Radio Communication

March 1989

BUY OR BUILD?

Review: Kenwood TS-680S Transceiver

G3TXQ Portable Transceiver

KENWOOD

TS-790E – Just when you thought it was impossible

Impossible to design and produce a multi band VHF/UHF transceiver which would render all others obsolete? But this is what Kenwood have done with the TS-790E, in the same way that the TS-940S set new standards which have not yet been beaten, or the TR-751E 2 metre multimode, which is still without any serious competition. Kenwood have the magic touch which gives the customer what the customer wants, in a package which is easy to use, performs like a dream, and is simply a delight to own.

The TS-790E gives you all-mode operation on 2 metres, 70 centimetres, and with an optional internally fitted section adds 23 centimetres as well. Power output is 45 watts on 2, 40 watts on 70, and 10 watts on 23; and there is little doubt that the receiver performance will better any previous transceiver.

It is fashionable in some quarters to sneer at the microprocessor, but Kenwood write the software in their processors with the aim of giving the user complete control over a wide range of facilities and not confusing the issue. In this respect, the TS-790E adds a new dimension to VHF operating, with its dual (triple) band monitoring, cross band operation, full duplex facilities, and a wide range of features to make life easy for the operator.

I must mention the TS-790G which has already been advertised elsewhere. The "G" suffix denotes that the transceiver is produced for the Japanese home market. That's acceptable if you can read the Japanese handbook, but the 10 watt power outputs on 2 and 70 may not be to your liking, nor indeed the fact that there is no connection at all between the purveyor of the product and the Kenwood UK sales and service network. I know and understand the desire of certain importers to be the "First on the market" with a new product, but so often it's a bit like being the first man to offer the square wheel – not quite right for the intended purpose, but somebody will always buy it.

As always; Caveat Emptor.

John Wilson
G3PCY/5N2AAC

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines)

Sole Appointed UK Distributor for KENWOOD Amateur Radio

Editor
Trevor Preece, G3TRP

News Editor
David Gough, G6EFQ

Sub Editor
Alan Burrows

Design
Linda Penny

Draughtsman
Derek Cole

Editorial Secretary
Marcia Brimson

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

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

Tel (Editorial): 0707 59015
Tel (GB2RS late changes): 0707 59260
E-mail (Telecom Gold): 76:MSX020
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Reports for *Spectrum Analysis* should be sent to the Band Editors:
HF
John Allaway, G3FKM, 10 Knightlow Road, Birmingham B17 8QB
VHF/UHF
Ken Willis, G8VR, 6 Lerryn Gardens, Broadstairs, Kent CT10 3BH
Microwaves
Mike Dixon, G3PFR, 'Woodstock', Gazebank, Norley, Warrington, Cheshire WA6 8LL

Headline News recording:
Tel 0707 59312

ADVERTISING
Advertisements (not Members' Ads) should be sent to:
M J Hawkins, G3ZNI
RSGB Advertisement Agent,
The Business Workshop Ltd
Design House
Junction Road,
Dorking, Surrey RH4 3HB
Tel: 0306 740010
Fax: 0306 740899

Correspondence concerning the distribution of *Radio Communication*and all other Society matters should be addressed to:
RSGB Headquarters,
Lambda House, Cranborne Road
Potters Bar, Herts EN6 3JE
Tel: 0707 59015
Fax: 0707 45105
E-Mail: Telecom Gold 87:CQQ083

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Radio Communication

VOLUME 65 No 3 MARCH 1989

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Kenwood TS680 transceiver. Review: page 47.

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded 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 secretary, from whom full details of Society services may also be obtained.

Headquarters and registered office:
Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE
Telex 9312 130923 (RGS)
Electronic mail via Dialcom/Telecom Gold: 87:CQQ083
Telephone: 0707 59015. Fax: 0707 45105

Secretary and Chief Executive: David Evans, G3OUF

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Affiliated club or society/registered group (UK): £20.50 (including *Radio Communication*): **£12.30** (excluding *Radio Communication*) (Subscriptions include VAT where applicable)
Membership application forms available from RSGB HQ

COUNCIL BRIEFS

24 November 1988

■In his financial report, the Hon. Treasurer announced that the income from the lottery totalled £32,600 and it was hoped that this sum would increase to £35,000 before the closing date. The accounts for the quarter showed a surplus before depreciation and tax.

■The Secretary reported on Project YEAR, which was proceeding well, being enthusiastically received in many clubs recently visited by Society representatives. An analysis of the Project YEAR questionnaire had just been completed and a report for *Rad Com* was currently being prepared.

■Council discussd proposals for the Student Licence and it was agreed that a draft document would be prepared and circulated for comment to the Spectrum Committees. The Licensing Advisory Committee would then co-ordinate feedback. It was expected that a response from the membership would be received following publication of the results of the survey. Tribute was paid to the work carried out by the Training and Education Advisory Working Group. Council noted the importance of the provision of Student Training Manuals and gave consideration to the form these would take.

■Much discussion took place on the Secretary's proposals for a new Junior or Student Associate section of membership. The Secretary spoke of his plans to develop this work and launch the new magazine designed for youngsters, D-i-Y Radio. It was agreed that Mr Case, GW4HWR would act as co-ordinator for D-i-Y Radio for one year. Mr Evans provided a full report on the current situation, outlining the various approaches made by the Society. He reported that an offer of sponsorship had been received from a TV Company, who could provide training videos.

■In his report on Society publications, Mr Evans informed Council that a number of books were to be produced on the new desk-top publishing system at HQ.

■Mr Brinkworth gave a report on a recent meeting held to discuss the recently circulated documentation on the EEC EMC Directive. Mr Brinkworth explained that the meeting had considered the directive unworkable, which called for an adequate degree of immunity and attenuation of radiation in all electronic equipment. Council agreed to convene a Working Group to input the Society's objections to the European Parliament. Comments would also be sought from outside bodies.

■Council ratified the recommendations for various committee awards.

■Agreement was given to a recommendation from the VHF Contests Committee, for the acceptance of the Scottish Trophy, offered by the West of Scotland Amateur Radio Society. This was to be awarded annually to the leading GM station in the restricted section of VHF NFD.

■Affiliations were granted to Brentwood ARS, Bucking Bronco Contest Group, Prudential ARS, Scottish Tourist Board (Amateur Radio) Expedition Group and Stanchester School Radio Club.

■Council appointed Mr P. Howarth, G3YAC, Chairman of the Raynet Committee as from 1 July 1989 at which time the current Chairman, Geoff Griffiths, G3STG, wished to stand down.

■Mrs J Heathershaw, G4CHH, was appointed Chairman of the Licensing Advisory Committee as from 1 January 1989. She would fulfil this role during the current chairman's year of presidency, following which Dr Gannaway would be reappointed as chairman.

■The Secretary briefed Council on developments in seeking charitable status for Raynet.

■The question of personalised car registrations was discussed.

■Council expressed its appreciation to Mrs Heathershaw for all the hard work she had undertaken during the year, particularly in connection with arrangements for the 75th anniversary.

Propagation Studies Committee – Vacancy

The Propagation Studies Committee is responsible for all matters concerning propagation study and for cooperation with other bodies engaged in propagation research having an impact on amateur interests.

A vacancy has arisen on the Committee for someone to undertake the examination an analysis of reports from observers of the 28MHz beacons of the International Beacon Project. This is a joint RSGB/Rutherford Appleton Laboratory project.

The new member should have an interest in HF propagation but need not be an advanced worker. Access to a home computer would, however, be necessary.

The Committee meets five or six times a year at approximately two monthly intervals. Meetings are usually in London on a Thursday commencing at 5.30pm.

If you would be interested in assisting the work of the Society in this way please write to the Chairman of the Propagation Studies Committee – Mr R. G. Flavell G3LTP, Jarlshof, 174 Finchhampstead Road, Wokingham, Berks, RG11 3EY

Vacancy for the Post of Honorary Treasurer

After a long and successful association with the Society's accounts, both as Chairman of the Finance and Staff Committee and as Honorary Treasurer, Basil O'Brien has recently stated his intention to retire at the end of the Society's financial year (30 June 1989). The Society is therefore seeking a new Honorary Treasurer.

This is an important post which provides an opportunity for someone to make a major contribution to the future well-being of Amateur Radio.

The Honorary Treasurer is responsible for advising Council on financial strategy and the monitoring and reporting of financial matters to Council. He will also be involved in preparing the annual accounts for audit, and presenting them at the Annual General Meeting.

This will entail attending meetings of the Finance and Staff Committee and working closely with Headquarters management, typically involving a workload of some 10 hours per week, with one or two meetings per month in Central London or at Potters Bar.

The Honorary Treasurer is an appointed member of Council, and must have been a corporate member of the society for at least three years.

The successful candidate will be experienced in financial management and have an interest in the future of the Amateur Radio movement. Formal accountancy qualifications may be advantageous, but are not regarded as essential.

Applicants should send a brief resumé to the Honorary Treasurer, Mr B. O'Brien, G2AMV, at Tanglewood, Anthony's Way, Heswall, Wirral, Merseyside L60 OBP.

HF Contests Committee Seeks New Members

The HFCC wish to hear from any members who may be interested in joining the committee.

The HFCC is a working committee of volunteers who are responsible to Council for all aspects of the Society's HF contests. The committee meets in central London about 10 times per year, usually between 1700 and 1900/2000 on a Thursday evening. Committee members decide on contest policy and rules, adjudicate contests and write up reports for publication in RadCom. Travel and out-of-pocket expenses related to the attendance at meetings are funded by the Society.

Applicants should be active amateurs or BRS members with an interest in HF contesting. The committee considers that events for Short Wave Listeners are most important and would welcome additional help.

Members who are interested should write or phone the Chairman, Ron Glaisher, G6LX, 279 Addiscombe Road, Croydon CR0 7HY Tel: 01-654 1406 – evenings).

RSGB QSL BUREAU

All QSL cards and correspondence relating to the RSGB QSL Bureau should be sent to the QSL Bureau Manager at the address below.

MR E G Allen, G 3DRN
QSL Bureau Manager
30 Bodnant Gardens.
Wimbledon,
London, SW20 OUP.

PACKET POISED FOR ANOTHER REVOLUTION

For the past four years packet radio has been the fastest growing facet of amateur radio in the UK and the enthusiasm with which it has been greeted shows no signs of abating. Why? Primarily because it is new.

Packet represents many new challenges – both technical and organisational. The high level of mutual co-operation required to form a network to handle messages efficiently around a city, a country, a continent or the world is new and unique within amateur radio. Never before has so much co-ordination between individual radio amateurs been required on a single project. Technically the challenges are enormous as software, hardware, digital and RF devotees combine their strengths to solve the problems encountered.

More and more UK amateurs are beginning to realise what packet radio has to offer. There are now over 120 licensed mailboxes in the UK, and the numbers are growing at a rate of two or three a week. These are all linked together in an ad hoc network. If you live in Aberdeen you can type in a message to your local mailbox and within a few tens of hours it will arrive in Guernsey having travelled through the network from mailbox to mailbox. Provided your friend is on packet and provided you know the address of his/her local mailbox, you can send a message practically anywhere in the world. Satellites, like the University of Surrey's UoSAT II, and HF links can now transport your message from continent to continent.

The very success of packet could be its own worst enemy. Most UK amateurs who venture onto packet for the first time will do so using their 144MHz FM equipment. However, 144·650MHz is very crowded indeed, especially in and around the larger cities. Packet allows a number of amateurs to share one frequency, but the more that share the slower the communication becomes.

At present the UK ad hoc network works, but it is fragile now that traffic levels are beginning to rise. Amateurs who would like real time packet communication over long distances using packet repeaters (digipeaters and nodes) vie with the inter-mailbox traffic for the limited channel time available. Overcrowding itself uses up the limited resources because repeats and re-tries are necessary to get the message through.

The situation should improve this year. Already there are a few 9600-baud links in place on 1·3GHz, with more to follow soon. These should dramatically improve the main longer-distance backbone routes used by real-time operators and for inter-mailbox traffic. Moreover, by the end of the year there might well be a dozen or so HF mailboxes licensed in the UK to ease international message forwarding, using both packet and AMTOR.

Of course, one has to realise that packet mailboxes, digipeaters and nodes are all provided by individual amateurs or groups of amateurs as a form of public-spirited service. A typical mailbox might tie-up £1000-worth of computers, TNC's, antennas and radios and, as such, represents quite an investment. RSGB also provides the licensing, equipment and frequency co-ordination and it is estimated that the existing UK packet network costs in excess of £20,000 per annum in electricity alone. All of this is effectively free of charge to the end user.

Packet is again set to explode in its capabilities this year as more investment of people's time and energies go into building a better network. Next time you send a bulletin or message to a friend, spare a thought for those who are involved in the planning and operating the UK packet network and for the problems and challenges that they are overcoming to help all radio amateurs.

Most of all, enjoy this fabulous new aspect of amateur radio. Encourage your friends to get involved; even ardent DX operators and those who specialise in other aspects of the hobby find packet of great value to their amateur activities. Encourage your local club to set up its own Mailbox/Bulletin Board so that radio amateurs can glean local/international news and information as rapidly as possible in the worldwide network of radio amateurs.

David Evans, G3OUF

RSGB NATIONAL VHF CONVENTION

Sandown Park Racecourse, Esher, Surrey

SUNDAY 16 APRIL 1989

- **One day exhibition and lecture programme**
- **Specialist groups**
- **Full lecture programme on VHF, UHF and micro-wave subjects**
- **Equipment test facility**
- **Morse tests**
- **Presentation of trophies**
- **Comprehensive trade exhibition**

PROGRAMME

1030	**Convention opens.** Enter through main entrance. **Refreshments.** Snack bar in the hall will be open from 1100 to 1800 and the licensed bar will be open throughout the convention.
1130	**AGM** 6m Group.
1330	**Convention address and presentation of trophies** by RSGB President Dr Julian Gannaway G3XGF

LECTURE PROGRAMME

Detailed arrangement for lectures will be notified on arrival

	A	B	C
1415	'EMC – What does the future hold?' Neil Brinkworth, G3UFB	'Beginners guide to VHF operating techniques' David Butler, G4ASR	'Potential of the milli-metric bands' Barry Chambers, G8AGN
1515	'An update on sporadic E' Dr Geoff Grayer, G3NAQ	'Microwave TV' Mike Sanders, G8LES	Remote imaging group AGM Henry Neale, G3REH
1615	VHF Committee Forum	'Eastnet – microwave aspects of package links', Phil Howarth, G3YAC	Morse test forum, Robert McEwan Reid, G4GTO
1715	Lecture session ends		
1800	Trade exhibition closes. Convention ends		

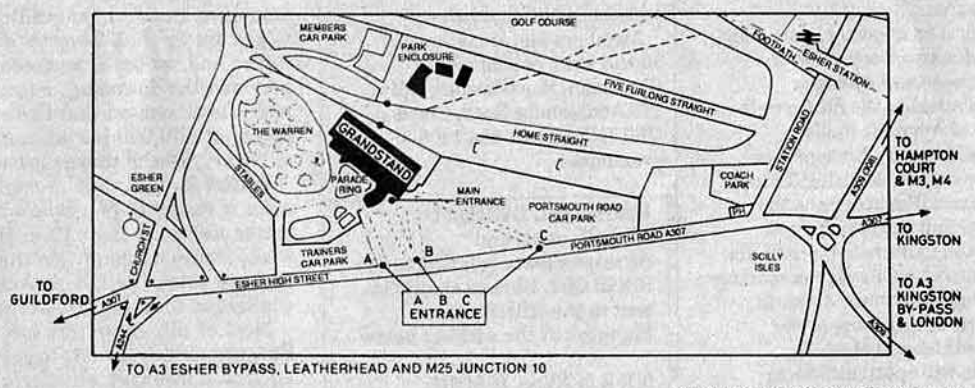
ADMISSION

To simplify management and to reduce costs, it has been decided, as last year, not to issue admission tickets for this convention, either in advance or at the gate.
Admission will be by payment on entry as follows:

Convention and exhibition	£1·50
:: :: :: (under 18)	£1·00
:: :: :: (under 14)	Free

RAIL TRAVEL
Please note that British Rail's Esher station is now open on Sundays.

ACCESS MAP TO SANDOWN PARK
Talk-in station
GB2 VHF:
channels S22
SU22



Map by courtesy of United Racecourses

MEL North Polar Trek - on schedule

Just after last month's issue went to press, the first official "MEL North Polar Trek" press conference took place at the House of Commons. RSGB was invited to attend to hear Sir Ranulph 'Ran' Fiennes explain the reasoning behind an unsupported attempt on the North Pole and Laurence Howell, GM4DMA, describe the various aspects of the scientific programme, including details of communications links.

We thought that the details of the transceiver and antenna arrangements which will be used for communications in the field were particularly interesting - if you think your portable contest station has a hard life, read on. All communication equipment has to function totally reliably in temperatures of -60 degrees or less. The transceiver used for the job is the PRC319, made for special forces use by MEL (a member of the Philips Defence and Control Systems Group) and weighing a mere 7.5lb. This little job covers the entire HF spectrum from 1.5 to 40MHz and has facilities for all sorts of clever modes designed to stop enemy forces knowing what you're up to. As far as antennas go, the intention is to use resonant dipoles laid on the snow and ice surface - which is only a metre or so above the Arctic Ocean. The antenna height will lead to a near-vertical incidence of radio waves, giving the maximum benefit for "local" (0-700km) traffic. The base communication antenna for this field link will also be low, receiving much of the signal from near vertical reflection off the ionosphere.

From the amateur viewpoint, Laurence said that the base camp would be using a variety of antennas, one of which would be a home-brewed full-size half-sloping rhombic with home-brewed open wire feeder. This antenna will be at 60' with an apex angle of 45 degrees at the feed point. The halfway point will be at 30', from which it will slope away to a final height of 6' at the termination point. The resistance at the termination and will be 450 ohms. This antenna will work satisfactorily on amateur bands from 7MHz up to 28MHz and will be directed towards the UK. The ability to be able to switch rapidly between a variety of antennas is paramount since conditions near the pole can vary considerably within a matter of minutes. The 50MHz station will consist of two transceivers - a home-brew Meon and an FT690 - each with its own amplifier, and running approx 120 W to a 4-element beam antenna. Laurence also said that base camp may come up on any frequency at any time using the callsigns GM4DMA/VE8 or GM1ILL/VE8 on the appropriate bands, but that the best frequencies to listen on were probably 14.345MHz, 28.885MHz, 50.110MHz and 144.123MHz. QSL will be via G8VR until the end of 1989. Incidentally, anyone who heard or worked the stations during last year's trip will have to wait a little longer since cards from "the sponsor" are still awaited.

Looking at the scientific programme, a twice daily report will be sent from the base camp to the Atmospheric Environmental Services at Resolute Bay, some 700 miles south. The overall picture of Arctic weather patterns is restricted because of the number of reporting stations. This makes forecasting very difficult and since the Arctic weather patterns have a direct effect on those of the entire Northern Hemisphere, the data sent by the base camp team will help give forecasters a clearer idea of what is going on. A radio programme to investigate the effects of very close proximity to the magnetic north pole and what influences this can have on communications will be continued this year.

Detailed records and recordings of signals both at HF and VHF, terrestrial and satellite, will be made. The sun's influence at Ward Hunt Island is very strong. Particles emitted by the sun as plasma (solar wind) are focused by the earth's very strong magnetic field and can have a very destructive nature, making radio blackouts very long and often completely wiping out HF communicatiuons for days. However, there are other effects which are only noticeable at this high latitude and which might well aid communications on a temporary basis (see last month's item entitled "Laurence & Morag Go Auroral").

The Schedule

As we went to press, the team of four - Sir Ranulph Fiennes, Dr Mike Stroud and Laurence and Morag Howell - were scheduled to fly from London Heathrow to Montreal on 20 February. The next day they were to continue their journey from Montreal to Resolute Bay for training. On 4 March they will fly by Bradley Air Services from Resolute Bay to Ward Hunt Island and set up the base camp. The 'Ice Group', Sir Ranulph Fiennes and Dr Mike Stroud, will set off for 90 degrees North on 10/11 March leaving Laurence and Morag to run the base camp operations at Ward Hunt Is. Approximately 60 days later, in early/mid May, the Ice Group will be flown from their most northerly point to Ward Hunt Is. where Laurence and Morag will be collected and flown back to Resolute Bay and on to the UK.

Incidentally, did you know that the Ward Hunt Island base camp is approx 400 mile NE of magnetic North?

REVISED GB2RS CW BROADCAST SCHEDULE

Following several months of successful experimental CW transmissions, the GB2RS schedule for the 40m band (7047.5kHz) will be modified as from 5 February. The new schedule is given below:

Time (local)	TX from	Mode	Notes
0900	GI3GGY	AM	Voice transmission
1000	G3LEQ	CW	Identification
	G3LEQ	CW	News at 30 wpm
	G3LEQ	CW	News at 26 wpm
	G3LEQ	CW	News at 22 wpm
1030	G3LEQ	CW	Repeat news at 18 wpm
1100	G3LEQ	LSB	Voice transmission

Note - The information given in the January issue was incorrect, but was published as supplied to Headquarters. We apologise for any inconvenience this may have caused. G3LEQ will be pleased to receive reports of his transmissions and will aknowledge these with a GB2RS QSL card. Reports should be sent direct to G3LEQ, QTHR.

RSGB calls industry conference

If all goes according to plan, the first RSGB Project Y.E.A.R Industry Conference will take place towards the end of May. Robert Atkins, Parliamentary Under-Secretary of State for Industry has tentatively agreed to open the conference and make a keynote address.

With assistance from the DTI, the RSGB will be inviting heads of industry to the conference, which is designed to alert industry to the aims of Project Y.E.A.R in guiding young people's interests towards science, technology and electronics. One of the prime functions of the conference will be to seek industry sponsorship for Project Y.E.A.R.

Data Symposium - change of dates & venue

In last month's 'Council Brief' it was announced that Council had given the go-ahead for the 2nd RSGB Data Symposium, following the success of last year's event. Although Harrow School was again chosen as the venue for the 1989 event, escalating costs and an unfortunate double booking by the school have resulted in a change of both the date and venue.

The 1989 RSGB Data Symposium will now be held concurrently with the AMSAT-UK Colloquium at the University of Surrey, Guildford between 28-30 July. The joint event will be co-hosted by the Society and AMSAT-UK and, as last year, Ron Broadbent, G3AAJ will be heavily involved in the planning and organisation of both parts.

It's intended that the first two days will be geared towards data orientated subjects and the last two days to satellite subjects but, since two two's into three doesn't go, the middle day will be designed to appeal to both interest groups by dealing with those topics which overlap into both areas. There is no intention to dilute either event by this move. Quite the reverse - it will allow more people, especially those from overseas, to attend both events without the need to take two 'holidays'. Many of those who attended last year's RSGB Data Symposium also attended the AMSAT-UK Colloquium. In addition, the excellent facilities at the University will mean that both events will be able to maintain a professional conference standard.

We are sure that neither satellite nor data buffs will be disappointed, nor should they fear that their particular area of interest will be eclipsed by the other. There will be plenty of time for both. It's expected that there will be additional displays and stands together with facilities for informal discussions.

Any data or satellite orientated traders or groups who are interested in putting on a stand or display should contact Ron Broadbent, G3AAJ, as soon as possible since available space is limited.

Anyone who would like to present a paper to the Data Symposium should contact Mike Dennison, G3XDV, at RSGB Headquarters as soon as possible.

Further details and an application form should be available in the April issues of *Radio Communication* and *OSCAR News*.

Unfortunately, this announcement could not be included in the latest issue of *OSCAR News* since the decision to combine the two events was made after OSCAR News went to press.

UK Amateurs Receive New Year's Honours

Mr Leslie Cobb, G3UI (right) was awarded the British Empire Medal, in the recent New Year's Honours List, in recognition of 40 years' service in the Air Training Corps with 250 (Halifax) Squadron. Leslie, aged 68, has been a radio enthusiast all his life and, in 1936, held the artificial aerial licence '2ABC'.

He received his present callsign in 1938, just prior to serving with the Territorial Army from 1938 to 1946, during which time he was a Japanese prisoner of war for three-and-a-half years. After the war, he was employed as Service Manager with Pohlmann & Son of Halifax, which began business as a manufacturer of pianos and later moved into radio and television retailing.

Leslie has been a member of the Northern Heights ARS since it began in the early 1950s and has been its Secretary since he retired four years ago. He is active mainly in the HF bands and is a keen 'home-brewer'. His latest project was a 28MHz CW transceiver.

Mr John Martindale, GM4VPA (below) received the Queen's Police Medal, which is awarded for distinguished service by a police officer. John is a Chief Superintendent with Strathclyde Police and is currently responsible for the Scottish Criminal Record Office on behalf of all Scottish police forces, together with a major computer installation with an extensive data communications network north of the border and also one of the largest fingerprint bureaux in the UK. He is also in charge of the Identification Bureau of Strathclyde Police.

John first became interested in radio as a school boy and his skill in building crystal sets was in great demand by his fellow pupils. Before joining the Army in 1954, he was involved in the establishment of police radio systems in the Stirlingshire area. He returned from service in Kenya in 1956 and joined the Stirlingshire Police Force. Although an avid short wave listener throughout that time, the hobby took a back seat as his career progressed. In the early 1980s, whilst convalescing, John renewed his interest in short wave listening and decided that he wanted to have a go at transmitting. He used his time in studying for the RAE and, following his success in the examination, he went on to take the Morse test and was issued with his present callsign shortly before joining the RSGB in November 1983. John is a member of the Strathclyde Park ARC in Motherwell and is particularly interested in packet radio. He is active in the HF and VHF bands, and would like to get more involved in satellite operation, if he could find the time. He still does some home-brewing but, like many of us, prefers building with discrete components rather than chips.

NEW HQ TELEX NUMBER

RSGB Headquarters now has its own dedicated telex number and answer-back. This means that callers NO LONGER need to quote the "CQQ 083" reference on the first line of the message.

The new number and answer-back is: 9312130923 RSG

It's the Volts that Jolts - The Sequel

You may remember that in January's News Bulletin we ran a piece on some problems caused at Chateau 'FRX by poor line regulation, and we appended a sour comment to the end about not expecting your local electricity board to take much interest in any problems of this sort. The reason for this uncharacteristic grumpiness was that MANWEB (the writer's local lot) weren't in the slightest bit interested in doing anything about it - or even commenting on it - despite the fact that technically they're in breach of their statutory obligations. And the power-line noise we experience sometimes has to be heard to be believed - I reckon that the entire output of one power station is being dissipated in one of our local lines! Do they care? Not a scrap. However, it seems that MANWEB's attitude might not be typical. Roger Horne, G4HBA, of Morley, Leeds, wrote outlining his experiences:

"I too am an avid VHF operator, and of late my sole interest has been on 50MHz. To this end I have gone to great lengths to ensure that my 50MHz station is as 'state of the art' as possible. About three months ago, the final addition was a pair of 4-element J-Beams stacked at 45'. Imagine my great disappointment on finding that, after having spent in the region of £800 on equipment and antennas and many hours on the construction of equipment, a problem arose which I had not been prepared for.

"The problem was overhead line noise. The noise problem is so bad at times that listening for weak signals is impossible, the S-meter reading 20dB over 9 when I beam at the power line. A bit of detective work with an FT690 soon proved that the noise was coming from the pole that supported the transformer feeding our cottage - at a distance of about a quarter of a mile. The line noise was always at its worst in damp and humid conditions, as might be expected.

"So, armed with the above information, I approached my local Electricity Board engineer and explained to him who I was and what the problem was. He said that, while he had never heard of anyone with this problem before, he would see if anything could be done. A little while later I received a phone call from him in which he made an appointment to come and see me so that I could demonstrate the problem.

"The day of his visit duly arrived and - guess what - not a single dB of interference was detected on the main receiver! For a change it was a warm and sunny day, which was probably why. Undeterred, however, we both donned our boots and set off following the line through ploughed fields and carrying the FT690 looking for the offending noisy pole. Even directly under the transformer there wasn't a thing, and you can imagine how I felt trying to explain this to the engineer. However, this wasn't the end of the story.

"During our conversation the subject of poor line regulation, from which we suffer from time to time, cropped up. The upshot was that a line crew was sent out to investigate. Two faults on the line were found. One was a corroded joint in the line and the other was the result of one of the transformer fuses which had not been seated properly; it had arced and burned the holder, causing a high-resistance connection. Both faults were duly repaired and the line regulation is now excellent. However, the problem of the line noise still remains.

"The local Area Board has not given up yet. The engineer has left me his home telephone number so that I could contact him if the interference was bad and so that he could come and observe it. They plan to check the joints and insulators on the high-voltage side of the transformer, and if that does not cure it the transformer itself is to be changed.

"It seems that if you approach the local Electricity Board in a friendly manner and explain the problem as it affects you, perhaps their response will be positive - as my experience has proved. I will let you know the final outcome."

Those wishing to move to Morley, Leeds, form an orderly queue behind me.

New UK Agency for 'VHF Communications'

VHF enthusiasts will be delighted to learn that, at long last, a new UK agent has been appointed for the German 'VHF Communications' magazine. He is Mr Mike Wooding, G6IQM. It's many years since there has been a UK agent for this popular magazine, and obtaining the magazine, back issues, binders, kits and PCBs for some of the projects has been a problem. However, Mike assures all past, present and new subscribers that "all this is a thing of the past. A full service is now available and it's cheaper too!". 'VHF Communications' contains constructional articles on transmitters, receivers, demodulators, test equipment, RF amplifiers and pre-amplifiers - in fact on all subjects to do with VHF, UHF and SHF communication in the amateur bands. The subscription rate for 1989 is £8.75 inc p&p and if you'd like to receive a regular copy, please send a cheque made out to 'M Wooding' to:

Mike Wooding, G6IQM
5 Ware Orchard
Barby
Rugby, CV23 8UF

Mike can also be contacted by telephoning 0788 890365 and leaving a message on the answerphone. Incidentally, Mike is also the Assistant Editor of CQ-TV, the journal of the British Amateur TV Club (BATC).

Dayton Hamvention 1989 - Largest Event in the States

We've just received the early reservation information for this year's Dayton Hamvention - probably the largest amateur radio event in North America - which takes place over three days from 28 to 30 April. One of the main features of this event is the 'Giant 3-Day Flea Market' which attracts people from all over the US who have bits and pieces for sale. Admission to the event is £10.00 for the three days and tickets can be purchased in advance from:

Dayton Hamvention
Box 2205
Dayton, OH 45401

Information about lodgings in the Dayton area can be obtained by writing to:

Lodging
Dayton Hamvention
Chamber Plaza
5th & Main Streets
Dayton, OH 45402

Looking Ahead

In last month's issue we ran a short item by Charlie Newton, G2FKZ, on the possibility of trans-auroral propagation between Laurence and Morag Howell, on Ward Hunt Island, and the UK. Whilst we had Charlie in a relaxed frame of mind and with a pen in his hand, we thought we'd get him to write a little piece on what's happening generally in the esoteric world of propagation in 1989. Microphone back to you, dear friend:

"As we all know, the American space programme has been virtually at a standstill for the past year and so many plans which might have come to fruition as a result of satellite launches have not materialised. However the time has not been wasted and much thought has been put into what can be achieved on the ground. It has been known for some time that NO ionospheric predictions - regardless of who does them, are 100% reliable - so a great deal of thought has been put into how they can be improved. The best forecasts up to now work on a system of ionospheric maps and circuit paths, such as those published in RadCom, so attention has been focused on how to improve the maps. An international conference was called to establish just what could be done and various suggestions were made. Finally it was agreed to get a more worldwide ionospheric picture by setting up a series of transmitting stations round the Equator, with countries all over the world providing automatic receiving stations. It is, to say the least, a bold and imaginative plan. "The receiving stations will have to work automatically and provide data in a form suitable for computer processing. To this end a good deal of work has already been done, particularly by Hull University, in designing and building prototype equipment. It has not yet been decided just what range of frequencies will be used, but of necessity this will be quite wide. It's hoped that our 28MHz beacons will also be a part of the project. If all goes well the rewards will be enormous, and the `fiddle factors' in our present ionospheric forecasts will be consigned to the past. "Another very exciting programme which we hope will materialise this year is the solar wind monitoring telescope operated by Professor Hewish and his team at Cambridge. They have found that they can detect the outflow of the solar wind from the sun. So when massive outbursts occur, which give rise to such phenomena as magnetic disturbance on earth, radio aurora, ionospheric disturbances, possible danger to astronauts etc, it should be possible to give a warning that such an event is on its way. Another by-product of the system is that they can trace back the precise location on the sun where the particle stream originated. We hope that this will tell us whether it is coronal holes, massive flares or perhaps something else, that is responsible for such events, as there is a good deal of controversy about these points at present. "To operate the telescope for this purpose costs money, and it is only in recent times with American help that funds have been found to enable the project to proceed. It is hoped that the forecasts will be available via the Ursigram service, which means we will be on the list. If all goes well, the forecasting of auroras should prove to be much easier and more reliable - and we can only wish the Cambridge team good luck in the extremely difficult task that they have taken on.

"The amateur service has also been planning very hard and it is hoped that this year will see the setting up of a geophysical data broadcasting service. The problem has been discussed by the Propagation Studies Committee with the International Amateur Radio Union and also the professional bodies such as the Rutherford Appleton Laboratory from whom the broadcast information would have to come, since there is a pressing need for the broadcast of such information throughout Europe. "GEC-Marconi Communications has generously donated a 1kW transmitter for the service. It is hoped that the station can be sited at the University of Sheffield field site at Buxton in Derbyshire, which would give good coverage to most of NW Europe as well as the UK. The scheme has the encouragement of the propagation staff of the DTI, to the extent that they might well be prepared to support an application for a "fixed service" licence on an assigned frequency just outside the UK 3.5MHz amateur band in order to mitigate the effect of interference. Informal advice has now been given by the UK DTI on frequency and clearance aspects and a formal approach for a licence is now to be made."

Last Chance to Apply for RSGB 75 Award

The closing date for the RSGB 75 Award is 1 April 1989, so you've got about a month in which to get your application to John Harvey, G4IVJ. Those of you who have already applied will be pleased to know that following a few printing problems, we've finally received the stocks of certificates - and very nice they look too! We've now got the mammoth task of writing all your names and callsigns onto them and packing them off in the post together with the special 'surprise' item we promised. Please be patient and bear with us a little longer.

The Rules for this award were published in various issues of *Radio Communication* during last year and its purpose was to raise the level of amateur activity in a spirit of friendship during the RSGB's 75th Anniversary Year. For many of you who took part, that's exactly what it did. John received the following letter from a delighted applicant:

"I am very pleased to submit a claim for the RSGB 75 Award. As you will see, I was fortunate to work more stations than the minimum requirement and these included both GB75RS and GB75AC as well as twelve other GB75 stations and over 75 RSGB members.

"Unfortunately, I could not make it to the NEC in July so I am very glad I could join in the spirit of the 75th anniversary year by working many new stations specifically to qualify for the award. The pleasure was all mine!

"One notable contact was with Gerry, G2BTO on 80m, who called me on his Panda transmitter using AM, I duly

responded after a quick look at the handbook to see how to set the drive levels for my TS440S.

"Another amusing comment came from Tom, GM2BMJ in Dumfries, noted my persistence on the band and called one Sunday afternoon. He said he felt he knew me rather well because every time he tuned across the band that afternoon he heard my voice. He even went for a 5 mile walk and found I was still there when he returned so had to come on and give me a point. Well you certainly cannot expect to qualify for an award without some effort going into it and I have enjoyed hours of pleasure and amusement on this occasion.

"Vy 73, es mni tnx for considering my award claim - Bob Harwood, GM0HRT".

If you worked any of the qualifying GB75 prefix callsigns, it's worth having a look through your logbook to see if you managed to work 75 different RSGB members during 1988. You may be sitting on an award and not know it!

On a recent visit to RAF Locking, Air Commodore D G Harrington, President of RAFARS, made a presentation of a suitably inscribed Class D morse key to 'Pop' Seymour, G3GNS, in recognition of his many years service running the RAFARS slow-morse transmissions. It's now over 25 years since 'Pop' first became involved with these broadcasts, which are still sent out daily for the benefit of would-be class A licensees throughout the UK. Now in his eighties, 'Pop' has many tales to tell of his 24 years service in the RAF, fourteen of which were spent in India and Malta where he operated VU2DX and ZB1Q respectively.

WAB News

First of all, a change to the date of one of the WAB 144MHz contests. In order to avoid clashing with the RSGB 50MHz Trophy Contest, the date of the WAB 144MHz Contest has been moved to 25 June 1989.

This month has seen the first claim for the new WAB Overseas Bookholders' Award, which is designed to encourage members to work bookholders who live outside the UK. The Basic certificate is awarded for working 10 bookholders (who can only be claimed once regardless of how many books they hold). Bob, G4GEE, was first off the mark gaining the award on mixed bands using mixed modes.

PE1JVH was also quick to claim, being the first to achieve the required 10 bookholders on 144 MHz SSB.

Moving to HF only, SWL Chris Gibbs has become the first to achieve 2500 mixed series bookholders and 1800 3rd series bookholders on 3.5MHz SSB.

It's been another busy month on the VHF band with Roy, G1NUS becoming the first to achieve 2300, 2400 and 2500 areas worked on 144MHz SSB. GW8PTS is the first to complete the Decade Award on 144 MHz FM, and G0JHC has become the first to collect 200 bookholders on 50MHz SSB.

New WACRAL QSL Manager

The World Association of Christian Radio Amateurs and Listeners (WACRAL) has just appointed a new QSL Manager, Malcolm, G6UGW. Cards should now be sent to him at the following address;

M J Bell, G6UGW
WACRAL QSL Manager
61 Oldbury Orchard
Churchdown
Glos. GL3 2PU

Julian Bortowski, GW0FPY sent us this pic of his 1-month old son Paul James, who appears to have a very good 'fist' for CW. Could he be a future 'Young Amateur of the Year'?

Red Dragon Contest Group Celebrates 10th Birthday

The Red Dragon Contest Group, GW8GT, based in Blackwood, Gwent, was formed in 1979 with the purpose of mounting a major entry in that year's CQ World Wide SSB Contest, which coincided with the peak of solar cycle 21. The following year the group won top place in Europe and was placed fourth in the world.

The group is now well established and enters major contests from a permanent contest site located in the Blackwood area. On the site are two 60' towers, three full size five-element Yagi beams for 20m, 15m and 10m, a vertical with buried radials, a two-element beam for 40m and the usual dipoles. An 80' tower is currently being purchased to support a 40m quad antenna and provide extra crucial support for a Sterba Curtain. There are three permanent cabins on the site; one is used for operating, one for storage and one for sleeping. The group's five-berth caravan serves as a kitchen and rest area.

Members of the group are drawn from a wide geographical area but more members are currently being sought, particularly since a major entry is being planned for the 1989 CQ World Wide Contest to mark the 10th anniversary of the group's formation. Anyone who is interested in HF contests and who wishes to become a member of the Red Dragon Contest Group can obtain further information from Brian Davies, GW3KYA, tel 0495 225825 or write QTHR.

Basingstoke ARC on Show

The Basingstoke Amateur Radio Club will be holding an exhibition in the foyer of the Basingstoke Library on Saturday 11 March between 9.30am and 3.30pm. The club has obtained the special event callsign GB4BLE (Basingstoke Library Exhibition) and will be operating in the VHF bands and, if conditions permit, in the HF bands. Several members of the club will be on hand throughout the day to talk to the public about the club's activities and amateur radio in general. Local or visiting amateurs will be very welcome to attend and further details can be obtained from Mike Lewis, G1MDS on Basingstoke (0256) 473401.

DTI Announces New UK Frequency Guide

The radio frequency bands allocated to commercial and industrial users in the UK can now be seen at a glance on a colour-coded bar chart prepared by the DTI's Radiocommunications Division and published by HMSO.

A copy of this 6pp two-fold A4 chart arrived on our doormat a couple of weeks ago. It covers frequencies in the range 1kHz to 60GHz, which are sub-divided into primary and secondary users. The main users shown are broadcasting, fixed stations, mobile, amateur, meteorological, radio location, navigation, astronomy, space, and various maritime, aeronautical and satellite bands.

The "United Kingdom Radio Frequency Allocations Chart" is published by HMSO, ISBN 0 11 514637 7 and is priced at £2.50. It can be obtained direct from HMSO Government Bookshops in London, Edinburgh, Manchester, Bristol, Birmingham and Belfast, or through major booksellers. Telephone orders can be made by contacting the HMSO Publications Centre on tel: 01-873 9090.

Minister Leans on Pirates

At a press conference on 12 January 1989 Industry Minister Robert Atkins said that there would be no let-up in the Government's crackdown on pirate radio stations in the wake of a record year of raids on illegal broadcasters. The RIS made nearly 450 raids last year and more than 100 people were prosecuted. The Minister also announced that the Government would be seeking more powers to prosecute advertisers and suppliers, and he added that anyone with a conviction for piracy committed after 1 January 1989 would be barred for five years from applying for a community radio licence.

C&G Appeal Fees

The City & Guilds of London Institute has announced the introduction of fees for the handling of queries relating to candidates' examination results. These fees (detailed below) will come into effect from the May 1989 examination series and have proved to be necessary in order recover the costs of investigating appeals. The fees will be charged at two levels; a) for arranging a clerical check only, to verify the result issued, £5.00 per candidate per component; b) for arranging for re-assessment and preparing a report, including a clerical check, £7.00 per candidate per component. In the case of the Radio Amateurs' Examination these charges equate to £10.00 for a clerical check of both parts or £14.00 for a re-assessment check and report. The fees must be paid in advance. However, in the event of a result being upgraded or of an error being found the fees will be refunded. A word of warning though. City & Guilds' track record in the RAE is very good. In the years when the Society ran examination centres at both Derby and London, no adjustments in the grading were ever made and no errors were found in the results of the few candidates who appealed. Experience has shown that the majority of appeal applications are made by candidates who had an over-optimistic view of their study and performance.

Late Rally Dates

Almost immediately after we'd run off the 'Diary of Events' pages we received a couple more rally dates - well that's life. Both events takes place in July and here are the basic details:

23 July

Anglian Mobile Rally - Highwoods Sport & Leisure Centre, Severalls Lane, Colchester. Details Peter, G0DZB tel: 0473-58367 ext 157, weekdays or Jeremy, G0KEH tel: 0206-384829, evenings and weekends.

30 July

Hilderstone Radio Rally - Hilderstone College, St.Peters, Broadstairs, Kent. Details Ron, G3TAJ tel: 0304-812723.

RNARS Members Form HMS Plymouth Group

Members of the Royal Naval Amateur radio Society living in Devon and Cornwall have recently formed the "HMS Plymouth Group" which will be responsible for amateur radio operations from the Falklands2 veteran "HMS Plymouth" based at her namesake city. It is the group's intention to provide - as far as possible - a replica W/T Office and operate amateur radio from it as a demonstration to visitors. The amateur radio station will be active in the HF and VHF bands and QSL cards will be available for all contacts. The callsign has yet to be allocated but it is hoped that a callsign suffix with the old Davenport signal letters 'GUZ' will be possible. The group is hoping to obtain the permanent callsign GB3GUZ.

Members of RNARS, both at home and abroad, are invited to join the group at an annual subscription rate of £2.00. This should be sent to:

Chris Harper, Hon Treasurer
24 Cunningham Road
Tamerton Foliot, Plymouth PL5 4PS

Other financial offers would be gratefully accepted and applied to the provision of additional equipment.

The Secretary of the Group is Mrs 'Bobby' Harper (XYL of Chris) and she can also be contacted at the above address.

HMS Plymouth is the last of the Type 12 Frigates and is currently 'in retirement'.

The photograph shows HMS Plymouth entering Plymouth Sound flying her 'paying-off' pennant. Originally, she was to have been heading for a watery grave as a missile target but the Warship Preservation Trust and a strong team of volunteers have worked small miracles to save her and put her on public display at Millbay Docks, Plymouth (departure dock for continental ferries).

The ship will be open to the public from 23 March until October and there will be a modest entrance fee charged. A warm welcome is extended to all visitors, particularly those with an interest in amateur radio.

VHF Conventions - Which Way?

Regrettably, G3UBX had to report to the VHF Committee that attendance at last October's Midlands VHF Convention was disappointing. This means that the event will probably not be held this year - aren't there any active VHF types north of Watford? On a brighter note, we're currently considering making future VHF Conventions in the south two-day affairs - basically because of continually increasing attendances at this event. This year, however, it will follow the usual pattern. Don't forget that it's scheduled for next month (see details in this issue of Radcom), and extra space has been booked at Sandown Park.

This year, for the first time, there will be a members' mart similar to the one at the Woburn Rally. A small number of tables will be available to members, who are not traders, for the disposal of amateur radio and allied items. The cost of each table used will be £4.00/hour. Tables can be pre-booked by sending a cheque -payable to 'RSGB' - to Martin Shardlow, G3SZJ (QTHR).

New 'G5RP Trophy'

Friends of the late Ted Wake, G5RP, have generously donated a new trophy - 'The G5RP Trophy' - which will be awarded annually to the RSGB member, permanently resident in the UK, who, in the opinion of the RSGB HF Committee and the Vale of White Horse ARS, has made the greatest progress in the field of HF (1.8 to 30MHz) DX in a 12-month period between July and the following June.

The trophy is intended to encourage keen newcomers to HF DX and emphasis will be placed on progress rather than an absolute level of achievement. In determining the recipient, particular attention will be paid to progress in DXCC, WAZ, and in the RSGB's Commonwealth, IOTA and ITU Zones programmes.

Nominations for the trophy should include the name and callsign of the nominated operator together with a summary of all relevant DX achievements in the previous 12-month period. Two nominators are required, both of whom should be RSGB members and class A licence holders. Nominations should be sent, by 31 July, to the Chairman of the HF Committee at 41 Enniskillen Road, Cambridge, CB4 1SQ.

The trophy will be awarded for the first time at the 1989 RSGB HF Convention for progress during the period July 1988 to June 1989.

Square-bashers in Madeira

It's understood that the Square Bashers DXpedition Group is heading for CT3 this year. The planned operation will not be from the island of Madeira itself but from a small island to the north for two weeks commencing 31 May.

Activity will include cross-band operation to 4m and the group will be fully QRV on both 6m and 2m. Equipment for 4m will include a converter which, it is hoped, will remain on the island to be used by one of the resident operators once the group has left. He is keen on both 6m and 4m operation so by leaving the converter it's hoped that more regular cross-band activity will be sustained in the future.

When the Square Bashers return to the UK, we'll try to bring you yet another exciting account of their activities.

1989 G3PAO Memorial Lecture

This year the Verulam ARC's G3PAO Memorial Lecture will be given by Dr Peter Duffett-Smith, G3XJE, of the Cavendish Laboratories in Cambridge. The lecture, which takes place on 28 March, is entitled "Long Delayed Echoes", phenomena which have caused much speculation over the years.

As usual, visitors are welcome to attend the lecture - which starts at 8pm in the RAF Association HQ, New Kent Road, St. Albans. Further details can be obtained from the Secretary on tel: 01-427 4800.

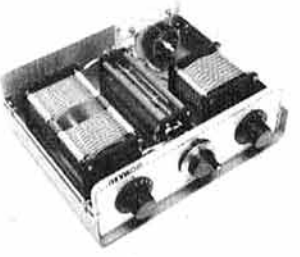
Verulam's Second Project YEAR Meet

The Verulam ARC will be holding its second Project Y.E.A.R meeting on Tuesday 14 March in the RAF Association HQ, New Kent Road, St.Albans, starting at 7.30pm. This is a follow-up to the successful Amateur Radio Activity Evening held last October.

The evening will provide an in-depth look at weather satellites including demonstrations, and an introduction to packet radio with a fully operational station. In the second part of the evening, youngsters will have a chance to see the ARRL video entitled "New World of Amateur Radio".

Nevada Introduces New TM1000 ATU

The new version of the popular British designed and manufactured TM 1000 Broadband ATU covers 1.8 to 30MHz continuously and is capable of handling 2kW PEP. The unit provides effortless matching of all long wire, co-ax or open wire fed antennas. Nevada has invested in tooling and injection moulding equipment to improve the capacitors and roller-coaster which have been manufactured to the highest standard to ensure negligible stray reactance at high frequencies and ensure years of trouble free use. The really good news is that this new and improved version will still sell for the same price as the original, ie £168.00.



AWARDS

NATIONAL

Worked All Britain Award

WAB has introduced a new award to encourage members to work stations outside the UK or Northern Ireland (see WAB NEWS). It is available to all (including listeners) and a certificate is earned by working at least 10 members. Endorsements are issued for each additional 10 members worked. The cost is £2.00 plus two first-class stamps, and each endorsement also costs two stamps. Contact

Dave Brooks, G4IAR
28 Avon Vale Rd,
Loughborough, LE11 2AA

for more information.

Solent Fortifications Award

There has been a change of award manager and fee for the Solent Fortications Award. The fee has been increased to £3.00 and this should be sent with your application to G0IVW (QTHR)

Civil Service ARS Activity Award

The Civil Service Amateur Radio Society, callsigns G1CSR and G3CSR, offers an award for working or hearing CSARS members on one or more amateur bands using any of the permitted modes of operation. All contacts from 1 January 1985 are valid for the award, which is split into three categories; Standard, Silver and Gold. The requirement for each category is as follows:

Standard Award
For achieving a total of 15 points with a maximum of two CSARS club or special callsigns.

Silver Award
For achieving 25 points with a maximum of three CSARS club or special callsigns. Additional special calls may be worked but will only count as 1 point each.

Gold Award
For achieving 45 points with a maximum of four CSARS club or special callsigns. Additional special calls may be worked but will only count as 1 point each.

Contacts with CSARS members using their own callsigns over a path greater than 50 miles count as 2 points. Contacts over a path of less than 50 miles count as 1 point. CSARS callsigns, such as G1CSR (VHF) and G3CSR (HF), together with special event callsigns GB75CSR, GB0CSR, GB1CSR etc count as 5 points. CSARS Club stations are usually active from the headquarters in Westminster but occasionally operate outside this area on a portable basis. Each callsign counts once, no matter how many times it is worked or how many modes of operation or bands are used, or whether the callsign has a suffix or not. Contacts via repeaters or satellite are not allowed. CSARS nets take place on Tuesdays at 1930 BST on 144.370 MHz and at 2000 BST on 3720 kHz. A full list of CSARS members and the award rules can be obtained by sending a stamped addressed envelope to:

CSARS Activity Award
Civil Service ARS
CS Recreation Centre
Monck Street
London SW1P 2BL

INTERNATIONAL

Luxembourg Independency Award

This is an official diploma issued by RL, a founding member society of IARU. It celebrates the independence of the Grand Duchy of Luxembourg within its present boundaries, which was established by the Treaty of London, signed on 19 April 1839. It is available to licensed amateurs and listeners who contact the required number of Luxembourg stations during 1989. Each QSO counts 10 points to Europeans and 20 to others, and each QSO with club station LX0RL or LX150L counts 15 and 30 points respectively. Each station may be worked once per band only - irrespective of mode. A list of claimed contacts (or stations logged) showing date, time, callsign, frequency, and mode, certified by an award manager of an IARU member society, a club official, or two licensed amateurs should be sent to:

Reseau Luxembourgeois
des Amateurs d'Ondes
Courtes,
Awards Manager,
PO Box 1352,
L-10 13 Luxembourg,
Luxembourg

together with ten IRCs, US $6.00, or DM10 and an adhesive self-addressed label. All applications must be postmarked no later than 31 July 1990.

Andorra 5 Bands Award

This one is also new and requires confirmed contacts with five different Andorran stations since 1 January 1989. These may have been on any of the bands 3.5, 7, 14, 21, or 28MHz, and may be all-CW, all-SSB, or mixed. Note that only stations using the C31 prefix count. Send the five QSLs to:

URA
PO Box 150
Andorra la Vella
Andorra

WORLD NEWS BRIEF

AUSTRALIA

Electronics Australia is Australia's oldest technical electronics magazine and next month it will be celebrating 50 years of continuous publication as a monthly. The April issue will be a much fatter than usual and will come with a special souvenir booklet reproducing highlights from the April 1939 issue as well as various feature articles dealing with the development of the electronics industry over the last 50 years.

There will also be messages of goodwill from many of the world's other radio and electronics magazines and journals including Radio Communication.

After several months of trials and tests, two new HF packet forwarding links between Australia and Europe are now in place and working well. The new links were set up for the purpose of connecting the AsiaNet network with the various European networks. Both links are dedicated to message forwarding and serve as an alternative path to the DCE for routing messages to and from Europe.

EIRE

The IRTS Radio News Broadcast celebrated its 20th anniversary in January. The first broadcast was made at 12 noon on 19 January 1969 by the late Bill McIlwaine, EI9F.

FRANCE

The World Amateur Radio Medal (below) has been designed and engraved by a radio amateur. Dedicated to the radio amateurs of the world in honour of their spirit and fraternity, it can be given as a gift, prize or award by radio clubs. The blank rectangular area is for the recipients name or callsign and there is also space on the diamond for the national society's initials.

The medal is cast in bronze, is 70mm in diameter and weighs 150g. The cost (outside France) is 95 FF each and enquiries/orders should be directed to:

Arthus Bertrand
6 Place Saint-Germain-des-Pres
75006 Paris
France

ISRAEL

The Israel Amateur Radio Club is pleased to announce that following a meeting of its executive council on 26 December, foreign members may now be accepted. The decision of the executive council was unanimous and long-awaited. Foreign members will be accepted with 'Associate Member' status and will receive a monthly issue of 'HaGal International', sent by air mail. The annual membership fee is $25.00 due 1 January each year.

JAPAN

It's understood that Japan is planning to change the morse code testing procedures for its class 1 and 2 licences such that only the reception of morse code will be tested. Nevertheless, the test still appears to be a tough one with the candidate having to receive 50 characters/minute of Japanese telegraphy plus, for the class 2 licence, 60 characters/minute of international plain text.

NETHERLANDS

1989 should prove to be a top year for Radio Netherlands, with conditions on the bands improving and new facilities at the studio centre in Hilversum. An even more creative programme schedule has been planned for the next 12 months. Programme information can be obtained in electronic form by dialling (31) 35 45395 to reach Radio Netherlands' IBM host computer. It operates at 300/1200/2400 baud, uses the standard 8-N-1 format and both CCITT and BELL tones.

This Year's First Major Tropo Opening

Jim Bacon G3YLA tells us why

On 24/25 January 1989 there was a nice tropo opening from the UK and Eire to central and southern Europe and Scandinavia. No doubt the finer points of who worked what will get covered in the VHF/UHF column at some point - however, we thought we'd try a new feature this month. What we plan to do goes something like this. Tropo openings at VHF and UHF aren't exactly hot news; they happen quite often, and unless you're either new to this area of amateur radio or it's a mega-opening they're not especially dramatic, although they're great fun. However, it's been bothering us for some time that the usual text- book write-ups about how tropo openings occur aren't all that helpful - and there seem to be an awful lot of unanswered questions about exactly what goes on up there. So we thought we'd try a different tack. When there's some good tropo we'll have a little news story about the opening itself and follow that up with some facts and figures from Anglia TV weatherman Jim Bacon, G3YLA. We've been unashamedly twisting Jim's arm to do this for us - and we gather that in turn he's been twisting those of his colleagues at Anglia Television, so MNI TNX chaps, all greatly appreciated. Jim will explain what weather conditions were involved and the connection between the DX and all those nice S9 Germans in your 144 MHz receiver. The idea, of course, is to help us all learn a bit more about the whole thing.

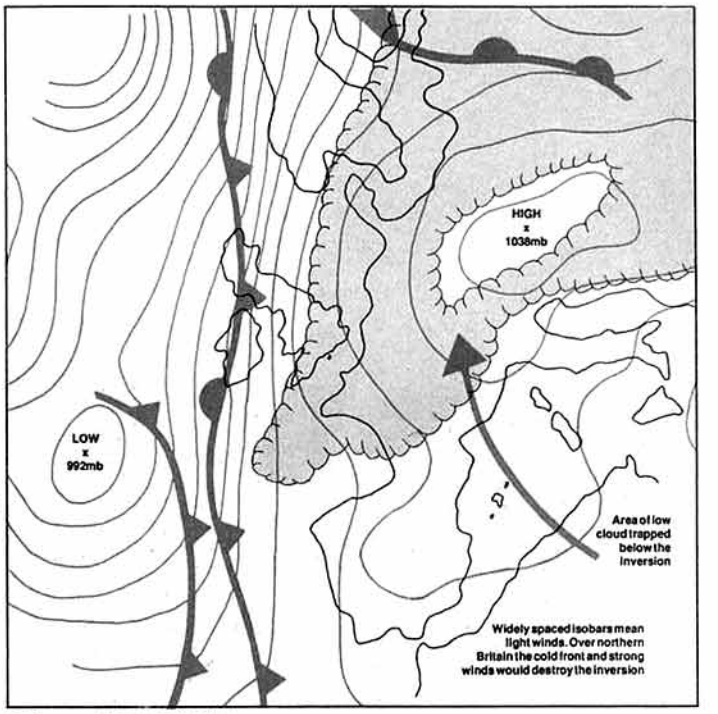
So what happened? At about 1600 on 24 January, stations in the Midlands and the south of England started hearing Dutch and German 144 MHz signals at ever-increasing strength. It was one of those openings where the middle of the country seemed to do better than the rest, with stations anywhere between the East Midlands and Jim, EI3GE just south of Dublin - who was working loads of tasty DX - reporting some very strong signals. In the early evening OE2CAL in JN67 was exceedingly loud almost everywhere south of the Mersey and the Swiss beacon was about S6, although no-one apart from one or two well-sited stations in the south mentioned working HB9. One or two stations on the East Coast reported hearing weak HGs but not working them.

By the following morning the opening had swung northwards to Scandinavia, and some OZ and SM stations were S9+ in most parts of the UK. Who was loudest depended very much on where you were; it was one of those fascinating openings where - for example - OZ1HNE in JO57 was very strong in one place and very weak ten miles away, whereas for an SM station in JO67 the position was completely reversed. It was also noticeable that, as on many occasions, the strongest signals were those from the most distant stations - SM7NNJ in JO86 was a good S9 for most of the afternoon of the 25th. However, the cut-off appeared to be very sharp - did anyone work anything past 90 row, for example? One or two East Germans were also about.

By about 2100 it had all gone, and there was just the usual white noise in the Rx. So what happened? Here's Jim Bacon:

"For much of January, propagation was bordering on 'lift' conditions. This period, as many of you will have realized from the length of the grass, was rather exceptional from a weather point of view.

"On Tuesday 24 January a widespread tropo opening occurred, which was a direct result of the almost semi-permanent area of high pressure over the continent. At 0001 GMT on the 25th the synoptic chart (see map) shows the high centred over southern Czechoslovakia.



25 January 1989 - 0001GMT

"The important thing about the high was its production of a marked temperature (subsidence) inversion - see chapter 2 of the VHF/UHF Manual. Large highs are typically regions of dry warm air above the inversion level. If this inversion also traps a layer of moist air between it and the ground, then conditions are ideal for a 'lift'.

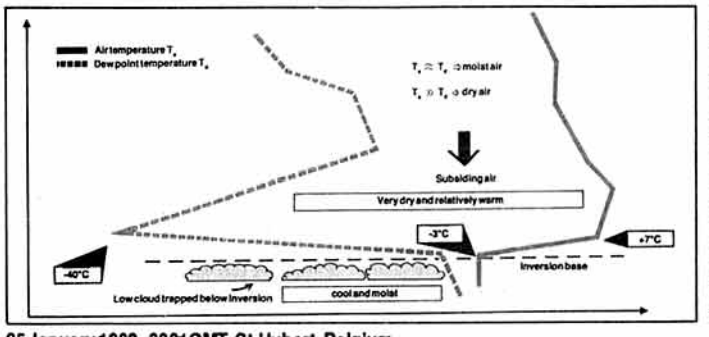
"The principal requirements for tropo are a sharp change of temperature and moisture across a relatively short vertical distance; both of these elements affect the refractive index of the air. The upper air radio-sonde readings taken at 0001 GMT on the 25th were examined to see whether such contrasts existed on this occasion. The plotting convention of these graphs is essentially that temperature increases to the right and - as usual - altitude is the left-hand axis.

"On this particular radio-sonde ascent from Belgium, which was typical of much of the cloud area around the high, there was indeed a marked contrast of temperature and moisture across the inversion. The effect which this had on the radio refractive index was to cause a decrease of approximately -168 units per kilometre through the inversion, or perhaps a little greater. This is comfortably in excess of the -157 units/km needed to bring a radio wave back to ground or cause ducting as was required for the DX paths. The inversion was between 2000 and 2500 ft.

"Over 45mb (ie 411 metres) a decrease of 45.7 units gives a gradient of -111/km. Over 25mb (228m) a decrease of 38.5 units gives a gradient of 168/km. If the whole change took place in the first 25mb (ie allowing for a time lag in the instrument), this gives a gradient of -199/km. This is comfortably enough to bring in some good DX!"

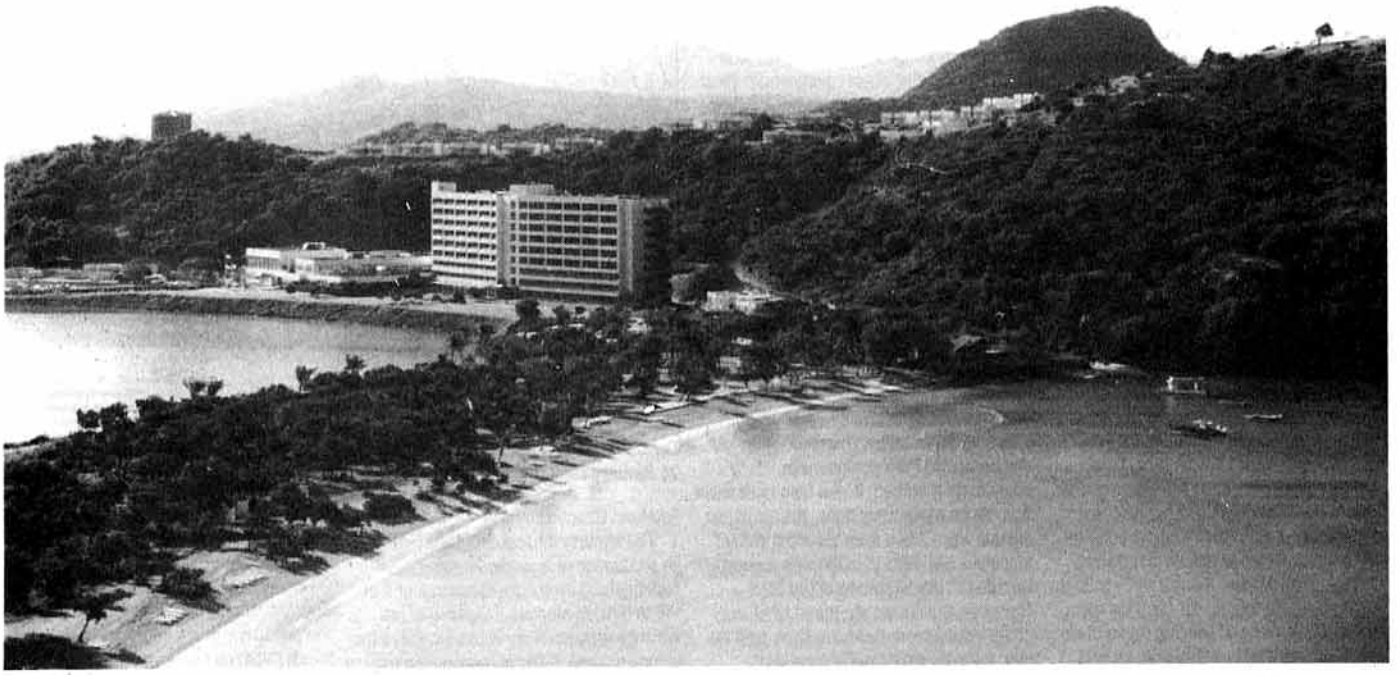
So there you have it - or some of it, anyway. What's especially interesting is the possibility of a very large gradient, which might go some way towards explaining why some stations in the Netherlands and on the German border were giving a lot of S-meters in the UK some serious stick.

Incidentally, this opening showed up a perennial problem yet again. The sector between 144.15 and about 144.35MHz was full of both strong DX signals and local QSOs, but between .35 and the top of the SSB allocation there was almost no-one on. Inevitably, some of the local natterers got clobbered by chaps calling weakish DX underneath them which they couldn't hear. When there's a major 144 MHz opening - or even when conditions are halfway reasonable - it makes enormous sense to move local QSOs, nets, etc up above about 144.400 to reduce the possibilities of mutual interference. One gentleman we heard having a little local QSO on 144.330MHz was extremely put out when someone a few miles away and obviously rather better sited went back to an SM7 who was calling CQ on the same frequency. Said gentleman didn't seem to be able to grasp the fact that conditions on the band were slightly different from normal and that 144.33MHz wasn't a very sensible place that night for a local ragchew. If we all made better use of our bandplanned allocations, we'd all work more of whatever we want to work with less clobberage - which also means staying sharp and using the receiver as though it belonged to a radio amateur instead of a PMR operator...



25 January 1989 - 0001GMT. St.Hubert, Belgium

Pressure	Temperature	Dew Point	Modified refractive index
900mb	+7.1	-40.0	250.8
920mb	+7.5	-28.0	257.3
945mb	-3.5	-3.9	295.8



DXpedition to Antigua

IAN SHEPHERD
G4LJF/V2A

We've run quite a few DXpedition stories in the Bulletin, and the feedback we get suggests that you like reading them. However, with one notable exception they've all been about VHF/UHF DXpeditions. The reasons for this remain unclear. Maybe VHF types are naturally good with their word processors and typewriters whereas the HF fraternity are naturally tongue-tied. Maybe the HF brigade collectively spends far too much time working exotic DX worldwide to have any left for writing! Whatever the answer, the bottom line is that unless someone writes the stuff we can't publish it. John Pitty, G4PEO, writing in last month's "Last Word", was wrong: it isn't that we're "...biased towards VHF", it's just that our contributors seem to be!

However, you can't say we don't try. Arms have been twisted, veiled threats bordering on blackmail have been issued and gauntlets have been thrown down - and in this month's Bulletin we've actually got an HF DXpedition story for you. It's by Ian Shepherd, G4LJF, who - when he isn't flying all over the place for British Airways - is a crack HF operator. Ian has been to a number of interesting places over the years and put them on the air; here's the story of his latest foray into being DX rather than working it. Fasten your seat-belts...

I suppose that every DXpeditioner gets a yearning to go back. I sometimes wonder why, since a productive DXpedition with a single operator is not exactly a holiday. The combination of continual sleepless nights, the noise and the bad behaviour on the bands usually results in a bad case of total exhaustion. But nevertheless - in the aftermath of writing out the QSL cards there's always that 'pull' that takes you back to being DX again. Eighteen months after my operation as S79LJ, I was beginning to become restless again. I had had moderately high hopes of obtaining permission to visit Agalega Island, 3B6, after being involved in a meeting at Government House in Mauritius. However, it was not to be for the time being.

Last June, in the course of my flying duties, I happened to be at a cocktail party in Antigua; specifically, at the new Royal Antiguan Hotel, which is situated in Deep Bay on the north-west corner of the island and owned by the Government. The hotel had been built by a workforce of Italians and all the materials had been imported by ship, including a generous allocation of very fine marble. The end result is a magnificent establishment. However, it had been a very expensive development, and had in fact led to Antigua's national debt being doubled. Not surprisingly, there had been considerable criticism from anti-Government factions. To make matters worse, occupancy of the hotel had been much lower than expected, mainly because tourists seem to be lured away from Antigua and towards Barbados - where there is a more tourist-orientated approach to visitors. Personally, I think that Antigua is a far nicer island. I prefer to get away to unspoiled beaches like the ones you see in the advertisements and to be on an island that is not full of noisy discos and lager louts!

There is something very magical about a warm dark night on a quiet Caribbean island, and Antigua fits this bill very nicely.

So there I was, chatting to the hotel manager together with Adrian Bulpin, the hotel's engineer and his lovely wife Lynne, when I had an idea. It crossed my mind that an amateur radio expedition could help the hotel by promoting its existence through QSL cards. We had some preliminary discussions: as soon as I returned home I put my ideas into writing and enclosed some of my S79LJ cards, which had been designed to promote Bird Island in the Seychelles. Lynne took my idea to the Deputy Prime Minister of Antigua, Mr Lester Bird and, following a meeting with the directors of the hotel, I was thrilled to be invited to come and

operate from there. However, I did point out that there might be a problem. The hotel is situated in a bay with hills rising to more than 300ft just behind it, which isn't a good start, but some luxury villas (some $320,000 apiece...) had been built as part of the same development. These are situated on the ridge above the hotel itself, so I asked whether I could use one of these as my base. After consultation with the Deep Bay Development Corporation, who are trying to sell the villas, the answer was yes. So I was now all set for a good DXpedition and it was time to set about getting things together since I had some leave coming up in November.

I suppose the first question was who would want to work V2? Looking through my computer log, I noticed that I had only worked one V2 in the last two and a half years! There seemed to be little doubt that many people would be needing it. Since 28 MHz was open again, that looked likely to be a favourite as well as the LF bands, and I thought that some CW might be welcome. As I was going to operate from a villa instead of the usual beach, I was going to have to mount the antennas on the roof, so I decided to increase the number of radials on my Butternut HF2V from 27 to 55. I would take the Fritzel GP 30 vertical for 10-20, and also a TS 430S together with an Amp Supply LA-1000 amplifier to produce 400 watts out on the LF bands. I remembered that the Butternut hadn't been easy to match on 160M when I was in S7, and with 55 radials it was likely that the feed impedance would be altered even further away from the desired 50 ohms - so I went to Ammcom and bought a Versatuner ATU. This is a T-match design, probably the best there is for the job, and although the model I bought was only rated at 300 watts, I felt that I would get away with putting 400 through it on a short duty cycle providing that the mismatch was not too great. The unit is really compact, and would be easy to carry.

DIRECT TO LAP-TOP

I decided that the target would be to make 5000 QSOs - however, having made a similar number from S7, I remembered all to clearly the horrendous task of typing all the QSO records into my computer so that I could produce the labels for the cards. I swore that I would never do that again, and that in future I would log directly into a lap-top computer. I already had one of these but - in the time- honoured way - a screw worked loose a week or so before the day of departure for V2 and the thing blew up! Unfortunately the service agents in the UK were unable to repair it in time. Luckily I had a trip to New York before I left, and after several long distance telephone calls (and having to pay $100 rush air freight up to New York) I was able to pick up one of the new Zenith Supersport Lap Tops, with one of the best screens in the business and a built-in 20MB hard disk...ideal for the job in hand.

IN-FLIGHT PROGRAMMING

So on 15 November I set off on the world's favourite airline, albeit a little late owing to the dense fog at Heathrow that morning. First Class had some vacant seats that morning (it's useful working for an airline...) so I had a bit of space in which to get down to writing a computer program to handle the logging for me. All I wanted to do was to tell the computer what band and mode I was operating at the start of the run, then type in each callsign as a station was worked. The computer would put in the time and date automatically. I assumed that reports would be 59 or 599, but there was a chance to edit these without breaking out of the program. I was hoping to add a dupe check as well, but I did not have enough time to include that before we arrived.

Our approach to Bird Airport was a circling one and took us right over Deep Bay. I looked down upon the villas where I was to operate from, and all in all it looked a magnificent sight. After some hassles with the Customs Officer over my equipment, I finally struggled out of the Terminal and - much to my relief - found Lynne waiting for me with her car. We drove straight to the Villas, only to find a very agitated maid. She had been up there to clean the place prior to my arrival, and the wind had blown the front door shut locking her out. Guess where the only key was. Correct - inside. So I started my visit to Antigua by playing burglar. I found a piece of wire in the grass and managed to prise out one of the panes of glass in a louvred window. Shortly after that we had enough panes out for the maid to climb back in again!

The villa was very nice but I felt it was a little too near to a hillock to the west of me. Much to Lynne's dismay I asked if I could move to another one a little further to the east. I could see that she was a little upset by this since she had gone to great lengths to get the place ready for me, but she waved her magic wand and I moved into an unfinished villa. This was still full of builder's rubble and dust and there was no hot water or gas - but there was electricity and a good take off in all directions. To make life even better, after a week I managed to get the immersion heater working - a great relief!

On the morning after my arrival, Lynne and I went into the capital - St Johns - to get my licence from the Ministry of Works. Micky Mathew, V21AR, was not there as he was off the Island that week; however, his secretary had the matter efficiently in hand despite the fact that I had never received any reply to my letters (the SAE was still attached to my letter to him!). I had requested the callsign V21LJ, but since Mickey was not there I had to accept G4LJF/V2A. (After my return to England, they did in fact issue V29AB. Things move slowly in the Caribbean!) We then returned to the villa to set up the antennas. We found two large paint tins, took them down to the beach, filled them with sand and then took them back up the hill in the back of Lynne's car. Within an hour or so, we had the Fritzel assembled and working.

INDISPENSIBLE LYNNE

The Butternut was placed in its sand-filled tin on the top of an air-conditioning unit in the centre of the flat roof. Setting out the 55 radials was an arduous and painstaking task. Each of the longer radials had to be tied to the bottom of the antenna with a strain-relieving line secured with a rolling hitch. The ends of the longer radials were fixed to the roofs of adjoining villas, lamp posts, trees or anything else which could be found. This involved a lot of lugging of the ladder from the roof, up and down slopes to the fixture point and back for the next one, all in 30 degrees of heat and blazing sunshine! Lynne steadfastly helped me with this task, and I doubt whether I would have seen it through without her help.

The shorter radials were taken over the roof to stakes driven into the ground and tensioned, again using a rolling hitch. In the end, the villa was covered in a huge web of wires, making access a tricky business, especially in the dark! It was a mammoth job that took two days to complete, and I must admit that I sighed for a beach location where the wires could be simply laid out on the sand. However, I think the effort was worth it. I got terrific results on the LF bands, and the only contact that I really struggled with was with Jim Smith, VK9NS, on 3.5 MHz!

INSTANT PILE-UP!

The operation kicked off on 28 MHz, where there was an instant pile-up from all sides. I resorted to mostly co- channel working in the end, as signals were strong all round, and I called for Europe followed by South America, North America, the Far East and Pacific and then round again, and it all worked very well. The computer log told me exactly how many I had worked after each QSO, so it was easy to switch from one area to the other after a set number of QSO's with each area.

The Indonesians came romping in on 28 MHz, but there was completely different propagation to Japan. I only had an opening to JA on 10 and 15 in my evening time for about 30 minutes at the most, and on many evenings there was no 28 MHz opening at all. The solar flux took quite a dive whilst I was there which was a pity. ▷

Ian Shepherd in his make-shift shack in the luxury of the unfinished villa

However I worked almost 500 JA stations on bands between 3.5 and 28 MHz, although there were very few on 80 and most of the contacts on 40 were on CW. Almost all contacts with JA were made split-frequency due to the size of the pile up and the fact that signals were none too strong. Europe, of course, was easy to work on all bands and in both modes apart from Top Band. I only 7 heard Europe twice on 1.8 MHz, in the shape of OH1XX and OK3EY calling me, but they did not hear me with my 100W! At my sunset I had an S9+20 noise level from some kind of electrical interference locally, but at around 0100Z I had no problems and worked hundreds of Americans on 160 CW.

A NINE YEAR-OLD

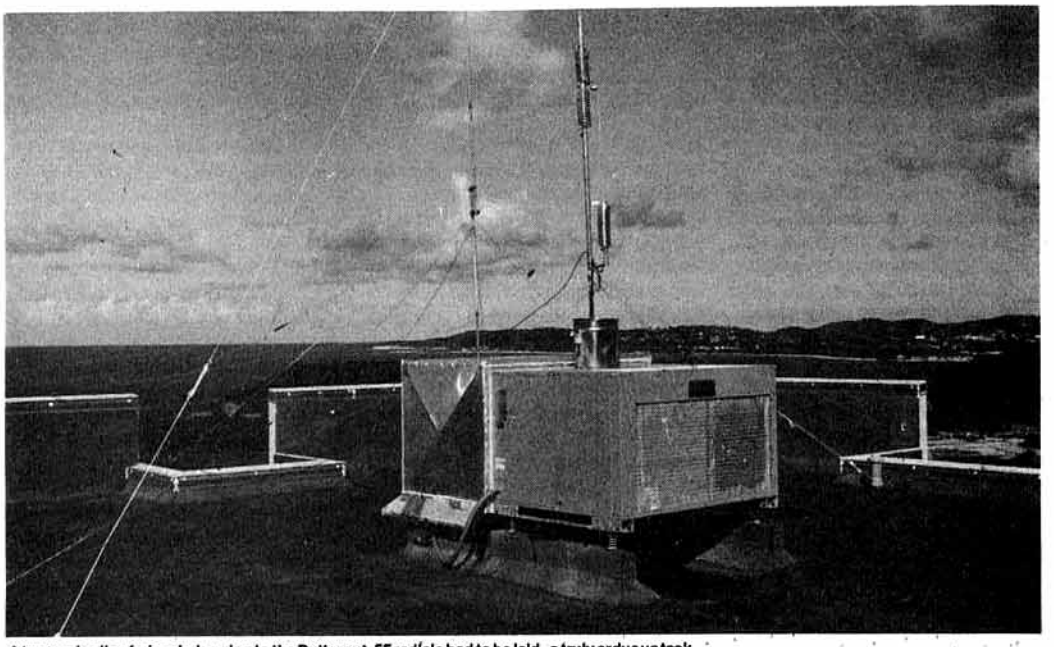
There are two contacts which I shall remember for a very long time. The first was with 9Y4TP; Colin had been licensed for 58 years and had been the founder of amateur radio in Trinidad. Would you believe that his contact with me was the first QSO he had ever had with Antigua!

The second occasion was in the middle of a big 28 MHz pile-up from Stateside. I heard a small female voice screaming her lungs out from Alaska; when I picked her up, I asked her how old she was. She replied that she was nine and then told me to stand by for her big brother, who was ten. Then I worked Mom and Dad too. Four amateurs in one family - not bad!

There was always a vast and impressive pile-up from North America. Antigua was a new one for a great many, either as a new country or on a new band, and I was especially popular on the LF bands. I only ever heard one V2 on the air whilst I was there, which was Jacques, W4LLZ/V2. Although there are half-a-dozen licensed station there, you rarely hear them outside Caribbean nets and they seldom venture on to LF or CW. Talking about that, the CW side went better than I expected despite difficulties with my temperamental Bencher. I found it extremely hard going when the pile-up became very large and all signals merged into a great wall of nothing! I see now why some DX operators regularly go QRT for five minutes or so and then come back when the pile-up has diminished... I am not sure either that my 430S is the best tool for the job with its fixed AGC. Still, I worked 1027 stations on CW, which wasn't bad considering that it is not my favourite mode. I just wish I was able to concentrate for longer periods on receiving, but I find that my brain gets saturated after 45 minutes or so. This is especially when tired, which is what I was most of the time!

The QRP skeds with CDXC members (and others) went well, and whenever I heard a QRP call in the pile up I would offer a 2-way QRP and reduce power to 3 watts for him. It surprised me how effective low power can be at times.

The Versatuner worked extremely well and enabled me to move from SSB to CW without having to climb on the roof and adjust the Butternut each time, except on Top Band. The problem was that, with the HF2V set up for 1832 CW, I was unable to tune it at 1840 on SSB without readjusting the 160M tuning coil. As a result I stuck with CW on 1.8 MHz, although I could hear North Americans well at times on phone.



A true umbrella of wires belonging to the Butternut. 55 radials had to be laid - a truly arduous task

By and large, apart from the South Americans, most people were well behaved in the pile-ups. I really can't say that the Europeans were bad at all: in fact they were really quite good, with a very few exceptions. The Americans were easier to work, but then signals were stronger between us, which always helps maintain discipline. As usual, the JAs displayed impeccable manners and were a delight to work. The South Americans though, apart from the regular DX'ers were a pain in the ear! Time and time again, especially on 7 MHz, they would start up an S9+ QSO or - worse - a net within 1 kHz of the frequency I was using to work Europe. Their lack of English and my total lack of Spanish or Portuguese did not help matters, and a lot of bad feeling was created at times. It appears that many operators from this part of the world have no comprehension of the difficulties of working DX; neither do they appreciate that the cleanest SSB signal ever is still going to cover something like 4 kHz-worth of band.

The other unfortunate occurrence was again on 7 MHz. I was on 7045 working Europe and the Far East, when a certain W1 station told me in no uncertain terms to get out of the American CW band. I told him to get lost! From that day on for the next week I was regularly jammed by a strong carrier when on SSB. According to many stations in North America, it originated in W1 - they were fed up with it too!

I worked hard towards my target. Breakfast was cereal and after that I lived more or less on peanut butter on toast, supplanted by one good meal a day down at the Royal Antiguan Hotel. It was quite a hike down the hill (and a real killer walking back up it) so I went down there as little as I could. The meal was usually preceded by a long swim at the beach, and I usually found time to practice my wind surfing as well. On the weekends I was wined and dined by various people associated with the Hotel and we had some fun times at Shirley Heights. This is a hill-top location above Nelson's Dockyard where you watch the sunset, drink far too much rum and dance to the sounds of a reggae band till you have had enough. Once I had made 5000 QSOs I must admit that I eased off a bit and enjoyed the beach and the hotel facilities more. Lynne took me sight seeing around the island and I took quite a lot of video with my camera.

WILD GOAT HAZARD!

In the end the QSO total ran to 7131, with 1027 on CW and 1587 on LF. 28 MHz seemed to generate the most interest, and 21 MHz the least. I guess that with 28 MHz open, many stations are looking there; 15 always seemed very quiet except when the JA's knew that I would be looking for them there. The only problems that I had with the equipment were the loss of several radials due to the wild goats that roamed daily around my villa, and twice the LF feeder burnt through the insulation where it was taped to the Butternut below the feed point. This happened both times on 1.8 MHz barefoot, which goes to show how the voltages rise considerably when operating into a mismatch.

Eventually it was time to leave. Lynne had secured a job as manageress of the new Gucci store that will soon be opening at the Heritage Quay duty-free shopping area in St John's and had to go to St Martin for a six week training course, so I was left to pack everything up on my own. Surprisingly, those radials came down very much more quickly than they went up, and I had everything packed up within a day. Adrian drove me to the airport, and nine hours later I was back to an English winter and hundreds of direct QSL's that had already arrived! It was good to be home, though I do miss the relaxed atmosphere of the Caribbean, and not having to dress up in the morning.

It was a fun DXpedition, although being so close to North America robbed it of that thrill of being on a distant island and working the world. That tenuous thread of the radio wave doesn't seem quite so magical when one was so close to two major continents. Still, I worked 148 countries all told and made many people happy, judging from the comments on their cards. The computer worked faultlessly, and all the records were transferred to my main machine in a matter of seconds. The cards have been ordered and I am currently wading through the 900+ 'directs' received so far, ready to produce the labels before the onslaught from the bureau! Maybe in about eighteen months I will have caught up, and will get that restlessness that will take me on the next expedition.

Thanks to those of you who called - it's always good to hear from the 'home team'!

THIS REPORT IS BUT THE TIP OF THE ICEBERG. DXPEDITIONS MAKE POPULAR READING, AND SO WE PLAN TO LINE UP A REGULAR FEATURE. IF YOU HAVE AN INTERESTING STORY TO TELL, CONTACT DAVID GOUGH, NEWS EDITOR, STRAIGHT AWAY

SPECTRUM ANALYSIS

HF

JOHN ALLAWAY G3FKM

Another good month - and it's clear that "fastest WACs" on 28MHz are of interest again. G3PH has set the ball rolling with one on 4 January in 30m. Your entries please!

It's quite clear that G8KG's optimism is justified as can be seen by the following loggings. However I must again mention GW3YDX who has produced another extraordinary 1.8MHz log - this included an amazing opening on 2 January when 26 W6s and W7s were worked between 0410 and 0715. Ron also says that the band is open into Japan most evenings but is limited by QRM from European SSB (NB Japanese stations may only transmit between 1.907.5 and 1.912.5MHz...)

Thanks to the following who sent in logs: G2DRT, G2HKU, GM3CSM, GJ3EML, G3s GVV,KSH,SED, GW3YDX, G3YRM, GM4CHX, G4EHQ, GM4ELV, GW4KGR, G4s LRS, MUW, NXG/M, OBK, OII, SJG, UZN, XAH, GD4XTT, and GD0ELY. Calls in italics were of stations using A1A.

1.8MHz
0000 *LY2WW, YL2RG, RV9CFP.*
0400 *K7QQ, KD7Z, N7CKD, W7s AWA, MCU, OEV,WA.*
0500 *AB9O/7, CM6CG, KN6J, N7UA, VE7BS, W6RR.*
0600 *FM5BH, VP2MDC.*
0800 *KX6DC,* ZL2BT.
2000 *VU2IN.*
2100 *JA's, LY2WW.*
2200 *JA1,3,4,5,6, OX3OX, K1ZM, K2EK, 9M2AX.*

3.5MHz
0100 *DK7PE/SV9, W1-W4.*
0300 *SU1EE.*
2100 *VO1QF.*
2200 *JA6LCJ.*
2300 5T5CK.

7MHz
0100 4S7WN, 9N88C.
0200 FR/DL4BBO, *SU1EE,* VP2EHF.
0800 *VP9NLQ, ZL3ABV, 7X3DA.*
2000 VU2INK, YC0MCA.
2100 JA2BAY, *JA7DAH.*

10MHz
0800 *KY9L.*
1100 *SP4BY, VP2MIX.*
1700 *ZLs 1HY, 3KR.*
2000 *VK3NC.*

14MHz
0700 FK8BT, KH0AC, YJ8JH, 3D2AG.
0800 AH2AN, KC4AAA, *KL7GNP,* VE6-VE7, *VS6D0,* ZL.
0900 VR6TC, YI0AD.
1100 VK9ZM.
1600 SU1ER, VK9ZM.
1700 YK1AO.
1800 6W7OG.
1900 KH6IJ, VK, ZL4OD.
2000 V21AZZ, VP2VA, 6T2MG.
2300 *JA1CWZ,* W6-W7, YB, ZL, 5U7CW.

18MHz
0900 *SP3FGR, TU2QQ.*

21MHz
0700 K0EA.
0800 BV2B, BY1QH, *C65/F2CW,* JA.
0900 BYS 1PK, 8AC, JD1/JH1MAD, VS6GA, ZL.
1000 BYs 4WNG, 7HY.
1100 *FR/DL4BBO.*
1200 YI2ARB.
1500 *FO5JR,* 3A/F9UW/M.
1700 FH4EE, 9L1AC.
1800 *FP5HL,* VP8BUD, 3B9FR.
1900 C9MKT, FR4FD.
2000 VK4AI, *3C1MM.*
2300 *JA,* TR8RLA.

24MHz
0900 *ZL3GN.*
1000 *PT7BZ, TU2QQ, VU2ZAP.*
1100 *IK6BAK, PY2AMI, VK5BTW.*
1200 *KP2J, W1,W4.*
1400 *KP4TIN, TU4CO, W1-6, W8-W0. 5T5CJ, 9J2WS.*

28MHz
0700 BY5NC.
0800 BYs 5RA, 8AC, WL7E/KH6, TU4BR/5U7.
0900 BV2DA, BYs 1BJ, 4WNG, J42O, JT1BG, *SU1EE, VK8AB, 9V1VB.*
1000 BV2A, KG6JJH, *RA0AA,* VK1RJ, WL7E.
1100 AP2UR, CV0Z, 4U1UN, 9Q5NW, 9X5AA.
1200 A41KA, HV3SJ, PY0FF, TL1EE, VK4-VK6, VU.
1300 A45GY, FG/W3BTX/FS7, JX1UG, UA6HPR/UG5G, V31PC, KA3B/VP5, XE3PLV, YI0BIF.
1400 AZ4F, C56/F2CW, FP5HL, TA3C, TZ6FIC, YN3CC, *3C1MM.*
1500 HK0HEU, P40V, W5-W7, ZD9BV.
1600 HH7PV, LP2U, G4LJF/V2A, VP8BUR, XF1C.
1700 PY1DFF/CE0, J73LC, W7, ZF2NC/8.
2000 ZF2AG/8.
2100 CE, CO, LU, PY.

DXCC

January 1989 *QST* lists the callsigns of all those who are members of DXCC in the order of 'all-time' countries worked. The leader is W1GKK with 370 - but bear in mind that the current list is on 319 countries. Some of the top UK scores listed are as follows:

Mixed
G4CP-365, G3AAE, GW3AHN-363, G3FXB-361, G3FKM-360, G5VT-359, GI3IVJ-356, G2FSP-353, G3HCT, GM3ITN-352, G2BOZ-351, G2FYT-349, G3KMA-346, G3IOR-345, G5RP-341, G3GIQ, G3UML-340, G3JEC,GI3OQR-339, GM3BQA-338, G3HTA-337, G3JAG-336, G2DMR-335, G3KDB-332, G3DOG, G3LQP-331.

Phone
(Top of list TI2HP with 366) GW3AHN-360, G5VT-359, G3FKM-356, GI3IVJ-351, G3NLY,G3UML-340, G3JEC-339, GM3BQA-338.

CW
(Top of list W9KNI with 323) G3KMA-312, G4GIR-275, G4EDG-270, GM3YOR-266, G3TXF-264.

The same article in *QST* said that QSLs for credit with 4J1FS, Malyj Vysotskij Is, may be submitted for credit commencing 1 March.

NEWS

A sad note heads up the news this month. Early in December Jack Maling, G5JL, who had been a regular contributor to this column for over twenty years, became a silent key. His letters always contained details of loggings of good DX on CW on all bands from 1.8 to 28MHz and other useful news items. He was a real DX'er of the type which we would rather not lose.

Please note the comments which appear with the tables - in addition to these Henry, G3GIQ, wishes to pass his best wishes to all who entered in 1988 and also his thanks for the many letters. He apologises for not replying to them all owing to lack of time.

QRP

A very interesting report from Chris, G4BUE, on some QSOs which he had with with Randy, AA2U, during the G-QRP-Club's Winter Sports between 26 December and 1 January last. He first worked him at 1504 on 27 December on 28MHz and had another 28MHz contact the following day. At that time Randy told him that his signals had been heard on 3.5MHz that morning at 0800. A sked was fixed for the next day and at 0725 on the 27th Chris made his first trans-Atlantic QRP contact on 3.5MHz. They tried 7MHz without success but at 0749 on the 31st they worked each other on 7MHz. During this contact they set up schedules for the HF bands and these resulted in contacts on 31 December on 21MHz, 14MHz, and 10MHz, and a cross-band one on 14/18MHz. The next day they made it on 24MHz! This meant that they had had low-power QSOs on seven (and a half) bands. Power in use at all times was 3W. Is this the first time that multi-band two-way QRP contacts have been made across the Atlantic?

Tony Smith, G4FAI, of the European CW Association, has issued a press release which says that there is now a EUCW Net which is open to all - it meets at 1900 every Tuesday on 3.555MHz and is directed by SM7GWF together with OZ8O and DL2ZAV and all are invited to join in.

1988 FINAL ALL BAND TABLE

	1.8	3.5	7.0	14	21	28	Total
G4OBK	64	74	112	154	157	162	723
G3SXW	41	58	84	142	122	122	569(CW)
G3TXF	44	37	66	186	72	103	508(CW)
G4ZYQ	-	41	31	115	122	177	486
G4NXG/M	-	17	32	101	108	161	419
G4ELV	-	6	20	42	38	31	137
G4FVK	9	6	10	22	17	2	66

The next deadline (for the 1989 table) is 8 April - to G3GIQ please.

10MHz COUNTRIES TABLE

	All-time	1988
G4XRV	45	45
G2AFV	39	39
G3PJT	106	36
G3SED	71	32
G3JJG	102	18
G3AAK	111	-
G4VDX	71	-
G4YWG	64	-
G4OBK	57	-

DX NEWS

The DX Advisory Committee unanimously recommended that **Rotuma Is**, 3D, be added to the DXCC list. This has now been accepted and QSLs may be submitted (after 1 June 1989) for contacts since 15 November 1945. At the same time the committee voted against the reinstallation of **Okino-Torishima**. There now seems to be doubt whether the **Marquesas Is** could be eligible for DXCC status because French Polynesia is not a separate country by reason of government and therefore any separate islands would have to be more than 500 miles from the Tuamotu archipelago to qualify. However, and in spite of this at the time of writing it was believed that W1XX and N1CIX (both of ARRL) together with some W6 operators were making plans to visit the islands, possibly during the ARRL DX Contest this month.

Some of the Pacific expeditions being made by DL5UF, DK1CE, and DF2UU should still be taking place when this magazine is published. Callsigns are not known but frequencies to watch are given as 1.832-1.835, 3.505, 3.805 (QSX down), 7.005, 7.075, 14.005, 14.195, 21.005, 21.195, 28.005, and 28.495MHz. The proposed itinerary included 5W, ZK1, ZK3, KH8, A3, 3D2, and ZL, but the order in which they might be visited is not known. DL2GAC is also expected to be somewhere in the Pacific area at this time together with DF5UG. He takes special interest in IOTA and was hoping to visit a number of unusual islands in the Papua ▷

New Guinea and Solomon Is area around now. Equipment, according to *DX News Sheet* consists of an FT757, FT707, and Fritzel GPA30 antennas. Likely frequencies include 14.260, 14.275, 21.260, 21.275, and 28.560MHz. NY6M/KH2 and KD7P/KH2 are planning to be on **Midway Is** this month for the WPX Contest.

W1BIH should be in **Curacao** until next month and be using the callsign PJ9JT on all bands 1.8 to 50MHz. All QSLs only via W1AX please.

Old timers will have been fascinated to hear stations on the bands using the YL prefix - this used to be used by stations in Latvia but was being used in December and January to celebrate the 70th anniversary of Latvian independence. *DX News Sheet* also says that some stations in Lithuania were using LY prefixes during January.

More trouble for Martin, OY7ML. He has suffered severe storm damage to his house and antennas and was off the air when this was being written. However, the pirate "OY7ML" continued his activities. Both Martin and the pirate were active in the CQWWDX Contest - the latter mostly on 21 and 14MHz between 1100 and 1700. When he is back on the air (according to *DX News Sheet*) Martin will not in future operate between 0900 and 1700 on weekdays.

The *Lynx DX Bulletin* says that there should be activity beginning during the first week of April from **Marion Is**. Hopefully ZS6TP will be on the air for fourteen months as ZS8TP. However, *DX-press* gives the callsign as ZS8MI. The *Long Island DX Bulletin* says that J52US in **Guinea Bissau** is often on 28.502MHz from 1800 and moves to the 21.200MHz area at 2030 for an hour or so. *DX Report* mentions ZL2QB/TL8 as a surprise check in on the 14.222MHz net - the **Central African Republic** is quite rare these days and VK9NS says that this operator will be there for some time.

PROPAGATION

G8KG's contribution this month goes as follows: "For those of us following the progress of Cycle 22, December 1988 will be a month to remember. It started quietly enough but in the second half of the month solar activity began to rise steeply, passing the 250 SFU level and remaining above 240 for seven days before settling down again to values around 200, way above those at the end of November. Because the upsurge happened late in the month the monthly mean solar flux only just topped the 200 SFU mark but it was still the highest so far in this cycle and the 27-day running average has continued to rise in early January, reaching 222 SFU at the time of writing with a daily value of 268 on 8 January. The provisional monthly sunspot number is likely to be in the region of 150 or higher.

For readers who are not fully familiar with the background it is only necessary to

FINAL 1988 28MHz COUNTRIES TABLE

G3VOF	222	GM4ELV(QRP)	139
G4XAH(SSB)	200	G0CKP(CW)	135
G4ZYQ	177	G4DXW	128
G4MUW(SSB)	175	G0HOF	125
G4OBK	162	G3PXT/M	115
G4NXG/M	161	GM4CHX	90
GD0ELY	158	GW4TEJ	57
G4SJG	156	G4JBR	50
GD4XTT	156	G0FYD	38
G0DNV	150	G4OUT(CW)	34

1989 28MHz COUNTRIES TABLE

G4DXW	40	G4ZYQ	25
G4MUW	33	G4NXG/M	25
GM4ELV	26		

HF F-LAYER PROPAGATION PREDICTIONS FOR MARCH 1989

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

Time / / GMT	28MHz 000001111122 024680246802	24MHz 000001111122 024680246802	21MHz 000001111122 024680246802	18MHz 000001111122 024680246802	14MHz 000001111122 024680246802	10MHz 000001111122 024680246802	7MHz 000001111122 024680246802	3.5MHz 000001111122 024680246802
** EUROPE								
MOSCOW	....467761..	....688884..	...38899971.	...58888993.	211776667984	865543345799	875211112588	+42.....25+
MALTA	....577663..	....788886..	...29999983.	1..588889962	531876678997	987754445899	998421123689	++52.....3++
GIBRALTAR	....155443..	....377675..	....6888883.	88889961	32.387777995	885765445799	998632222589	+++3.....2++
ICELAND	......2221..	.....24443..	.....577761.	....1788883.	1...57778883	652365556788	997632223568	+++3.....23+
** ASIA								
OSAKA	....361.....	...1573.....	...277421...	...37543321.	...152124653	....2...2574	351	.........2.
HONGKONG	...268852...	...3788742...	...2676665..	...145457731	2...12125874	2.......2687	364	32
BANGKOK	...3788872..	...4788884..	...34767871.	...125457831	3....2125886	4.......2688	367	34
SINGAPORE	...3788872..	...4688884..	...34767871.	...115457832	3....2125886	3.......2688	1........366	33
NEW DELHI	...478883...	...578885...	...44666721.	1.12223457432	511...1125786	73......2689	61.......367	3.........45
TEHERAN	...5888882..	...6778884..	...655678721	2.2522457853	6342..125888	973.....2689	751......367	52........34
COLOMBO	...5888883..	...5678895..	...335678821	2..112457953	62....125888	72......2689	5........367	2.........34
BAHRAIN	...5888883..	...77788951.	1..644668842	312422447975	8541..115898	973.....2689	751......367	52........34
CYPRUS	...4999995..	...69999981.	1..888889952	411876778985	865654456899	996321124799	8841....1478	+5........4+
ADEN	...5+++9961.	...776789831	3..633568975	632411247997	9751...15899	983.....2688	761......367	53........44
** OCEANIA								
SUVA/S	.....1332...	.....35542..	....2566651.	...14545772.	...45322572.	...43...25..	...1.....2..	.....
SUVA/L	32..521..175	43.174311385	3314864336?4	122675334862	..275211473.	...42...15..	...2.....2..	.....
WELLINGTON/S	....14532...	....366542..	...1566675..	...37555772.	...55222574.	...32...252.	...1.....3..	.....
WELLINGTON/L	22..2.....24	43..4.....46	442262...166	3334731..374	.13652..2651	...42...152.	...1.....2..	.....
SYDNEY/S	...2786641..	...4887763..	...6876786..	...57545782.	...252125862	....2...2651	.........32.	.....
SYDNEY/L	....21....22	....431...44	221.7521..76	2211752222?6	...252113573	...13...154.	.........22.	.....
PERTH	...5887531..	...5888753..	...467667621	1..245457853	3...12125887	2.......2686	363	.........3.
HONOLULU	.........1..	........131.	.....21.362.	....1321572.	.112431155..	..352...22..	..13.....	.....
** AFRICA								
SEYCHELLES	...56688551.	1..666787732	31.433568975	632211347998	963....15899	961.....2689	73.......367	5.........34
MAURITIUS	...58+++9721	1..667889853	41.433668986	742211347998	973....15899	951.....2689	73.......367	5.........44
NAIROBI	1..587888842	2..666689964	631633368998	853511147999	9962...15899	984.....2588	772......366	54........44
HARARE	2..3788+9964	41.566689986	741633368999	973511147999	9962...15899	985.....2588	772......367	54........34
CAPETOWN	2..1888+++975	41.387789997	73.665468999	972742237999	99651..14799	9973....1589	784......267	55........34
LAGOS	31.19++++976	64.287678998	972573337999	994751116999	99872...3799	8985.....589	7862.....267	453.......34
ASCENSION Is	32..8+767755	54..97667877	872285334899	995572112799	99975....599	88862....279	7763.....57	444.......25
DAKAR	21..7++++974	43..88767996	773186435899	996474112799	999751...589	98862....279	7763.....57	444.......25
LAS PALMAS	69999851	89999972	22.198888995	562388778998	997776555799	999743222589	88852....268	++52.....3+
** S. AMERICA								
Sth SHETLAND	21...38++974	42..15888986	763136667788	986455346678	899752113357	78862.....24	4673.....2	234.....
FALKLAND Is	11..16+++873	33..37887886	663167665688	885375333478	99975211.157	98862.....25	6863.....2	454.....
R DE JANEIRO	11...8866773	22..18766785	663147533588	885365211389	999752....58	98862.....27	7763.....5	544.....2
BUENOS AIRES	....26+88873	22..47876785	552167643478	885375421268	9996521...37	89862.....5	6873.....2	454.....
LIMA	888861	....1.876663	221.42653246	553163421.27	8985521....5	79863.....2	5873.....	254.....
BOGOTA	888861	1876663	111..2653356	443123421127	8874421....6	89863.....3	6873.....1	354.....
** N. AMERICA								
BARBADOS	5888861	7876773	221.17643477	453135411158	8985521...27	99863.....5	7873.....2	554.....
JAMAICA	887751	876663	11...2653355	332.23431137	8873421....5	79863.....3	5873.....	254.....
BERMUDA	2887861	4877773	11...6654576	332.25431267	8863431...37	89863.....4	6773.....2	354.....
NEW YORK	......57775.	1677762	1....2665575	321..4443357	77523311..26	78853.....3	5763.....1	244.....
MEXICO	.......7774.	177652	1.....365333	321.21342113	57524211...1	48853.....	1663.....	.34.....
MONTREAL	......46674.	1677762	1....2666674	32...4443466	775223111136	78853.....14	5763.....1	244.....
DENVER	.......1452.	26641	46542	21..1..45333	56313.112..2	37853.....	1463.....	.24.....
LOS ANGELES	........442.	........663.	27532	21..1..26322	353131.13...	15753....1...	.263.....	..4.....
VANCOUVER	.........11.	........132.	3541	11.....15532	34212..14212	25652...2...	.253.....	..2.....
FAIRBANKS	.....	.....	.....1122.	1....11123441	331242114553	23453...2322	.133....1..	.....

The provisional mean sunspot number for December 1988, issued by the Sunspot Index Data Centre, Brussels, was 179.4. The maximum daily sunspot number was 255 on 22 December and the minimum was 105 on 2 December. The predicted smoothed sunspot numbers for March, April, May and June are respectively: (classical method) 154, 161, 166 and 172; (SIDC adjusted values) 151, 158, 165 and 172.

TABLE SERIAL NO 27
ALL TIME TABLE WITH DELETIONS No 17

Call	1.8	3.5	7.0	14	21	28	Total
G3KMA	125	**240**	**308**	333	334	318	1658
G3GIQ	71	211	267	339	336	315	1539
G3MCS	62	212	263	323	324	396	1492
G3XTT	**160**	209	258	298	291	263	1479
G4GIR	100	215	252	297	287	269	1420
G4BWP	106	220	254	299	276	253	1418
G3UML	33	225	242	338	303	268	1409
G4DYO	66	186	233	313	395	287	1390
GW3AHN	16	109	118	367	**362**	**335**	1307
G3XQU	57	180	206	305	279	259	1286
GW4OFQ	54	231	218	245	225	196	1169
G4OBK	124	145	184	267	236	207	1163
G3TXF	64	161	194	278	250	214	1161
G3NOF	5	96	96	346	331	283	1157
G4LJF	28	198	295	267	235	198	1131
G3YMC	80	109	180	245	250	191	1055
GM3YOR	75	139	187	221	200	183	1005(CW)
GM3PPE	66	157	163	200	188	149	923
G4ZYQ	-	121	69	195	210	188	783
G3JXN	16	40	100	152	12	179	612
G4NXG/M	-	27	54	174	177	168	600
AVERAGE	62	163	193	276	263	240	1198

Next deadline - Current All Time - to reach G3GIQ by 8 April. There will now be only four entries per year for the yearly tables expected at the same time as the all-time entries i.e. 8 January, April, July, October.
Entrants in the all-time tables are expected in future to have *at least one QSO on all six bands.*

explain that Cycle 19, which peaked at the end of 1957, was the highest and most active in 150 years of reliable records. So far, second place is held by Cycle 21 which peaked late in 1979 and ended in September 1986. In December the present cycle was in its 27th month and, reaching a daily solar flux value above 250 SFU and a monthly average of 200 SFU, it was two months ahead of Cycle 19 and much further ahead of Cycle 21 which only topped 250 in its 41st month.

A graph in last month's column showed the relative positions of the three cycles in terms of the 3-month mean sunspot number. A similar graph using 3-month mean solar flux shows that Cycle 22 now has a distinct lead, with an average for October to December of 176 SFU as compared with 160 at the same stage in Cycle 19 and a mere 137 in Cycle 21. A monthly sunspot number for December of anything above 135 will confirm this lead.

As can be seen, the race to be the highest cycle is still on. None of this means that Cycle 22 will necessarily end up the winner but on several counts it seems to be out in front at the turn of the year. The most recent forecast from NGDC Boulder was made before the December upsurge and was for a most probable peak smoothed sunspot number of 187 late this year or early in 1990. When the December data is included the prediction may well move up into the 190s."

I would like to thank the following publications for news extracted: *DX Bulletin* (VP2ML), *DXNL* (DL3RK), *Long Island DX Bulletin* (W2IYX), *DX News Sheet* (G4DYO), *the Ex-G Radio Club Bulletin* (WA8TGA), *DX Report* (VK9NS), the *Lynx DX Group Bulletin* (EA2JGO), *DX'press* (PA3CXC), and *CQ Magazine* (W1WY).

For **May** issue please send everything to reach me by 5 March 1989

QTH CORNER

C56/F2CW	J.Calvo, Le Bois de L'Essard, Nercillac, F-16200 Jarnac, France.
CV0Z	via CX2CS, Ricardo Susena, PO Box 20063, Montevideo, Uruguay.
K4YT	Karl Renz, 29E Chapman St, Alexandria, VA, 22301, USA.
SU1EK	PO Box 190, Mahadi, Cairo, Egypt.
PJ9JT	via W1AX, 60 Warwick Drive, Westwood, MA 02090, USA.
VK9ZM	via NM2L, G.Potter, RFD 2 Box 395, Central Square, NY,13036, USA.
VK9ZW	VE3CPU, 5 Romko Court, St.Catharines, Ont, L2N 7A1, Canada.
ZS3Z	ZS6BCR, C. Burger, Box 4485, Pretoria 0001, Republic of S.Africa.
TU4BR/5U7	via KN4F, J.Lane, 5104 Pilgrim Rd, Memphis, TN, 38116, USA.
5U7CW	DJ6SI, Baldur Drobnica, Zedernweg 6, D-5010 Bergheim, FR Germany.
5U7DX	DK9KX, Hans Hannapel, Eschenbruchstr 1, D-5000 Cologne 80, FR Germany.
8P9EM	G3VBL, C.Pedder, 5 Royalty Lane, New Longton, Preston, PR4 4JD.
9N88C	Kastsuhide Kawase, JH8BKL, 1655 Kawaguchi, Hokkaido 98-33, Japan.

VHF/UHF

KEN WILLIS G8VR

50MHz

To include all information based on correspondence related to 50MHz received over the past month would be impossible; I must be brief. Following the opening to VP5 and P43 at the end of November, December provided F2 openings almost every day after the 6th, and several new countries were worked. As in previous cycles, Bob, VE1YX in Nova Scotia provided a band-opening indicator on most days, and on several days other Canadian and USA stations were worked from the UK. Here are some of the major openings:

12 Dec. ZD8MB worked six G stations from 22100GMT.
13 Dec. J52US (Guinea Bissau, W.Africa worked 21 Europeans and VE1YX from 1600GMT.
15 Dec. PZ1AP worked 46 W/VE stations plus CT1DTQ
16 Dec. FY7THF beacon hrd UK mid-day
18 Dec. J52US worked USA as far west as W0.
19 Dec. FY7THF, KP2A and HC2FG beacons copied in UK. Major opening between CT and PY during evening.
20 Dec. Opening to VE/W as far as W9OEH (Indiana)
21 Dec. Major opening between UK and W8/W9.
22 Dec. FY7THF beacon, KP2A, WP4G, KP4EOR, P43AS all worked by G stations. GM working into KP4, P43, HC.
23 Dec. HC1IE working into UK. OH1VR/2 heard VK3OT, 0745GMT
24 Dec. 4X4IF copied G4UPS keyer. DJ3OS/EA8 worked into G and GM, J52US worked 39 UK stations, VO1JN working UK, big opening to USA PM.
25 Dec.PZ1AP, TI2HL worked UK. CO2KK heard by G4UPS. PA0HIP worked KC4SM.
26 Dec. opening to East coast USA 1300-1640
27 Dec. 5B4CY beacon heard in UK 0900. PM opening to east coast USA.
28 Dec. Opening UK to VE3 and USA. W5 station heard.
29 Dec. HC1BI and HC2FG copied in UK 1330.
30 Dec. J52US keyer copied in UK 1535 to 1605.

The band sounds quite deserted until DX signals appear, then one realises just how many stations are monitoring. Around mid-day on days when VE1YX was the only DX coming through, every "QRZ" from him resulted in a wall of sound. Our friends across the Atlantic say that it has to be heard to be believed, and the fact that almost all UK stations are received at the same strength makes identification of calls very difficult.
G4JCC worked T70A (San Marino) who is permitted to work CW at bottom end of band; PA's can work SSB only between 50.100 and 50.300, which is important for meteor scatter skeds; FY5DG (French Guiana) is equipped for 50MHz and has heard UK beacons; DJ3OS/EA8 believed to have lost his permit for 50MHz, but other EA8's are trying for permits; Z23JO is on from Zimbabwe (KH52); all contacts with SV1DO and SV0FE between 19 April and 15 July were valid; father of OH2BK is moving to Madeira and will operate under CT3 call on 50MHz; HZ1AB (Saudi) hoping for 50MHz permit; K22BMI/VP2V will soon be QRV, also VP2MJ (VE3EVW); Fred, VP8PTG on Falklands should have received a 5 element Tonna and be active soon; HB9's trying without much success so far for permits; French stations cannot operate below 50.200; ZS3VHF beacon now on from Namibia, 50.022.5; new Alaska beacon KL7WE 50.065; W1BIH in Curacoa until April - good CW operator used to handling pile-ups!; V31AB is on from Belize; ZS6PT going to Marion Island in April, call probably ZS8MI; OH1ZAA now in USA operating as NN0Y, hoping to get Grand Cayman beacon QRV soon; WB2MAI is planning a trip to 6Y5 for last week in March and first week April; for a real rate one, try PP8AO in Amazon jungle, worked by K2YOF.

My thanks to GM0EWX, G1CWP, G1TCH, G3SED,G4JCC, G4ODA, G4UPS, GJ4ICD,G5UM,G8KG, K2YOF and ZS6WB for 50MHz logs and information, and my apologies for not being able to present in more detail all they have told me.

144MHz

By and large, conditions on the band had been poor for several weeks until some welcome tropo occurred at the end of December. Peter, G3IPV (Norwich), reported working into EA, and there were also reports of contacts in the HB9 and OE direction, but the really big winter tropo openings which we often enjoy have seemed to elude us in 1988. Perhaps this partly accounts for the apparent exodus to 50MHz, where so many of the calls usually associated with 2m can now be heard. VHF folk-lore suggests that the (radio) active life of an amateur embraces just five solar cycles, so it isn't surprising that a lot of amateurs want to savour the different sort of DX which this band has to offer while it lasts. (Come to think of it, I'm in my fifth cycle!)

Meanwhile John, G3IMV has reached a total of 410 squares worked on this band, all from a town location using a single yagi, but being a superb CW operator, this no doubt contributes much to his success. He has 401 confirmed too. John says that a good place to listen in order to keep abreast of what is happening on the band is 144.285MHz during the evening when several devotees of this band gather to discuss conditions and results.

Jack Hum, G5UM, again reminds us that "Monday night is CW activity night on Two, which he inaugurated two decades ago when he wrote this feature. It continues to ▷

attract an increasing number of A1A operators. Listen on 144.050 to get in on this activity.

432MHz

At the last count G3IMV had worked 124 squares on this band, and so is finding new ones hard to come by, especially as he is located on the western edge of all the east European activity. John feels that EME is perhaps the next logical step, but the complexity of the equipment needed to work the mode successfully is daunting. DUBUS listings show that leading 432MHz stations in more favourable spots have worked over 200 squares on the band.

Last year in his *Ham Radio* VHF column, Joe Reisert, W1JR, in listing the common types of VHF/UHF propagation, included meteor scatter and auroral modes as ways of working DX on 432 MHz, though accepting that it gets much more difficult above 225MHz. Some of the leading DUBUS-listed stations show 432MHz meteor scatter contacts over paths as long as 1418km, so this could be a fruitful field for experiment. Some more comments on this next month.

AURORA

I am surprised that we have had so few big auroras of late, because it looks very much as if we are approaching the peak of the solar cycle,and auroras are generally reckoned to occur on either side of the peak. Anyone who was around in the early 1980's will recall these events making possible 144MHz contacts right down to the Mediterranean.

I asked Doug Smillie, GM4DJS, to let me have his records of recent auroral activity. Doug (Wishaw) is clearly in the right place, and he monitors the geomagnetic field using his electronic version of the Jamjar magnetometer. He also submits radio auroral data to the BAA Aurora Group, so a better observer would be hard to find.

Doug says that "Observing the magnetic trace, one can see the effects of unsettled conditions which may lead to a magnetic storm followed by either a radio or visual aurora. The aurora can occur any time after the commencement of the storm, and typically I would only expect a few minutes warning." Many readers will have experienced the aurora of 5 January, reported separately, which came the day after a proton event had been announced by Radio Australia.

Here are the days and times in the last four months of 1988 when Doug recorded radio auroras at his QTH. Check with your own log to see whether they reached your area:

11 Sept	1400-1650
6 Oct.	1030-1845 Intense aurora, storm conditions
10 Oct	1330-1900 Intense, storm
18 Oct	1530-1630 Weak, storm
2 Nov	1845-1930 Weak, storm
30 Nov	1530-1630 Weak, storm
14 Dec	1930-1955 Weak
16 Dec	1730-1830 Weak

No recordings between 22 and 31 December.

Some readers have asked for definitions of the terms used to describe solar activity. I will try to find space next month, but meanwhile 'storm' requires an A index from 30 to above 100 (K= 4 to above 6), and is typically sub-divided into minor, major or severe levels.

SOLAR DATA

Look this month in John Allaway's HF band column for Smithy. G8KG's comments on present solar cycle developments. Suffice to say activity is very much on the increase, with the December monthly number reaching 179 only 27 months from the bottom of the cycle. Cycle 19 took 31 months to achieve the same level and went on to be a real hum-dinger. Remember that while a high solar flux is needed for good F2 propagation (preferably when it starts to fall after a period of readings above 200), we also want settled geomagnetic conditions indicated by low values of the A or K index. Radio Australia gives the previous day's figures, but the A and K indices can change very rapidly. As an example, today as I write this (11 January), Mike Bird gave yesterday's A-index as 12, while simultaneously, WWV was announcing a K of only 1, which equates to an A-index of 2 or 3. (See VHF/UHF for February 1987 for A/K relationship). See also comments under Aurora this month.

There now seems to be general support in favour of the peak of Cycle 22 occurring this year.

METEOR SCATTER

Paul, G4IJE, noted a 'glitch' in the W1JR computer program, which produced false readings for 1989. When this was corrected, the predicted peak of the Quadrantids shower came out at 10.47GMT on 3 January. John Hunter, G3IMV, felt that, in fact, it lasted from the early hours of that day through to mid-afternoon, and that both the onset and disappearance of the shower were very rapid. During the shower, John attempted two long-range CW skeds, with YT5G (LB) and UZ3DD (SQ), but heard nothing from either. He believes that YT5G suffered amplifier problems and wonders if anyone managed to work them. Generally, John found reflections to be good, with the shower performing much as predicted, but activity was low, with many of the European 'regulars' missing. This was certainly the impression gained from listening on 144MHz. Compared with past years, the random channels appeared very quiet.

Gerald, G4OIG, also had two skeds, neither of which was completed. These were with IK1LGV on SSB, and a long-range CW attempt with OH9NLO (MA 39e) with only four weak pings being received. Gerald heard "the usual D/I/EA calls" on random channels.

Expedition station GB4XS (Sutherland) was much in demand on the 14MHz VHF net for MS skeds. They completed 18 out of 25 skeds, all but one being on CW. They also contacted several UK stations on 50MHz SSB via the mode, and their operating technique was superb, enabling me (and others) to complete a QSO in a single burst. In my case, the entire contact involving an exchange of calls, reports and rogers, lasted less than 15 seconds.

Mike, G4UXC (Evesham) operated on 50MHz during the shower to gain his first experience of CW MS, taking advantage of the longer reflections on this band to use normal-speed CW. He worked one new country by completing with PA3DOL, and also worked LA3EQ, some GMs and a GI. Bursts of over 120 seconds at 9 plus 20 dB were copied during the shower.

Some of the perils of working meteor scatter on 6m were explained by Eric, G2ADR (York). In a CW sked with a PA0 station, propagation changed to tropo, and finally back-scatter, so procedures became somewhat confused. Later a local was heard to observe drily that "G2ADR doesn't understand MS procedures!"

G4OIG is something of a meteor scatter specialist who has shown that successful results on 144MHz MS can be achieved with relatively simple equipment. He uses only 70watts to a 9 element yagi, and his score for the band (not all MS of course) stands at 233 squares. Only eight were added during 1988, and Gerald feels that meteor scatter conditions have been poor, with major showers in a period of decline and increasingly unreliable. Sporadic meteors, on the other hand, he thinks are improving slightly, based on observations over the past 6 years. He would like other operators' comments on these findings.

For some time, I3LGP has maintained some long-term sporadic meteor skeds with UK stations on 2m, G4YUZ (Hoddesden) being one who has been regularly at the UK end of the link. Another is G4OIG, who between January and November 1988, had 38 skeds with Giuliano, completing no less than 34 of them. This type of test provides useful statistical information on sporadic meteors and is a good way of keeping interest alive when band conditions are flat. Anyone keeping such schedules could perhaps send the details.

REPEATER NEWS

Space prevented earlier reference to a Leicestershire Repeater Group Newsletter received at the end of last year. Featured in this issue was an informative article by Don, G3IPL, on "How GB3CF uses only one aerial". Anyone who wants to know just how a single system can be used to receive and transmit at the same time would find most of the answers in this text. G3IPL is engineering manager for the group. Another article, this time by membership secretary Paul G6ZZE, unravelled some of the mysteries of data communication interfacing. The group had over 100 paid-up members at the end of last year. The group maintains GB3CF (144MHz), GB3LE (432MHz, known as "Miss Ellie" by G5UM), GB3GV (TV) GB7LRG (packet) and GB3LEX, GB3LES (microwave), and have applied for a 28MHz permit for a Robot CW beacon, GB3ROB. It will be interesting to know the outcome.

Central Scotland FM Group's FM News No 67, winter 1988 edition, was produced by the committee since the editor, Colin, GM8LBC, found it necessary to relinquish his editorship last autumn. Colin had edited it for several years, and frequent mention has been made in these columns of Colin's abilities as a writer and an editor. It will be difficult to replace him. The chairman, Tom Hughes, GM3EDZ, is hoping that a group member "with a computer and desktop publishing software" will come forward to take over the editorship of this publication noted for its high standards.

MICROWAVES

MIKE DIXON G3PFR

My opposite number in the USA, Bob Atkins, reported significant doings at 10GHz and above in the USA - the December issue of QST carried details of some new American records which are worth repeating here since they are, by any standards, quite remarkable and should help encourage UK operators to further efforts! Mostly what is required is some dedication and determination to emulate these results as well as those of our nearer cousins in Europe. Our climate and shorter 'line of sight' paths might be less conducive to outstanding results but the mere fact that many world records were once held by UK operators should provide some kind of spur to try to redress the position which seems to have slipped somewhat in recent years. Our best chance of real DX is either by super-refraction over the sea or by troposcatter, possibly aided by other atmospheric modes and, of course, using narrowband techniques!

Starting at the lowest frequency, 10GHz, N6QX/XE2GFH and WA5LIG/XE2GBO worked successive paths of 498, 521.7 and 595.3 miles (797, 835 and 952.5km) using Microwave Associates Gunnplexers - yes, wideband! The power used was 80mW at one end and 10mW at the other, both stations using 4ft dishes.

The world record at 47GHz (53km between HB9MIN/P and HB9AMH/P) has been well and truly extended, indeed almost doubled, during the ARRL UHF contest in August last. Using between 3.5 and 4.5mW from linear transverters WA3RMX/7 and K7AUO, from sites 7300ft up, worked with S3 signals over a 65.37 mile (105.4km) path. In contrast to the original record which was set in sub-zero temperatures (very low humidity), the new record was set under arid (70 degrees

Fahrenheit) conditions when humidity might have been somewhat higher than the original HB contact, but still lower than we might expect in the UK. I imagine that much of the success was due to the use of narrowband techniques.

Finally, in the 'light' part of the spectrum, somewhere in the infra-red, two Arizona amateurs were reported to have made a 95mile (152km) QSO using 10mW helium-cadmium lasers and 19" by 22" Fresnel lenses. Not too many UK amateurs have made this kind of distance at 10 or 24GHz with similar power, let alone with light! The ordinary infra-red led and phototransistor, it was said, offers the possibility (when focussed with something like a 2" lens) of communication over a couple of miles or so. There were several ideas published in the popular press some years ago, but I don't think the idea caught the imagination of radio amateurs at that time. I'd be very pleased to hear from anyone experimenting in this part of the spectrum which, of course, does not need a licence to transmit! Perhaps someone has experimented with an infra-red controller, such as those used to control domestic entertainment equipment. This might suggest one approach, while another might be to use suitable infra-red emitters and phototransistors available in most of the major catalogues, such as RS Components. Another thought is to use inexpensive fibre-optics as a feeder, if such a thing is needed. QRV light?

K0RZ compiled a worldwide list of known Oscar Mode-L users which was published in a recent issue of DUBUS. It listed some 210 operators known to be active on this (unidirectional microwave) satellite mode. Sad to say, there seem to be only nine UK stations listed. By contrast there were no less than 42 German, 32 Japanese and 79 US stations listed, which makes our representation look pretty thin by comparison! I understand that Mode-S, using 2.3GHz, is even less well patronised so much so that the mode S transponder hasn't even been switched on for several weeks.

Back here on earth, the normal terrestrial activity levels seem to have died with winter. There have been very, very few reports of activity even on the popular bands, 1.3 and 10GHz. Could it be that many of the better known and more often heard callsigns have disappeared onto 6m? Certainly at least three of the better known callsigns, who shall remain nameless, have been heard frequenting this 'DC' band to the apparent detriment of microwaves.

Are you all psyched-up for this year's contests - or should I say is your gear all tweaked-up and ready to go? By the time you read this, there will be about a month to go before the start of the season, with IARU and RSGB contests (multiband), the RSGB Microwave Cumulatives on 10GHz and many others to stir you into activity. This year the 10GHz cumulatives run from April to September and include, for the first time, on an experimental basis, one optional 24hr event: see the contest news section for details and rules. This was requested by several operators who are anxious to exploit the dusk and dawn lifts which often occur on this band. Also on a trial basis, it has been decided to introduce three Saturday 24GHz cumulatives - short period to see whether there is enough interest to arrange a 'full' series next year. Again see the contests section for details.

SWL

BOB TREACHER BRS32525

Albert Tideswell, BRS48462, provided a brief update of activities from Stoke-on-Trent. We shall hear more from him through the year, but his 3.5MHz 'heard' totals are quite impressive, with 278 heard and 2103 confirmed. He also mentioned several good long path openings to the West Coast of the US over the Xmas holidays.

David Whitaker, BRS25429, also mentioned these openings, but referred mainly to the one of 31 December. N7UA, W7FU, KC7EM, W7WA and W7XR were all heard at his Harrogate QTH up to about 5x6 between 1530 and 1615. They were the best-ever signals heard on the long path at David's trip to CT3 next month.

Robert Small, BRS8841, had aother good month, logging the low-key XF4C trip to Revilla Gigedo on 7MHz CW and 9N88C on 3.5MHz CW. He would like to know where CE0OGZ was located. In general, he could 3.5MHz a bit "up and down", but heard HL1EJ for a new one on 7MHz. Robert rightly points out that 3D2 (Rotuma) now counts for DXCC credit and can be added to All Time Country totals, along with 4J1FS, which might be active again this month.

Much has been said in the DX press about the QSLing techniques of F6FNU who is manager for a hose of DX stations. He sent Robert a card for 5R8JD but sent three other reports back saying that he needed one SAE for each card sent. However, a few days later another envelope arrived from F6FNU with cards for FR4FA/J, 6V6A and TR2A!

Brad Bradbury, BRS1066, had a poor 1988 simply because he had little time to devote to SWLing. He promises more activity this year, but offered J52US for country number 95 on 1.8MHz. On the Oblast front, Brad had heard 174 of the 179, with 156 confirmed.

Colin Watson, BRS46598 had spent much time on the LF bands judging from his latest report. KX601, 3X1SG and 5T5CK seemed to be the pick on 7MHz, while 3.MHz produced 6Y5EW.

Arthur Miller, BRS88969, found the CQWW information which appeared in January most interesting. Unfortunately the matrix did not appear. This was due to the fact that I had used up all my available space! I can provide a copy of it if anyone wants one. Just send me an SAE.

You will see his end of year score in the table. Arthur felt that despite the resurgence of 28MHz, the star band for 1988 was 7MHz. His score of 181 countries beat by 22 his previous best score on the band. However, he is firmly of the opinion that the propagation was inferior to that in 1974 and 1985 when many DX stations on the band were substantially stronger. The reason for the success in 1988 was undoubtedly due to the reduction in BC QRM which not only made it possible to hear weak signals regularly, but also brought far more stations onto the band.

THE FINAL SWL HF TABLE

Station	DXCC	28	21	14	7	3.5	1.8	Total
BRS8841	262	196	222	235	157	149	59	1018
BRS25429	257	194	208	211	178	142	70	1003
BRS88969	241	183	205	206	181	140	60	975
BRS52543	227	169	169	179	144	136	53	850
BRS32525	199	171	123	137	122	131	57	741
BRS90400	212	129	139	174	77	96	35	650
BRS1066	162	83	113	122	92	50	48	508
BRS91397	140	54	101	93	52	45	15	360
ORS45992	172	95	100	115	21	20	0	351
BRS90808	143	21	59	109	43	52	12	296
BRS20249	121	52	71	81	26	45	9	284
F11ATZ	124	76	87	55	25	15	0	258

Congratulations are due once more to Robert Small who held off several determined challenges to head the HF Table. A surprisingly large addition to last month's published total ensured his victory. David Whitaker feels that his week in CT3 cost him victory, but that at the end of the year it is difficult to add too many new countries to such a large total ammassed during the previous 11 months.

I hope that this year will see some new competition for the established regulars.

DX NEWS

As I compile this column, the VK92M DXpedition is in full swing. Most big expeditions cause some "friction" on 14.195MHz, but in my opinion the behaviour of the Southern and Eastern European "policemen" is this time bordering on the unprintable. I listened to VK9ZM's 5x5 signals for over half an hour and could honestly say that I only copied the details from a handful of the QSOs they made in this time owing to the incessant bad manners, tuner uppers, etc on the frequency. None of this makes it easy for the poor SWL with his normally random antenna who has to sit patiently waiting for his amateur colleagues' behaviour to improve so that what is actually quite a rare country can be logged.

Listeners will have heard some strange callsigns emanating from the USSR in January. The YL calls - YL2RG, KZ, ZG, LG and VZ - were aired to celebrate the 70th anniversary of the first Latvian Soviet Republic. LY2WR, WW, ZA, ZO, and ZZ were QRV from Lithuania. Stations in Byelorussia were using EU2 and EW2 prefixes to commemmorate 70 years of that Republic.

WHY SPECTRUM ANALYSIS?

"What's happened to 'News & Views'?"

"What's this 'Spectrum Analysis' bit?"

Well, before you ask those questions, we thought we'd pre-empt you and tell you what we're doing and why we're doing it.

Basically, this hobby of ours has been changing rapidly over the last few years - whether we like it or not - and the time is right for RadCom to sharpen up its image by bringing you the most accurate and up to date news of what's been happening on the amateur bands in an easy-to-digest format.

From this month the news items which used to appear in 'News & Views' along with the band reports, will now appear as part of the general news in the 'News & Reports' section at the front of the issue. 'Spectrum Analysis' will concentrate more on what's been happening on the bands over the last month by analysing the many logs and reports sent by readers to the Band Editors (see the Contents page for addresses). 'Spectrum Analysis' will also look at the various propagation-related events which have occurred during the same period. All of which, we are sure, will give you a clearer indication of who worked who and why your signals got where they did.

From time to time, there will be specially-commissioned propagation features which will take an in-depth look at some of the more intriguing mechanisms, what to look for when attempting to predict them, and why some show a distinct patterns from year to year or solar cycle to cycle. If all goes according to plan, the first of these features will appear next month.

The JST-135 from JRC

Japan Radio Company are big; sales turnover last year was in excess of £620 million. Not only are they big, they have been solely concerned with communications radio since 1915 and are therefore one of the world's leading companies in the field. JRC for example fit out most of the supertankers and coastal radio stations so I think there is sufficient evidence of their expertise. As a humble radio amateur, I am particularly glad that JRC find time and money to produce what must be amongst the best amateur radio equipment in the world, and as an appointed distributor in the UK, I was even more pleased to see the JST-135 arrive.

Those who know the NRD-525 receiver will recognise the family resemblance; actually the NRD-525 and JST-135 look identical, because they are clearly meant to mate together as an ultimate station. And what a transceiver the JST-135 has turned out to be. It would be impossible to list all the features which make it so outstanding, because so much of the engineering does not appear to the casual view, but take it from me, the JST-135 is destined to become a landmark in equipment design and performance.

The construction of the transceiver follows that of the NRD-525 is using individually screened and mounted plug in vertical boards; an expensive way to build, but JRC try to build to a standard of quality, not down to a price – and it looks terrific when you peek inside.

The measures taken to ensure signal quality include using the same semiconductor devices in the transmit driver stage as those in the PA; not for simplicity but to allow them to be run in Class A. The result is exceptional linearity, improved signal quality, and of course cancellation of second harmonic distortion products. the PA itself is followed by a three section Chebyshev filter, which may not interest you particularly but it all helps the reduction of harmonic radiation, and that is certainly of interest to the station trying to operate on the frequency of your third harmonic. . .

If putting frequencies into memory is your pleasure, you have 200 to go at, with each memory storing frequency, mode, agc time constant, RF attenuator setting, and IF bandwidth. Should be enough for almost anyone. All mode? certainly, with USB, LSB, CW (full and semi break-in), AM, FSK, and FM. There is even an optional ECSS unit if you want to dig out rare broadcast stations in a band full of half megawatt propaganda sources.

The receiver side (100kHz to 30MHz) has had the same dedicated attention as the transmitter, and there are some intriguing features such as the optional automatic notch system which grabs an interfering signal, throttles it at birth, and then hangs on to it whilst you tune around so that it causes no more pain and distress.

Further facilities available as options include a fully variable bandwidth filter system, an RS-232 computer control interface, a full range of high performance filters, and the surprising NFG-230 automatic aerial tuner. So what? there are other automatic tuners on the market. True, but this one is fully waterproof, offers virtually instantaneous tuning of a dipole or wire aerial and is meant to be mounted where tuners ought to be – at the feedpoint of the aerial system, out there in the wind and the rain.

These brief comments are only a taste of what the JST-135 can do. For more complete information, why not send off £1 for our pack containing details of all the equipment we stock, and make a particular request for the JRC range, or indeed any other equipment which takes your fancy.

The sales of the JST-135 have been very good indeed, and when considering the price range in which it competes, it is hardly surprising. The original price was to be £1395, and we thought it was a bargain. Imagine our delight, and the delight of prospective owners when JRC thought hard, sharpened their negotiating pencils, and came up with a new price of £1195. There is no question that the JST-135 is currently the bargain of the decade, and if you are thinking of a new transceiver, I recommend that you leap in to a Lowe Electronics branch and take a look at the JST-135.

73
John Wilson
G3PCY/5N2AAC

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As always, I advise you to ask for brochures on these sets because it is impossible to list all the features in this small space.

Funny thing about Kenwood equipment; it always 'feels right', and this applies to everything they make from the TS-940S to the smallest accessory. Why not call in at your nearest APPROVED dealer and ask to see (and hold) a Kenwood hand held. You will not be disappointed.

If you care to send £1 to us at Matlock, we will be pleased to return the full Kenwood catalogues and detailed information on any rig you mention.

KANTRONICS NEWS BULLETIN

Packet Radio has recently been an area of fast expansion in Amateur Radio. There now exists a national and international trunking system for automatic forwarding of information. Personal 'mail' from one Radio Amateur can be sent to another Radio Amateur around the globe in a matter of days or even hours in many cases. 'Bulletins' and items of general interest can be sent and received, they are very diverse in content and range from club activities on a local basis to the AMSAT, RSGB and ARRL news. Real time communication is still available so you can conduct a QSO just like RTTY and AMTOR. Kantronics has remained at the head of the search for new ideas.

Many UP-GRADES have been released by Kantronics to keep the range at this forward position. These are in the form of plug-in EPROMS with accompanying addendum and range in price between about ten and thirty pounds, a fraction of the cost of the new unit.

All units now come with a standard 32K of RAM. In the case of the KPC4 this may be expanded to 64K at extra cost. All units are fitted with CW identification (CW-ID) to comply with the UK amateur license. WE-FAX is a standard fitting on all units, this means that you can receive those wonderful MET forecast pictures off-air. A special program is required for WE-FAX reception but is available for a wide range of computers. The KA-NODE facility allows other operators to not only digipeat through your station but to connect to you and let your KA-NODE handle the acknowledgements, creating more efficient message handling. The personal mailbox (PBBS) allows people to leave messages for YOU at your station even when you are doing something else. It is now possible to add a battery-backup to keep your messages even if you switch off or have a power cut. A PBP command now prevents third party message, and a CMSG-PBBS command divert calls directly to the PBBS when you are not there. Multi-connect allows you to talk to more people than you could possibly want to at the same time. There are even 100 user commands which you can use to personalise your station, you can in fact ignore most of them too if you want to! All are TTL and RS232 compatible. The range is fully MBL software compatible including YAPP, do remember to set your software to type one. All units are metal cased.

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For more information on the IC-725 budget H.F. and other ICOM amateur equipment contact your nearest authorised ICOM dealer or phone us direct.

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Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

Count on us!

IC-575, 28/50MHz Dual band multimode.

The ICOM IC-575 base station has been developed to meet the demand for advanced communications for the recently acquired 6m band. Similar in appearance to the IC-275/475 2m and 70cm base stations, the beauty of this new transceiver from ICOM is that it gives you the best of both worlds, 6 & 10m in one compact unit. The IC-575 covers 28-30Mhz and 50-54Mhz. Operating modes are SSB, CW, AM & FM. Power output is 10 watts (AM 4 watts) with a front panel control to reduce output for QRP operations. A pass band tuning circuit narrows the I.F. passband width, eliminating signal in the passband. A built-in notch filter eliminates beat signals with sharp attenuation characteristics.

Some PLL systems have difficulty meeting the lockup time demands placed on them by new data communications. This is why ICOM developed the DDS (Direct Digital Synthesizer) method. With a lockup time of just 5msec the DDS method allows the IC-575 to handle data communications such as packet or AMTOR. 99 programmable memories can store frequency, mode, offset frequency and direction. A total of four scanning functions for easy access to a wide range of frequencies, memory scan, programmed scan, selected mode memory scan and lock out scan. The IC-575 has an internal A.C. power supply, but can also be used on 13.8v DC for mobile or portable operation.

Optional accessories available are the UT36 voice synthesizer, the IC-FL83 CW narrow filter, SM7 external loudspeaker, HP2 communication headphones and SM8/SM10 desk microphones. Other transceivers available in this range are: IC-275E 2m multimode 25w, IC-275H 2m multimode 100w, IC-475E 70cm multimode 25w, IC-475H 70cm multimode 75w.

IC-505, 50Mhz Transceiver

The IC-505 is a 6mtr BAND SSB, CW, FM (Optional) transceiver. It can be used as a portable or like other transceivers of this type as a base station unit. When used with an external 13.8v power supply the 505 gives 10 watts RF output, 3 watts or 0.5 watts on low power is available when using internal batteries. Other features include 5 memories with memory scan, program band scan, dual VFO's with split operation.

The easy-to-read LCD readout includes frequency, memory scan and call modes. Full metering of battery condition signal strength and power output is provided. When fitted with the optional EX248 FM unit the IC-505 offers 50MHz operation at an affordable price.

Helpline: Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.
Datapost: Despatch on same day whenever possible.
Access & Barclaycard: Telephone orders taken by our mail order dept, instant credit & interest-free H.P.

ICS Electronics Ltd.

PO Box 2, Arundel, West Sussex BN18 ONX

This month, we are pleased to announce our appointment as the UK importer for the superb DIGITAR range of weather monitoring equipment from America. This should be of interest to all radio amateurs - whether you are interested in the wind load on your antenna, UHF propagation or just in talking about the weather on the air.

TWR-3 Microcomputer Weather Station

The TWR-3 gives constant digital readout of:-

- Wind Speed and Direction
- Temperature
- Time
- Precipitation (optional)

This exceptionally well priced unit is battery driven and can be programmed to record maximum wind gust and minimum/maximum temperature.

TWR-3: £129.95 plus £4.00 p+p
RG-3 Rain Gauge: £39.95 plus £3.00 p+p
DSK-22 Desk Stand: £7.75 plus £2.50 p+p

AMIGA-FAX and AMIGA-SSTV

This superb software and hardware interface combination gives excellent results on any Commodore Amiga computer. Fax with 16 levels of grey scale. Full colour SSTV. Send for details.

AMIGA-FAX or AMIGA-SSTV: £109.95 plus £2.50 p+p
Both together: £169.95 plus £2.50 p+p

MET-1 Meteosat Receiver for AMIGA-FAX

A new product which should be ready by the time this advert appears. Call for details.

PK-232 Seven Mode Data Terminal Unit

- Amtor, Packet, RTTY, CW, ASCII, Facsimile, Navtex
- Superb filter/ demodulator performance
- The UK market leader!
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PK-88 VHF/HF Packet Radio TNC

- Built in HF modem and personal mailbox
- Excellent host mode driver software
- Full front panel status display
- 32K RAM
- Excellent documentation
- NET-ROM compatible
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FAX-1 Weather Facsimile Demodulator

- Demodulates facsimile, RTTY and Navtex
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★ 12.5kHz & 25kHz steps.
★ Includes microphone & mobile mount.
★ Bright LCD display
★ Reverse repeater etc.

2m FM Mobile ALR-22E

£249

Order now to beat the price rise

Designed for optimum performance combined with small size, the ALINCO ALR-22E reaches new heights in both technical performance and value for money. We've managed to keep the price down to a level that cannot be matched by any other manufacturer although we believe that a small increase will shortly be made to the price. What better time therefore, than now to purchase one of these super rigs. You won't see prices like this again! Technically it's superb and inside it looks very much like some of its more expensive competitors! Measuring only 5.5" × 6.5" it will fit into most places and if you ask, we will extend the frequency range to cover 140-170MHz on receive. We could bore you with the specification but frankly its just the same as all the others (apart from the price of course). We could tell you about all the various features it has, but again its not much different from the competition. Lets be honest, apart from being scome £100 cheaper than some of its competitors and having an extended receiver coverage, it really is like most other rigs. So if money is no object and you only want 144-146MHz coverage, you probably won't be interested in the ALR-22E. If on the other hand these things are important to you, why not send for the full colour brochure today.

★ 2M FM 144-146MHz
★ RX 140-170MHz!
★ 3 Watts output
★ Battery Saver
★ 10 memories
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★ Priority
★ 12.5KHz steps
★ 12v DC operation!

Another winner from ALINCO. A true handy transceiver with no extras to buy! Unlike its competitors, you get the nicad pack (500mAH) AC charger, and provisions for direct 12v DC charge. Measuring 168 × 61 × 30mm it's a beauty! Optional accessories include speaker-mic, mobile bracket and high power packs. Get the facts today!

DJ-100E 2M FM

NEW

IN STOCK

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£449

★ 2m/70cm. Full duplex operation.
★ 25 watts FM on both bands.
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★ 21 memories & 2 "call channels".
★ Programmable scanning and priority.
★ 12.5KHz & 25KHz steps.
★ Includes all hardware & microphone.
★ Bright LCD readout.
★ Reverse repeater operation.
★ 12 months warranty parts & labour.

QRP & AERIALS!

We are about to introduce a range of compact single band hf rigs (80/40/20m) for the QRP enthusiast. Each one provides SSB/CW output of 2 watts. Features include VXO tuning, RIT, optional noise blanker and break-in module, built-in Morse key, internal dry cells or external supply, analogue power/S-meter, good dynamic range, excellent IF rejection and ultra stable. Send SAE for further details, prices and availability.

The GLOBAL, LF-80/40 dipole kit is now in stock and gives you a two band antenna for 80 & 40 metres with a total length of 70ft. £29 + £1.50.

GLOBAL Mini G5RV kit. We can now supply a trap kit that will enable you to turn your half-size G5RV into one that covers 80 metres. Total length becomes 66ft approx. (80-10m). £17.95 + 1.00.

NEW AZDEN PCS 2M FM rig in stock! Fitted Airband 25w FM plus AM/FM 118-180MHz rx. 12.5/25/50kHz steps (Airband 5kHz) Send for gen. **£329**

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X50 2m/70cm 4.5/7.2dB	£59.00
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D130N Discona 26-1300MHz	£82.00
CLP5130 1-50-1300MHz beam 12dB	£179.00
CLP5130-2 105-1300MHz beam 13dB	£89.00
CP22J 2m 6.5dB base antenna	£49.95
M265 2m Mobile 5/6th PL259	£14.95
EL770H 2m/70cm Mobile PL259	£30.00
NR72M 70cm mobile 5.5dB PL259	£27.00
GLS Gutter mount/cable for mobiles	£14.95
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CP4 40-10m vert + radials	£149.00
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SX600 1.6-525MHz 5/20/200w	£119.00
MS1 Monitor Scope Pep etc	£269.00

MISC

ADONIS AM303G Base mic	£49.95
ADONIS AM503G Base mic	£65.95
ADONIS FX-1 Mobile Goose Neck	£55.00
2m 5/8th BNC telescopic ant	£12.95
LF 80/40 70ft dipole kits	£29.00
'Limpet' Rubber mag base. It won't move!	£19.00
VHF/UHF Airband Guide 2nd Ed	£5.95
UK Confidential Frequency List	£6.95
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Oceanic Airband Communications	£3.50

PLUS HUGE STOCKS OF KENWOOD; YAESU; ICOM: DATONG: JAYBEAM: TONNA: etc. If its in this magazine we have probably got it!

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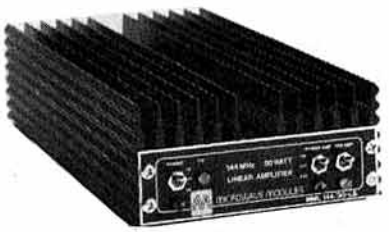
Microwave Modules

MML 144/100-S £149 (C)

★ 100 Watts output power.
★ Suitable for 10 or 25 Watt transceivers.
★ Linear all-mode operation.
★ Straight through operation when turned off.
★ Ultra-low noise receive preamplifier — front panel selectable.
★ Equipped with RF vox and manual override.
★ Led status lights for power, transmit and preamp on.

MML 144/30-LS £105 (B)

★ 30 Watts output power.
★ Suitable for 1 or 3 Watt transceivers.
★ Linear all-mode operation.
★ Straight through operation when turned off.
★ Ultra-low noise receive preamplifier — front panel selectable.
★ Equipped with RF vox and manual override.
★ Led status lights for power, transmit and preamp on.



MMT 50/28-S £295 (B)

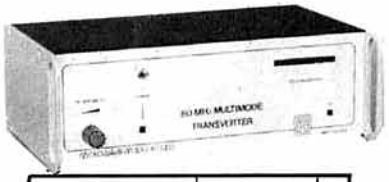
★ 20 Watts output power.
★ Input frequency range 28-30MHz.
★ Output frequency range 50-54MHz.
★ Input level range 0.1-750 milliwatts.
★ Modes:- SSB, FM, CW, FSK or AM.
★ 18.5 dB conversion gain.
★ Exceptional large signal receiver performance.
★ RF vox operator adjustable from 20 milliseconds to 1.5 seconds.

MMT 70/144 £149 (B)

★ 10 Watts TX output.
★ Output frequency range 70-72MHz.
★ Input frequency range 144-146MHz.
★ Input power range 10-500 milliwatts.
★ Low noise receive converter.
★ RF vox provides automatic changeover.
★ Input modes:- SSB, FM, AM or CW.

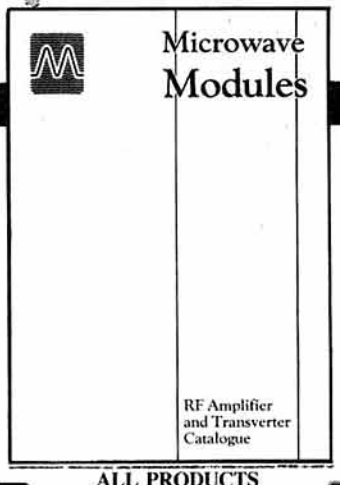
MMT 50/144 £295 (B)

★ 20 Watts output power.
★ Input frequency range 144-148MHz.
★ Output frequency range 50-54MHz.
★ Input level range 150 milliwatts-15 watts.
★ Modes:- SSB, FM, CW, FSK or AM.
★ 10 dB conversion gain.
★ Exceptional large signal receiver performance.
★ RF vox operator adjustable from 20 milliseconds to 1.5 seconds.



FREE CATALOGUE

We have many other linears and transverters in our range as well as ATV and weather satellite equipment. Just write or 'phone and we will be pleased to send you a **FREE** catalogue which contains detailed descriptions and the full specifications of our products.



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50/767	6M Unit 10W O/P	**£169.00**
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430/767	70Cms Unit 10W O/P	**£215.00**
FL7000	500W PEP HF Linear	**£1600.00**
SP767	External Speaker	**£69.95**
FIF232C	Computer	**£75.00**

For existing owners of the FT767GX who purchased their sets through Yaesu's official UK distribution network, Yaesu are offering an upgraded local unit for a nominal charge. Please contact us for details.

FT-411/811

COMPACT CPU-CONTROLLED FM TRANSCEIVERS

5W RF output
49 Memory Channels
Built in Vox
Adjustable Powersave
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Uses FT23R Accessories
70 cm FT811 available

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uses all FT23R Access.

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SMC South Midlands Communications Ltd.

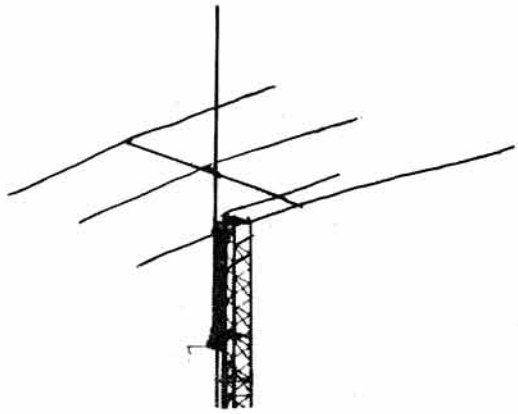
CREATE NEWS

The CREATE company has, for the past twenty years, been the leading manufacturer of amateur and commercial antennas (mainly HF) in Japan.

Now available to customers in the UK through South Midlands Communications, the appointed distributor, are the popular CREATE HF beams to cover the 10/15/20 metre bands, HF baluns up to 10KW PEP and the exciting 10/15/20/40V dipole which has elements of only 19ft and is designed in such a way that it can be mounted in particularly awkward places. SMC also stock what must be one of the largest amateur antennas available, the 40 metre full sized beam, as well as 6 and 7 element and six metre yagis and professional quality log, periodic antennas for 50-1300 and 105-1300MHz. CREATE also manufacture rotators to exacting levels of precision and these have initially no back lash, quiet gears, variable speed and large torque. All are now available from SMC stock.

Model 318Jr Compact 4-Element

CREATE introduces the 318 Series of DX Tri-Band Beam Antennas that offer outstanding efficiency with High-Q TRaps especially designed for 14, 21, and 28MHz. Design emphasis is placed on full-sized monobanders. Each model functions as a full-sized beam on 28MHz, physically reduced by 15 percent on 21MHz and 25 percent on 11MHz. Large High-Q wavetraps are employed, resulting in performance comparable to that of full-sized elements. In the past, multiband trap antennas were difficult to tune, and performance parameters varied considerably – especially VSWR curves. These irregulars and performance distortions were due largely to design in wavetrap constants and tolerances in manufacturing. CREATE assures stable, uniform VSWR characteristics with an accuracy of 0.5 percent (maximum) by using only the best in engineering and manufacturing technologies. Materials are carefully selected for the best combination of long life, maximum reliability, and light weight. At key stress points, such as the centre section, tubing is dual-structured and overlapped, and hardware clamps are die-cast.



ONLY **£299**

SPECIFICATIONS	Model 318Jr
Frequency MHz	14 21 28
Forward Gain dB	7 7.5 8
F/B Ratio dB	18 18 18
Power Capability PEP CW: 50% Duty, 1/2 PEP	1.2W/14MHz 2kW
Impedance	50 ohms
Longest Element	8.6m (28')
Boom Length	4m (13' 1-1½")
Mast Diameter, All Models	49 to 60 mm
Weight	13kg (28lbs)
Wind Survival Rating	125 km/hr (80 mph)
Rotational Radius	4.8m (15.8')

All beams supplied complete with balun

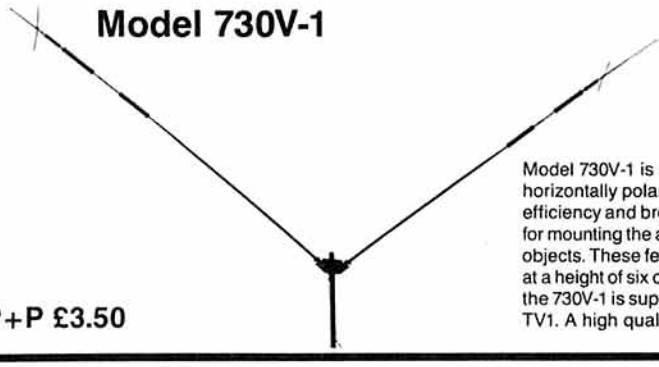
CD318JR 4 ele 10-15-20M 750W PEP Gain 7:7:5:8dB F/B 18dB Only £299, P&P £5.90
CD318 4 ele 10-15-20M 2KW PEP Gain 7:8:8:5dB F/B 18:20:20dB Only £349, P&P £5.90
CD318B 5 ele 10-15-20M 2KW PEP Gain 7:5:9:9:5dB F/B 20:18:20dB Only £449, P&P £7.90
CL40B-4 3 ele Yagi 40M 4KW PEP Gain 8dB F/B 22-18dB Only £999 P&P £12.50
CV48 40M vertical 2KW PEP 500W PEP Radial wires included suitable for ground or roof mounting Only £210
AD385 Matching network 40/80M for CV48 remote switchable Only £49 P&P £2.85
CV730V-1 V dipole for 10-15-20-40 1KW-2KW PEP 19' ele capable of being mounted anywhere Only £149 P&P £3.50

NEW

ONLY **£149**

7·14·21·28MHz

Model 730V-1



P+P £3.50

Model	730V-1
Frequency	7/14/21/28 MHz
Polarization	Horizontal
VSWR	Horizontal
Impedance	50 Ohms
Power Capability (PEP)	1kW/7MHz, 2kW/14.2MHz
Element Length	5.8m/19
Rotational Radius	4m/13' 1"
Mast Diameter	50mm/2"
Weight	more than 3m/9' 10"
Recommended Height	more than 3m/9' 10"

Model 730V-1 is a compact V type 4 band dipole antenna with a figure 8 directivity pattern and is horizontally polarized. The shortest possible elements are used while still providing high radiation efficiency and broad band VSWR characteristics. The use of the V shape reduces the area needed for mounting the antenna and is sensitive to changes in height above ground and surrounding metallic objects. These features allow the antenna to be installed at almost any site. The antenna is operable at a height of six or more feet above the ground. Due to the horizontal polarization and figure 8 pattern, the 730V-1 is superior to the usual compact ground plane antenna, especially in respect to gain and TV1. A high quality balun is included as a standard component of this high performing antenna.

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- Adjustable RF Gain control
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- Illuminated display for night use
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TECHNICAL TOPICS

PAT HAWKER G3VA

ANOTHER FORECAST FOR CYCLE 22

'A near-record solar cycle?' in *TT*, August 1988, p601 included a forecast that sunspot cycle 22 may have a maximum number of 175±35, peaking in 1990±1. This was based on the prediction made in *Nature* (12 May 1988) by Dr Geoffrey Brown of the University College of Wales arising from a study of the occurrence of geomagnetic abnormal quiet days (AQDs) observed during the minimum period between cycles 21 and 22. Dr Brown suggested that "It seems likely that cycle 22 could be second only to cycle 19 as the largest cycle on record."

However, his prediction of 175±35 encompasses the relatively wide range of 140 to 210. More recently Robert M Wilson of the NASA Marshall Space Flight Center, Alabama, in a letter to *Nature* (27 October 1988, p773) ventilates an alternative approach which suggests that the peak may be close to the lower limit of Dr Brown's forecast. Dr Wilson believes that predictions based on 'bivariate fits' combining the effects of the geomagnetic index and the level of sunspot number at the beginning of the cycle appear to be more accurate historically. He writes:

"Of several bivariate fits, the most reliable for predicting maximum amplitude, *R*(max), is one that uses the minimum annual averages of sunspot number, R(min) and the Ap index, Ap(min), having a correlation coefficient of 0·997 and a standard error of only 3·9. For cycle 22, R(min) occurred in 1986, having a value of 13·4, and Ap(min) occurred in 1987, having a value of 11·0, implying that R(max) should be about 144·6±7·8. Based on cycles 17 to 21 this particular fit has never erred by more than 4·1 units of sunspot number. Providing that cycle 22 is statistically no different from that of cycles 17 to 21, one infers that cycle 22 should be smaller than both cycles 21 (164·5) and 18 (151·8) and probably about the size of cycle 11 (140·5) making it the fourth or fifth largest sunspot cycle of the modern record . . . Cycle 22 probably will not be an exceptionally large, record-setting sunspot cycle, although it will be above average."

SETTING UP VHF/UHF SSB TRANSMITTERS

At one time it used to be suggested that nobody should use SSB who did not have access to a two-tone generator and an oscilloscope. Today, factory-built black boxes suffer relatively little drift

PRE-HISTORY OF AMATEUR SSB

In *TT* (July 1988) I noted how SSB became established in amateur radio following the 1947 experimental SSB project run by Dr O G 'Mike' Villard, W6QYT. He had been impressed by wartime use of SSB but felt that the filters required were too complex for amateurs and 're-invented' the phasing method of SSB generation that, unknown to him, had been invented and patented in the late 1920s. Following the publication of these early efforts in the January 1948 *QST*, SSB gradually caught on and, in the September 1988 *TT*, I recalled how SSB spread to Europe with G2NX of Oswestry the first British amateur to start the SSB mode rolling.

However, I had pointed out that the theory of SSB had been proved mathematically by Carson as early as 1922, had been used for the long-wave, VLF, transatlantic radio telephone service that opened in 1929, and, with pilot carrier, had been pioneered for commercial HF point-to-point working in the 1930s. What I did not make clear was that there had been various attempts by amateurs to introduce SSB working in both the USA and the UK even before the results of the Stanford project became evident.

A detailed article 'The development of amateur SSB: a brief history' by John J Nagle, K4KJ (*Ham Radio*, September 1984, pp12-16, 19-23) explains how two groups of amateurs tried to establish SSB on the amateur bands in the 1930s. Pride of place would seem to go to Robert M Moore, then W6DEI, who described a 3·5MHz SSB transmitter (Fig 1) in that one-time excellent American magazine *R/9* (renamed *Radio* in 1933) using low-frequency filter techniques based on work published by Bell Telephone Laboratories. A second group was led by James J Lamb of crystal-filter fame while technical editor of *QST*. In September 1933 he produced a 12-page report describing the feasability of amateur SSB but the ARRL management decided not to pursue development on the assumption that SSB equipment would prove too complicated for the average amateur. His report was never published in full.

What I believe has never been revealed before is that one of those who were much impressed by the military use of SSB during the second world war for long-distance point-to-point circuits was a senior British signals officer, Christopher Henn-Collins, who was also a peacetime radio amateur G(U)5ZC. It is rather a sad story but worth telling as further evidence that amateur radio can interact with professional engineering to the benefit of both. GU5ZC writes:

"As Head of the Radio Division of the Signal Section of AFHQ in Algiers in 1942-43 I soon became acquainted with, and was much impressed by, the Western Electric independent sideband equipment and linear amplifier with which the US Signal Corps worked to the States running a plurality of RTTY and other circuits. The Royal Signals had only a single channel of high speed morse back to the UK. Yet, at four times the range, the Americans often operated their transmitter at less power than we found necessary.

"I quickly became hooked on the merits of SSB.

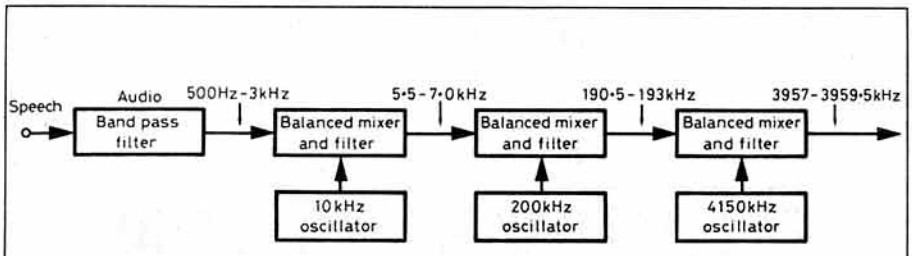

Fig 1. Block diagram of the 3·5MHz SSB transmitter developed and described by Robert Moore, W6DEI in the Amateur Radio Magazine R/9 about 1933 based on commercial practice in using LC filters at low frequencies about 1933 as reproduced by K4KJ in *Ham Radio*. It was not until many years later that suitable filters (crystal) were available at HF.

In 1944 I returned to the UK to head the Wireless Branch of the Directorate of Signals at the War Office. I managed to give things something of a technical wash-and-brush-up, including making a start with RTTY working in the British Army. I was, however, stopped in my tracks by the then Chief Superintendent of the Signals Research and Development Establishment (SRDE) who firmly minuted my boss, the late Brigadier Hickman, that due to the frequency stability requirements and complexity, SSB was quite unsuitable for military communications. However, I gained an ally in the GPO who promised to update some of their SSB equipment for use on main-line Army circuits, though I still wonder how many years the Army had to wait for a mobile SSB rig for use in the field (1960s I think, G3VA)..

"In 1945 I was posted away from the War Office to a job that had little to do with radio communications. The only place where I could build any equipment was here in Guernsey where my parents then lived. I became determined to build a mobile SSB rig to prove its feasibility for military use.

"I consulted the late Sir Archibald Gill, then Engineer-in-Chief of the GPO, whom I knew and much respected. He warned that it was a considerable project to build an SSB station from scratch but added that should I encounter any difficulties with his engineers in regard to the conditions of the Amateur Licence, I was at liberty to refer to him any GPO inspector or engineer raising difficulties.

"There were no text books to rely on. The Germans had left behind on Guernsey a Trager Frequenz Gerat equipment that provided the basic SSB signal at 36kHz. I bought a surplus Canadian C43 transmitter to house the equipment and provide the basics of a linear amplifier. A leave was then spent building test gear to check what I had done. On one leave in 1947 it all worked. However, contacts proved disappointing since nobody seemed to know then how to tune an SSB signal!

"The disappointment stayed with me for about ten years. Then, on a visit to my mother, I put the equipment on the air again. By then SSB had become established on the amateur bands and I must be a candidate for an award for creating one of the biggest pile-ups on 14MHz when I put the beam on to North America. Later I gave the whole equipment to the local radio club, I believe the receiver is still in use."

while solid-state devices do not show the gradual change in characteristics associated with gradual, but progressive, loss of valve emission. The result is that many amateurs operate SSB equipment with little or no test equipment suitable for checking linearity. Nevertheless, access to test equipment is still essential for anyone building their own equipment, and still extremely useful for occasionally checking the overall performance of equipment to guard against 'flat-topping' etc.

Ian Waters, G3KKD has sent along an item originally written for the *Cambridgeshire Repeater Group Newsletter* which shows succinctly a technique that makes it possible for VHF/UHF to display a two-tone waveform on an oscilloscope of limited bandwidth. G3KKD also provides an outline of two-tone testing applicable to all SSB transmitters. The following notes are based directly on G3KKD's newsletter article:

Those who listen on the SSB segments of our VHF and UHF bands will know that while there are many good clean signals to listen to, there are some that fall far short of this ideal. Badly overdriven rigs can make DX contacts a waste of time: over-driven local stations can spread over a hefty chunk of spectrum.

So, how do we set up our transmitters to prevent this happening?

Our text books will tell us how to set up HF transmitters: **(1)** Modulate with a two-tone audio test signal. **(2)** Run the transmitter into a good resistive load. **(3)** Observe the waveform across the load on an oscilloscope.

This is all very well – but how does a VHF/UHF operator do this?

Few of us have an oscilloscope that has a bandwidth up to 50MHz let alone the other VHF/UHF bands, up to say 1296MHz.

The solution adopted at G3KKD is to provide a small down-converter for each band used. The idea has so far been tested on 50 and 144MHz using two converters based on the circuit shown in Fig 2 with output on about 10MHz. It is intended to make others for 432 and 1296MHz, similar in principle but with circuit details adjusted to cope with these higher frequencies.

The converters are fed with a small sample of the transmitter output from a forward loop coupler in the transmission line after the harmonic filter. The output frequency is about 10MHz but this is not at all critical provided that the frequency is within the bandpass of the oscilloscope. The general arrangement is shown in Fig 3.

A correctly adjusted transmitter should result in a display similar to Fig 4. The two-tone PEP waveform should not exhibit any compression or clipping on the peaks and the cross-over at the base line should not be distorted. If one tone is switched off, the amplitude (a) should be half that of the two-tone signal (b). Since power varies as voltage squared, the two-tone PEP power will be four times the single-tone power, which is as it should be. If your dummy load can also act as a wattmeter, reading RMS power, the power measured with two tones should be twice that measured with only one tone present.

Adjust the level of the modulating signal or the drive to the linear (power) amplifier to limit the envelope peaks. If the amplifier operates biased in class AB, the stading current with no drive applied should be set to minimise the bottom bend distortion of the output device, transistor or valve, which shows up as cross-over distortion on the waveform.

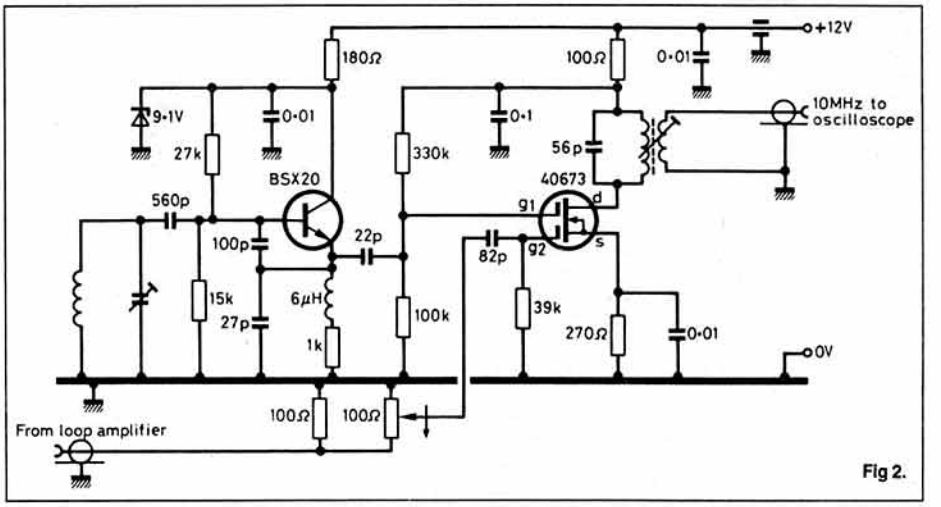

Fig 2.

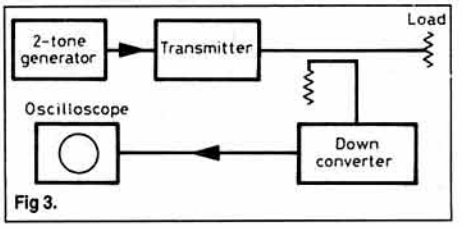

Fig 3.

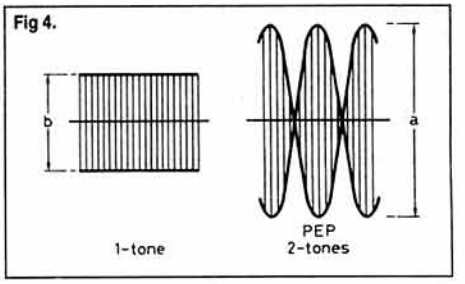

Fig 4.

Fig 2. 50MHz to 10MHz down-converter used by G3KKD to check the linearity etc. of a 50MHz SSB transmitter without a requirement for a high-cost oscilloscope. Basically similar down-converters can be used for the other VHF/UHF bands.

Fig 3. Set-up for checking or adjusting VHF/UHF SSB transmitters using small-signal down converters.

Fig 4. Oscilloscope waveforms of a correctly adjusted ssb transmitter modulated by one and two sine-wave tones.

Fig 5. Circuit diagram of a two-tone generator (*Radio Handbook*).

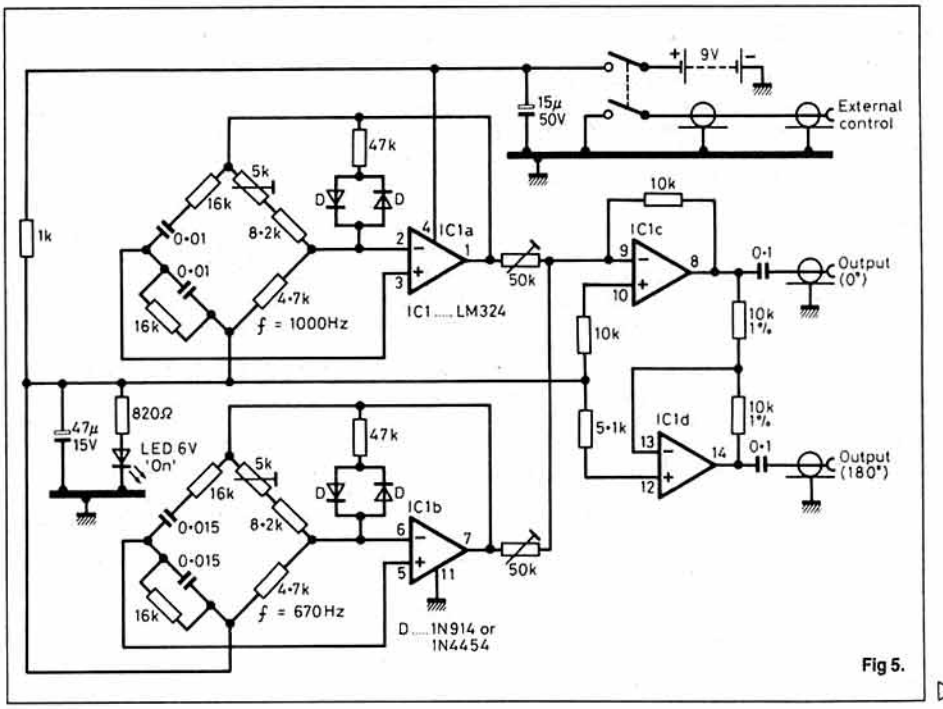

Fig 5.

Care must be taken to ensure that the small-signal down-converter is not overloaded and so introduce distortion which would confuse the results. For this reason, the Y-gain control on the oscilloscope should be turned well up and the input potentiometer on the converter should not be advanced more than necessary. You can discover how much headroom there is on the converter by turning the oscilloscope gain down and turning the converter input up until the overload point is found.

A two-tone generator consists of two sine-wave audio oscillators with frequencies, which are not harmonically related, within the speech passband. I used 1·45 and 2·2kHz but these may not necessarily be ideal.

The outputs of each audio oscillator are adjusted to have equal amplitudes and then mixed together. A final control sets the level fed to the transmitter. I find it necessary to feed the two-tone signal into the SSB modulator directly, bypassing the speech processor, which distorts the balance of the two audio tones.

It seems appropriate to complete G3KKD's notes by adding an outline of an easy-to-build compact two-tone generator. Fig 5 shows the circuit diagram of a generator described in the *Radio Handbook* (22nd Edition, 1981, pp31.35/36) although many other suitable units have been published. This generator provides a pair of linearly added sine waves with second harmonic and intermodulation products reduced at least 35dB below one tone. It operates from an internal 9V battery with no inductors or transformers that might induce mains hum.

Two Wien-bridge AF oscillators and associated buffer/mixer stages are based on a single LM324 quad IC. One generator is adjusted for 1000Hz, the other for 670Hz although of course the oscillators could be modified for other combinations. The original model was enclosed within an aluminium utility box (3·5 by 2 by 1·5 inches) with all components mounted on a perforated circuit board. The 9V battery was mounted below the board in a small clip. The unit provides either balanced or unbalanced output.

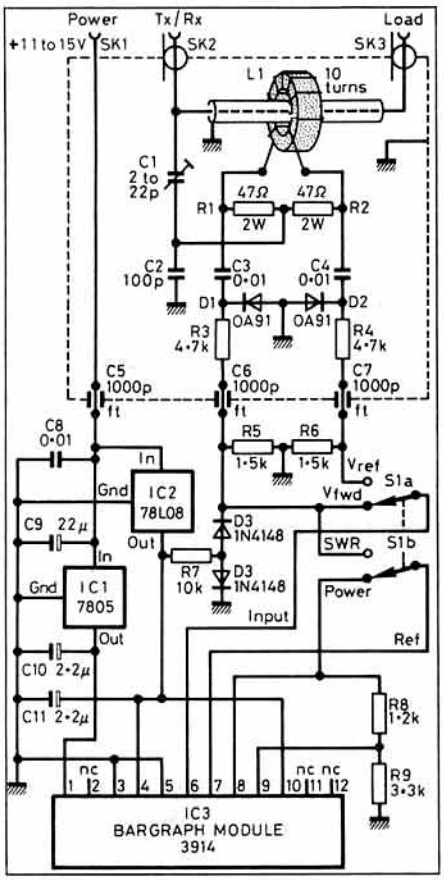

Fig 8. Direct-reading VSWR/power bargraph indicator developed by G3TXQ.

DIRECT-READING VSWR/POWER INDICATOR

Steve Hunt, G3TXQ has devised a useful-looking direct-reading VSWR/power indicator (Fig 8) which avoids the complexity and costs of some previously published designs for this type of unit. He writes:

"Components within the screened area (dotted line in Fig 8) comprise a conventional VSWR bridge producing voltages dependent on *forward* (FWD) and *reflected* (REF) power (energy). With the values shown, the bridge works well over the HF bands at power levels from 1W to 100W.

"With S1 in the 'power' position, the REF voltage is fed to the LED bargraph display module IC3. The reference input to IC3 (pin 7) is a fixed voltage derived from the on-board voltage regulator (IC2). In this mode the LED display gives a useful indication of power output over the range 1W to 100W and has the important advantage of indicating instantaneous peak power.

"With S1 in the 'SWR' position, the REF voltage is fed to the input of IC3 but the reference input for IC3 is now the FWD voltage. In this way, the bargraph indicates the *ratio* of VFWD and VREF and can be calibrated to display VSWR independent of the power level. No longer should the problem be experienced of adjusting an ATU for minimum reflected power, only to find that what has actually been done is to tune for a very *high* VSWR which has automatically caused the solidstate power amplifier to shut down!

"R7, D3 and D4 apply a small voltage to the bargraph module in order to extinguish all the LEDs when the transceiver is in the 'receive' mode."

G3TXQ adds that he has produced a PCB for this design, together with assembly instructions. He can also supply the required components. For details telephone him on 0604 858090 after 7pm (his postal address is 21 Green Street, Milton Malsor, Northampton NN7 3AT).

MODERN RADIO SCIENCE

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This book comprises eleven 'tutorials' papers originally presented by eminent radio scientists at the 1987 URSI General Assembly at Tel Aviv. While it is not a book likely to find a place on many amateur radio bookshelves, it includes excellent papers on ionospheric propagation, radio astronomy, etc, providing understandable explanations of the current state of thinking on important subjects. It would well repay any efforts required to obtain a library copy.

For example, in two succinct pages (87-8) will be found an up-to-date explanation of what is known about Sporadic E propagation.

It is much to be welcomed that many professional specialist conferences are now including 'tutorial days' or tutorial papers that set the scene for non-specialists.

Contents: 1, Laser measurement 1968-87 and beyond (W Wolinski); 2, Waves and spectra; a modern perspective (Leopold B Felsen); 3, Queuing and coding in multi-user communications; ideas, techniques, theory (S. Csibi); 4, Coherent optical fibre communications (T. Okoshi); 5, Present and future of research on wave propagation (R K Crane); 6, Aspects of ionospheric physics relevant to radio propagation (H. Rishbeth); 7, Present and future trends in research in waves in plasmas (W S Kurth and S D Shawhan); 8 Radio astronomy – new horizons (Wm J Welsch); 9 New communication networks (Helga Seguin); 10, Digital optical techniques in computing and switching (J E Midwinter); and 11, The encounters with Comet Halley, March 1986. Index.

PACKET SYNDROME – NO KNOWN CURE

For some years in the 1950s I lived in a house converted into three flats in a most pleasant Bloomsbury garden-square until thrown out by London University who wanted to convert the building into a computer centre. Immediately above and below me were practising psychiatrists, but to my relief they apparently never detected that I was a radio amateur clearly in need of their professional services.

I was reminded of this by an article in *QST* (November 1988, p46) by Mike Bailey, KB6LSO a psychiatrist who confesses to using amateur radio as an escape from a busy practice. He claims that over the past year he has become aware of a new psychiatric disorder which he names the 'Packeteer Addictive Syndrome (PAS)'. A first stage of this disorder is marked by an increase in energy and a heightened mood; the second stage frustration and discouragement when the amount of hardware and software needed becomes apparent; the third, chronic stage begins as the packeteer gets on the air and spends increasing periods of time at his computer and radio – compulsively connecting with others, searching for new packet modes and exploring bulletin boards until he becomes obsessed, ignoring social and family obligations: "He is heard less and less on local radio (speech) nets, ignores HF completely, forgets Morse code and speaks a vocabulary punctuated by terms such as digirepeater, CTEXT, PACLEN etc."

As the syndrome progresses, KB6LSO claims, the victim spends more and more time hunched over his video screen. If, at this stage, his equipment fails, he will frantically attempt to get back on the air. If unable to do so, he appears distant, depressed and listless, akin to someone with a severe organic or endogenous depression.

With no known cure to PAS, KB6LSO believes that self-help groups, 'Packeteers Anonymous', may prove useful in controlling the progression of this syndrome. With the benefit of hindsight I would

suggest that similar syndromes have been observed before, marking the times when new modes or new activities have erupted on the amateur-radio scene. Even in the 1930s ARRL found it necessary to devise a six-point 'Amateur's Code' of which the fifth commandment was: 'The Amateur is Balanced . . . Radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school, or his community.' Ah me, if only we had been able to observe that commandment, how different some of our lives might have been!

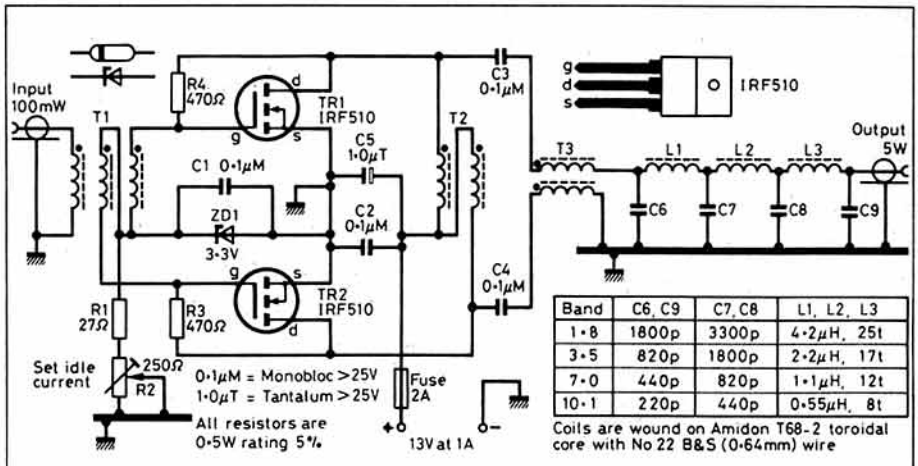
For packet-radio enthuslasts, a book worth seeking out in good technical libraries is 'Packet Radio Networks – Architectures, Protocols, Technologies and Applications' by Clifford A Lynch and Edwin B Brown (Pergammon Press, 1987, 292 + xviii pages, £43, ISBN 0-08-035913-2). Although a 'professional' book (at a professional price) it is virtually non-mathematical and readable by non-specialists. The authors are at the University of California, Berkeley.

1·8 – 10·1MHz MOSFET POWER AMPLIFIER

The other day I found myself working a Dutch amateur who was running 500mW on 7MHz CW quite successfully. But, personally, I would never recommend this order of QRP to anyone just starting up on HF. It needs a good, well-matched antenna and even then the outgoing signals are all too vulnerable to interference and fading. On the other hand, with an RF output of, say, five watts or more, a newcomer should have little difficulty in making satisfactory CW or SSB contacts on 1·8, 3·5, 7 or 10·1MHz, even with an indifferent antenna.

A broadband amplifier using a pair of D-MOS power FETs in push-pull and capable of providing about five Watts CW or six Watts PEP output with 100mW input, using 13V supplies, has been described in the *Novice Notes* of WIA's *Amateur Radio* October, 1988 by Drew Diamond, VK3XU. This uses two D-MOS, n-channel, enhancement mode FETs intended primarily for switching applications but useful as HF amplifiers up to about 10MHz. IRF510 devices are available in the UK at about £1·50p or less. VK3XU gives the amplifier gain as about 17dB and two-tone IMD characteristics as at least −30dBc (typically −35dBc). When used with the suggested band-filters all harmonics should be at least −50dBc. This amplifier should withstand short-circuited or open-circuited loads without damage and should remain stable regardless of load SWR. Such characteristics would seem to make such an amplifier a good project for anyone making a start in homebrewing a solidstate transmitter, as a beginner or for QRP operation.

The drain-to-drain impedance of the push-pull FETs is 2×24=48 ohms so that no elaborate impedance transformation is needed to match into 50ohms. T3 converts the balanced output to provide the usual unbalanced output. T2 forms a balanced choke feed for the devices. Negative RF feedback is provided by R3 and R4, stabilising the amplifier and helping to keep the frequency response level throughout the range. The heatsink of the bias zener, ZD1, is positioned against the heatsinks of TR1 and TR2 with a small blob of petroleum jelly so that it tracks the temperature of the FETs, causing the bias voltage to be influenced by their operating temperature. The polarity of the zener diode should be carefully observed and the



Band	C6, C9	C7, C8	L1, L2, L3
1·8	1800p	3300p	4·2μH, 25t
3·5	820p	1800p	2·2μH, 17t
7·0	440p	820p	1·1μH, 12t
10·1	220p	440p	0·55μH, 8t

Coils are wound on Amidon T68-2 toroidal core with No 22 B&S (0·64mm) wire

Fig 6. Circuit diagram of the 1·8MHz to 10·1MHz push-pull FET power amplifier capable of providing 5W (CW), 6W (pep) output as described in *Amateur Radio* by VK3XU.

TR1, TR2 and ZD1 attached to 6030 heatsinks in physical contact to enable ZD1 to temperature-track the fets. T1 comprises 11-turn loops of 24 B&S (0·5mm) enam. Wire on amidon FT50-43 core. T2, T3 11-turn loops of 22 B&S (0·64mm) enam. Wire on Amidon FT50-43.

***Indicates start of winding.**

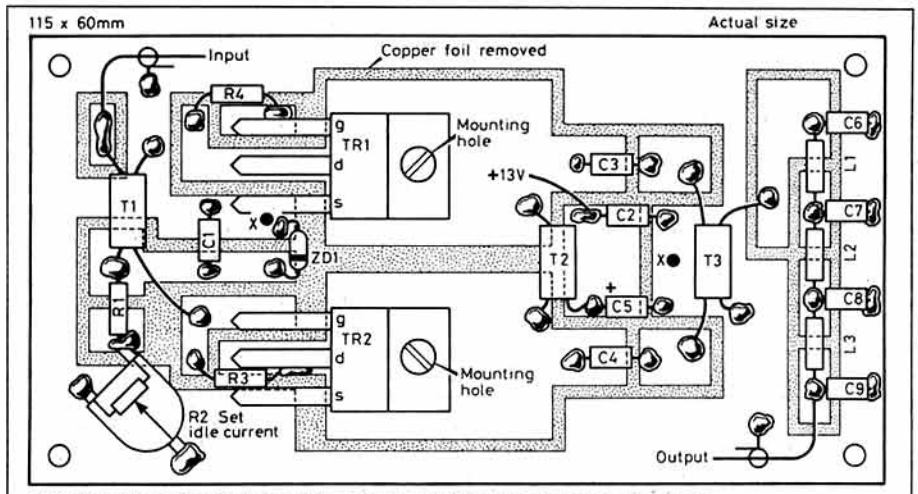


Fig 7. Circuit board layout (full size) for the FET amplifier. Double-sided copper board.

enclosure for the amplifier should have adequate ventilation. The complete amplifier (with one band filter) can be built on a double-sided, 115mm by 60mm PCB. For stability, the unetched 'ground plans' should be connected to the etched-side common-earth (positive polarity) in at least two places near the input and output areas. The prototype has through links at the source of TR1 and at the point where C2 and C5 have their earth connections marked on the board layout diagram with a small circle, marked 'X'. Drill the holes with a one millimetre drill.

If multiband operation is required, the highest band-filter should be accommodated on the PCB and kept permanently in circuit; lower frequency band filters can then be built on an additional board. Polystyrene/Styroseal capacitors should be used for the band-filters, it may prove difficult to obtain the larger values such as 1800pF and 3300pF. Silver mica capacitors can be used if available. Provide a 2A fuse in the supply circuit.

When setting up, with R2 set for minimum resistance, the ideal no-signal current is about 200 to 300mA. Output must be terminated with a 50ohm dummy load resistor. Current drawn with 100mW drive should be about 1A. With suitable heatsinks, no discomfort should be experienced when the heatsinks are lightly touched after some minutes operation at the five watts level. While 100mW drive should suffice on the lower bands, up to 300mW may be needed at 10·1MHz which is about the limit for these devices. Do not overdrive or flat-topping will result. With larger heatsinks it would presumably be possible to obtain more RF power output by using a higher supply voltage, but before attempting this check the detailed characteristics of the IRF150 etc.

LONG LIVE MANUAL MORSE!

As Bruce Morris, GW4XXF has pointed out, many of the British and foreign 500kHz coast stations have been closed down during the past few years. ▷

Now, the International Maritime Organisation has endorsed the future adoption of the push-button 'Global Maritime Distress and Safety System (GMDSS)' based on satellite technology and automatic data transmission proposing that the traditional manual morse distress service be gradually phased out. The Royal Navy is proposing to abolish morse, even as a fall-back system, in favour of slow speed diversity modems using 7-unit ASCII machine code. This system, noted briefly in *TT*, May 1985, p356 and in an article 'Farewell to Morse . . .?' *DTE Spotlight*, June 1988 brought to my notice by Ron Cannon, G8OTG, employs frequency and time diversity. It requires a full 3kHz of bandwidth to transmit messages at about 12wpm (10bit/s), repeating each 'bit' five times on different audio frequencies and so using, in effect, ten 100-baud channels, all in conjunction with an 'intelligent' detecting decoding algorithm. It is far from a 'kiss' system but designed to achieve copy in conditions of poor propagation and/or severe interference. However even so, this is roughly of the same order as that of a human operator limited by fixed frequency operation.

With such developments, manual morse is being written off by some observers as an old-fashioned, obsolete form of communication. In fact, it is a highly efficient binary, non-return-to-zero, digital code. I admit to prejudice and make no apology for believing that, within amateur radio, there is and will continue to be an essential and fundamental role for manual morse.

Just one example. In a *TT* item (February 1986, p105), Nigel Neame, G2AUB, stressed the unique value of morse to those suffering from deafness or with extreme loss of hearing. He wrote, "CW enables a licensed deaf amateur to communicate *on equal terms* with any other person virtually throughout the world. The words 'on equal terms' are most significant, since there is no other means of direct *human* to *human* communication available between the deaf and non-deaf apart from 'signing' and lip-reading – and how many non-deaf people learn those skills?"

On other occasions it has been noted in *TT* that many people 'deaf' to normal speech can 'hear' the single tone of CW. Others can receive by their tactile sense, detecting the vibrations. A recent item in *Radio-ZS* noted that 79-year-old Denis Richardson, ZS1B was active again after ten years off the air. This was due to total deafness that had followed ten years of deteriorating hearing. Then a fellow amateur suggested he should try copying morse by vibration. ZS1B simply removed the cap from one of his earpieces and gently placed his forefinger on the diaphragm. He describes what happened: "A chill went down my spine. I could feel the dits and dahs of Morse coming though my finger . . . in no time at all I was able to read up to 20wpm." Soon he had fired up a small valve transmitter and his 40-year-old communications receiver. ZS1B was back on the air.

G3SBI's SIX-BAND VERTICAL ANTENNA

The 30ft vertical whip antenna with remote, automatically-tuned matching network has been widely used in professional HF land and maritime mobile communications but tends to be too costly an approach for widespread use by amateurs.

However, Colin Horrabin, G3SBI has developed an ingenious lightweight vertical antenna that can be used on 1·8, 3·5, 7, 14, 21 and 28MHz, providing on each band a nominal 50ohm base feedpoint impedance and functioning on each band without any remote switching or matching from a 50-ohm coaxial transmission line. Colin hopes later to prepare a detailed constructional article but feels that his unusual method of feeding the antenna on 14 and 28MHz, and the consequent enhanced 28MHz performance, should prove of general interest. His method of using stubs appears to be novel. His antenna was initially developed using a one-tenth scale model enabling current distributions and feedpoint impedance to be measured.

Fig 9 shows the complete antenna and Fig 10 the current distribution on 14 and 28MHz. G3SBI writes:

"On 14MHz the current distribution is similar to a 200° (electrical degrees) vertical; on 21MHz it resembles that of an 'elevated-feed' vertical one-wavelength high; over good earth this provides a main lobe at an elevation of only 10° above the horizon.

"To set-up the stubs initially, the 14MHz stub is adjusted for minimum SWR (Note that the length is such that a 90° bend is required as in Fig 9). The tapping point is moved up and down the element until an SWR better than about 1·3:1 is achieved. The same method is used with the 28MHz stub; but in this case a length of nylon rope is attached temporarily by means of PVC tape so that the length of the stub can be adjusted from ground level with minimum SWR centred on 28·5MHz.

"The 14MHz stub wire should not be more than 2-in from the vertical element since at any greater distance it will affect the resonance on 21MHz where the antenna functions as a ¾-wave monopole. It may prove necessary to readjust the length of the 14MHz stub slightly after adjusting the 28MHz stub."

G3SBI has recently expanded his original notes to give some further explanation of the feed mechanism for 14 and 28MHz: "The tapping point for the stubs on the 2-in OD aluminium mast-element determines the minimum SWR that can be achieved; the length of the stub determines at what frequency within the band this occurs. In my case the actual tapping points were within six inches of those predicted from my one-tenth scale model to obtain an SWR of less than 1·5:1.

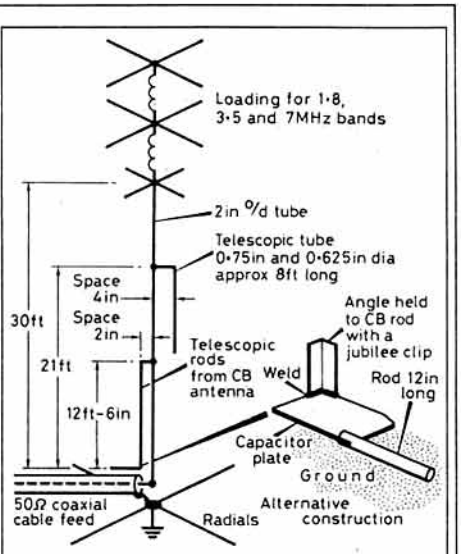


Fig 9. G3SBI's six-band vertical HF antenna.

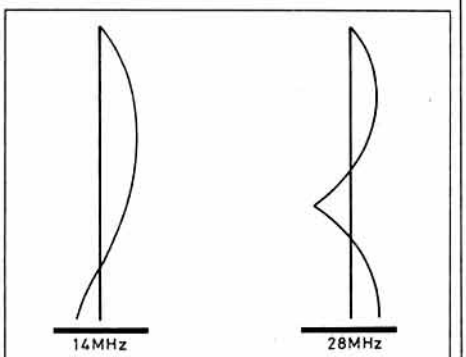


Fig 10. Current distribution of the G3SBI antenna on 14 and 28MHz.

"What did surprise me was that, with base feed, the current distribution on 28MHz, where the vertical height is roughly 1λ, is similar to that of the 1λ elevated-feed vertical derived from a Marconi D/F system described many years ago in TT and included in most editions of *Amateur Radio Techniques* though now out of print.

"My back garden is 36ft by 24ft and the results seem particularly good on 28MHz although the antenna has been used to work South America (LU) and Australia (VK6) on 3·5MHz. I am convinced that this feed method would be of use to anyone with a conventional 33ft vertical at the bottom of their garden, since no remote L-network is required to match the element to coaxial cable."

TRANSMITTING CLOTHES RACK

At the 1988 BBC Radio Show at Earl's Court, I noted that all of the modern equipments on the Royal Signals stand featured either a keyboard or microphone, only the 'museum pieces' such as the paramilitary Mk123 had a built-in key for CW operation.

What I did *not* see was the antenna, temporarily mounted on the roof of the hall, used by the Royal Signals in conjunction with the Army's national data network. According to a cutting from *British Aerospace News*, sent in by Bob Connell, G4JQY, this was a transportable HF loop antenna, originally designed as part of an airborne military system "shaped somewhat like a clothes rack from a dress shop . . . It is portable, easily tunable and quickly assembled in a confined space."

The report claims that the BAe loop antenna has been tested by all three British services in field trials under arduous conditions, including the snows of Northern Norway. The success of the trials led the Royal Signals to borrow the BAe antenna for the Radio Show. They successfully relayed high-speed signals for the Army's computerised national data network, despite the high degree of 'electronic noise' in the city environment."

It would seem that the 'clothes-rack' rectangular tubular loop is rather bigger than most other compact HF transmitting loops, and does not require the use of a ground plane. It provides another example of the growing use of transmitting loops. Some further details appear in *Electronics Wireless World* (February 1989, p108). □

COMPACT AND EFFECTIVE HF ANTENNA

DESIGN FOR AN HF ANTENNA WHICH TAKES UP LITTLE SPACE, NEEDS NO TRAPS NOR LOADING INDUCTORS, BUT WHICH IS HIGHLY EFFECTIVE

BY TONY PREEDY G3LNP

Few amateurs have the space to erect a really large, efficient, HF antenna. The alternatives commonly require traps or loading inductors, which are complications that not everyone wants to be involved with. I am just such a case, and so, over the years, have evolved a system which I describe here for the benefit of like-minded amateurs. Fig 1 illustrates the arrangement; the short radiator ensures that the horizontal radiation is concentrated to the broadside on all frequencies from 7MHz to 30MHz. The entire radiating section is used on each band, and above the natural resonant frequency of 10·5MHz, the antenna has some gain over a half-wave dipole.

DESIGN DETAILS

The height of the radiator satisfies several criteria for optimum performance; 12m – or 0·3 wavelength – is as high as one should erect a horizontal antenna for use on 7MHz and still expect full performance on UK contacts via near-vertical ionospheric reflection. Even so, I have had good reports from Japan when using this antenna on that band. On 14MHz, the height is 0·6 wavelength, which yields maximum gain owing to ground reflection. Radiation becomes maximum at an elevation angle of approximately 25° and is best for intermediate distance propagation.

Comparisons on the air show that this antenna performs equally as well as a half-wave dipole at the same height and orientation on 7MHz. This is not unexpected, because with appropriate conductor diameter, there is nowhere for the input power to be lost except in the 600ohm feeder. And this, being of open construction, has negligible attenuation despite having a VSWR of almost 20!

The chosen height, in conjunction with the length of the dipole, also makes 3·7MHz operation feasible when the feeder wires are strapped and the antenna becomes a T-loaded quarter-wave vertical radiator. Performance in this mode is very much dependent upon the effectiveness of the ground system situated beneath the antenna, against which it will be driven.

Just how this influences radiation efficiency can be seen from the following set of measurements which show how the mean 3·7MHz field strength, measured at 1km from the antenna, changed as the earth system was progressively improved.

EARTH SYSTEM	RELATIVE FIELD
2 x 1m copper rods	0dB
plus 4 buried radial wires 14m long	+2·5dB
plus 16 buried radials 14m long	+3dB

The length of the horizontal dipole was chosen because it is the maximum which will still maintain all of the radiation broadside to the wire at the highest working frequency of 30MHz. At this frequency a gain of 3dB over a half-wave dipole is achieved.

MULTI-FREQUENCY MATCHING

You can probably best visualise the matching system's principle of operation by considering one half of the dipole to be an extension of the 600ohm feeder, and to start with a total electrical length of a half-wave at 7MHz. As Fig 2 shows, the impedance seen at the end of the feeder will be a pure but very high resistance at this frequency. At the harmonically-related frequencies of 14, 21 and 28MHz this point will progressively become resistive less as we go up in frequency. The value of this resistance is a function of both radiation resistance and the impedance-transforming action of the feeder. Because radiation resistance increases with frequency it causes the transformed resistance at this point to fall with increasing frequency.

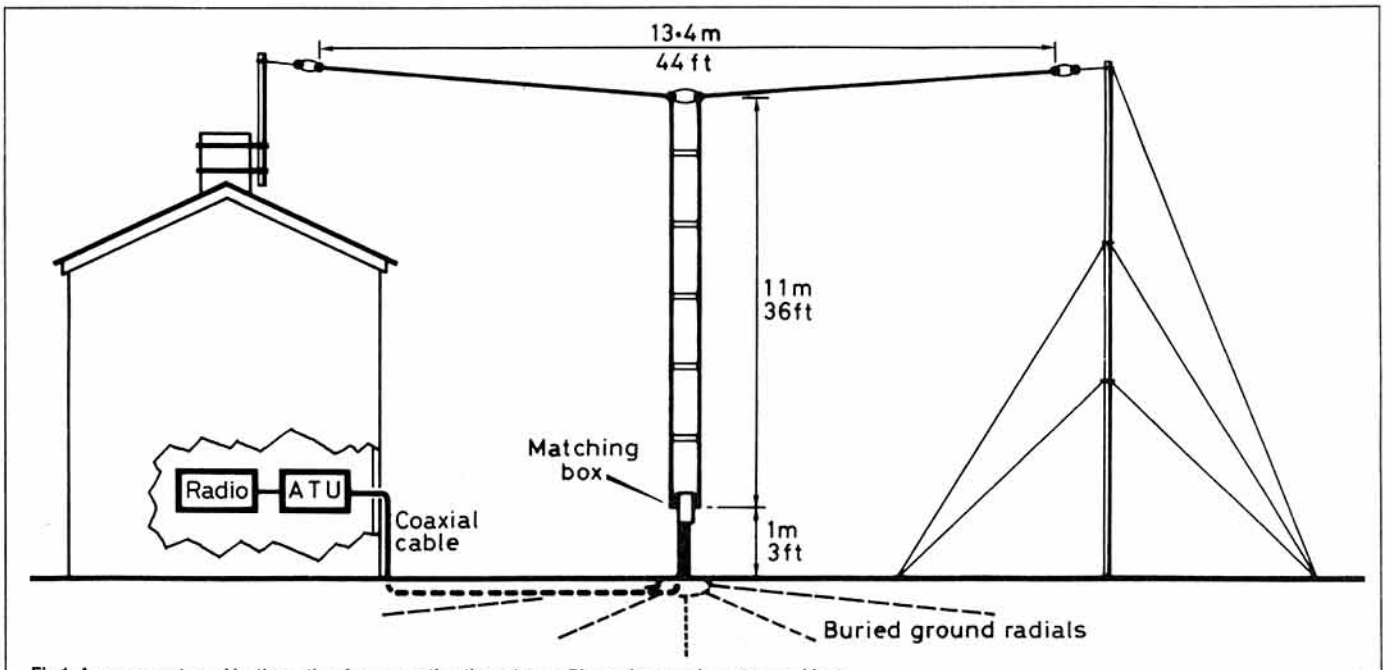


Fig 1. Arrangement used by the author for supporting the antenna. Dimensions are in metres and feet

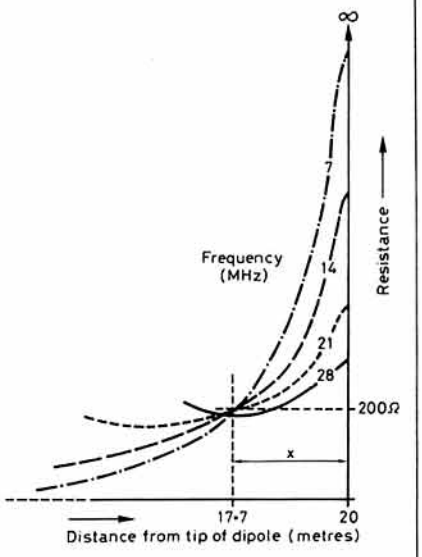


Fig 2. Resistance in the region of a half-wavelength from the end of the dipole

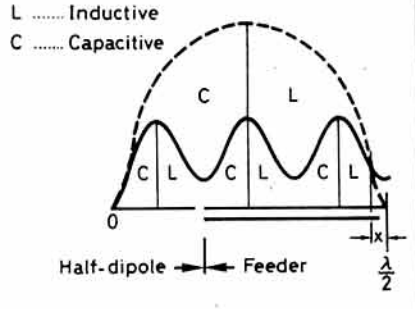


Fig 3. Current and form of the reactance at fundamental and third harmonic showing that when x is less than a quarter wavelength, the reactance is consistently inductive at the point where currents and hence resistances are equal

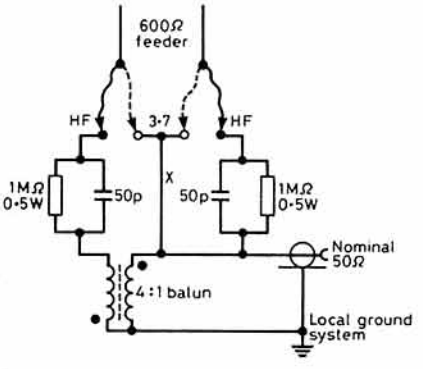


Fig 4. Matching box circuit showing the method of changing between 3·7MHz and the HF bands

Now if at 7MHz we move our measuring point towards the antenna a place will be found where the resistance has dropped to 200ohms, but this will be accompanied by an inductive reactance of typically 800ohms. At harmonic frequencies the rate of change of resistance with electrical distance is progressively less, so that even though we started with a lower resistance at the half-wave point the value at the new measuring point still tends to look like 200ohms. A similar effect (Fig 3) can be expected with the associated reactance, the magnitude of which roughly will be in inverse relationship to frequency. A capacitor with a reactance of 800ohms will therefore cancel the feeder reactance at this point at 7MHz, and because the reactance of a capacitor is inversely proportional to frequency, it will nearly provide the correct reactance necessary for the harmonic frequencies.

Two capacitors are required – each of 400ohms reactance at 7MHz, because the load is balanced. When these are trimmed they should provide simultaneously a perfect match at the 4 to 1 balun at, say, 7·1MHz, and an acceptably low VSWR on the harmonically-related bands. Here a simple pi-type ATU may be necessary at the transmitter end of the coaxial cable.

PRACTICAL POINTS

Very high voltages will be produced across the matching capacitors, particularly on 7MHz, so make these from open sections of coaxial cable. At first, make them a little longer than necessary to provide a capacitance of 50pF. They can then be trimmed for minimum VSWR at a point in the middle of the 7MHz band. Resistors of 1Mohm are required in order to prevent the accumulation of static charges across the capacitors, as shown in Fig 4. Crocodile clips or U-links should be used to change between 3·7MHz and HF operation. The voltage here is almost certainly to be too high for switches or relays, unless specially high voltage types can be procured. The capacitors are folded up and mounted in a weather-proof box, together with the balun.

The writer's balun consists of five turns of twisted pair insulated wire on a large ferrite toroid obtained from a surplus supplier. Any proprietary type designed for the required frequency range and power will, of course, be suitable.

The matching box should be fitted to a short wooden pole set into the ground, immediately below the centre of the dipole if possible.

Wire of 12swg, or equivalent size flexible wire, is required for the dipole itself. In order to avoid using numerous spacers and excessive tension at the feeder the wire should be very flexible. I used miniature coaxial cable 2·5mm in diameter and a spacing of 120mm. This possesses a plated steel inner conductor and will not stretch provided the inner and braid are joined at each end. Only two spacers were necessary.

Any length of low impedance coaxial cable can be used to connect the transmitter or receiver to the antenna matching box.

RESULTS

Actual impedances that will be obtained will no doubt vary between different installations owing to obvious factors such as proximity to buildings and ground conditions. By way of example, here follow some VSWR measurements taken on the 50ohm coaxial cable at my installation:

FREQUENCY (MHZ)	VSWR(a)	VSWR(b)
3·7	1·5	1·5
7·1	1·8	1·0
14·2	3·2	3·2
21·3	2·6	2·5
28·4	3·5	5·0

The value of the capacitance at (a), where the 7MHz VSWR was sacrificed in order to improve the match at 28MHz, was 45pF. At (b) the capacitance was 50pF.

MAKING THE CAPACITORS

Cut the coaxial cable for the capacitors on the basis of 100pF per metre for 50ohm cable and seal the ends, after trimming, with self-amalgamating tape. The inner conductor should connect to the feeder and the braid to the balun, which is the low voltage side.

USING 75OHM CABLE

Because 75ohm coaxial cable is more readily available in the UK, some experiments were made to see what changes would be necessary to adapt the system. As might be expected from looking at Fig 2, a longer section of open-wire feeder is required and slightly less capacitance gave the best compromise VSWR over the bands.

The feeder length is now 12m (39 feet) and the capacitors were each 40pF. On the 80m band, resonance occurs at a lower frequency nearer the band centre. Results of VSWR measurement referred to 75ohms are shown below:

MHZ	VSWR
3·6	1·5
3·7	1·8
7·0	2·0
7·1	1·9
14·0	2·5
14·3	2·6
21·0	1·3
28·0	2·7
28·4	2·2
28·8	1·0
29·0	1·7

In each band it was possible to dispense with the ATU when using my old valve-type transceiver.

OPERATION ON OTHER BANDS

The antenna will work on the WARC bands (10, 18 and 24MHz), but it does not then present a low VSWR. An ATU would be essential, and it would also be necessary to short-circuit the matching capacitors. Operation on 160m has not been attempted, but it should be possible provided a suitable loading inductor is inserted at point X in Fig 4, and adjusted to bring the antenna to resonance in the band.

ANTENNA SUPPORTS

My local TV aerial erection company was employed to fix a short aluminium pole onto the chimney stack, complete with halyard and back-stay, for a very reasonable price. No difficulty was experienced in obtaining planning consent for the stayed mast which supported the other end of the antenna. The designed height of both supports is 12·2m (40 feet) and tension in the feeder will be correct with a sag of 0·3m (1 foot) at the centre. □

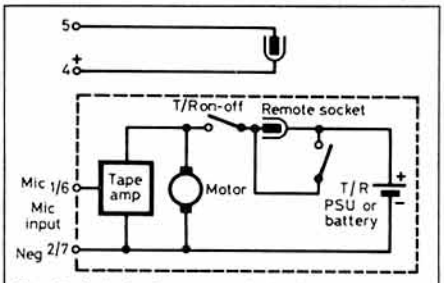
SIMPLE TAPE RECORDER VOX SYSTEM

Derek Alexander, G4GVM describes a circuit which helped him run tests on mobile systems without wasting tape

A need for this device arose while I was testing some 144MHz mobile antennas, which included a project to allow a rear window heater element to be used as an antenna (*Radcom* Feb '87 page 106).

Initially, I set up my base station receiver and tape recorder on a little-used channel; off I drove in my car with the mobile rig, gutter mounted 7/8 whip and the antenna under test. The antennas were arranged so that either could be easily and immediately switched into circuit.

Unfortunately, this test programme ate time up – the 45 minute tape ran out before tests could be completed and there were very long gaps of unused tape. It was obvious that I needed to switch the tape recorder on when modulation was present and off when not. After consulting John Everingham, G4TRN, whose kind advice directed me to look at VOX circuits, I set about modifying such a circuit to solve the problem. I therefore make no claim of originality in the basic circuit.



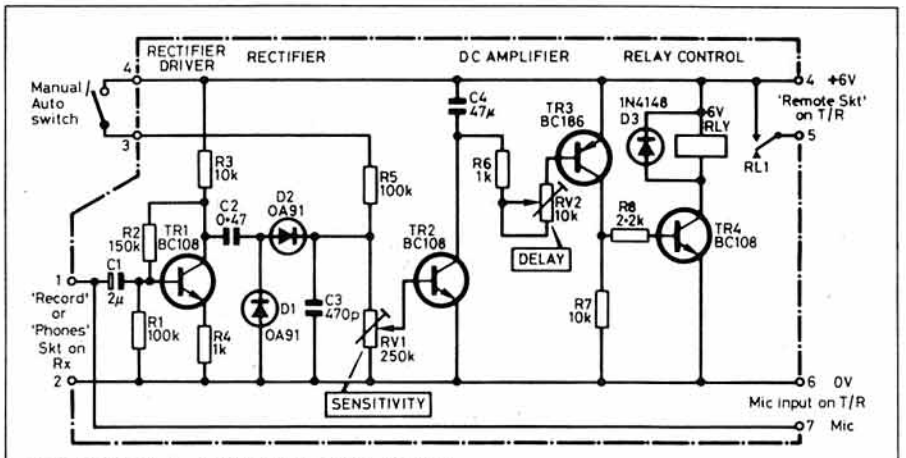
Circuit of a typical tape recorder is shown inside the dotted line

Derek Alexander has been interested in radio all his life, building his first crystal set aged seven or eight. After passing through the Royal Military Academy Sandhurst and serving twelve years in the Regular Army, he joined British Relay in 1959.

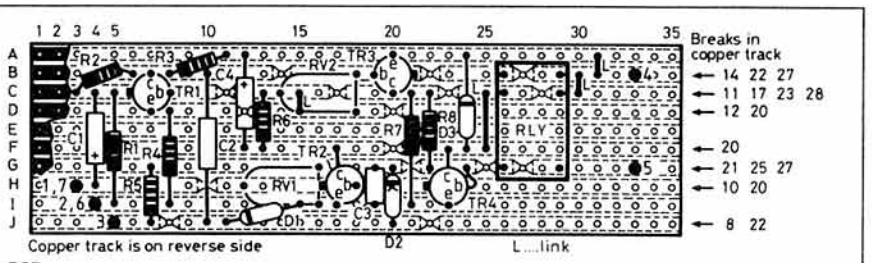
There he built television cable systems in four 'new' towns and later became General Manager for London and outlying towns. He was a council member of the Cable Television Association and a member of the British Institute of Management.

He was a consultant to British Rail on the subject of early warning systems for track maintenance gangs and a Fellow of the Permanent Way Institution.

Before taking up amateur radio ten years ago, when he became self-employed, his hobby interest lay in radio control of models.



Modulation control circuit for tape recorder start/stop



PCB

CIRCUIT DESCRIPTION

As the diagram shows, the circuit is quite straightforward. One point of note is the long – five second – delay in switching off. Unlike a VOX circuit, a tape recorder takes time to get going and if it is constantly switching off and on, the result will not be satisfactory.

I have shown a Veroboard layout but minor alterations may be necessary to accommodate components of different sizes. The layout is not critical.

The board can be boxed as a separate unit or conveniently housed within the tape recorder case itself. The only external control needed is the 'manual/auto' switch – left 'on' for normal tape recorder use and 'off' for operation by the audio modulation.

CONCLUSION

With the aid of this device I was able to spread the tests over a full day out, while absorbed in other work. I came home to find each test on the tape at five second intervals – plus a couple of overs from someone else who happened to be on the channel sometime during the day!

Audio quality tests and comparisons are also facilitated using the set-up, and it is fun to use. Allow time for the tape recorder to start up before each over, make a clear statement about the antenna or mic being tested, and give your location. It may be of interest to others listening on the channel to know what you are doing, so an announcement to that effect every so often will not go amiss – and give you something to talk about, even if only to yourself! □

COMPONENT LIST

RESISTORS	
R4,R6	1k
R8	2k2
R3,R7	10k
R1,R5	100k
R2	150k
PRESETS	
RV2	10k
RV1	250k
CAPACITORS	
C3	470µF
C2	0·47µF
C1	2µF
C4	47µF
SEMICONDUCTORS	
D1,D2	OA91
D3	1N148
TR1,2,4	BC108
TR3	BC186
MISCELLANEOUS	
RL1	6V Relay
SW1	SPDT switch
Veroboard	
5 Vero pins	
Mic cable	

PORTABILITY

PART TWO OF G3TXQ's DESIGN FOR A 3-BAND PORTABLE HF TRANSCEIVER

CONTROL BOARD

The main function of the control board (Fig 8) is to generate the 'T' and 'R' voltages necessary to power the Transmit and Receive circuitry on the remaining boards. When the Transmit/Receive line (T/R) goes low, D601 conducts and TR601 is switched OFF. This turns ON TR602 which pulls the base of TR603 low and power is applied to the T line. When the T/R line goes high, TR605 is ON, TR606 is hard ON, and power is applied to the R line. The inclusion of TR604 and TR607 ensures that when not powered, the T and R lines are grounded, rather than left floating. The addition of C601 and C602 ensures that the T and R lines are powered only after a slight delay – this is necessary to prevent the lines being momentarily energised simultaneously (a condition that causes havoc, particularly in the Driver/Preamp board!). The more usual 'emitter-follower' configuration for TR603, TR606 was avoided so as not to incur too great a voltage drop between the regulated supply and T and R lines.

TR608 and TR609 provide a 'semi break-in' facility on CW. When the KEY line is grounded, the tone oscillator on the IF/Audio board is keyed directly via D605; TR608 conducts, TR609 is turned ON and the CW T/R line is grounded. When the key is released, TR608 is turned OFF and C607 discharges via R619 and R618. Once the voltage on C607 falls below threshold, TR609 turns OFF and the transceiver reverts to Receive. If the key is depressed within this delay time, TR608 conducts

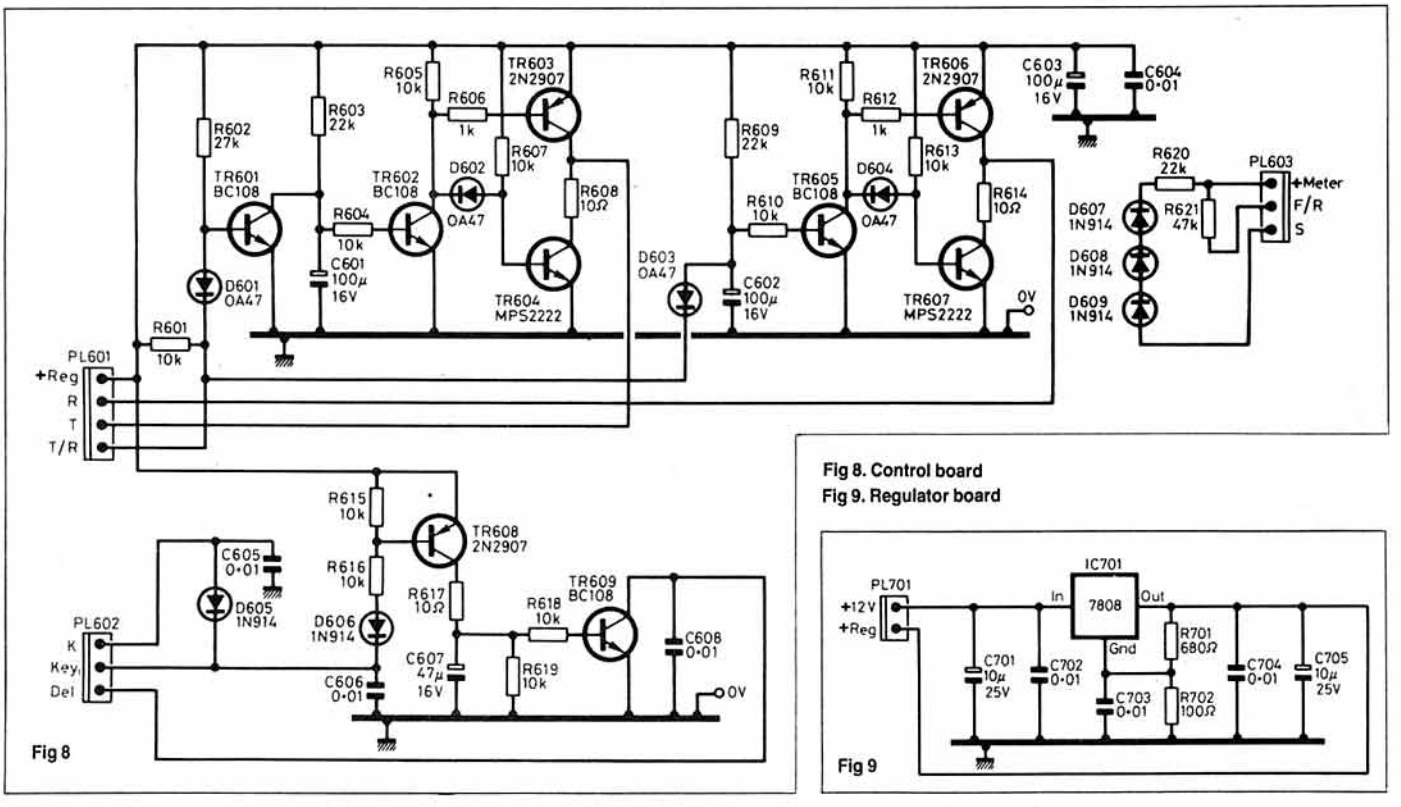
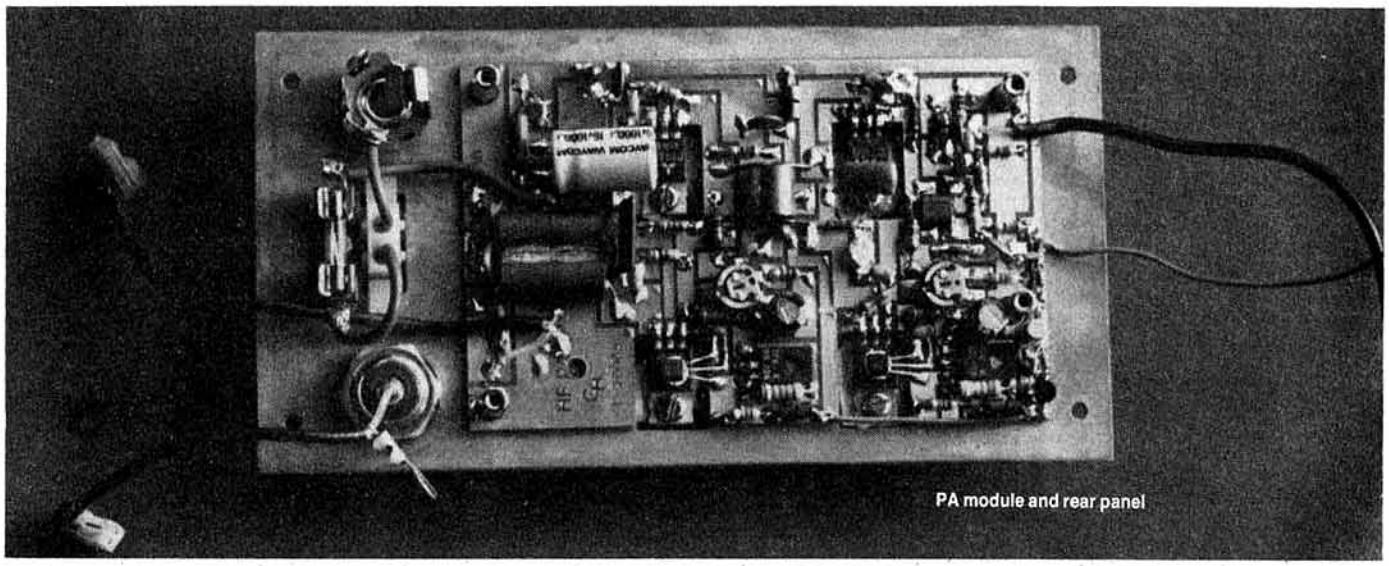


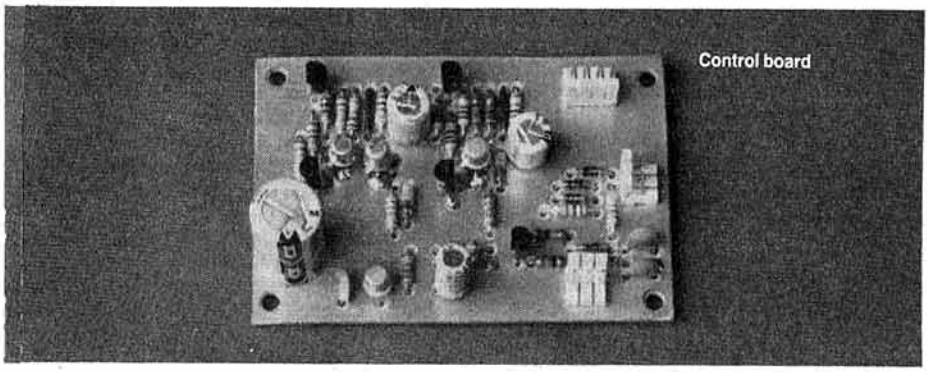
Fig 8

Fig 8. Control board
Fig 9. Regulator board

Fig 9



PA module and rear panel



Control board

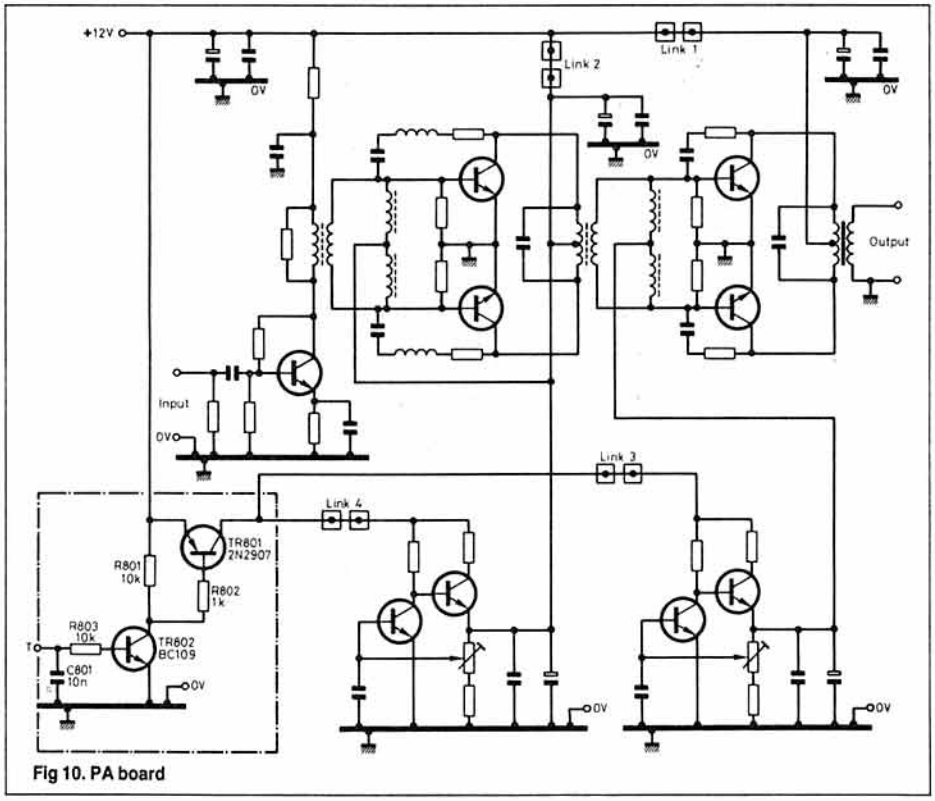


Fig 10. PA board

again, C607 charges, and the CW T/R line stays low, keeping the transceiver in Transmit.

On Receive, the AGC voltage from the IF/Audio board is applied via diodes D607 through D609, and R620 to the front-panel meter. The diodes produce a 1·8V drop which removes most of the offset on the AGC line caused by the 2V threshold of the IF amplifier ICs. R620 can be changed if necessary to suit the sensitivity of the meter. On Transmit, either the Forward or Reflected power signal (selected by the front-panel switch) is applied to the meter via R621.

REGULATOR BOARD

The Regulator board (Fig 9) supplies a regulated 9·5V to the majority of the low-power transceiver stages. It provides essential isolation of these stages from changes in the 12V supply caused by variations in current drawn by the PA. The circuit comprises an 8V regulator IC together with a potential divider R701, R702 which sets the output voltage to 9·5V. C701 through C705 are essential to prevent oscillation.

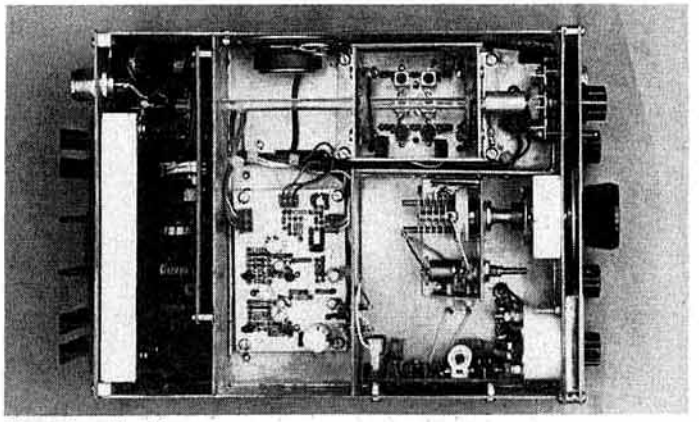
PA BOARD

Readers should refer to the literature supplied with the PA kit for a full description of the circuit. The design is modified by the inclusion of the components shown within the dotted area of Fig 10; these changes enable Tx/Rx switching to be effected without drawing excessive current from the 'T' line. I managed to mount these components on the board in the area around Link 4. PA alignment consists of adjusting the standing current of the Driver and PA stages for 20mA and 100mA respectively under no-drive conditions.

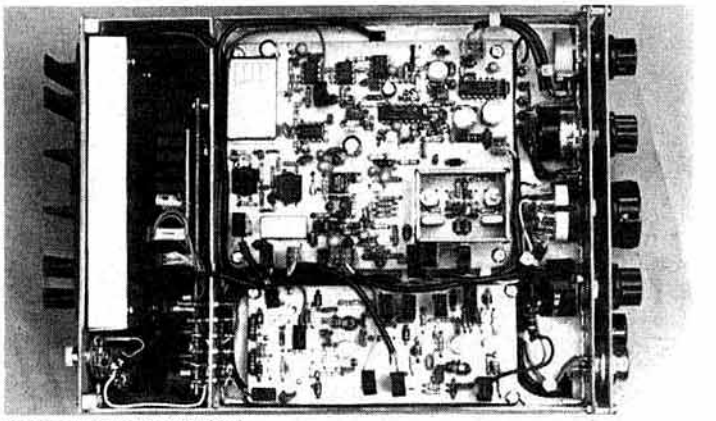
CONSTRUCTION

PCB artwork and component layouts for each board are available from the publications department of the RSGB. All boards are double-sided with continuous copper groundplane on the component side. After etching and drilling, the groundplane is relieved with a spot-cutter or drill around holes where an earth connection is not required. The PCB's should also be available from us shortly.

The body of the transceiver measures 9" × 7" × 3·5" and is constructed entirely from double-sided ▷



Transceiver: Top view



Transceiver: Underside view

copper-clad board soldered together as shown in the accompanying photographs. A horizontal screen mounted 2" down divides the front part of the chassis into two sections; the section below the screen contains the IF/Audio and Driver/Preamp boards, while the section above the screen contains the VFO, Band-pass filter and Control boards. The VFO is surrounded by a further screen. A vertical screen 2" in from the rear-panel forms a compartment which houses the PA and Low-pass filter boards positioned vertically. The PA transistors are bolted to a substantial heat-sink mounted on the rear panel. The small regulator board can be mounted conveniently on the Low-pass filter board in the space below the filter components. All non-screened leads from the PA compartment are fed through solder-in feed-through capacitors.

The VFO tank-circuit capacitor and inductor are mounted on a small bracket within the VFO compartment. The capacitor is rotated by a 6:1/36:1 slow motion ball-drive which carries an analogue dial. All leads into the VFO compartment come via feed-through capacitors.

It is important that the band-switch shaft extension protruding into the PA compartment should be made of insulating material – a metal shaft here provides coupling for RF energy from the Low-pass filter board back to the band-pass filters and the likelihood of oscillation.

Fig 11 shows how the boards are interconnected and wired to chassis-mounted components.

IN USE

Despite the modest power output, the transceiver has provided many contacts from /P locations using inverted-v antennas at heights of only 20 feet. I later built a matching ATU/battery-pack containing a 5·6Ah dryfit battery, and together the two equipments are a effective /P station.

I deliberately left room in the transceiver for expansion to other bands. This will require the addition of a crystal/mixer board to generate the necessary local oscillator signals, and the addition of appropriate band-pass and low-pass filters. □

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[1] "A modern HF transceiver", G N Fare, G3OGQ. *RadCom* April, May, June, July 1983.
[2] "A solidstate 30W SSB transceiver for 1·8MHz", M J Grierson, G3TSO. *Rad Com* July, August 1985.
[3] "A linear HF power amplifier". *Radio & Electronics World*, September 1983.
[4] "A general coverage synthesised HF transceiver", F Ogden, G4JST. *Ham Radio Today*, February 1983.

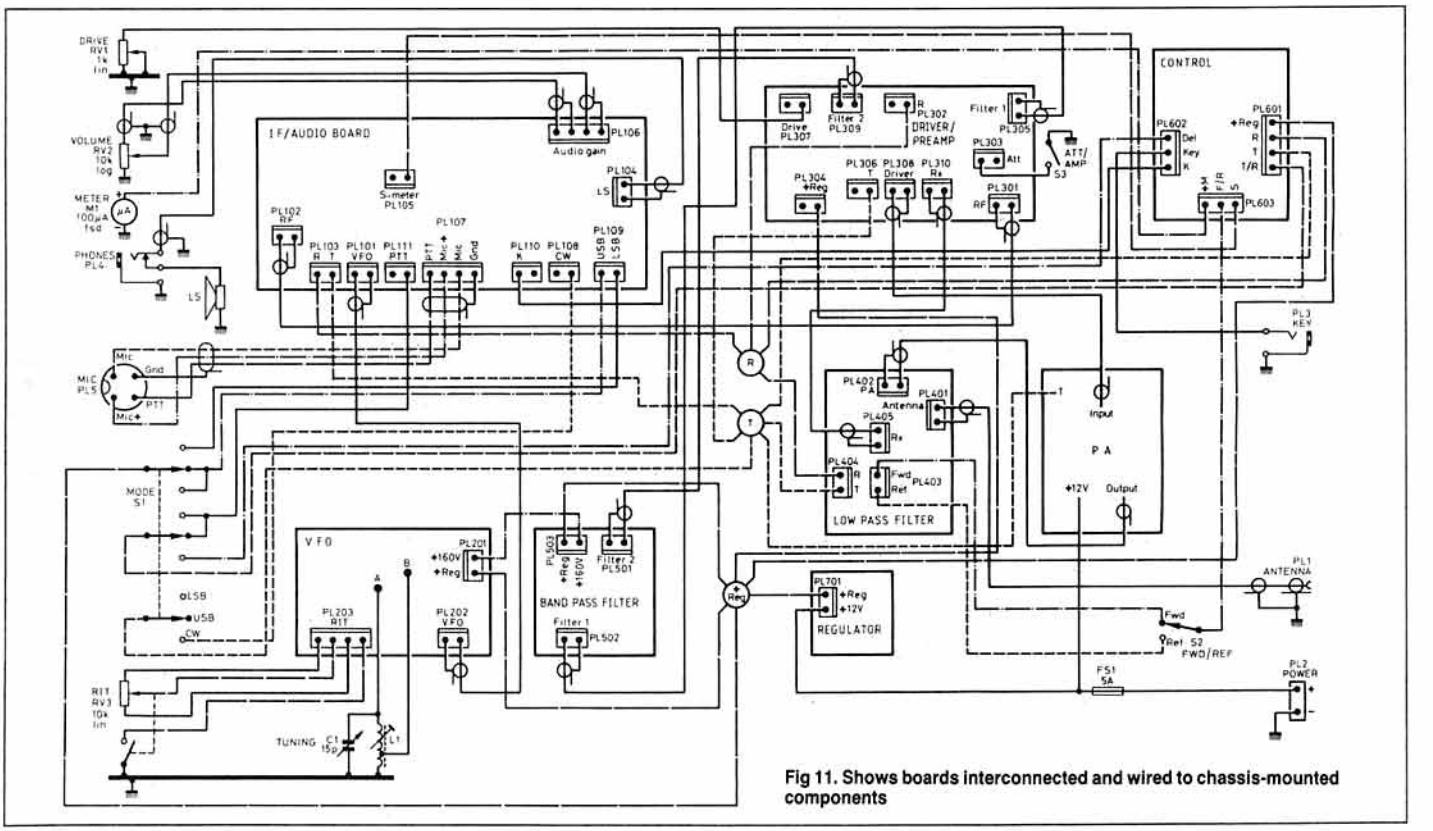

Fig 11. Shows boards interconnected and wired to chassis-mounted components

COMPONENTS – IF/AUDIO BOARD

R101, R106	560
R102	22k
R103, R104, R129, R130	4·7k
R132, R141, R148	
R105	220
R107, R124	47
R108, R109, R153	100
R110, R123	330
R111, R112, R133, R134	10k
R135, R142, R143, R146	
R147	
R113, R128	3·3k
R114, R137, R138, R152	12k
R154	
R115, R136, R116	100k
R117	2·7k
R118	47k
R119, R120	150
R121	1·0M
R122	820
R125	1·2k
R126	4·7k
R127	220k
R131	82k
R139	180k
R140	150k
R144, R157, R158	1k0
R145	56k
R149, R155, R159	27k
R150	390
R151	2k7
R156	270

COMPONENTS – IF/AUDIO BOARD

L101, L102, L103, L104	3·5 turns on FX1115 ferrite bead
L105, L107, L111	
L106, L108, L109, L110	100µH choke
D101, D102, D103, D104	BA224 diode
D105, D106	1N914 mounted across R115
D107, D108, D109, D110	1N914
D111	
D112	3·9V 250mW zener
D113	8·2V 250mW zener
D114, D115	1N4007
TR101	J309 FET
TR103, TR108, TR109	2N3819 FET
TR102, TR105, TR106	BC108
TR107	
TR104	BF441
IC101	MD108 ring mixer
IC102, IC108	78L06 regulator
IC103, IC104	SL1612
IC105, IC110	SL1641
IC106	LF351
IC107	LM380
IC109	SL6270
IC111	TL084
T101	Primary 2t, secondary 6t 28SWG on FX2249 core
T1022	Primary 3t, secondary 6t 28SWG on FX2249 core
FL101, X101, X102	IQD IQXF 90H2·4 crystal filter with matching carrier crystals
PL101 – PL110	PCB headers (Electromail 473-543)

VFO BOARD

R201	47k
R202, R210	100k
R203, R213, R214, R216	10k
R217, R218	
R204	820
R205	1·5k
R206	12k
R207	10
R208	270
R209	47
R211, R215	2·7k
R212	10k trimpot

IF/AUDIO BOARD

C101, C106, C111, C117	0·1µF ceramic
C119, C122, C124, C128, C142, C144, C145, C147, C148, C149, C150, C151	
C102, C114, C129, C130 C141	100µF 15V electrolytic
C103, C104, C109, C118 C125, C134, C136, C139 C152, C159, C165, C167 C170	1000pF ceramic
C105, C127, C137, C143 C154, C161, C164	47µF electrolytic
C107, C108	22pF ceramic
C110, C113, C121, C126 C131, C132, C156, C157 C158, C163	0·01µF ceramic
C112, C115	100pF ceramic
C116, C155	10µF 15V electrolytic
C120	0·022µF ceramic
C123, C153	470pF ceramic
C133, C135, C138, C162	2·2µF
C140, C160	1µF electrolytic
C166, C173	3-30pF trimmer
C168, C169, C171, C172 C146	22pF ceramic 1µF ceramic

BAND PASS FILTER BOARD

C501,C503	330pF ceramic
C502	82pF ceramic
C504,C505	470pF ceramic
C506,C508	120pF ceramic
C507	27pF ceramic
C509,C510	220pF ceramic
C511,C513	15pF ceramic
C512	1p8F ceramic
C514,C515	68pF ceramic
L501,L502	8·2µH Toko 119ANA5874HM (Cirkit 35-58741)
L503,L504	5·6µH Toko 113CNK1369HM (Cirkit 35-13691)
L505,L506	1·7µH Toko 113KN2K1026HM (Cirkit 35-10261)
S501	2-pole, 6-way wafer (Electromail 327-771) 1-pole 3-way used
S502,S503	2-pole, 6-way wafer (electromail 327-771) 2-pole 3-way used

PL501-PL503PCB headers (Electromail 473-543)

PA MODULE

R801,R803	10k
R802	1k
C801	10nF
TR801	2N2907
TR802	BC108

All other components – see Cirkit Kit [41-00903]

DRIVER/PREAMP BOARD

R301,R302	8R2
R303,R310	150
R304,R308,R309,R316 R318,R325,R327,R328	1·5k
R305,R315,R321,R329	470
R306,R307	4·7k
R311	10k
R312,R323	100
R313	680
R314	3·3k
R317,R322	10
R319	3·3k
R320	560
R324,R326	1·0k
C301,C302,C307,C311 C315	0·01µF ceramic
C303,C304,C305,C306 C308,C309,C312,C314	0·1µF ceramic
C316,C317 C310,C313	0·047µF ceramic
L301,L302,L303,L304	1mH choke
T301	Primary 1t, secondary 17t tapped at 4t, on ferrite ring core (Electrovalue K0038X830)
T302	6t bifilar wound on ferrite core (Electrovalue K0038X830)
D301,D301,D303,D304 D305,D306,D307,D308	1N4007
TR301,TR302,TR305	BC108
TR303	2N5109
TR304	2N3866
PL301-PL309,PL310	PCB headers (Electromail 473-543)

CONTROL BOARD

R601,R604,R605,R607 R610,R611,R613,R615 R616,R618,R619	10k
R602	27k
R603,R609,R620	22k
R606,R612	1k
R608,R614,R617 R621	47k
C601,C602,C603	100µF 16V electrolytic
C604,C605,C606,C608	0·01µF ceramic
C607	47µF 16V electrolytic
D601,D602,D603,D604 D605,D606,D607,D608 D609	OA47 1N914
TR601,TR602,TR605 TR609	BC108
TR603,TR606,TR608	2N2907
TR604,TR607	MPS2222
PL601-PL603	PCB headers (Electromail 473-543)

VFO BOARD

C201	120pF mica
C202	8·2pF ceramic
C203, C207, C208	0·01µF ceramic
C204	27pF ceramic
C205	0·001µF ceramic
C206	47µF 10V electrolytic
C209	0·1µF ceramic
L201	48 turns, 0.25" diameter former, occupying 0·6" slug tuned
D201, D203, D204	1N914
D202	varactor diode – see text
TR201	2N3819 FET
TR202, TR203, TR204 TR205	BC108
IC201	78L06 regulator
RL201	12V reed relay (Tandy 275-233)
PL201 – PL203	PCB headers (Electromail 473-543)

▷

CHASSIS

RV1	1k lin. pot. (DRIVE)
RV2	10k log. pot. (VOLUME)
RV3	10k lin. pot. with switch (RIT)
C1	15pF SLC tuning capacitor (Maplin Stock No. FF43W)
L1	30 turns tapped at 7 turns on 0·38" diameter slug-tuned former, 26 SWG occupying 0·625" winding length
S1	3 pole – 3 way rotary switch (MODE)
S2	Single pole – double throw toggle switch (FWD/REF)
S3	Single pole – On/Off toggle switch (ATT/AMP)
PL1	SO239 chassis socket (ANT)
PL2	2-pin power socket (POWER)
PL3	6mm jack socket (KEY)
PL4	3·5mm jack socket (PHONES)
PL5	4-pin socket to suit mic. (MIC)
M1	100µA FSD moving-coil meter
SPKR	2" diameter 8ohm speaker
FS1	Fuse holder and 5A fuse

LOW PASS FILTER BOARD

R401,R402	47
R403,R404	4·7k
R405	150
R406,R407	10k
R408	330
R409	47k
R410	2·2k
C401,C403,C405	1500pF mica or polystyrene
C402	3300pF "
C404,C406	680pF "
C407,C409	220pF "
C408	470pF "
C410	7-40pF trimmer capacitor
C411	180pF ceramic
C412,C413,C414, C415 C416,C417	0·01µF ceramic
C418	47pF ceramic
C419	8p2 ceramic
L401,L402	26t on T68-2 core
L403,L404	19t on T68-2 core
L405,L406	11t on T68-6 core
L407	10t on ferrite ring core (Electrovalue K0038X830)
L408,L409	100µH choke
D401,D402,D403, D404	1N914
D405,D406	1N4007
TR401	BC178
TR402	BC108
401,402	2-pole, 6-way wafers (Electromail 327-771) 3 ways used
PL401-PL405	PCB headers (Electromail 473-543)

REGULATOR BOARD

R701	680
R702	100
C701,C705	10µF 25V electrolytic
C702,C703,C704	0·01µF ceramic
IC701	7808 voltage regulator
PL701	PCB header (Electromail 473-543)

Kenwood TS680 Auto Antenna Selector

BILL STIRLING, GM4DGT

Anyone who possesses a Kenwood TS680 will, depending upon his or her tolerance level, be mildly or very annoyed by the fact that it has only one antenna socket to cover the HF bands and 50MHz, because it involves swapping PL259 plugs each time a band-change occurs. The alternatives are to use a manual change-over switch or a relay operated via a switch, but this is unlikely to be reasonable for prolonged operation on a particular band and group of bands. When it comes to operating cross-band from six to an HF band, unless the signals are strong enough to be readable on the 50MHz beam, when even then an erroneous signal report will be given, the inconvenience and danger to the rig of inadvertently operating into the wrong antenna becomes apparent.

An examination of the circuit associated with the control of the Kenwood automatic antenna tuner (AT250) revealed the logic that selects the bands on the AT250. This socket is labelled 'ACC3' on the rig and 'CN26' on the diagram. A simple check with a meter enabled the code in Table 1 to be derived. This then opened the door to automatic antenna selection, as I will describe. Another fact emerged insofar as there is a mistake in the pin assignments on the circuit diagram: pin 7 and pin 8 physically reversed. A corrected pin layout is shown in the diagram Fig 1. Please not that on *NO* account use this 12V supply for the relay driver circuit, but use the rig's 12V PSU. It was also necessary to provide a ground line and 5V line to supply the external logic. It seems strange to me that a pin has not been assigned for zero volts, which means that the AT250 ground will depend on the outer of the coax or a bond between itself and the TS680. The DIN socket does not appear to have a connection to the outer metal sheath either so that it cannot ground this way. No doubt the mystery would be solved should I ever purchase and AT250.

As there are two spare pins on the socket (CN26) I used pin 3 as the ground and pin 6 as the 5V supply. If you are unwilling to use the TS680's 5V line you can ignore this connection and provide your own 5V line taken from the relay supply via a regulator.

If you only require the 6m to 10m cross-band facility a NAND gate (74LS00) can be used to combine the outputs from pin 1 and pin 2 of CN26 as 50MHz is the only band where they are at a logic one level. The diagram shows the circuit and the pin connections necessary to drive the NAND gate. The output from this gate drives a BFY51 and 2N3054 in a Darlington configuration which should adequately sink enough current to operate most coaxial relays available. As mentioned earlier, a separate regulator circuit is shown for those who would prefer not to use the internal 5V from the TS680.

Replacing the diodes and resistor with 2·2k in series is as a safeguard, so that the transistor will switch hard on and also the C-B breakdown in BFY51 will not send +12V back into the Rig via the 7400.

The use of filtering on the lines is recommended as I encountered some relay chatter owing to RF pickup. I took the precaution of testing the unit on the bench with just the logic control connected and noted the chatter. The symptoms I experienced may partly be due to the fact that I have just moved QTH and the antenna is in a temporary location in the roof space about eight feet above my head, so the RF field will be particularly strong.

For anyone with a more ambitious antenna system, further perusal of this system using a 74LS145 as shown on the TS680 diagram (IC2) would enable you to decode the output into a series of relay drivers to allow automatic selection of the appropriate antenna as you changed band using the *'up'* and *'down'* switches as intended with the AT250. □

Table 1— Output of ACC3

Band MHz	Pin 1	2	4	5	8
1·8	H	L	L	L	L
3·5	H	L	L	L	H
7	L	L	H	L	H
10	H	L	H	H	L
14	H	L	H	L	H
18	L	H	L	H	L
21	L	H	L	L	L
24	L	H	L	H	H
28	L	H	L	L	H
50	H	H	L	L	L

Pin 7 ..... +12V on Tx
Pin 3 ..... 0V
Pin 6 ..... +5V
} Note - spare pins modified for use

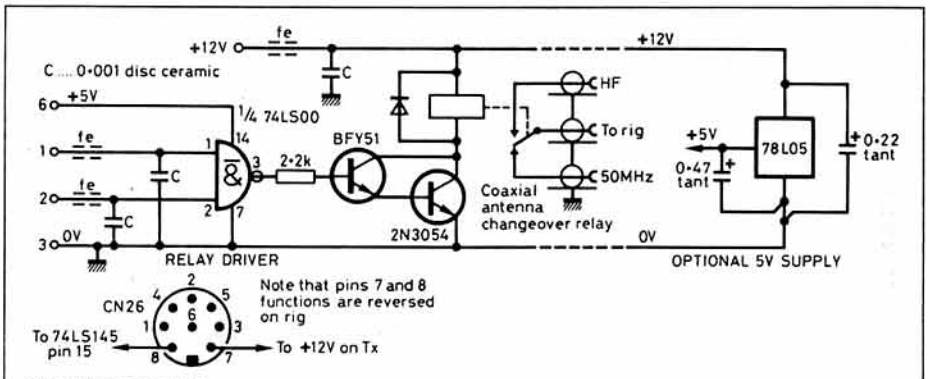

Fig 1: Circuit diagram

KENWOOD TS-680S TRANSCEIVER

'A useful general purpose HF and 50MHz Transceiver for home, mobile and portable use at an economical price.' – Peter Hart G3SJX.

Early in 1988, Kenwood introduced two new budget priced HF transceivers onto the market. These were the TS-140S and TS-680S. The TS-140S covers the bands 1·8 to 28MHz with the TS-680S having an extended frequency range to cover 50MHz. With one small exception, the rigs are almost identical. Both rigs are 12V operated, include multimode operation and a general coverage receiver.

Now that we have entered a period of sunspot maximum, 50MHz is proving a most interesting band; we can look forward to several years of useful DX propagation. Anyone without 50MHz capability and considering a new HF transceiver is likely to regard the TS-680S as a valid proposition.

PRINCIPAL FEATURES

The TS-680S includes a particularly wide range general coverage receiver tuning 50kHz to 35MHz and 45 to 60MHz. This is wider than the manual quotes although the sensitivity drops off markedly below 200kHz. Transmission is limited to band segments around the amateur bands. The transmitter nominally runs 100watts output on the HF bands and 10watts on 50MHz. USB, LSB, CW, AM and FM modes are provided as standard plus narrow CW with an optional extra filter installed.

The main tuning knob tunes in 10Hz steps at 10kHz per revolution on SSB/CW and in 100Hz steps at 50kHz per revolution on AM/FM. The tuning rate increases when the knob is rotated faster than three revolutions per second. An auxiliary small clickstop rotary knob steps in 10kHz intervals on SSB (240kHz per revolution) and also switches between the memories, 31 memories are incorporated storing frequency and mode. Ten of these memories will store separate receive and transmit frequencies for 28MHz repeaters and eleven can be used for programmable band markers. Memory control features include twin VFOs which can be used split even for crossband/crossmode working. Memories and VFOs are lithium battery backed to preserve their contents when the power is switched off. Band and memory scanning is provided with scanning speed selectable from the front panel.

A blue fluorescent display provides readout to 10Hz or 100Hz resolution (user selectable), RIT offset, memory channel and a variety of annotations. Key presses are confirmed either by beep tones or in morse code eg "U" for USB. Some warning messages are also sent in morse code. For example, if memory scan is initiated on an empty memory "CHECK MEMORY" in full plain language morse is emitted from the loudspeaker! A number of parameters may be selected at power-on such as display resolution, AM step size, audible confirmations etc. Numerous user-friendly software enhancements are built-in, some of which will be described later.

Receiver functions include switchable RF amplifier above 24MHz, attenuator, fast/slow AGC but no AGC off, twin adjustable noise blankers for ignition noise/woodpecker, and RIT. IF shift is included, but not variable bandwidth. This is understandable in a budget-priced rig. IF shift can be accomplished inexpensively, but variable bandwidth requires a second full-performance SSB filter. Transmitter functions include AF speech processor, full/semi CW break-in, metering of ALC or RF power and thermostatically operated fan. Although VOX is included in the TS-140S, it is omitted in the TS-680S.

The rear panel carries connectors for 12V power input, external speaker, key, antenna and three multi-pin accessory sockets. These accessory connectors provide comprehensive interfacing to linear, audio in/out, packet TNC, T/R switching and external auto-atu. Only one antenna socket is fitted covering both HF and 50MHz – in my opinion a separate antenna socket for 50MHz would be much more convenient, and coded band data is available on the auto-ATU connector which could be used for remote switching of antennas (see the preceding article – Ed). Another omission is the lack of a transverter-drive capability. This is a pity because it reduces the transceiver's versatility.

Internal options available at extra charge include a narrow CW filter and computer interface. A wide range of external accessories are available from Kenwood.

A 44-page instruction manual is provided, common to both the TS-140S and TS-680S. Comprehensive driving instructions are given plus an overview of the circuit operation. Circuit diagrams are provided for the TS-140S but not the TS-680S.

DESCRIPTION

The TS-680S is a smallish rig measuring 26·8 (W) by 10·5 (H) by 27cm (D) and weighs 6·1kg. The metalwork and most of the PCBs are common with the TS-140S. As you can see from the photograph, the equipment comprises two hinged units. The upper unit is fully screened and contains the transmitter power amplifiers with fan blown diecast heatsink, relay switched filter bank and an upward-facing 8cm diameter speaker. The lower unit comprises two large circuit boards on either side of a steel chassis. This unit also supports the steel front panel and PCB, overlaid with a plastic moulding containing the controls and displays.

The receiver is double conversion with IFs of 40·055MHz and 455kHz. The main selectivity is

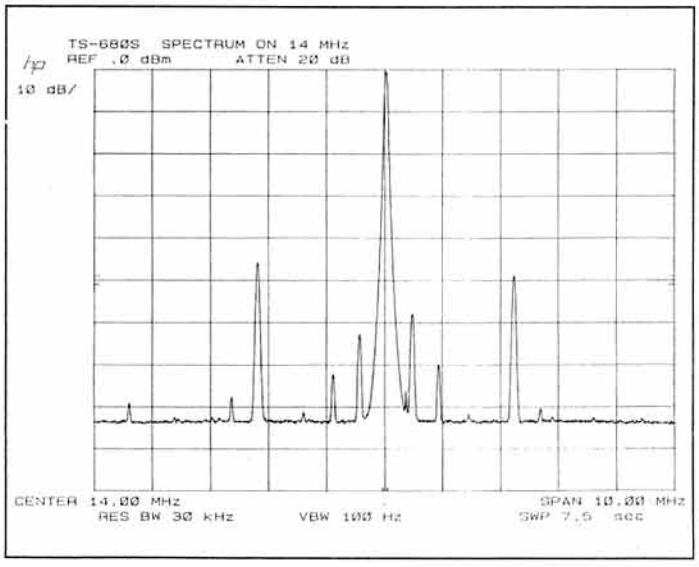

Fig 1. Transmitter output spectrum on 14MHz. Vertical scale 10dB/division. Horizontal scale 1MHz/division.

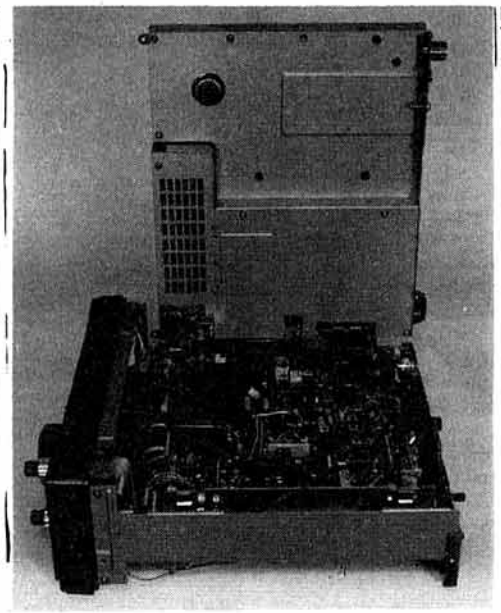

Fig 6. Interior view of the TS-680S with upper and lower units unhinged.

achieved at the 455kHz IF. On transmit, SSB is generated at 455kHz and mixed via 40·055MHz to final frequency. Separate power amplifiers are used for HF and 50MHz; a wideband ferrite transformer-coupled amplifier chain for HF and a hybrid module for 50MHz. The frequency synthesiser section generates all mixer heterodyne frequencies and oscillator sources from a 36MHz reference using four phase locked loops. A single microcontroller is used.

MEASUREMENTS

Measurements were made with the TS-680S powered from the PS-430 PSU. Results of the measurements are provided in the accompanying table.

Additional comments are as follows.

RECEIVER MEASUREMENT

SENSITIVITY

The sensitivity is very good and outstanding with the preamplifier switched in on 28 and 50MHz.

S-METER CALIBRATION

The linearity on SSB is fair, becoming rather optimistic with the preamp switched in. As usual, on FM, the range and linearity are poor.

SPURIOUS REJECTION

Rejection of the 40·055MHz IF and its subharmonics was generally well in excess of 90dB except on 50MHz (54dB). Primary image rejection 80·11MHz above the receive frequency is just adequate.

A secondary image, 910kHz above the receive frequency was obtained on all bands at about 72dB down. This represents the skirt selectivity or leakage around the 40·055MHz IF filter. This level may result in weak spurious signals when receiving LF of strong broadcast stations. Rejection of all other spurious signals was generally good.

AGC PERFORMANCE

The AGC had an abrupt threshold and a very level response above the threshold.

SELECTIVITY

Reciprocal mixing limited measurements to about -60dB. The FM selectivity is too wide for 10kHz channelling on 29MHz.

INTERMODULATION

The front-end intercept and dynamic range is good although the performance degrades noticeably with the preamp switched in. The close-in intermodulation performance degrades as is normal with up-conversion rigs. The performance is better than the older TS-430S but not as good as the more expensive TS-930S. Inband linearity measured with 200Hz tone spacing is very poor at around -22dB.

RECIPROCAL MIXING

It was not possible to measure reciprocal mixing within 20kHz of the receive frequency owing to a strange phenomenon which resulted in a raising of the noise floor for interfering signals as low as -80dBm. This is unexplained. At greater offsets, the reciprocal mixing performance is reasonable for a budget priced receiver.

TRANSMITTER MEASUREMENTS

POWER OUTPUT

The front panel control will reduce power to below 0·5W output on CW but only down to 10W on SSB. This control is very non-linear. Power output on FM was limited to 50W (12W on 50MHz). The internal power meter was accurate to within 10% across the whole range of power and frequency. This is very good.

TS680S MEASURED PERFORMANCE

RECEIVER MEASUREMENTS

Frequency	Sensitivity SSB 10dBs+n:n	Input for S9	Image rejection
1·8MHz	0·12µV (−125dBm)	28µV	70dB
3·5MHz	0·11µV (−126dBm)	25µV	78dB
7MHz	0·1µV (−127dBm)	22µV	79dB
10MHz	0·12µV (−125dBm)	28µV	90dB
14MHz	0·1µV (−127dBm)	22µV	82dB
18MHz	0·1µV (−127dBm)	24µV	78dB
21MHz	0·12µV (−125dBm)	28µV	72dB
24MHz	0.12µV (−125dBm)	35µV	81dB
24MHz+preamp	0·1µV (−127dBm)	9µV	
28MHz	0·11µV (−126dBm)	29µV	81dB
28MHz+preamp	0·08µV (−129dBm)	7µV	
50MHz	0·14µV (−124dBm)	25µV	62dB
50MHz+preamp	0·07µV (−130dBm)	10µV	

AM sensitivity (14MHz): 0·64µV for 10dBs+n:n at 30% mod depth
FM sensitivity (28 or 50MHz preamp in): 0·14µV for 12dB SINAD 3kHz pk deviation
AGC threshold: 0·9µV
100dB above threshold for +1·5dB audio output
AGC decay time: 0·1–0·3s (F) 1·3–4s (S)
Max audio before clipping: 1·4W into 8ohm at 1% distortion
Inband intermodulation products: −22 to −25dB

Frequency Offset	Reciprocal mixing for 3dB noise	Blocking	TX noise wrt carrier in 2·5kHz bandwidth
5kHz	see text	−37dBm	−78dB
10kHz	see text	−37dBm	−88dB
15kHz	see text	−20dBm	
20kHz	see text	−7dBm	−95dB
30kHz	96dB	−5dBm	
50kHz	108dB	−5dBm	−103dB
100kHz	114dB	−5dBm	
200KHz	121dB	−5dBm	

INTERMODULATION (50kHz TONE SPACING) Frequency	3rd order intercept	2 tone dynamic range
1·8MHz	+3·5dBm	93dB
3·5MHz	+4dBm	94dB
7MHz	+2dBm	93dB
14MHz	+7dBm	96dB
21MHz	+11dBm	98dB
28MHz	+11dBm	98dB
28MHz+preamp	−5dBm	90dB
50MHz	−3dBm	88dB
50MHz+preamp	−10dBm	87dB

Tone spacing (7MHz band)	3rd 3rd order intercept	2 Tone dynamic range
5kHz	−35dBm	68dB
10kHz	−18dBm	80dB
15kHz	−3dBm	90dB
20 kHz	0dBm	91·5dB
>25kHz	+1dBm	92dB

S-READING (14MHz)	INPUT LEVEL SSB	FM
S1	1·1µV	1·3µV
S3	1·8µV	1·8µV
S5	3·5µV	2·5µV
S7	7·7µV	3·5µV
S9	23µV	5·8µV
S9+20	370µV	20µV
S9+40	5·2mV	98µV
S9+60	32mV	450µV

SELECTIVITY Response	—BANDWIDTH— SSB/CW	AM	FM
−6dB	2·28kHz	5·88kHz	9·32kHz
−60dB	3·84kHz	12·78kHz	20·04kHz

TRANSMITTER MEASUREMENTS

Frequency	CW power output	SSB (pep power output	harmonics	Intermodulation products third order	fifth order
1·8MHz	99W	120W	−50dB	−22dB	−40dB
3·5MHz	102W	120W	−56dB	−22dB	−35dB
7MHz	102W	120W	−55dB	−22dB	−32dB
10MHz	101W	120W	−48dB	−15dB	−34dB
14MHz	100W	120W	−58dB	−20dB	−34dB
18MHz	97W	116W	−55dB	−20dB	−35dB
21MHz	96W	112W	−58dB	−20dB	−38dB
24MHz	94W	110W	−58dB	−24dB	−35dB
28MHz	91W	108W	−58dB	−24dB	−34dB
50MHz	12W	12W	−53dB	−20dB	−40dB

Carrier suppression: −40 to −50dB
Sideband suppression: −60dB at 1kHz
Transmitter noise: see table above
Transmitter AF response at −6dB: 450-2400Hz (LSB and USB)
Transmitter AF distortion: <0·3% up to 100mV input
Microphone input sensitivity: 3mV for full output
FM peak deviation: 4kHz
T/R switching speed (SSB): mute-TX 23ms, TX-mute 10ms, mute-RX 23ms, RX-mute 1ms
Power into load mismatch: 2:1 VSWR 38-67W, 3:1 VSWR 14-21W
Frequency accuracy (transmit and receive): within 20Hz at 28MHz

NOTE: All signal input voltages given as PD across antenna terminal. Unless stated otherwise, all measurements made on SSB. All two-tone transmitter intermodulation products quoted WRT either originating tone.

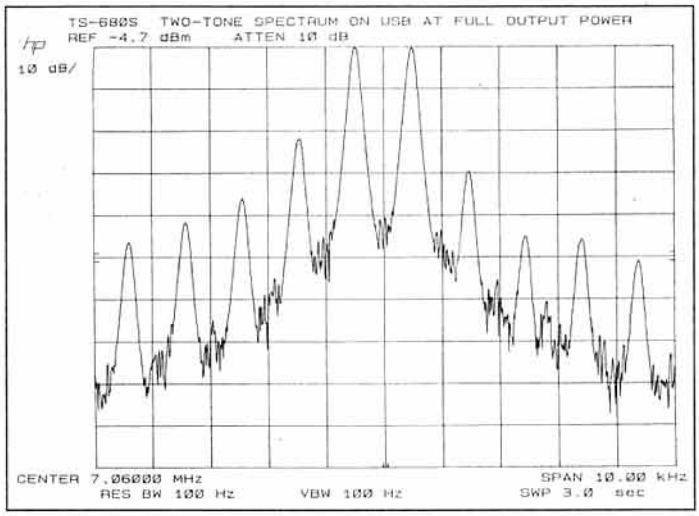

Fig 2. Two-tone transmitter spectrum on 7MHz. Vertical scale 10dB/division. Horizontal scale 1kHz/division.

SPURIOUS OUTPUTS

The harmonic output is just about adequate but the level of non-harmonically related spurii is excessively high on some bands. The worst band is 14MHz and Fig 1 shows the output spectrum on this band. The lower level close-in spurii are at ±455kHz and ±910kHz.

These appear on most bands and are due to limited stopband attenuation at the 40·055MHz IF.

SSB DISTORTION

The table shows the power output and distortion obtained using a two-tone signal and driving to maximum power according to the manual (top of ALC zone). Intermodulation products were generally on the high side. Higher order products at ±10kHz were -60 to -65dB and at ±20kHz, -70 to -80dB. Fig 2 shows the two-tone spectrum on 7MHz. The speech processor did not change the distortion levels significantly.

CW KEYING PERFORMANCE

Figs 3 and 4 show the CW keying waveform at 40WPM. Fig 3 is for semi break-in and Fig 4 for full break-in operation. Full break-in introduces some shortening and distortion of the character. The rise and fall times are a little fast and could cause minor clicks. Ideally the waveform should be a little more rounded.

OPERATION INTO MISMATCHED LOADS

The power output of the transmitter reduces very substantially into quite minor mismatches, more so than other rigs of this type. To achieve full output power, it is necessary for the antenna to have a close match to 50ohm or an ATU must be used. This has an important consequence for mobile operation. Mobile HF antennas do not normally exhibit a very low VSWR and ATUs in the car are inconvenient. The power output may be disappointingly low for mobile use.

TRANSMIT-RECEIVE SWITCHING SPEED

Transmit and receive recovery times are just adequate for satisfactory operation on AMTOR and Packet.

ON-THE-AIR PERFORMANCE

The rig was used from the home QTH using the home station antennas and also mobile from Devon over the New Year period with a 'G whip' antenna.

The receiver performed well on the higher bands but the attenuator was required most of the time on the LF bands. Even so there were times when the receiver didn't sound as clean as other more expensive rigs. This comment was echoed by several stations worked and is probably due to the poor inband linearity or close-in dynamic range. The TS-680S seems to have sold well in the US judging by the number of stations worked who had used this rig and provided useful comments. The noise blankers did not seem that effective and noise blanker 1 (for suppression of ignition interference) was particularly prone to generating added strong signal problems. On SSB, the synthesiser is largely clear of clicks apart from a major 'hole' every 50kHz. By 'hole' I mean the opposite of a click – a momentary silencing of the receiver as the frequency changes through an exact multiple of 50kHz. Slight clicks are audible on AM when tuning through quiet carriers.

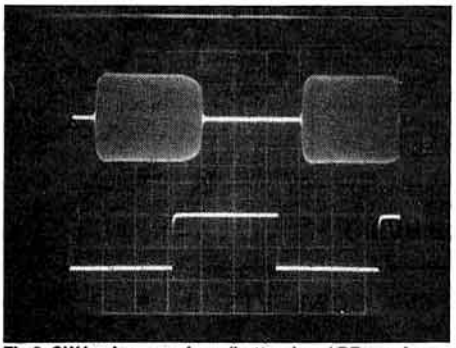

Fig 3. CW keying waveform (bottom) and RF envelope (top) at 40wpm in semi break-in mode. Horizontal scale 10ms/division.

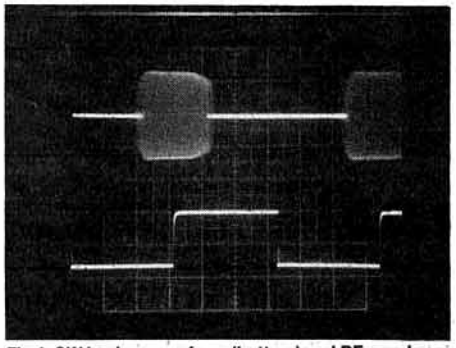

Fig 4. CW keying waveform (bottom) and RF envelope (top) at 40wpm in full break-in mode. Horizontal scale 10ms/division.

The AM performance on the broadcast bands was good – much better than most rigs in fact. The AM bandwidth was about the optimum compromise between selectivity and audio fidelity. On medium wave AM broadcast, it should be possible to select 9kHz instead of 10kHz step size on the auxiliary clickstop tuning knob. (9kHz is the European channel spacing on medium wave). This feature did not function. With the recent high level of sunspot activity, the extended coverage of the receiver to 35MHz yielded some interesting transmissions from the many and the various US utilities (fire brigade, taxi, police etc).

On transmit, reports on the SSB audio quality were good and particularly favourable with the audio processor switched in. On CW, key clicks were just audible. I did not like the full break-in performance. The receiver recovery was too loud between characters, overriding the sidetone. As the antenna match departed from 50ohms, the transmit power decreased rapidly, confirming the measurements. I could only obtain 30W when operating mobile.

In general, the transceiver was easy to use and the controls well positioned. My only adverse comment relates to the row of pushbuttons along the bottom of the panel – it's a little difficult to determine when these are pushed in or not. The fan is exceptionally quiet. Very user-friendly software is built-in including numerous little niceties such as auto selection of preferred sideband (USB above 9·5MHz, LSB below), skipping of empty memories, alarm messages etc. One of the most useful controls is the auxiliary clickstop tuning knob (M.CH/VFO CH). This enables rapid changes in frequency to be achieved across large sections of the bands. Engineered as an economy rig, some of the frills of its more expensive relatives have been omitted. Some may miss the VOX but I never use this function. Perhaps the only omission which I really missed is a good IF notch filter, which I think would come in handy.

The review transceiver was not fitted with the narrow CW filter which really is essential for serious CW operation. As supplied from the factory, the external control relay is not activated. If an external linear is to be used, the case must be removed and an internal slide switch set to the 'ON' position. This is fully described in the manual.

VERDICT

The TS-680S is a useful general purpose HF and 50MHz transceiver for home, mobile and portable use at an economical price. The TS-140S is similar but does not cover 50MHz. For the price, the performance is reasonable and can be thoroughly recommended. However, for demanding applications such as DX working on the LF bands, the close-in strong signal performance does not match up to its more expensive relations.

PRICES

Typical prices current in January 1989 were £985 for the TS-680S and £862 for the TS-140S. In addition, for home station use, a 12V power supply is required. The matching PS-430 costs £173. All prices include VAT

ACKNOWLEDGEMENTS

I would like to thank Lowe Electronics of Matlock for the loan of the equipment, and the many stations worked who provided comments. □

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MFJ949C	300W Deluxe Versatuner built-in dummy load, cross needle SWR/PWR meter, 6-way switch and balun	157.75
MFJ941D	300W Built-in SWR/PWR Meter, 6 way switch and balun	105.13
MFJ901B	200W Versatuner	63.07
MFJ1601O	Random Wire Tuner	42.02
MFJ1701	6-way Antenna Switch 2KW SSB	30.72
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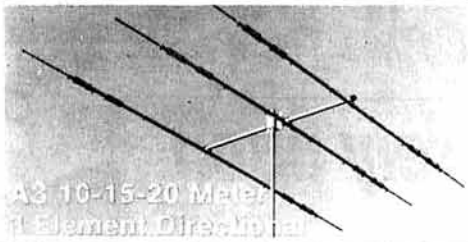

Multiband Beams

A3S	3 Element 20-15-10M	299
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A4	4 Element 20-15-10M	353.35
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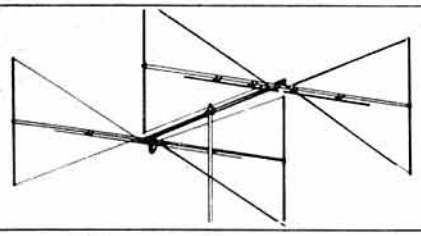

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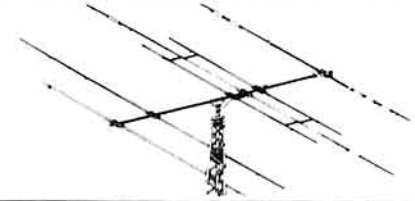

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205BAS	5 Element 20M	524.17
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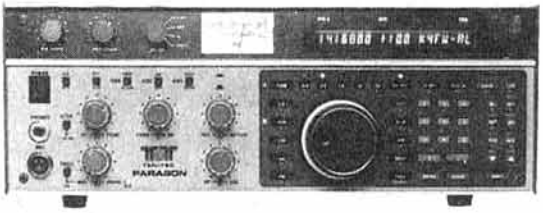

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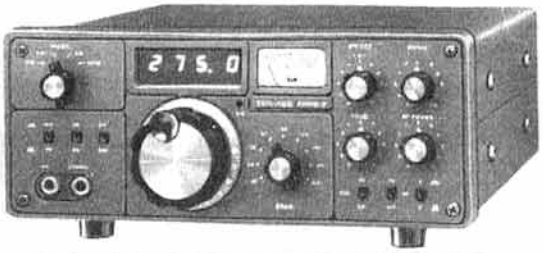

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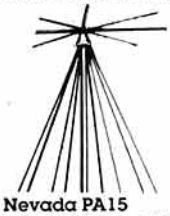

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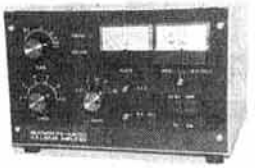

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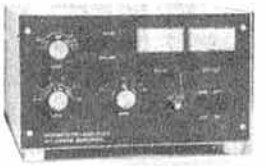

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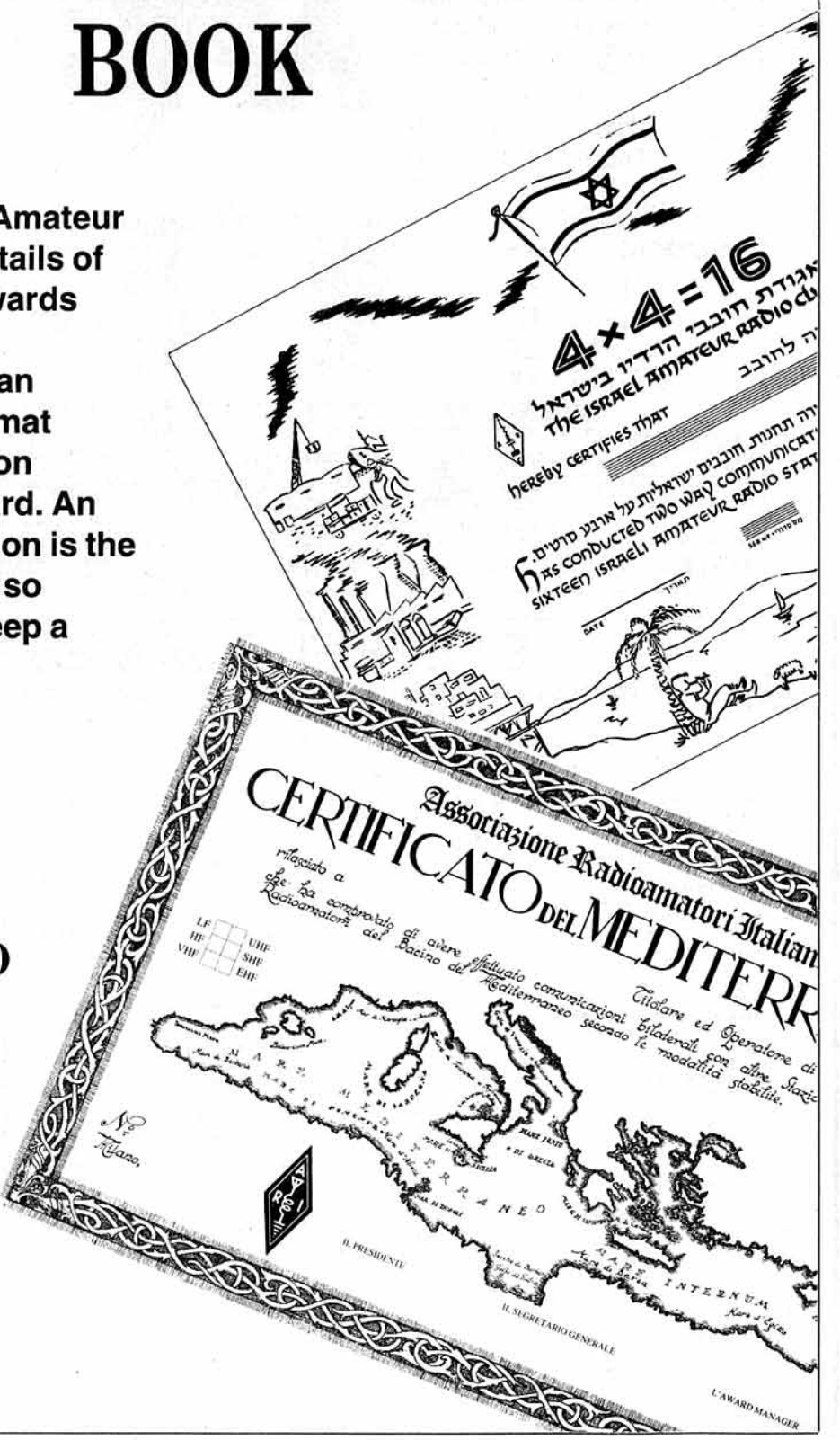

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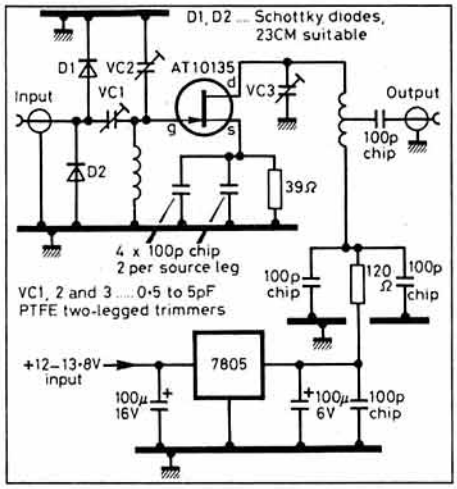
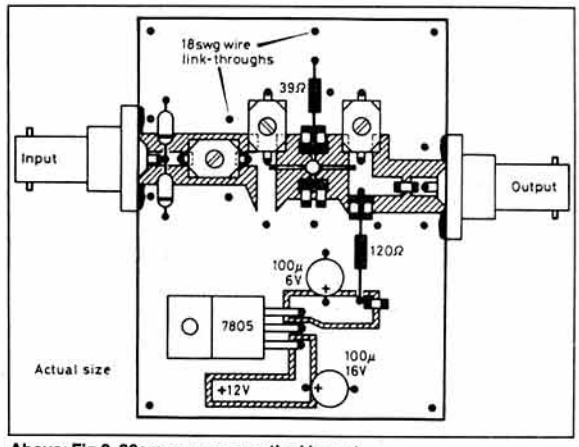
MIKE SANDERS G8LES
39 Telegraph Lane, Four Marks, Alton, Hants GU34 2NJ

Two communications have come in from the Severnside Television Group, the subjects of which occupy a major segment of this month's column. If nothing else, this goes to prove that if you send information in, you will be featured!

SEVERNSIDE ATV GROUP

The Bristol Group, known more specifically as the Servernside Television Group, is a friendly social group that supports its local repeater GB3ZZ. They run a newsletter, which interestingly this month carries advertisements for a couple of items which could well get interested but poverty-stricken amateurs up and running. One is a 23cm aerial that gives 10dB of gain over the 23cm band. This performance can be attributed mainly to the construction using TV aerial size elements – it looks pretty chunky on 23. The price of £14 plus postage is extremely cheap. Contact G8VPG or G4YQR. Then there are some secondhand satellite receivers at £40. These cover 950 to 1750 MHz and so work on 23cm. They will not be as sensitive as an amateur-only receiver, as they are designed to demodulate broadcast broadband wide deviation transmissions. The output video will therefore be lower than one volt, and turning this level up will increase the background noise. They are, however, very good at producing colour and sound on a weak grade. Compared with a good amateur receiver receiving a P2, it will just produce a detectable picture. The input noise figure is around 8dB and so a preamp is essential for 23cm use. If a dish and an LNB are added to the receiver you find yourself with a satellite system. Supplies of this item don't appear frequently, so contact the club to reserve one.





Above: Fig 2. 23cm preamp practical layout.
Left: Fig 1. 23cm preamp circuit diagram.

23CM PREAMP

Above is the circuit and practical layout using the Avantek AT10135 GaAs FET, available from Bonex. It's very simple and, provided 23cm constructional techniques are employed, yields a considerable improvement over bipolar devices.

THE BRISTOL RALLY

The Servernside Television Group put on a display at the Bristol radio rally on 18 September, the organising club was the South Bristol ARC. Their obvious recourse was to display the Bristol TV repeater at the rally, and this went ahead. Brunel Old Station at Temple Meads was the location; G1IXF and G7CAR covered the installation, but not without difficulties. Murphy got to the ladder and made it too short. Luckily another was procured, and it reached the roof! A JVL 28 element aerial was installed up there, producing a P5 picture on the display stand. With a total of 800 visitors it was a very successful day; topped with new recruits to the society from visiting amateurs.

The group also put in an entry for the September ATV contest. This involved borrowing a 75 foot trailer winch-up mast to make aerial erection on site very easy. The mast sported broken elevation wires, which meant that the usual conditions of loan prevailed: you fix it and you can borrow it. The scores were higher than previously recorded owing to enhanced conditions, but as I found they also reported a drop in conditions on Sunday, with some rain.

REPEATERS AND LINKS

This same group has also written to me concerning its scheme for a genlocked BBC computer which will form part of its Mark 2 repeater. They have expressed a wish to use DTMF ▷

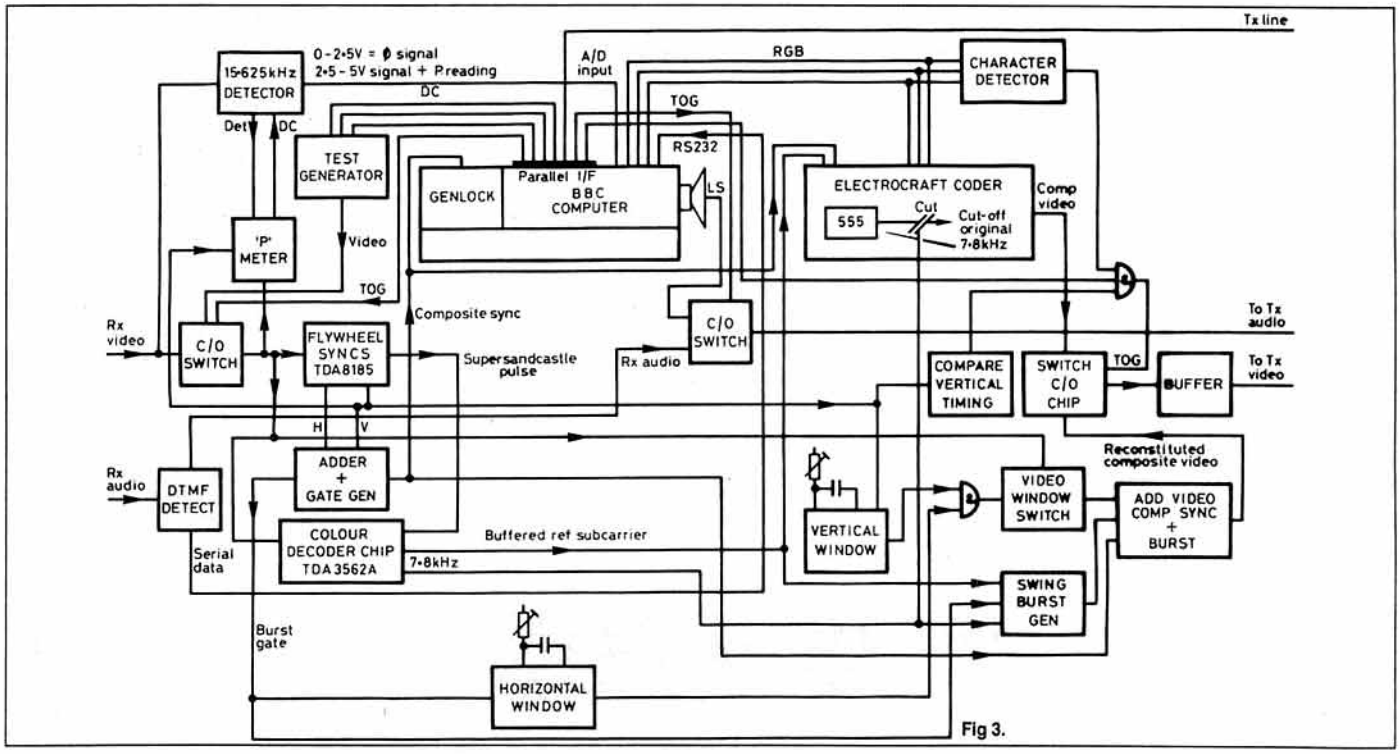


Fig 3.

tones to access special test pages; we clearly need a national standard for these as it is by this method that link instructions can be issued. Maybe we could apply single numbers for local working and three-figure numbers for remote operation. Are there any practical ideas on this topic out there?

I have drawn up an outline of a typical system, in block form, Fig 3, which also includes the P meter circuit and signal reprocessing. It would be a miracle if the first shot at this is correct so do look over the diagram perhaps offer constructive criticism on ways to improve the concept.

Full use is made of the computer interfaces of RGB, A to D, Serial and Parallel. Computer characters are detected at RGB but are only switched through to the TX video when the appropriate parallel interface bit is set. The P meter output is added to the DC level from the 15·625kHz detector so that a level below 2·5 volts registers as no input signal, but levels above that are detected as P meter reading values. The incoming video locks the locally generated sync and burst generators for a clean output signal. These are also used to lock up the colour coder. The incoming viewable picture area is the remaining part of the signal that has to go through as received. It is, however, gated so that it does not add noise to the locally generated syncs or burst.

DTMF tones on the audio channel are detected and either cause a test page to be displayed for a predetermined time or go through to the output to set up a link chain. Apart from two antennas and feeders, standard home stations are used for the links. These employ a receiver, transmitter and a 4-way N type relay system which turns the system round so that the transmitter and receiver are now connected to each other's original antenna.

Towards the end of last year, Hastings Repeater Group announced that their TV repeater, GB3VI, was operational with just 1 watt of output, but a 15 watt amplifier is now being built by Mick, G4PRJ, to boost the signal. GB3VI transmits on 1311·5MHz (input 1276·5MHz), and the group was offering prospective viewers a kit of parts for a simple down-converter which they could build at home. The group is part of the Hastings Electronics and Radio Club, one of the best organised and supported clubs in the country. Wanting to instal a 10-metre repeater, an application was submitted to DTI, who replied that the Licensing Authority was not ready to approve repeaters in this band, other recent applications having also been refused. Hon Treasurer of the group is G4CLV, QTHR. (G8VR)

RON BROADBENT G3AAJ
94 Herongate Road, Wanstead Park, London E12 5EQ. 01-989 6741

As we speculated in the last issue, *Rad Com* is about to get a new look, and the Editor has decreed that my monthly writings should concentrate on past events and useful data, leaving the forthcoming events to the News Bulletin section of your favourite radio magazine.

To someone who is with another cap on his head, trying to give up-to-the-minute goings-on in the satellite world, this will be a tough task. Moreover, there are some events which must be put into the body of the magazine so that anyone who wants to refer to dates, times, and tables can locate them straight away. With this in mind I shall still place such things as mode changes and MA times in this column. One such is the OSCAR 13 Transponder Schedule from March 13 until May 3, 1989, as follows:

Mode B	From MA 100 until MA 150
Mode JL	From MA 150 until MA 210
Mode B	From MA 210 until MA 000
Mode OFF	From MA 000 until MA 100

AO-13 will be Magnetorqued to the new position because of decreasing sun angles on the Solar cells. The reposition and above schedule should enable the battery and energy conditions to be kept stable. At the time of writing (Jan) the Mode S transponder had still not been put into general use. However, it may have been ON for short periods by the time you read this. Certainly there was a growing band of enthusiastic satellite folk who were just getting to grips with the S-Band mode and encouraging others to have a try, when silenced by the long switch-off. Let's hope that a little more time is given to this, plus the L-Mode in months to come. At least this will perhaps enable some UK amateurs to design, build and *then publish* their findings so that we can all benefit.

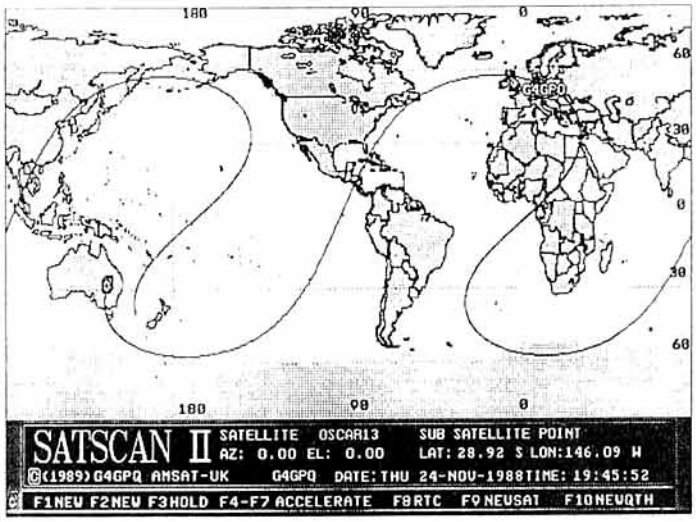
WRITERS REQUIRED

There appears, to a few of us, to be a great gulf between the amount of technical writing done for the 'student' and for the highly technical amongst our ranks. I am sure that there must be dozens of amateurs out there who have a couple of original thoughts and who simply do not spread them around. Why is this? Is it because they want paying for everything they do? That they cannot write? Or are just so wrapped up in their own thoughts that it never occurs to them to put a few words on paper for us lesser mortals to read? Think about that for a while when you are on your way to work.

I'll offer a challenge. Send your words to whatever magazine you wish, if you don't get an answer in two weeks send it to 'OSCAR NEWS' c/o the above address. This, of course, applies only to satellite subjects, you will at least get an answer by return of post. Mind you, you will not be paid for your work, you only get the glory, and your name in Lights.

OSCAR 10

I have been asked by a few readers to include the small chart that Bob, G4IQQ, used to place in these pages which depicted where Oscar 10 was going to be in view during the coming month. I have asked Bob Phillips for his IBM programme for this job, and he has promised to send it in a few days. Unfortunately, unless I get a bit of extra time, I will not be able to place it here this month. I will have a go for the next issue for Oscar 13. I digress.



OSCAR 13 Ground Track as depicted on new AMSAT-UK software.

UOSAT-D/E SATELLITES

A mass of work has been conducted on the UOSAT-D and E satellites being designed and built at University of Surrey under the team leadership of Dr Martin Sweeting, G3YJO. Readers will remember that UOSAT D and E form part of the payload on Ariane. They will be placed, with four Amsat-NA Microsats, underneath the primary SPOT-2 payload on the July 1989 Ariane mission from Devils Island.

UOSAT D and E will support amateur radio store and forward communications transponders, devices to study orbital radiation, and development of low cost CCD earth imagery experiments. Martin, G3YJO tells me that he has already made a visit to the Ariane space launch site at Kourou and were able to discuss interfacing and technical procedures with the Ariane and SPOT teams working on that site.

The most difficult problem so far encountered is the laying down of the Kapton insulating layer between the aluminium skin of the solar array panel and the GaAs solar cells. These difficulties have been solved but the adhesive has caused problems during extreme thermal vacuum tests. Seems I've heard that before; prior to the first Shuttle flight they had problems getting the outer tiles to stay on during vacuum testing. In fact, if my memory serves me well, some of those same tiles came off during that flight.

Perhaps readers should also note that because of the amount of work needed to be actioned at Surrey UOSAT office, until after the launch all information will come as news releases via Oscar News and the UOSAT Bulletin on 145·825MHz, as and when necessary. As with *all* amateur radio satellite builders you just cannot build the satellite(s) and speak to every Tom, Dick and Harry who wants to get into the act every day of the week, there is not enough time or staff to do so. Mind you, If any organisation wants to put their hand in their pockets to the tune of a couple of hundred thousand pounds, we can arrange a visit, and perhaps a few minutes of a basic tour of the labs. All applications to AMSAT-UK, with cheque book in hand, will be gratefully received.

AMSAT-UK COLLOQUIUM

Speaking of the University of Surrey reminds me that I wrote of the AMSAT-UK Colloquium in the last issue. This is to be held during the last weekend in July 1989. Booking forms ▷

will be available to anyone who wants to attend from April onwards via AMSAT-UK and RSGB. By now I shall have made final arrangements, on behalf of the RSGB, to hold the Second DATA Symposium in all probability at the same place, at the same time and in conjunction with the Colloquium. Owing to circumstances too complicted, and too personal to air, we lost out on the Harrow School venue for the Data do this year, although I completed arrangements in September 1988. However, looking at the attendance records of both events in 1988 (as I was in some small way involved), it was evident that 50% of the folk at the Data Symposium were also part of the AMSAT-UK Colloquium. As we at the Colloquium put on a goodly section of Data Communication talks, and my ears were listening to attendees at Surrey talking Packet Radio as well as Satellites, it appears to a few of us to be a good idea.

Now comes your part. As of *now* we want you to tell us that you are keen on the idea and will attend, replies to RSGB or AMSAT-UK (and overseas readers, to your own National Society's HQ or AMSAT Groups). There will be special travel arrangements, accommodation cheaper than local hotels, and it will run from Thursday to Sunday 27/30 July 1989. Book your holidays around that date, get a gang together from your local club, hire a coach and come along. An all-in package will be available from RSGB and AMSAT-UK towards the end of April. There will be daily as well as complete packages. *There's no entrance without booking first.*

Incidently, The Papers of the 1988 AMSAT-UK Colloquium are still available from me at a very reasonable cost. If you want to know some technical details of things satellite, and store and forward packet satellite workings, this is the set of papers to get hold of. We will also be printing the 1989 papers as well, prior to the event, and this should also be a winner.

As last year, we also let out the foyer of the lecture halls at the U of S to traders who have any goods which are satellite-orientated. The cost of hire is minimal if you are paying to attend the meetings, and reasonable even if you do not want to attend the lectures. Demonstrations of members' equipment on data and satellites is encouraged, and a space will be made available if due notice is given (at no cost) if you are also attending the lectures.

JAS-1B

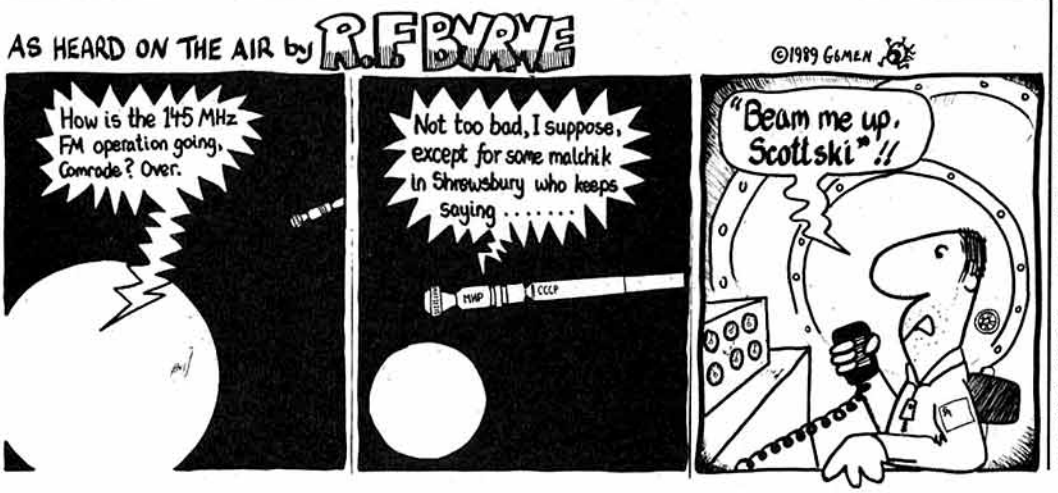
This second amateur radio satellite by JARL/JAMSAT team is to be launched piggyback with the MOS-1B mission during the winter of 1989/90, date is as yet not known. This clone of FUJI will have higher capacity solar cells than JAS-1 and a new antenna system. No doubt the design team in Japan will also take some notice of the lessons learnt by the not-100% performance of JAS-1. To my mind it is all very well saying, two years later, that the system was not a 'full success' but hundreds of the world's satellite folk spent a lot of wasted hours with NO information on switch ON times. Perhaps JARL will not only budget for the engineering, but budget for information to be sent around the world about modes, times, and on/off dates. This is best done via AMSAT groups, not national societies who usually have a slow response time for this kind of input. I am possibly sticking my neck out, but AMSAT groups get satellite information to the satellite gang in there own country in hours, not days. Mind you, to be fair to our friends in JARL, they are members of AMSAT-UK and I do get a fax every time there is a new operation schedule for Fuji, this is instant, and appreciated. At the time of writing it is too early to expect the March schedule, so it will be in the News section and on AMSAT Nets.

I wish to repeat my offer to those who cannot find their chosen satellite during the days when they can operate. For less than 2p per day anyone can have a regular supply of up to the minute pass times of *all* amateur radio satellites. It's called the 'Orbital Calendar' and is available from the above address. It is published every two months. Work it out – 60 days times 2p – then send for a copy.

MIR

As I suggested before Christmas, there appears to be no Amateur radio activity from MIR (since 23 December 1988). Having said that, there was a short sharp burst of activity on 28 Dec. All has been quiet up to this date. My old friend Chris van de Berg in the Netherlands, who listens to the Russian speech nearly every day on their command channels, tells me that there appears to be no sign of a repeat Ham QSO in the foreseeable future. Perhaps the reason is that there is no licensed amateur up there now. Our apologies for the various errors in February's column under my name, there were generated after leaving my hands and not under RSGB control prior to printing.

That's all folks, by the time you read this Oscar 10 will have gone into Eclipse, and perhaps come out again. If so, listen to the recommendations of the command stations, keep power down, and see if we can nurse the old girl into another twelve months of service. I certainly have had more fun on AO-10 over the last few weeks than on AO-13. **G3AAJ.**



BOB TREACHER BRS32525
93 Elibank Road, Eltham, London SE9 1QJ

My plans for this column have been changed somewhat from what was said at the end of last month's column. Information on the Belgian SWL's had not materialised at the time of writing this piece, while I have decided to hold over the DX-TV piece until next month.

ANTENNA SLOT – INVERTED VEES REVISITED

G5WW took the time to write regarding the December 'Antenna Slot'. He has some well found views to offer.

G5WW was professionally concerned with these antennas a few years ago, it seems that the Inverted Vee had some attractions for tactical military use, but that little was really known about its performance. To find out what happened, measurements were taken and the following interesting facts emerged:
(1) There was little difference in the shape of the broadside polar diagram between the Inverted Vee and a normal dipole.
(2) The Inverted Vee radiated predominantly from the ends and was shown to be about 4dB down on the broadside direction of a normal dipole.
(3) It has extremely good end fire low angle radiation and produces a good groundwave in those directions.
(4) The Inverted Vee may be considered as an omni-directional aerial but with little reception below 20 degrees in the broadside plane.

The above assumes an apex height of 0·275λ and the legs drooped at 45 degrees. As the angle of droop is decreased, the gain and polar diagram approximate more nearly to a conventional dipole. All this proves that it is a useful omni directional device with excellent end fire low angle performance, but the same as a conventional dipole broadside on and some 4dB down.

It is, of course, a single frequency device, but it can be cut for a number of frequencies with insulators and shorting links inserted at appropriate places. All shorting links not in use should be left open circuit as unbroken wire adjacent to the ends of a dipole will affect both the polar diagram and impedence; such an arrangement can only be at the correct height for one frequency.

G5WW felt that the arrangement showed in 'Antenna Slot' in November was to be preferred and he suggests that this could be drooped to suit the site arrangements and that slotted 300ohm ribbon feeder could be used. He further suggests that if any SWL wants a really versatile 'droopy' ▷

antenna, the G5RV's dimensions drooped to suit the site arrangements (ie no particular angle) with about 30ft of slotted ribbon extended with 50ohm coax to the receiver would perform well.

I am delighted that Paul took the trouble to pass on these useful views, he always reads this piece and remembers his SWL days as BRS869. Paul also QSL's all SWL reports and even remembered the one I sent him in 1969!

VHF SWL EVENTS IN 1989

Last month I promised a look at VHF events this year for the SWL.

I am pleased to say that the number of RSGB contests with SWL sections has been increased this year. Please refer to the Contest Calendar for dates.

It would be a bonus if this year's VHF events were even better supported than last year's. Why not 'have a go' at some of the events. It does not matter about the size of the submitted score, simply entering would encourage the VHF Contests Committee to include yet further sections for the SWL.

The general rules which SWL's should follow in these contests were published in January's Contest News (page 62). Please follow them, and the individual contest rules, carefully. Best of luck and let us hope for far better conditions in 1989 than we experienced in 1988!

NEWS FROM INTERBOOKS

Listeners will remember me referring to the 'Interbooks' catalogue last year. They have moved QTH to 8 Abbot Street, Perth, PH2 0EB and are offering 1989 editions of some of their publications. The company have a wide range of books which cater for all facets of the SWL hobby. A few examples include '99 Nights on Medium Wave', 'Getting the most from your Multimeter', 'Scanners', 'Secrets of Successful QSL'ing', and the ever popular 'World Radio and TV Handbook'. Send for a list of publications and see for yourself what is on offer.

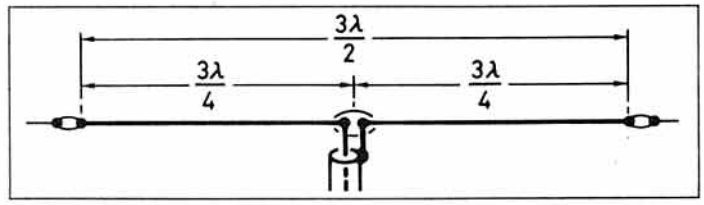


Fig 1. 3/2-wave antenna.

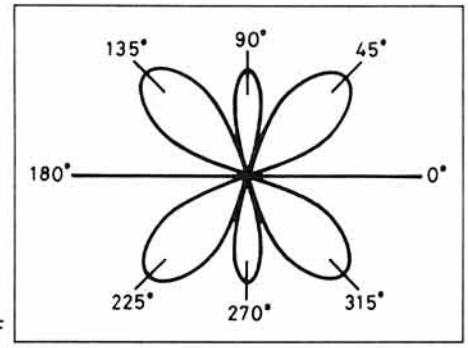


Fig 2. Sensitivity pattern with additional ¼ wave.

ANTENNA SLOT – THE 1·5λ DIPOLE

For SWL's with a 'largish' back garden, the long wire antenna can be used with good effect. 1·5λ can be used in a number of configurations, including a vee, inverted vee, a tilted 3/2-wave and a multi-band version. Let us consider the 3/2-wave here.

Antennas can be resonated to a specific frequency by making their overall electrical length a whole multiple of a half wavelength, and there is a rise in the amount of gain with each half-wave addition. Figure 1 shows a 3/2-wave antenna with each leg 3/4-wave long. This establishes a low-impedance feed point at the centre. The sensitivity pattern with this additional 1/4 wave (at Figure 2) shows that two additional lobes have been added compared with the 'figure of eight' pattern of a half-wave dipole. Mathematically, a 3/4 wavelength on the 21MHz band would be

$$3/4\text{-wave} = \frac{738}{21{\cdot}2} = 34{\cdot}8\text{ft}$$

Overall length of a 3/2-wave antenna would then be just under 70ft.

The horizontal sensitivity lobe of a 1·5λ dipole can be oriented in favoured directions by choosing the proper angle for running the antenna wire. Assuming north as 0 degrees, the approximate angles of the lobes of a 3/2-wave antenna would be 45, 90, 135, 225, 270 and 315 degrees. The 90 and 270 degree lobes should be somewhat weaker and narrower than the four cloverleaf lobes.

With such an antenna erected in Britain and running approximately 100-280 degrees it would give favourable results at about 55, 145, 235 and 325 degrees which would equate roughly with North and South America, the Far East and Africa. For good low-angle sensitivity, the antenna should be mounted between 0·5 and 1·0 wavelength above ground.

Next month, I shall take a look at a Vee-Beam and the Rhombic. If any SWL has their own pet antenna he or she would like me to feature in this series of articles, please drop me a line with full details.

VHF AWARDS

Ian, G4OUT, our new VHF Awards Manager, wrote to me to encourage claims from SWLs for the Society's range of VHF awards. Ian will ensure that better publicity is given to these awards as he feels that there are many listeners who send cards to amateurs heard on VHF. The certificates are very attractive, especially the 'Squares' certificates and are free to Society members. Last year two Square Awards were issued to myself and my XYL, Joan, BRS62088, so it isn't *that* difficult. The rules are simple and a high QSL card count is not demanded to claim the basic awards.

Recently Ian has sent a number of contest certificates to listeners and hopes that participation by SWLs in the year's UHF/VHF contests will reach an all-time high. In the past few years, the same listeners have entered the Society's contests and it is time for some new blood.

On a personal point, G4OUT is keen to receive listener reports and often provides token gifts to the senders of the more informative reports he receives by way of encouragement.

Once again I have probably over run, but it is pleasing to note that with

FINALE

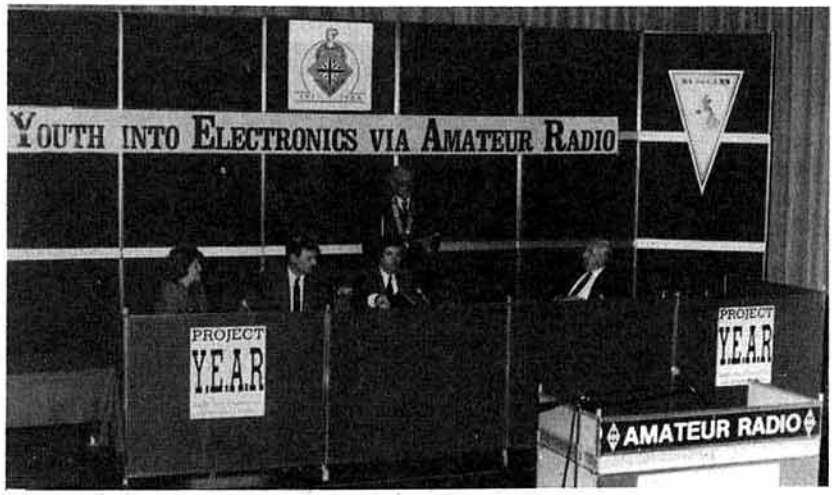
Once again I have probably over run, but it is pleasing to note that with the extra space allocated to the column, the number of contributors has trebled in recent months. I will keep the plans for next month's column under wraps, so remember to send me your news, views, antenna ideas, table scores to reach me by 7th March. □

The shack of Joan Slater BR90400 showing HF-125 receiver and several awards.

THE SOCIETY'S ANNUAL MEETING

10 DECEMBER 1988 AT UMIST, MANCHESTER

The meeting was officially opened by the President, Sir Richard Davies, G2XM, who expressed his pleasure at the very good attendance to this, the first RSGB AGM to be held outside London. He explained that the afternoon's proceedings were to consist of two meetings: first the official Annual General Meeting which would deal with the business of the Society as required by the Company's Act, followed by an open meeting which would give members an opportunity to raise any amateur radio matter. Sir Richard informed the meeting that an official audio tape recording was being made of the proceedings and this would be available to anyone who wished to purchase a copy from the Society.



MINUTES OF THE 62nd ANNUAL GENERAL MEETING OF RSGB

Sir Richard introduced to the meeting the officials who were seated with him on the rostrum. These were Mrs Joan Heathershaw, G4CHH, Immediate Past President; Dr Julian Gannaway, G3YGF, Executive Vice President and President-Elect; David Evans, G3OUF, the Society's Secretary; Basil O'Brien, G2AMV, Honorary Treasurer; and Willie McClintock, G3VPK, Chairman of the Finance & Staff Committee and a Past President of the Society. Council Members present at the meeting were then asked to identify themselves. Apologies for absence from the meeting were noted from Messrs Smith, G4AJJ; Fisher, G3WSN; Broadbent, G3AAJ; Butcher, G3FSN; Jessop, G6JP; Winchcombe, G6ZH; Hughes, G3GVV; Paul, G3AUB and Thornley, G1NUS.

The President announced that more than 50 members were present. This was the number required to constitute a forum at the Society's annual meeting. (It was later recorded that some 290 members were present.)

The Secretary then read the notice convening the meeting, circulated to members with the November issue of Radio Communication.

The President drew members' attention to the first agenda item which was **to receive and consider the minutes of the 61st AGM**, circulated with the May 1988 issue of Radio Communication. No written comment on the minutes had been received and none was raised at the meeting.

The President then proceeded to agenda item two, which was **to receive and consider the accounts of the year ended 30 June 1988** and the reports of the Council and the auditors thereon. Sir Richard called upon Mr McClintock, G3VPK, to read the auditors' report for the year ended June 1988. This certified the auditors' satisfaction with the accounts and their compliance with the Company's Act 1985.

The auditors' report having been read, the President called upon Mr O'Brien, G2AMV, to present and discuss the accounts for the 1987/88 financial year.

Mr O'Brien spoke of Council's concern, which he shared, that the accounts showed a deficit of £5,599. He drew members' attention to a statement in the accounts which, he felt, summed up the situation:

"Valiant efforts were made by HQ staff and by Council, which resulted in a saving of some £68,000." Mr O'Brien explained that the significant factors were falls in advertising revenue and booksales, which were disappointing, although both showed an improvement on the previous year's figures. Mr O'Brien assured the meeting that positive steps were being taken towards further improvement in these areas. He added that ▷

the task of preparing the budget for the coming year had been more difficult than usual. This was due to the launching of Project Y.E.A.R., the 75th Anniversary and the unpredictable result of the lottery. Mr O'Brien spoke of the increasing value of the substantial Headquarters property at Potters Bar. Mr O'Brien closed his report by stating that, taking into account the reduced subscription rates of students and senior citizens, the average UK subscription to the Society was £17.75, which, when compared with the cost of commercial amateur radio magazines, meant that the vast range of RSGB services was available to members of the Society at a bargain price!

A written question on the accounts had been received from Mr Mansfield, G2SP. This related to the costs of council and regional meetings. In his reply, the Hon. Treasurer explained that the figure given in the accounts for committees, council and regional costs included overhead costs not attributable to a specific committee, such as the cost of the AGM, election printing and stationery, Presidential expenses etc. Mr Mansfield asked if a breakdown of these items could be given in future. Mr O'Brien replied that the accounts would run to many pages if each item were noted individually. However, consideration would be given to providing a breakdown of some of the larger items.

Mr O'Brien then answered several general questions relating to the accounts and membership figures.

The Secretary stated that, as quoted in the Annual Report, there was a reduction of 0.86% in the membership during the year under review.

Mr Mansfield, G2SP, had submitted a written question in which he noted that the DTI was issuing an increasing number of licences and he wondered if Council had considered why the Society was losing its 'market share'.

In response, the Secretary pointed out that the Society's membership consisted not only of licensed amateurs, but also included shortwave listeners. Mr Evans said that another significant factor was that a percentage of members were lost whenever the rise in inflation forced an increase in subscription rates. He added that there was a possibility that new licensees considered it less necessary to join their national society. Mr Evans hoped that every member would try to convince new licensees that this was not the case.

Mr Evans then replied to several more questions from the floor. These related to travel and subsistence allowances, book sales and 75th anniversary costs and Project Y.E.A.R.

The President then moved to item three of the agenda, which was **to announce the names of members to serve on Council for 1989.** He announced the results of the recent Council election, declaring that Mr G Benbow, G3HB; Mrs M H Claytonsmith, G4JKS; Mr A A McKenzie, G3OSS; Mr N F O'Brien, G3LP, and Mr F S G Rose, G2DRT, had been elected as Ordinary Members of Council. In the zonal elections, Mr J Greenwell, G3AEZ, had been elected for Zone C, Mr F Hall, GM8BZX, had been elected for Zone G and Messrs P Chadwick, G3RZP, and E J Case, GW4HWR, were elected unopposed for Zones D and E, respectively. Sir Richard read the complete list of names of Council Members to serve for 1989.

The President then formally thanked the election scrutineers for their work. This year's team comprised G6JJ, to whom special thanks were expressed for his leadership, G4EAN, G3FSN, G6DIA, G0DCU, G3BYC, G1LKJ, G8VXY, G4VNR, G3MCK and G6ZH. Volunteers to assist with next year's election count were called for and their names noted.

The President then announced the final official agenda item. This was **to pass a resolution to re-appoint the auditors, Messrs Moores & Rowland, and to authorise Council to fix their remuneration.**

Following a brief discussion, acceptance of the resolution was proposed by Mr B Donn, G3XSN, seconded by Mr H Fenton, G8GG, and carried by a very large majority of the meeting.

The meeting then adjourned for a short tea break.

The reassembled meeting was then addressed by Mr Barnes, G3AOS, who said he wished to compliment the RSGB's foresight in bringing this important meeting to the north of the country. He paid tribute to the work done "behind the scenes", particularly that undertaken by volunteers.

These remarks were warmly endorsed by the meeting.

The presentation of trophies then took place as follows:

COUNCIL AWARDS

Calcutta Key – given for outstanding services to international friendship within amateur radio – to Dr Tony England, W0ORE, for his considerable work in connection with the

P64 – Top: R C Wheldon, G3PJT, receives the Ostermeyer trophy for his article 'An Electrically Steerable Vertical Parasitic Array for 10MHz'.

P64 – Bottom: For his experimental work on high performance modems, James Miller, G3RUH, collects the Wortley Talbot Trophy.

Above: Mr Reynolds, G3ZPF, is awarded the Courtenay Price Trophy for the most outstanding technical contribution to amateur radio.

Left: The Calcutta Key is presented to Dr Tony England, W0ORE, for his work in connection with the Shuttle Amateur Radio Experiment and for promoting youth into amateur radio.

Below: For his design for a phase-lock loop narrow band transceiver for 24GHz, Les Sharrock receives the John Rouse Memorial Award.

Shuttle Amateur Radio Experiment and for promoting youth into amateur radio. This award was collected on Dr England's behalf by Mr Brian Davies, GW3KYA.

Founders Trophy – for services to the Society – to Mr Neville Ianson, G3GDO, for his inordinate amount of work in helping the Society to set up the morse test scheme, interview all the examiners and to maintain standards and generally run the scheme from the voluntary point of view.

G5RV Trophy – for contribution to the Society in the field of EMC – to Mr Bob Peace, G8SOZ, for his outstanding and supportive work.

COMMITTEE AWARDS

Ostermeyer Trophy – awarded for the best article in RadCom for home-constructed equipment published during the year ended 30 June to Mr R C Whelan, G3PJT, for his article entitled "An Electrically Steerable Vertical Parasitic Array for 10MHz" published January 1988.

Norman Keith Adams Prize – for the most original article published in RadCom during the year ended 30 June 1988 – to Mr Mike Gibbings, G3FDW, for "Moxon Slopes at VHF and Other Thoughts", published in May 1988.

Courtenay Price Trophy – for the most outstanding technical contribution to amateur radio published in the year ended 30 June 1988 – to Mr Reynolds, G3ZPF, for his article entitled "Windloading", published in the April and May 1988 issues of Radio Communication.

Wortley Talbot Trophy – for experimental work in amateur radio – to Mr James Miller, G3RUH, for his original experimental work on high performance modems in the field of amateur satellites, data and packet radio.

Raynet Trophy – to Mr John Stewart, G0CPR, on behalf of the many groups throughout the UK, in recognition of the work done during the hurricane which hit the south-east of England and during the subsequent flooding in South Wales and elsewhere in October 1987.

John Rouse Memorial Award – to Mr Les Sharrock, G3BNL, for his design of a phase lock loop narrow band transceiver for 24GHz.

The Secretary then announced an additional presentation. This was to the winner of the Families and Activities Day, held on 24 July, as part of the 75th Anniversary celebrations. The winning entry had been submitted by the White Rose Amateur Radio Society from Leeds and the prize – a case of champagne – was collected by Dorothy, G4AOT, on the club's behalf.

Mrs Heathershaw, G4CHH, announced that a short video of the 75th Anniversary exhibition at NEC was to be shown to the meeting. Members would see the Society's Patron, HRH Prince Philip, giving his opening address and launching Project Y.E.A.R., in addition to the speech of Mr Coolican the Head of Licensing and Enforcement at the DTI, in which he pledged the DTI's support for Project Y.E.A.R., together with the presentation of the Young Amateur of the Year Award to Mr Andrew Keeble.

▷

The video was received with enthusiasm and appreciation.

The President then addressed the meeting, remarking that the past year had been a special one for the Society in several ways. As well as 1988 marking the 75th anniversary of the founding of the Society, the year had also seen the emergence of some new challenges to be met and important, new initiatives to be pursued. Referring to the Society's founders, a group of enthusiastic radio amateurs, or experimenters, who met together in friendship and common interests, recognising the need to form a common front against the increasing threat of regulation and restriction, Sir Richard remarked that there had been challenges to face ever since and it was one of the main purposes of RSGB to represent the interest of British radio amateurs, at home or overseas. He expressed the hope that all members present would take every opportunity of pointing this out to non-members.

Sir Richard then spoke of the constant vigilance necessary to maintain and improve the position of amateur radio in the face of increasing market pressures on frequency allocations. He assured the meeting that the Society would do everything in its power to prevent any loss from the amateur spectrum. If the number of licensed amateurs, and therefore band occupancy, fell, this would obviously weaken the Society's case. This was at least one good reason to encourage recruits, particularly youngsters, into the hobby. Sir Richard drew attention to Project Y.E.A.R., and the vast amount of work being undertaken to seek sponsorship for the other various activities needed to develop the Project. He announced that one sponsor had agreed to contribute some £150,000 worth of professional effort in the preparation of educational and promotional material. Also, the DTI had agreed in principle to assist in the organisation of an Industry Conference in early 1989. This would provide an opportunity for the Society to speak to representatives of UK electronics and radio industries about Project Y.E.A.R. Sir Richard reported that the pilot issue of "D-i-Y Radio", the magazine aimed at the newcomer, had been very well received and he felt this would play a useful and substantial part in attracting newcomers.

The President then referred to the revised amateur licence, which was the result of a great deal of work undertaken by the DTI and RSGB. In recognising that the new document was not perfect, Sir Richard gave an assurance that the Society's representatives would continue to press on those matters which were outstanding.

Further welcome changes seen in the last twelve months were the new CEPT provisions, making it easier to operate in other European countries and for other European amateurs to operate in the UK.

The President then spoke of the newly established RLO scheme, aimed at broadening representation and providing assistance to members on a more local basis.

The President then highlighted two innovations which had taken place at HQ during the year. These were a new computer-based management accounting system, facilitating a clearer production of the accounts, and a desktop publishing system, which was expected to improve the speed and economy of book production.

Out come the lottery prizes. This case of champagne was heading to a deserving home – The White Rose Amateur Radio Society. Dorothy G4AOT is seen receiving it.

Sir Richard paid tribute to the many dedicated voluntary workers, who gave much time and effort supporting the work of the Society. He also acknowledged the hard work of the loyal, and often over-burdened, HQ staff.

In conclusion, Sir Richard stated that he had been deeply honoured to have served as the Society's President and he expressed his sincere thanks to all those whose advice and kindness had assisted him throughout the year. He felt that, with members' continued support and encouragement, this great Society was good for at least another 75 years!

THE SOCIETY'S OPEN MEETING

Introducing the "question and answer" session, Sir Richard explained that a few written questions had been received prior to the meeting and it was intended to deal with these when the specific topic was raised. Earlier in the meeting members had been invited to write a question on cards specially provided and these had been placed in a box, from which the President now drew the first question.

This was from a member who wished to see more simple constructional articles in RadCom.

The Secretary replied that this comment was noted. He added that the Society's new Editor-in-Chief was keen to publish more straightforward projects and an invitation had recently appeared in RadCom inviting authors to submit such articles.

The second question was from G4IGC, who asked about the outcome of the Wita case and the costs incurred by the Society.

Mr Evans briefly explained the background of this case. No variation of licence had yet been received and in making its many representations to the RIS on behalf of the member, the Society had spent a lot of money. The Secretary estimated that approximately £10,000 had been incurred in staff time, and legal and technical advice. He emphasised that this particular case was extremely complicated and as yet had not reached a conclusion. The work done could, however, benefit all members extensively.

A question from Mr Hodgkins, G3EJF, asked why it took so long for the minutes of the AGM to appear in RadCom.

The Secretary outlined the usual procedure for preparing minutes from a transcription of the recorded meeting. He cited the problems involved with the task, for example in ensuring the accuracy of the minutes by attempting to confirm the identities of members who did not always give their names and callsigns clearly when addressing the meeting. Mr Evans added that the Society always undertook to produce the minutes as quickly as possible.

The President proceeded to a question from Mr Foster, G1DRG, asking if the Society would approach AMSAT-DL regarding

several satellite uplink transmissions from the 144.4MHz band, a quiet part of the band used for SSB DX nets where the ability to copy very weak signals was paramount.

Mr Appleby, G3ZNU, chairman of the Society's VHF Committee, replied that he was not familiar with this particular input band but he would follow this up with AMSAT-DL and AMSAT-UK to ensure that a consistent bandplanning policy was maintained.

Mr Duddington, G4BFH, requested an explanation of the fluctuations in the price of the Society's transmitting log book over the past year.

In his reply the Secretary noted that this matter had been considered by Council and action had since been taken to effect a more commercial approach to certain Society publications. The price of the book in question was now established.

Mr Hall, G3NSY, then expressed his views on how the Society should enhance its publicity, given that the monthly membership, ie RadCom plus the many services provided by RSGB, cost no more than an issue of one of the commercial radio magazines.

The President thanked Mr Hall for his remarks, which would be noted by Council and staff.

Mr Scrivens, G0HHL, enquired whether Council had considered writing to each new licensee to invite him or her to join RSGB. Also, had Council considered the issue of simple, helpful guidance to new licensees who faced the traumatic experience of their first QSO?

The Secretary referred to a mailing shot sent in 1987 to all Class B licensees following the announcement of 50 and 70MHz for Class B licensees. Approximately 900 new members had been recruited from the 10,000 licensees. He confirmed that Council had indeed agreed to a similar recruitment exercise during the next year. With regard to advice to the new licensee, Mr Evans stated that a number of Society publications covered this area and further material was planned for publication in conjunction with Project Y.E.A.R. He remarked upon the importance of teaching correct operating techniques at an early stage, to instil confidence and discipline into the newly licensed amateur.

Mr Bolt, G4SUI, suggested that non-members be charged for their use of the QSL bureau.

The Secretary said that this possibility was being investigated and could be viable, if administration costs were not too high.

Mr Manning, G1LKJ, wondered whether RadCom could perhaps be sold to the general public via newsagents.

The Secretary replied that this question had often been raised in the past and consequently was reviewed regularly. He explained that it would require risking a significant outlay and it had never been considered worthwhile. He added that at present it was intended to produce small introductory booklets to promote amateur radio, which was felt to be better commercially than marketing a magazine which dated quickly.

President Sir Richard Davies, G2XM (right) greets Dr Julian Gannaway, G3YGF, President-Elect.

A question from G6TJT was then read by the President. This concerned plans to up-date the Radio Communications Handbook and the VHF/UHF Manual.

The Secretary answered that it had recently been decided to split the latter book into three volumes, each dealing with a different aspect of VHF technology. Mr Evans spoke of the difficulties experienced in finding authors to undertake this, and the necessary up-dating of the RadCom Handbook.

Mr Lundegarde, G3GJW, asked why the Society did not save money by allowing Raynet to be a self-financing organisation, such as AMSAT-UK and BARTG.

This point was answered by Mr Griffiths, G3STG, Chairman of the Society's Raynet Committee, who stated that Raynet and the Society had a mutual need for each other. He felt it would be wrong for RSGB to cut itself off from Raynet, which often gave amateur radio an air of respectability in the eyes of the Government and the general public. On the other hand, Raynet needed financial backing from the Society in order to provide training and support to its members.

Mr Lundegarde explained that he was not suggesting that Raynet should be separated from the Society, but that it should be self-financing.

Mr Griffiths replied that this possibility was being investigated.

Noting the existence of a dormant company, RSGB Raynet Ltd, which was mentioned in the accounts, Mr Bolt, G4SUI, asked if it were possible to put this to use.

Mr Griffiths said that this would not be a suitable medium for the route which was currently under consideration.

The President then read out a remark from G2AKK, who thought that Council should explore the possibility of moving Headquarters to the Manchester area and so take advantage of lower property prices and cheaper printing costs. This suggestion was very well received by the meeting!

The Hon Treasurer explained that when the Society had made known its intention to move from Central London some years ago, members from the larger cities in the UK had suggested their own city as the perfect location. However, in order to retain the existing staff it had been decided to move within an approximate 20-mile radius of London. Mr O'Brien added that, he personally would much prefer to travel to Manchester, rather than London.

A question from Mr Rigg, G6FAP, stated that the delivery of RadCom in his area had been extremely erratic for the last two years. He asked what steps were being taken to improve this situation.

The Secretary commented that this was by no means a new problem. The Society had been aware of a general spread in delivery dates throughout the country for a number of years and, regrettably, there was little that could be done since the responsibility was entirely in the hands of the Post Office.

The PRO of the East Lancashire ARC spoke of the difficulty of getting news items publicised for events to be held at the beginning of the month.

This point was noted. ▷

In answer to a question from Mr Paterson, G0HAL, the Secretary confirmed that usually all copies of RadCom were delivered to the Post Office on the same day. There were very rare occasions when, due to publication problems, this was not possible.

Mr Crosland, G6JNS, asked why members were not given the opportunity to pay an additional sum to have RadCom sent by first-class mail.

Several members stated that, in their experience, this would not make much difference to the delivery time.

Mr Metcalf, G6VS, said that he had written to HQ several times and had not received a reply. He then referred to a QSO he had had with an EI member earlier in the day, who had asked him to report that a number of members had been lost in EI because of the refusal to allow them to participate in contests.

The President replied that the EI problem was noted and was being looked into.

Mr Donn, G3XSN, raised the possibility of introducing a new reduced category of membership without RadCom, aimed at people who were out of work.

The President acknowledged that this was a widespread problem and assured Mr Donn that it would be discussed by Council.

The President then referred to the subject of the student licence, on which notice of three questions had been received prior to the meeting. The first was from Mr Shaw, G4EKW, asking if Council intended to implement the student licence without consulting the membership.

The Secretary drew attention to the consultative questionnaire on this topic, published in the September issue of RadCom. An analysis of replies received was to be published in the January issue.

Replying to a question from the floor, Mr Evans said that a response was received from approximately 2.3% of the membership which was considered by the experts to be a satisfactory random sample.

There followed a general discussion about the format of the questionnaire.

Mr James, RS90512, spoke with enthusiasm about the prospect of the new licence.

Mr Stewart raised the possibility of the DTI's acceptance, as an exemption to part of the RAE, of a GCSE pass in electronics.

Mr Smith, G4DAX, Chairman of the Society's Membership Liaison Committee, reported on a recent meeting which had been held to brief RSGB Liaison Officers about the Society's proposals regarding the student licence. He pointed out that clubs must use their RLOs, inviting him to meetings in order to get their money's worth from their elected officer!

There followed a further general discussion on the subject of the student licence, for which there was much support.

The winners of the lottery are drawn.

Moving to another subject, the President read a letter from Mr Winchcombe, G6ZH, concerning the registration of motor vehicles which would be prefaced with the letter G next year, raising the possibility of an arrangement for amateurs to secure plates showing their callsigns.

The President replied that submissions had been put to the Dept of Transport and the matter was to be discussed further at the January meeting of Council.

Sir Richard announced that about thirty questions remained in the box and there would not be time to respond them all during the meeting. However, it was intended that those left unanswered today would be dealt with by post as soon as possible. He then read out a question from G1TXV, who complained that the Call Book print was of poor quality and too small to read easily.

The Secretary explained that this edition was experimental and had been produced by a convenient and economic method. However, he expected that the next version would be improved.

Mr Bailey, G0CRF, then referred to the increasing number of licensees who chose to withhold their addresses from the Call Book, reducing the worth of the book. He asked whether at least a town or locator could be provided against each entry.

The Secretary replied that the DTI had agreed to release the first part of the postcode of these licensees, so enabling the Society to include the relevant town or postal area. This news was welcomed by the meeting.

Mr Whetstone, G4OUB, asked if there was any possibility of vertical polarisation to enable amateurs to go mobile on 50MHz in the near future.

Dr Gannaway, Chairman of the Society's Licensing Advisory Committee, replied that this was suggested to the DTI some time ago. He added that the subject of 50MHz was a delicate one, pointing out that it would probably be a few years before any more privileges were granted on this band.

Mr Lundegarde, G3GJW, asked if the questions outstanding at the end of this meeting could be published, together with the Society's replies, with the minutes of the AGM.

The President replied that while he did not agree that it would be appropriate to include the questions with the minutes, consideration would be given to the matter.

By the time these minutes appear in print, those members who submitted questions, but which were not answered at the meeting, will have received a reply by post. Unfortunately space precludes publication of the voluminous replies. – Ed

Mr Stokes, G3ZXZ, spoke of a problem with abuse of the local repeater, GB3NA, which gave listeners a very bad impression of amateur radio.

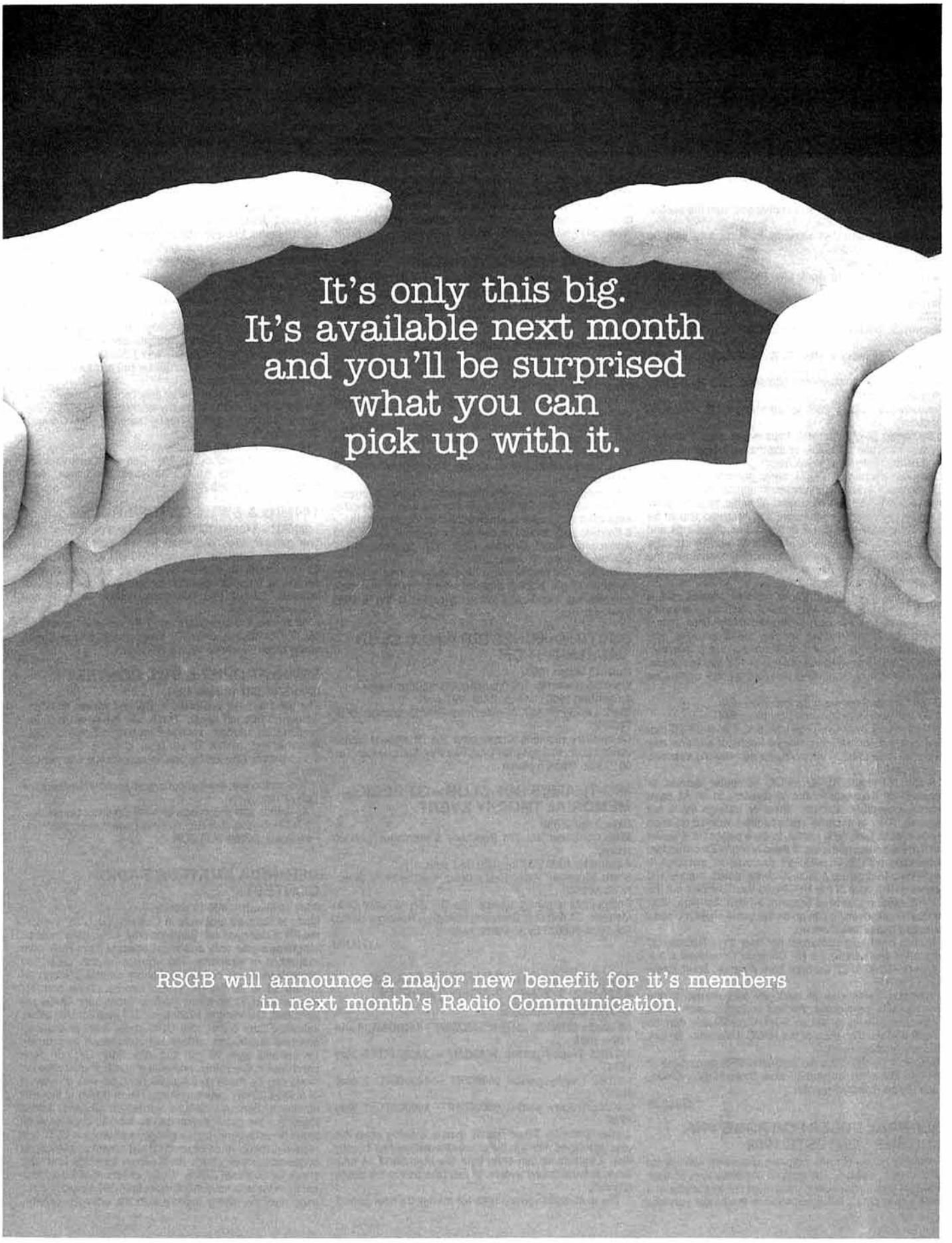
Mr Smith, G4DAX, replied on behalf of the Society's Repeater Management Group, of which he was a corresponding member. He explained that each repeater group was responsible not only for the technical operation of its repeater, but also for its moral application. Standard forms had been sent by the Amateur Radio Observation Service to complainants and these forms had, apparently, not yet been completed and returned to AROS. This was the first official step which must be taken.

The President then closed the informal question and answer session, pointing out that there was a tight schedule to follow, since the Presidential Installation was to be held during the evening. He warmly thanked members of NARSA for their help in hosting the meeting, adding that the 1989 Council would be inviting proposals for the venue for next year's AGM.

The President's final task was to draw the ten winning lottery tickets. The Secretary announced that 148,000 tickets had been sold, the money for which had been invested in a fund which currently stood at £37,664.35.

The lottery tickets were then drawn by the President (see February issue of RadCom for details of the winners).

In officially closing the meeting Sir Richard thanked all those present for attending the meeting, wishing everyone a safe and pleasant journey home.



RSGB will announce a major new benefit for it's members
in next month's Radio Communication.

CONTEST NEWS

RULES

FIRST 28MHz CUMULATIVES 1989 RULES

1 The format of the Contest is unchanged from the second 28MHz Cumulatives 1988.
2 Eligible entrants: All entrants must be fully paid up members of the RSGB.
3 Dates and Times:
Session 1 Monday 10 April: CW 1900-2000; SSB 2030-2130.
Session 2 Tuesday 18 April: SSB 1900-2000; CW 2030-2130.
Session 3 Wednesday 26 April: CW 1900-2000; SSB 2030-2130.
Session 4 Thursday 4 May: SSB 1900-2000; CW 2030-2130.
Session 5 Friday 12 May: CW 1900-2000; SSB 2030-2130.
All times are GMT.
Frequencies: CW – 28·0 to 28·1 and SSB – 28·5 to 28·6MHz.
4 Sections: Single operator, transmitting only. If desired entrants may use a portable or alternative location but this must be the same for all sessions.
5 Contest exchange: RS(T), serial number starting with 001 on each evening running continuously through both modes and RSGB country codes. All times, reports, serial numbers and county codes sent and received should be logged. Incomplete logs will be treated as check-logs and not scored. Entrants may work stations world-wide. The same station may be contacted on both modes during the same evening. Each day is treated as a separate event apart from scoring. See (6).
6 Scoring: Three points per completed contact plus a bonus of ten points for each county, including entrant's own, and each new country outside the British Isles. Bonus points should be claimed for the same counties and countries in both CW and SSB on the same evening. Duplicate contacts will be penalised at 10X claimed score. Entries should be submitted selected by the entrant as folows:
a) Total of best three sessions from five – CW.
b) Total of best three sessions from five – SSB.
c) Total of best three evenings from five, CW and SSB (not necessarily a+b). An entry may be made for any one, any two or all three parts. A check-log for non-scoring sessions is most useful.
7 Logs: Standard RSGB HFC1, computer derived or prepared on the same format 40 contacts to an A4 page are all acceptable. A 'dupe' sheet or callsign list is not required. A list of counties and countries worked on each mode in each session is useful, to save paper if it is easier put it at the bottom of the log; if there is room! One standard declaration (HFC2) is sufficient to cover all sessions, it might help to draw up a table showing dates, modes and scores on the back of the HFC2 and then just pick out the scoring sessions, several entrants did this last time. Both modes for one evening can go on the same sheet, no need to leave a gap or split them up.
8 Entries must be postmarked not later than Tuesday 30 May 1989 and sent to the HF Contests Committee c/o J. Kennedy G3MCX, 22 Croham Park Avenue, South Croydon, CR2 7HH.
9 Awards: Certificates of merit will be awarded to the entrants with the highest checked scores in each of the three categories in (6) above. Further certificates may be awarded at the discretion of the HFCC if the entry for any category exceeds twenty.
10 Note: If the CW CQ is too fast, send QRS de own call or QRS ĪMĪ, the other op should slow down to any speed, you may be worth 13 points!

G3MCX

GENERAL RULES FOR RSGB VHF/UHF/SHF CONTESTS 1989

Feedback from members indicates that some clarification of rule 16 is needed. The second sentence should read: The final amplifier device(s) used must not be capable of a rated power output in excess of twice the power specified for the event or *twice* the legal limit, whichever is lower.

Where commercial transmitters are used, the manufacturer's maximum output power rating for the transmitter will be taken as the 'rated power output'. Where published ratings for amplifier devices do not contain data on the exact mode of operation being used, the published ratings or characteristics for the nearest similar class of service will be used. In multi-mode contests equipment ratings will be based on those appropriate for SSB operation. *G3XDY*

ROPOCO 1 CONTEST RULES

A new trophy which has been presented to the Society by the Verulam club will be awarded on a similar basis to the G3XTJ trophy award in Ropoco 2. Other than this, there are no changes to the rules for this very popular short CW contest.
1 Date: 0800-1000GMT Sunday 2 April 1989
2 Eligible Entrants: This is a single-operator contest open to all paid-up members of the RSGB resident in the British Isles holding a Class-A licence.
3 Frequencies/mode: CW in the IARU recommended segment between 3510-3550kHz.
4 Exchange: Send RST for the first contact plus entrant's own post code. For the second and subsequent contacts the postal code received in the previous contact should be sent. Contacts with stations outside the British Isles will not count for points.
5 Scoring: 10 points for each contact. Accuracy in logging and re-transmitting the *Postcode that has been received* is most important as points are deducted for logging errors.
6 Entries: Logs should be sent to R L Glaisher, G6LX, 279 Addiscombe Road, Croydon, CR0 7HY, postmarked not later than Monday 17 April 1989.
7 Awards: The new Verulam Silver Jubilee Trophy will be awarded to the highest placed entrant having the most accurate log. Certificates will be awarded to the leading three stations.

SOUTH MANCHESTER RADIO CLUB 'QUAD NIGHT DF'

Date: 11 March 1989.
Map: OS Sheet No. 109 (Manchester) 1:50000 series.
Assemble: 1900 GMT for 1920 GMT start.
Start: Lay-By on A57, ¼ mile South of M63 junction. NGR 748972.
Competitors requiring supper after the DF should advise David Yorke, 40 Edgefold Road, Worsley, Manchester. Tel. 061-790-4749 by 6 March.

MID-THAMES RDF CLUB – GT PECK MEMORIAL TROPHY EVENT

Date: 2 April 1989.
Map: OS Sheet No. 174 (Newbury & Wantage) 1:50000 series.
Assemble: 1300 BST for 1320 BST start.
Start: Ridgeway Path, East side of road at Bury Down. NGR. 480840.
Competitors requiring tea after the DF should notify Colin Metcalfe, 34 Millbank Crescent, Woodley, Reading, Berks. Tel. 0734-698073 by 26 March 1989.

G1MPJ

432MHz – 24GHz CONTEST RULES 432MHz, 1·3GHz, 2·3GHz TROPHY CONTEST RULES

All bands 432MHz – 24GHz 1400GMT – 1400GMT, 6 and 7 May 1989
432MHz Trophy period 1400GMT – 2200GMT, 6 May 1989
1·3GHz Trophy period 0600GMT – 1400GMT, 7 May 1989
2·3GHz Trophy period 0600GMT – 1400GMT, 7 May 1989
A new format for these Trophy events is being used this year, combined with the IARU coordinated contest in early May. Contestants can enter both the multi band 24 hour event and the trophy events, or just take part in the trophy contests.

The multi-band contest runs for the full 24 hour period, and there will be individual band tables and an overall table published, with certificates awarded to the band leaders and overall winners.

The first eight hours operation on 432MHz qualify for the Trophy contest. the 1·3GHz and 2·3GHz Trophy contests run concurrently in the last eight hours. It will be permissible for multi-operator stations to use a different callsign on 1·3 and 2·3GHz for the Trophy period from that used in the first 16 hours. Entrants should complete a 4422 Summary sheet if taking part in the multi-band event, and indicate whether they wish to take part in the trophy sections as well.

The general rules published in *RadCom*, January 1989, will apply. There will be two sections, section S for Single Operator Fixed Stations using one callsign on all bands, and section 'O' for all others, who may operate all bands concurrently using different callsigns. Scoring will be by the radial ring system on 432MHz and 1·3GHz, and at 1pt/km on other bands. Half points may be claimed for crossband contacts on and above 3·4GHz.

The following trophies will be awarded:
Overall winner, 432MHz Trophy section: 1951 Council Cup
Overall winner, 1·3GHz Trophy section: VHF Contests Committee Cup
Overall winner, 2·3GHz Trophy section: G6ZR Trophy
All entries and check logs to: VHF Contests Committee, c/o A J Collett, G4NBS, 10 Quince Road, The Limes, Hardwick, Cambridge CB3 7XJ.

144MHz & SWL CONTEST RULES

1400GMT – 1400GMT, 27 & 28 May 1989
The general rules published in the 'Operating Guide' supplement, *RadCom*, January 1988 will apply. There will be three sections, section S for single operator stations, section M for multi-operator stations, and section L for listeners. County and country multipliers will be used (general rule 14).

All entries and checklogs to: VHF Contests Committee, c/o D J C Bushell, G4WAD, Tanglewood, Bridge Street, Lower Moor, Pershore, Worcs WR10 2PL.

50MHz TROPHY & SWL CONTEST

0900-1700GMT 18 June 1989
The general rules published in Contest News, *RadCom*, January 1989 will apply. There will be three sections, section L for listeners, section F for Single Operator Fixed Stations, and section O for other stations. County and Country multipliers will be used in accordance with general rule 14.

The station with the highest overall score will receive the Telford Trophy.

All entries and check logs to: VHF Contests Committee, c/o D J Robinson, G4FRE, 15 Ferry Lane, Cavendish Park, Felixstowe, Suffolk IP11 8UR.

BERMUDA AMATEUR RADIO CONTEST

0001 18 March - 2400 19 March
Open to licensed amateurs in Canada, the USA, the UK, the FR of Germany and Bermuda only. All stations must be **single-operator only and must operate from their own residence or property**. Top winners for the 1984-1988 contests shall only be eligible for area awards. The contest covers 3·5 to 28MHz (no WARC bands), phone and CW may be used but no mixed mode or cross band QSOs are permitted. Contestants exchange RS/T plus (for UK) letters indicating their county, (for USA) state, and (for Canada) province. Bermudan stations will send report and parish. UK entrants work VE, W, and VP9. Each QSO on each band counts five points, and repeat contacts on a different mode may be made on the same band but with an interval of at least 30min. between them. The multiplier is the total number of Bermuda stations worked on all bands added together - the same station can be worked once on each mode on each band. Logs must show all times in UTC, and separate sheets must be used for each band and mode. All contestants must check their scores carefully and also check for duplicate QSOs. 'Dupe' sheets must be submitted by those who have made more than 200 contacts. Each page must be clearly marked with the entrant's callsign,

band, and date, and it is essential to enclose a signed declaration that the rules of the contest and the terms of the entrant's licence have been observed. Each unmarked duplicate will attract a penalty of three contacts and an excess will result in disqualification.

The top scorer in each province, state, parish or county will receive a printed certificate provided that a minimum of 100 contacts have been made. The top scorers in the US, Canada, FR Germany, and the UK will receive awards which will be presented at the RSB's annual banquet in October, and for this purpose round-trip air transportation and accommodation will be provided. All logs must be received by the Contest Committee, Radio Society of Bermuda, PO Box HM275, Hamilton, Bermuda HM AX, no later than 1100 on 1 June 1989 – please enclose IRCs and SAE if acknowledgement of receipt is required. If you think you might have won – send it all by registered air-mail – the prize is well worth it!

EAST MEETS WEST SSB CONTEST

0800-2200 18 March

Sponsored by the YLRL and open to "women operators throughout the world'. I can supply photocopies of rules.

CQ WW WPX Contest

0000 25 March - 2400 26 March (SSB)

1·8 to 28MHz (no WARC bands). QSOs with own continent count two points on 14, 21, and 28MHz, and four on 1·8, 3·5, and 7MHz. With other continents they count three and six respectively. Own country counts for multiplier credit only. The multiplier is the total number of different prefixes worked - each counts once only (see *WPX Award.*) Exchange RS and serial QSO number (from 001). There are single-operator single and multi-band and multi-operator multi-band single-transmitter sections. There is also a QRP section for those running no more than 5W output and entries in this class must be clearly marked 'QRP'. Single-operator entrants may operate for a maximum of 30h only and may take up to five breaks which must be marked in the log. Photocopies of the full rules should be available from me by now (SASE please,- but I do not have any contest stationery). *G3FKM*

24GHz CUMULATIVE CONTEST RULES

1500-2100GMT, 13 May, 8 July, 9 September

Except where modified below all the general rules for VHF/UHF/SHF contests contained in the January 1989 *RadCom* apply.

The two best scoring periods will be combined to give an overall score.

Stations operating from within the UK must state in their logs the national grid reference of all sites used.

There will be no limit on the number of antennas used for transmitting and receiving (rule 17 does not apply).

There will be one section for all entrants. Additional awards will be made to the leading foreign station and fixed station.

During each activity period, a station may change its location once. For the purposes of this contest the 'location' is defined as any point within a 5km radius of a fixed point. Contestants may start from a new location for each activity period.

Contacts will be scored at one point per kilometre. Half points may be claimed by both stations for a crossband contact if two way communication cannot be established on the same band. A full contest exchange should be given on both bands. All crossband contacts must be clearly marked as such in the respective logs.

Please do not send in logs until after the last event. All entries and checklogs to: The VHF Contests Committee, c/o D J Robinson, G4FRE, 15 Ferry Lane, Cavendish Park, Felixstowe, Suffolk IP11 8UR.

10GHz CUMULATIVE CONTEST RULES

0900-2100GMT, 16 April, 14 May, 16 July, 13 August, 10 September.

2000GMT 24 June to 2000GMT 25 June.

Except where modified below all the general rules for VHF/UHF/SHF contests contained in the January 1989 *RadCom* apply.

Entrants unable to be active for three periods are strongly encouraged to send in their logs as a record of their activity, but will not be eligible for an award. Such logs will be recorded in the results.

Entries from outside the UK will be accepted, whether or not they RSGB members.

Stations operating from within the UK must state in their logs the national grid reference of all sites used.

There will be no limit on the number of antennas used for transmitting and receiving (rule 17 does not apply).

During the cumulative period on 24/25 June a minimum of an eight hour continuous break must be taken.

There will be two sections, wideband and narrowband, which will be scored separately. Stations may operate in all sections if they wish. A given station may be contacted twice, once on each mode. In the case of crossmode contacts, the contact should be included in the section appropriate to the equipment used at your end. Serial numbers start at 001 and advance by one for each contact, irrespective of section. Additional awards will be made to the leading foreign station and fixed station in both sections.

During each activity period a station may change its location once. For the purposes of this contest the 'location' is defined as any point within a 5km radius of a fixed point. Contestants may start from a new location for each activity period.

Contacts will be scored at one point per kilometre. Half points may be claimed by both stations for a crossband contact if two way communication cannot be established on the same band. A full contest exchange should be given on both bands. All crossband contacts must be clearly marked as such in the respective logs. Please do not send in logs until after the last event.

All entries and checklogs to: The VHF Contests Committee, c/o D J Robinson, G4FRE, 15 Ferry Lane, Cavendish Park, Felixstowe, Suffolk IP11 8UR.

COUNTY ROUND-UP

This is a new contest taking place over a weekend, on both SSB and CW. It is similar in format to the now defunct Region Round-up with county codes replacing region numbers.

1 The General Rules of RSGB HF contests apply.

2 Eligible Entrants: All paid up members of the RSGB resident in the UK. Single operator entries only.

3 When: 08.00–11.00GMT – 20 May 1989 – SSB. 08.00–11.00GMT – 21 May 1989 – CW.

4 Sections: There are two sections, A – SSB B – CW. Logs may be submitted for either or both sections of the contest.

5 Frequencies: Contacts to be made on 3·5 and 7MHz bands. Section A SSB – 3·600–3·775MHz and 7·050–7·100MHz. Section B – CW – 3·520–3·560MHz and 7·010–7·040MHz.

6 Exchange: Report and serial number, starting 001 in each section (and incrementing by one for each contact) plus county code as published in January 1989 *RadCom*. NB: Overseas stations only send report and serial number.

7 Scoring: 3 pooints per contact. Each station may be contacted for points only once on each band during each section. Points can be claimed for contacts outside the UK. The final score is the total number of points on each band added together and multiplied by the total number of counties worked on each band added together. Each section to be scored separately. Scores for both sections count towards the HF championship.

8 Entries: Separate log sheets to be used for each band in each section. Standard HFC 1 log sheets (or ones identical in format) are to be used. A cover sheet and signed declaration (HFC 2) must accompany logs which should be sent to – PO Box 73, Lichfield, Staffs, WS13 6UJ and be postmarked no later than 15 days after the contest.

9 Awards: Certificates of merit will be awarded to each of the three leading stations in each section.

RESULTS

144MHz CW CONTESTS NOVEMBER 1988 RESULTS

Conditions for these contests were above average on Saturday evening but did not compare with the outstanding conditions of the November 1987 event. Best DX was achieved by G3PRC/P, the Plymouth Radio Club, with OE3JPC/3 at a distance of 1350km but this was exceptional. G4THB/P 'The Hill-billies' managed OK1KTL/P at 1015km. However the majority of DX was in HB9, DL and F. Operating standards were good overall with only one or two exceptions.

Certificates go to the winners of each section and entries in both the 6hr and 24hr sections have been sent to ARI (Italy) for the Marconi Memorial contest. As before many of the 6hr entrants have done well enough for a good placing in the IARU 24hr contest. Check logs were received with thanks from G3ZDM and G0HGA.

6Hr – Single Operator Stations

Pos	Call	Pts	QSOp	Loc	Best DX	Xm
1	G4BLX	24634	89	IO90WV	DK8ZB/P	711
2	GM4YXI	23224	75	IO84KX	F6GOE/P	784
3	G4RGK	21148	73	IO91ON	DK8ZB/P	760
4	G4ASR	20438	83	IO81MX	DK5WL	767
5	G0CLP/P	20279	77	IO84KD	FE6ACU	933
6	G3VIP	13064	42	IO93XN	DF7LJ	572
7	G3WRJ	7193	34	IO91UX	DL2KBM/P	507
8	G3KNU	4838	24	IO93QN	G3PRC/P	392

6Hr – Multi-Operator Stations

Pos	Call	Pts	QSOs	Loc	Best DX	Km
1	G5RS/P	21515	89	IO91TF	DK2XZ/P	696

24 Hr – Single-Operator Stations

Pos	Call	Pts	QSOs	Loc	Best DX	km
1	G4P1Q	74898	235	JO1MU	DL1MAJ	876
2	G3JXN	48966	163	IO91UM	DL8NBN/P	901
3	G3XBY	38959	147	IO92UG	HB9BZA/P	860
4	G4ZEC	38768	126	IO92MA	F6EAH/P	812
5	G40UT	20459	91	IO92AT	HB9BZA/P	916
6	G4AGQ	17841	49	IO91OF	DF3TT/P	771
7	G4ZVS	14630	79	IO92BK	DK0BN/P	726
8	G2DHV	3392	21	JO01BK	G4THB/P	430
9	G3JJZ	1958	8	JO01AJ	F6IOC/P	485

24 Hr – Single-Operator Stations

Pos	Call	Pts	QSOs	Loc	Best DX	km
1	G3PRC/P	103744	181	IO80AQ	OE3JPC/P	1350
2	G4XBF/P	92804	257	JO0IO	DL1MAJ	846
3	G4THB/P	83050	207	IO94RJ	OK1KTL/P	1015

IARU REGION 1 SSB FIELD DAY 1988

The activity must have been trebled on the HF bands this year, some groups operating on 14 and 21MHz particularly, were working USA and VE stations at a tremendous rate, add to that the fact that 28MHz also played its part with a good range of additional multipliers. 3·5MHz produced plenty of European contacts as would be expected but 7MHz was partially ignored by a lot of groups, being by-passed in favour of the rich pickings to be had on the higher frequencies.

Winners of the open section, Lichfield ARS (G3WAS/P) amassed nearly a million points with 176 multipliers, claiming 1,636 contacts. Over 350,000 points behind in second place are The Windy Yett Contest Group (GM5VG/P) whose total would have nearly been a winner last year, with Pontefract & D ARS (G3FYQ/P) relatively close behind in third place as they were last year.

The leading stations in the Restricted section achieved some good results, South Manchester RC (GD3FVA/P) and Liverpool DARS (GD3AHD/P) both emigrating to the Isle of Man for the event, and Torbay ARS (G3NJA/P) took the honours.

The prefixes listed in the logs reads like a DX chaser's paradise: ZL, VK, 6W, ZS, HK, HH, CE were but just a few that came to the surface in the contest on 14 and 21MHz particularly. One group remarked that they could have stayed on 14 for the whole 24 hours.

The adjudicator never ceases to be amazed that a group of people could spend a weekend in all kinds of weather and conditions, heaving antennas skywards, risking life and limb climbing trees and various other dangerous acts, to let the whole thing go to waste or be subjected to heavy loss of points by not checking their entry before submitting their logs or ensuring the person(s) responsible can count and know an unmarked duplicate contact when they see one. Whilst referring to loss of points, it may be of interest that over 200,000 points were lost totally.

As has been said in the past, the majority of logs were excellent, but still one or two let the side down. A good, clean presentation does help the adjudicators. A log scribbled out by three or four different people does nothing for anybody except to waste time and causes the checkers to lose their sense of humour. You need one of those when checking contests. Regrettably one entry has had to be disqualified for containing 16 unmarked duplicates on one band alone. Sorry, Ipswich RC!

The adjudicator wishes to thank those who wrote saying ▷

how much they appreciated the work done by the HF Contests Committee and to G3XEP/P and G4ZGO/P for their check logs.

Comments from entrants:

Spent three hours transmitting into useless aerial. Checked bands at home – OK. Barbeque was excellent on Saturday evening! – *Plymouth RC.*

An errant cow became 'legged up' in one of our guy wires bringing top of mast down. Managed to repair in time for kick-off – a near thing – *Central Lancs ARC.*

Strong winds and heavy showers dampened our enthusiasm in every sense and an ATC Commando exercise on our site (a double booking!) caused bit of a stir – operating station in the middle of a war zone quite an experience. Blackened faces peering through tent windows at 0100 served to reassure us we were not the only idiots in the open in such weather – *Windy Yett Group.*

Weather excellent – blackberries in field still needed one more week to be at their best – *Swansea ARS.*

BRS20249

Operators of the leading stations

G3WAS/P: G3KDB, G3LNS, G3NAS, G3NKC, G3NLY
GM5VG/P: GM3AXX, GM3NEQ, GM3NIG, GM4FDM, GM4YMA
G3FYQ/P: G4OSY, G4TLZ, G4ZVB
GD3FVA/P: G3SVW, G4HON, G0AOU, G0CBJ
GD3AHD/P: G4CVZ, G4VYR
G3NJA/P: G3HFG, G3LHJ. G4ELZ, G0BNJ

Open Section

Pos	Call	Group	Multi	Score
1	G3WAS/P	Lichfield ARS	176	964,656
2	GM5VG/P	The Windy Yett Contest Group	148	610,204
3	G3FYQ/P	Pontefract & D ARS	142	584,614
4	GM4AGG/P	West of Scotland ARS	136	508,096
5	GW4CC/P	Swansea ARS	117	482,742
6	G4SDP/P	Hell Hole Contest Group	112	460,208
7	G4ADD/P	FOF Contest Group	90	447,660
8	GW4NZ/P	Port Talbot ARS	95	403,560
9	G4HRS/P	Horsham ARC	120	402,840
10	G3SFG/P	Southgate ARC	95	321,385
11	GU3HFN/P	Guernsey ARS	77	288,057
12	G4ARN/P	Norfolk ARC	79	280,687
13	G3TBK/P	East Notts Contest Group	85	257,720
14	G3MDG/P	Chesham & D ARS	77	198,275
15	G3GHN/P	Clifton ARS	82	169,494
16	G4SJM/P	Ripon & D ARS	84	156,744
17	G3GLL/P	Colchester Radio Amateurs	65	153,270
18	G3GIZ/P	Chester RS	59	124,313
19	G3VGG/P	Bromsgrove & D ARC	71	111,612
20	GM4EAF/P	Perth & D ARG	48	107,088
21	G4RSE/P	Sears Contest Group	55	93,885
22	G4GXP/P	Kidderminster & D ARS	55	93,005
23	GJ3DVC/P	Jersey ARS	63	87,570
24	G3SRC/P	Surrey Radio Contact Club	43	84,925
25	G4FPQ/P	Stamford & D ARS	67	81,606
26	G4ECT/P	Cheshunt & D ARC	49	66,934
27	G3NFC/P	Burton-on-Trent & D RS	46	54,510
28	G3XZW/P	Taunton & DARC	21	5,901

Restricted Section

Pos	Call	Group	Multi	Score
1	GD3FVA/P	South Manchester RC	146	444,278
2	GD3AHD/P	Liverpool & D ARS	95	321,290
3	G3NJA/P	Torbay ARS	78	182,832
4	G3YDD/P	Hereford ARS	77	176,946
5	GD3RFH/P	Western Contest Group Isle of Man	90	173,250
6	G0FDX/P	Central Lancs ARC	73	151,621
7	GI3XRQ/P	Bangor & D ARS	78	150,072
8	G4WGE/P	Sutton & Cheam RS	69	145,866
9	G4FUH/P	Scunthorpe ARC	68	135,796
10	G3PGU/P	Stratford-on-Avon ARC	70	130,620
11	GM4TOQ/P	West of Scotland B	75	129,750
12	G4AYM/P	Gloucester ARS	57	119,130
13	G4FOX/P	Melton Mowbray ARS	69	112,815
14	GM0ADX/P	Kilmarnock & Loudoun ARC	59	111,569
15	G4JBR/P	North Devon Contest Group	72	100,080
16	G3PRC/P	Plymouth RC	52	92,976
17	GW4EZW/P	Newport ARS	53	89,464
18	GM3STU/P	Unst RC	53	75,684
19	GM3ZRC/P	Greenock & D ARC	42	70,224
20	GM0GNK/P	IBM Greenock ARC	40	57,400
21	G5LK/P	Reigate ATS	43	55,771
22	G6HC/P	Wimbledon & Coulsdon ARS's	66	52,734
23	G0AER/P	Hatfield Dynamics RC	37	51,319
24	G4XOM/P	North Worcestershire Contest Group	43	51,127
25	G3GXI/P	Eccles & D ARS	37	47,064
26	GM4LKJ/P	—	45	35,640

CONTACTS MADE BY THE HOUR

Hour	G3WAS	GM5VG	G3FYQ	GD3FVA	GD3AHD	G3NJA
1	77	27	38	30	39	13
2	103	49	117	42	94	54
3	98	68	84	42	93	47
4	81	69	90	34	60	45
5	86	85	87	39	78	27
6	43	76	70	33	55	12
7	71	64	71	21	34	18
8	76	44	57	20	35	5
9	86	49	63	43	18	19
10	112	45	39	37	13	61
11	81	78	42	38	11	35
12	78	44	43	12	27	27
13	94	35	38	39	19	16
14	53	22	31	37	27	26
15	51	51	22	22	37	28
16	44	44	41	20	16	6
17	48	31	25	9	33	7
18	41	34	28	23	33	19
19	53	22	16	41	41	17
20	53	52	15	33	33	17
21	41	28	36	45	29	26
22	67	75	59	64	38	14
23	49	59	52	56	42	22
24	50	65	69	67	48	19
Total	**1,636**	**1,216**	**1,233**	**857**	**953**	**580**

'Hell Hole' Contest Group's field day site. On the occasion of the IARU's Region 1 SSB Field Day 1988.

SECOND 28MHz CUMULATIVE CONTEST 1988 RESULTS

All three sections had very clear winners, the CW and again the combined by Mick, G4WQN and the SSB by Steve, G0KBB (G4VMM). The log-keeping was very good, few errors were made and in many cases considerable time had been taken to produce excellent logs. The entry was encouraging and comments made on the log and elsewhere point to an even better entry next time.

Most entrants used transceivers but there was quite an assortment of aerials, G4WQN used a four element Yagi at 50ft, G0KBB with the highest single mode score used a homebrew four element wide spaced Yagi at 75ft, G0CEI had a Western DX 34 at 40ft, and G4AGQ/M had a 5ft 6 inch firestik on the roof of his car. Others used 5RV's, dipoles, verticals, long wires and ground planes. Only session four produced a fair amount of DX with just a little at the start of session three.

To those who asked about the lack of G0's or activity in the north there appear to be about 25 stations active mostly in YSW & YSS, about half of them are G0 who seem to work each other. There is activity spread right across the south and a smaller group in the middle. The entrants in the middle are able to work all three groups but north and south rarely make it and few east, west contacts are made across the large area of the south.

Most other comments refer to the time and duration of these contests, could it be earlier to catch more DX, could we go back to two hours now that there is more activity, could we run it over ten weeks alternate CW and SSB with two hour sessions. An article could be written on how the half hour break is spent!

Jim G0HGH thanks all operators for slowing down to his speed, these are practice sessions and advice will be given if considered useful. Thanks to all who took part and sent logs in, see you all next time, please carry on recruiting. Footnote: G3WRR apologised for the paw prints but cats like to help in log production. *G3MCX*

2nd 28 MHz CUMULATIVES 1988

(a) BEST 3 – CW

Pos	Call	County	10/10	18/10	26/10	3/11	11/11	Pts
1	G4WQN	NOT	210	155	174	CK	–	539
2	G4WYG	KNT	CK	147	164	149	CK	460
3	G4WVX	BKS	121	140	155	CK	CK	416
4	G3BFP	LDN	–	–	143	152	109	404
5	G3JJZ	LDN	CK	114	CK	138	138	390
6	G0BON	BRK	126	134	114	CK	CK	374
7	G3MCX	LDN	121	CK	122	128	CK	371
8	G4AGQ/M	SXW	139	CK	CK	115	111	365
9	G6NK	SRY	112	118	120	CK	–	350
10	G3WRR	LDN	CK	CK	89	128	122	339
11	G30ZT	HPH	136	96	84	–	–	316
12	G4XRV	BKS	–	100	87	CK	86	273
13	G0DJF	HWR	71	58	77	CK	CK	206
14	G0HGH	BKS	CK	–	43	74	89	206

(b) BEST 3 – SSB

Pos	Call	County	10/10	18/10	26/10	3/11	11/11	Pts
1	G0KBB	LEC	CK	346	CK	264	239	849
2	G0CEI	OFE	–	282	–	203	208	693
3	C4WQN	NOT	CK	202	152	245	–	599
4	G4WYG	KNT	170	CK	CK	157	151	478
5	G4WEY	DOR	–	–	165	139	133	437
6	G0EZL	LDN	127	CK	132	CK	148	407
7	G4MET	HWR	–	216	84	–	84	384
8	G4AGQ/M	SXW	170	CK	CK	90	122	382
9	G3MCX	LDN	122	CK	116	100	CK	338
10	G3JJZ	LDN	CK	CK	83	116	119	318
11	G0DJF	HWR	CK	97	100	CK	83	280
12	G3WRR	LDN	96	CK	90	87	CK	273
13	G3OTE/P	MCH	–	–	77	112	47	236
14	G0HGH	BKS	CK	–	39	68	99	206
15	G4XKC	YSW	66	–	60	–	76	202
16	G3BFP	LDN	–	–	76	–	93	169

(c) BEST 3 – EVENINGS

Pos	Call	County	10/10	18/10	26/10	3/11	11/11	Pts
1	G4WQN	NOT	CK	357	326	353	–	1036
2	G4WYG	KNT	317	CK	301	306	CK	924
3	G4AGQ/M	SXW	309	CK	CK	205	233	747
4	G3MCX	LDN	243	CK	238	228	CK	709
5	G3JJZ	LDN	CK	191	CK	254	257	702
6	G3WRR	LDN	CK	CK	179	215	206	600
7	G3BFP	LDN	–	–	219	152	202	573
8	G0DJF	HWR	141	155	177	CK	CK	473
9	G0HGH	BKS	CK	–	82	142	188	412

Checklogs received with thanks from G3CXM, G0CKP, G0FUV and entrant's extra evenings marked CK in the tables. *G3MCX*

RSGB DG National Final. Presentation to winner, Andy Collett, of the Dartford Heath Club, 18 September 1988. (Results and write up in February *Rad Com*).

50MHz TROPHY CONTEST RESULTS

This contest was well supported in both sections and the recent explosion in activity on 50MHz was reflected by a trebling in the QSO totals of the leading stations relative to last year. A total of 585 different callsigns appeared in the logs, broken down as follows:G-499; GB-1; GD-3; GI-2; GJ-5; GM-17; GU-2; GW-23; (Class A licensees – 263, Class B-289); EI-1; F-5; PA-24; ZS-2; 5N-1. Perhaps that will answer the contestants who claim that there are no GW, GI, etc, stations active! GW4MGR/P commented on the gentlemanly attitude found on the band, very akin to 4 metres.

Conditions were described as average to better than average over mainland Britain and as very poor in the Channel Islands, with much QRN from a local car rally. Some excitement was provided for a select few by openings to South Africa and Nigeria, G3GJQ/5N28 working 28 stations in the UK, France and Portugal between 13-48 and 14-23 hours. Contacts in the UK were into IN89, IO90, IO91 and JO01 squares only, a fact which encouraged many contestants to make known their approval of the 25 point maximum rule! Such privileged contacts probably would have distorted the results if normal scoring had been used. GJ41CD claimed a GJ-5N first on 50MHz. The check log from G3GJQ/5N28 was very interesting and helpful, although, as a result of cross-checking, a few contestants may be disappointed to find that their QSOs were invalid.

The standard of logging was generally good and all contestants provided reasonable multiplier check-lists. However this is still an area where conformity would be useful and some contestants should note that certain countries, eg GJ, count as both country and county multipliers. If there was a prize (which there isn't!) for the most comprehensive and useful check-list, it should go to G4THB/P whose efforts would make a good book!

Congratulations to all the winners and runners-up. Certificates will be awarded to G4KUX and GJ4ICD in the Single-Op Fixed Section and to G4THB/P (ops – G4UJS, G4XUM) and GW4MGR/P (ops – G0JSB, G3UVR) in the Open Section. Subject to Council approval, the Telford Trophy will be presented to G4THB/P.

G4WAD

All Other Stations Section

Pos	Call	Pts	Multi	QSOs	Loc	Best DX	km
1	G4THB/P	150684	58	270	94RJ	GJ41CD	584
2	GW4MGR/P	146853	63	308	83JA	PA3BYI	566
3	G1CWP/P	129642	62	294	90WV	ZS3AT	8334
4	G4BVY/P	94164	57	228	82LB	GM3WOJ	620
5	G3UUT/P	84040	55	195	94KH	GM3POT/A	524
6	G4RFR	41308	46	147	90AS	G3GJQ/5N28	5000
7	G4ZTR/P	30708	36	125	01PU	PA0OOS	393
8	G0FSF/P	28200	40	143	93AD	–	–
9	G4DDW	25543	41	153	92KK	GM0CLN	331
10	G8VOI/P	20824	38	104	90KX	G3GJQ/5N28	4900
11	G3LRS	19760	38	114	92KP	G8VOI/P	273
12	GW1TCH/A	8484	28	47	82FJ	G4THB/P	298

Checklogs received with thanks from G3GJQ/5N28, G3MY, G8XZW, and G1LAM.

Single-Operator Fixed Stations Section

Pos	Call	Pts	Multi	QSOs	Loc	Best DX	km
1	G4KUX	104888	56	197	94BO	GJ4ICD	597
2	GJ14ICD	71714	46	143	89WF	ZS6XJ	8800
3	G3XBY	63130	59	220	92DG	PA0RDY	447
4	G3JXN	58956	51	213	91UM	–	–
5	G4AHN	49873	53	188	91OE	–	–
6	G4UXC	33764	46	163	92BC	GJ4ICD	319
7	G6IAT	28152	46	134	91TV	GD3AHV	378
8	G8BFL	20623	41	113	92BQ	G0FAJ	230
9	G3XTT	18603	39	116	91MM	G3GJQ/5N28	5000
10	G3TCU	16150	38	102	91QE	–	–
11	G4NBS	15804	36	95	02AF	GJ4ICD	366
12	G1YNR	10260	30	76	93QN	G1CWP/P	298
13	G1DWQ	6832	28	56	90AT	G4THB/P	409
14	G8JXV	5448	24	55	91VE	G4KUX	396
15	G3ILO	5000	25	37	81VQ	G4KUX	324
16	G8DXC	4914	26	32	02DL	GJ4ICD	398
17	G6MKK	4671	27	45	91JS	G4KUX	319
18	G4LDR	4524	26	34	91CD	G4KUX	384
19	G7ANH	4510	22	32	01PX	GJ4ICD	389
20	G4XCS	4316	26	36	82QA	GJ4ICD	312
21	G8GMC	3800	25	40	82XO	G1CWP/P	231
22	G0BJU	3565	23	41	93FJ	G1CWP/P	278
23	G8ORG	3504	24	35	83UC	G1CWP/P	290
24	G4LRT	3360	24	29	92KJ	–	–
25	G1HSK	3171	21	33	93MQ	G4AHN	278
26	GM8MJV	2904	22	22	85LW	G4BVY/P	431
27	G5UM	2772	22	30	92MP	G4KUX	142

CONTESTS CALENDAR

RSGB HF CONTESTS

25,26 Feb	7MHz CW (Oct88)
11,12 Mar	Commonwealth Contest (Jan 89)
2 Apr	Ropoco 1
9 Apr	50MHz Fixed (Jan 89)
10 Apr	28MHz Cumulative
16 Apr	Low Power Fixed (Feb 89)
18 Apr	28MHz Cumulative
26 Apr	28MHz Cumulative
4 May	28MHz Cumulative
12 May	28MHz Cumulative
21 May	Region Roundup
3,4 Jun	NFD/Region 1 CW Field Day (Feb 89)
24,25 Jun	Summer 1·8MHz (Apr 89)
8,9 Jul	SWL (May 89)
16 Jul	Low Power Field Day (May 89)
6 Aug	Ropoco 2 (Jun 89)
20 Aug	Hopscotch
2,3 Sep	SSB Field Day (Jul 89)
8 Oct	21/28MHz Phone (Jul 89)
9 Oct	28MHz Cumulative
15 Oct	21MHz CW
17 Oct	28MHz Cumulative
25 Oct	28MHz Cumulative
2 Nov	28MHz Cumulative
10 Nov	28MHz Cumulative
11 Nov	1·8MHz SSB Clubs
11 Nov	Club Calls Contest 'CCC' – all modes & SWL (Sep 89)
18,19 Nov	Second 1·8 MHz CW (Sep 89)

Region Roundup and Hopscotch are under review and may be replaced with similar type events. Please watch *RadCom* for further information

RSGB VHF CONTESTS

26 Feb	70MHz Cumulative (Jan 89)
4,5 Mar	144/432MHz & SWL (Jan 89)
11 Mar	South Manchester Quad Night DF
12 Mar	70MHz Cumulative (Jan 89)
26 Mar	70MHz Cumulative (Jan 89)
9 Apr	50MHz Fixed (Jan 89)
16 Apr	Spring VHF/UHF RTTY (Feb 89)
9 Apr	10GHz Cumulative
23 Apr	70MHz Fixed (Feb 89)
6,7 May	432MHz-24GHz Trophy Contests & SWL
14 May	10GHz Cumulative
27,28 May	144MHz & SWL
17 Jun	144MHz Low Power & SWL
18 Jun	432MHz Low Power & SWL
18 Jun	50MHz Trophy & SWL
25 Jun	10GHz Cumulative
1,2 Jul	70MHz Cumulative
1,2 Jul	VHF NFD
16 Jul	10GHz Cumulative
5 Aug	144MHz Low Power & SWL
5 Aug	50MHz Trophy & SWL
6 Aug	432MHz Low Power & SWL
13 Aug	10GHz Cumulative
2,3 Sep	144MHz Trophy/IARU VHF & SWL
10 Sep	10GHz Cumulative
17 Sep	70MHz Trophy & SWL
7,8 Oct	432MHz-24GHz/IARU UHF/SHF
13 Oct	432MHz Cumulative
21 Oct	1·3/2·3GHz Cumulative
29 Oct	432MHz Cumulative
4,5 Nov	144MHz CW
6 Nov	1·3/2·3GHz Cumulative
14 Nov	432MHz Cumulative
22 Nov	1·3/2·3GHz Cumulative
30 Nov	432MHz Cumulative
3 Dec	144MHz Fixed & AFS & SWL

OTHER CONTESTS

25,26 Feb	French HF SSB Contest (Jan 89 HFN)
18 Mar	Bermuda Amateur Radio Contest (Mar 89)
18 Mar	East meets West SSB Contest (Mar 89)
20 Mar	BARTG Spring RTTY (Feb 89)
25 Mar	CQ WW WPX Contest (Mar 89)

First Tuesday each month 144MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)
First Thursday each month 432MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)
First Monday each month Microwave Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)
Dates of publication of rules in RadCom are shown in parentheses.

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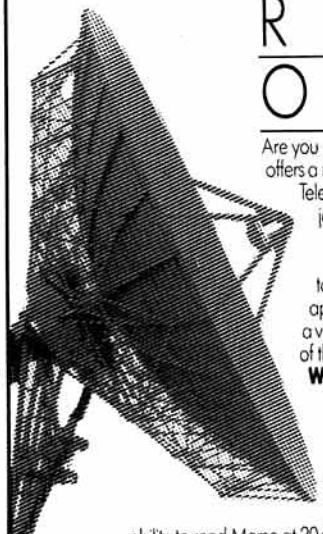

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RADIO COMMUNICATION

INDEX TO VOLUME 64 - JANUARY TO DECEMBER 1988

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● B28, RX640, RF26, IF1355, Wilcox Gay VFO, VCR97, MU104, EKCO M23, RX1132, 1132PSU, AR88D handbook, incomplete BC457A, incomplete BC453, Pye reporter, faulty Magnox tape machine, two dials type ZC28283, Codar PR40, books, valves. Offers, enquiries. G3KTH QTHR. (Droitwich) 0905 774624.

● FT101E spare valves: £260. Prefer collect deliver North East only. Guitar effects, pedals. Ross chorus. Vorg flanger delay. Also sequence memory rythym unit: £20 each. G3KMH QTHR.

● MICROWAVE modules cvtrs MMC137/28: £22. MMC432/28: £25. MMC50/28, MMC50/144, MMC70/28, MMC144/28: £20 each. MM4000 RTTY: £95. Timestep satellite interface with satpic rom for BBC: £65. Scarab RTTY modem: £40. Yaesu YC305D 250MHz counter: £40. G3BHT QTHR. 021-308 4764.

● SX200 scanner: £150. Fortop video demodulator: £10. Ant B/W monitor 8in: £45. AVO CT378A sig. gen. as new: £30. Jaybeam 5XY/2m unused: £20. 8XY/70cm unused: £30. G3BHT QTHR. 021-308 4764.

● RADCOM mags for the last 25 years c/w indices. June 1962 to Dec 1987. GW3PXY QTHR. 0970 828310.

● TS940S mint with MC60 mic. Instructions: £1600. Hallicrafters Super Skyrider VGC: £75. (Haywards Heath) 0444 458390.

● FT101ZD 9-band, FM, fan, unmarked: £500. FT101EE CW filter, GC: £310. Icom 04E 70cm H/H charger, speaker mic, case, VGC: £210. G0FJO QTHR. (Weymouth) 0305 779028.

● BBC Master 128 plus rom extender cartridge. Manuals rom/disk software: £190. Colour monitor Microvitec 1451. Resolution exceeds Master requirement: £110. Twin 800K drives 40-80 track fitted Acorn plinth, computer slides under monitor above: £90. 9 mths old. John. 0525 376269.

● SOTA 432/28 tvtr, 10W, 4MHz coverage, VGC, reasonable offers? John G4HGT. 0532 665581 eve.

● FT101ZD exc.cond: £395. Kenwood TR7850 as new: £180. PSU: £15. All aces, manuals, packing etc. Capco, SPC 3000 ATU: £195. Prefer buyers inspect and collect or carr. extra. GW3CBA QTHR. 0444 741520 anytime.

● TRIO TS820 fitted digital display, HF tcvr with mic, good cond: £400. Datong UC/1 up-conv: £75. G3PLX type RTTY unit with built-in keyboard, additional memory fitted. Space for TV. All tech info supplied: £20. G3MNV QTHR. 02372 74564 eve-w/e.

● IC740 with keyer, calibrator, all filters fitted: £775. PK64 packet, RTTY, AMTOR, CW adaptor for C64: £175. Miracle modem (V21/23), cartridge for C64: £50. KR400RC rotator: £110. Orig. handbooks for TCS6 and R1154/5. Offers? G3TUX. 0428 61515.

● FT290RII, nicads, charger, case, 25W linear mobile mount, ext. spkr, boom mic, PTT switch unit. All Yaesu gear. Raycom 12A PSU, gutter mount 5/8 whip HB9CV: £450. Kenwood SP230 spkr with filters: £30. G4ISO QTHR. (Baldock) 0462 892765.

● TS711E mint cond. Now unused due to class a call. Very clean, no box hence: £695 ono. Buyer collects. 2m a treat, not so hot on HF! Could deliver reasonable distance if pushed! Was G1AGS not QTHR. (Milton Keynes) 0908 643358.

● KENWOOD TS830S, AT230, SP230, extra filters fitted, spare 6146B PA valves, MC50 desk mic: £800. Will split. G0COY QTHR. 0533 773908 or 0836 745763.

● KENWOOD TM221ES 144-146 FM mobile tcvr. As new cond. See review Dec Radcom: £230. G0COY QTHR. 0533 773908 or 0836 745763.

● YAESU FT102 AM/FM fitted, repeater t/burst, FV707DM digital VFO U/D scan 12 memory. FTV107R tvtr c/w 2m mod. SP102 spkr, K/wood MC35S fist mic. All manuals, will not split: £895. Nentone 12A PSU VHF supp: £60 ono. Brian, G1UWV QTHR. 0425 615860.

● UNIDEN 400 tcvr. 40 channels FM band. Brand new, boxed: £80. Hi-gain Silver Rod aerial: £15. RS85809. (Bournemouth) 0202 872085 eve.

● KENWOOD TS780 VHF/UHF all-mode tcvr: £625. Yaesu FRG7 rcvr. Timestep digital display, mechanical filter: £125. Microwave Modules MML432/50 70cm 50W linear: £125. Complete 10GHz station based on Mutek GDIF107ub and Solfan Gunn with 18in dish: £65. G8JAY. 0242 578914.

● FT101B good cond: £250. G4AEP QTHR. (Wokingham) 0734 786870.

● PYE PMR equipment F401AM basestation. T/T and line control high band: £275. PF2AM handportables H/B. c/w batts, cases etc: £45. BC10A single charger: £15. BCII 10-way charger: £45. Postage at cost. GM4HWO QTHR. 031-336 5917 after 6pm.

● FT290R: £230. FRG7: £130. M1ZUHO MX2: £60. Colour Genie with software: £100. Jaybeam 8 over 8 yagi: £10. All boxed and mint cond, except aerial. G6STD QTHR. (Newbury) 0635 23262.

● PMR equipment PF1 UHF TX/RX units with batts: £20 pair. Storno 813 VHF 150MHz 25kHz handportable less case aerial battery: £45. Storno 813 for spares: £10. Postage at cost. GM4HWO QTHR. 031-336 5917 after 6pm.

● YAESU FT101ZD tcvr mint cond. MK3 fan. WARC bands worked the world. Upgrading station. Prefer buyer inspects and collects. New PA's and driver: £500. G0EYN QTHR. (Mansfield) 0623 556509.

● TRIO TS7000 2m multimode: £250. Valve linear for 2m. 2X4CX250B with PSU: £250. KW2000B HF tcvr with AC and DC PSU's, Shure 201 mic, Datong RF clipper: £200. Adonis AM5036 desk mic: £30 KR400RC rotator: £90. G3MEW QTHR. (Portsmouth) 0705 820315.

● 2 9ele Tonnas with phasing harness: £30. Cirkit masthead preamp for 2m: £30. 13.8V 30A PSU: £50. Adonis noise cancelling mobile mic: £15. G3MEW QTHR. (Portsmouth) 0705 820315.

● TRIO TS711E 2m multimode basestation. 25W variable output. Exc. cond, c/w orig. packaging: £550. G0EVU QTHR. 0480 216442.

● YAESU FT747GX immaculate cond. c/w heavy duty PSU, mic, swr meter. Phones and Datapost carr. Rig inc. FM/AM and CW filters: £695. G4YDM QTHR. 091-416 2606.

● RACAL professional rcvrs, realigned and in GWO. RA1218 transistorised 5 bandwidths, digital readout: £250. Manual: £15. RA17MkII with dust cover: £110. Manual: £10. Buyer inspects, air tests and collects. G4POL QTHR. 0993 813046 eve-w/e.

● TRS80 Mk3 48K, twin disk, books, some software. Bargain at: £100 or will exch. for MM 100W VHF out, 1/3W in amp or similar. Richard G1ZSN. (Stockport) 061-430 7515 between 8.30 and 10pm.

● SILENT key Trio HF tcvr TS530SP 100W, used once: £600. 2m IC271E tcvr fitted preamp AG20, service manual, new 25W multimodes: £550. Multitester, TMK 500 analogue, new: £25. 5A PSU: £10. All boxed as new. G1LCA. 091-413 8613.

● DRESSLER D200S 2m linear, 4CX350A valve. GWO with manual and spare fuses. Going QRT forces reluctant sale. Offers around: £450. Buyer collects or arranges carr. G4MVR QTHR. 01-857 0083 eve.

● TRIO TS130V: £350, linear SL250DX: £60. DFC230: £50, SP120: £20. All exc. cond, manuals, boxes. Meon 6m/2m tvtr: £30. Crofton 9in green monitor: £30. G4GRU QTHR. 061-440 0556.

● TRIO 9130 2m multimode. MM 100W 2m linear: £450. Kenwood TS530SP, AT2300 ATU. Unused on transmit: £700. SEM QRM eliminator: £30. Kenwood swr/pwr dual meter. SW200: £70. Revex wave monitor scope: £175. GW7AOH QTHR. (Pembroke) 0646 686112.

● SONY ICF7600DS rcvr. Mint, unwanted gift: £105 ono. (Weymouth) 0305 773240.

● TS430S FM, narrow CW, BNOS 25A PSU, Amtech ATU: £700. Amstrad 6128 green monitor, Amstrad DMP3160 printer, lots of software: £300. FT2700RH, voice synth, duplexer, dual-band aerial: £300. 0983 755383 after 6pm.

● FISHER 1220X. Discriminating automatic ground reject motion, metal detector. Mint cond, boxed, c/w coil cover, detector stand, carry bag and manual. Buyer collects or Securior: £200. G4AUS QTHR. 0533 25507.

● G2DAF QRO linear 80m-10m. Built-in PSU 400W out all bands. QYA400 plus spare. Int c/o relay vacuum variable. Fully metered: £175. Or swap Trio ATU. G3MGW QTHR. 020630 2382.

● EDDYSTONE 770U/R: £25 each SDK 10.69350MHz xtal filter with carrier xtals. 2.4kHz BW 6dB/60dB 4.3kHz: £12.50. Another MCF/10M4S 10.695MHz: £7.50. Ideal SSB Homebrew projects. Advance DI/D sig.gen. 10-500MHz, minus lid otherwise OK: £20. Collect heavy items. Add postage. G3MOE. 0242 524217.

● £50 buys a DNT 10FM rig 29.310-29.700MHz. Brand new. Warranted air tested OK. TR8400 70cm tcvr, little used, orig. packing: £250. Datong D70 morse tutor, as new: £38. All postage inc. G4SNO QTHR. 0562 710817.

● Sommerkamp FL200B TX. Exc. cond. 240W SSB, CW: £120 ono. G0DTR. 091-273 5320.

● RADIO site. Much land for antennas, no planning problems, quiet country location: £53,000 ono. Sale to include 3/4 bedroom detached residence with self-contained annexe, full oil CH, partial DG. Panoramic Welsh mountain/sea views. GW4BZD QTHR. 0248 600241 eve.

● JST125 100W HF tcvr as new: £850. Trio TS700 all-mode AC/DC powered tcvr 10XLS fitted: £225. 14ele Cushcraft boomer ant: £25. FT230R 5-25W 2m FM and 5/8in mag mount: £185. All cartons and manuals. Mint cond. G4LFB QTHR. 0707 329756.

● TONO 2m linear 100W output, 10W input: £85. G0IIQ not QTHR. (Grimsby) 0472 750480 after 7pm.

● 100W AM TX model DX100: £50. Steve. 0254

823305.

● SOMMERKAMP FT277ZD (FT101ZD) with FM, narrow filter, 12-bands: £425. Yaesu FC902: £110. Mutek TVVF144A tvtr: £125. Yaesu FRG7 inc narrow filter: £125. Kent 1AB1C keyer: £55. Pac Comm TNC220: £100. Brass key: £10. 25A PSU: £50. Trio function pwr meter PF810: £40. 4ele quad 2m and rotator: £40. HF5: £35. G0AWY. (Harlow) 0279 445718.

● ICO2E FM tcvr c/w battery 1/4 wave, spkr, mic, nicad charger: £185. G0ESZ. 0233 629685.

● YAESU FT480R 2m multimode: £290. FT780R 70cm multimode: £300. FT290R inc case, nicads, charger: £240. Microwave Modules MML432/50 70cm 50W linear: £100. All equip. boxed and in exc cond. G0IVA. (Stockport) 061-456 8499.

● FT290R with Mutek front end, nicads and charger, soft case, rubber duck, immaculate cond. with orig. packing and manual: £260. Datong morse tutor: £30. G4YIL. (Cambridge) 0954 210762.

● TRIO 9000 2m multimode c/w BO9 base and mobile bracket used as basestation only. Good cond: £350. Buyer collects. G0DLQ QTHR. 0602 640007.

● FT708 70cm H/H, YM24 spkr, mic, 2 battery packs, charger, helical, manual, boxed: £150. G8NWR QTHR. (Evesham) 0386 750380.

● TRIO TS830S. Mint, boxed. KW107 Supermatch ATU. The two: £800. 0302 859451.

● OLD fashioned straight key. Prefer large and heavy. Also wanted, electronic keyer. Prefer single paddle or squeeze keyer. GW3YTL QTHR. (Ruthin, Clwyd) 4010 eve.

● ICOM AT100 ATU: £200 ono. TA33J tri-band: £90. NAG 144XL VHF amp: £350 ono. Kenwood VC10 VHF converter, boxed: £90 ono. Met 4-way VHF splitter, as new: £25. 2 10ele Tigers splitter cables, spares: £60. G0IAS QTHR. 0777 83647.

● MICROWAVE Modules MML144/100LS 2m linear 1 or 3W in, 100W out. Little used. VGC: £125. G1YJI QTHR. 01-882 2351.

● FT7B HF tcvr. VGC. 50W output. Works well: £310. G0DOE. 01-391 0514.

● ALL valve SSB equip. KW77 HF RX: £80. KW Viceroy HF TX and PSU and mic: £90. Both in working order and handbooks. If both purchased, will deliver free to 100 miles from Wickford, Essex. G3PZZ QTHR. 0268 732791.

● JAPAN Radio Co (JRC), JST125 tcvr, NBD500 PSU, tested only, brand new, boxed. Superior quality equip at: £975 ono. 0602 609345.

● VERSAPOD, flat roof mounting for HF/VHF, dish antenna's specially designed by Strumech. Heavy-duty triangular lattice tripod, 5ft base footprint, H2R rotor head unit, KS065 thrust bearing, galvanised, free-standing 10ft6in height, plus stub mast. Drawing available. As new, offers. 0602 609345.

● ALTRON tilt-over telescopic mast 45ft with ground post: £300 ono. Western 3ele triband beam: £100 ono. GM4BWT QTHR. 031-449 4421 eve.

● HEATHERLITE 2m Explorer amp 4CX250B valve, boxed: £425. FC707 ATU boxed: £100. 2m tvtr F2V107R boxed: £150. Kenwood PS430 PSU, SP430 spkr: £150. 2m 19ele Met antenna: £35. Mike G1UAX. (Herts) 07072 65025.

● BNOS LPM 144-10-180W linear amp. Immaculate cond: £180. Alan G1TFH. 091-483 4876 after 6pm.

● MUTEK 50MHz tvtr TVVF50A. 10W on 6m from your 10m rig. All-mode. Exc.cond: £190 inc postage. Also Seikosha GP100A printer, with Centronics (parallel) interface. Suits most computers: £55. G1OJX. 01-894 2507.

● DRAKE R4C GWO: £300. Jon, G4AOS not QTHR. 091-236 2013.

● EXCHANGE stereo system, cost £850 plus, worth approx £350 for FT290, Mutek, nicads etc or other 144MHz multimode. May consider FT790 or FT690. May be possible to deliver within 100 miles of Kings Lynn. Dave. 0553 761943.

● TEMPO 2002 2kW 2m amp, mint cond: £850 ono. K2RIW 70cm linear amp kit of parts for RF section. All metal work chassis, silver plated anode and grid lines, 2 new Eimac 4CX250B's, 2 new Eimac 620 UHF bases: £250 ono. Yaesu FTV 2m tvtr module: £70. Yaesu YC1000 data logger frequency, volts, temperature digital display and paper hard copy: £250 ono. SMC RF speech processor: £20. 6m Microwave Modules 6m preamp: £20. G4CCZ QTHR. 0932 240688.

● YAESU FT101 with FM and 27MHz xtals: £250. Einstein 64k twin disk computer spreadsheet WP and books. Sharp pocket computer, micro recorder/printer unit plus software: £45. 0773 715525.

● IC730: £450. IC740: £550. IC402 (3SK97 Dubus): £200. IC202: £90. 12V.20A PSU: £60. Mutek TVVF144a (1 mth old. Cost £350): £250. New M57762 20W 23cm PA: £60. PA0LPE 2m-23cm PCB: £9. All VGC gone H/B). David. 0778 425367.

● AQ6 2ele minibeam 10-15-20 with rotator. Never used: £150 ono. Mark. (Biddenden,Kent) 291075 after 7pm.

● YAESU FT980 MDI, mic. Little used: £1000. FT209H new FNB4 cell, spkr, mic, YH2 mic, headset, NC15 base charger, PA3 car adaptor, Welz 2DB antenna: £275. Hi-mound marble base, key: £30. All ono. G4XJI QTHR. 0527 25928 or 45158.

● FT707: £325. FC902 ATU: £100. Linear Sommerkamp SL250DX: £90. 12 GBC PSU, mobile mount for FT707: £20. Digital counter Venner TSA6636/2: £25. 200kHz standard RX 1-10MHz: £10. Professional rcvr HF Telefunken type E724 kW/2: £85. Pye Westminster, working: £25. Stornophone CQM700 with remote unit and test ass. Ideal 2m conv: £50. ICZE 2m hand portable: £60. Mobile mount for ICZE: £15. 0480 810927 eve.

● YAESU HF tcvr T301D, 1.8-30Hz, all transistorised, 200W input, digital frequency readout 12V or mains voltage, SSB, CW, AM and FSK. All filters: £390. Trap vertical for 10-15-20m: £28. G4IRD not QTHR. (Northampton) 0604 44341.

● KENWOOD PS430 DC PSU. Little use in conjuction with TR9130 2m rig only. Orig. literature and box. Mint cond: £120. G4WIA QTHR. 0406 350835 after 5.30pm or w/e.

● KENWOOD TR751E 2m multimode, as new. Still under waranty, c/w mobile mount and boxed: £499 only. G0JXZ QTHR. 021-748 7851.

● FDK multi 750 multimode. Good cond. 2.5W and low output. Can be adjusted to 20W max. One owner, c/w mobile mount, inst. book and orig. packing: £200. G1LUN QTHR. (Leeds) 0532 676949.

● UNIDEN 28/30 with MM 2m tvtr. 10W multimode operation on both bands for only: £299! Pair of 8in disk drives (new) with PSU. Nascom 1, cased. Offers. G4HUP QTHR. 0473 37320.

● BERETTA 686 sporting multichoke u/o 12 gauge 28in/2.75 in mint cond: £650. Would consider HF tcvr FT757GX Mk2 or 2m/70 basestation. Also have FT902DM, FC902 ATU, FTV901R 2m/70cm. Would exch. for FT767GX with cash adjustment. G6COB. 0606 550258.

● PACKET BBS system, Xerox 820 computer and spare board, Ferguson amber monitor. Twin Shugart 851 8in disk drives and PSU,s. Loads a' CP/M software inc W0RLI BBS/Gateway 200 plus disks. All docs: £250 ono. 3CX2500A3 valves. Offers? 0508 70278.

● WG14 bits, TX and RX mixers, preamps on diode mounts, waveguide to co-ax transitions, isolators, one circulator, waveguide filters, various other waveguide bits from old microwave link, suit 5.7GHz. Offers invited. (Walsall, W.Mids) 0922 473492.

● TS530S. All bands 1.8kHz and 800Hz narrow filters fitted. VGC: £450 ono. G0EGR QTHR. (Bournemouth) 0202 302698.

● KW204 TX and KW202 RX. Both GWO: £200 the pair. Realistic PRO32 scanner, nicads and charger: £140. Roger, G4WOI not QTHR. (Newquay, Cornwall) 0637 875166 x158 day, 0637 878133 eve-w/e.

● FT290 nicads, charger, flexi-whip, soft case,, companion FL2010 10W linear and mobile mount. Orig.packing: £275. Cobra 148GTLDX, modified for 10m, plus 150W linear with preamp, and 4-position power output: £175 ono. G0IQL QTHR. (Worthing, Sussex) 0903 36780.

● TRIO TS830S, HF TX/RX, exc.cond, superb audio, little used: £750. Yaesu FT209RH, 2m handheld, spkr/mic, case, headset. All mint cond: £180. G4MPD QTHR. (Cheshire) 0606 47552.

● CUSHCRAFT Jr. Boomer 2m yagi. 214B-214FB with inst. VGC: £40. Buyer collects. Ken G0CVJ. (Huddersfield) 0484 606085.

● YAESU FT101ZDIII FM unit, fan, s/valves, perfect, manuals: £450. Matching FT101DM memory ext. VFO: £90. ERA microreader with Morse Tutor upgraded for RS232 VDU as new: £90. Kit-built RTTY terminal with PS: £25. G0EZW QTHR. 0773 810010.

● DISK drive unit comprising two 51/4in double-sided 80 track drives, boxed with PSU and cable to suit BBC, QL etc. Hardly used: £140 ono. Also BBC micro, QL, Spectrum. Call for details eve. only. Tim, G4IAC QTHR. 06755 2745.

● SHACK clearance. AOR2001, KPC2, QL computer with comm. interface, HP41CX, calculator. 2 Starphones not xtaled, Tandy plot/printer, 12-chan xtal rcvr, 2-chan xtaled 2m. OM10 camera and lenses. Various open frame PSUs etc. 150A diodes. Iain GM1PSU. 0506 883091.

● ICOM 251E with Mutek and Icom desk mic: £475. Yaesu FT790R with case: £275. FL7010 10W matching 70cm linear: £50. Versatower PB30 with head bearing auto winch 4m stub mast: £300. MM1296/144 tvtr: £125. Welz SP400 pwr/swr meter: £50. Icom 70cm masthead preamp: £40. KR600RC rotator: £120. KR500 elevation rotator: £85. Cushcraft 2m 14ele boomer: £25. Jaybeam 2m 8ele quad: £15. 70cm 18ele parabeam: £10. 23cm two 15 over 15 with splitter: £50. 2m vertical: £10. Halbar two 70cm portable quads: £20. Tonna portable mast: £15. Scarab TU with CBM64 software and leads: £40. DL0PR 2m linear chassis HT transformer with electrolytics and valve: £40. UPX6 modified 23cm cavity: £25. 7289: £20. 2C39: £10. G6LUD not QTHR. 0474 334905.

● OLD interesting books, SAE list. SGBrown F phones, new, unused Howes ST2: £5ea. Marris, 35 Kingswood Hse, Farnham Rd, Slough, SL2 1DA.

● YAESU FT726R VHF multimode basestation fitted for 2 and 70 with satellite option for cross-band full-duplex. Boxed in perfect cond: £725. Diamond X50 dual-band colinear and duplexor: £70. Move to bottom of cliff forces sale! G8TQH not QTHR. 054851 483.

● TRIO 430S FM: £650 ono. Trio 9000 2m: £285 ono. Kenwood AT230 ATU: £150 ono. All in good cond. Manuals and boxed. Exch. IC751A, IC745, IC735, 767. Colin G0JDX. 0623 513758 after 6.30pm.

● SOTA 1296 linear amp, PSU: £100. Met antenna 50MHz 3ele: £25. Buyer collects. G8WPL QTHR.

● YAESU FL2100Z linear: £500 ono. Trio TS830S tcvr: £600 ono. Heathkit HW32A 20m single bander, SB600 spkr and HP23 PSU, HM102 swr meter: £100. Buyer collects. GW3SSG. 0792 205012.

● FT727R handheld 2m/70cm, NC15 base charger, spkr/mic, FNB4A, FBA5A battery packs, NC18C wall charger, YH2 headset: £300. G0JNT not QTHR. (Grimsby) 0472 752794.

● EDDYSTONE 940 RX inc. spkr plinth. GWO. Plus orig. Eddystone booklet and wiring diagram: £125. Laughton RS87320. (Doncaster) 0302 884446.

● SHACK clearance. FT757CX, exc.cond: £650. TR9000, system base, PS10 PSU: £250. BNOS 25A PSU: £75. SEM Zmatch: £45. Welz SP15M: £25. Trio SP100: £15. All with manuals and orig. packing. Other odds and s***. G4UPV QTHR. 0705 501718.

● IC735, PS55, as new: £895. ICu2E, charger, new: £195. 240/115V tapped 1kVA autoxfmr: £10. Qty 2102 memory chips £2/10. KT34A 4ele to 6ele conv. kit, unused: £125. Various meters, enquire. G3TTC new QTHR. (Warwick) 0926 490897.

● FT101ZD Mk3 FM, fan, CW filter, manual, boxed, VGC: £500. FTV901R, c/w 6m, 4m, 70cm. VGC: £450. FC902, VGC: £100. FL2100Z, VGC: £550. G4NRG QTHR. 0268 584564.

● DATONG speech processor, cased, plugs and battery. Perfect: £25. Two Qy3 125 ideal for qro linear: £30. Both plus postage. G4ISB QTHR. 061-766 5265.

● GEN.COV RX, MR4099, similar Sony 2001D, outperforms FRG7, Ideal SWL: £68. (Thante) 0843 294446.

● DRAKE TR4Cw: £475. Denton GLA1000B, new valves: £395. Datong FL2 multimode filter: £50. Datong ASP: £50. All in VGC with hbks. GW4RYK. 0686 86255.

● KW2000 160-10 tcvr with LS/PP circuits etc and spare valves. Working but sold as seen. Buyer collects: £100. G3IIO QTHR. 0273 475908.

● FL2100Z immac: £500. Shure 444 d/mic: £25. 4ele quad, mint: £27. World clock HC10: £20. Datong FL3 M/M filter with PSU: £80 as new. G0DNL QTHR.

● FT221 144-148MHz FM/SSB/AM. Good cond: £280. Solent 23cm TV convertor: £20. Tonna 23cm 23ele: £10. Amstrad PCW8256 computer, 1yr old. Little use: £260. G4CMU. (Surrey) 0737 354497.

● YAESU 726 2m 70cm sat board and HF module, plus sat mic. Mint: £850. Realistic 300 channel pro 2004 scanner. Unused, still in wrappers: £230. John G4PDW. (Grimsby) 0472 70125.

● PROGRAMMABLE scanner PRO2021 AM/FM VHF 68-88/108 136/138 174MHz. UHF 380-512. Mint cond, boxed: £190 ono. G0ATB QTHR. 01-311 0332.

● ST5C, 13.8V. Wide normal shift. RS232/TTL, mic, socket: £60. Bremi 10A PSU: £25. Spectrum 48k Dktronics keyboard built-in PSU, morse interface. RTTY, slowscan, ATV and other software. Save, load, record TX switch unit: £40. G0JIX QTHR. 0743 65818.

● TEN-TEC Century 22 keyer circuit breaker. As new cond: £250. CR100 works well, recent front end realignment. Manual, spare valves: £45 ono. G0KMC. (Aylesbury) 0296 29342 eve-w/e.

● 70CM equip. Homebrew solid state 50-432MHz tvtr 3W out: £30. Used 8/8 slot: £5. PFI RX with xtal for 433.0MHz and rechargeable battery: £10. Prefer buyer collects. John Roberts G8FDJ. (Sheffield) 0742 333847.

● DUE to time-wasters, still available. TS530S c/w 270Hz and 500Hz filters and VFO120. Also new 12V DC converter for TS830S. Offers. FT707 service manual. Offers. G4PDQ QTHR. 0242 42336.

● FT726R 2m/70cm satellite fitted £750. Kenpro KR500 elevator: £50. Commodore 64, PSU, cassette: £130. All in good cond. Phil, G1GXS QTHR. 01-672 1833 after 7pm.

● TVTRS MMT 432/28S: £115 ono. MMT 144/28: £95 ono. RC-pack plus Lowe BBC ROM: £165 ono. Taylor. (Twickenham) 01-891 2820 eve.

● 6JS6C matched pair, boxed and unused: £20. G3BCI QTHR. 0202 760231.

● ICOM ICR70 HF RX FM board. Exc.cond: £425. Code Master CW/RTTY model CWR 610E: £60. GM4GUF. 0968 74070 eve.

● COMMODORE PET 3032 32k computer. Monitor, dual disk drive and printer in soundproof box. Exc-.cond: £200 ono. 0942 324452 after 6pm.

● 50MHz portable tcvr 6m multimode FT690 Mk1: £220. Good cond. with soft case. G0KNN QTHR. (Spennymoor) 0388 817325.

● FT301D solid state all-band tcvr 100W with matching FP301 PSU, clock/ident, FC301 ATU swr/pwr meters, YO301 monitor scope twin tone osc etc: £650. Yaesu FP301 12V 10A PSU, built-in spkr: £85. 0243 573308 eve.

● PK232 latest, as new: £235. FT221R 2m multimode tcvr c/w YC221 digital display: £275. Philips LDH 0050/03 TV camera, 200V AC 12V DC, c/w lenses. New, never used, sensible offers. Squeeze key on marble base, as new: £5. 0243 573308.

● DENTRON Clipperton linear 160-10m 2kW, very little used: £350. KW Supermatch: £90. Avo 8 Mk5 RE/CAL: £85. Gould digital multimeter DMM7A, mains/batt: £95. Advance digital multimeter DMM3: £85. 0243 573308 eve.

● YAESU separates, FLDX400 transmitter, FRDX400 rcvr, SSB/CW/AM/FM inc 2m/4m/27MHz RX. Can be used TX or as separate VFO,s. Recently overhauled with 2 new PA valves fitted, inc mic on stand and handbook: £200. 0709 814550.

● HELP! My floorboards are sagging. Over 30,000 IC's and they've got to go. All modern types, and at silly prices. Examples: at 20p each: 67401 15MHz FIFO, M6086 sine-wave look-up table, HY12/HZ12 hybrid D-A modules, HA2-2635-5 fast power op-amp (normally £15 each). Info available, LM318/LF356. At 10p each: CA3060/80 txconductance op-amp, NE529, CA3146, 74LS192/194, 74LS290. At 5p each: TLO80, CA3130, CA339, UA733 video-amp, 74S74/112, 74LS95, and loads more besides! Mixed selection packs £5/100 or £10/250. Please state linear/digital/mixed. Please add 50p postage. ALSO Sinclair QL with twin 3.5in floppies and NEC colour monitor: £175 ono. Tractor-feed 80-col printer, Centronics: £30. Jaybeam 2m whitestick: £15. G8KSM. (Durley) 04896 661 or write: 2 Sciviers Villa, Sciviers Lane, Lower Upham, Southampton, SO3 1HB.

● PRINTER Copal model SC5500 from ICS. Wide carriage 136/233 columns. 12 char sets and NLQ. 180cps. Parallel Centronics interface Epson compatible, c/w nearly 2000 fanfold sheets, 2 spare ribbons and manual: £150. G3RDG QTHR. 01-455 8831.

● RTTY ST5MC T/U and Creed 444 plus Creed mod. 7E with paper rolls and all cables. Mint. Can dem. Buyer collects: £85 ono. 19ele 70cm Tonna ant: £10. G1AVE QTHR. 0245 55648.

● SONY PRO80 150kHz-220MHz: £180. Pwr meter Yaesu YS60 .1W to 2kW, 1.6-60MHz: £40. Printer Seikosha GP100A 50cps Centronics: £40. ATU Amtec 300 1.6-30MHz 100W: £30. G6TBT not QTHR. 01-948 4496.

● INTERESTING RTTY terminal, well constructed/documented in heavy duty aluminium enclosure. Circuit boards on edge connectors. Features inc. keyboard, memory, hard copy (Creed 444 free to purchaser), audio in/out, video out. Details/offers, G4GXE QTHR. 0298 78861.

● FT101Z Mk3, fan, mic, h/book: £390. Gone QRP. Jaybeam vertical VR3, 10/15/20m: £25. GM3HVN QTHR. (Aberdeenshire) 0358 21324.

● HW101 with PSU, spkr h/mic. 600Hz filter fitted: £230. FRG7 with integral DFM: £135. Icom IC260 2m m-mode with AC PSU, M/M and h/mic: £265. All VGC. Buyer collect or pay carr. G4NJB. (Hull) 0482 500648 eve.

● YAESU FT726R 2m 70cm and satellite module, mint cond: £750. Hansen FS603M 70cm PEP meter: £35. Jaybeam 70cm 19ele parabeam: £30. Vertical colinear: £30. Never used outside! All no offers. Trio JR599 custom special: £130. G6EYD. (Chesterfield) 0246 239487.

● ICOM IC2E with case and charger: £120. Also Yaesu FT2700RH with voice synthesiser (never used mobile): £310. Both units in exc.cond. G6MRZ. 0782 630843.

● SELLING Leak Varislope valve amp. 12W: £15. Rogers valve VHF tuner: £15. Thompson CSF BandW camera. Needs lens: £12. Neon Helium laser tube 1.2mW and PSU, working £60. TV tuner, UHF, amateur, bands 1 and 3: £30. G8JAO. 0684 573977.

● FT290R with nicads, charger, phones, Mutek front end, carrying case, rubber duck: £275. Tektronix scope 581A with type 82 dual trace, type L, type 53/54k, calibration and differential plug-ins, type 81 adaptor, probe and manual: £200 ono. Marconi sig.gen. 10-480MHz, calibrated attenuator: £50. Wayne-Kerr LCR bridge: £20. David G4ZZS. 0703 695144.

● MICROWAVE Modules 2m linear amp MML100S, 100W output 10W input. As new: £85. G4NTY

QTHR. 061-790 7673.

● ICOM IC251A as new: £375. FT101ZD, fan, 12V inverter, 6-bands: £375. WARC kit for FT101Z: £20. 2m Tonna 13ele portable: £25. Prestel terminal, built-in screen, modem, keypad (ideal for RSGB Data Box): £35. G4GXL. (Dursley, Glos) 0453 46463.

● AR88D: £45. LG300 TX and PSU: Free. Four 813s and two bases: £20. Seven 807s and one base: £10. 5-band vertical 18AVT-WB: £50. Jaybeam 2m 10ele yagi: £5. Two Jaybeam 4m 4ele yagis and splitter: £10. G5NU QTHR. 0734 871200.

● TEKTRONIX storage scope type 549 with type M quad trace module and type CA dual trace module. Manuals and trolley/stand. Buyer collect or arrange (hernia inducing!): £55. Mike G4GGC QTHR. (Suffolk) 0787 71842.

● KENWOOD dip meter and coils type DM81 for sale with a Daiwa type CS401 4-channel aerial switch. The lot: £29. G4VLN QTHR. 01-330 2739.

● RCVR R1155 with spkr and mains PSU. BC221 frequency meter with PSU. Both in working order. Will sell separately. R1155: £30 ono. BC221: £50 ono. Buyer collects. Reason for sale, going solid state. G3DSX QTHR. 0264 52603.

● ICOM ICR70 comm. rcvr. ICSP3 ext. spkr, FM board fitted. 2m Microwave Modules cvtr, mint cond, orig. boxes and manual. Buyer inspects and collects. £530 ovno. Cash preferred please. G0BPX QTHR. (Oxford) 0865 246992.

● YAESU digital display YC601 for FT101/277 and FT401/505 series tcvrs, boxed and manual: £38 inc leads. G4ZUX QTHR. 0934 512141.

● KW2000E and Q mult. Good cond: £175. Heath HW101, HP23B, SB650 frequency display, outboard VFO. Codar PR30 pre-selector: £150. MM2 electronic memory keyer: £50. G4AMT QTHR. (Cornwall) 0736 871560.

● TS700G 2m all-modes: £350. Heathkit GDM model GD/IU: £10. Heathkit VVM model 1M/18D: £25. Heathkit sig.gen RF/IU: £25. Rotator RTA175: £40. Jaybeam 8XY/2m: £15. Atlas vertical 10/15/20/40: £15. GEC resistor/capacitor tester (AC mains): £10. G4EGP. (Paignton) 0803 555549.

● STATION of late G3KBN. HRO with 8 GC coils: £20. Minimitter TOP27 transmitter: £20. MC70 xtal mic: £5. TE20D sig.gen: £10. Heathkit HW7 QRP tcvr kit unused, as new, complete: £25. All plus carr. G3ATF QTHR. (Devon) 0805 22561.

● MET 70cm 17ele crossed yagi: £20. Dave, G0CAD QTHR. (Oxford) 0865 341428.

● TEN-TEC Argosy HF tcvr with accessories, PSU, exc.cond: £350. Hameg HM203-4 20MHz scope. Exc.cond: £180 ono. SEM Transmatch Ezitune. VGC: £70. John, G4GWE QTHR. 0908 511129 eve.

● BELCOM LS102L: £150 ono. Nato Commtron 21/8/D FM/AM: £75 ono. G1PLX. 0526 52540.

● FT707, 100W, WARC. Exc.cond: £395. BBC-B ISS7 DFS/ADFS: £225. Solidisk 128K RAM/ROM: £40. 80TSDD: £65 each. Panasonic KXP1080 printer: £140. Ferguson 12in monitor: £60. Joysticks: £8. W/wise and orig. registration: £25. Alf. 0243 822891.

● YAESU FL2000B linear 80-10m, in first class cond: £275. RAF 1155, no mods, working with cased PSU/spkr for AC mains operation. A gift at £25. Creed 444, low hours with additional commercial acoustic cover that cost £250!: £30. Masses of paper free to purchaser. KW 160 AM/CW TX, VFO controlled, in VGC. Self-contained, mains powered, metered: £25. Prefer buyer collect/s. Carr. extra. G3CRH QTHR. (W.Mids) 05436 6364 after 6.30pm.

● RACAL RA17 RX 0.5MHz to 30MHz. Rack mounting model with tuned RF amp. A bit scruffy but GWO: £140 ono. G0KIH. (Surrey) 0252 722139.

● HOWES 50MHz tvtr 144MHz input, as new: £105. Belcom Liner 2, 144MHz SSB tcvr, VGC, manual, mic: £75. Yaesu FL2050 144MHz linear, 50W and O/P, as new: £65. Realistic PRO32 scanner, as new, nicads, charger: £125. G4JXK. (Fareham) 0329 230737.

● FT230R, nicads, scope, Hameg HM312-8 dual trace. Yaesu FRG7000. Altai dip meter. Offers invited. Yamaha electronic organ, 2 manuals, pedal board. Model B-4BR. Offers over: £200. G6ROE QTHR. 0702 586781.

● STRUMECH winch with trans: £100. IC210 2m with PSU: £80. 4m Storno boot mount, 3-chans: £40. Standard 420 70cm handheld 6-chans: £65. Hudson FM208 4m: £10. Piper EME 23cm amp 150W with PSU, unused: £150. G4CXB QTHR. (Iver) 0753 652933.

● TRIO TS120S with mobile bracket. Exc.cond: £350. G4RDT. 0329 236906.

● YAESU YD148 dynamic desk mic, boxed, as new: £15. Hi-mound HK802 brass key, exc.cond: £55 ono. Paul G0KPH. (Warwick) 0926 429719.

● UNIDEN BC170 scanner, 16-memory, (29-512MHz). 12V mains adaptor. Unwanted gift, as new with handbook: £120. G6VFR. Dr. Kevin Dorsey-Tyler. 0602 421421 and bleep.

● COLLINS KWM1 tcvr collectors item. See TT RadCom July 88. PSU, spare valves, mic, manual, superb cond. Offers or exch. compact solid state tcvr WHY? Bob Ralph, G4KSG QTHR. 021-743 7979.

● TRIO TH21E compact 2m handheld, boxed. Spare nicad battery, C type battery case and spkr/mic: £120. G4KSG QTHR. 021-743 7979.

● FT102 tcvr. Fitted AM/FM board, manuals: £525 ono. Adonis desk mic, AM303G: £28. Bargain. All exc.cond. Buyer inspects and collects. G3MIN QTHR. (Now Stamford, Lincs) 0780 62675.

● PACCOM TNC220, c/w leads for BBC-B: £110 ono. Bart G RTTY terminal ST5C c/w leads for BBC-B and FT707: £60 ono. Both in exc.cond. Stephen, G0DUA QTHR. (Suffolk) 0284 878159.

● YAESU FT23R 2m tcvr c/w 2 nicad FNB10 battery packs, NC28C mains charger, PA6 DC car adaptor/charger. Soft case, MH18 spkr/mic. Belt clip: £250. G4YBU. 01-393 9691 eve-w/e.

● EDISON Gem cylinder phonograph with 15 2in cylinders. Offers. Brother Daisy-wheel printer, model HR10C for Commodore 64, Plus 4, Vic 20 and 16. New: £75 ono. G3IJL QTHR. 01-749 1454.

● VALVES 2C39A, 4CX250B, QQV0320. Small quantity of each. Bases, SK620, QQ(B7A) to suit if req'd, unfinished projects. Any reasonable offers accepted or WHY?. G1ASR not QTHR. 0780 720989 after 6pm.

● FT902DM with CW filter, mic, handbook, orig-.packing. Little used, looks like new: £495. No offers. Roger, G4NVA QTHR. (Central Cheshire) 0477 33011.

● 10GHz WB/TX/RX: £30. Printer RS232: £30. Tape punch 300cps: £30. Teletype 33 with stand: £25. 2-216MHz sig.gen: £75. 2304MHz preamp: £18. Waterproof wallmtg case: £15. Mains motors, fans: £4 each. Mains transformers, chokes, digital junk, ribbon cable. G4NVA QTHR. (Cheshire) 0477 33011.

● FDK750E 2m multimode. Exc.cond. c/w mobile mic: £250. Phil, G0DDI QTHR. 0702 76104.

● Z88 computer with extra 32k RAM, software by C Port to PCW8256, as new. Boxed, manual etc: £195. David Cole. 01-594 3495 day.

● YAESU FT980 tcvr: £950. MD1B8 desk mic: £40. Yaesu FT227R 2m tcvr, mic and PSU: £95. KW109 Supermatch: £90, CM8533 RGB monitor: £120. AR-22R rotator with 150ft cable: £95. Ex G3VQC. 0905 820374.

● DATONG FL2: £60. Lowe ultra loop UL1000 tuned preamp: £30. Racal 12m telescopic mast, used for lightweight HF beam. As new: £100. BBC-B 32K sideways ram, double density fitted twin 40/80 track disk drives. Software galore. 70 roms, 300 games. All on disk. Business utilities, technical and amateur radio progs, inc. log, qty locator, repeater, search, identification, lat-long locator, spreadsheet, town/city search for UK and USSR, giving lat-long QTH locator etc. All on one program. Plus £100 worth books, all mint. Offers. John G4TEN QTHR. (Blandford) 0258 53075 eve-w/e.

WANTED . .

● VERSATOWER 30/40/60 or similar tiltover mast. Trio SM220 plus BS80 SP940. G3MJK QTHR. (Hants) 025687 439.

● WORKSHOP manual for Alda 103 3-band tcvr or copy. All expenses refunded. G3ZLJ QTHR. (Wolverhampton) 0902 761339.

● LEAFLETS from shows, for exhibition in Wireless Museum. Wartime "Radio Times", wireless books, magazines, catalogues etc. List pre-WW1 amateurs. Cartridge recorder, BBC mic, R1082 T1083. Details to Douglas Byrne, G3KPO QTHR. 0983 67665.

● SCHEMATIC or circuit diagram for Eddystone IS770R or copy. Will pay expenses. G0EYN QTHR. (Mansfield) 0623 556509.

● YAESU FT107M HF trans, must be mint or VGC with int. or ext. PSU. (Weymouth) 0305 773240.

● FC902 ATU with or without FT902DM tcvr. Also KW107 Supermatch ATU. Digital unit for FT101Z. G0KCB QTHR. 0449 672726.

● DRAKE 2B rcvr in good cond. Collins CW and RTTY 455K/C filters. GI3NUM QTHR. 0861 524315 day, 08462 70796.

● COLLINS 75S3B, 32S3, 30LI, 30SI or KWM2(A). Turns counters Groth, Millen or B and W. Hy-gain dB10-15 or similar 10-15m dual-band yagi. Chris Pedder, G3VBL QTHR. 0772 612289.

● WANTED, wanted, wanted... Faulty of damaged Racal RX etc. Steve. 0254 823305.

● HAMMALUND SP600RX. Good cond. Exch for GEC BRT400 RX. Racal RA1772 RX. Anything considered, any condition. Cash waiting. Please help Racal nut! Also bandspread coils for HRO. G6XNC. 01-462 4461.

● DECCA KW108 monitorscope – replacement power transformer required or scrap monitorscope containing serviceable transformer. Goulding GW3GWA QTHR. 0978 266760 eve.

● 300Wplus linear wanted. All offers replied to and acknowledged. GM0EKM QTHR. 09505 405.

● EARLY wireless Xtal sets, horn speakers, valves, old books, catalogues, bound volumes Wireless World wanted. Also interested in American Comm. RX's. Jim Taylor G4ERU. 5 Luther Road, Winton, Bournemouth. 0202 510400.

● Drake R4C with Sherwood filter mods for CW and SSB. Ron G3TLX. 01-958 8671 eve.

● YAESU FTV700 tvtr frame with 2m module. G0JXZ QTHR. 021-748 7851.

● KW2000 any model, don't mind if not working or incomplete but must be cheap. Also need various bits and pieces for AR88D restoration, can you help? Chris G1ZXY. (Beguildy) 05477 273.

● 100W mobile HF tcvr such as FT707, TS120S, TS130S, TS140S. Also Fax-1 wanted. (Somerset) 0278 652139.

● Power unit Codar 250/S as used with AT5 TX. Marris, 35 Kingswood Hse, Farnham Rd, Slough, SL2 1DA.

● VALVES type 6LQ6 wanted. G4RHI QTHR. 0297 32572.

● TWO anode connectors for conduction cooled 4CX250's (CCS1). Your price paid. G3RPD. 0285 76329 eve.

● WANTED for T1154/R1155 installation, Jones plugs, visual indicators, A1134 amp WHY? Also wanted for FTDX401 tcvr, FV401 ext. VFO. G0JNT not QTHR. 0472 752794.

● FINAL amp 425UH RF choke. 500k ohms AF gain pot with Cal switch for Heathkit SB101 tcvr. John, G0JUO QTHR. 0789 740511.

● GEN.COV. Tx/RX, FT757GX, FT747, IC720A etc. Anything considered. Also early HF SSB rig, suitable spares/repair, FT401, Swan 350, FT200 anything. (Thanet) 0843 294446.

● 40A PSU not Homebrew. 35A considered, must be in good cond. Also JST 135 tcvr wanted. Must be mint. Howard, G0HZH QTHR. 0394 460474.

● KLYSTRON CV2346. Also wanted, Microwave oscillator approx 10-15GHz. Also wavemeter to measure 12-15GHz. Good price paid, carr. arranged. Needed urgently for microwave experiments. N.S.Bennett, G3HSC. 45 Green Lane, Purley, Surrey, CR2 3PQ. 01-660 2896 anytime.

● DRAKE T4XC AC4 MS4, R4C T4XC MS4 AC4. Will consider solo R4C. Equip. must be mint cond with boxes, manuals, spares if available. Will inspect/collect in April. Mail info/photos to Box 5347, Ras al Khaimah, U.A.E. Your postage costs will be repaid.

● TEN-TEC Argosy. 0243 573308 eve.

● STILL looking for any parts for G2DAF RX, complete rigs, part builts, unfinished ones or just components, in particular coils, xtals, 898 dial, mech. filter, metalwork etc. G8HLJ. 051-334 4012.

● DATONG keyboard model MK. G8FR QTHR. (Hants) 0243 376177.

● BC348, BC224 for spares/restoration, parts, dynamotors etc. APA10, BC1031 panadaptors. PSU module for German E52 RX or duff E52 containing one. PVI35 (ATP35) PA bottle for WS12 TX. G8LIU QTHR. (Uxbridge) 0895 30006.

● SONY ICF 7600DS. 0202 301913 eve.

● SMALL petrol generator, preferbaly lightweight and quiet, Honda or similar WHY? Manual or loan to copy for Marconi TF144H/45 sig.gen. Dave, G0CAD QTHR.(Oxford) 0865 341428.

● G3MPO FET dip oscillator Mk2 or similar. GDO must be in good cond. G3AO QTHR. 0663 50639.

● FT77 CW filter, 20A PSU. Alf. 0243 822891.

● ATU KW107 or similar. Preferbaly with int. swr/pwr meter, dummy load and antenna switching. Martyn, G4HIA QTHR. 0742 368267.

● MORSE keys, brass pre-1939 please. (Lincs) 0778 424496.

● FV101DM, FTV901R. Ex, VFO and tvtr. Paul G0KPH. (Warwick) 0926 429719.

● SERVICE sheet for Telefunken Allegretto 10-10 stereo tuner-amp. Handbook for Marconi TF2200A scope. Pages 27-29 inclusive from handbook for Swan SS200 tcvr. John Power, GM0KTO, 43 Marwick St, Glasgow, G31 3NE. 041-556 6985 after 5pm and w/e.

MODULAR TRANSCEIVERS

The following discrepancies have been reported to G3TSO by constructors of his Modular Transceiver:

Module 1. Components list, add D108 – SBL1. T101 is 2t + 6t not 6t + 6T as T102.

Module 4. Components list, C421 is 470 pF not 270 pF.

Module 5. Components list, L505 to L512 cores are T50-6 not T50-2.

Fig 5 page 774. IC301 pins 11 and 13 are reversed.

Fig 21 page 883. IC2 is CA3140 not CA3130.

Will anyone interested in obtaining PCBs for the Modular Transceiver please contact G3TSO in writing, as soon as possible. PCB's will be made available in complete sets of seven boards. If they include a SAE he will advise them of the cost and time scale of production. He anticipates that he will need to order at least 25 sets to make the cost acceptable. Those who have already contacted him by phone are also requested to write.

He can provide data of relevant filters necessary for WARC band operation.

HF LOOP ANTENNA

CapCo have pointed out what they regard as a problem in I1ARZ's design published last month. As it stands with the dimensions provided, they say that the tuning won't work on 10m.

Additionally the internal diameter should be 80cm, and at least a 2.5" gap should be included at the top.

3-BAND TRANSCEIVER

In G3TXQ's transceiver (Feb 89 RadCom) p45 Fig 2, IC109 (SL6270) should have 22kohm resistor from pin 5 to earth (pin 6). Without this, oscillation can occur at AGC threshold, dependent upon the polarity of the input offset between pins 4 and 5. This polarity is batch dependent, the resistor is advised in the data book.

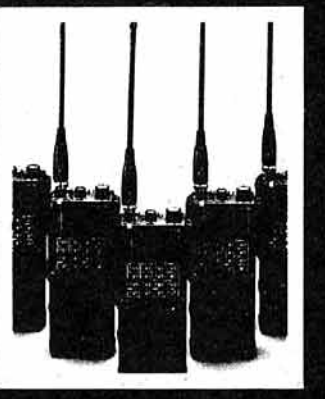
HELPLINES

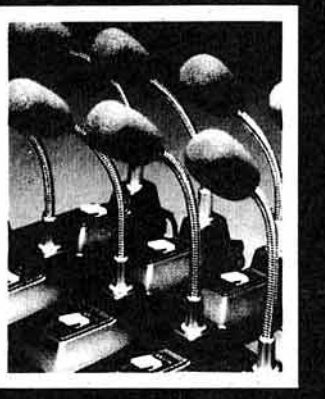
Owing to the heavy demand on space in this month's *RadCom* we have had to temporarily forgo this popular feature.

But remember the deadline for the MAY issue of *RadCom* is Wednesday 22 MARCH latest, and if you can send items in earlier it would be much appreciated.

Write to us marking your envelope 'Helplines' and we'll do what we can to get the message out.

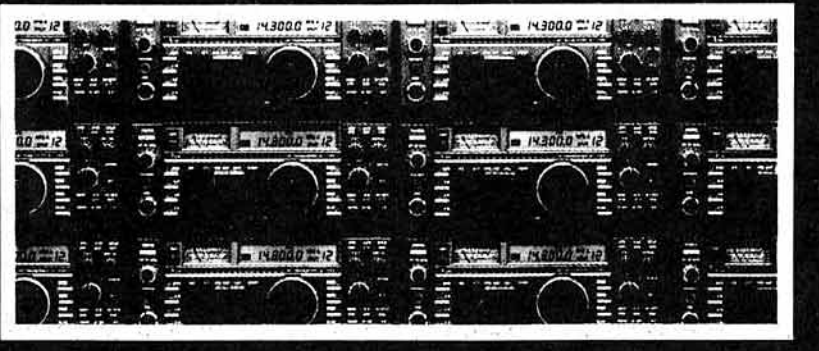
RAE
MANUAL





OUT NOW

£4.95 **TO RSGB MEMBERS BY POST**



George Benbow G3HB

CLUB NEWS

DEADLINE - Items for inclusion in the MAY issue must be sent to HQ marked "Club News - DIARY" to be received by Wednesday 22 MARCH latest.

If news is received by the published deadline, it will 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.

AVON:
* Bath & DARC - 1, HF night on the air; 15, preparation for AGM; 29, video night.
* Bristol ARC - *NEW SECRETARY* Barry Robbins, GOCFM tel: Bristol 600603.
* North Bristol ARC - 17, HF activity night; 24, third inter-club "Bulls Eye" competition; 31, 80m activity night.
* Shirehampton ARC - 3, Satellite TV demo by GOIHE; 10, Discourse by G3YHV; 17, talk "Spectrometers" by G4DPJ.
* South Bristol ARC - 1, talk "GWR from the Footplate" by Ron Gardner; 8, HF activity evening; 15, bring & buy/junk sale; 22, Easter activity evening; 29, hand-held rig meet.
* Thornbury & DARC - 1, talk "Aerials Illuminate" by D Yates, G3PGO, BBC Engineering Training Dept. Evesham; 15, HF activity.

BEDFORDSHIRE:
* Dunstable Downs RC - 20, GB2WGG at Watford Girls' Grammar School.
* Shefford & DARC - 9, talk "Op Amps" by Hugh, G6TQT and Derek, G4JLP; 16, junk sale; 23, computer evening - bring your machine & software; 30, talk by Alan, G4PSO and Tim, G6RCT.

BERKSHIRE:
* Burnham Beeches RC - 6, AGM & talk; 20, talk "Networks" by Brian Kerr.
* Reading ARC - 9, junk sale; 23, discussion on Project YEAR.

BUCKINGHAMSHIRE:
* High Wycombe ARC - *NEW* meets every second Thursday of the month at Unit 2, Fryers Works, Abercrombe Avenue, High Wycombe. Details G2DRT.

CENTRAL:
* Falkirk & DRS - *REFORMED* Details Bill Ferguson, GM6VCV tel: 0324-2244.
* Stirling & DARS - *NEW SECRETARY* Brian Mulleady, GM1PVG tel: 0324-36235.

CHANNEL ISLANDS:
* Guernsey ARS - *NEW SECRETARY* Peter Bannier, GU4SXM.

CHESHIRE:
* Chester & DRS - 14, "Your questions answered"; 21, talk & demonstration "Notes from an experimenter's diary" by G2FVA; 28, surplus equipment sale.
* Woodford (RATEC) - 6, talk "Underwater DXing" by Geoff, G4SYC (provisional); 20 talk "The 7th mystery" by Trevor, G8TYY.

CLWYD:
* Conwy Valley ARC - *TEMPORARY SECRETARY* GW4NNL, tel: 0492-530725. 2, annual construction competition.
* Delyn RC - 14, AGM; 28 RSGB film or video.

DERBYSHIRE:
* Buxton RAs - *NEW VENUE* Leewood Hotel, Buxton. Details G4IHO tel: 0298-5006.
* Derby & DARS - 1, junk sale; 8, talk "TVI - its causes and cures" by Fred Ward, G2CVV; 15, talk & demo by Mutek Ltd; 22, AGM; 29, talk "Meteor-Scatter" by Nigel Wilson, G4VVZ.

DEVON:
* Exeter ARS - 13, talk "DF on top band" by John, G3EQM.
* Exmoor RC - *NEW SECRETARY* Nigel Puttick, G4PGW tel: 07697-607. *NEW VENUE* The Old Chapel, North Molton, first and third Thursday at 7.30pm.
* Taunton & DARC - *NEW SECRETARY* Peter Robinson, GOEYR tel: 0823-275973. 3, talk by Eric Godfrey, G3GC; 17 RSGB video.

DORSET:
* Bournemouth RS - *NEW ORGANISER* Clive, G6MYT tel: 0202-422441. 19, bring & buy.
* Flight Refuelling ARS - *NEW SECRETARY* Graham, G3VMO tel: 0202-886151. 5, talk "Direction Finding" by John, G6AZV; 12, talk "Audio Techniques" by Colin, G6MXL; 19, talk "EMC Technology" by G4WHO.
* South Dorset RS - 7, junk sale and bring & buy.

ESSEX:
* Loughton & DARS - 10, G3OPA top Band DF set construction judging night. RLO Ted Whitworth, G4TUO is the judge.

GREATER LONDON:
* Acton, Brentford & Chiswick ARC - 21, talk "Aeronautical Communications" by G4GD.
* Echelford ARS - *NEW VENUE/SECRETARY* Staines Congregational Church, Kingston Road, Staines, Middx. Details GOJSP, 114 Peterfield Ave, Staines, Middx.
* Edgware & DARS - 9, RSGB video evening; 23, talk & demo "Weather Satellite Reception" by John Cobley, G4RMD.
* Harrow ARS - 3, talk "Howes Products" by Dave, G4KQH; 10, activity night; 17, construction contest; 31, AGM.
* Home Counties ATVG - 22, talk "Safety in the Shack" by G8PDS.
* Southgate ARC - 9, talk "The Effects of Weather on Propagation " by Jim Bacon, G3YLA; 23, portable HF rig evaluation night.
* Wimbledon & DARS - *RECENT NEW SECRETARY* Nick Lawlor G6AJY, tel: 01-330 2703.

GREATER MANCHESTER:
* Eccles & DARS - 7, demonstration "Avoiding TVI" by G8KRG.
* South Manchester RC - 10, talk "Computers in Education" by John Ashurst, B.Sc.; 17, surplus equipment sale; 31, talk "Confessions of a Safety Engineer" by C. Plummer.
* Stockport RS - 8, club project.

GWENT:
* Chepstow & DARS - *NEW SECRETARY* Dan Taylor GWOEGH, tel: 0291-424725.

GWYNEDD:
* Dragon ARC - *NEW SECRETARY* Tony Rees, GWOFMQ tel: 0248-600963. 6, debate "Will the introduction of a student/novice licence be a good thing for the future of Amateur Radio?"; 20, talk "Fifty Years of Amateur Radio" by Ron Horrocks, GW2FLP.
* Meirion ARS - *NEW SECRETARY* Brian GW4KDP.

HAMPSHIRE:
* Andover RAC - *NEW SECRETARY* G8ALR tel: 0264-23741.
* Basingstoke ARC - *NEW SECRETARY* David Deane, G3ZOI tel: 0734-332777. 6, talk "The RSGB" by Trevor, G3KWU, local RLO.
* Farnborough & DARS - *NEW PRO* GOHNA tel: 0252-519773. 8, talk "VHF Contest Committee" by G3HHI.
* Horndean & DARS - *NEW SECRETARY* Mr F Charrett, G3COO, 8 Mavis Crescent, Havant, Hants, PO9 2AE. 2, talk "The RSGB" by G3WKU.
* Itchen Valley ARC - 10, AGM; 18, annual Dinner; 24, talk "Palaeontology" by G4EOW;.
* Rowner & DARS - *NEW SECRETARY* G6WGN tel: 0705-261977.
* Southampton ARS - *NEW SECRETARY* Malcolm Troy, G1UWL tel: 0703-701770.
* Three Counties ARC - 1, talk "Satellite Communications" by the RAF; 15, club night; 29, talk "Satellite Digital Communications" by Michael Meerman.
* Victory Contest Group - 4, talk "4C 250 Amplifiers Built & Tested in 80 hours" by G3XDY, at Butser Hill Beacon, 3 pm.
* Winchester ARC - 17, talk "SWR and that Burning Smell" by G3RZP.
* Waterside SWC - 28, talk "Amateur Microwave Equipment".

HEREFORD & WORCESTER:
* Bromsgrove ARS - 14, DTI RIS rig checks; 28, 4m night on the air.
* Bromsgrove & DARC - 10, AGM at Avoncroft Art Centre, Bromsgrove at 8 pm.
* Malvern Hills ARC - 14, talk "Meteorology" by John Spicer, G8LJU.
* Vale of Evesham ARC - 2, talk "Something in the Sky" by G4NIJ.
* Wythall RC - 14, rally preparation; 19, 4th annual Wythall radio rally; 21, rally roundup and review; 28, The New Licence Conditions reviewed by Chris Pettitt, GOEYO.

HERTFORDSHIRE:
* Cheshunt & DARC - *NEW SECRETARY* Roger, G4OAA tel: 0992-464795. 8, talk "History of communications - pt3" by Derek, GOBTX; 22, junk sale.
* Welwyn-Hatfield ARC - 20, video evening.

HUMBERSIDE:
* North Ferriby United ARC - 10, talk "QRP" by Rev.George Dobbs; 17, activity night; 31, talk "Aerials" by Peter, G3PDL.

ISLE OF MAN:
* Isle of Man ARS - *NEW SECRETARY* June Wrigley, 20 Fairy Hill Close, Ballafesson, Port Erin, Isle of Man, tel: 0624-834257.

ISLE OF WIGHT:
* Binstead ARS - *NEW ADDRESS FOR SECRETARY* Mr D.F. Barnes, Flat 17, Rose Court, Melville Street, Ryde PO33 3AT.

JERSEY:
* Jersey ARS - *NEW SECRETARY* David Reid, GJOBZF.

KENT:
* Edenbridge ARS - 1, net night; 8, gadgets & gizzmos/project; 22, shack visit by G4TPJ.
* Felixstowe & DARS - 6, talk "Police Dog Handling" by Ken Backhouse, G4RHR, Suffolk Constabulary.
* Maidstone (YMCA) ARS - 10, "ATV" with G8TCY.
* Sevenoaks & DARS - *NEW* Meetings 7.30pm on 3rd Monday of each month at Emergency Control Centre, Sevenoaks DC Offices. Secretary: Barry Leggett, G7CIC tel: 0732-741222 ext.245. 20, Radio Amateurs exams.
* SE Kent (YMCA) ARC - 8, ten-minute talks; 16, Morse test; 23, construction contest.

LANCASHIRE:
* East Lancs ARC - 7, surplus equipment sale.
* Eccles & DARS - 7, talk/demo "Avoiding TVI" by G8KRG.
* Fylde ARS - *NEW VENUE* South Shore Lawn Tennis Club, Midgeland Lane, Blackpool, second and fourth Thursdays. 9, talk "Printed Circuits from DIY to Mass Production" by Steve Williamson, G3WGU.
* Southport & DARC - 20, junk sale.
* Thornton Cleveleys ARS - 13, video "Japanese Morse" by Norman Kendrick.

LEICESTERSHIRE:
* Leicester RS - 6, quarterly progress, open meeting; 13, HF/VHF activity night; 20, talk "Let's get Giga-ling (10GHz)" by G8MWR.
* Melton Mowbray ARS - 17, grand junk sale.

LINCOLNSHIRE:
* Grantham RC - *NEWS SECRETARY* John, G8WWJ tel: 0476-65743.

MERSEYSIDE:
* Liverpool & DARS - *NEW SECRETARY* Lynn Bromsgrove, G1EXJ tel: 051-486 5745. 7, RLO's report; 14, activity - construction - club stn on air; 21, talk "EMC" by Gordon, G3OVW; 28, surplis equipment sale.
* Wirral ARS - *NEW SECRETARY* Alex Seed, G3FOO.

NORFOLK:
* Norfolk ARC - 1, "Any Questions" - ask the panel for answers!; 8, surplus equipment auction/bring & buy; 15, talk "Computer aided Printed Circuits" by Paul Sergent, G4ONF; 22, The Shefford Club project 2m DC XCVR, by Dick Bacon, G3WRJ.
* Yarmouth RC - 2, talk & demo "Using 2M for Local & DX Talk"; 16, talk "Electronics & Medical Imageing"; 23, talk "Fault Finding on Radio Equipment" by G3VKM.

NORTH YORKSHIRE:
* Hornsea RC - 1, talk "SWR" by G3TEU; 15, talk "Omega Entertains" by G4YTV; 22, talk "Computer Operating Systems" by Simon SWL.

NOTTINGHAMSHIRE:
* Mansfield ARS - *NEW VENUE* Westfield Folk House, Westfield Lane, Mansfield, second and fourth Fridays at 7.30pm. 24, "Foxhunt".
* Worksop ARS - 14, talk/video "W5LFL"; 28, talk "Astronomy" by Kevin G4MDQ.

ORKNEY:
* Orkney Group - 1, slide & tape lecture "Solar Cycle 21".

SHROPSHIRE:
* Telford & DARS - 1, G3ZME on the air; 8, under £5 construction contest; 15, packet radio update, G3IMP; 22 construction competition; 29, Morse class and club station.

SOMERSET:
* Yeovil ARC - 2, talk "Logarithms & DBW" by G3MYM; 9, entries in for constructors contest - home brew tobacco tin transceiver; 16, talk "The Effect of Sunspot Maximum" by G3MYM; 23, constructors contest.

SOUTH GLAMORGAN:
* British Telecom ARS - 8, talk/demo "What's Up There?" by Mr. L.E. Hornby of Spacetech; 16, IBTE visit.,
* Cardiff RSGB Group - 13, talk "Converting CB Rigs" by GW3SPA.
* Highfields ARC - 2, technical talk by John Case, GW4HWR; 16, technical talk by John Case, GW4HWR; 30, quiz.

SOUTH YORKSHIRE:
* Barnsley & DARC - 13, talk/demo "Microwave Construction" by Eric, G3MWN; 27, on the air.
* Rotherham & DARS - *NEW VENUE* The Comedian public house, St.Anns Road, Rotherham. Meets on the first Wednesday of each month.

STRATHCLYDE:
* West of Scotland ARS - 24, "Tenna Mast" GM4VHZ.

SUFFOLK:
* Ipswich RC - 8, constructional contest - members only; 29, meeting of South Anglia Repeater Group.

SURREY:
* Sutton & Cheam RS - 17, constructional contest.

WARWICKSHIRE:
* Rugby ATS - 14; talk by Ian Hopwood, GOEDT, RSGB Liaison Officer; 28, test gear evening with G8TWH.
* Stratford-upon-Avon & DARC - 13, Howes Communications; 27 AGM and junk sale.

WEST GLAMORGAN:
* Swansea ARS - 2, visit to HTV Studios, Cardiff. Details: GW0BBO, tel:0792-818100.

WEST MIDLANDS:
* Coventry ARS - 3, night on the air and Morse tuition; 10, members' slide/video show; 17, night on the air and Morse tuition; 24, talk from British Amateur TV Club; 31, night on the air and Morse tuition.
* Sutton Coldfield RS - *NEW SECRETARY* Tony Quy, GOFEO, 17 Fircroft, Kingsbury Park, Kingsbury, W.Mids.
* Wolverhampton ARS - 14, talk "The effects of acid rain, and alternative means of generating power" by the CEGB; 21, club project; 28, night on the air.

WEST SUSSEX:
* Horsham ARC - 2, Spring junk sale.

WEST YORKSHIRE:
* Keighley ARS - 7, talk "Clandestine Radio" by G3LEQ; 21, night on the air; 28 visit to SMC Leeds, 8pm.
* Leeds & DARS - 13, junk sale.
* Spen Valley ARS - 2, simple electronic projects by Gerald Edinburgh, G3SDY; 16, pre-AGM.
* Todmorden & DARS -
* White Rose ARS - 15, construction contest.

MOBILE RALLIES

This is a list of all rallies, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

4 MARCH
* The Blue Star Radio Rally - High Gosforth Park (Newcastle Racecourse). Usual attractions, talk-in available. Details Terry, G6VEG tel: 091-264 8196.

5 MARCH
* Barry Rally - Barry Leisure Centre, off Holton Road, Barry. Details Mike GW8CMU tel: 0446-711426.
* Bury Hamfeast - The Castle Leisure Centre, Bolton Street, Bury. Doors open 11am, large bring & buy, refreshments available, talk-in on S22. Venue just 3 mins from M66. Details G4KLT tel: 061-762 9308.

12 MARCH
* Trafford Rally - *NEW VENUE* The G-MEX Centre, Manchester. Opens 11am (10.30am for disabled), RSGB stand, usual traders, bring & buy, refreshments and bar. Entrance £1 includes free cash prize draw. Ample free and paid for parking adjacent or close by. Details Graham G1IJK tel: 061-748 9804.
* Pontefract & DARS 9th Annual Components Fair - Opens 11am, admission free, prize programme, trade stands, bring & buy stall, QRP stand, bookstall, usual refreshments.Details Colin GOAAO tel: 0977-43101.

19 MARCH
* Wythall RC Rally - Wythall Park, Silver Street, Wythall (south of Birmingham on A435, 2 miles from M42 junc 3). Opens 11.30am, 3 large halls, usual traders, junk & flea markets, bar and snacks. Talk-in available on S22 and ample free parking. Details Chris GOEYO tel: 021-430 7267.
* South Essex ARS Mobile Rally - The Paddocks Community Centre, Long Road, Canvey Is. Opens 10am, talk-in on S22 by GB4RSE. Details Ken GOBBN tel: 0268-755350.
* Mid-Devon Rally - Pannier Market, Tiverton. Opens 10am, trade stands, bring & buy, refreshments, talk-in on S22. Details G4TSW, Mid-Devon Rally, PO Box 3, Tiverton, Devon.
* Cambridgeshire Repeater Group Junk Sale & Rally Extravaganza - Philips Catering Centre, St.Andrews Road, Cambridge. Traders, bring & buy, all-day auction. Details GOHEM tel: 0799-23689.
* Bournemouth Amateur Event - Kinson Community Centre. Opens at 2pm, trade stands, bring & buy, refreshments, free parking. Details Clive, G6MYT tel: 0202-422441, evenings.

26 MARCH
* Cunninghame District RC Rally - Magnum Leisure Centre, Irvine. *NEW* Opens 10.30am, trade stands, leisure centre facilities for the family. Details Peter GMOFCI tel: 0294-72253.

2 APRIL
* White Rose Rally - Leeds University. Details A.S Kessler, G4DXA, PO Box 73, Leeds, LS1 5AR.
* North Cornwall Radio Rally - Sports Hall, Launceston College. Details Mary tel: 0566-5632.

16 APRIL
* RSGB VHF CONVENTION - Sandown Park Racecourse, Esher, Surrey. Usual trade stands, lecture programme, large RSGB bookstall and committee stands, refreshments, bar, ample car parking. This year there will be a Members' Mart (similar to Woburn) with a small number of tables available to non-trader members for the disposal of amateur radio and allied items - cost £4.00/table/hour. Tables can be pre-booked by sending a cheque made out to 'RSGB', to Martin Shardlow, G3SZJ (OTHR). Details RSGB HQ or see advertisment in this issue.

23 APRIL
* Swansea ARS Rally - Leisure Centre, A4067 Swansea to Mumbles road. Opens 10.30am, trade stands, bring & buy, bookstall, HF demonstration station, bar and refreshments. Talk-in on S22 and via RB6 by GB2SWR. Details Roger GW4HSH tel: 0792-404422.
* Marske-by-the-Sea Rally - Marske Community Centre, High Street, Marske, nr Saltburn, E.Cleveland. Details Allen, G7CBR tel: 0642-480055.

30 APRIL
* BATC Rally - The Crest Hotel, junction 2 of the M6 motorway. Small entrance fee must be charged to comply with local Sunday trading regulations. Opens 10am, trade stands, components stands, everything for the keen ATV enthusiast, lectures and construction displays. Details Trevor, G8CJS tel: 0532-670115.
* 6th Anglo-Scottish Rally - *CHANGE OF DATE* Tait Hall, Kelso. Details Bruce GM4UIB.

1 MAY
* Mid-Cheshire ARS Rally - Civic Hall, Winsford. Opens 11am (10.30 for disabled). Full catering and ample car parking. Details David, G4XUV tel: 0606-77787.

7 MAY
* Southend & District Mobile Rally - Roachway Youth Centre, Rochford, Essex. Doors open 10am. Details Ted G4TUO tel: 0702-202129.
* Yeovil QRP Convention - Preston Centre, Monks Dale, Yeovil. Doors open 9am, traders, two lectures, refreshments. Details Dave, G1MNM.

14 MAY
* Drayton Manor Mobile Radio Rally - Drayton Manor Park, Tamworth, Staffs. On A4091, 1 mile from A5 junction. Opens 11am, usual traders, flea market, park facilities for family, refreshments, bars. Talk-in on S22 and 70cm. Details Norman G8BHE, tel: 021-422 9787.

21 MAY
* 32nd Northern Mobile Rally - Great Yorkshire Showground, Harrogate, North Yorkshire. Usual large number of traders, craft stalls. Details Harry G3CQQ. 0943 602118
* British Telecom ARS Rally - BT HQ, Coryton, Cardiff. Opens 10.30am, traders, bring & buy, refreshments and bar. £1 admission (half-price children/OAPs). Ample parking and easy access 100 yards from M4 junc 32. Details Martyn Jenkins, tel: 0222-379634 (office).
* Parkanaur Rally - Silverwood Hotel, Lurgan, Co.Armagh. Opens 12 noon. Usual trade stands, bring & buy, bookstall, QSL bureau. Talk-in on S22. Details Jim, G11YGS tel: 0762-851179.

28 MAY
* 13th East Suffolk Wireless Revival - Civil Service Sportsground, Bucklesham, nr. Ipswich. Opens 10am, usual traders and attractions. Well suited for family day out. Free parking. Details Jack, G4IFF tel: 0473-464047.
* Maidstone (YMCA) Radio Rally - Sports Centre, Melrose Close, Maidstone. Usual traders and attractions, snack bar and beer tent. Details G6FZD tel: 0622-50709.
* Plymouth RC Mobile Rally - Plymstock School, Church Road, Plymstock, Plymouth. Opens 10am, usual traders, demonstrations, refreshments and raffle. Large free car park, talk-in on S22. Details Joe, G1RXR tel: 0752-509855.

29 MAY
* Doncaster Radio Rally - Bircotes Sports Centre, near Bawtry, Doncaster. Details Audrey Wilson tel: 0302-721259 or 0302-857526. Write: 23 Florence Avenue, Balby, Doncaster.

IN BRIEF - More details later.

11 JUNE
* Elvaston Castle Mobile Rally - Elvaston Country Park near Derby. Details John G4PZY tel: 0332-767994. Trade Peter G3WFU tel: 0332-700265 evenings.
* 29th RNARS Mobile Rally - HMS Mercury, Petersfield, Hants. Details Cliff, G4UJR tel: 0703-557469.
* Norfolk Raynet Rally - Barford Village Hall (7 miles E of Norwich, NGR: TG 113 078). Details Tim, G4CTT.
* Mid-Lanark ARS Open Day - Community Education Centre, Newarthill, by Motherwell. Details David, GM1SSA tel: Holytown 732403.

18 JUNE
* Denby Dale ARS Rally - Shelley High School, 5 miles SE of Huddersfield, W.Yorks. Details Gerald Edinburgh tel: 0484-602905.

25 JUNE
* 32nd Longleat Mobile Rally - Longleat Park, nr. Warminster, Wilts. Details Shaun, G8VPG tel: 0225-873098.

9 JULY
* Worcester & DARC Droitwich Strawberry Rally - High School, Droitwich. Details Derek Batchelor tel: 0905-641733.

15 JULY
* Cornish RAC Rally - Richard Lander School, Truro. Details Rolf Little tel: 0872-72554.

16 JULY
* Sussex Amateur Radio & Computer Fair - Brighton Racecourse, Sussex. Details Bob, G1IOS tel: 0798-43841.
* Pontefract Racecourse Rally & Fair - *CHANGE OF DATE* Details Colin GOAAO tel: 0977-43101.

29/30 JULY
* 4th AMSAT-UK Colloquium/2nd RSGB Data Symposium University of Surrey, Guildford. Details G3AAJ tel: 01-989 6741. (See news item re this joint event).

30 JULY
* Scarborough ARS Rally - The Spa, Scarborough. Details Ian, G4UQP tel: 0723-376847.

6 AUGUST
* RSGB NATIONAL MOBILE RALLY - Woburn Abbey, Bedfordshire. Details Norman Miller, G3MVV tel: 0277-225563 daytime.

13 AUGUST
* Flight Refuelling Hamfest '89 - Flight Refuelling Sports Ground, Wimborne, Dorset. Details John GOAPI tel: 0202-691649 or Rob G6DUN tel: 0202-479038.
* Derby Radio Rally - Lower Bemrose School, St.Albans Road, Derby. Details Martin, G3SZJ tel: 0332-556875.

20 AUGUST
* Red Rose Summer Rally - Bolton Sports & Exhibition Centre. Details Dave, G1IOO tel: 0204-24104 evenings.

27 AUGUST
* Torbay Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3KZJ (OTHR). NO APPLICATIONS UNTIL AFTER MAY 1989 PLEASE
* Galashiels & DARS Open Day - Focus Centre, Galashiels. Details John, GMOAMB.
* BARTG Rally - Sandown Park Racecourse, Esher, Surrey. Details Peter, G8VXY tel: 021-453 2676.

3 SEPTEMBER
* 22nd Preston ARS Rally - University of Lancaster. Details Godfrey, G3DWQ tel: 0772-53810.
* Telford Amateur Radio Rally - Telford Exhibition Centre. Details Martyn, G3UKV tel: 0952-255416.

10 SEPTEMBER
* Lincoln Hamfest '89 - Lincolnshire Showground, 4 miles north of Lincoln on A15. Details John G8VCF tel: 0522-25760.
* Vange ARS Rally - Nicholas School, Basildon. Details G4NVT tel: 0268-43025 or Mrs Thompson tel: 0268-552606.

* 6th National Amateur Car Boot Sale - The Shuttleworth Collection, Old Warden Aerodrome, nr Biggleswade, Beds. Details Tony G0COQ tel: 0582-508259 (24hrs). Permission to 'fly-in' tel: Northill 288.

16 SEPTEMBER
* Scottish National Convention - (PROVISIONAL) Fife Sports Institute. Details John, GM4ALA tel: 0592-742760.
* Wight Wireless Rally - Wirless Museum, Arreton Manor, nr Newport, IOW. Details Douglas, G3KPO tel: 0983-67665.

17 SEPTEMBER
* Peterborough R & ES Mobile Rally - Wirrina Sports Centre, Peterborough. Details G4PYP tel: 0733-230412, evenings.

24 SEPTEMBER
* Harlow Mobile Rally - Harlow Sports Centre. Details G4MIS tel: 0279-722622 evenings or G4KVR tel: 0279-22365 daytime.

1 OCTOBER
* Great Lumley ARES Rally - Great Lumley Community Centre, Chester-le-Street, Co.Durham. Details Barry G1JDP tel: 091-388 5936.

OTHER EVENTS

13 MARCH
* Telecommunications Symposium - Watford Grammar School for Girls, Lady's Close, Watford, Herts. Schools particularly welcome. Lectures, talks and demonstrations. Details Tony Kelsey-Stead, G0COQ (Head of Physics) tel: Watford 223403, daytime or 0582-508259, 24 hours.

29/30 JULY
* **4th AMSAT-UK Colloquium/2nd RSGB Data Symposium** University of Surrey, Guildford. Details G3AAJ tel: 01-989 6741. (See news item re this joint event).

GB CALLS

The list below shows ALL the special event stations licensed for operation during this month and early next month, (as at press date)

It is taken direct from the GB Calls file on the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1 to 28 days.

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* DON'T FORGET *
* ENTRIES FOR THE RSGB 75 AWARD *
* CLOSE ON 1 APRIL 1989 *
****

1 MARCH:
GB0ATC - 888 SQDN. ATC., W.Mids.
GB0CCM -St.Dunstan's College, London SE6.
GB0CDN - Grid: SZ 295 849
GB0RCT - Clayhidon, Devon.
GB0YDS - St.David's, Dyfed.
GB2RND - Old Swinford Hospital School, W.Mids.
GB5AC - 85 SQUADRON A.T.C., LONDON N21.
GB50BB - Central Methodist School, W.Mids.
GB8NR - Nunsfield House, Derby.
GB8OO - Thornton Par, Northampton.

2 MARCH:
GB1HHC - Haywards Heath, W.Sussex.
GB5LV - Crystal Palace, London SE19.

3 MARCH:
GB4BR -Barry Rally, S.Glamorgan.

4 MARCH:
GB0CDK - Fort Gilkicker.
GB0CDM - Monkton.
GB0CDX - Grid: SZ 339 879.
GB2PYM - Paisley YMCA, Strathclyde.
GB8RAF - Leicester.

8 MARCH:
GB1CDA - Gosport, Hants.
GB4XXX - DX-pedition to N.Wales.

9 MARCH:
GB0XXV - 25th Anniversary Bristol ARC.
GB4HHC - Haywards Heath College, W.Sussex.

10 MARCH:
GB2PCS - Monks Dale, Somerset.
GB4SBC - Seaford, E.Sussex.

11 MARCH:
GB4BLE - Basingstoke Library, Hants.
GB5DX - Menwith Hill, N.Yorks.

12 MARCH:
GB1GMX - G-MEX Exhibition Centre, Manchester.
GB4HMS - HMS Warrior 1860, Hants.
GB4RCH - Horwich, Lancs.

13 MARCH
GB0CDS - Grid: SU 628 069.
GB0TOC - Tamworth, Staffs.
GB1CDS - Grid: SU 628 069.

14 MARCH:
GB4QRS - Quainton Railway Centre, Aylesbury.
GB4SPD - Co.Antrim, N.Ireland.

15 MARCH:
GB1CDJ - Portsmouth, Hants.
GB1CDK -Fort Gilkicker, Hants.
GB1CDM - Fort Monkton, Hants.
GB1CDQ - Portsmouth, Hants.
GB1CDS - Fort Southwick, Hants.
GB1CDW - Fort Widley, Hants.

17 MARCH:
GB2GGA - Girl Guides Assoc., Clitheroe, Lancs.
GB2RAF - RAF Newton, Notts.

18 MARCH:
GB2CDT - Hilsea, Portsmouth.
GB2CDW - Fort Wallington.
GB50RAF - Yorkshire Air Museum, York.

20 MARCH:
GB2WGG - Watford Girls Grammar School, Herts.
GB4RAF - Yorkshire Air Museum, York.

22 MARCH:
GB50K - 50 Kidderminster T.A. Centre.

24 MARCH:
GB2STB - Mill No.3, Scotland.
GB50RAF - RAF Halton, Bucks.

25 MARCH:
GB4WTF - Wortley Top, Sheffield.

31 MARCH:
GB1CDN - Needles Battery.

1 APRIL:
GB0CDK - Fort Gilkicker.
GB0CDM - Monkton.
GB0IMD - Old Telegraph Station, IOW.
GB4ACF - Grid: SE 301 712.

3 APRIL:
GB2TCC - Thornton Cleveleys, Blackpool.

the last ...

DON'T GIVE UP BEFORE YOU START BUILDING

Perhaps I may be allowed to reply to G4LXN's letter in the Feb *RadCom*. I find it both sad and strange that he should find it necessary to go QRT because he is unable to find sufficient inspiration or information from which to build a simple amateur radio project.

He quotes my recent article as a possible contender but then says that there is insufficient information. I am not surprised. If I wanted to take up motor racing I would not start by entering the Grand Prix; such a project is for the experienced constructor. The beginner with little or no experience should start with simple projects, perhaps a simple audio amplifier, a DC receiver, or some item of test equipment such as a GDO.

The newcomer will initially make lots of silly mistakes, and even the most simple circuit may not work, but this is how the knowledge begins. Every mistake is a potential lesson in fault finding; you learn how a basic circuit works, what stops it working and those items that are critical to correct operation.

There is no substitute for experience. The more you try to build the more you will learn and, as a result, you learn to do things for yourself such as designing your own simple circuits.

Initially you must find some ideas and this is where G4LXN claims to have failed. I wonder has he a copy of the ARRL Handbook (any year), a copy of the *QRP Circuits Manual*, the ARRL *Solid State Design Manual* or what about *Ham Radio* (The American one) available through the RSGB. There are dozens of publications containing hundreds of simple designs for the newcomer.

I started constructing radio equipment at the age of 13. Many of the articles in the few magazines that existed were over my head, but it did not stop me. As I recall I found a book in the local library covering one, two and three-valve radios. No instructions are so comprehensive that they tell you everything; you have to think a bit for yourself, experiment a little and persist until something eventually works. I taught myself to pass the RAE from the only book available, the ARRL Handbook. It took three months.

In 1989 you can buy electronic components by just picking up the telephone from numerous suppliers; there are rallies nearly every weekend of the year with thousands of components on offer; and there are books and manuals containing almost every circuit that you could ever think of. It has never been easier, but at the end of the day it is down to the individual – you will only get out of it what you put into it. I am not an engineer, I have never had any training in radio at all, yet I have never had any trouble finding the necessary information to build my own equipment so why should G4LXN by any different.

I can recall an amateur of my vintage who went QRT shortly after receiving his licence; the reason did not emerge for a while but it appeared that other amateurs had laughed at him because he had a brand new commercial rig! How times have changed, but I expect in the final analysis both he and G4LXN have something in common. Neither were very interested in amateur radio in the first place, or they would not have been so easily put off.

Incidentally, in mid-December I worked Dave, G4HMC, who was using my design from the Oct/Nov RadCom. This, plus the numerous other enquiries I have received has restored my faith in the more traditional side of amateur radio. Home brewing is indeed alive and well. Come on G4LXN, if you are really interested in amateur radio get some more books and start building – you will never regret it. *M J Grierson, G3TSO*

VHF EGO TRIP?

Further to the article "It's volts that jolts – a winter's tale" which appeared on page 20 of RadCom for January 1989, I would like to point out one or two items which were not mentioned in the article.

The property mentioned was probably built before the widespread use of washing machines, dishwashers, fridges, freezers and electric cookers. This means that the electricity supply to the house would not have been designed with these appliances in mind.

City supplies usually are capable of taking these loads because the concentration of electrical loads in one area demands more robust systems. However, overhead line systems to rural areas suffer from the fact that the load is spread out and long runs of overhead line are required to reach them.The voltage drop compensations required to give our friend, the author, a stable supply would require complex monitoring systems, or a lot of money spent upon uprating the network.If the property is such a ".. spiffing VHF QTH.." why does the author require a linear amplifier using a 4CX350? Surely he could prove his operating abilities by using lower power? Or perhaps he is on some sort of Ego trip!

Finally, Electricity Boards do investigate and improve supplies upon receipt of complaints of low or high voltage. However, a simple job such as replacing the transformer, high voltage overhead line and low voltage feeder to the house would run into thousands of pounds. Who would pay? The author who's load is causing the problems? Or the rest of us mere mortals who live in the city and operate with lower power, using the better VHF conditions to get a little further? *D J Ackrill, G0DJA.*

I fear that Mr Ackrill has rather comprehensively missed the point of the article, which is all the more surprising insofar as I understand that he is employed in the electricity supply industry. He should, therefore, be familiar with the statutory requirements relating to the maintenance of voltage and frequency at a consumer's premises. Also, of course, the matter of whether or not the property was built "...before the widespread use of washing machines, dishwashers, fridges...etc" is quite irrelevant to the fact that the Board has a statutory obligation to maintain its supply within certain defined parameters. A statutory obligation remains a statutory obligation. Mr Ackrill will be interested to learn that the property in question was converted and the supply to it installed in 1983: although we are not as advanced as Birmingham in these matters, electric domestic appliances were quite common in the county of Powys by the early 1980s. It is also an incontrovertible fact that my local electricity board has shown not the slightest interest in acknowledging that a problem exists, contrary to the implication in Mr Ackrill's last paragraph. As a matter of record, I understand from other correspondence received as a result of this article that many other amateurs in the UK have suffered from the twin problems of poor regulation and the unwillingness of their local electricity board to consider the matter. On Mr Ackrill's other point, it is not "...the author who's (sic) load is causing the problem"; the article made it clear that both line and load regulation were inadequate, and as a matter of fact the off-load line regulation at this site is very sub-standard at around 10per cent.

I was amused by Mr Ackrill's suggestion that operating ability is an inverse function of the amplifier power used by the operator and that those who choose to use high amplifier power from good sites are on an "...ego trip". This merely demonstrates a lack of knowledge of the factors affecting VHF propagation. Firstly, I am afraid that the laws of physics are immutable and that the requirements for working real DX via earth-moon-earth and aurora involve high effective radiated power (not merely high amplifier power) however "spiffing" the QTH. I assume that Mr Ackrill habitually uses low transmitter power, and assumes from my article that I habitually use high transmitter power. Even if both these assumptions are true, neither tells the full story of our respective station's capabilities: that would only emerge if our respective antennas were taken into account. However, if my assumption is correct, I expect that the stations which Mr Ackrill is able to work when conditions are good are those who – like myself – run high ERP. Presumably they are all – like myself – on an ego trip, in which case I assume that he will henceforth decline to work any strong European station he hears when conditions are good.

I have every respect for the QRP fraternity. However, Mr Ackrill's implied suggestion that all QRP operators are good operators is very far from true. Many seem to feel, for example, that running low power entitles them to call out of turn in a pile-up when specific areas or prefixes have been requested. Many UK 144MHz QRP operators appear to favour protracted CQ calls when conditions are good, which achieve nothing apart from causing interference. Equally, it is notable that a very large number of low- and medium-power 144MHz stations in the UK radiate transmissions which are of considerably poorer quality than many from those which run the full legal limit. More seriously, those who enjoy low-power VHF DX work generally fail to recognise and acknowledge an important point. This is that the DX with which they make contact usually consists of those who have taken the trouble to put together a station which will hold up both ends of the QSO. Amongst other things, this normally involves a high-gain antenna and high transmitter power. I have a large number of QSL cards from Mr Ackrill's counterparts in Europe, many of which carry statements of the form "first GW" or "mni tnx new square" or "FB for my 3W". In other words, some of us are quite happy to be DX for others as well as to take advantage of those operators who have been willing to erect good antennas and use high power.

All in all, I rather think that Mr Ackrill would benefit considerably from a few hours' study of the equations governing path loss capability. He will doubtless discover that high amplifier power is the least effective way of improving the station's DX performance under everyday conditions. What is far more important are a) the site and its take-off and b) the antenna used by the station.

G4FRX

DILIGENCE AND TACTICS ARE THE ANSWER

In answer to the pleas from G1UGA (Sec. Greater Peterborough Amateur Radio Club) in "The Last Word", RadCom, January 1989, the schools in my area operate internal clubs during school time and for an hour after school finishes. These take the form of Computer, Electronics, Music etc clubs. What we need to do is to take Amateur Radio to them, not wait for them to come to us. At the school you would have a captive audience!!

Your first step is to find out what clubs operate in your local schools. Computers and Electronics are the obvious ones to start with. Contact the teacher who runs the club, get him interested and you are half way there.

Seek the assistance of retired radio amateurs for the display because they will be able to attend during school time. Continuity is the key, so be prepared to attend at least three weeks in a row. Invite the teacher and the children around to your house to see your station, ply them with cakes, and get them interested.

What about the RSGB having a mobile Amateur Radio Information Van which could visit the schools? It could be fitted out with all examples of our hobby. Funding would come from the many Amateur Radio equipment suppliers who have a vested interest in seeing our hobby flourish.

Steve Foster, G4MPK.

DO WE REALLY NEED THE EXTRA CHANNELS?

Over recent months, and no doubt triggered by Angus McKenzie's excellent analysis, I have heard considerable discussion regarding the occupancy of the 2 metre FM band. I am surprised, however, that two points do not seem to have been considered.

First, in view of the high occupancy of the band, is FM and channelisation really necessary? Under present standards, one FM transmission takes the bandwidth of at least four AM stations or eight using SSB. Putting it another way, twelve FM channels occupy the same amount of the frequency spectrum as the whole of the eighty metre band. A change of mode, coupled with dechannelisation and there would be room to spare.

Secondly, modern developments have made 40-50watt FM equipment commonplace. If located favourably and using a standard omni-directional aerial, a station using such equipment could reasonably expect a service area in the order of 50 miles radius. The channel which that station is using can therefore only carry a single contact over an area of 8000 square miles. Reduction of power to the minimum necessary would obviously help, but if even the simplest of beam aerials were used, this would immediately reduce that area by at least a half and permit a doubling of band occupancy "at a stroke'.

B Kendal, G3GDU

... word

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"They said I couldn't work DX with just 100 watts. Especially with a radio that has less than 1000 switches on the front panel.

But the truth is, I'm working lots of DX, more than some of these blockbuster types, thanks to my Yaesu FT-747GX.

You see, my no-nonsense FT-747GX was designed with me in mind, so I can hop around the band fast to nail those DX stations. While the other hams are warming up their amplifiers, I'm working the new country!

My FT-747GX has a super receiver, with a directly-driven mixer for great overload protection. And, Yaesu included the CW filter in the purchase price (I used the money I saved on postage for the QSL cards!).

And my FT-747GX is loaded with other features. The receiver works from 100kHz straight through 30MHz, and it's a fantastic shortwave broadcast receiver. I can use all twenty memories for that alone! Plus it's got dual VFOs. A noise blanker. Split frequency operation for the pile-ups. And scanning up the band helps me check out openings as they happen.

I just put in the optional crystal oven, and next month I'm going to pick up the FM board.

And with the money I saved when I bought my FT-747GX, I got a second ten-metre antenna for satellite work on the high end of the band. I use my personal computer to tell me what satellites are going by, and the computer even sets the frequencies on the radio for me.

Now my friends are getting FT-747GX rigs, too. I knew they'd figure out my secret weapon sooner or later. But now I'm setting the pace!

Thanks, Yaesu. You've made a rig that makes sense, at a price I can afford."

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