constant throughout the event. If a change of power is necessary due to technical problems, the fox will make announcements of such on all subsequent carriers.

5. The lair should be in any location that is not private nor requires permission or payment.

6. The team is deemed to be the driver and passengers in one car. When searching for a portable fox, the team should search together and not spread out, increasing the area of search.

7. Only one set of DF equipment to be used per team at any one time.

8. Apart from the fox, transmission is forbidden on the fox frequency. When a team has found the fox they should leave the immediate area, and should not transmit on *any* frequency in the immediate vicinity of the fox.

9. The fox is deemed to be the *transmitter* not the antenna or operator.

10. The winning team will be the one to find the fox in the shortest combined time for a double event. It is the prerogative of each team to decide in which order they search for the fox.

SOUTH AMERICA

Posn	Call	QSOs	Pts	Mult	Total
1	PY4OY	612	4750	66	313500
2	HK3JJH	444	3230	53	171190
3	PY2DBU	76	740	34	25160
4	PS7AB	17	220	14	3080

NORTH AMERICA

Posn	Call	QSOs	Pts	Mult	Total
1	CF3HO	521	3825	106	405450
2	WD8MGQ	256	2600	117	304200
3	W1BWS	286	3020	100	302000
4	K2PS	271	2850	102	290700
5	KC8PG	179	2225	125	278125
6	WF5E	127	1525	80	122000
7	W4BAA	125	1385	86	119110
8	W2HG	107	1455	79	114945
9	K5MK	216	1410	69	97290
10	VE6VK	89	1170	70	81900
11	WB9EEE	104	1065	70	74550
12	N6JM	87	915	54	49410
13	N8FU	64	775	40	31000
14	KD6GC	50	480	33	15840
15	W6ISQ	37	500	30	15000
16	K4BAI	48	560	26	14560
17	K3LVO	32	430	26	11180
18	VE4RP	39	365	20	7300
19	K7RDH/W4	27	265	20	5300
20	WA1MKS	23	285	10	5130
21	KC4BVM	31	135	13	1755
22	KL7FAP	6	90	6	540

UK ALL BAND

Posn	Call	QSOs	Pts	Mult	Total
1	GW8GT *	1922	11250	137	1541250
2	G3KMA	855	6020	150	903000
3	G3ZAY	332	3090	143	441870
4	G2XV/P *	706	4355	80	348400
5	G4PKP	101	705	20	21980
6	G4OBK	36	490	31	15190
7	GI0RDJ	45	390	19	7315

UK HF SECTION

Posn	Call	QSOs	Pts	Mult	Total
1	G3QZF	463	3555	82	291510
2	G3PJT	264	2225	90	200250
3	G3XTT	145	1555	78	121290
4	G3SQX	300	1940	45	87300
5	GW0PUH	250	1690	44	72670
6	G0CDO	163	1320	42	55400
7	G3HQX	95	930	37	34410
8	G0OFD	58	635	34	21590
9	G0HSD	76	650	25	16250
10	G0OUG	57	565	25	14125
11	G4IUF	43	345	24	8280
12	GM3CIX	24	315	22	6930
13	G2BLA	26	315	20	6300

UK LF SECTION

Posn	Call	QSOs	Pts	Mult	Total
1	GW0ANA	107	840	30	26040

SWL ENTRIES

Posn	Call	QSOs	Pts	Mult	Total
1	ONL383	549	4980	160	796800
2	SP9-3021	488	4510	136	613360
3	UA3-119-640	274	3785	127	480695
4	OKL30	379	3815	117	446355
5	UA3-122-1393	279	2825	108	305100
6	OM3-0001	322	3000	84	252000
7	UA3-147-412	239	2365	94	222310
8	OH2-836	236	2960	72	213120
9	I1-12387	220	2110	94	198340
10	SP-23022-OP	96	2030	78	158340
11	UA3-142-1896	206	2110	73	154030
12	BRS95258	158	1505	75	112875
13	LZ1-H-192	204	1740	58	100920
14	SP4-208	132	1390	54	75060
15	SP-0189-GD	129	2294	30	68820
16	UA3-155-75	88	830	32	26560
17	BRS20249	71	690	37	25530
18	SM0-7730	46	390	9	3510
19	F11AJB	15	225	15	3375

CHECKLOGS

DL1JEI; EA1FCG; EA3GDX; EA5EFV; EA5JC; G0EVV; G0LUQ; G0OSF; G0RVA; G4DJC; HC2HVE; IK3SCB; IV3FSG; JA3CE; LA2EIA; LA4DM; N4UH; N7ICK; OK2KLS; OZ5PA; SM0BNK; SM2BQE; SM3MHD; SM3MQF; SM5GA; SM5JE; SP1DMD; SP1/OK2BOB/P; SP2CYK; SP2FAP/P; SP2KPF; SP2WDW; SP4SHW; SP5TZC; SP6CPF; SP6SO; SP7VCK; SP7VCO; SP8JMA; UB4WZA UT5UBN; UW3RR; VE6EDS.

WALSALL VHF 2M NATIONAL HUNT

Date: 22 May 1994

Maps: Landranger 128 (Derby and Burton upon Trent)

DF Area: 00E 08N
130 08N
25E 25N
00E 25N

Start location: Anywhere in the nominated area but the lay-by at Longdon Green on A52 (NGR 090128) is central.

Start Time: 13.30pm

Transmissions: 30 seconds every 5 minutes

Frequency: 144.725MHz

End of hunt rendezvous is NGR 005154 - Cannock Chase Visitors' Centre Car Park. For further information tel: 0922 473492.

FOREST OF DEAN VHF DF WEEKEND

Date: 9/10 July 1994

Maps: Landranger 162 (Gloucester and Forest of Dean)

Outdoor Leisure 14 (Wye Valley and Forest of Dean)

DF Area:

Northern boundary - The Northing 19, from SO579190 to SO700190

Southern boundary - The Northing 00, from SO536000 to SO622000

Western boundary - The river Wye

Eastern boundary - The Easting 70, from SO700190 to SO700069 (additionally constrained by the river Severn)

Itinerary:

Saturday 9 July - 1030 - 1400 double fox

Saturday 9 July - 1600 - 1930 double fox

Sunday 10 July - 0930 - 1300 double fox

All times are BST

The fox may be mobile or portable

Camping is available at the Forestry Commission's Bracelands camp site located at SO560130, 5km South of Monmouth. For camping enquiries contact Ian Batchelor, tel: 0792 795176. For further information on the DF weekend contact Phil Smith, tel: 0792 642001.

SLADE QUALIFYING EVENT (TOP BAND)

Date: 22 May 1994

Map: 138 (Kidderminster & The Wyre Forest)

Assembly: Clee Hill, NGR 611758

Competitors requiring tea should notify John Drakeley, tel: 021 770 3474 no later than 15 May.

IOTA CONTEST WRITE-UP

RADCOM NEWS FEATURE

RSGB IOTA Contest 1993

by Dave Lawley, G4BUO

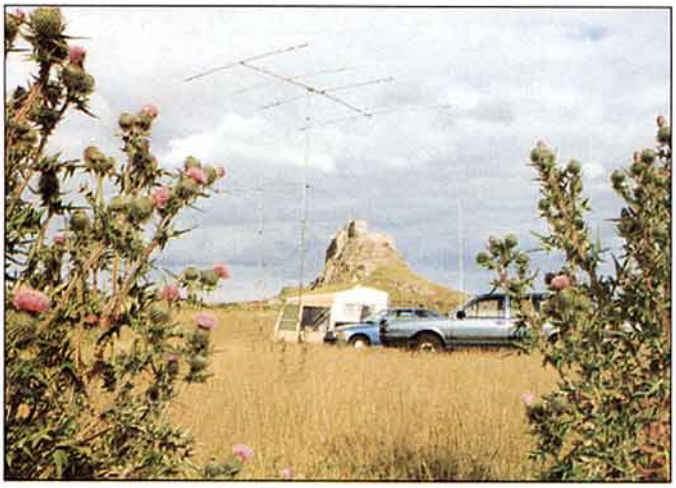
GORAN, SM4DHF/7, commented: "Thanks for introducing the contest. Interest in island chasing is increasing and the amount of stations in this first contest indicates that it was a success". These sentiments are typical of the many comments received and the first run of this event far exceeded the HF Contest Committee's expectations. Almost 200 different IOTA numbers were active, and some entrants worked 100, the basic IOTA award requirement, in 24 hours. There was certainly no shortage of multipliers or stations to work.

UK listener Geoff Watts founded the IOTA Award in December 1964, and from 1966 to 1972 organised an IOTA contest. The rules were somewhat different from the 1993 event, and contacts were verified by means of QSL cards. The first winner was IT1TAI. Several people who appeared in Geoff's contest listings over 20 years ago were active in this event, including CF3HO who operated then as 5H3LV.

Trying to frame contest rules around an existing award programme was found to be uniquely difficult. Additionally, the contest was intended in part as a replacement for the RSGB LF SSB contest. Some of the oddities in the rules, particularly relating to UK contacts, come from these factors. Entrants' comments were taken into account when revising the rules for 1994.

The Leaders

THE WINNERS of the Island section went to Bugio Island, EU-040, with a massive 2.5M points from 2053 QSOs. Using the callsign **CS4B**, operators CT4NH, CT1AHU, CT1BOP and CT1DIZ are to be congratulated on a fine win and they will receive the first ever trophy donated by the IOTA Committee. Competition for second place was fierce, with the **EJ1D** group on Dalkey Island EU-121 making almost as many QSOs but missing out on 21/28MHz propagation from their more northerly location, and therefore unable to find as many multipliers. Two stations from the opposite side of the world, **P29DX** and **V7A** (operated by Ken V73C), also figure in the top five. Steve, G4JVG, writes: ". . . . pileup was so big I could not pick out any callsigns. I asked for Europe only which reduced it by 50% as all the JAs waited. Then I asked for UK and had the biggest pileup of Gs that I have witnessed in two and a half years of operating from P29! It was great to hear so much activity from British stations." He assumed conditions would be no good overnight (the first eight hours of the event) and when he got up at 5am he found that V7A was up to 700 QSOs, which was too much of a deficit to be able to recover.



EU-120 based on Lindisfarne worked by G0KJW/P.

Murphy struck G4BWP and G5LP operating **GW5LP/P** from Anglesey, EU-124. They had computer problems losing them 358 QSOs from the log. Some were recovered during the checking process, but tragically they were robbed of second place overall.

It is interesting to note that all these high-scoring expedition stations used a simple set-up: CS4B had a TS-690, A3S and longwire for LF; EJ1D used a 20m monobander and loop antennas for the other bands, GW5LP/P used a Vee beam and 128ft centre fed. Many IOTA expeditions are short operations using simple antennas and, if the right location is chosen, such an operation can run up a very good score in this contest. The bulk of the non-island entry was from Europe and North America.

EJ1D operating from Dalkey Island EU-121 just off Co Dublin.

The scoring system which awarded zero points for contacts with one's own country was especially unfair to North American island stations and has been changed in 1994 to give two points for such contacts. In Europe, the multi-operator team at LZ1KDP was way out in front with 1.2M points. RB5MT would have been closer but some duplicates reduced his score substantially.

The objective of the contest, to put a premium on contacts with island stations, was clearly met since QSO totals made by island stations were generally much higher. VE3HO, using the special prefix CF3, benefitted from 177 scoring contacts with US stations, but even if these are disregarded he would still have come out ahead of WD8MGQ.

The division of UK entries shows a preference for the shorter, HF section as several felt that they could not commit a full 24 hours. This concept has been retained in 1994 in the limited category and opened to all entrants. GW0ANA was the only one to enter the LF section and his 107 QSOs were all made on 40m. Few entrants in any section made more than 25 QSOs on 80m. G3OZF led the pack in the UK HF section and his log shows 7 hours and 43 minutes of operation.

Given that there was plenty of activity from Great Britain EU-005, the Red Dragon Contest Group, GW8GT, turned in a tremendous score of 1.54M, including 1603 QSOs on 20m. Operators G4BKI, GW4JBQ and GW0MAW didn't have time to repair their 80m dipole and made no QSOs on that band, otherwise theirs could have been the second highest score overall. Second place in the UK section goes to IOTA Director Roger, G3KMA and several keen IOTA chasers were delighted to work Roger for the first time.

Italian special prize winner: Jose, CT1EEB, with Roger, G3KMA (left).

Prizes

THE EDITOR of the *RSGB DX News Sheet* has kindly donated a trophy to the leading single-operator in the UK section and it is fitting that Roger, **G3KMA**, should be the first winner.

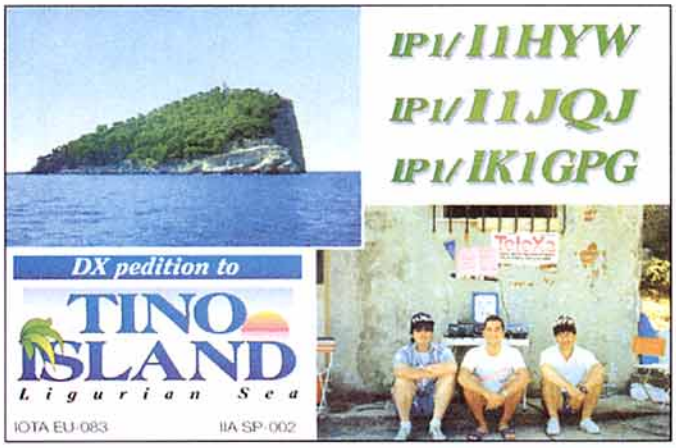
The level of SWL entries was very gratifying, including Patrik SM0-7730 who is just 11 years old. Jean-Jacques, **ONL383**, emerged as the clear winner. He used a Drake R7 and 12AVQ, trap dipole and G5RV antennas.

In memory of Angelo Ferrari I2PHN, the Diamond DX Club offered a special prize for the station who worked the greatest number of different Italian IOTA island groups. Ten groups out of a possible nineteen were active and only **CR8A**, operated by Jose CT1EEB, found all ten.

Hopefully interest in the IOTA award programme has been kindled in many of the entrants who viewed this as primarily just another contest. The basic IOTA award could have been achieved by concentrated effort in just the 24 hours of this contest, and a good start made on several of the regional awards. Anyone serious about the award programme is strongly advised to get an IOTA Directory from RSGB [see *Book Case* pp94/95 – *Ed*].

Log Keeping

THE LOGS clearly showed that people who are already familiar with the IOTA award programme had an advantage, since they were more easily able to spot callsigns of island stations and to 'filter out' incorrectly copied references and other errors. The HFCC is extremely grateful to Paul O'Kane, EI5DI, for putting in much effort to adapt his Super-Duper program (see review in Sept 1993 *RadCom*) for the IOTA contest and to make it available free of charge. Computer-generated logs make the work of the checking team much easier, even more so if the entry is sent in on disk rather than paper. An updated version for the 1994 contest is available from EI5DI or G4PKP QTHR. In view of the extensive rule changes it will not be acceptable to use the 1993 version of the program for the 1994 event.



Two attractive QSL cards from Tino Island and Öland Island.

Although SDI was by far the most widely-used program overall, only three of the top five island stations used it: V7A used N6TR's LOG program, and P29DX used CT. Fourteen of the UK entries used SDI, and G3WGV's LOG was also in evidence. Some of the handwritten logs were good, but in a contest of this size the adjudicator's task is made very hard by bad handwriting, transposed columns, incorrect totalling etc. It was clear from the logs that some stations did not always send their portable suffix. Also some island stations, including many Gs, did not give their reference with every contact. This could have caused missed multipliers. The HF Contests Committee is very grateful to adjudicators G3TMA, G3SQX, G3KMA and G4BUO for the hard work put in to the adjudication, and to G3TMA for preparing the tabulation.

Soapbox

"CONTEST EXCEEDED all our expectations" – EJ1D, "it was all the expeditions to islands that made it a real IOTA-contest" – SM4DHF/7, "Nice sunny day crossing to the island but an hour after (difficult) landing a storm came up and blew away antennas, tents and generators, and threw two operators three metres onto some rocks. We put all the station together again but could only be on the air for ten hours in total" – ED1EK, "very fine contest, not too long. UK stations did not use their IOTA number" – OH9OM/P, "thoroughly enjoyed but how about CW?" – EA6ZY, "a very fine contest. Did not chase mults but concentrated on giving out the Blaskets, hope we made a few island hunters happy" – EJ6FR, "wow, that was fun!" – GM2LO, "overvoltage caused a problem with the rig and I had to stop after 3 hours" – ZY7XC, "good participation from the States, rate of 197/hour. Used the contest to show new operators how to run a contest. Have put it in next year's calendar for CT3M" – CQ3H, "first contest I have participated in and enjoyed the friendly spirit. Hope I made some island hunters happy, giving them Rottnest island – VK6LC/P. My first SSB contest" – OH3NM, "found this contest much like the 'BERU' of old, friendly operating and people enjoying themselves" – CF3HO, "great fun. Wasn't interested in chasing islands before, now I'm hooked. Conditions poor but had one hour to Europe running 100 QSOs" – K2PS, "never entered a contest before but I wanted to let you know how much fun I had" – WA1MKS, "great start for the IOTA contest. I was delighted to see all the activity from European islands" – W1BWS, "many US stations have told me they worked so many islands in the contest that they just had to learn more about IOTA" – W4BAA, "operated from the VE8RCS club station. Great to see such a good worldwide reaction to this contest. You can guess I am very 'pro' IOTA as I am on a rare one!" – VE3UWC/VE8.

IOTA

THE RSGB HF Contests Committee and the IOTA community look forward to an even greater level of activity in this year's event on 30 – 31 July. In addition to adding CW, the peculiarities of scoring relating to the UK have been removed. Separate single operator, single operator limited and multi-operator categories have been introduced and the UK will be part of the IOTA section, like any other island group.

The comment of overall winners CS4B sums it up nicely: "Congratulations! this is surely not just another contest, but a *great* one born among the big contests of the year."

Breakdown of Leading Island Scores

	80	40	20	15	10
CS4B	3/35/2	52/500/20	1330/9245/84	405/3005/50	263/2200/16
EJ1D	28/245/11	102/887/15	1622/9728/78	228/1265/17	15/115/05
V7A	—	9/105/3	771/5248/52	1162/8520/42	52/785/07
GW5LP/P	59/580/13	326/2825/35	833/5020/61	226/1520/36	24/185/05
P29DX	13/160/06	11/150/10	469/3010/40	851/7450/50	40/448/08

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The agent will be required to process about 180,000 licences per annum, and provide a telephone advisory service for customers; to maintain the U.K. registers of Amateur Radio and unique vessel callsigns for ship radio licensing, and to notify the latter to the International Telecommunications Union (ITU) or the Agency on a regular basis; to provide licence information to the Agency for enforcement, licensing accounting purposes and access on-line to the database; and to supply management information to allow effective monitoring of performance.

The contract will be for 3 years from 1st April 1995 with an option to extend for a further 2 years up to a maximum of 5 years. The agent will be required to act as the prime contractor and tenders may be made for either the entire service or for Amateur Radio, C.B. and Ship's Licensing individually.

Tenderers will be expected to provide details of their company's operation, it's major customers, full audited accounts for the previous 2 financial years; details of 2 customers to whom similar or broadly similar services have been provided during the previous 2 financial years and certificates of their satisfaction. The company should have demonstrable quality assurance measures in force.

Requests to participate should be made in writing to the Agency at the address below and must be received by 13th May 1994.

Please mark for the attention of Mr J. A. Keeling.

Further Information -
071-215 2013/2263/2323.

Radiocommunications Agency, Special Applications Section
Room 614, Waterloo Bridge House
Waterloo Road, London SE1 8UA

Fax 071-620 2793 Telex: 261969 DTIWBHG

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RSGB Members wishing to place an advertisement in this section must use the official form incorporated on the label carrier of Radio Communication. This will prove membership and must be for the current month. No acknowledgment will be sent. Ads not clearly worded, or which do not comply with these conditions will be returned. If an ad is cancelled no refund will be due. An advertisement longer than 60 words will be charged pro rata. Trade or business ads, even from members, will not be accepted. Traders who wish to use this facility must send a signed declaration that the items for sale are part of, or intended for, their own personal amateur station. The RSGB reserves the right to refuse ads, and accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange. Ads for CB equipment will not be accepted. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into. Licensed members are asked to use their callsign and QTHR, provided their address in the current edition of the RSGB Amateur Callbook is correct. RS members will have to provide their name and address or telephone number. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available edition of *RadCom*.

Warning: *Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the cash paid.*

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ATARI STE 4Mb Designer programme for complex pictures and PCB design: £20. Also RTTY and Morse: £10. Up-grade Atari STE 520K of RAM: £5. 70cm Co-Linear approx 10dB: £45. Write to Mr V McClure, 43 Roman Way, Seaton, Devon, EX12 2NT. NO TELEPHONE NUMBER.

AUTOMATIC ATU Kenwood AT250, little used, boxed: £250. Phone G0CIJ. (Southend on Sea) 0702 230133.

BC221J with H/B: £60. CT375 LCR Bridge with H/B: £30. Redifon GR479 Tcvr: £120. AR88LF: £55. AR88D: £35. AR88 Speaker: £15. 78M Wobbulator: £45. Racal RA63 SSB Unit: £90. Racal RA98 SSB Unit: £50. Buyers collect. Contact Bob. (Timberland, Lincs) 0526 378685.

BUTTERNUT HB5 Minibeam boxed as new: £175. Crushcraft DW3 WARC Rotary Dipole, new, cost £160, accept: £85. Heathkit SB220 2kW HF Amp: £350. Light Duty Rotator: £25. 6m Vertical as new: £25. 5 Band HF Mobile Ant, Mag mount, new, unused: £40. Untested Avo 8 and Fluke Meters: £20 each. Daiwa CR-4P Rotator Controller, brand new: £50. FC700 ATU as new: £100. Contact Mark. (Dereham) 0362 691099.

BUTTERNUT HF5B 5 Band 2 ele Beam: £120. Cushcraft 3 ele 10 metre Monobander: £40. H/B 2 ele Tribander, elements 22ft long, 7ft Boom: £35. If possible buyer collects. G0FQX, QTHR. (Milton Keynes) 0908 667250.

COLLINS R278 UHF Rx, 225 - 400MHz, 1750 Crystal controlled channels, large 29 valve set, VGC: £100. G3VXZ, QTHR. (Maidenhead) 0628 27350.

COMMODORE 64 with Packet Module, cassette and Disk box: £50. New 100W SMC Dummy Load: £10. Power Supply 5A: £7. (Rotherham) 0709 850517.

COMMODORE 64: £45. Commodore D/drive: £45. Icom E2 2m, Yaesu Mic, 2 battery chargers, 2 batteries, 3 Antennas, case: £100. TX3 Tifi RTTY/CW/ASCII: £30. (Clapton Common) 081 806 4470.

COMPLETE STATION, comprising HW101, Power supply, Spkr and Mic, SB201 Linear, ATU, B & W T/dipole, Hustler Vertical, all boxed, new and UNBUILT. Property of AOP, ill health prevents obtaining licence. Will sell complete station for best offer. Buyer collect. Absolutly unique opportunity. Cost over 2850 Dollars 10+ years ago. Bids to G4EMC, QTHR. Offers will be opened one month after publication. (West Malling) 0732 843497.

COMPUTER AUSTIN 286 PC 16MHz, Super VGA Colour Monitor, 4Mb RAM, 44Mb HD, 3.25inch 1.44Mb Floppy, Internal Fax/Modem Card, 1Mb Video Card, Lifetime freefone technical support. MS-DOS 4.01, Windows 3.0, absolutely immaculate. Also TNC Tiny-2 Packet controller, hardly used. £395 for both or may split. G6XYP, QTHR. (Melton Mowbray) 0664 501957.

CREATE LOG Periodic Aerial, 50 to 1300MHz: £95. CUE-DEE Aerial 10 ele 144MHz: £30. Control Box for CD44 Rotator: £15. IC202S: £95. Bird 43 Meter movement: £25. Please phone 7 - 9pm. (Colchester) 0206 240700.

FL2100B LINEAR Amplifier as new, boxed, handbook: £450 ono. TS120S Tcvr, handbook, little use, boxed: £300 ono. (Ramsbottom) 0706 822090.

FT-902DM 1.8-30MHz CW/SSB FM, all Filters, WARC bands, with manual: £525. Phone evening, w/e after 6.30pm. Bob, G0JTD. (Swindon) 0793 823973.

FT-ONE All mode Tcvr, memory and FM boards fitted XF-8 9KC CW XF-8 9KA AM and CFW455G FM Filters installed, c/w YM-38 Desk Mic, operating and technical manuals, PCB extender boards, checked by Castle Electronics, excl condx: £775. G3RDG, QTHR. (NW London) 081 455 8831.

FT101Z with unused spare valves etc: £250. Icom IC24G 2m FM Mobile: £100. Akai 4000DS Stereo R/R Tape Recorder: £50. Other items, all VGC. Buyer collects North Devon. G3ATF, QTHR. (Torrington) 0805 22561.

FT101ZD, FM, WARC bands, fan, Mic, also FV901DM VFO, with manuals, all VGC: £595 ono. New Tcvr ordered. (Coventry) 0203 450476.

FT101ZED, WARC, FM, fan, CW filter, little used, original PAs, spare set PA valves: £280. G4RGA, QTHR. (Wellington) 0823 664911.

FT102 Tx/Rx new relays, ex condx: £480. Yaesu FTV901R Transverter with 144MHz Plug-in: £160. Pair 572B tubes, new: £150. (Newbury) 0635 299146.

FT200, VGC, manual: £200. C13 Tcvr, ATU, manual: £190. Buyer collects. G4XIL, evenings. (Cambridge) 0223 356432.

FT690 6m M/mode 2.5W, c/w Mic: £250 ono. G3KIP, QTHR. (Tunbridge Wells) 0892 547643 evenings.

FT726 2m, 70cm, 6m and Satellite unit, Desk and Hand Mics, manual, cables: £750. MM 100W Linear Amp 2m: £100. FT901DM HF Tcvr plus new Band kit, Mic and manuals: £400. G4XRU. (Lewes) 0273 473505.

FT890 Xtal Filter 500 and 2.6 Fitted: £1000 ovno. Daiwa PS304 PSU 30A: £100 ovno. Cushcraft R7 Multiband Vertical: £250 ovno. FRG7700 FRA770: £250 ovno. ATU Nectronics VC300DLP: £100. Black Jaguar Scanner: £80. RTTY to TV Converter MM2001: £50. Datong Filter FFL2: £80. Bencher Paddle black: £50. Starmaster Keyer: £40. Oscilloscope Phillips PM3217 D/beam 50Mhz with manual, Probes: £250. (Wakefield) 0924 372717.

FT902DM IMMAC: £495. Professional Rx 10kHz - 30MHz Solid state Plessey PR1155: £250. Trio 2300 2m Portable Tx/Rx inc Nicads, charger, Mic, exc, boxed: £95. 386/16 PC Tokier, 2Mb/48Mb HDD, 17inch FST Colour Monitor, manuals, etc as new: £450. G4FYY, QTHR. (Crawley) 0293 514788.

HATELY Crossed field Antenna, ready con-

structed, full documentation, possible help with collection: £150 ono. G0EWR, QTHR. (Sheffield) 0742 884889.

HEATHKIT SB300/400 Tx/Rx gd wkg order, completly realigned, spare new 6146's: £120. Heath SB620 Panoramic Adaptor/ Spectrum Analyser, mint condx: £120. Buyer collects. (Ringwood) 0425 477404.

ICOM 211E 144MHz M/mode 10W o/p, H/Mic, original box: £275. Drae VHF Wavemeter: £10. AEC SWR Meter SWR50A: £10. Icom IC-SM2 Desk Mic: £15. Heatherlite mobile Mic, Trio 4 pin type: £10. 2m H/brew Linear 10-30W not pretty but works OK: £15. 2m 5/8wave Ground Plane Antenna, S/steel elements plus F/glass Radials, used ok: £10. All above plus Postage. G8CYW, QTHR. (Gateshead) 091 414 6189.

ICOM 707 HF Tx/Rx mint, boxed, new Dec93: £700. Trio R600 0-30MHz Rx: £150 ono. (Silent Key items). Also Icom Auto ATU IC-AT100 hardly used, mint, boxed: £250. Yaesu FT290 Mk1, with new Nicads, mint and boxed, as new: £220. (Nr Chester) 051 339 3433.

ICOM IC-R72 HF Rx: £400. Altron SM30 Mast Telescopic Tilting wall mounted, unused: £400. G1CJH, QTHR. (Birmingham) 021 784 2639.

ICOM IC271E fitted Pre/Amp Mains Power supply moduals, Manuals, boxed, packing: £375. Tono 5000 Terminal, package, boxed: £400. Both little used. Phone (Richmond) 081 876 1108.

ICOM IC4E 70cm H/held: £100. Standard C78 70cm Portable with 10W PA and Mobile bracket: £150. Jaybeam C5 2m Colinear: £30. Pye F460 UHF Base: £20. 50Mhz FM Westminster, unmodified: £25. PF2UB 70cm H/held: £15. Mizuho KX-2 SWL ATU: £15. Shure 4ch Mic Mixer and 4ch Production Mixer: £50. Vero 4U Black Rack Cabinet: £20. Buyer collects. G4VZO, NOT QTHR. (Kingswinford) 0384 287454.

ICOM IC701 + IC701 PS + SM2 Mic, exc condx: £400 ono. 2m Linear Mirage B108, 5-15W in, 80W out, Preamp: £50 ono. Carriage extra. G0NMS, QTHR. (Stowmarket) 0449 781277.

ICOM IC735, 250Hz Filter, Keyer, Mic, boxed, immac: £600. HW7: £50. Daiwa PS304 30A PSU: £90 ono. Alan, G0KMC. (Aylesbury) 0296 658037.

ICOM IC740 HF Tcvr plus PS IC-PS15, Hand Mic, service manuals. Buyer collects or will include carriage UK: £375. (Hazel Grove) 0625 873659.

ICOM745 Tx/Rx, HM12 Mic: £550. Icom 745 PS15: £75. Kenwood AT-230: £75. Desk Mic SM-20: £50. (Glasgow) 041 779 2771.

KAM All Mode TNC complete with box, cables and manuals, VGC, no longer needed: £200. Alan. (Tiptree, Essex) 0621 815978.

KENWOOD 450 SAT as new cond, used for SWL, original packing, manuals: £950. Yaesu FT290, gd wkg order, Nicad charger, tatty carrying case: £200. (Manchester) 061 723 3461.

KENWOOD 450SAT, CW filter, new condx: £1,200. Heatherlite Hunter Linear 600W, as new: £775. Reason for sale. G3GHS. (St Austell) 0726 843487.

KENWOOD AT200 HF ATU PWR Meter: £100. MFJ 486 Grandmaster 10 memory Keyer and Morse Tutor: £80. Dragon 32, Modem, BMK RTTY S/ware: £30. 4inch B&W Mains/12v, Portable TV: £20. All with handbooks and in mint condx. G4AFU. (Bedale, N Yorks) 0677 423750.

KENWOOD R1000 Receiver, boxed with H/book, ideal General coverage and A R bands. Ring Richard, G3UGF, daytime 0484 710313. (W Yorks) 0422 882663 evenings.

KENWOOD TH26E 2m FM H/held with charger and SMC-33 Remote Spkr/Mic, boxed, gd condx: £150. Graham, G1ULB, NOT QTHR. (Manchester) 061 747 5764.

KENWOOD TS140S fine condx with Mic MC43, operating manual: £600. G0LRS, QTHR. (Epsom, Surrey) 081 394 0249.

KENWOOD TS140S little used, boxed and mobile bracket: £625. G0CIJ. Phone. (Southend on Sea) 0702 230133.

KENWOOD TS440S Auto ATU and filters with PS50 and MC60, all mint: £800. PK232MBX with all leads and S/ware, also mint: £230. All the above hardly used from new. Call G4HBD. (Poole) 0202 767583.

KENWOOD TS440S built in Auto ATU and MC50 Base Mic, reluctant sale: £800. GW7LLF, QTHR. (Tonypandy) 0443 431864.

KENWOOD TS820, VGC, new valves, DC-DC Converter, CW Filter, MC50 Mic: £400. Phone after 6pm. Buyer Collects. (Coventry) 0203 445974.

KENWOOD TS830S c/w Mic, boxed and manual: £500. Kenwood TS900, PS900 HF rig, boxed and manuals: £400. All exc condx. (Plymouth) 0752 707550.

KLM KT34A new never unpacked, retail £500 only : £300. Daiwa GNW419 Antenna Tuner: £60. G4BUV, QTHR. (Thetford) 0953 488267.

LOWE HF125 Rx, inc FM/Portable options, gwo: £250. Racal RA117 needs attention: £80. Husky V21/V23 Modem +S/ware: £20. Hi-Mound HK702 Marble Base Key: £30. Hazeltime 1552 RS232 Terminal: £15. Maplin TU1000 RTTY Terminal: £30. MC30S Hand Mic: £25. Spectrum and ZX81 various parts & S/ware, offers. 2m 1/4 Wave Mag Mount: £5. Burr-Brown ASCII Terminal: £15. Datong 2m Rx Converter: £15. 4 Way Coax Switch: £20. Brian, G4GAS. (Swindon) 0793 750130.

MFJ-948 Deluxe Versa Tuner 2, boxed as new: £90 ono. (Telford) 0952 618016.

MICROWAVE MODULE 144/50MHz Transverter: £65. Welz SPR Meter: £50. Yaesu FRT7700 VHF Antenna Tuner: £25. Yaesu FRG7700 Receiver: £275. Tonna 5 ele 6m Beam: £10. Call Gary, G0ENW. (West Horsley) 0483 282808.

MIRAGE 2m gas FET Masthead Pre-Amp: £100. Microset 2m Amp 4-25W in, 100W output: £110. Both Items, under twelve month old. G1GFQ, QTHR. (Runcorn) 0928 567987.

MITAC 387 SX Laptop, brand new, Co-processor, 4Mb Ram, case, MS works, much amateur S/ware: £700. Mutek GFBA144E Masthead Preamp, ATCS 500 Sequencer: £75. Luxor Satellite Rx, positioner, Actuator, immac: £100. 2m Dish, patio mount, C-Band LNB: £150. MMG 1691 Meteosat Preamp: £50. Microwave Modules Digital Framestore and Yaesu YVM1 Monitor: £100. G3KHZ Electronic Keyer, case matches Datong ASP/FL3: £25. G4JBH. (Yeovil) 0935 28341.

PNEUMATIC MAST previously fitted to Transit Van, c/w 12v Compressor. Buyer inspects/ collects, GWO: £150. G4AJE, 9am to 6pm. (March, Cambs) 0354 741168.

PRE HOUSE MOVE Sale HF5B 2ele Beam: £130. Computers, VHF Tcvrs, Linear Bits, Test Gears etc. Call after 6pm. (Rugby) 0788 815506.

RACAL 17 in VGC: £200. Trio 530SP: £475. VFO 240: £70, The Pair: £520. G4ERA, QTHR. (Hastings) 0424 812350.

RETIREMENT BARGAINS. Jaybeam LW8/ 2m Yagi, new: £20. Two Alloy Poles 8ft, 9ft: £2 each. Stolle Rotator 2010, new: £20. Buyer collects. Heathkit Dip Meter HD-1250: £15. Many other Components, tubes, waveguides, couplers, attenuators, books. Send 25p stamp for lists. G8AXK, QTHR. (Welyn Gdn City) 0707 326071.

ROBOT 1200C High Resolution Colour SSTV Converter, upgraded version, storage via Audio tape or computer, Control Interface S/ ware included: £500. (Glasgow) 041 632 2793.

ROBOT 1200C Slow Scan TV Converter, four colour memories, snatch pictures from TV, Test card built in: £650. Dave. (Prestwick) 0292 79217.

SELL DRAKE TR7A Tcvr all filter options fitted, RV7 Remote VFO, PS7 PSU, 7077 Desk Mic. Set NOT Wkg 14Mhz and 28Mhz or WARC. Consider cash offer or swap 30L-1 Linear Amp. G3JFC, NOT QTHR. (Sleaford, Lincs) 0529 413547.

SHACK CLEAROUT Icom IC720A: £370. TH6DXX: £300. Cushcraft 204CD: £200. HF Linear 4C100 Tube, needs 3Kv PSU: £500. Kenpro FM740 70cm Mobile: £140. Cossor CD150 Scope: £50. Marconi TF995A Generator: £20. Cossor 1049 Scope: £10. Wobbulator: £20. All negotiable. G4LPL. (Boston) 0205 480843.

SILENT KEY G8RAB. Trio 9130 2m M/mode 25W: £290. Kenwood TR2300 2m FM Tx/Rx : £50. Eddystone EC10 Rx: £30. Eddystone 680X model: £20. Datong Morse Tutor TE20D 120KHz-500MHz: £10. MM 144MHz Linear Power Amp 40W and receive Pre-Amp: £20. SAS GDO Lowe FX1 0.7-250MHz: £15. AR88 Rx OFFERS!. (Liverpool) 051 521 6440.

SILENT KEY SALE (G4EYD). IC735: £650. Alinco DR590 Dual Band: £285. AOR AR1500 Scanner: £250. AR240A: £80. Standard C828M 2m plus SR-C12 PSU: £50. Realistic DX100L Receiver: £25. KW E-2EE Match: £22. Maldol 2m/70cm Colinear: £35. DeComm 70cm Colinear: £18. Howes ASL5 Filter: £7.50. Kenwood LF-30A LPF: £12. Ikgami CTC-4300 B/W Camera: £28. Technical S/ware RX8 for BBC: £85. Various Test Equipment. Also Telequipment Serviscope S-15-A: £18. Set Tavasu Loading coils: £10. Prefer buyer inspects and collects. Enquiries: G3MTQ, QTHR. (Birmingham) 021 440 1384.

SILENT KEY SALE G2DYZ. Trio TS820, plus VFO Module attached, Mic, operating manual. Both items: £350 inc, ono. Other items available. (Market Drayton) 0630 655482.

SILENT KEY Sale. Please send SAE for list. FT101, FT230R, IC25E, ATU, SWR Meters and lots more Test Gear. G1HLP, QTHR. (Bridgewater) 0278 423288.

TELEQUIPMENT OSCILLOSCOPE Type S32AR in gd wkg order with manual: £40 ono. G4ZZN, QTHR. (London) 081 850 1440.

TEN TEC CENTUARY 22 Tcvr very gd condx: £200 ono. Vibroflex Original delux Bug-Key, very gd condx: £100 ono. Ring Laura, GW0BXZ, QTHR. (Oswestry) NO TELEPHONE NUMBER.

TEN-TEC ARGOSY 2, complete with CW filter, Mic, matching PSU and DC cut-out switch. Also FET Dip Meter and KW207 Supermatch ATU. All Items in exc condx: £500 the lot. Can deliver 100 miles. G0FNZ, QTHR. (Shepperton) 0932 221586.

TEN-TEC CENTURY 22, 6 Band CW Tcvr, built in Xtal Cal and Keyer, user manual, gd condx: £220. GD0HWA, QTHR. (Isle of Man) 0624 812643.

TEN-TEC CENTURY 22: £180. Trio TR7200 G: £50. Datong D70 Morse Tutor: £30. KW 107 ATU: £100. KW Vespa: £60. CDE Rotator: £40. Hanson SWR Bridge: £10. Shure 201 Mic: £10. MM 144MHz and 432MHz Converters: £10 each. Kenwood 30G Remote VFO. Offers. (Tamworth) 0827 899318.

THREE MODULES for FT767GX for 6m, 70cm and 2m. 6m: £100. 70cm: £150. 2m: £100 ono. (Spalding) 0775 722940.

THREE ZX81. two 16K Ram. Extender Board. Maplin Key board. Radio Program cassettes. Games cassette, Morse Reader cassette. Guide to ZX81 Programming course. 30 hour course. How to program ZX81, training manual. Exercise book. ZX81 Computing and cassette. RTTY Terminal Unit, unused kit. Interface Unit, unused kit. Offers for the lot. G4GYD, QTHR. (Welwyn Garden City) 0707 325257.

TOSHIBA LAPTOP PC, ideal for Data/Packet, 286 Processor, 20Mb HD, 3.5 Floppy, DOS 4, Plasma Screen, exc condx, with carry case: £500 ono. Michael, G4FBK. (Watford) 0923 822766.

TRIO 520S and Remote VFO, VGC, Handbook: £300. G3POJ, QTHR. (Nottingham) 0602 273601.

TRIO R2000, VGC: £350. Kawai X430S 3-Manual Organ, VGC: £495. John, eves/ weekends. (Diss) 0379 652043.

TS140 little used as spare rig: £550. Collect or delivered. G3DYY, QTHR. (Nr Huntingdon) 0487 841558.

TS830 with CW Filter, Mic, Manual, mint condx: £525 ono. GW0MSW, QTHR. (Monmouth) 0600 712498.

TS930S, Auto ATU, Full break-in. Beautiful condx, with Mic and Operating and Workshop(unopened) Manuals: £850, its a bargain! Capco SPC300 ATU up to 1KW PEP, lovely condx plus PSU 13.8v 5A (quality unit): £135. (St Helens) 0744 57471.

TWO RA17L Receivers in Racal Black crackle Cabinets, complete with leads, spares and valves. Contact Rob. (Lincs) 0526 378685.

YAESU 726R 2m, 70cm and 6m with Yaesu MD1 Mic, also workshop manual, gd condx: £900. (Durham) 0207 529020.

YAESU FLDX400/FRDX400 Tx/Rx Pair: £150. Einstein Computer with manuals, green Monitor and Packet S/ware: £50. Phone Haydn evening. (Cardiff) 0222 596344.

YAESU FRG-100 Communication Receiver, purchased before Christmas, mint condx. Have new Tcvr, so regrettably must Go!: £410 ono. Malcolm, G4TJK. (Hook, Hants) 0256 766558.

YAESU FT101ZD Mk3 with Mic: £450. KW600 Linear: £130. Both very gd condx with manuals. George, G0OEL. (Nr Cambridge) 0954 719273.

YAESU FT101ZD, WARC bands, FM Board, fan, Mic, looks like new, with box and Instructions: £385 ono. G0RXG. (Bristol) 0272 568380.

YAESU FT757GX2 Tcvr, all HF Bands, all Modes, plus FP757GX PSU, Desk and Hand Mics. Never used Mobile: £650. Prefer buyer to inspect and collect. G0MLU, QTHR. (Bracknell) 0344 488847.

YAESU FT7B 50W Mobile/Base HF Tcvr with Mic, handbook, mobile mount, gd condx: £300. Ring Eric, G3YUG day/evening. (Bedford) 0234 768120.

YAESU FT902DM 160-10m: £450. Codar AT5 160/80m AM/CW with mains and mobile PSU's. Offers. Chris, G4AQW, QTHR. (Blandford) 0258 456391.

YAESU FT990 with Auto ATU, SP-6 Spkr and narrow CW Filter, absolutely immaculate, boxed, hardly used: £1,675. (Reading) 0252 844248.

YAESU FT990DC mint condx with Internal Auto ATU, PSU, Mic, Manual: £1,495. (Oldham) 061 627 1661.

YAESU YD148 Desk Mic: £25. XT Laptop, ideal Packet: £150, alternatively P/ex Kenwood SM220 or Tiny 2 TNC. Also wanted Mac carrybag and Sinclair PC200, will give upto £25 and £50 respectively. Phone Dave, evenings and W/ends. (Norwich) 0603 745512.

YAESU YR901 CW/RTTY Reader c/w YK901 Keyboard, YVM 1 Monitor, matches FT902, dry joint fault: £100. HF5 Vertical, unused: £40. G4JBH. (Yeovil) 0935 28341.

WANTED

AP1086 issue 1 (RAF Radio Stores Ref No's) Also Air Publications relating to Radio, Radar equipment. Exc price offered. Would purchase current to Post-War Magnetrons, Klystrons, T/R cells, Photo-Multipliers, Ignitrons, Thyratrons, TWTs, Microwave Tubes, BackWard-wave Oscillators, 1 inch CRTs and special CV types. Required Rx Type R1355 10D/13032 unmodified. Please phone any time. (London) 071 511 4786 or 071 790 2846.

KENWOOD AT440 Auto ATU for TS440S. Datong FL3 Filters or similar. Wanted by invalid English operator. (Stan, EA5ADZ). Phone Ken, G6YPN. (Nr Reigate, Surrey) 0306 611286.

'HANDBOOK OF TECHNICAL Instruction for Wireless Telegraphists' by H M Dowsett and L E Q Walker. G3BLS, QTHR. (Oxford) 0865 247311.

23cm FM RX or Tx/Rx for Repeater use. Please contact G1XCC, (Not QTHR). (W Yorks) 0924 851113 or write to: 23 Ferncroft, Hightown, Liversedge, WF15 8DT.

ADDITIONAL DAIWA Motors (MR-750U) needed for Daiwa Multi Torque Rotator MR-750E. Tel: Brian, G0KDX any time. (Standish) 0257 422547.

ATLAS 215X, 180, 350. Working or broken. Any Atlas bits. Base Console, Mobile Mount and Matcher for Antenna. Tel Dave. (Romford) 0708 374043.

B2 SUITCASE SET (Type 3 Mk2) Wanted. Tx/Rx/PSU and any Accessories. Also any other similar Sets of interest. Tel: G4OFO. (Surrey) 081 949 2317.

BBC "DISK DOCTOR" EPROM also instruction Books for computer and Disk Drive. (Crewe) 0270 68693.

CW CRYSTAL FILTER for Kenwood TS900, part No L77-0236-05, model No YJ 3395.0 kHz. (Hounslow) 081 894 0047.

EDDYSTONE 696/1, EY11, EB35, EC10, EC10 Mk2, 960, 358X, 870A. Plus £10 offered for Scrap sets. Collection locally. Lepino. Fax 0372 454381. (Surrey) 0374 128170.

HEATHKIT HW8/9. Also Hand book for Collins 30-L-1 Linear. Contact Dave, G4RSD. (Ipswich) 047 337459.

HELP! Has anyone any HUGE Oil-Filled Capacitors? I need two 40mfd 1.5Kv or smaller ones to make up. Would consider cheap Power Supply 3Kv at 0.5A. Also Modulation Transformer T2A and Key Jack for Mk2 19 Set and copy manual for AR88D. Time wasters welcome. G3MFW, QTHR. (St Austell) 0726 73608.

ICOM CW Filter FL100 or FL101 for IC725. Versatuner or similar ATU with internal VSWR Metering. AOR AR1000. Martin, G4NCE. (Birmingham) 021 357 6139.

KANTRONICS KAM plus 128k. Details to Tony, G4KHT, QTHR. (Hull) 0482 843457.

PROGRAMS/INFO for Amateur Radio use of Sharp Organizer IQ 8400. G3RSJ, NOT QTHR. (Trowbridge) 0225 761476.

QUAD, LEAK, Radford etc. Valve Hi-Fi Equipment. Working or not. Will Pay cash and collect. (Chelmsford) 0245 266027.

RACAL cabinet Speaker Plinth 150HM Speaker Plessey Mk 4, 12 way Plug Racal Active Antenna AE3002. (Salterton, Devon) 0395 443373.

RACAL, COLLINS, Watkins-Johnson, Spares accessories Handbooks Scrap Units required. Can any one help score ??????? to RS232 Conversion for Racal RA1792. Original literiture and application notes wanted for above equipment W.H.Y. costs refunded. Call Allan. (Warrington) 0925 445605.

TABLETOP CASE for AR88D, please has anyone got one for sale. Condx not important, whole scrap set considered. (Stockton on Tees) 0642 559845.

TRANSVERTER 6 - 2 for TR751E, 5 ele Yagi for 6m, long Yagi for 2m(crossed). Tel: Tony, G7NZR. (Ickley) 0943 607506.

WORLD RADIO VFO 755, V10, Heathkit VFO must have all Bands. Condx and costs, GM0KMG. (Glasgow) 041 649 4345.

YAESU FC102 ATU, must be in mint condx. Please phone (Bournemouth) 0202 547920, after 6pm.

YAESU FV-50 VFO Unit, wanted working or repairable for use with FT-75. G3SMW, QTHR. (Marlow) 0628 482508.

EXCHANGE

ECKO MODEL M23 (1933) Bakelite Cabinet Only. Murphy 'Baffle' model A122, original valves. Offers? /Exchange 70cm H/held/ sideband. Bill, GW3DGT. (Narberth) 083483 369.

CLUB NEWS

DEADLINE - Items for inclusion in the **July 1994** issue must be sent to HQ marked "Club News - DIARY", to be received by **27 May** 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

NORTH BRISTOL ARC - 6, Committee meeting; 13, Display of Radios for all; 20, Open forum; 27, How to use - A Dip Oscillator. Tution for RAE and Morse is available at every meeting. Details 0272 513573.

RSGB CITY OF BRISTOL GROUP - 31, Half Yearly meeting. ***NEW VENUE*** Now meets at New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol, BS16 1BG. Details G4NKT 0272 672124.

SHIREHAMPTON ARC - 6, CW night SARC contest Simulator, G3YHV; 13, HF NFD Planning, G4NAQ/G3YHV; 20, Use of EI5DI S/ware for NFD, G4NAQ; 27, Final HF NFD Preparations, G3YHV/G4NAQ; Jun 3, Club Closed(half term). Details 0272 770504.

SOUTH BRISTOL ARC - 4, 20m Activity evening & Com meeting; 11, Cellular Radio by G0BBL(ex PA0VDR); 18, Simple Computer Program Logging? by Len, G4RZY; 25, Talk 'Working Lundy Island station' by David, G7PKS. Details 0275 834282.

WESTON-SUPER-MARE - 9, talk 'Radio Operation in the Far East' by W Titmus; 16, Workshop night. Details 0934 415700.

BEDFORDSHIRE

SHEFFORD & DARS - 5, talk 'Coopering, the making of wooden barrels' by Brian Palfrey of Bury St Edmunds; 10, Committe meeting, G6RHL QTH; 12, Members activity night, preliminary planning of VHF NFD; 19, Talk 'Television Detection' (Yet to be confirmed); 26, Mobile DF hunt. Details 0462 700618.

BERKSHIRE

BRACKNELL ARC - 11, Talk 'Fire alarm Systems' by G7IEA, plus EGM; Jun 8, Radio Treasure Hunt. Details 0344 420577.

MAIDENHEAD & DARC - 5, Talk & Demo 'Static Electricity' by Paul, G3BGL; 17, Preparations for HF & VHF Field Days. Details Neil, G0SVN 0635 863310.

NEWBURY & DARS - 25, talk 'HF radio Contesting' by G3SJJ. Details 0635 863310.

READING & DARC - 12, NFD 1994: Planning for a 4th win! by G3WGV and G3XTT; 21, Support for Christain Aid sponsored walk; 26, Construction and alignment evening + QSL card Comp. 1994 is the 60th year of the Club's existance. A number of activities are planned to celebrate this anniversary. Details 0734 733745 after 7pm.

BUCKINGHAMSHIRE

AYLESBURY VALE RS - 4, talk 'Direction Finding' by Alan Simmonds. Details 0296 81097.

CHESHAM & DARS - 4, General meeting; 11, Silly Contest (2m FM); 18, Technical topic - Computers in Amateur Radio(part 3) by Alan, G6CDV; 25, CW Practice. All meetings take place in the Top Floor meeting Room at The White Hill Centre, White Hill, Chesham, Bucks at 8.15pm. Details 0494 676391.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 6, Demonstration of Contest scoring Software; 13, Talk 'Ham Radio as it was' by Peter, G3GGK; 20, Home brewed HF/VHF wire antennas, including Magnetic Loop design by Brian, G3WQF; 27, Morse Practice and operating evening. Details 0763 243570.

CENTRAL

DOLLAR ACADEMY ARC - Meets most afternoons at the Academy after 5.15pm. Details GM0LOD 0259 742126.

STIRLING & DARS - Meets every Thursday at 7.30pm in the Clubrooms, Bandeath Industrial Estate, Throsk, Nr Stirling. Morse instruction available when requested. Details 0324 636235.

CHESHIRE

CHESTER & DARS - 10, The Production of 'Practical Wireless' by Rob Mannion, G3FXD, Editor; 17, Satellite TV by Paul, G3TZO; 24, Video Night - 'DX-Pedition to Pacific 1991'; 31, Surplus Equipment Sale. Details 051 608 3229.

MID-CHESHIRE ARS - 2, MIDCARS Rally, Winsford; 4, On-Air/Construction night; 11, Talk 'Canals, part 1' by Phil, G0UCO. Details 0606 331210.

STOCKPORT RS - 6, Computer Group - Circuit Diagrams on TurboCad by Frank Lunt; 11, Contesting Operating & NFD Preparation; 13, Computer Group - How to Apply Applications by G0NKM; 20, Computer Group - Easy Home Brew by G3URW; 25, HMS Bronnington by G3XGE. Details 061 439 4952.

CLWYD

CONWY VALLEY ARC - 5, Talk 'Creatures from the Deep' by Dr David Last, GW3MZY; 24, Annual General Meeting. (Moved forward from June Meeting.). Details 0492 530725.

RHYL & DARC - Meets every 1st and 3rd Monday of each month, WRVS Centre 116, Vale Road, Rhyl at 8pm. Details 0745 351362.

WREXHAM AMATEUR RADIO - 3, Annual Constructors Contest; 17, HF Activity night; Jun 7, Junk Sale. Details 0978 845858.

CO ANTRIM

CARRICKFERGUS ARG - 3, Talk on Contesting by GI0NMV. All are welcome. Club meets every Tuesday at 7pm in Downshire Secondary School. Details 0960 351807.

CO DOWN

BANGOR & DARS - Visitors welcome at all meetings. Details Keith, GI0SSA 0247 883315.

CORNWALL

CORNISH RAC - 5, Family History by Peter, G3WKP. Details 0209 820118.

NEWQUAY & DARS - Now meets alternate Friday. Anyone intersted in Amateur Radio is welcome to attend. Details G0KEM 0726 882752.

PENZANCE RAC - Club has regular meetings on Mondays, also second Morse Test centre via RSGB only. Details Brian, 0736 61427.

POLDHU ARC GB2GM, GX0PZE - Regular Meetings on Tuesdays and Fridays 7.30pm. Visitors welcome. HF net Wednesdays 7.30pm around 3.75MHz. All welcome. Details 0326 290638.

DERBYSHIRE

BOLSOVER ARS - 18, 2nd Direction Finding Contest; Jun 8, 3rd DF Contest. Details Colin, G0RXT 0246 822856.

BUXTON RA - 10, Fox Hunt; 24, New Members night. Meets at the Lee Wood Hotel, Buxton at 8pm. Details Derek, G4IHO on 0298 25506.

DERBY & DARS - 4, Surplus Sale; 11, 'AOR wideband receivers' illustrated talk by Richard, G4NAD; 18, The Cairo System - a practical demonstration by Peter Best, G8CQH of Aston University (No connection with Egypt!); 25, Technical topic discussion; Jun 1, Surplus Sale. Details 0773 856904.

NUNSFIELD HOUSE ARG - Meets every Friday at 8pm, at Nunsfield House Community Centre, Bolton Lane, Derby. Details Mark, G0MGX 0332 518256.

DEVON

APPLEDORE & DARC - 16, Talk on Radio Operating by G0DLC, G0FCL and G0KKG. Club meets 3rd Monday of each month at Appledore Football Clubroom at 7.30pm. Details 0237 477301.

EXETER ARS - 9, Club station operating night; Jun 13, Surplus Sale. Now meets in the Moose International Centre, Blackboy Road, Exeter. Details from Ray, G3YBK 0392 78710.

EXMOUTH ARC - Meetings held at the Scout Hut, Marpool Road, Exmouth on alternate Wednesdays at 7.30pm. Details 0395 279574.

PLYMOUTH RC - 3, Checking & overhauling the contest equipment; 10, Data transmission Demonstration night; 11, Visit to Crownhill Police Station Comms Room; 17, business meeting & natter night; 22, proposed trip to Goonhilly Downs Earth Station; 24, Rally job selection night; 29, PRC Rally; 31, Field Day briefing. Start of Summer program, (1st and 3rd Tuesdays of June, July and August). Details 0752 563222.

TORBAY ARS - 20, (90/10) Second Hand Sale. Meets each Friday at ECC Social Club, Highweek, Newton Abbot. Details Walt, G3HTX 0803 526762.

DORSET

BLACKMORE VALE ARS - ***NEW VENUE*** Now meets at Shaftesbury School, Dorset on 2nd and 4th Tuesday of each month. Details G1THG 0747 830439.

DORSET POLICE ARS - 5, RAE revision; 19, Visit by staff of Practical Wireless.; Jun 2, Talk on Direction Finding by Ted Bain & Clive Hardy. Club meets at Dorset Police HQ on 1st and 3rd Thursday of each month. Details from Pc 915 Richard Newton, Ferdown Police Station, Dorset on 0202 229351.

FLIGHT REFUELLING ARS - 1, Video 'Radio Nuts'; 8, Talk on GPS (Global Positioning); 15, Events update and FR railways Society talk; 22, Talk "Dreaded dBs & fickle filters" by G0MDK; 29, Quiz night. Details G4POF 0425 653404.

SOUTH DORSET RS - 3, Talk & question evening 'Planning Regs:- application, consent and the Radio Amateur' by Mike Kelly, Assistant Chief Planning Officer, Weymouth & Portland Borough Council. Meets 1st Tuesday of every month. New members and visitors welcome. Details from Mike, G7HNY 0305 773860.

DYFED

ABERYSTWYTH & DARS - 12, DF Hunt by Ray, GW3LNM at 8pm; 26, GW0ARA on the Air at 8pm. Club meets 2nd Thursday each month at 8pm, Scout Hut, Plascrug Avenue, Aberystwyth. Details 0545 580675.

EAST SUSSEX

HASTINGS E&RC - 18, Talk 'Images of Man' by Dr J Craig, G3SGR, Radiology Dept of the new Conquest Hospital. Details 0424 830454.

SOUTHDOWN ARS - 9, Aerial polar diagrams and aerial modelling by G3GRO. Details 0323 484282.

WORTHING & DARC - 8, (Sunday) 2m Portable Competition; 11, 'Antennas & Feeders System' by G5RV; 15, Special Event Station GB0HSM, High Salvington Mill, Worthing; 25, Discussion evening. Meets every Wednesday at 7.30 for 8pm at Parish Hall, South Street, Lancing. Details 0903 753893.

ESSEX

BRAINTREE & DARS - 2, No Meeting - Come and help at Bocking May Fayre!; 16, Annual General Meeting. Club meets every Monday at Bocking Hockey Club at 8pm. Details 0376 327431.

CHELMSFORD ARS - 3, Digital Receivers by Richard Easom. Marconi College at 7.30pm. Details G0GJS 0245 256654.

COLCHESTER RA - 5, Kites and Antennae, by Colin, G0STW; 19, Electronics and the Bomber Offensive, by J Stanley Wood; Jun 2, Construction Competition. Details 0206 764034.

LOUGHTON & DARS - Details 081 508 3434.

VANGE ARS - 5, **NO MEETING** (local Elections in hall). Details 0268 552606.

FIFE

DUNFERMLINE & DARC - 5, natter night; 12, HF operating evening (An ideal time for Class B Amateurs to gain some operating experience); 19, Contest Logging by Computer, a demonstration of G3WGV and Super-Duper by Wallace, GM0GNT; 26, Junk Sale. Club meets every Thursday at 7.30pm, at the former RAF Radio station at Outh Muir. Anyone intending to visit during the Winter/Spring months is strongly advised to listen to GB3FF (R0) after 7pm, in case meeting has to be postponed due to bad weather conditions. Details GM0GNT, QTHR.

GRAMPIAN

ABERDEEN ARS - 6, Junk Sale; 13, Unlucky for Some; 20, Building the Yearling - part 3; 27, Mock FCC Exam. Club meets every Friday at Queen Mother House, Aberdeen. Details 0224 780591.

GLOUCESTERSHIRE

CHELTENHAM ARA - Meets 1st Friday of each month at Charlton Kings Library. Details G8MZV 0242 242336.

GREATER LONDON

BROMLEY & DARS - 17, Short Talks. Details 081 777 0420.

COULSDON ATS - 9, Sale of Surplus Equipment. Details 081 684 0610.

CRAY VALLEY RS - 5, talk 'Ballooning with Branson' by G4SOT; 19, Talk 'Radio Communication' by Mike Dennison, G3XDV, Editor. Details Bob on 081 850 1386.

EDGWARE & DARS - 12, Talk 'F J Camm, the man and his "Comic"' by Steve, G0PQB. Details 081 204 1868.

The R S of HARROW - 6, Spring Junk Sale. All welcome; 27, Clandestine Radio in WW2. Details Jim on 0895 632377(eve, w/end) or 071 251 2700(daytime).

KINGSTON & DARS - 18, Siberian Adventures by Paul, G0BXC. Club meets on the 3rd Wednesday of the month at 7.45pm for 8pm. Details 081 398 1128.

SOUTHGATE ARC - 12, Lecture entitled 'Electronics and the Bomber Offensive' by Stan Woods. Details 081 360 2453.

SURREY RCC - 9, Construction Contest; Jun 6, 'Early Days of Baird TV' by Ray Herbert, G2KU. Details 081 660 7517.

SUTTON & CHEAM RS - 19, Annual General Meeting. Club meets at Sutton United Football Club, Gander Green Lane, Sutton. Details John, G0BWV 081 644 9945.

WIMBLEDON & DARS - 27, Surplus Equipment Sale. Details 081 540 2180.

GREATER MANCHESTER

ECCLES & DARS - 3, Lecture 'Using databases' by G0KLF; Jun 7, Discussion '432MHz Low Power Contest'. Details 061 773 7899.

SOUTH MANCHESTER RC - 6, Home Brew Contest; 13, Computers in Radio; 20, Annual General Meeting; 27, Talk by 'Home Brew Winner'. Details G7FQY 061 969 1964.

TAMESIDE ARS - Now meets every Wednesday night at 7.30pm at the ATC Hut, Moorcroft Street, Droylsden, Tameside. Details from: A N Laughlan, 8 Kempton Close, Droylsden, Tameside, M43 7JL.

GWENT

NEWPORT ARS - 2, Closed for Bank Holiday; 9, Video (Tbc); 16, Construction night; 23, talk by Clive, GW4YKL; 30, Closed for Bank Holiday; Jun 6, General meeting. Details 0633 250017(work).

GWYNEDD

DRAGON ARC - 2, talk 'Afghanistan the forgotten fighting' by Dr Ieuan Jones, GW4FQU; 16, Update on UHF/VHF repeater link and packet; Jun 6, The art of QRP by Rev George Dobbs. Details 0248 600963.

PORTHMADOG & DARS - 19, Talk 'History of Radio' by Pat, GW3KJW. Details 0766 770546.

HAMPSHIRE

ANDOVER RAC - 3, Quiz night (Salisbury v Andover); 17, Model Control (incl Flying Display); RAE classes each meeting at 7pm. Meets at Wildhearn Village Hall, 1st and 3rd Tuesdays of each month. Details 0264 773547 evenings.

BASINGSTOKE ARC - 2, Indoor 'Foxhunt' by G8FMH; 22, 2m DF Competition: OS174 - Fox, Eddie, G4SQZ; June 4/5, 2m DF Weekend in the New Forest: Foxes - G8FMH/G4BEZ/G4SQZ - Saturday Competition under RSGB Rules. Details 0256 25517.

FARNBOROUGH & DRS - 11, Morse the Key to success; 25, HF Field Day preview and Minilectures. Details 0252 715765.

HASTINGS E&RC - 18, Talk 'Images of Man' by Dr John Craig, G3SGR Radiology Dept at the Conquest Hospital. Details 0424 830454.

HORNDEAN & DARC - 5, Raynet by Dick, G0MNL; Jun 2, 'Radio Bygones' by Geoff Arnold, G3GSR. Details 0705 472846.

ITCHEN VALLEY ARC - 13, Social Treasure Hunt & natter night; 27, Talk 'How Antennas & Feeders work or how wireless got its name' by Nigel, G7CAW. Details 0703 732997.

WATERSIDE ARS - 24, Workshop Practical by Ray, G3YJJ. Details G0IDN 0703 843491.

HEREFORD AND WORCESTER

BROMSGROVE ARS - 10, Annual General Meeting; 24, Night on the Air(HF); Jun 14, Scouts/Novice evening follow-up. Details 0527 542266.

VALE OF EVESHAM RAC - 5, A talk on Astronomy and the Radio Amateur by Ken, G4NIJ. Start at 8pm BBC Club Evesham, Worcs. Details 0386 41508.

REDDITCH RC - 12, Beginners steps in Packet Radio by G4GHL. Club meets 2nd Thursday each month. WRVS Centre, Ludlow Road at 8pm. Details G3EVT 0789 762041.

HERTFORDSHIRE

CHESHUNT & DARC - 4, VHF/UHF Rig Clinic(Test equip for rig line-up); 11, natter nite & members forum; 18, Open air meeting (Baas Hill Common); 25, natter nite. Details 0992 464795.

DACORUM ARTS - 3, Informal meeting; 17, Bill's Bar-B-Que and Radio Junk Sale. Meets 1st and 3rd Tuesdays, 8pm at Heath Park, Cotterells, Hemel Hempstead. Details Nick, G7KFQ 0582 766973.

HODDESDON RC - 12, Junk Sale and natter evening; 26, Talk 'Photography is my Profession' by Rod, Grafton ARC. All meeting at 8pm. Details John, G7OCI, 0920 466639.

STEVENAGE & DARS - 3, TCP-IP Talk about the latest developments in packet by Ian, G6KHW, Alan, G8XLH and Paul, G0MHD; 10, Look to the Future - ideas for Club events by Paul, G7PPI; 17, Talk 'How to give talks' by Ralph, G7HFD; 24, Arrangements for VHF Field Day(Jul 2/3); 31, Video evening. Details Neil, 2E1ASZ on 0438 350882.

HUMBERSIDE

GOOLE R & ES - 6, 'On Air' evening; 13, Talk 'Contests'; 20, DF Practice; 27, Social evening (Old George Inn). Meets Friday at 7.30pm at West Park Pavilion, West Park, Goole. Details Steve, G8VHL 0405 769130.

GRIMSBY ARS - 12, Bring and buy book Sale; 26, Live demonstration of weather satellites by Dave, G0IIQ. Details John, G3DOT 0472 825899.

HORNSEA ARC - 19, ATV Link Quiz. Details 0964 534283.

NORTH FERRIBY ARS - 6, Talk 'Get to Know your Sec.', by David, G7PER; 13, Training night; 20, Talk 'RSGB Matters' by Clive, G8EQZ; 27, natter night. Details 0482 656324.

KENT

DARENTH VALLEY RS - ***NEW SECRETARY - Ray Rodgers, G1UKH**** 11, Computer Forum; 25, Station on the Air. Details 0689 826846.

DOVER RC - 4, Novice evening and committe meeting; 11, Squares, WAB style by G7NOR; 18, Natter & operating night; 25, Locators by G1PJJ. Meets Wednesday evenings 6.30-10pm during term time. Novice, full RAE and Morse classes. All ages (over 8) welcome. Details 0304 825030.

MAIDSTONE YMCA ARS - 7, Morse Test. Details John, G0RHO 0622 43317.

MEDWAY AR & TS - 6, Talk 'Satellite TV' by Colin, G3VTT; 20, Air Traffic Control and Airband Radio by Dave, G6HXR. Details 0634 710023.

SEVENOAKS & DARS - 16, Electronics Repairs by John, G1TVJ. Details from Mrs A Dawson, c/o Council Offices, Argyle Road, Sevenoaks, Kent TN13 1HG.

LANCASHIRE

BURY RS - 10, A Presentation talk by Bob Hayter of Nuclear Electric; 17, NFD discussion; 24, NFD discussion +; 31, RSGB Video. Details 0204 883212.

FYLDE ARS - 10, Tba; 24, DF Foxhunt. Meets every 2nd & 4th Tuesdays of each month. Details G7CUL 0772 635464.

ROCHDALE & DARS - 16, Talk 'PMR gear' by G0GNR. Meetings held every Monday, except Bank Hols at The Cemetry Hotel, Bury Road. Details 0706 376204.

THORNTON CLEVELEYS ARS - 2, NO MEETING - Net on 2m, G6GMW/P; 9, Operating evening; 16, Bring your Computer along; 23, Preparations for VHF Field Day. Details G4BFH, QTHR.

LEICESTERSHIRE

LEICESTER RS - 2, HF/VHF NoA; 9, Committee meeting + NoA; 16, HF/VHF Noa; 23, Talk 'FSK Modems' by Bob Hornby, Texas Instruments; 30, HF/VHF NoA. Details Wayne, G6NGV 0533 546851(eve) or 0827 711722 daytime.

LOUGHBOROUGH & DARC - 3, DF, 8pm start; 10, Nostalga evening, bring your old interesting items along; 17, A night at 'Wymswold'; 24, HF evening + QP arrangements; 31, Final arrangements for Queens Park SES D-Day. Details G8SNF, 0509 218259.

LINCOLNSHIRE

LINCOLN SHORTWAVE C - 11, Annual General Meeting; 18, 'Japanese Morse' by Norman, G3CSG; 25, Trip to Guildhall; June 8, Junk Sale. Club meets every Wednesday night at the city Enginerrs Club, Waterside South at 8pm. Details Pam, G4STO 0427 788356.

SPILSBY ARS - **Change of date of monthly meeting.** Now held at The White Hart Hotel, Spilsby, 1st Thursday in month at 7.45pm. Details 0790 52712.

LOTHIANS

LOTHIAN RS - 11, Rig Tune Up / DF Tune Up; 25, DF Hunt - meet outside Braid Hills Hotel; Jun 8, Annual General Meeting. Details Colin, GM4HWO, QTHR or general enquiries to the club Secretary, Dick, GM4DTH, QTHR.

MERSEYSIDE

LIVERPOOL & DARS - 3, Novice Course Postmortem; 10, GX3AHD On the Air; 17, Quiz; 24, DF Hunt; 31, Surplus Sale. Details Ian, G4WWX, QTHR.

NORTH SEFTON ARC - Meets 2nd Wednesday of each month. Details G1DFT on 0704 579017 or Fax 0704 570089.

WIRRAL & DARC - 4, D&W at Shrewsbury Arms, Ness; 11, Quiz night, Radio and general knowlegde; 18, Social evening (names to Ron, G3HFA); 25, Practice DF Hunt at 8pm at Heswall lay-by. Details Bob, G4NCI 051 677 0210.

NORFOLK

DEREHAM ARC - 12, Trip to Eastern Communications. Details Mark, G0LGJ 0362 691099.

ARC FAKENHAM - 3, Used Equipment Sale; Jun 7, AGM. Details Dave, G4DCJ 0485 528633.

NORFOLK ARC - 4, Construction QRP, NoA and Morse practice; 11, Talk 'Simple Frequency Counter' by Mike, G4EOL; 18, Construction QRP, Morse practice, NoA; 25, Final HF NFD breifing. Details Sheila, G0KWP 0603 618810.

YARMOUTH RC - 5, Used Equipment Sale; 12, Informal; 19, Caravan maintenance (Party to Bradwell); 26, Informal; Jun 2, NFD briefing. Details 0493 721173.

NORTHAMPTON

KETTERING & DARS - 17, A talk by the Radio Investagation Service; 28/29, SES Rockingham Castle (GB8RC) on HF. Club meets every Tuesday at Electricity Sports & Social Club, Eskdale Street, Kettering at 7.30pm. Details Len, G0RDV 0536 514544.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM - 5, Forum & NoA; 12, Talk by Henry, G4MHB entitled The Secret War; 19, Fox Hunt number 2; 26, Construction/activity night. Details Simon, G0IEG 0602 501733.

MANSFIELD ARS - 9, Annual General Meeting at The Polish Catholic Club, Off Windmill Lane, Woodhouse Road, Mansfield at 7.30pm. Details Mary, G0NZA 0623 755288.

NOTTINGHAM RAYNET ARC - 15, Belvoir Castle Bike Ride 9.30am to 5pm; 18, Open Forum, Sherwood Community Centre at 7.30pm. Details 0602 400111 9am to 5pm then 0602 260391 after 6.30pm.

NORTH YORKSHIRE

HAMBLETON ARS - 5, RAE course; 12, Practical / Ops night; 19, Club Aerial Project; 26, Talk 'The Cobwebb' spider and flytrap Aerials' by Steve Webb, G3TPW. Details Nigel, G0NHM 0609 776608.

OXFORDSHIRE

OXFORD & DARS - Meets 2nd and 4th Wednesdays of the month. Club and programme details Terry, G0CFN 0865 863526.

VALE OF WHITE HORSE ARS - 3, Meeting. Club meets 1st Tuesday of every month, 8pm, the Fox, Steventon. Visitors Welcome. Details 0235 531559.

SHROPSHIRE

SALOP ARS - 5, natter night; 12, Junk Sale at 8pm; 19, 2nd Fox Hunt(envelopes & maps to be collected by 7.30pm start; 26, A discussion by RSGB Council Member (Zone B), Dave Gourley, G0MJY at 8pm, The Oak Hotel. Details Sheila, G0SST 0743 361935.

TELFORD & DARS - 4, NoA; 7, 25th Anniversary Dinner, Wrekin View, 7pm; 11, Radio Principles demonstrated by 2E1AGS; 18, Junk Sale at Red Lion, Wellington; 25, Telford Rally preparations. Details Dave, G4EIX 0952 588878.

SOMERSET

TAUNTON & DARC - 6, TBA; 20, Talk 'Aerial radiation patterns, why and how' by Eric, G3GC (Yeovil Club). Other Fridays Operating/Morse, discussions. Details 0823 680778.

YEOVIL ARC - 5, Preparation for QRP Convention; 12, QRP Convention Post-Mortem and introduction to new members by G3ICO(***Also Enrolment Night for RAE Classes at Yeovil ARC for Examination in Dec 1994**.); 19, Talk 'Negative Restistance Oscillators' by G3MYM; 26, Club station on Air & committe meeting; 31 to Jun 7, D-Day SES operated by members at Ex GI Base at Sherbourne. Details Cedric, 0258 473845.

SOUTH GLAMORGAN

CARDIFF RSGB G - 9, Visit to Rhoose Air Traffic Control. Details 0222 810368.

STRATHCLYDE

CENTRAL SCOTLAND FM G - Details from GM3AXX 0560 482720.

PAISLEY (YMCA) ARC - 11, "SARDA" by Mr J W Armstrong; 25, Annual General Meeting. RAE/Morse classes, run on Tuesdays. Details Stuart, GM0UKD 0505 335195.

WEST OF SCOTLAND ARS - 6, Talk 'Advanced Developments in In-car entertainment" by Garry, GM7MZZ; 13, Club night; 15, Fox Hunt & Bar-B-Q; 20, Annual General Meeting. Details 0698 350926.

SUFFOLK

BURY ST EDMUNDS ARS - 17, Talk by a Member of the RIS. Details 0284 728418.

FELIXSTOWE & DARS - 2, **(Bank Holiday) NO MEETING**; 9, RAE examination; 16, ESWR Planning; 29, 18th Annual East Suffolk Wireless Revival. Detail Paul, G4YQC 0394 273507(evenings).

IPSWICH RC - 4, 'Slim Jim Construction evening with George, G0JWQ and John, G4BAV; 11, Social evening; 18, ESW Rally Planning Meeting(with MRS and FDARS); 25, CW evening. All meetings start at 7.30pm, at The Rose and Crown. Details Sheila, G8HYE 0473 742072.

MARTLESHAM RS - 11, A Talk on 'Amateur Radio and Multimedia' by Dr J E Thompson. Due to security requirements at BT Labs, Martlesham Heath, please call to book a place. Details Darren Hatcher, G7BKO 0473 227332 (office hours).

SUDBURY & DRA - 3, Talk 'Magnetic Loop Aerials' by Tony, G4ZVR; 15, SES, Kesgrave - details Mike, G4GGC; 17, Natter. Details Tony, G8LTY 0787 313212.

SURREY

DORKING & DRS - Jun 28, 'Operation Overlord', 50th Anniversary Presentation by David Ford. Arrive at 7.45pm Venue 'Friends Meeting House', South Street, Dorking. Details John 0306 631236.

ECHELFORD ARS - 12, Talk 'Operation from Tristan da Cunha' by Roger, G3SXW; 26, Talk 'Microwaves' by G4KNZ. Details 0344 843472.

HORSHAM ARC - 5, Home Brew evening. Details Peter, GBSUI 0737 842150.

REIGATE ATS - 17, Annual General Meeting at Tilgates, Bletchingley at 8pm. Details 0342 325322.

THREE COUNTIES ARC - Apr 27, AGM; May 11, Computer night. The history of computers. Bring in your oldest computer, G7CND will bring his small collection; 25, Talk 'The History of Electronic Warfare' by Harry Spiller, ex chief engineer Racal Electronics. Details 0428 606298.

TAYSIDE

DUNDEE ARC - 3, Construction night; 10, Lecture by C H Matthews, Curator, Museum of Communication, Bo'ness.; 17, Club Awards evening; 24, Construction Night. College closes for summer recess. Meets on Tuesdays in the College of Further Education, Graham Street, Dundee at 7pm. Details from GM4FSB, QTHR.

TYNE AND WEAR

HAZELLRIGG ARC - Meets every Monday, Hazellrigg Community Centre at 7pm. Classes for Morse, Novice and talks on various subjects held on last Monday in the month. Details 091 264 4608 after 6pm.

WARWICKSHIRE

COVENTRY ARS - Meets every Friday, 8pm at Baden Powell House, 121 St Nicholas Street, Radford. Details 0203 311468.

STRATFORD on AVON & DARS - 9, Tal 'Old Pye Communications Equipment' by "The Pyeman" from Bewdley; 23, 2m DF Hunt. Meets 2nd & 4th Mondays the Home Guard Club, Main Street, Tiddington, Stratford u Avon, at 7.30pm. Details 0789 450623.

WEST MIDLANDS

ALDRIDGE & BARR BEACON ARC - Meets 1st & 3rd Mondays in the month. Details G0NOL 0922 36162.

RS of BLOXWICH - 9, Construction Project; 23, Contest preparation. All meetings and events are Non-Smoking. Details 0922 683877.

COVENTRY ARS - 6, 2m Fox Hunt; 13, NoA and Morse Tuition (Prelim for VHF NFD); 20, Portable NoA; 27, NoA and Morse Tuition. Visitors always welcome. Meets every Friday. Details 0203 311468.

MIDLAND ARS - Every Wednesday, RAE & Morse classes; Every Thursday Night on Air; 2nd and 4th Monday in month, PC night; Last Friday in month Atari night. Details John, G0LAI 021 628 7632.

SOLIHULL ARS - **New Secretary** Paul Gaskin, G8AYY, QTHR. Details 021 783 2996.(Nov 10th notified)

STOURBRIDGE & DARS - 9, On Air & natter night; 21/22, 144MHz Contest at G4CVK Shack, Stourbridge; 23, Good CQ by Bob, G4EEM. Details James, G7HEZ 0384 374354.

WEST BROMWICH CENTRAL RC - 15, Talk 'Just the Tonic' by H Nevett. Meets every Sunday at the Sandwell Hotel, High Street West Bromwich, at 7.30pm for 8pm. Details Ian, G0PAI on 021 561 2884(home) or 0902 353522 ext 2093(office).

WEST YORKSHIRE

HALIFAX & DARS - 17, Talk 'Valves' by Jim, G4MH. Details 0274 496222.

KEIGHLEY ARS - 1, Temple Bank Fun run; 15, Pride of Huddersfield; 21/22, Moorsman Hike. Details Trev, G1SRA 0274 496222.

NORTH WAKEFIELD RC - 5, Official Grande Opening of the Clubs new Shack, Bar-B-Q; 12, Open night/On the Air; 18, Visit to Leeds Weather Centre; 19, Open Night; 20, Talk 'Top Band & LF' by Gerald, G3SDY. Details John, G4RCG 0924 362144.

SPEN VALLEY ARS - 5, Spring Surplus Sale, auctioneer Roy, G4YDI; 19, Home Brew 23cm FM Mobile Rig. Details David, G1CTO 0924 497767.

WILTSHIRE

SALISBURY R & ES - 3, Talk 'Microwave, part 2' by G4LDR and G8OFA; 10, Talk 'Raynet' by Gordon, G6ZHJ; 17, HF operating evening; 24, Construction & advice clinic; 31, Talk 'RAIBC' by Dick, G0MZI. Details 0722 330971.

TROWBRIDGE & DARC - 4, Talk 'Amateur Satellites' by G7AZP; 18, Foxhunt Planning. Details 0225 864698 (evenings).

RALLIES AND EVENTS

This is a list of all rallies, hamfests, exhibitions and conventions notified to HQ (as at deadline date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

1 MAY

11th ANGLO-SCOTTISH Rally - Tait Hall, Kelso. Doors open 11am. Features the usual traders, bring and buy, catering and many other attractions in historic Kelso. Entrance still £1. Talk-in S22 via GM4KHS. Details GM4UFP, 0750 20006 after 6pm.

BRITISH AMATEUR TELEVISION CLUB (BATC) Rally. ***NEW VENUE*** The Sports Connexion, Leamington Road, Ryton-on-Dunsmore, Coventry. Details Mike, G6IQM, Tel: 0788 890365 or Fax 0788 891883.

2 MAY(MONDAY)

DARTMOOR Radio Rally - Yelverton Memorial Village Hall, Meavy Lane, Yelverton, Devon. Doors open 10.30am. Parking for 600 cars, access for disabled. Trade stands, bring and buy, etc. Refreshments and playground for children. Talk-in on S22. Details Ron on 0822 852586.

MID-CHESHIRE ARS Rally - Civic Hall, Winsford, Cheshire. Doors open 11am, 10.30 for disabled visitors. Full catering facilities. Entry fee £1. Ample car parking. Details Dave, G4XUV on 0606 77787.

8 MAY

MARS/DRAYTON Mobile Radio Rally - Drayton Manor Park, Tamworth, Staffs on the A4091. Doors open 10.30am. Usual traders, club stands, flea market, car boot area. 'The family rally'. Details G6DRN on 021 443 1189. Trade stands Norman, G8BHE 021 422 9787(evenings).

10th YEOVIL QRP Convention - Preston Centre, Yeovil. Doors open 9am to 5pm. Traders orientated to QRP kits, components etc. Club bring and buy. Bob's QRP Club stand (bring your QSLs), on air QRP stations. Talks on propagation, construction, oscillators, RSGB matters. Displays of DIY Rigs, vintage Ham radio and communication equipment. Admission one pound and fifty pence, free car park. Talk-in on S22 by GB2LOW. Details G3COR, QTHR. Tel: 0935 813054.

15 MAY

DUNSTABLE DOWNS RC 11th Annual National AR Car Boot Sale - Stockwood County Park, Luton. Near Jun 10 M1. 10am to 5pm. Talk-in on 2m. Attractions include admission to the Environmental Open Day, free entry to The Mossman Collection of Horse Drawn Vehicles, Craft Museum and carriage rides. Plot details on 0582 451057 (6-8pm only please). Pre booking for plots available until 8 May. Plots can be purchased on the day.

MID-ULSTER ARC PARKANAUR Rally - Silverwood Hotel, Lurgan. Starts at 12 noon. Trade stands, bring and buy, RSGB Book stand, refreshments available. Admission at least £1. Proceeds in aid of The Stanley Eakins Memorial Fund - to provide additional comforts for pupils at 'Pakanaur School for the Handicapped'. Details Bill, GI7BQH 0693 61298.

21/22 MAY

INTERNATIONAL KITE Festival - With kite aerials flown from the Wireless Museum at Puckpool Park, Seaview, Isle of Wight. Details from Douglas, G3KPO 0983 567665.

21 MAY

IPSWICH COMPUTER SHOW - Willis Corroon Sports & Social Club, The Street, Rushmere St Andrew, Ipswich. Doors open 10am - 4pm. Details 0473 272002 or Fax 0473 272008.

22 MAY

The 3rd GLOUCESTER Radio Rally - Naas Lane, Quedgeley, Glos. (Off the old Bristol Road, look for signs!!). Starts at 9am. Features car boot sale, small & large plots. Bring and buy stall, flea market stalls. Details Mike on 0452 503786.

The 37th NORTHERN Mobile Rally - The Flower Show Hall, on the Great Yorkshire Show Ground, Harrogate, North Yorkshire. Details Mike, G0MKK, Tel: 0423 507653 eve, G0MKK at GB7CYM.

29 MAY

EAST SUFFOLK WIRELESS REVIVAL (ESWR), East Anglia Radio & Computer Rally - The Maidenhall Sports Centre, Stoke Park High School, Ipswich, Suffolk. Attractions include, Novice stall, RAIBC, BYLARA and Raynet stands. And lots, lots more. Refreshments available. Admission £1.50, includes car parking. Talk-in on S22 by GB4SWR. (ESWR - a joint Felixstowe & DARS, Martlesham RS & Ipswich RC venture) Details 0394 271257.

PLYMOUTH RC Annual Radio Electronics Fair - ***VENUE CHANGE*** now Coombe Dean School, Charnhill Way, Elburton, Plymouth. Doors open 10.30am. Over 25 stalls selling electronic, computer and radio components, a large bring & buy stall. Bookstall. Grand raffle. Refreshments available through the day. Admission £1. Talk-in on S22. Details Derek, G7ESZ 0752 364150/257224.

27-30MAY(FRIDAY-MONDAY)

AMATEUR RADIO CARAVAN AND CAMPING CLUB - Late Spring Bank Holiday Rally, Mapledurham, near Caversham, Berkshire. Limited number of pitches available for visitors who might be intersted in combining camping with Amateur Radio. Details and booking forms from Rally Secretary, John, G4SGY, Tel: 0509 215487 or via packet G4SGY @ GB7AYI. Completed applications must be with the club no later than Saturday 21 May.

5 JUNE

BURNLEY Radio Rally - St Peter's C E Primary School, Church Street, Burnley. Doors open 10.30am till 4pm. Bring and buy, stalls and refreshment. Admission fifty pence. Details 0282 37533 or 451342.

SPALDING AR Exhibition & Rally - Springfields Exhibition Centre, Spalding, Lincs. Doors open 10am. Trade stands, car boot sales, restaurant, ample on-site parking. Details G4TWR 0775 722940 or G7CWM 0775 680447.

6 JUNE

D-DAY EXHIBITION - Details G3KPO, QTHR or 0983 567665.

12 JUNE

The 25th ELVASTON CASTLE National Radio Rally - Elvaston Castle Country Park, nr Derby. Details Ken, G3OCA, 0332 662818. Trader enquiries to Keith, G1ZLQ, 0332 662896.

ROYAL NAVAL ARS Annual Mobile Rally - The Sports Field HMS Collingwood, Fareham. Leave M27 at jn 11 and follow A27 to Fareham. Doors open 10am to 5pm. Features dozens of trade stands, a bring and buy sale, flea market, local repeater and radio clubs plus a large arts and crafts exhibition. Plus a range of entertainment for all the family. Refreshment available. Talk-in on 144 and 432MHz. Details Clive, G3YTQ 0705 3327621(daytime) 0329 234143(eve).

EVENTS DIARY

19 JUNE

The 5th BELFAST Radio Rally - The Chimney Corner Hotel, 630 Antrim Road, Glengormley. Starts at 12 noon. Features the usual trade stands, a bring and buy and other attractions. Entrance £1 and accompanied children fifty pence. Proceeds go to the RAIBC equipment fund of Northern Ireland. Enquiries/details 0232 471370.

BURY ST EDMUNDS ARS Car Boot Sale - Scout Pavilion Stanton (A143). Open 10am. Trade stands and Raynet supplies. Light refreshments available. Talk-in on S22 by G2JO. Free parking and admission. Details Jim, G0MEV 0359 50271.

DENBY DALE & DARS Annual Mobile Rally - Shelley High School, mid way between Huddersfield and Wakefield on B6116 road 2 miles fron A636, Wakefield/Holmfirth road. Doors open 11am. Features the usual traders, craft stalls, bring and buy and car boot sale. Refreshment available and talk-in on S22 and SU22. Details G4FSQ 0484 644827.

NEWBURY Car Boot Sale - Acland Hall, Cold Ash, Nr Thatcham, nr Newbury. 9am to 3pm set up after 8am. Plots £6. No advanced bookings. Free admission & parking. Talk in on S22 by GB4NBS. Details Richard, G3ZGC on 0635 46241.

25/26 JUNE

WREXHAM Amateur Radio Society Mobile Rally - at the Clwyd Veteran and Vintage Machienery Societys 18th Annual Steam Rally at the Plassey, Eyton, Near Wrexham, Clwyd. Features a Radio/electronic related 'Car Boot' Flea market. Provision has been made for trader to bring along a Caravan/Tent at a reduced camping rate. Details from Ian on 0978 845858.

26 JUNE

The 37th LONGLEAT Amateur Radio Rally - Longleat Park near Warminster, Wiltshire. Follow the signposts to "Longleat House" not the Safari Park. Features over 150 traders, covering communications, computers and associated peripherals, a bring and buy section and Craft fair. Refreshment will be available. Prices to both visitors & trade will be frozen at 1993 levels, £2.50 for adults, £1.50 for pensioners and fifty pence for children. For Campsite booking contact Longleat Caravan club tel: 0985 844663. Details Shaun, G8VPG on 0272 860422 (office hours), 0225 873098 (eve & weekends), FAX 0272 869387.

NORFOLK RAYNET BARFORD Rally - Village Hall and Playing Field, Barford, 7 miles west of Norwich on B1108. Starts 10am. Trade stands, refreshments, car boot pitches available. Book your pitch now, contact Bill, G4TWT, 0603 427008.

2/3 JULY

HAMFEST-UK - The County Showground, Weston Road, Stafford. Some 5 minutes from M6 jun 14. The new event for Amateur Radio, SWL and computer enthusiast. Features a large trade presence, lectures, bring and buy, special interest groups. Refreshment available. Talk-in on S22. Details 0923 893929.

3 JULY

YORK Radio Rally - Tattersall Building, York Racecourse, Knavesmire, York. Doors open 10.30am. Amateur radio, electronics and computers, Arts and craft. Admission £1. Refreshments, licenced bar and Cafe. Talk-in on S22. Details Dave, G7FGA 0904 790079.

9 JULY

CORNISH RAC Rally - Penair School, Truro, Cornwall. Doors open 10.30am. Features bring and buy, official Morse Test (via RSGB). Hot snacks, free parking and talk-in on S22. Details from Ted on 0872 222605 or Ken on 0209 821073.

9/10 JULY

THE VHF/UHF DX Convention - Organised by the Northern Lights. Features Lectures on Saturday and Sunday, VHF/UHF trade stands and computer software, also demonstrations. Refreshments. Details Tony, G4APA 0270 761805.

10 JULY

HORNCASTLE AR Electronics and Computer Fair - Venue is halt way between Lincoln and Skegness and signposted on the main roads from Boston, Louth, Skegness and Lincoln. Features many trade stands, a bring and buy. Refreshments available and talk-in on S22. Details from Tony, G6CZV 0507 522482 or G6CZV @ GB7LNX.

SUSSEX AR and Computer Fair - Brighton Racecourse, Sussex. Doors open 10.30am. Trade stands, covering most amateur radio and computer interests, plus a bring and buy stall. Refreshments available. Admission £1.50. Free car park and free minibus trips to Brighton beach. Details Ron, G8VEH, QTHR Tel: 0903 763978 or 0273 417756 office hours.

17 JULY

The 11th McMICHAEL Rally and Car Boot Sale - Haymill Youth and Community Centre, Burnham Lane, Slough, near Burnham railway station. Doors open 10.30am. Admission £1.50. Car boot sale (no advanced booking) is £7 per pitch on the day. Trade bookings contact Julian, G7JTV 0734 732059 Fax 0734 733721. General details contact Neil, G0SVN or Roy, G4XYN on 0628 25952.

RAIBC Romsey Picnic - Broadlands, Romsey, Hants. All members, families, friends and supporters welcome. Features a grand draw, junk sale, refreshments. Talk-in on S22. Details John, G4COM 0703 693017.

24 JULY

COLCHESTER Radio & Computer Rally - St Helena School, Sheepen Road, Colchester. Adjacent to the Colchester inner by-pass Avenue of Rememberance. Doors open 10am - 4pm. Wide range of radio and computer traders, amateur radio car bot sale and a bring and buy. Refreshments and licensed bar. RSGB Morse Test on Demand, but two passport size photographs must be produced. Admission £1. Ample free car parking and easy access for wheelchairs. Talk-in on S22. Details Frank, G3FIJ 0n 0206 851189.

FIRST HUMBER BRIDGE AR Rally - The Exhibition Centre, Freightliner Road, off the Clive Sullivan Way, Hull. Easy access one mile from the bridge, on site parking. Doors open 11am, 10.30am for disabled visitors. 2 large halls, with excellent access facilities for disabled visitors . Bring and buy, bar and refreshments. Talk-in on S22. Details & booking contact Roly, G0UKS on 0482 837042.

28-31 JULY(THURSDAY-SUNDAY)

AMSAT-UK Colloquium - The University of Surrey, Guildford. Details from Ron, G3AAJ on 081 989 6741.

31 JULY

RUGBY ATS 6th Annual Amateur Radio Rally - BP Truckstop on the A5, 3 miles east of Rugby and just 2.5 miles north-west from june 18 of the M1. Open from 10am, admission is £1 per car. Pitches are £7 pre-booked or £10 on the day. Refreshments available. Details Peter on 0455 552449 or Steve (for bookings) on 0788 824214.

7 AUGUST

RSGB WOBURN Rally - Details from Norman Miller, G3MVV, 0277 225563.

14 AUGUST

DERBY & DARS Annual Radio Rally - Littleover Community School, Pastures Hill, Littleover, Derby. Details Martin, G3SEJ 0332 556875.

FLIGHT REFUELLING ARS HAMFEST'94 - Flight Refuelling Sports Ground, Merley, Wimborne. Details Richard, G4VCQ 0202 691021.

21 AUGUST

5th GREAT EASTERN Rally - ***NEW DATE*** (organised by the Kings Lynn ARC) - Cattle Market, Hardwick Narrows, Kings Lynn. Details 0553 765614.

WEST MANCHESTER Radio Clubs "RED ROSE RALLY" - Details Dave, G1IOO 0204 24104(evenings only).

27-29 AUGUST(SATURDAY-MONDAY)

COMPUTER FAIR 1994, To include a Radio Rally & Electronic Fair - Walsall Airport, Aldridge, West Midlands. Details 0543 372807(after 5pm or anytime weekends).

28 AUGUST

THE EAST COAST Amateur Radio and Computer Rally - Clacton Leisure Centre, Vista Road, Clacton-on-Sea, Essex. Details 0473 272002 or Fax 0473 272008.

30th TORBAY Rally - Details John, G3YCH, QTHR 0803 842178.

29 AUGUST(MONDAY)

HUNTINGDONSHIRE ARS Annual Bank Holiday Monday Rally - Details David, G7DIU 0480 431333.

SCARBOROUGH Radio Electronics and Computer Fair - The Spa, South Foreshore, Scarborough. Details Ross, G4NZ, 0723 514767.

3 SEPTEMBER

ANNUAL WIGHT WIRELESS RALLY - Details G3KPO, QTHR or 0983 567665.

4 SEPTEMBER

BRISTOL Radio Rally (Incorporating Bristol Computer & Electronics Market) - Details G4YZR 0275 834282.

PRESTON Amateur Radio Society 26th Annual Rally - Details George 0772 718175 or Godfrey on 0772 253810.

TELFORD Radio Rally - Details 0743 249943.

VANGE Amateur Radio Society Rally - Details Stuart, G1VWB 0375 859632.

11 SEPTEMBER

BARTG Rally - Details Peter, G8VXY 021 453 2676.

13th LINCOLN Hamfest - Details Sue, (XYL G8VGF) 0522 525760.

25 SEPTEMBER

HARLOW Amateur Radio Rally - Details Mike, 0850 487863 or Ken 0279 426647(home).

THE THREE COUNTIES Rally - Malvern, Worcs. Details G4PQZ 0905 773181.

NORTH WAKEFIELD Radio Club Rally - Details G4RCG 0924 362144 or G0EVT 0924 825443.

PETERBOROUGH Radio & Electronics Society East of England Rally - Bookings and further details contact Ted, G0REM 0733 66471.

2 OCTOBER

BLACKWOOD & DARS Rally - Details Norman, GW0MAW 0495 227550.

GREAT LUMLEY AR & E S Radio Rally, Co Durham - Details Barry, G1JDP 091 388 5936.

7-9 OCTOBER(FRIDAY-SUNDAY)

RSGB INTERNATIONAL HF & IOTA CONVENTION and IOTA's 30th Birthday Party - Details G3NUG. Tel/fax 0442 62929.

9 OCTOBER

KIDDERMINSTER & DARS Rally - Details G8JTL 0384 894019, G4HFP 0299 823818 or G0RJP 0299 822206.

16 OCTOBER

HORNSEA ARC (East Yorkshire) Radio Rally - Details Duncan Heathershaw on 0964 532588.

21/22 OCTOBER(FRIDAY/SATURDAY)

LEICESTER AR Show - Granby Halls - Details Frank, G4PDZ 0533 871086.

5/6 NOVEMBER

NORTH WALES Radio & Electronics Show - Details Barrie, GW7EXH 0745 591704.

6 NOVEMBER

The 14th NORTH DEVON Rally - Details G8MXI, QTHR.

12 NOVEMBER(SATURDAY)

THE ALL MICRO Show - Details 0473 272002.

13 NOVEMBER

MARS-STOCKLAND Radio/Computer Rally - Details Norman, G8BHE 021 422 9787 or Peter, G6DRN 021 443 1189 evenings.

20 NOVEMBER

BISHOP AUCKLAND Radio & Computer Annual Rally - Details G0PRQ 0388 766264.

27 NOVEMBER

BRIDGEND & DARC Radio Rally - Details Mike, GW7NIS 0656 722199 or Don, GW3RVG 0656 860434.

WEST MANCHESTER Radio Clubs "WINTER RALLY" - Details G1IOO 0204 24104(evenings only).

11 DECEMBER

VERULAM CHRISTMAS Rally - (**NEW VENUE**) Watford Leisure Centre, Horseshoe Lane, Garston, Watford, Herts. Details from Walter, G3PMF on 0923 262180.

5 FEBRUARY 1995

SOUTH ESSEX ARS Radio Rally - Details 0268 693786 or 0268 755350.

GB CALLS

The list below was taken from the HQ computer on 5 April. These callsigns are valid for use from the date given but the period of operation may vary from 1-28 days.

5 APR
GB4SSC St Swithun's Church
GB4SSC St Swithun's Church

1 MAY
GB1NSG Newent Scout Group
GB2BMF Bocking Mayday Fayre
GB2GMM Guglielmo Marconi Memorial
GB500JC John Cabot
GB6HWM Herne Wind Mill

2 MAY
GB0AMC Ardenlea Marie Curie Centre
GB2LOW Low Power/Low Output Watts
GB2MAM Mosquito Aircraft Museum
GB2NCL North Carr Lightship

3 MAY
GB0IGB 1st Independent Guards Brigade

5 MAY
GB0CT Channel Tunnel
GB0DH Derian House

6 MAY
GB2WCC Watford Central Clubs

7 MAY
GB2PW Polegate Windmill
GB2LOW Low Power/Low Output Watts

8 MAY
GB0SND Special Needs Activities

13 MAY
GB2SEM Southern Electric Museum
GB5FDC Forest of Dean Cubs

14 MAY
GB0DH Derian House
GB0TWR Blackpool Tower Centenary
GB8RC Rockingham Castle

15 MAY
GB0BOF Blessing of the Fleet
GB0HSM High Salvington Mill

16 MAY
GB0BUF Grand Order of Buffaloes
GB4FMT First Morse Telegraph

18 MAY
GB0IFE Invasion Fortress Europe
GB0RNS Royal Naval Special

20 MAY
GB8WC Westminster College

21 MAY
GB0ADS Abraham Darby School
GB2AMF Astbury Mayday Festival
GB2BLE Bristol Lundy Expedition
GB4WMF Winterslow May Fair

22 MAY
GB800DON Doncaster 800 Festival

24 MAY
GB0FYD Fifty Years on (D Day)
GB4BPX Bletchley Park (Station) X

26 MAY
GB6TWS The Walthams Scouts
GB8SH Shiant Islands

27 MAY
GB5OD Force 'O' 'D' Day

28 MAY
GB4OH Oxburgh Hall
GB800DON Doncaster 800 Festival

30 MAY
GB2MAM Mosquito Aircraft Museum
GB4DD D Day

SILENT KEYS

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

2E1AGA	Mr A R Stephens	09.12.93
G0JUP	Mr A E G Taylor	21.02.94
G0KGG	Mr S Mosely	Jan 94
G0PVC	Mr N Cappelluto	Mar 94
G1IIV	Mr K W T Lock	25.02.94
G1XEE	Mr P Harris	
G2BVM	Mr K Pearce	22.03.94
G3BBZ	Mr S P Turner	13.02.94
G3HMT	Mr S R Richards	
G3JTT	Mr W R Thompson	05.12.93
G3LP	Mr N F O'Brien	24.02.94
G3NVY	Mr R E Dore	25 Dec 93
G3PEQ	Mr A T Campbell	09.11.93
G3RH	Mr R Hewson	26.02.94
G3RXJ	Mr E J Letts	29.11.93
G4AYG	Mr J Elsworthy	08.02.94
G4TYM	Mr N Holberton	11.02.94
G5ZA	Mr R T Wright	28.02.94
G6JXK	Mr J L Fellowes	20.08.93
G6MUK	Mr D J Jennings	25.02.94
G6SFD	Mr R P McAllister	
G6YTL	Mr J Stanford	19.01.94
G7DNN	Mr H Sharp	06.02.94'
G8LZ	Mr E J Bonner	27.01.94
G8UI	Mr W T Bassage	q11.02.94
GM0CPL	Mr J M Wight	
GM4BAF	Mr J Stepney	09.03.94
GW3RVF	Mr K Brown	

BEWARE!

Is that rig stolen?

Amateur radio equipment is being stolen in large quantities from the premises of distributors and retailers. Members are advised to take every precaution when purchasing any transmitters, receivers and accessories, new or 'secondhand', from sources other than the recognised dealers or trusted associates.

Should you be offered items with serial numbers printed below, or with the serial numbers removed or obliterated, please note the vendors particulars and report the incident to the Radio Society of Gt. Britain.

CHECK THE NUMBER BEFORE YOU BUY!

The following items have been reported as a result of recent burglaries as at 21st March 1994. The listings are in random numerical order and should be checked accordingly.

HF TRANSCEIVERS

Kenwood TS850S 4100200
Kenwood TS450S 41100440
Kenwood TS50S 41102153
Kenwood TS140 4040063
Icom IC728 004780
Icom IC707 001557
Icom IC735 041191
Tentec Scout 555 09A10523

HAND HELD TRANSCEIVERS

Kenwood TH22E 50600436
Kenwood TH28E 40706848
Kenwood TH48E 40701030
Kenwood TH26E 41100436
Kenwood TH78E 40703068
Icom ICW21E 001259
Icom ICA1E 001321
Icom IC21E 001418
Icom ICP2E 002197
Icom ICP2ET 011074
Yaesu FT530 2N060640
Yaesu FT26E 2C181998
Yaesu FT530 11080974
Alinco DJF1E 0009802
Alinco DJ180EB T009092

RECEIVERS

Kenwood R5000 41100089
Icom ICR7100 003528
Icom ICR72E 003010
Icom ICR1 072220
Bearcat UBC200XLT
Alinco DJX1 0009598
AOR AR1500EX 0025656

SCANNERS

Yupiteru VT125 21100161
Yupiteru VT225 20800102

ACCESSORIES

Icom PWR Supply IC-PS 55 015574
Kenwood Antenna Tuner AT50 41000347
Kenwood Charger BC15A 40100066
Kenwood Batteries Nicads x 4

PROFESSIONAL HAND HELD TRANSCEIVERS

Kenwood TK-340 41200153
Kenwood TK-340 50100237

YAESU

FT-840's 3L041273 to 3L041276
3L041233 to 3L041236
3L040947 to 3L040948
FT-5200 1M130492 to 1M130500
FT-416 3H320331-3H320335
FT-816 3H190546
FT-990DC 3H250148
FT-11R's 3K021941 to 3K021960
3K0211366
3K021370 to 3K021380

ALINCO

DR-599 s/n 0001346 d/band mobile
DJ-S1E s/n 0000995 2mtr h/held
DJ-F1E s/n 0009540 2mtr h/held
DJ-F1E s/n 0009412 2mtr h/held
DJ-F4E s/n 0000617 70cms h/held
DJ-F4E s/n 0000781 70cms h/held
DJ-X1 s/n 0020453 scanner
DJ-X1D s/n 0000944 scanner
DJ-500 s/n 000533 d/band h/held
DJ-580 s/n 0002802 d/band h/held

AOR

AR 2000 s/n 0018271 scanner
AR1500 s/n 0016856 scanner
AR1500 s/n 0019722 scanner
AR3000A 034921
AR2800 11245
AR2000 17609

KENPRO

KT22 s/n 100449 2mtr h/held
KT22 s/n 100978 2mtr h/held
KT44 s/n 100114 70cms h/held
KT44 s/n 100379 70cms h/held

KENWOOD

TH-77 s/n not known d/band h/held
TH-78 s/n 40703045 d/band h/held

ICOM

IC-W2E s/n 951003251 d/band h/held

YAESU

FT-209RH NSN 2mtr h/held
FT-790R NSN 70cms multimode

YUPITERU

MVT 7000 s/n 20703615 scanner
MVT 7000 s/n 20701803 scanner
VT 225 s/n 20800029 air band scanner
VT 225 s/n 20300383 air band scanner
VT 125 Mk2 s/n 10400166 air band scanner
VT 125 Mk2 s/n 21100496 air band scanner
VT 150 s/n 10900145 marine scanner
VT-225 11201652
MVT-6000 9080489
MVT-7100 30400986

ICOM

IC-R1 890013168
IC-W2E 951001697
IC-X2E 935000007
IC-2SET 835001106
IC-475E 585001122
IC-R71E 22003635
IC-3220E 894001126
IC-R7100 978001093
IC-229E 10396005721
IC-229H 10152006032
IC-229H 10152006034
IC-P4E 10335001008
IC-SP20 70311006131
IC-3230H 10410001643
IC-R1 890032313
IC-R1 10199068847
IC-R1 10199068849
IC-R72E 892001056
IC-729 10388001079
IC-729 10388001086
IC-R100 888005751
IC-229H 10153021843
IC-2SRE 10284002065
IC-P2ET 10319001118
IC-2SE 1023209592
IC-2SE 1023019595
IC-3210 707001454
IC-4SE 802001021
IC-2SET 835001082
IC-W21E 10460001218

KANTRONICS

KAM 11K01004456

MISCELLANEOUS

HT106 6mtr SSB TX/RX 7100355/7100356
AR3000A receiver 34847
AR1500EX handheld scanner 32195
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FT26 Yaesu h/held TX/RX (IG064794)
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AR1500 s/n 0015843
200XLT
RL102 s/n 033842, 033880, 033858,
033983, 033846
FT530 B3 3F160336, B3M 3F160309,
229, 328, 367, 307
TH28E s/n 40900045
TH78E s/n 40900453
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RNB111
RNB112
MVT7100 21101622
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MH12A2B MIC
FNB14 BATT
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RNB111 BATT

NB!

The location of the above properties is urgently sought. Please report any relevant information to the Society. All such reports will be treated in strict confidence. There will be no publication of your reports.

Contact the General Manager

RADIO SOCIETY OF GREAT BRITAIN

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TEL 0707 659015 FAX 0707 645105

The LAST WORD

COMMERCIAL LIFE SAVER

I wholeheartedly agree with G4GSA's letter (*The Last Word*, April 94) regarding homebrew contests.

But, and it's a big but, everyone and his auntie knows that building single band transceivers has never been easier but the trouble is the majority of people consider the exercise 'unclean'.

Buying fun is far better and easier (for most people) than making it. Yaesu, along with other manufacturers discovered that amazing fact years ago and were quick to exploit it, right? Besides, by way of illustration, how many people build kit-cars? Not many! They'd rather purchase a ready built one. And who can blame them? On a more mundane level, how many radio amateurs (or anyone else for that matter) bake their own bread? I don't. No, more enlightened souls trot down to the nearest Tesco and purchase a plastic wrapped Hovis. Or, as is the case with radio amateurs, buy a plastic wrapped transceiver.

Don't get me wrong, I prefer home construction - when I get the time. But I believe all those people who constantly sing the praises of 'home-brew' should ask themselves: where would amateur radio be today without the introduction of commercially available rigs? I know one thing, there certainly wouldn't be 50,000 plus licensed radio amateurs in the UK. And don't forget all the employment that commercially produced transceivers gives to thousands of people world-wide.

No, those who reject the commercialism of our hobby need to remember that they owe a huge debt of gratitude to others within our ranks who have chosen the right to embrace consumerism and instead buy cartloads of Japanese 'black-boxes'. Because, like it or not, they've unwittingly kept our hobby alive and kicking. I salute them!

Ray J Howes G4OWY

G7PMR TO THE RESCUE

During a trip down to Birmingham a few weeks ago Baz, G0RBJ, and myself had an experience not to be repeated, when the engine in the car caught fire whilst travelling down the motorway. Being a chap who thinks ahead, G0RBJ has always carried a fire extinguisher in the vehicle which was put into use with some dispatch and the fire was soon out. Unfortunately this left us unable to carry on as the ignition leads had been burnt out. As Baz and I are somewhat disabled, neither of us being able to walk far, this left us way up the creek without a paddle.

Luckily I had my VHF handheld with me and I called for help on the GB3VT Repeater. We were answered by Bill, G7PMR, who took the trouble to telephone the breakdown people and we only waited about 35 minutes before the tow truck was with us and within a couple of hours we were on the road again to complete the journey.

How many amateurs who go mobile think to carry a fire extinguisher in the car? And please do not decry the use of VHF and the two metre band in general; this country has a good coverage of repeaters both on VHF and UHF so you are only a CQ away from help, be it for information or assistance.

The fire extinguisher certainly paid for itself - it's cheaper than a car, and the handheld has yet again come in for what it was bought for - a good means of portable communication. As an ex-lifeboat crew member I am well aware of the need for radio communication both ashore and afloat. When you need it you need it in a hurry; it's no good if you have left the handheld in the shack.

Bill Cross, G0ELZ and Baz Evans, G0RBJ

[Perhaps that answers the question in G0DPT's letter above - Ed]

FIGHT AGAINST CRIME

I have been worried recently by the ever-increasing number of amateurs who announce quite openly their private travel/holiday plans for the immediate future.

One two-letter G station was heard recently on 80m SSB giving what appeared to be quite specific dates and times for his forthcoming holiday when he would be away from his home for quite a long period of time.

It does not take too much imagination to realise that this is a very risky and dangerous practice and although it is certain that most sensible people make the necessary security arrangements for their property 'in absentia', nevertheless addresses are available in call books and amateur aerials are visible in many cases to casual passers-by.

Much amateur radio traffic these days is conducted on the assumption that amateur radio was specifically invented to replace the telephone but what is forgotten is that the telephone is generally more secure.

M C Pavely G3GWD

HANDY SIZE

Last weekend I visited the RSGB London Amateur Radio and Computer Show and was pleased to meet many friends. While looking at the manufacturers' stands, my wife asked me why they were producing handheld transceivers that were so small. I really could not give her a satisfactory answer. Why are they so small?

As a member of a radio club long before I gained a licence, I remember going out portable as being almost a rucksack event. Then along came portable transceivers such as the Icom IC-2E and I remember amateurs saying at the time that they were too small. However, in practice, portables of that size really are useful and the numbers sold confirm that.

But what of the 'tinies' of today? What place do they hold in the hobby? At the stands, I asked how long the batteries lasted on a single charge and got a reply, on average of between three and four hours on receive. To what does that equate in transmission time? I can understand that having a tiny transceiver is useful for a day on your feet, but if you have to take quantities of charged spare batteries in your pockets, the larger transceiver is better to begin with. I have also learnt that spare batteries are not cheap.

Is technology going so far as to be heading towards transceivers that are designed as implants? Or perhaps, like the disposable camera market, the prices will plummet and we will have a twenty-QSO transceiver that you simply bin and replace.

I admit that these comments are facetious and in reality I am impressed at today's technology. But I do question the validity of such equipment. Again sales will tell - but what do others think?

M C Smith G0DPT

[Turn to page 49 for our review of the tiny FT-11R and FT-41R transceivers - Ed]

THANKS WHERE IT'S DUE

On behalf of myself and fellow amateurs, I put pen to paper to express thanks to Mike, GM0JKF. Mike has had to stop reading the *GB2RS* news bulletin on 2 metres on Sundays, due to a change in work pattern.

He carried out his task admirably and after five years has been missed terribly. My only wish is that someone will come forward and take over this worthwhile task.

Not only did he read the GB2RS news, he also controlled a net after the news for comments on the news, and if anyone required information or help with anything, he was always ready to oblige. He also sent slow Morse for two-and-a-half years, and anyone wishing to could participate. Thank you very much, Mike.

Caroline Pirie GM0TCU

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.

NO SUBTERFUGE HERE

I read with some measure of disbelief the letter from G3FDW (*The Last Word*, March) alleging all manner of subterfuge, illegal practices, and pure chicanery by the rich members of the 'London Wireless Society' designed to keep the impecunious northern members in their appropriate place.

Over a period of seven years, we - G0CLP (formerly G5ECD) and G4BZP - have entered eighteen VHF/UHF contests and have achieved six first places, eight second places, three third places and one fifth place. Most of these successes have been in the low power single operator categories, for reasons which will be obvious to those who read further.

Let me outline for the benefit of your readers the modus operandi: Operation is from a 2000ft mountain, and involves a climb of 1900ft carrying a bivouac style tent, transceiver, mast, antenna, food, stove, sleeping bag, etc, and one fully-charged car battery. Distance covered is six miles, and all of it is on foot with the equipment in a rucksack.

My equipment list is as follows Transceiver, TR7010 rescued from bring and buy (£55); J-Beam aluminium mast with additional guys (£25); Much cannibalised six or eight element Yagi antenna (£30.00); CB type reflectometer from flea market (£8); 30ft of low-loss coax (£20); Car battery borrowed leaving XYL immobile (No cost); Mountain equipment from other hobby (No cost).

Ironically the location (IO84IG) is only 17.5 miles from the QTH of G3FDW. Proof positive that success from the north of England is not difficult.

Should any amateur be willing to put in the effort, a place in the first half dozen of any UHF/VHF contest can be virtually guaranteed. As I am 61 years of age, these efforts are not over exacting. Dedication, planning and a determination to succeed are all that is necessary. This applies to whatever section of a contest the competitor takes part in.

As to the laws of physics; the horizon is 1.42 times the square root of the height in feet above sea level. Hence the horizon is for us at sixty miles, which in practice means over 100 miles under flat band conditions. Add to that, zero electrical noise and no neighbours and we have constructed an advantage. Each successful competitor has to develop such an advantage. In all cases it means hard work, planning, dedication and thought. We do not wish to join the large groups but I know just how much effort they've put in to gain their place. As a consequence they have my admiration.

So, G3FDW, give me adequate notice, transport yourself from IO84NE to IO84IG, allow me to show you the ropes, and I will 'guarantee' a place in the first ten of the appropriate section of a VHF/UHF contest, and put very favourable odds on gaining a place in the first three. That would be a real conspiracy to show the London Wireless Society that things can still happen in remote areas.

F L Partington G4BZP, and C L Partington G0CLP

REALLY GOOD READ

Well done all concerned. April's *Radcom* was the best edition I have read for many months. G2AJV's article on the toroidal aerial (with which I have hands-on experience, but that's another story!) had my brain in top gear, and John Morris's thoughts on home-brewing happen to coincide with my own. Add to this yet another excellent *Technical Topics* and a larger than usual member's letters page and we have the recipe for a really good read.

This collection of thought-provoking and challenging articles is in itself worth a year's RSGB membership. As if these weren't enough, we were treated to *Eurotek*'s novel voice analyzer and the 'MSF Locked Frequency Reference' from Andy Talbot, G4JNT. I normally cut out and keep any interesting or useful bits of *RadCom*, but this month I'll be keeping the entire magazine. This is the kind of *RadCom* that I want to read - what do others think?

A J Howlett G1HBE

PARISH COUNCIL CENTENARY

It is suggested that any Special Event Stations set up to celebrate the Centenary of the 1894 Act enabling Parish Councils could exchange messages on 3680MHz at 12 noon on Sunday 26 June. Meopham, Kent will be operating GB2MPC and hope to send greetings from the Council Chairman.

Bob Bastow G3BAC

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Old style available only in green, limited stock.
Normally £5.10. Now only **£2.75**

RSGB SUNDRIES
Pencil, bug, bookmark, keyring – post free.
All four for £1.50

Car Stickers

Brighten up your rear window! Styles are: 'I Love Amateur Radio', 'I'm monitoring .5, are you?' (2 colours), and 'I'm on the air with amateur radio' (4 colours). **(£0.99) £0.84**

There is also an RSGB diamond car sticker. (Members only). **£0.84**

EMC Filters

FERRITE RING TOROID
Pack of 2. **(£4.25) £3.63**
Size: outer 37mm, inner 25mm approx.
(Postage pair: UK 50p, Overseas: 75p)

FILTERS
Filter 1 - Braid Breaker. Filter 2 - High Pass for FM Broadcast Band 2. Filter 3 - High Pass for UHF TV. Filter 4 - Notch Tuned to 145MHz. Filter 5 - Notch Tuned to 435MHz. Filter 6 - Notch Tuned to 50MHz. Filter 7 - Notch Tuned to 70MHz. Filter 10 - Notch Tuned to 28MHz. Filter 15 - Notch Tuned to 21MHz. Filter 20 - Notch Tuned to 14MHz.
Each: **(£8.50) £7.23**
(Postage each: UK 60p, Overseas: £1.50)

Filter 8 - Six Section for UHF TV.
(£21.50) £18.28
(Postage each: UK 50p, Overseas: £1.00)

Filters are despatched post free if ordered with a book

REMEMBER TO ADD POSTAGE TO ALL PURCHASES

HOW TO ORDER

PRICES. Retail prices are in (brackets) followed by members' discounted prices. If you are a member, please quote your call sign or RS number when ordering. All prices include VAT (where applicable) and are subject to change without notice. Except where otherwise stated, please add postage as follows.

POST AND PACKING: Please add £1.00 (overseas £1.75) for one item and £2.00 (overseas £3.50) for two items or more. For orders over £40 post and packing is free. Overseas deliveries are by surface mail.

Newsletter and magazine prices include postage. Overseas Airmail and first class UK post prices are available on request.

AVAILABILITY. Goods are available over the counter at RSGB Headquarters 9.15am to 5.15pm, Monday to Friday. However, you are strongly advised to confirm availability of goods by telephone before visiting Headquarters.

PAYMENT. Payment may be made by post, enclosing a cheque or postal order. These should be crossed and made payable to 'Radio Society of Great Britain'. If sending cash please use registered post. We accept Visa and Access (Mastercharge) cards and our telephone number for credit-card orders is (0707) 659015. Our Giro account number is 533 5256.

DELIVERY. Goods will be despatched to UK destinations by 2nd class letter post or parcel post, or surface mail to overseas destinations. Please allow 28 days for delivery.

ORDER FROM: **RSGB SALES (CWO)**
Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE

Access VISA **plus AMEX & DINERS CLUB**

Credit card hotline: 0707 659015
Or use our fax: 0707 645105

CLASSIFIED ADVERTISEMENTS

Classified advertisements 55p per word (VAT incl) minimum 14 words (£7.70). Please write clearly. No responsibility accepted for errors. Latest date for acceptance — 5 weeks before 1st of issue month.

All classified advertisements MUST be prepaid.

NB: CHEQUES SHOULD BE MADE PAYABLE TO RSGB.

Copy and remittance to: **Victor Brand Associates Ltd, 'West Barn', Low Common, Bunwell, Norwich, Norfolk, NR16 1SY.**

NB. Members' Ads must be sent to "Members' Ads," RSGB Hq.

FOR SALE

MARCH MAYOTTE DX'PEDITION, FH/DJ2BW, FH/DFOPG, and others used Samson ETM-9C microprocessor memory keyers. Why not you? S.A.E. details all models. G5BM. QTHR. (0531-820960).

G4TJB QSL CARDS, CARDS printed to your specifications, send large S.A.E. for samples and full product list. Unit 6, Worle Industrial Centre, Coker Road, Worle, Weston-super-Mare, BS22 0BX. Tel: (0934) 512757, (0850) 707257, Fax (0934) 512757.

CUSTOM DRAWN QSLs etc to your instructions £12.99. GW3COI QTHR Abersoch 712675. SAE samples.

YAESU OR ICOM? FT840 (now £769 cash) is terrific, but IC728 is even better (sold one to son-in-law!). Switchable pre amp, AM filter & variable selectivity — not just IF shift — cash/cheque £875. I/C737 13.5v base station with key pad entry and an auto ATU that actually works! Cash/cheque £1,349. FT990, best rig Yaesu have ever made since 101ZD? Basic DC version with good auto ATU. Cash/Cheque £1,660. AC version + CW filter, £1,919. Keen prices on Yaesu & Icom see below...

COUNTER OFFERS. SAJE 400MHz counter (was £105) £79 pp, 1300MHz (was £129) £99 pp. Bench model 1300MHz (was £175) £129 pp cash/cheque. Holdings Amateur Electronics, (G3LLL), 45 Johnston Street, Blackburn BB2 1EF (0254 59595). Normally open Tues, Wed, Fri & Sat. Lunch 12-1.30 pm but phone and check. (Company est 1953).

QSLS 1000 £27.50 (SWLS. Logos. Colour cards. Stamps. Patches — S.A.S.E. for samples) Currie, 87 Derwent St, Consett, DH8 8LT.

"RAYNET" YELLOW REFLECTIVE TABARDS with "RAYNET". Medium £10.50, Large £11.00, XLarge £11.50. "RAYNET CONTROLLER" 50p extra.- EPSON PX4+ lap top computer, built-in printer, charger Eprom for packet £46.50 inc pp. Nonreversible battery connectors line/panel mounting (10 pairs/pack) £6.50. Mike Watson G8CPH, Ipswich (0473) 831448.

MOSLEY ANTENNAE — All the famous British Manufactured Antennae, direct from us including spares/replacements. Mustang, Elan, TA-33Jnr etc. Full details shown in our Handbook, price £1.25 refunded upon purchase of Antennae, Mosley Electronics, 196 Norwich Road, New Costessey, Norwich NR55 0EX (Administrative address only).

G2DYM CUSTOM BUILT AERIALS, trap-dipoles, anti-TVI, anti-interference, multiband, baluns, ATUs, traps, parts: Data 36p sae, aerial guide £1. Reconditioned HF/VHF, Kenwood, Yaesu, Icom transceivers, receivers, ATUs. G2DYM, Uplowman, Devon EX16 7PH. Phone 03986-215 anytime.

QSL CARDS. Gloss or tinted cards. SAE for samples to Twrog Press, Penybont, Gellilydan, Blaenau, Ffestiniog, Gwynedd LL41 4P.

ALUMINIUM TUBE. Heavy-duty (scaffold) tube approx. dimensions 20' long, 2" dia, 11/64" (4.5mm) wall thickness. 20' and 10' lengths available @ £1.80 + VAT per ft. C.W.O. Rusper Hire (Crawley) 0293 87 1621 office hours only.

SOLAR/WIND POWER. All sizes and types available. For new catalogue, info, prices send £1 or 4 x 1st class stamps to Keysolar Systems (GW4IED), 4 Glanmor Cres, Newport, Gwent, NP9 8AX.

QSL CARDS — low cost, quick delivery, superior designs, quality guaranteed, personal designs our speciality. L.S.A.E. for samples: The Standfast Press, 5 South Drive, Inskip, Preston PR4 0UT.

AMIDON/MICROMETALS TOROIDAL CORES, Ferrite, Beads, Rods etc. Send 50p for catalogue. Ferromagnetics, P.O. Box 577, Mold, Clwyd, N.Wales CH7 1AH.

QSL. SWLS ECONOMY CARDS. Very low prices, quick delivery. Sample enquiry to: G3ETU, 34 Park Lane Court, Salford, Manchester M7 4LP. 061-792 9144.

DIY Z MATCH ATU 80 to 10 BFO and other radio projects. SAE Rylands, 39 Parkside Avenue, Southampton SO1 9AF.

LANDWEHR VHF/UHF MASTHEAD PREAMPLIFIERS 2 metre 145mas £147 and 70cm 435ma £152. Post & packing £4. Write or phone for leaflet. Qualitas Radio, 23 Dark Lane, Hollywood, Birmingham B47 5BS, Tel: 021-430 7267.

PMR RIGS. Handhelds, mobiles, basestations, chargers, nicads. Lowband, highband, UHF, FM, AM. 0435 830888.

OSCILLOSCOPE HAMEG HM203 dual trace DC-20MHz, recent overhaul and calibration by Hameg, excellent condition, £195. (0302) 538683 (Doncaster).

RSGB AMATEUR RADIO INSURANCE SCHEME

"ALL RISKS" INSURANCE for portable/mobile/base station amateur radio and ancillary equipment. A service for RSGB members only. Also public liability and equipment insurance for affiliated clubs and societies. Details and leaflets from Jennifer Lawson, Amateur Radio Insurance Services Ltd, Shepheards Hurst, Green Lane, Outwood, Surrey RH1 5QS. Tel: 034-284-4000. Fax: 034-284-4554.

COMPUTER SOFTWARE HARDWARE

BRAND NEW FULLY CONFIGURED PC COMPATIBLES. For example: Intel 486SX in Mini tower, Vesa Local Bus, 4Mb Ram, 256k Cache, 250Mb IDE HD, 3.5" 1.44Mb FDD, Super I/O 2S/1P/1G, 1Mb SVGA Local Bus Graphics, SVGA Non Int low radiation. 28 dot pitch monitor, DOS V6.2 windows v3.1. 1 year warranty. Unbeatable price £1,195. Including VAT & delivery!!! Or phone for your personal configuration. Call Paul, G3PCT, at Personal Computer Technology. Tel: 0245 321086.

G4UXD'S MORSE TUTOR/PRACTICE See Feb Novice News. IBM-PCs, BBCs. Random everything! Adjustable speed, delay, letter frequency; 100 tests, attach your key. Novice/Standard modes, £9.50. SAE details/free trial. D. Brandon, 1 Woodlands Rd, Chester CH4 8LB.

G4BMK PACTOR — See display advert this issue. Grosvenor Software, 2 Beacon Close, Seaford, Sussex.

SUPER-DUPER, THE PC CONTEST LOGGING PROGRAM for RSGB and international HF Contests. Attention clubs — it's ideal for NFD. "Highly recommended" — RadCom September 1993, £25.00. Paul O'Kane EI5DI, 36 Coolkill, Sandyford, Dublin 18. (01 0353 1295 3668).

G4TYF LOGS, PC compatible, Amiga, Commodore, BBC. Try before you buy. SAE for free demo disk. State size. 64 Gurney Valley, Bishop Auckland DL14 8RW. 0388 607500.

MORSE PRACTICE IBM PC compatibles. Adjustable wpm/character speed. Random letters/number groups (or mixed). Tests from disk. Key morse from keyboard or attach key. Dual Media, Manual, £10. CompRad Limited, PO Box 64, Wokingham RG11 3YY. Tel/Fax 0734 733214.

NEW!! SHACKLOG4 *the* PC logging system. Real time and post event QSO logging. QSL labels. Database analysis, reports, import, packet terminal etc. Optional IOTA database (G3KMA). Plus lots more!! Still only £27.50!! SASE (+disk for demo copy) for full details. G3PMR, 30 West Street, Gt Gransden, Sandy, SG19 3AU. 0767 677913.

DX-PREDICT PC PROPAGATION PROGRAM. Greyline, LUF, MUF, and much more for £3.55. Cheques to Steve Nichols, 4 Suffield Close, Cringleford, Norwich, NR4 6UB.

HOLIDAY ACCOMMODATION

FLYING FROM GATWICK? Stay at Mill Lodge Guest House. 4 minutes from airport. Transport available. Telephone (0293) 771170.

NORTH WALES. Elevated site, B&B, caravan, bunkhouse, camping, open all year, use of shack. "Tynrhos", Mynytho, Pwllheli, LL53 7PS, (0758) 740712.

CORNWALL, NEAR CRACKINGTON HAVEN. Luxury flatlet leading into 1.5 acre grounds, suit couple, also luxury family caravan. Dogs welcome. Use of aerials. Brochure 0566 781493.

SOUTH DEVON. B&B by the water's edge. Tor Haven Hotel (G0JFM), Brixham, Torbay. 0803 882281.

FERNDOWN, DORSET. 2 bedroomed bungalow in quiet avenue, situated 8 miles from Bournemouth, Poole and New Forest. For details phone 0768 65091 or 0202 873895.

MISCELLANEOUS

COURSE FOR CITY & GUILDS, Radio Amateurs Examination. Pass this important examination and obtain your licence, with an RRC Home Study Course. For details of this and other courses (GCSE, career and professional examinations, etc) write or phone — THE RAPID RESULTS COLLEGE, Dept JT108, Tuition House, London SW19 4DS. Tel: 081-947 7272 (9am-5pm) or use our 24hr answerphone service 081-946 1102 quoting JT108

VIDEO TAPE CONVERSIONS to and from all modes N.T.S.C.; S.E.C.A.M.; P.A.L.N.; P.A.L.M. Digital processing. Fast and economical service. Also 'cine' conversions. Phone G4WMP 0932 846139.

PATENTS, TRADE MARKS, DESIGNS, COPYRIGHT. For professional advice contact KINGS PATENT AGENCY LTD (Est 1886 by Benj. T. King). Dir J.B. King (G5TA mem. RSGB). Regd. Patent and Trade Mark Agent. Information, fees and literature on request. Phone 071-248 6161. Fax: 071-831 0926. 73 Farringdon Road, London EC1M 3JB.

OLD STORNO EQUIPMENT WANTED. Have you any old Storno radios lying unused? Best prices paid. Call Richard Lane on 0202 673636.

MOBILE PHONES. From FOC, free re-connections, all makes/models. Call G7HRH, 0532 666066, mobile 0831 578314.

ATTENTION ALL OWNERS OF MANSON EP925 POWER SUPPLIES

If you have purchased a Manson EP925 25A power supply that has a serial number **below 9251781** then it is possible that the outer metal case may not be grounded.

On units prior to this serial number, the manufacturers connected the chassis to ground via one of the mains transformer mounting screws. In some cases it has been found that this method of connection is not adequate due to the paint on the outer case acting as an insulator.

If you have one of these units, a simple DC continuity check between the ground wire of the AC mains lead and the metal case of the power supply should reveal whether your unit has this problem. If it has, or if you are in any doubt, then please contact either the dealer where you purchased the unit or the importers at the address below for free details of the simple modification required.

If you do not wish to carry out the check or the modification yourself, it can be carried out free of charge by your dealer or the importer.

Lowe Electronics Ltd, Chesterfield Road, Matlock, Derbyshire DE4 5LE.

NEW DEVELOPMENTS FROM G3PCJ

- **40m YEOVIL** converter — new or retrofit — TCVR now does CW & SSB on 20, 40 & 80m **£25**
- **DIGITAL COUNTER** — 5 digit MHz & KHz to 60+ MHz — 2 channels, add or subtract. For DC or Superhet rigs (any IF) or as test gear **£49**
- **TINY TIM** — complete simple 80m phone TVCR **£75**
- **CONSTRUCTION CLUB** for kit stage payments and HOT IRON newsletter **£5**

SAE for details to:-

WALFORD ELECTRONICS, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ. Tel: 0458 241224

ADVERTISERS INDEX

NEXT COPY DATE

The display advertisement copy date for our July 1994 issue will be **11th May, 1994**

NOW! Icom have *extended* their mobile range so that you can too

IC-820: •Compact size but small enough for mobile and portable operations •data jack for 9600bps for PACKET •New DDS for 1Hz resolution •satellite functions, normal and reverse tracking, doppler compensation •10 satellite memories •FM, USB/LSB, CW,CW-N. **IC-2700H:** Detachable front panel •Independent switches and controls for each band •CTCSS tone scan with UT84 •simultaneous V/V or U/U receive •infra-red remote from optional HM90. **IC-281H:** •additional receive on UHF •data jack for 9600bps for PACKET •60 memory channels with auto-advance, 10 scratch-pad memories •CTCSS tone scan with UT85 accessory •50 watt O/P switchable. **IC-2340H:** Independent switches and controls for each band • one-push-action switches •CTCSS tone scan with UT81 •110 memories (50 regular, 2 scratch, 2 scan edge, 1 call per band) •built-in duplexer and loads more.

IC-820 VHF/UHF Dualband Multimode Transceiver - *it's big, but not too big!*

NEW!

IC-2700H 2m/70cm Mobile Transceiver - *it's small, but not too small!*

IC-281H VHF FM Mobile Transceiver - *a new look from Icom.*

IC-2340H 2m/70cm Dualband FM Mobile Transceiver - *keep on the move with an Icom.*

ICOM

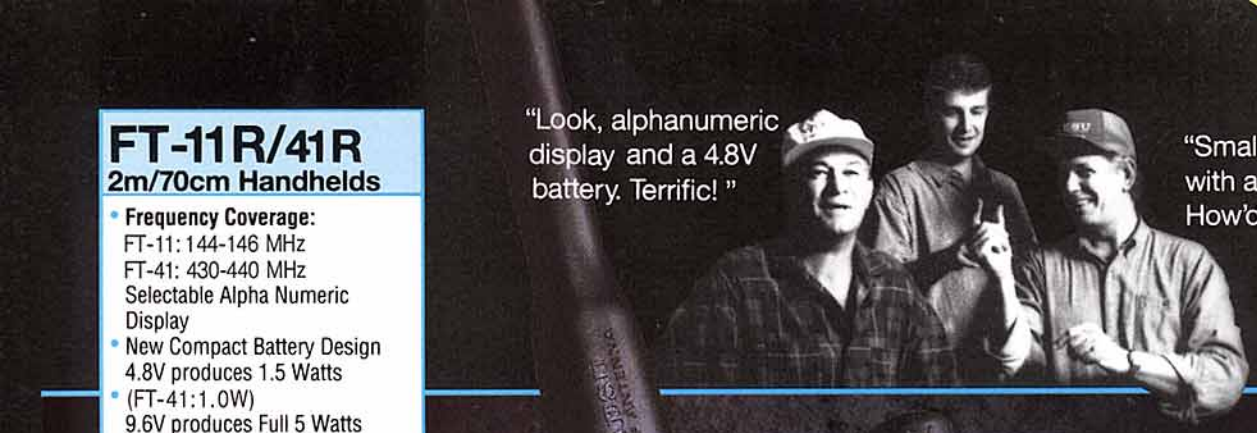
Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD
Telephone: 0227 743001 Fax: 0227 741742

NEW!

"Look, alphanumeric display and a 4.8V battery. Terrific!"

"Small and thin – with a full sized keypad! How'd they do that?"

"Yaesu did it again!"



FT-11R/41R
2m/70cm Handhelds

- **Frequency Coverage:**
  FT-11: 144-146 MHz
  FT-41: 430-440 MHz
  Selectable Alpha Numeric Display
- New Compact Battery Design
  4.8V produces 1.5 Watts
- (FT-41:1.0W)
  9.6V produces Full 5 Watts
  150 Memory Channels
- (75 when Alpha Numeric)
  AM "Aircraft" Receive
- (110-136 MHz)
  Small Compact Size w/ Easy
- Operation (measures only:
  102(H)×57(W)×25.5(D)mm)
  Rx/Tx Battery Savers
- High-efficiency MOS FET Power
- Module
  Large Back-Lit Keypad and
- Display
  Up/Down Volume/Squelch
- Controls
  Built-in DTMF Paging/Coded
- Squelch
  Automatic Power Off (APO)
- **Accessories:**
- **FNB-31** 4.8V, 600 mAh Battery
  FNB-33 4.8V, 1200 mAh Battery
  FNB-38 9.6V, 600 mAh Battery
  FBA-14 6 AA Size Battery Case
  FTS-26 CTCSS Decode Unit
  NC-50 Dual Slot 1-Hour Desk Charger
  CA-10 Charge Adapter (required w/ NC-50)

Contact your Dealer for full details.

NEW Alphanumeric Display
First time for Yaesu HT Full function LCD combines letters and numbers.

NEW Up/Down Thumb Control
with Volume and Squelch Bar Graph. No other radio has this. Back lit, too!

NEW Compact Battery Design
4.8V gets you 1.5 Watts. A first for amateur radio. (FT-41: 1.0W)

Get a grip on this!

World's smallest size HT with a full sized keypad
Measures only: 102(H)×57(W)×25.5(D)mm

"Small" is relative, isn't it? It could mean size – which in this case it does. And, it could mean "reduced", which it doesn't! Nothing missing from the hot new FT-11R HT from Yaesu except bulk! You're going to wonder just how all the features of this full-function radio fit in. Until you remember Yaesu pioneered 2-way radio micro technology.

To see what this really means to you, check out all the new features. Like the alphanumeric display. This Yaesu HT first, lets you tag your favorite frequency by name, call sign or number. Or, the new "voltage stingy" battery. It's an industry first for amateur radio. Smaller and compact, the 4.8V battery gives you 1.5 watts on TX (FT-41: 1.0W). And, if that's not enough, there's an optional drop in, dash mount battery charger.

You see it's not a small time performer. Just small sized. The FT-11R. Another small example of Yaesu superiority. See your dealer today!

YAESU

Performance without compromise.℠

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